



**State of Washington
DEPARTMENT OF FISH AND WILDLIFE**

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October 5, 2009

Dear Interested Parties:

The Washington Department of Fish and Wildlife (WDFW) has published a Draft Environmental Impact Statement (DEIS) titled: *Wolf Conservation and Management Plan for Washington*. This is a non-project review proposal. Non-project review allows agencies and the public to focus on issues that are ready for decision.

Gray wolves were classified as endangered in Washington at the federal level in 1973 and at the state level in 1980. They were delisted under federal law in 2009 in the eastern third of Washington, and remain federally listed in the western two-thirds of the state; they continue to be state listed throughout Washington. Expansion of a currently small breeding population of wolves in Washington is expected as a result of increased dispersal of wolves from recovering populations in Idaho and Montana, and dispersers from British Columbia.

In response to this, and in anticipation of the eventual return of all wolf management to the state, the Washington Department of Fish and Wildlife initiated development of a state wolf conservation and management plan. A determination of significance and request for comments on scope of an environmental impact statement (EIS) was issued August 1, 2007. WDFW appointed an advisory Wolf Working Group comprised of 17 citizens to provide recommendations on the plan to WDFW. The draft plan establishes conservation/recovery objectives for downlisting and delisting the species, and identifies strategies to address conflicts and achieve recovery. This draft plan and DEIS incorporate recommendations and suggestions from public scoping comments, peer review comments, WDFW reviews and the Wolf Working Group recommendations. The draft plan together with the DEIS is now available for a 95-day public review.

Public Meetings:

All of the following meetings will be from 6:30 to 9 pm

Tue., Oct. 20	Clarkston	Walla Walla Community College lecture hall 1470 Bridge ST
Wed., Oct. 21	Richland	Pacific NW National Laboratory auditorium 904 Battelle Blvd
Thu., Oct. 22	Yakima	Red Lion Hotel Yakima Center 607 E. Yakima AVE
Mon., Oct. 26	Colville	NEWA Fairgrounds Ag-Trade Center 317 West Astor AVE
Tue., Oct. 27	Spokane	Spokane Valley Center Place 2426 N Discovery Place
Wed., Oct. 28	Vancouver	Water Resources Education Center 4600 SE Columbia Way
Thu., Oct. 29	Aberdeen	Rotary Log Pavillion east of Aberdeen off Hwy 12
Mon., Nov. 2	Seattle	REI store 222 Yale AVE N
Wed., Nov. 4	Mount Vernon	Cottontree Inn Convention Center 2300 Market ST
Thu., Nov. 5	Sequim	Guy Cole Convention Center Carrie Blake Park, 212 Blake AVE
Mon., Nov. 9	Omak	Okanogan County Fairgrounds Agriplex Hwy 97 South
Tue., Nov. 10	Wenatchee	Chelan County PUD Auditorium 327 N Wenatchee Ave.

Agencies, affected tribes, and members of the public are invited to review and comment on this DEIS. We must receive your comments within 95 days of the date of issuing this DEIS. *This means we must receive your comments no later than 5pm on January 8, 2010.* See Fact Sheet for details on availability and commenting.

MAJOR CONCLUSIONS

Four alternatives for a wolf conservation and management plan in Washington were evaluated, including a no action alternative. The alternatives varied in how conservation of wolves in Washington could be accomplished and how conservation and management would be balanced. These included differences in geographic distribution of conservation targets, numbers of recovery areas, management options to address conflicts, and compensation for livestock depredation. Alternative 2, the draft wolf conservation and management plan, is the preferred alternative. The DEIS considers the possible environmental effects of each alternative.

AREAS OF CONTROVERSY AND UNCERTAINTY

Areas of controversy about developing a wolf conservation and management plan involve concerns in two primary areas: conservation/recovery and management of conflicts with livestock and big game ungulate species. Areas of controversy include the conservation targets for down listing and delisting the wolf in Washington, geographic distribution of recovery targets, whether there would be separate targets for far western Washington (including the Olympic Peninsula), management options that include lethal control, impacts on livestock, levels of compensation to be paid for wolf depredation of livestock, and impacts on hunted ungulates. Areas of uncertainty and concern include the biological adequacy of recovery objectives for down listing and delisting, whether recovery of the species in Washington will be hampered by human-caused mortality, what the impacts of recolonizing wolves will be to livestock producers, big game populations and recreational harvest opportunities, and how to address and resolve conflicts.

The foundation and goal of the proposed Wolf Conservation and Management Plan is to ensure the reestablishment of a self-sustaining population of wolves in the state and to encourage social tolerance for the species by reducing and addressing conflicts.

WDFW believes this draft environmental impact statement will assist decision makers to identify the key environmental issues and options associated with this non-project proposal. Based on comments received from agencies and interested parties during public review of this draft document, WDFW will prepare and distribute a Final Environmental Impact Statement (FEIS). The FEIS will be released in 2010.

Sincerely,



Teresa A. Eturaspe
SEPA Responsible Official
Washington State Fish & Wildlife
Habitat Program

DRAFT

Environmental Impact Statement (DEIS)

for the

**Wolf Conservation and Management Plan
for Washington**

LEAD AGENCY

Washington Department of Fish and Wildlife
Wildlife Program
600 Capitol Way N
Olympia, Washington

October 2009

Fact Sheet

Title: Wolf Conservation and Management Plan for Washington Draft Environmental Impact Statement (DEIS)

Description: This is a non-project review proposal. Wolves were classified as endangered in Washington at the federal level in 1973 and at the state level in 1980. They were delisted under federal law in 2009 in the eastern third of Washington, and remain federally listed in the western two-thirds of the state; and state listed throughout Washington. The expansion of a currently small breeding population of wolves in Washington is expected as a result of increased dispersal of wolves from recovering populations in Idaho and Montana, and dispersers from British Columbia.

In response to this, and in anticipation of the eventual return of all wolf management to the state, the Washington Department of Fish and Wildlife (WDFW) initiated development of a state wolf conservation and management plan. A determination of significance and request for comments on scope of an environmental impact statement EIS was issued August 1, 2007. WDFW appointed an advisory Wolf Working Group comprised of 17 citizens to provide recommendations on the plan to the Department.

The attached draft plan is the preferred alternative which was developed as a result of the alternatives studied. The draft plan establishes conservation/recovery objectives for downlisting and delisting the species, and identifies strategies to address conflicts and achieve recovery. This draft plan and Draft EIS incorporates recommendations and suggestions from public scoping comments, peer review comments, WDFW reviews and the Wolf Working Group recommendations. The draft plan together with the DEIS is now available for a 95-day public review.

Location: Statewide

Proponent and Lead Agency:

Washington Department of Fish and Wildlife (WDFW)
Wildlife Management Program
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5

6 **Permits and Licenses Required:** None required
7

8 **Authors and Principle Contributors:** WDFW Staff: Gary Wiles, Harriet Allen, John Pierce,
9 Rocky Beach, Dave Ware, Jerry Nelson, Donny Martorello, Steve Pozzanghera, Dave Brittell,
10 Madonna Luers, Jeff Lewis; Other: 43 peer reviewers (see Preferred Alternative 2, Appendix C).
11

12 **Date Issued:** The DEIS is available for review and download beginning October 5, 2009 on
13 WDFW's SEPA website at: <http://wdfw.wa.gov/hab/sepa/sepa.htm>
14

15 If you prefer a printed copy of the DEIS or CD (supplies limited), please contact the Wildlife
16 Program at (360) 902-2515.
17

18 **DEIS Comment Period:** Agencies, affected tribes, and members of the public are invited to
19 review and comment on this DEIS. We must receive your comments within 95 days of the date of
20 issuing this DEIS.
21

22 *This means we must receive your comments no later than 5pm on January 8, 2010.*
23

24 You can submit your comments by email, through the WDFW SEPA website comment link at
25 <http://www.wdfw.wa.gov/hab/sepa/sepa.htm>
26 Fax to: (360) 902-2946, or mail to the address below. When you send us your comments, please
27 include the name of the proposal in your comment letter:
28

29 **“Wolf Conservation and Management Plan DEIS”**
30

31 **Mail comments to:**
32 Responsible Official: Teresa A. Eturaspe
33 SEPA/NEPA Coordinator
34 600 Capitol Way North
35 Olympia, WA 98501-1091
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37
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1 **Meetings for Public Participation:**

2 **All of the following meetings will be from 6:30 to 9 p.m.**

3

4

Tue., Oct. 20	Clarkston	Walla Walla Community College lecture hall 1470 Bridge St.
Wed., Oct. 21	Richland	Pacific NW National Laboratory auditorium 904 Battelle Blvd.
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Tue., Nov. 10	Wenatchee	Chelan County PUD Auditorium 327 N. Wenatchee Ave.

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7 **Date Final Action is planned:** The Final Environmental Impact Statement (FEIS) on the Wolf

8 Conservation and Management Plan will be released in 2010.

9

10 **Date of Next Action and Subsequent Environmental Reviews:** The Final Environmental

11 Impact Statement (FEIS) is a non-project action. The Wolf Conservation and Management Plan will

12 be provided to the Washington Department of Fish and Wildlife (WDFW) Commission for action

13 in 2010.

1 **Literature citations for the references used in the DEIS are found in Section 5 of the DEIS**
2 **and in Chapter 15 of Preferred Alternative 2.**

3

4 **Distribution List:** Notice of the availability of this DEIS is posted on the WDFW SEPA website
5 at: <http://wdfw.wa.gov/hab/sepa/sepa.htm>, and it has been sent to local government planning
6 departments (city and county); affected Tribes; all state and federal agencies with jurisdiction and
7 interested parties. Printed hard copies have been sent to state and regional libraries and WDFW
8 Regional Offices.

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1. Executive Summary

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A wolf conservation and management plan is being developed for Washington. The purpose of the plan is to ensure the reestablishment of a self-sustaining population of gray wolves in Washington and to encourage social tolerance for the species by reducing and addressing conflicts. Four alternatives were considered in developing the plan, including a no action alternative. Other alternatives were considered but not studied in detail because they did not meet the purpose and need of the plan. The attached draft plan (Alternative 2) is the preferred alternative which was developed as a result of the alternatives studied. The draft plan establishes conservation/recovery objectives for downlisting and delisting the species, and identifies strategies to address conflicts and achieve recovery. This draft plan and draft Environmental Impact Statement incorporate recommendations and suggestions from public scoping comments, scientific peer review comments, WDFW reviews, and the Wolf Working Group recommendations.

Four alternatives for a wolf conservation and management plan in Washington were evaluated, including a no action alternative. The alternatives varied in how conservation of wolves in Washington could be accomplished and how conservation and management would be balanced. These included differences in geographic distribution of conservation targets, numbers of recovery areas, management options to address conflicts, and compensation for livestock depredation. The DEIS considers the possible environmental effects of each alternative.

Alternative 3 places the greatest emphasis on protection and restoration of wolves in Washington, but has less emphasis on management options for addressing wolf-livestock conflicts. Alternative 1 is feasible, but has a lower standard for protection and restoration of wolves in the state and a more aggressive lethal control strategy. Alternative 4 (the No Action Alternative) emphasizes protection and restoration of wolves using existing programs, but does not develop a conservation and management plan. As a result, wolves would continue to be listed as endangered until a state recovery plan was completed that established recovery objectives. Alternative 2, the draft wolf conservation and management plan, was selected as the Preferred Alternative because it meets the goals and objectives for establishing a long-term viable wolf population in Washington while at the same time addressing wolf-livestock conflicts and interactions between wolves and wild ungulates.

Translocation (moving animals from one recovery region in Washington to another for the purpose of establishing a new population) is a conservation tool in the draft plan that may be used to establish and expand wolf populations in recovery regions that wolves have failed to reach through natural dispersal. It is a key element of the plan and was broadly supported among members of the Wolf Working Group. To build public tolerance for wolves, the draft wolf conservation and management plan outlines a range of proactive (e.g., modified husbandry methods and non-lethal deterrents) and lethal management options for addressing wolf-livestock conflicts. Implementation of these would be based on the status of wolves to ensure that conservation/recovery objectives are

1 met. Non-lethal management will be emphasized while the species is recolonizing and will transition
2 to more flexible approaches as wolves progress toward a delisted status. The draft plan also includes
3 a program to compensate livestock producers for livestock losses due to wolves. Compensation will
4 be paid for confirmed and probable wolf losses using a two-tiered system based on the size of the
5 land parcel being grazed. It is also recommended that a program be developed by WDFW and a
6 multi-interest stakeholder group to compensate livestock owners for unknown losses (i.e., where
7 there is no direct evidence of depredation, but the owner can demonstrate a loss ratio in excess of
8 historical losses) in areas with wolves.

9 The effects that wolves will have on elk, deer, and other ungulate populations and hunter harvest are
10 difficult to predict, but observations from neighboring states suggest that as wolf numbers increase
11 in Washington, there are likely to be localized impacts on ungulate abundance or habitat use.
12 Improved habitat management, flexibility in harvest strategies, and greater prevention of illegal
13 hunting are recommended as measures for sustaining healthy ungulate populations that will support
14 wolves and maintain harvest opportunities.

15 This draft wolf conservation and management plan recommends that information and training
16 about the low risk of wolf attacks, preventing habituation, and learning to live with wolves be
17 provided to hunters, trappers, rural landowners, outdoor recreationists, outfitters and guides, forest
18 workers and contractors, and others who might encounter wolves. Dog owners need to be
19 informed on ways to reduce interactions between dogs and wolves and the public should be made
20 aware of the risks posed by wolf-dog hybrids and pet wolves. Implementation of a public outreach
21 and education program is a high priority for aiding reestablishment of wolves.

2. Background

2.1. State Environmental Policy Act Process Overview

The Washington Department of Fish and Wildlife (WDFW) recognizes the importance of the State Environmental Policy Act (SEPA) in the process of developing a draft wolf conservation and management plan for the state. The environmental impact statement (EIS) process provides opportunities for other agencies, stakeholders, tribal governments, and the public to participate in developing and analyzing information. This process, as detailed in WAC 197-11-440 helps ensure that WDFW understands the environmental consequences of its decisions and considers mitigation of probable significant adverse environmental impacts when making decisions. The SEPA process is being used for the development of a wolf conservation and management plan for Washington to ensure public input into the plan. Key steps in the EIS process include:

- Scoping
- Preparing a draft EIS, which analyzes the probable impacts of a proposal and reasonable alternatives
- Issuing a draft EIS for review and public comment
- Preparing a final EIS, which includes analyzing and responding to comments received on the draft EIS
- Issuing a final EIS
- Using the final EIS in decision-making.

2.2. Scoping

Scoping initiates public involvement in the SEPA process. Its three purposes are to:

- Narrow the focus of the EIS to significant environmental issues;
- Eliminate insignificant impact issues or those not directly related to the proposal; and
- Help identify reasonable alternatives, consistent with the purpose and need of the proposed action, to be analyzed in the EIS.

The scoping process alerts the public, the project proponent, and the lead agency to areas of concern and potential controversy early in the process. Here, WDFW is both the project proponent and the lead agency. The SEPA process for the wolf conservation and management plan was formally initiated in August 2007. A 30-day scoping notice was sent on August 1, 2007 via mailings to state resource agencies, federal agencies, counties, cities, and tribes; a news release; and posting on the WDFW website to solicit input on issues and alternatives that should be considered in development of the plan. In addition, seven public scoping meetings were held between August 14-23, 2007 in Spokane, Clarkston, Yakima, Twisp, Sequim, Bellingham, and Vancouver, Washington, to solicit input. A total of 311 people attended the meetings and provided comments on wolf

1 conservation, wolf population objectives, wolf-livestock conflicts, wolf-game species interactions,
2 wolf-human interactions, and a variety of related issues.

3
4 In addition to the formal scoping process, the WDFW Director appointed a Wolf Working Group
5 in early 2007 to advise and provide recommendations to WDFW on the preparation of the draft
6 wolf conservation and management plan. The group was comprised of 18 members (later reduced
7 to 17; Appendix A) that represented both a broad range of perspectives and values on wolf
8 conservation and management in Washington and the geographic scope of the state. The group met
9 eight times over a 15-month period from February 2007 to May 2008 to develop recommendations
10 that balanced wolf conservation and management for WDFW to consider in the draft plan for
11 scientific peer review. Following scientific peer review, WDFW met with the group again for a
12 ninth meeting in September 2009 to solicit additional input on how the scientific peer review and
13 WDFW comments were addressed in the revised draft plan. Agendas and summaries from Working
14 Group meetings are available on the WDFW website at:
15 http://wdfw.wa.gov/wildlife/management/gray_wolf/working_group_meetings.html.

17 **2.3. Issues Identified Through Scoping**

18
19 The seven public scoping meetings conducted by WDFW in August 2007 produced numerous
20 comments pertaining to the conservation and management of wolves in Washington. These
21 comments are compiled in Appendix B and presented with information on whether the comment
22 was considered in preparation of the draft plan and the alternative, or whether it was outside the
23 scope of a wolf conservation and management plan for Washington.

24 The draft plan (Alternative 2) and other alternatives considered were developed using the public
25 scoping comments, the Wolf Working Group recommendations from meetings 1 through 8, peer
26 review comments, WDFW review comments, and the Wolf Working Group suggestions from
27 meeting 9.

28 **2.4. Non-Project Proposal**

29
30 The draft wolf conservation and management plan (hereafter referred to as “the plan” or “draft
31 plan”, or Alternative 2) is considered to be a “non-project action” under SEPA (WAC 197-11-442).
32 Non-project actions include the adoption of plans, policies, programs, or regulations containing
33 standards that will guide future actions. The probable significant adverse environmental impacts
34 analyzed in a non-project EIS are those impacts foreseeable at this stage, before specific project
35 actions are planned. If more specific actions are needed in the future, management decisions will be
36 guided by the policies developed during this process.

1 **2.5. Purpose and Need for the Non-Project Action**

2

3 **2.5.1. Purpose**

4 The purpose of the wolf conservation and management plan is to ensure the reestablishment of a
5 self-sustaining population of gray wolves in Washington and to encourage social tolerance for the
6 species by reducing and addressing conflicts.

7 **2.5.2. Need**

8 Wolves were classified as endangered in Washington at the federal level in 1973 and at the state level
9 in 1980. They were delisted under federal law in 2009 in the eastern third of Washington, and
10 remain federally listed in the western two-thirds of the state, and state-listed throughout
11 Washington. As of October 2009, a final court decision is pending on whether to relist the
12 Northern Rocky Mountain population under federal law, including the eastern third of Washington.

13 Gray wolves were formerly common throughout most of Washington, but declined rapidly as a
14 result of aggressive control efforts by Euro-American settlers that took up ranching and farming in
15 Washington from 1850-1900. Wolves were essentially eliminated as a breeding species from the
16 state by the 1930s, although infrequent reports of animals continued in the following decades,
17 suggesting that small numbers of individuals continued to disperse into Washington from
18 neighboring states and British Columbia. Intensified survey work to detect wolves in the early to
19 mid-1990s resulted in increased numbers of confirmed and probable wolf records, with three likely
20 breeding records. Reliable reports of wolves have again increased since 2005, originating mostly
21 from Pend Oreille and Stevens counties in the northeast, Okanogan County in north-central, and
22 the Blue Mountains in the southeast. As of September 2009, Washington had two breeding packs of
23 wolves; one was confirmed in Okanogan/Chelan counties in 2008 and one in Pend Oreille County
24 in 2009. There are also indications of an additional pack in the Blue Mountains and a few solitary
25 wolves in other scattered locations.

26 The expansion of a currently small breeding population in Washington is expected as a result of
27 increased dispersal of wolves from recovering populations in Idaho and Montana, and dispersers
28 from British Columbia. In response to this, and in anticipation of the eventual return of all wolf
29 management responsibilities to the state, WDFW initiated development of a state wolf conservation
30 and management plan.

31 The wolf conservation and management plan is the outline for state management and is designed to
32 restore and protect a self-sustaining wolf population in Washington. Washington's procedures for
33 listing and delisting endangered, threatened and sensitive species are found in WAC 232-12-297
34 (Appendix F in Alternative 2: Draft Wolf Conservation and Management Plan). The procedures
35 include requirements to set target recovery objectives for downlisting and delisting, and to identify
36 management and recovery strategies to protect and restore listed species.

1 **2.5.3. Plan Goals**

2 The goals of the wolf conservation and management plan are to:

- 3 1. Restore the wolf population in Washington to a self-sustaining size and geographic
4 distribution that will result in wolves having a high probability of persisting in the state
5 through the foreseeable future (>100 years).
- 6 2. Manage wolf-livestock conflicts in a way that minimizes livestock losses, while at the same
7 time not negatively impacting the recovery or long-term perpetuation of a sustainable wolf
8 population.
- 9 3. Manage ungulate populations in Washington to maintain harvest opportunities for hunters
10 and an adequate prey base for wolves so that wolf conservation goals can be met.
- 11 4. Develop public understanding of the conservation and management needs of wolves in
12 Washington, thereby promoting the public's coexistence with the species.

13 **2.6. Alternatives**

14

15 Alternative strategies are one of the required components of an EIS, including a no action
16 alternative. They present meaningful options for WDFW to consider in managing gray wolves in
17 Washington. The four alternatives presented in the draft EIS incorporate information gathered and
18 issues raised through the SEPA scoping process, the working group discussions and
19 recommendations, and the results of scientific peer review. The set of alternatives considered for
20 this draft EIS are described in Chapter 2 and summarized in Table 1. These alternatives present
21 choices consistent with the purpose and need of the plan as described in the previous section (see
22 Purpose and Need for the Non-Project Action).

23

24 **2.7. Affected Environment, Significant Impacts, and Mitigation Measures**

25

26 The draft wolf conservation and management plan consists of a set of strategies that strive to
27 balance WDFW's mandate to conserve and recover endangered gray wolf populations, while
28 addressing wolf-livestock, wolf ungulate, and wolf-human conflicts. The potential environmental
29 impacts that might result from the approval and implementation of this non-project action are
30 evaluated in Chapter 4. This section of the draft EIS describes the existing environment that might
31 be affected by the proposal and analyzes significant impacts of alternatives, including the proposed
32 action.

33

34 The draft EIS analyzes the environmental impacts of four alternatives to assess their risk of possible
35 significant adverse impacts to elements of the environment and to identify mitigation measures that
36 would avoid or minimize related adverse environmental impacts. Although this is a non-project

1 proposal, to the degree possible, the analysis of impacts in the draft EIS considers the current and
2 anticipated factors that may affect gray wolf recovery and other elements of the natural and built
3 environment that could result from implementation of proposed management strategies in the
4 preferred and other alternatives. Specific actions that may be proposed in the future relating to gray
5 wolf management in Washington would be evaluated under a supplemental environmental impact
6 statement process.

7
8 Each of the four alternatives is evaluated for both positive and negative potential environmental
9 impacts to elements of the environment. The “elements of the environment” that were evaluated
10 came from the list in WAC 197-11-444 (Appendix C). Those selected for evaluation were ones that
11 had a possible impact related to implementation of the draft plan alternatives. The elements were
12 associated with both the (1) natural environment and the (2) built environment (WAC 197-11-444,
13 elements of the environment).

14 15 **2.8. Next Steps**

16
17 This draft EIS will be available for public review from October 5, 2009 until January 8, 2010.
18 WDFW will accept comments on the draft EIS and draft wolf conservation and management plan at
19 public meetings, through written postal-mail, and through emails to the WDFW website. From
20 October 20 through November 10, 2009, WDFW will hold 12 public meetings in Clarkston,
21 Spokane, Colville, Tri-Cities, Yakima, Seattle, Mt. Vernon, Aberdeen, Vancouver, Omak,
22 Wenatchee, and Sequim, Washington (see Fact Sheet). These meetings will provide the public with
23 an opportunity to learn about the draft EIS (including alternatives considered and the preferred
24 alternative), to ask questions and give comments. Concurrent with the public review period,
25 WDFW will also be submitting the draft plan to an additional blind scientific peer review through
26 the University of Washington.

27
28 The comments from the public review and blind peer review will be addressed and responded to in
29 the final EIS, which is expected to be completed in 2010. The final EIS will provide decision-
30 makers - the Washington Fish and Wildlife Commission - with the information needed to make an
31 informed decision on adoption of a final wolf conservation and management plan for the state of
32 Washington. Upon approval of the final plan, WDFW will use it to guide the conservation and
33 management measures implemented to achieve the eventual recovery and delisting of the species.

34

3. Alternatives

This chapter describes and compares four alternatives for a wolf conservation and management plan for Washington, including a “no action” alternative (Table 1). In comparing the alternatives it defines the differences between each alternative and provides a clear basis for choice among options by the decision maker and the public. It also includes alternatives considered, but not studied in detail because they did not meet the purpose and need of the plan.

This chapter describes the following:

- Alternatives considered but eliminated from detailed analysis
- Descriptions of alternatives considered in detail, with comparisons to the preferred alternative
- Selection of the preferred alternative

3.1. Alternatives Considered, but Eliminated from Detailed Analysis

Under SEPA, a “reasonable alternative” is defined as “an action that could feasibly attain or approximate a proposal’s objectives, but at a lower environmental cost or decreased level of environmental degradation.” Reasonable alternatives may be those over which an agency with jurisdiction has authority to control impacts, either directly or indirectly (WAC 197-11-786). For this draft EIS, suggestions for various alternatives were made to WDFW during the scoping and Wolf Working Group discussions. These were considered, but were excluded from detailed analysis because they did not meet the stated purpose and need of the draft plan and were not considered to be “reasonable.” These included:

- 1) Not setting any recovery objectives at this time.
- 2) Setting targets for delisting at some level lower than 15 successful breeding pairs.
- 3) Restoring wolves to historic populations in the state.
- 4) Having the number of years to achieve recovery objectives be less than 3 years.
- 5) Reducing the geographic extent that wolves would need to occupy to achieve recovery objectives.
- 6) Reintroduction of wolves from outside the state.
- 7) Not allowing wolves to recover in Washington.

The alternative of not setting any recovery objectives at this time is similar to the “no action” Alternative 4 that is described in detail. Wolves would remain listed as endangered until a recovery plan was developed that established recovery objectives for downlisting and delisting. The option of not establishing conservation/recovery objectives until some wolf packs had established in the state was initially discussed with the Wolf Working Group. Modeling of the habitat use, demographics, and genetic considerations could then be used to derive scientifically-based estimates of the wolf

1 numbers needed for recovery, which would then be placed in a future version of the plan. All
2 Working Group members rejected this approach and recommended the inclusion of specific
3 recovery objectives in the plan. It was determined that measureable objectives needed to be
4 established to: meet state law (WAC 232-12-297); develop and implement management and
5 conservation strategies that would recover a self-sustaining population in the state; and determine
6 when downlisting and delisting could occur. The alternative of having no recovery objectives does
7 not meet the purpose and need of the plan.

8
9 Reduced numbers of successful breeding pairs for the conservation/recovery objectives would not
10 meet the goal of the draft wolf conservation and management plan to “restore the wolf population
11 in Washington to a self-sustaining size and geographic distribution that will result in wolves having a
12 high probability of persisting in the state through the foreseeable future (>100 years).” Based on
13 scientific information about wolf population viability (see Chapter 3, Section A, of the draft plan,
14 Alternative 2) and initial scientific peer review of the conservation/recovery objectives proposed in
15 the draft plan, the targets of 6, 12, and 15 successful breeding pairs for downlisting and delisting that
16 are used in Alternatives 1, 2 and 3 are considered minimal or barely adequate for achieving
17 population viability and recovery.

18
19 Restoring wolves to historic population levels was also excluded from consideration by WDFW at
20 the beginning of the process because it is an attainable goal given the many changes to Washington’s
21 landscape during the past 150 years.

22
23 The three-year criteria and distribution requirements in three recovery regions are factors that
24 contribute to the 15 breeding pairs being considered adequate to achieve recovery. For these
25 reasons, proposals incorporating smaller numbers of successful breeding pairs, reduced geographic
26 distribution, or shorter time requirements for the targets for downlisting and delisting wolves in
27 Washington carry a high risk of not achieving the conservation purpose of the draft plan. Such
28 proposals do not allow for robustness of the population on the landscape over time in light of
29 fluctuations in numbers between years, genetic issues, and other considerations.

30
31 Another alternative that was identified in the public scoping and considered, but not analyzed in
32 detail, was the reintroduction of wolves into Washington from outside the state. One of the policy
33 sideboards for the plan that was established by the WDFW director was that wolves would not be
34 reintroduced into Washington from outside of the state to assist recovery. Instead, recovery would
35 depend on wolves naturally dispersing back into the state on their own. It was determined that
36 reintroduction would be an expensive, highly controversial, and unnecessary step because wolves
37 were already dispersing into the state on their own and would continue to do so.

38
39 Lastly, the alternative of “no wolves”, or not allowing wolves to recover in Washington, was not
40 deemed reasonable and was specifically identified by the WDFW Director as one of the

1 “sideboards” at the beginning of the planning process. Having no wolves was not an option, and
2 clearly did not meet the stated purpose and need of the plan.

3 4 **3.2. Descriptions of Alternatives Considered in Detail, with Comparisons to** 5 **the Preferred Alternative**

6
7 The four alternatives developed represent a range of options for balancing the conservation and
8 management of wolves in Washington (Table 1). Alternatives 1-3 are consistent with the purpose
9 and need of the plan (see Chapter 1, Purpose and Need of the Non-project Action. Alternative 4,
10 the “no action” alternative, is presented and analyzed because it is required for SEPA; however, it
11 would not meet the purpose and need of the plan.

12
13 The conservation/recovery objectives of 6, 12, and 15 successful breeding pairs for downlisting and
14 delisting are constant within all of the alternatives, except Alternative 4, where there would be no
15 conservation/recovery objectives developed. These conservation/recovery objectives are
16 considered minimum for recovery in Washington and to meet the purpose and need of the plan to
17 achieve a viable population of wolves in the state that would persist over the long term. Alternatives
18 1-3 vary in how the numbers of successful breeding pairs are distributed among recovery regions for
19 downlisting and delisting criteria. Alternatives 1 and 2 each have three recovery regions (Figure 1);
20 and Alternative 3 has four recovery regions (Figure 2).

21
22 The four alternatives considered in developing the draft plan are described with respect to the
23 primary elements of conservation and management strategies that are included in each and shown
24 on Table 1. Human mortality is the single most important factor influencing recovery of wolves.
25 As such, conserving wolves in Washington and meeting the delisting criteria will necessitate social
26 tolerance for wolves on both public and private lands. It is unusual to include lethal management
27 strategies in a plan for recovery of a listed species. However, to build public tolerance for wolves, a
28 range of proactive, non-lethal, and lethal management options, as well as compensation, are outlined
29 in the four alternatives to address wolf-livestock conflicts. Programs to compensate livestock
30 producers for wolf-caused losses of livestock assist wolf recovery efforts by shifting some of the
31 economic burden associated with wolf restoration away from producers, thereby increasing overall
32 tolerance for the species. Lethal control of wolves may be necessary to resolve repeated wolf-
33 livestock conflicts and would be performed to remove problem animals that jeopardize public
34 tolerance for overall wolf recovery. Implementation of management options that include lethal
35 control would be based on the status of wolves to ensure that conservation/recovery objectives are
36 met; and the four alternatives vary on when these management options become available.

37 38 **3.2.1. Brief Summary of Alternatives**

39
40 **Alternative 1:** This alternative has a lower standard for protection and restoration of wolves in the
41 state and a more aggressive lethal control strategy (Table 1). It would implement lethal control

1 options at earlier listing statuses than the other alternatives. It sets a lower standard for geographic
2 distribution of recovery objectives, such that state downlisting and delisting of the species could
3 occur with the majority of animals present in one or two recovery regions. It allows earlier
4 implementation of management tools for addressing livestock conflicts, and it also recommends a
5 less generous compensation package for documented incidents of depredation.

6 **Alternative 2 (Preferred Alternative; Draft Wolf Conservation and Management Plan):** This
7 alternative meets the goals and objectives for establishing a long-term viable wolf population while
8 at the same time addressing wolf-livestock conflicts and interactions between wolves and ungulates.
9 It sets a moderate geographic distribution of conservation/recovery objectives for downlisting and
10 delisting, with an emphasis on adequate numbers being present in the Southern
11 Cascades/Northwest Coast recovery region, but does not require establishment of wolves in a
12 fourth Pacific Coast recovery region to achieve delisting. This alternative includes a range of
13 proactive, non-lethal and lethal control options for addressing livestock conflicts, and recommends
14 generous compensation for dealing with confirmed and probable depredations.

15 **Alternative 3:** This alternative places the greatest emphasis on protection and restoration of
16 wolves in Washington. It has a higher standard for the geographic distribution of
17 conservation/recovery objectives for downlisting and delisting wolves, including a requirement that
18 they be present in a fourth recovery region, the Pacific Coast Recovery Region (Figure 2), before the
19 species can be downlisted and delisted. This alternative is the most conservative on when
20 management tools for addressing livestock conflicts can be implemented, and it also recommends
21 the most generous compensation package for documented cases of confirmed and probable
22 depredation.

23 **Alternative 4 – No Action (Current Management):** This alternative emphasizes protection and
24 restoration of wolves using existing programs, but does not develop a conservation and
25 management plan for the Washington. As a result, wolves would continue to be listed as
26 endangered until a state recovery plan was completed that established recovery objectives. Limited
27 management options would be used to address conflicts, and compensation provided for livestock
28 depredation would be through the Defenders of Wildlife program or the Washington State
29 legislature.

Table 1. Four alternatives for a wolf conservation and management plan for Washington that were studied in detail, including a no action alternative. Other alternatives, with lower recovery objectives, reduced distribution and reintroduction, were considered, but not studied in detail because they did not meet the purpose and need for developing a wolf conservation and management plan.

Element	Alternative 1	Alternative 2 Preferred (Draft Plan)	Alternative 3	Alternative 4 No Action – Current Management
Number of recovery regions	(3) <ul style="list-style-type: none"> ▪ Eastern Washington ▪ Northern Cascades ▪ Southern Cascades/ Northwest Coast 	(3) <ul style="list-style-type: none"> ▪ Eastern Washington ▪ Northern Cascades ▪ Southern Cascades/ Northwest Coast 	(4) <ul style="list-style-type: none"> ▪ Eastern Washington ▪ Northern Cascades ▪ Southern Cascades ▪ Pacific Coast 	None designated
Distribution requirements for number of successful breeding pairs in each recovery region to downlist and delist				
Downlist to Threatened (6 successful breeding pairs)	2 in Eastern Washington 2 in Northern Cascades 2 anywhere in state	2 in Eastern Washington 2 in Northern Cascades 2 in Southern Cascades/ Northwest Coast	2 in Eastern Washington 2 in Northern Cascades 2 in Southern Cascades or Pacific Coast	None established. Wolves would remain listed as Endangered until a state recovery plan was developed, with objectives for downlisting and delisting.
Downlist to Sensitive (12 successful breeding pairs)	2 in Eastern Washington 2 in Northern Cascades 2 in Southern Cascades/ Northwest Coast 6 anywhere in state	2 in Eastern Washington 2 in Northern Cascades 5 in Southern Cascades/ Northwest Coast 3 anywhere in state	3 in Eastern Washington 3 in North Cascades 3 in South Cascades 3 in Pacific Coast	None established. Wolves would remain listed as Endangered until a state recovery plan was developed, with objectives for downlisting and delisting.
Delist (15 successful breeding pairs)	2 in Eastern Washington 2 in Northern Cascades 2 in Southern Cascades/ Northwest Coast 9 anywhere in state	2 in Eastern Washington 2 in North Cascades 5 in Southern Cascades/ Northwest Coast 6 anywhere in state	3 in Eastern Washington 3 in North Cascades 3 in Southern Cascades 3 in Pacific Coast 3 anywhere in state	None established. Wolves would remain listed until a state recovery plan was developed, with objectives for downlisting and delisting.
Translocation of wolves from one area of Washington to another to establish a new population	Available as a tool	Available as a tool	Available as a tool	Available as a tool

Table 1. Four alternatives for a wolf conservation and management plan for Washington that were studied in detail, including a no action alternative. Other alternatives, with lower recovery objectives, reduced distribution and reintroduction, were considered, but not studied in detail because they did not meet the purpose and need for developing a wolf conservation and management plan.

Element	Alternative 1	Alternative 2 Preferred (Draft Plan)	Alternative 3	Alternative 4 No Action – Current Management
Manage for landscape connectivity	Continue existing efforts to maintain and restore habitat connectivity for wolves and other large-ranging carnivores.	Expand existing efforts to maintain and restore habitat connectivity for wolves.	Expand existing efforts to maintain and restore habitat connectivity for wolves.	Continue existing efforts to maintain and restore habitat connectivity for wolves and other large-ranging carnivores.
Use of non-lethal injurious harassment	Allowed with a permit and training from WDFW during all listed statuses ; will be reconsidered during Endangered status if used inappropriately or a mortality occurs under this provision.	Allowed with a permit and training from WDFW during all listed statuses ; will be reconsidered during Endangered status if used inappropriately or a mortality occurs under this provision.	Allowed with a permit and training from WDFW upon reaching Sensitive status ; will be reconsidered if used inappropriately or a mortality occurs under this provision.	Allowed with a permit and training from WDFW; will be reconsidered if used inappropriately or a mortality occurs under this provision.
Lethal control by state/federal agents of wolves involved in repeated livestock depredations	Allowed during all listed statuses and after delisting, consistent with federal law.	Allowed during all listed statuses and after delisting, consistent with federal law.	Allowed during all listed statuses and after delisting, consistent with federal law.	Allowed, consistent with federal law.
Lethal control by livestock owners (including family members and authorized employees) of wolves involved in repeated livestock depredations	Allowed with an issued permit on private lands and public grazing allotments they own or lease when wolves reach Threatened status .	Allowed with an issued permit on private lands and public grazing allotments they own or lease when wolves reach Sensitive status .	Allowed with an issued permit on private lands they own or lease when wolves reach Sensitive status .	Conditions and limitations of state law will be developed through rulemaking, as directed by SHB 1778 (effective July 1, 2010).

Table 1. Four alternatives for a wolf conservation and management plan for Washington that were studied in detail, including a no action alternative. Other alternatives, with lower recovery objectives, reduced distribution and reintroduction, were considered, but not studied in detail because they did not meet the purpose and need for developing a wolf conservation and management plan.

Element	Alternative 1	Alternative 2 Preferred (Draft Plan)	Alternative 3	Alternative 4 No Action – Current Management
Lethal take of wolves in the act of attacking (biting, wounding, or killing) livestock	Allowed by livestock owners (including family members and authorized employees) on private land they own or lease during all listed statuses . Would be reconsidered if used inappropriately or more than 2 mortalities occur under this provision in a year.	Allowed by livestock owners (including family members and authorized employees) on private land they own or lease when wolves reach Threatened status . Would be reconsidered if used inappropriately or more than 2 mortalities occur under this provision in a year.	Allowed by livestock owners (including family members and authorized employees) on private land they own or lease when wolves reach Sensitive status . Would be reconsidered if used inappropriately or more than 2 mortalities occur under this provision in a year.	Conditions and limitations of state law will be developed through rulemaking, as directed by SHB 1778 (effective July 1, 2010).
Lethal take of wolves in the act of attacking (biting, wounding, or killing) domestic dogs	Allowed by private citizens on private lands when wolves reach Threatened status , and on private and public land when wolves are delisted . Would be reconsidered if used inappropriately or more than 2 mortalities occur under this provision in a year.	Allowed by private citizens on private lands when wolves reach Sensitive status , and on private and public land when wolves are delisted . Would be reconsidered if used inappropriately or more than 2 mortalities occur under this provision in a year.	Allowed by private citizens on private and public land when wolves are delisted .	Conditions and limitations of state law will be developed through rulemaking, as directed by SHB 1778 (effective July 1, 2010).

Table 1. Four alternatives for a wolf conservation and management plan for Washington that were studied in detail, including a no action alternative. Other alternatives, with lower recovery objectives, reduced distribution and reintroduction, were considered, but not studied in detail because they did not meet the purpose and need for developing a wolf conservation and management plan.

Element	Alternative 1	Alternative 2 Preferred (Draft Plan)	Alternative 3	Alternative 4 No Action – Current Management
Compensation for livestock (cattle, calves, pigs, horses, mules, sheep, lambs, llamas, goats, guarding animals, and herding dogs)				
Payment for confirmed livestock depredation	<p>Full value for each confirmed depredation on all parcel sizes.</p> <p>Losses covered on private lands only.</p>	<p>Twice the full value for each confirmed depredation on grazing sites of 100 or more acres.</p> <p>Full value for each confirmed depredation on sites of less than 100 acres.</p> <p>Losses covered on both private and public lands.</p>	<p>Twice the full value for each confirmed depredation on all parcel sizes.</p> <p>Losses covered on both private and public lands.</p>	<p>Currently, losses would be paid by Defenders of Wildlife at full value on private and public lands. Future role of this program is unknown.</p> <p>Losses of cattle, sheep, and horses not covered by Defenders of Wildlife or other groups would be covered under the conditions and limitations of SHB 1778 (effective July 1, 2010).</p>
Payment for probable livestock depredation	<p>Half the full value for each probable depredation on all parcel sizes.</p> <p>Losses covered on private lands only.</p>	<p>Full value for each probable depredation on grazing sites of 100 or more acres.</p> <p>Half the value for each probable depredation on sites of less than 100 acres.</p> <p>Losses covered on private and public lands.</p>	<p>Full value for each probable depredation on grazing sites of all sizes.</p> <p>Losses covered on private and public lands.</p>	<p>Currently, losses would be paid by Defenders of Wildlife at half value on private and public lands. Future role of this program is unknown.</p> <p>Losses of cattle, sheep, and horses not covered by Defenders of Wildlife or other groups would be covered under the conditions and limitations of SHB 1778 (effective July 1, 2010).</p>

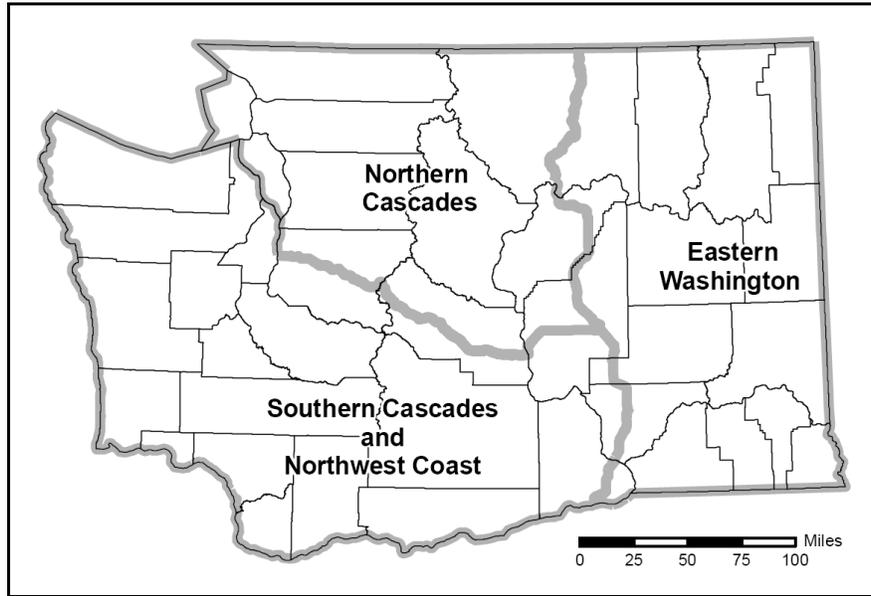
Table 1. Four alternatives for a wolf conservation and management plan for Washington that were studied in detail, including a no action alternative. Other alternatives, with lower recovery objectives, reduced distribution and reintroduction, were considered, but not studied in detail because they did not meet the purpose and need for developing a wolf conservation and management plan.

Element	Alternative 1	Alternative 2 Preferred (Draft Plan)	Alternative 3	Alternative 4 No Action – Current Management
Proactive measures to reduce depredation	<p>WDFW would work with livestock operators to provide technical assistance to implement proactive measures to reduce conflicts.</p> <p>Assistance with some costs may be paid by Defenders of Wildlife on a limited basis.</p>	<p>WDFW would hire wolf specialists, whose duties would include working with livestock operators to provide technical assistance to implement proactive measures to reduce conflicts.</p> <p>Assistance with some costs may be paid by Defenders of Wildlife on a limited basis.</p>	<p>WDFW would hire wolf specialists, whose duties would include working with livestock operators to provide technical assistance to implement proactive measures to reduce conflicts.</p> <p>Assistance with some costs may be paid by Defenders of Wildlife on a limited basis.</p>	<p>Currently, some costs of proactive measures would be paid by Defenders of Wildlife, but future role of this program is unknown.</p> <p>WDFW may offer some forms of technical assistance (including proactive measures) not covered by Defenders of Wildlife or other groups under the conditions and limitations of SHB 1778, (effective July 1, 2010).</p>
Ungulate management	<p>Manage for healthy ungulate populations through habitat improvement, harvest management, and reduction of illegal hunting using existing WDFW game management plans.</p>	<p>Manage for healthy ungulate populations through habitat improvement, harvest management, and reduction of illegal hunting. Manage harvest to benefit wolves only in localized areas if research has determined wolves are not meeting recovery objectives and prey availability is a limiting factor.</p>	<p>Manage for healthy ungulate populations through habitat improvement, harvest management, and reduction of illegal hunting. Manage harvest of ungulates to benefit wolves in each recovery region until recovery objectives for the region are met.</p>	<p>Manage for healthy ungulate populations through habitat improvement, harvest management, and reduction of illegal hunting using existing WDFW game management plans.</p>

Table 1. Four alternatives for a wolf conservation and management plan for Washington that were studied in detail, including a no action alternative. Other alternatives, with lower recovery objectives, reduced distribution and reintroduction, were considered, but not studied in detail because they did not meet the purpose and need for developing a wolf conservation and management plan.

Element	Alternative 1	Alternative 2 Preferred (Draft Plan)	Alternative 3	Alternative 4 No Action – Current Management
Wolf-ungulate conflict management	After wolves reach Sensitive status, if research determines that wolf predation is a limiting factor for ungulate populations that are below herd objectives , could consider moving, lethal control and other control techniques in localized areas.	After wolves are delisted , if research determines that wolf predation is a limiting factor for at-risk ungulate populations, could consider moving of wolves, lethal control, or other control techniques in localized areas.	After wolves are delisted , if research determines that wolf predation is a limiting factor for at-risk ungulate populations, could consider moving of wolves, or other non-lethal control techniques in localized areas.	Wolves would remain listed until a state recovery plan was developed with objectives for downlisting and delisting. Measures to address conflicts of this type would be delayed until wolves were delisted.
Outreach and education	Use existing WDFW staff to continue outreach and education at current levels.	Use WDFW wolf specialists to conduct outreach and education programs.	Use WDFW wolf specialists and staff to conduct outreach and education programs. Would be a high priority activity.	Use existing WDFW staff to continue outreach and education at current levels.

1

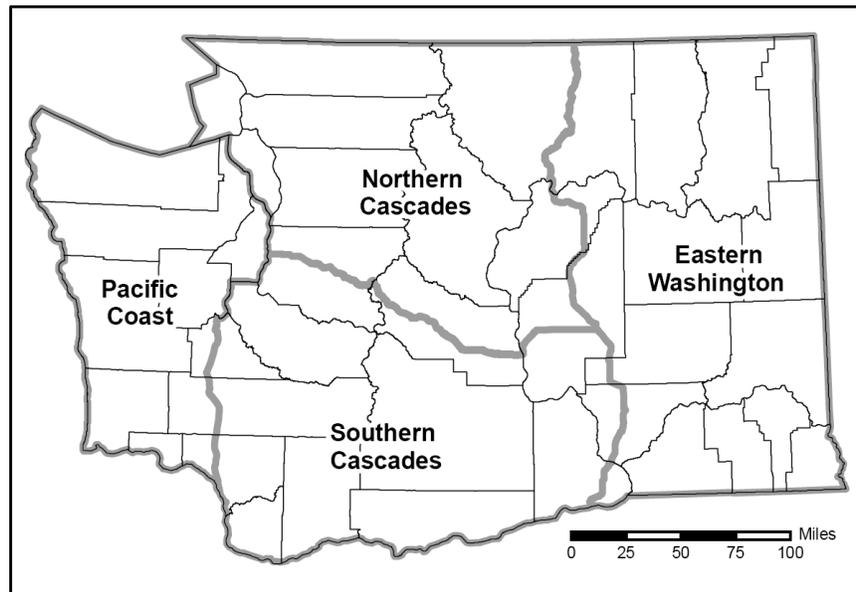


2

3 Figure 1. The three gray wolf recovery regions proposed for Washington in Alternative 1
4 and Alternative 2 (Preferred Alternative).

5

6



7

8 Figure 2. The four gray wolf recovery regions proposed for Washington in Alternative 3.

9

1 3.2.2. Alternative 2 (Preferred Alternative; Draft Wolf Conservation and Management Plan)

2 The draft wolf conservation and management plan is Alternative 2, the preferred alternative. The
3 objectives and strategies in the preferred alternative are intended to be both biologically and socially
4 acceptable. It attempts to provide a high likelihood of recovery of wolves in Washington, while
5 addressing livestock and ungulate conflicts to build social tolerance for wolf recovery. This
6 alternative calls for distribution of a recovered population in three recovery regions, but does not
7 require establishment of wolf populations in a fourth recovery region (the Pacific Coast, Figure 2) to
8 achieve delisting.

9 It sets moderate conservation objectives while addressing conflicts with livestock through increased
10 implementation of non-lethal proactive methods, use of lethal control, and generous compensation
11 for wolf depredation. It calls for managing ungulate prey populations through standard practices,
12 and acknowledges that adjustment of recreational harvest levels could be considered in the future to
13 benefit wolf conservation in certain limited situations; or alternatively, that management of at-risk
14 ungulate populations may require consideration of managing wolves to benefit ungulates after
15 delisting, if research identifies wolf predation as a limiting factor. This alternative recommends
16 translocation (moving animals from one area of Washington to another to establish a new
17 population), if needed; expanded efforts to maintain and restore landscape connectivity; and
18 expanded outreach and education efforts. The objectives and strategies to achieve delisting in
19 Alternative 2 are to:

- 20 1. Develop and implement a program to monitor the population status, trends, and
21 conservation and management needs of wolves in Washington.
- 22 2. Protect wolves from sources of mortality and disturbance at den sites.
- 23 3. Translocate wolves, if needed, to help achieve conservation/recovery objectives.
- 24 4. Develop and implement a comprehensive program to manage wolf-livestock conflicts in
25 cooperation with livestock producers.
- 26 5. Manage ungulate populations and habitats in Washington to provide an adequate prey base
27 for wolves and to maintain harvest opportunities for hunters.
- 28 6. Manage wolf-human interactions to reduce human safety concerns, prevent habituation of
29 wild wolves, decrease the risk of conflicts between domestic dogs and wolves, and to build
30 awareness of the risks posed by wolf hybrids and pet wolves.
- 31 7. Maintain and restore habitat connectivity for wolves in Washington.
- 32 8. Manage conflicts between wolves and state and federal listed/candidate species.
- 33 9. Develop and implement a comprehensive outreach and education program.

1 10. Coordinate and cooperate with public agencies, landowners, tribes, and non-governmental
2 organizations to help achieve wolf conservation and management objectives.

3 11. Conduct research on wolf biology, conservation, and management in Washington.

4 12. Report on and evaluate implementation of the plan.

5 Key elements of Alternative 2 (Preferred Alternative) are:

6 **Number of Recovery Regions:** This alternative establishes 3 recovery regions in the state: Eastern
7 Washington, Northern Cascades, and a combined Southern Cascades/Northwest Coast (Figure 1).

8 **Distribution Requirements for Downlisting and Delisting:** For Alternative 3, the
9 conservation/recovery objectives for downlisting and delisting are:

10 • From endangered to threatened: 6 successful breeding pairs present for 3 consecutive years,
11 with at least 2 successful breeding pairs in each of the three recovery regions.

12 • From threatened to sensitive: 12 successful breeding pairs present for 3 consecutive years,
13 with at least 2 successful breeding pairs each in the Eastern Washington and Northern
14 Cascades recovery regions, at least 5 successful breeding pairs in the Southern
15 Cascades/Northwest Coast Region, and 3 successful breeding pairs that could be distributed
16 in any of the three recovery regions.

17 • Delisting: 15 successful breeding pairs for 3 consecutive years, with at least 2 successful
18 breeding pairs each in the Eastern Washington and Northern Cascades recovery regions, at
19 least 5 successful breeding pairs in the Southern Cascades/Northwest Coast Region, and 6
20 successful breeding pairs that could be distributed in any of the three recovery regions.

21 **Translocation:** Translocation, which is defined as moving animals from one area of Washington to
22 another to establish a new population, is a key element of Alternative 2 and was broadly supported
23 among members of the Wolf Working Group. Under this alternative, translocation would be used if
24 wolves fail to reach one or more recovery regions through natural dispersal. Potential benefits from
25 translocation are that 1) it could be used to reduce wolf numbers in some regions where the species
26 has already exceeded recovery objectives, 2) it could hasten overall wolf recovery and downlisting in
27 the state, thereby leading to greater management flexibility in addressing conflicts, and 3) by
28 speeding recovery, it could help lower the overall costs associated with recovery.

29 **Manage for landscape connectivity:** Washington's objective of 15 successful breeding pairs
30 distributed across three recovery regions and maintained for 3 consecutive years is believed to be
31 sufficient to result in the reestablishment of self-sustaining wolf population in the state as long as
32 connectivity is maintained with populations in Idaho, Montana, British Columbia, and Oregon.
33 Within Washington, safe passage within and between habitat areas is vital for allowing wolves to
34 disperse and recolonize unoccupied habitat and for promoting genetic and demographic exchange

1 between subpopulations. On a regional scale, maintaining cross-border habitat linkages between
2 Washington and Idaho, British Columbia, and Oregon is vital to the reestablishment and long-term
3 viability of a wolf population in Washington. This alternative would expand existing efforts to
4 maintain and restore habitat connectivity for wolves.

5 **Use of non-lethal injurious harassment:** Non-lethal forms of harassment can make wolves more
6 fearful of people, making it less likely that they would frequent areas occupied by people and
7 livestock. Non-lethal injurious harassment involves striking wolves with rubber bullets or other
8 non-lethal projectiles. Under this alternative, livestock owners and grazing allotment holders (or
9 their designated agents) may be issued a permit to use this form of harassment on their own land or
10 their legally designated allotment, respectively, during all listed phases. This would require
11 authorization from WDFW and training in the use of the above listed projectiles. While wolves are
12 state listed as endangered, the use of non-lethal injurious harassment would be reconsidered if used
13 inappropriately or if a mortality occurred under this provision.

14 **Lethal control by state/federal agents of wolves involved in repeated livestock depredations:**
15 Lethal removal may be used to stop repeated depredation if it is documented that livestock have
16 clearly been killed by wolves, non-lethal methods have been tried but failed to resolve the conflict,
17 depredations are likely to continue, and there is no evidence of intentional feeding or unnatural
18 attraction of wolves by the livestock owner. Situations would have to be evaluated on a case-specific
19 basis, with management decisions based on pack history and size, pattern of depredations, number
20 of livestock killed, state listed status of wolves, extent of proactive management measures being used
21 on the property, and other considerations. If it is determined that lethal removal is necessary, it
22 would likely be used incrementally, as has been done in other states, with one or two offending
23 animals removed initially. If depredations continue, additional animals may be removed. In
24 Alternative 2, lethal control of wolves would be conducted by WDFW or federal agents and would
25 be available during all listed phases and after delisting, consistent with federal law.

26 **Lethal control by livestock owners of wolves involved in repeated livestock depredations:**
27 Under this alternative, WDFW may permit livestock owners (including their family members and
28 authorized employees) to lethally control a limited number of wolves during a specific time period
29 on private lands and public grazing allotments they own or lease after wolves reach state sensitive
30 status.

31 **Lethal take of wolves in the act of attacking (biting, wounding, or killing) livestock:** Under
32 Alternative 2, livestock owners, family members, and authorized employees would be allowed to
33 lethally take wolves “in the act” of attacking livestock (defined as biting, wounding, or killing; not
34 just chasing or pursuing) on private land they own or lease after wolves reach state threatened status.
35 While wolves are listed as threatened, this management tool would be reconsidered if used
36 inappropriately or if more than two wolves were killed under this provision in a year. After delisting,
37 this provision would be expanded to include both private and public land that the livestock producer
38 owns or leases.

1 Lethal take of wolves in the act of attacking (biting, wounding, or killing) domestic dogs:

2 Under Alternative 2, private citizens would be allowed to kill a wolf that is “in the act” of attacking
3 (defined as biting, wounding, or killing; not just chasing or pursuing) domestic dogs on private land
4 after wolves are downlisted to state sensitive status and on private or public land after they are
5 delisted. During sensitive status, this provision would be reconsidered if used inappropriately or
6 more than 2 mortalities occur in a year.

7 Compensation payment for confirmed and probable livestock depredation: Alternative 2

8 recommends a two-tiered compensation system for confirmed and probable wolf-killed livestock on
9 private and public lands. Under this system, higher compensation payments are recommended on
10 grazing sites of 100 or more acres because it is harder to find livestock carcasses on larger acreages.
11 For each documented loss on sites of this size, a two-to-one ratio for payment is used to account for
12 a possible carcass that couldn’t be located. Payments recommended on smaller areas do not include
13 payment for unknown animals because livestock owners are typically able to supervise their stock
14 more closely and can find nearly all carcasses.

15 For each animal confirmed to have been killed by a wolf on grazing sites of 100 or more acres, the
16 owner would receive payment at the 2:1 ratio using the current market value; and for each
17 documented probable kill, would receive half the current market value at the 2:1 ratio. For
18 confirmed kills on sites of less than 100 acres, the owner would receive the full current market value
19 of the animal; and for probable kills, half the current market value of the animal. Current market
20 value is the value of an animal at the time it would have normally gone to market. The draft wolf
21 conservation and management plan defines livestock as cattle, calves, pigs, horses, mules, sheep,
22 lambs, llamas, goats, guarding animals, and herding dogs.

23 **Proactive measures to reduce depredation:** Implementation of proactive non-lethal measures
24 such as modified husbandry techniques and non-lethal deterrents, can reduce (1) livestock
25 depredations by wolves, (2) the need to conduct lethal control, and (3) the costs of compensation
26 programs. Thus, use of such measures can build social tolerance for wolves and aid conservation of
27 the species. However, implementation of these measures can result in higher costs for livestock
28 producers. Under Alternative 2, WDFW would hire wolf specialists whose duties would include
29 working with livestock producers to provide technical assistance on non-lethal management
30 methods and technologies to minimize wolf-livestock conflicts and depredations. WDFW could
31 seek funding for assistance with implementing proactive measures and would work with other
32 organizations and agencies that are interested in providing livestock producers with funding,
33 additional training, and other resources needed to implement this type of assistance.

34 **Ungulate management:** Maintaining robust prey populations will benefit wolf conservation in
35 Washington by providing adequate prey for wolves, supplying hunters and recreational viewers of
36 wildlife with continued opportunities for hunting and seeing game, and reducing the potential for
37 livestock depredation by providing an alternative food to domestic animals. Alternative 2
38 recommends managing for healthy ungulate populations through habitat improvement, harvest

1 management, and reduction of illegal hunting to improve abundance in areas occupied or likely to be
2 occupied by wolves. If research determined that wolves were not meeting recovery objectives in
3 localized areas and prey availability was a key limiting factor, WDFW would consider adjusting
4 recreational harvest levels to provide adequate prey for wolves.

5 **Wolf-ungulate conflict management:** Wolves are expected to inhabit areas of Washington with
6 abundant prey that already support multiple species of predators and recreational hunters. The
7 effect on ungulate populations from adding wolves to existing predation levels and hunter harvest is
8 difficult to predict for Washington, but information from Idaho, Montana, and Wyoming, each of
9 which currently supports 300-850 wolves, suggests that wolves will have little or no effect on elk and
10 deer abundance or hunter harvest across large areas of Washington. Nevertheless, wolves have been
11 linked to declining elk herds in several areas, although they are often just one of several contributing
12 factors affecting the herds (e.g., changes in habitat, severe winter weather, and increasing
13 populations of other predators). Under Alternative 2, after wolves were delisted, WDFW could
14 consider moving wolves, or using lethal control or other control techniques to reduce wolf
15 abundance in localized areas with at-risk ungulate populations if research had determined that wolf
16 predation was a key limiting factor for the ungulate population.

17 **Outreach and education:** Outreach and education efforts are essential to wolf conservation. It is
18 crucial that wolves and wolf management issues be portrayed in an objective and unbiased manner,
19 and that the public receives accurate information about the species. The success of wolf recovery in
20 Montana, Idaho, and Wyoming is attributed, in part, to strong information and education programs
21 about wolves. Under Alternative 2, WDFW would use wolf specialists to develop and conduct
22 outreach and education programs for a variety of interested stakeholder groups, as described in
23 Chapter 12 of the draft wolf conservation and management plan.

24 **3.2.3. Alternative 1**

25 Alternative 1 has a lower standard for protection and restoration of wolves in the state and a more
26 aggressive lethal control strategy. The alternative sets the lowest objectives for achieving geographic
27 distribution, has a reduced emphasis on reestablishing wolves in the Southern Cascades/Northwest
28 Coast Recovery Region, and does not require the establishment of a wolf population in a fourth
29 recovery region (the Pacific Coast) to achieve recovery. This alternative would allow lethal control
30 of wolves by livestock owners to occur sooner than that recommended in Alternative 2 (Preferred
31 Alternative), but offers lower levels of compensation payments for wolf-caused depredation of
32 livestock. It proposes managing ungulate prey populations through standard practices, does not
33 recommend adjusting recreational harvest levels to benefit wolf conservation in certain limited
34 situations, and proposes that removal of wolves could be considered for management of ungulate
35 populations that were below herd objectives (not limited to at-risk ungulate populations) under
36 certain limited circumstances after wolves reach sensitive status. This alternative recommends
37 translocation of wolves within the state if needed, but calls for limited efforts to protect landscape
38 connectivity and conduct outreach and education for wolves.

1 Key elements of Alternative 1 are:

2 **Number of Recovery Regions:** Under this alternative, the same 3 recovery regions recommended
3 in Alternative 2 (Preferred Alternative) would be used: Eastern Washington, Northern Cascades, and
4 a combined Southern Cascades/Northwest Coast (Figure 1).

5 **Distribution Requirements for Downlisting and Delisting:** For Alternative 1, the
6 conservation/recovery objectives for downlisting and delisting are:

- 7 • From endangered to threatened: 6 successful breeding pairs are present for 3 consecutive
8 years, with at least 2 successful breeding pairs in both the Eastern Washington and
9 Northern Cascades recovery regions and 2 other successful breeding pairs in any of the
10 three recovery regions.
- 11 • From threatened to sensitive: 12 successful breeding pairs are present for 3 consecutive
12 years, with at least 2 successful breeding pairs each in the Eastern Washington, Northern
13 Cascades, and Southern Cascades/Northwest Coast recovery regions, and 6 successful
14 breeding pairs that can be distributed in any of the three recovery regions.
- 15 • Delisting: 15 successful breeding pairs for 3 consecutive years, with at least 2 successful
16 breeding pairs each in the Eastern Washington, Northern Cascades, and Southern
17 Cascades/Northwest Coast recovery regions, and 9 successful breeding pairs that can be
18 distributed in any of the three recovery regions.

19 **Translocation:** Translocation goals and implementation would be the same under Alternative 1
20 and Alternative 2 (Preferred Alternative).

21 **Manage for landscape connectivity:** Maintaining connectivity with wolf populations in Idaho,
22 Montana, British Columbia, and Oregon is needed to ensure the establishment of a self-sustaining
23 recovered wolf population in Washington. Under alternative 1, WDFW would continue to work
24 with other agencies and organizations to maintain and restore habitat connectivity for wolves and
25 other large-ranging carnivores, but less emphasis would be placed on these efforts than under
26 Alternative 2 (Preferred Alternative).

27 **Use of non-lethal injurious harassment:** Use of this tool by livestock owners and grazing
28 allotment holders (or their designated agents) and oversight by WDFW would be the same under
29 Alternative 1 and Alternative 2 (Preferred Alternative), with use allowed in all listed phases.

30 **Lethal control by state/federal agents of wolves involved in repeated livestock depredations:**
31 Use of this tool by state/federal agents is the same under Alternative 1 and Alternative 2 (Preferred
32 Alternative), with use allowed during all listed phases and after delisting, consistent with federal law.

33 **Lethal control by livestock owners of wolves involved in repeated livestock depredations:**
34 Use of this measure would be allowed by livestock owners (including family members and

1 authorized employees) with a permit from WDFW after wolves reach state threatened status under
2 Alternative 1, rather than state sensitive status as called for in Alternative 2 (Preferred Alternative).

3 **Lethal take of wolves in the act of attacking (biting, wounding, or killing) livestock:** Under
4 this alternative, use of this provision would be allowed by livestock owners (including family
5 members and authorized employees) on private land they own or lease during all state listed statuses.
6 While wolves are state listed as endangered, this management tool will be reconsidered if used
7 inappropriately or if more than two wolves are killed under this provision in a year. This contrasts
8 with Alternative 2 (Preferred Alternative), which allows use only after wolves reach state threatened
9 status. After wolves are delisted, both alternatives allow lethal take of a wolf in the act of attacking
10 livestock to occur on private and public land that the livestock producer owns or leases.

11 **Lethal take of wolves in the act of attacking (biting, wounding, or killing) domestic dogs:**
12 Under Alternative 1, use of this provision would be allowed by private citizens on private land after
13 wolves are downlisted to state threatened status. While wolves are state listed, this provision will be
14 reconsidered if used inappropriately or more than 2 mortalities occur in a year. This contrasts with
15 Alternative 2 (Preferred Alternative), which allows this measure only after wolves are downlisted to
16 state sensitive status. After wolves are delisted, both alternatives allow lethal take of a wolf in the act
17 of attacking of domestic dogs to occur on private and public land.

18 **Compensation payment for confirmed and probable livestock depredation:** Alternative 1
19 recommends a less generous compensation package without consideration of size of grazing site for
20 confirmed and probable wolf-killed livestock on private and public lands than that recommended in
21 Alternative 2 (Preferred Alternative). Under Alternative 1, livestock producers would receive the full
22 current market value for each confirmed livestock depredation and half the current market value for
23 each probable livestock depredation.

24 **Proactive measures to reduce depredation:** Under Alternative 1, WDFW would use existing staff
25 (with limited time availability) to provide livestock producers with technical assistance on non-lethal
26 management methods and technologies to minimize wolf-livestock conflicts and depredations,
27 whereas under Alternative 2 (Preferred Alternative), WDFW would hire wolf specialists to conduct
28 these activities. Under both alternatives, WDFW could seek funding for assistance with
29 implementing proactive measures and would work with other organizations and agencies that are
30 interested in providing livestock producers with funding, additional training, and other resources
31 needed to implement this type of assistance.

32 **Ungulate management:** Alternative 1 and Alternative 2 (Preferred Alternative) both recommend
33 managing for healthy ungulate populations through habitat improvement, harvest management, and
34 reduction of illegal hunting to improve abundance in areas occupied or likely to be occupied by
35 wolves, with Alternative 1 doing so through implementation of existing game management plans.
36 However, in contrast to Alternative 2 (Preferred Alternative), Alternative 1 would not consider
37 adjusting recreational harvest levels of ungulates to provide increased prey for wolves, even in

1 locations where inadequate prey availability was determined to be a primary limiting factor of wolf
2 populations.

3 **Wolf-ungulate conflict management:** Under Alternative 1, WDFW could consider reducing wolf
4 abundance in localized areas where ungulate populations were below herd objectives by moving
5 wolves, or using lethal control or other control techniques after wolves were downlisted to sensitive
6 status and research had demonstrated that wolf predation was a key limiting factor for the ungulate
7 population. This contrasts with Alternative 2 (Preferred Alternative), which would not consider
8 such actions until wolves were delisted, and then it would only be for ungulate populations that were
9 at risk.

10 **Outreach and education:** Under Alternative 1, WDFW would use existing staff to develop and
11 conduct outreach and education programs for wolves. Program efforts would remain the same as
12 currently expended at WDFW. These efforts would be a lower priority than under Alternative 2
13 (Preferred Alternative) and would rely on existing WDFW staff (with limited time availability) rather
14 than specifically-hired wolf specialists.

15 **3.2.4. Alternative 3**

16 Alternative 3 is predicted to have a higher probability of achieving and maintaining a long-term
17 viable wolf population in Washington compared to the other alternatives. It has the most stringent
18 distribution requirements, and places increased emphasis on reestablishing wolves in far western
19 Washington by requiring a wolf population to be present on the Olympic Peninsula or in the Willapa
20 Hills to achieve recovery. This alternative would place somewhat greater limitations on the use of
21 lethal control of wolves by livestock owners than Alternative 2 (Preferred Alternative), but would
22 offer higher levels of compensation payments for wolf-caused depredation of livestock. It calls for
23 managing ungulate prey populations through standard practices, but would also adjust levels of
24 recreational harvest to benefit wolf conservation in each wolf recovery region until recovery
25 objectives for the region were met. It acknowledges that management of at-risk ungulate
26 populations may require removal of wolves after delisting under certain limited circumstances, but
27 limits wolf removals to non-lethal methods. This alternative recommends translocating wolves
28 within the state if needed, expanding efforts to maintain and restore landscape connectivity, and
29 making wolf conservation outreach and education a high priority.

30 Key elements of Alternative 3 are:

31 **Number of Recovery Regions:** This alternative would create a fourth recovery region known as
32 the Pacific Coast Recovery Region (Figure 2). It would retain the Eastern Washington and
33 Northern Cascades recovery regions, but would separate the Southern Cascades into a separate
34 region. In comparison, Alternatives 2 (Preferred Alternative) and 1 would have only 3 recovery
35 regions: Eastern Washington, Northern Cascades, and a combined Southern Cascades/Northwest
36 Coast.

1 **Distribution Requirements for Downlisting and Delisting:** For Alternative 3, the
2 conservation/recovery objectives for downlisting and delisting are:

- 3 • From endangered to threatened: 6 successful breeding pairs are present for 3 consecutive
4 years, with at least 2 successful breeding pairs in both the Eastern Washington and Northern
5 Cascades Recovery Regions, and at least 2 successful breeding pairs distributed in either the
6 Southern Cascades or Pacific Coast Recovery Regions, or one in each of these two regions.
- 7 • From threatened to sensitive: 12 successful breeding pairs are present for 3 consecutive
8 years, with at least 3 successful breeding pairs in each of the four recovery regions.
- 9 • Delisting: 15 successful breeding pairs for 3 consecutive years, with at least 3 successful
10 breeding pairs each of the four recovery regions, and 3 successful breeding pairs that could
11 be distributed in any of the four recovery regions.

12 **Translocation:** Translocation goals and implementation would be the same under Alternative 3
13 and Alternative 2 (Preferred Alternative).

14 **Manage for landscape connectivity:** Maintaining connectivity with wolf populations in Idaho,
15 Montana, British Columbia, and Oregon is needed to ensure the establishment of a self-sustaining
16 recovered wolf population in Washington. Under Alternative 3, the need to expand existing efforts
17 to maintain and restore habitat connectivity for wolves would be emphasized the same as in
18 Alternative 2 (Preferred Alternative).

19 **Use of non-lethal injurious harassment:** In Alternative 3, use of this tool by livestock owners
20 and grazing allotment holders (or their designated agents) and oversight by WDFW would be
21 delayed until wolves were downlisted to state sensitive status. In contrast, Alternative 2 (Preferred
22 Alternative) recommends that use of this measure be allowed in all listed phases.

23 **Lethal control by state/federal agents of wolves involved in repeated livestock depredations:**
24 Use of this tool by state/federal agents would be the same under Alternative 3 and Alternative 2
25 (Preferred Alternative), with use allowed during all state listed statuses and after delisting, consistent
26 with federal law.

27 **Lethal control by livestock owners of wolves involved in repeated livestock depredations:**
28 Use of this measure would be allowed by livestock owners (including family members and
29 authorized employees) with a permit from WDFW after wolves reach state sensitive status under
30 both Alternative 3 and Alternative 2 (Preferred Alternative). However, while wolves are state-listed
31 as Sensitive, Alternative 3 would restrict the use of lethal control to private lands that the livestock
32 owner or family members/authorized employees own or lease. Use would be expanded to both
33 private and public lands that a livestock owner (including family members and authorized
34 employees) owns or leases after wolves were state delisted. In comparison, Alternative 2 (Preferred
35 Alternative) allows use of lethal control on both private and public lands that a livestock owner

1 (including family members and authorized employees) owns or leases after wolves are downlisted to
2 state sensitive status.

3 **Lethal take of wolves in the act of attacking (biting, wounding, or killing) livestock:** Under
4 Alternative 3, use of this provision would be allowed by livestock owners (including family members
5 and authorized employees) on private land they own or lease after wolves were downlisted to state
6 sensitive status. While wolves are state listed as sensitive, this management tool would be
7 reconsidered if used inappropriately or if more than two wolves were killed under this provision in a
8 year. This contrasts with Alternative 2 (Preferred Alternative), which allows use of this provision
9 after wolves reach state threatened status. After wolves are delisted, both alternatives would allow
10 lethal take of wolves in the act of attacking livestock that occurs on private and public land that the
11 livestock producer owns or leases.

12 **Lethal take of wolves in the act of attacking (biting, wounding, or killing) domestic dogs:**
13 Under Alternative 3, use of this provision would be allowed by private citizens on private and public
14 land after wolves are state delisted. By comparison, Alternative 2 (Preferred Alternative) allows this
15 measure on private land when wolves are downlisted to state sensitive status and on both private
16 and public land after wolves are delisted.

17 **Compensation payment for confirmed and probable livestock depredation:** Among the four
18 alternatives, Alternative 3 recommends the most generous compensation package for confirmed and
19 probable wolf depredations of livestock. Under this alternative, a livestock owner would receive
20 payment at the 2:1 ratio using the current market value for each confirmed depredation on grazing
21 areas of all sizes. For each probable depredation, the owner would receive half the current market
22 value at the 2:1 ratio. In contrast to Alternative 2 (Preferred Alternative), which uses a two-tiered
23 payment system with higher payments offered for losses on grazing areas of 100 or more acres,
24 Alternative 3 would not take size of the grazing area into consideration when determining
25 compensation amounts. Both Alternative 3 and Alternative 2 (Preferred Alternative) recommend
26 compensation for losses occurring on both private and public lands.

27 **Proactive measures to reduce depredation:** The goals and implementation of proactive measures
28 would be the same under Alternative 3 and Alternative 2 (Preferred Alternative).

29 **Ungulate management:** Alternative 3 and Alternative 2 (Preferred Alternative) both recommend
30 managing for healthy ungulate populations through habitat improvement, harvest management, and
31 reduction of illegal hunting to improve abundance in areas occupied or likely to be occupied by
32 wolves. However, under Alternative 3, consideration would be given to adjusting recreational
33 harvest levels to benefit wolves in each recovery region until recovery objectives for the region were
34 met. By comparison, under Alternative 2 (Preferred Alternative), WDFW would only consider
35 adjusting recreational harvest levels to benefit wolves in localized areas if research determined that
36 wolves were not meeting recovery objectives and prey availability was an important limiting factor.

1 **Wolf-ungulate conflict management:** Under Alternative 3, WDFW could consider moving
2 wolves or using other non-lethal control measures to reduce wolf abundance in localized areas with
3 at-risk ungulate populations after wolves were delisted and research had demonstrated that wolf
4 predation was a key limiting factor for the ungulate population. This differs from Alternative 2
5 (Preferred Alternative) by restricting control measures to non-lethal techniques only.

6
7 **Outreach and education:** Under Alternative 3, WDFW would use wolf specialists and existing
8 staff to conduct develop and conduct outreach and education programs for wolves. These efforts
9 would be a higher priority than under Alternative 2 (Preferred Alternative) and would rely on both
10 WDFW wolf specialists and other staff (as available).

11 12 **3.2.5. Alternative 4: No Action (Current Management)**

13
14 Analysis of a No Action (Current Management or Status Quo) Alternative (Alternative 4) is required
15 by SEPA. This alternative would maintain WDFW's current management approach toward wolves
16 and would not result in the development of a wolf conservation and management plan. The lack of
17 a recovery plan means that conservation objectives for downlisting and delisting the species in
18 Washington would not be established; thus wolves would remain a state endangered species into the
19 foreseeable future until such a plan was developed with objectives for downlisting and delisting.
20 Under this alternative, wolf conservation and management activities by WDFW would continue as
21 currently performed. Livestock owners would be able to implement proactive non-lethal
22 approaches for resolving conflicts with wolves, and state or federal agents would perform lethal
23 removals of wolves. Without a plan, compensation for wolf depredation of livestock would be
24 limited to that currently paid by conservation organizations or to what the state legislature might
25 provide in the future under Substitute House Bill 1778, effective July 1, 2010. Under this alternative,
26 WDFW would continue to manage ungulate prey populations through standard practices, but would
27 not adjust recreational harvest levels to benefit wolf conservation, or manage ungulate populations
28 through removal of wolves. Translocation of wolves could occur within the state, if needed, but
29 without recovery objectives, there would be a lack of incentive or justification. Efforts to protect
30 landscape connectivity and conduct outreach and education about wolf conservation and
31 management would continue at current levels using existing WDFW staff. Because Alternative 4
32 would not result in the eventual state delisting of wolves in Washington, it does not meet the stated
33 purpose and need of a wolf conservation and management plan.

34 Key elements of Alternative 4 are:

35 **Number of Recovery Regions:** There would be no recovery regions designated under this
36 alternative.

37 **Distribution Requirements for Downlisting and Delisting:** There would be no
38 conservation/recovery objectives designated for achieving state downlisting and delisting of wolves
39 in Washington under this alternative. Wolves would remain listed as endangered until a state
40 recovery plan was developed, with objectives for downlisting and delisting established.

1 **Translocation:** Translocation goals and implementation would be the same under Alternative 4
2 and Alternative 2 (Preferred Alternative); however, without recovery regions established or recovery
3 objectives, there would be no incentive or justification for translocation.

4 **Manage for landscape connectivity:** Under this alternative, WDFW would continue existing
5 efforts to work with other agencies and organizations to maintain and restore habitat connectivity
6 for wolves and other large-ranging carnivores. However, these efforts would be less expansive than
7 under Alternative 2 (Preferred Alternative).

8 **Use of non-lethal injurious harassment:** Under Alternative 4, use of this tool by livestock owners
9 and grazing allotment holders (or their designated agents) would be allowed with a permit and
10 training from WDFW. However, use would be reconsidered if this form of harassment was used
11 inappropriately or if a wolf mortality occurred. Thus, use of non-lethal injurious harassment of
12 wolves under Alternative 4 closely resembles that proposed under Alternative 2 (Preferred
13 Alternative).

14 **Lethal control by state/federal agents of wolves involved in repeated livestock depredations:**
15 Use of this measure by state/federal agents would be the same under Alternative 4 and Alternative 2
16 (Preferred Alternative), with use allowed, consistent with federal law.

17 **Lethal control by livestock owners of wolves involved in repeated livestock depredations:**
18 Under Alternative 4, this tool would be subject to the conditions and limitations of state law, which
19 will be developed through rulemaking, as directed by Substitute House Bill 1778 (effective July 1,
20 2010). In Alternative 2 (Preferred Alternative), this measure would be available on both private
21 land and public grazing allotments after wolves reached state threatened status.

22 **Lethal take of wolves in the act of attacking (biting, wounding, or killing) livestock:** Under
23 this alternative, this measure would be subject to the conditions and limitations of state law, which
24 will be developed through rulemaking, as directed by Substitute House Bill 1778 (effective July 1,
25 2010). By comparison, Alternative 2 (Preferred Alternative) would allow use of lethal take by
26 livestock owners (including family members and authorized employees) on private land they own or
27 lease after wolves reach state threatened status, with reconsideration if used inappropriately or more
28 than 2 mortalities occur under this provision in a year. Under alternative 2, lethal take would also be
29 allowable on private and public land they own or lease after wolves are delisted.

30 **Lethal take of wolves in the act of attacking (biting, wounding, or killing) domestic dogs:**
31 Under Alternative 4, this provision would be subject to the conditions and limitations of state law,
32 which will be developed through rulemaking, as directed by Substitute House Bill 1778 (effective
33 July 1, 2010). This contrasts with Alternative 2 (Preferred Alternative), which allows this measure by
34 private citizens on private land after wolves are downlisted to state sensitive status, and on private
35 and public land after wolves are delisted.

1 **Compensation payment for confirmed and probable livestock depredation:** In contrast to
2 Alternative 2, which pays compensation at a 2:1 ratio on grazing sites greater than or equal to 100
3 acres, and at a 1:1 ratio on smaller acreages, compensation in Alternative 4 would be limited to that
4 currently paid by the Defenders of Wildlife Bailey Wildlife Foundation Wolf Compensation Trust.
5 Defenders of Wildlife pays the full current market value for confirmed depredations of livestock and
6 half the current market value for probable livestock depredations. While losses in Washington
7 would currently be paid by the Defenders fund, the future role of this program in the state is
8 unknown. Any losses of cattle, sheep, and horses not covered by Defenders of Wildlife or other
9 groups would be covered under the conditions and limitations of Substitute House Bill 1778,
10 effective July 1, 2010.

11 **Proactive measures to reduce depredation:** Under Alternative 4, reimbursement for
12 implementing proactive measures to reduce wolf depredation of livestock would be limited to that
13 currently paid by the Defenders of Wildlife Bailey Wildlife Foundation Proactive Carnivore
14 Conservation Fund, which is able to cover only a relatively small number of projects. The future
15 role of this program in Washington is unknown. Under the conditions and limitations of Substitute
16 House Bill 1778, effective July 1, 2010, WDFW may offer some forms of technical assistance for
17 proactive measures not covered by Defenders of Wildlife or other groups.

18 By comparison, under Alternative 2 (Preferred Alternative), WDFW would actively work with
19 livestock producers to provide technical assistance on non-lethal management methods and
20 technologies to minimize wolf-livestock conflicts and depredations. WDFW could seek funding for
21 assistance with implementing proactive measures and would work with other organizations and
22 agencies that are interested in providing livestock producers with funding, additional training, and
23 other resources needed to implement this type of assistance.

24 **Ungulate management:** Alternative 4 and Alternative 2 (Preferred Alternative) both recommend
25 managing for healthy ungulate populations through habitat improvement, harvest management, and
26 reduction of illegal hunting to improve abundance in areas occupied or likely to be occupied by
27 wolves, with Alternative 4 doing so through implementation of existing game management plans. In
28 contrast to Alternative 2 (Preferred Alternative), Alternative 4 would not adjust recreational harvest
29 levels of ungulates to provide increased prey for wolves, even in locations where inadequate prey
30 availability was determined to be a primary limiting factor of wolf populations.

31 **Wolf-ungulate conflict management:** Under Alternative 4, measures to resolve conflicts between
32 wolves and ungulate populations would be delayed until wolves were delisted. Wolves would remain
33 listed until a state recovery plan was developed, with objectives established for downlisting and
34 delisting. This differs from Alternative 2 (Preferred Alternative), where WDFW could consider
35 moving wolves, or using lethal control or other control techniques to reduce wolf abundance in
36 localized areas with at-risk ungulate populations after wolves were delisted and research had
37 demonstrated that wolf predation was a key limiting factor for the ungulate population.

1 **Outreach and education:** Under Alternative 4, WDFW would use existing staff to develop and
2 conduct outreach and education programs about wolf conservation and management. Program
3 efforts would remain the same as currently expended at WDFW. In contrast to Alternative 2
4 (Preferred Alternative), wolf-related outreach and education under Alternative 4 would continue to
5 be a relatively low priority and would rely on existing WDFW staff (with limited time availability)
6 rather than specifically-hired wolf specialists.
7

8 **3.3. Selection of the Preferred Alternative**

9

10 Alternative 3 places the greatest emphasis on protection and restoration of wolves in Washington,
11 but has less emphasis on management options for addressing wolf-livestock conflicts. Alternative 1
12 is feasible, but has the least emphasis on protection and restoration of wolves in the state and wolf
13 populations could continue to be at risk under this alternative because of more aggressive lethal
14 control, and a more limited geographic distribution in the state. Alternative 4 emphasizes protection
15 and restoration of wolves using existing programs, but does not develop a conservation and
16 management plan. As a result, wolves would continue to be listed as endangered and the purpose
17 and need of a plan would not be met. Alternative 2 is the Preferred Alternative because it more fully
18 addresses and balances the purpose and need as described in Chapter 1, Purpose and Need. It best
19 meets the goals and objectives for establishing a long-term viable wolf population in Washington
20 while at the same time addressing wolf-livestock conflicts and interactions between wolves and wild
21 ungulates.

4. Affected Environment and Environmental Consequences

WAC 197-11-444 (Appendix C) provides a comprehensive list of subjects that must be considered in this analysis with the caveat that the EIS must only study the elements that apply to this proposal. The alternatives described in detail in Chapter 2 of this draft EIS for the Wolf Conservation and Management Plan have been examined in the context of WAC 197-11-144. The following elements are evaluated with respect to consideration of possible environmental effects of implementing conservation and management strategies in Alternatives 1-4:

(1) Natural Environment (Plants and Animals)

- a. Habitat for and numbers or diversity of species of plants, fish, or other wildlife (wolves, other carnivores, ungulates, ecosystem effects)
- b. Unique species (listed species, candidate species, and species of concern)

(2) Built Environment (Land and Shorelines Use)

- a. Recreation (hunting, wildlife watching, other types of backcountry recreation)
- b. Agricultural crops (livestock)
- c. Land use

4.1. Natural Environment – Plants and Animals

There are several elements of the natural environment that might be expected to experience direct and indirect impacts resulting from implementation of conservation and management strategies in Alternatives 1-4. They include: wolves, other carnivores, ungulates, ecosystems, and other listed wildlife species. Impacts of the various alternatives to wolves are primarily direct, while impacts to most of the other elements of the natural environment are indirect. They are impacts that can be anticipated as wolves recolonize and re-establish populations in Washington and are primarily derived from experiences in other western states where wolf recovery has occurred. The recovery level and geographic distribution of a recovered wolf population and management actions that are used to resolve conflicts under the different alternatives may determine the possible impacts to these elements of the environment. Predicting indirect environmental impacts of the alternatives is speculative because the draft conservation and management plan alternatives are non-project proposals, which lack very specific actions. The likely adverse or beneficial impacts to the natural environment of Alternatives 1-4 are discussed below.

4.1.1. Wolves

Gray wolves were formerly common throughout most of Washington, but declined rapidly as a result of aggressive control efforts by Euro-American settlers that took up ranching and farming in Washington from 1850-1900. Wolves were essentially eliminated as a breeding species from the state by the 1930s, although infrequent reports of animals continued in the following decades,

1 suggesting that small numbers of individuals continued to disperse into Washington from
2 neighboring states and British Columbia.

3
4 Intensified survey work in the early to mid-1990s resulted in increased numbers of confirmed and
5 probable wolf records, with three likely breeding records. Reliable reports of wolves have again
6 increased since 2005, originating mostly from Pend Oreille, Okanogan, and Stevens counties and the
7 Blue Mountains. Most recent reports involve single animals. As of September 2009, Washington
8 had two breeding packs of wolves, one confirmed in Okanogan/Chelan counties in 2008 and one in
9 Pend Oreille County in 2009. There are also indications of an additional pack in the Blue Mountains
10 and a few solitary wolves in other scattered locations.

11
12 Wolves are highly social and live in packs typically averaging five to ten animals. Packs normally
13 produce a single litter annually that averages four to six pups. Diet consists mainly of ungulates,
14 with elk, deer and moose expected to be the main prey in Washington. Some food is obtained
15 through scavenging. Packs establish territories and defend them from trespassing wolves. Territory
16 sizes usually average about 200 to 400 square miles in the western United States. From late April
17 until September, pack activity is centered at or near den or rendezvous sites, as adults hunt and bring
18 food back to the pups. One or more rendezvous sites are used after pups emerge from the den.
19 Upon reaching sexual maturity, most wolves disperse from their natal pack to search for a mate and
20 start a new pack of their own. Dispersal may be to unoccupied habitat near their natal pack's
21 territory or it may entail traveling much longer distances before locating vacant habitat, a mate, or
22 another pack to join. Wolves are generalists in their habitat use, but most populations in western
23 North America occur predominantly in forests and nearby open habitats with adequate prey.
24 Humans are the largest cause of wolf mortality in the western United States (Mitchell et al. 2008)
25 and are the only factor that can significantly affect the recovery of populations. On average, an
26 estimated 10% of the wolves in the northern Rocky Mountain states die annually from control
27 actions, 10% from illegal killing, 3% from human-related accidents, and 3% from natural causes
28 (USFWS 2009). Once established, wolf populations can withstand high mortality rates provided that
29 reproductive rates are also high and immigration continues. In most locations, sustainable mortality
30 rates range from about 32% to more than 50% (Fuller et al. 2003).

31 The draft wolf conservation and management plan identifies strategies to reestablish a naturally
32 reproducing and viable population of wolves distributed in a significant portion of the species'
33 former range in Washington. Conservation/recovery objectives for downlisting and delisting are set
34 at sufficient numbers of individuals and levels of geographic distribution to ensure that a
35 permanently viable population is reestablished. For the purposes of the draft plan a "viable"
36 population is one that is able to sustain its size, distribution, and genetic variation for the long term
37 (≥ 100 years) without requiring human intervention and conservation actions. Such populations
38 must also be able to withstand fluctuations in abundance and recruitment associated with variation
39 in food supplies, predation, disease, and habitat quality. For wolves, long-term persistence of a
40 population in Washington will depend on other factors as well, including proximity and connectivity

1 to source populations (outside and potentially within the state), competing carnivore populations,
2 the extent of conflicts with livestock production, and overall social tolerance by people.

- 3 ▪ **Alternative 1.** The downlisting and delisting objectives in Alternative 1 could result in a
4 more limited geographic distribution of wolves in Washington. Alternative 1 has a lower
5 recovery objective for reestablishing wolves in the Southern Cascades/Northwest Coast
6 Recovery Region and does not require the establishment of a wolf population in a fourth
7 recovery region (Pacific Coast) to achieve delisting. This could result in most wolves being
8 concentrated in the Eastern Washington and Northern Cascades recovery regions upon
9 delisting. Translocation could be used to expand distribution, but under this alternative,
10 there would be limited efforts to protect landscape connectivity to promote movement and
11 genetic exchange among populations.

12 This alternative would likely result in higher levels of human-caused mortality of wolves.
13 Lethal control of wolves by livestock owners would be allowed to occur during Threatened
14 status, as well as control (including lethal) of wolves determined to be limiting ungulate
15 populations that were considered below herd objectives when wolves were at Sensitive
16 status. Non-lethal removal of wolves to protect these herds could also be detrimental to
17 wolf populations by disrupting pack dynamics, therefore reducing pack productivity. This
18 alternative would not consider reductions in recreational harvest levels in certain limited
19 situations to benefit wolf populations that were not achieving recovery objectives and were
20 constrained by prey availability. This alternative would be less likely to increase public
21 tolerance for wolves because both compensation for wolf-caused depredation of livestock
22 and outreach and education efforts would be maintained at current levels.

23 Alternative 1 is predicted to have potentially adverse impacts on achieving and maintaining a
24 long-term viable wolf population in Washington. It would likely result in higher mortality
25 rates and slower population growth among wolves and geographic distribution of wolves in
26 the state would also likely be reduced, which would lower the long-term viability of the
27 population.

- 28 ▪ **Alternative 2 – Preferred Alternative (Draft Wolf Conservation and Management**
29 **Plan).** The recovery objectives in Alternative 2 would require that wolves have a fairly
30 extensive geographic distribution in Washington at the time of delisting. The requirement
31 for at least five successful breeding pairs in the Southern Cascades/Northwest Coast
32 Recovery Region for reaching sensitive status and delisting ensures a stronger presence in
33 this portion of the state. However, establishment of a wolf population in a Pacific Coast
34 recovery region is not required to achieve recovery, thus this alternative does not seek to
35 reestablish wolves statewide. Under this alternative, translocation would be available to
36 expand distribution if needed and there would be expanded efforts to protect landscape
37 connectivity to promote movement and genetic exchange among populations.

1 The conservation and management strategies of Alternative 2 would likely result in
2 intermediate levels of human-caused mortality in wolves. These include allowing the use of
3 lethal control of wolves by livestock owners to start during the latter stages of recovery and
4 lethal control for enhancing at-risk ungulate populations only under certain limited
5 circumstances after delisting. Non-lethal removal of wolves to protect at-risk ungulate
6 populations would be limited to a few situations and therefore would be unlikely to disrupt
7 pack dynamics and productivity. This alternative would consider reductions in recreational
8 harvest levels in certain limited situations, which could benefit prey-limited wolf populations.
9 The generous livestock compensation system under this alternative and expansion of
10 outreach and education would likely increase public tolerance for wolves, thereby helping to
11 reduce human-caused mortalities.

12 Alternative 2 sets intermediate goals for numbers and distribution of wolves in Washington
13 by using recovery objectives that attempt to be both biologically and socially acceptable.
14 However, they are expected to succeed in establishing a population that has long-term
15 viability and is distributed across a significant portion of the state, while ensuring that
16 livestock conflicts are addressed. Alternative 2 is expected to result in recovery of a viable
17 population because it will result in reduced mortality, could use translocation to speed
18 recovery, and does not have a requirement for wolves to be present in a Pacific Coast region.

- 19 ■ **Alternative 3.** Alternative 3 is predicted to have the most beneficial impact for wolves and
20 the highest probability of achieving and maintaining a long-term viable wolf population in
21 Washington. The management strategies in Alternative 3 would likely result in lower levels
22 of human-caused mortality of wolves, which could allow larger numbers of wolves to be
23 present in the state when delisting occurs. Alternative 3 would place more limitations on the
24 use of lethal control of wolves by livestock owners and would not consider lethal control of
25 wolves to enhance ungulate populations. Use of non-lethal removal of wolves to protect
26 ungulate populations would be limited to the few herds considered to be “at-risk,” thus
27 removals of this type would be unlikely to disrupt pack dynamics and productivity. This
28 alternative would allow reductions in recreational harvest levels of ungulates in each recovery
29 region until wolf recovery objectives for the region were met, thereby ensuring sufficient
30 prey for expanding wolf populations. The most generous livestock compensation system
31 and expanded outreach and education efforts under this alternative would be more likely to
32 increase public tolerance for wolves than under other alternatives.

33 The recovery objectives in Alternative 3 would ensure the broadest geographic distribution
34 of wolves in Washington at the time of delisting by requiring the establishment of a wolf
35 population with at least three successful breeding pairs in the Pacific Coast recovery region.
36 Under this alternative, translocation could be used to expand distribution and there would be
37 stronger efforts to protect landscape connectivity for wolves to promote movement and
38 genetic exchange among populations.

1 Alternative 3 is highly likely to result in a wolf population with larger numbers and a broader
2 distribution, and hence greater long-term viability at the time of delisting. However, because
3 of the requirement for wolves to be established in the Pacific Coast region, it would likely
4 take longer to achieve recovery, unless translocation were used in recovery regions where
5 wolves were not establishing breeding pairs on their own.

- 6 ■ **Alternative 4 – No Action (Current Management).** This alternative would continue wolf
7 conservation and management activities as currently performed, without development of a
8 wolf conservation and management plan, and with no recovery objectives established.
9 Wolves would remain listed as endangered until a recovery plan was developed. As such,
10 human-caused mortality would probably remain relatively low because of restrictions on
11 lethal control by livestock owners or for the purpose of managing ungulate populations.
12 Non-lethal removal of wolves to protect ungulates would not be expected. This alternative
13 would continue current management for healthy ungulate populations through habitat
14 improvement, harvest management, and reduction of illegal hunting using existing WDFW
15 game management plans. It is unknown whether there would be adjustments to recreational
16 harvest levels to benefit wolf populations that were determined to be prey-limited. This
17 alternative would continue the current programs for compensation for wolf-caused
18 depredation of livestock and existing outreach and education efforts, thus it would be less
19 likely to increase public tolerance for wolves.

20 Under the current management practices of Alternative 4, it is unknown how rapidly wolves
21 might expand their geographic distribution to meet the requirement that it be a significant
22 portion of their former range in Washington, but it would probably occur more slowly than
23 if proactive recovery efforts were underway. Translocation of wolves would be possible
24 under Alternative 4, but it is doubtful that it would be conducted without the guidance of a
25 conservation and management plan with recovery objectives. This alternative would
26 continue the current limited efforts to protect landscape connectivity to promote movement
27 and genetic exchange among wolf populations.

28 The potentially adverse impact of Alternative 4 (current management) is that it would be
29 unlikely to result in achieving a wolf population with long-term viability in Washington.
30 Wolves would be managed cautiously to avoid mortality; but without proactive conservation
31 measures as outlined in a recovery plan, it is unlikely that they would expand in numbers and
32 geographic distribution sufficiently to establish a viable population and re-occupy a
33 significant portion of their former range in the state.

34 4.1.2. Other Carnivores

35 Gray wolves in North America have long co-existed with a variety of other carnivores. How these
36 species interact with wolves varies depending on the extent of dietary overlap, habitat,
37 environmental conditions, and other factors. To date, no definitive research exists on the effects
38 that wolves have on carnivore community structure or populations (USFWS 1994, Ballard et al.

1 2003). In Washington, wolves will share habitats occupied by a number of other carnivores,
2 including cougars, coyotes, black bears, grizzly bears, bobcats, lynx, red foxes, river otters, mink,
3 martens, weasels, skunks, wolverines, badgers, raccoons, and fishers. Direct interactions almost
4 certainly will occur as wolves begin to reoccupy portions of their historical range in Washington and
5 reestablish packs.

6 Information regarding the interactions between other carnivores and wolves is primarily
7 observational and subject to interpretation when attempting to make predictions at the population
8 or community level. Because wolves are wide-ranging and many carnivores are secretive in nature,
9 collecting data on interactions is difficult. Observations to date suggest that wolves can reduce, or in
10 rare cases eliminate, certain carnivores (such as coyotes) locally, but no evidence of long-term spatial
11 partitioning of resources within an area has yet been detected (Ballard et al. 2003).

12 Interactions between wolves and coyotes have been discussed in the scientific literature more often
13 than for other carnivores. Reestablishment of wolves has led to reductions in coyotes in some areas
14 (e.g., Yellowstone and Grand Teton National Parks), but not at others (Ballard et al. 2003).
15 Extirpation of coyotes by wolves can occur rarely (e.g., at Isle Royale National Park), but probably
16 only under limited ecological circumstances, such as where immigration is prevented. Recent studies
17 at Grand Teton and Yellowstone National Parks have detected declines in coyote densities of 33%
18 and 39%, respectively, in areas reoccupied by wolves and are reflective of competition between the
19 two species (Berger and Gese 2007). Localized or short-term decreases in coyote abundance can be
20 even higher, such as a 50% loss in the Lamar Valley population of Yellowstone from 1996 to 1998
21 (Crabtree and Sheldon 1999). Resident coyote home ranges often overlap extensively with those of
22 wolves, suggesting that coyotes may in fact derive some benefit from wolves by having a year-round
23 source of ungulate carcasses on which to scavenge (Switalski 2003, Berger and Gese 2007, Merkle et
24 al. 2009). Carrera et al. (2008) hypothesized that competition between the two species may be
25 especially high where their diets substantially overlap. Berger and Gese (2007) hypothesized that
26 wolves may have little or no effect on coyote densities outside of protected areas (where overall wolf
27 densities are likely to be lower because of conflicts with humans), although this observation was
28 based on few data.

29 Most wolf-grizzly bear interactions also involve fighting and chasing, which often take place at kill
30 sites (Ballard et al. 2003). Encounters at kill sites always appear to be won by grizzlies, whereas
31 wolves usually win those at wolf dens. Each species is occasionally recorded killing the other.
32 Because grizzlies readily usurp ungulate kills made by wolves, Servheen and Knight (1993)
33 speculated that the presence of wolves might be beneficial to threatened populations of grizzlies by
34 supplementing their diet with greater amounts of protein through increased availability of ungulate
35 carcasses. This may be especially true following mild winters, when ungulate carrion is normally far
36 less available. Most reported encounters between wolves and black bears involved fighting or
37 chasing one another, or wolves killing black bears. In a smaller number of interactions, wolves
38 displaced black bears from kills. Wolves will seek out and kill black bears in their dens but often do
39 not consume them, suggesting that interference competition exists between the two species.

1 Few observations of direct wolf-cougar interactions have been reported, but the two species do
2 occasionally kill each other. However, cougars have been noted moving away from kills to avoid
3 wolf contact (Akenson et al. 2005) and in general may avoid areas recently used by wolves (Kortello
4 et al. 2007). Wolves also seek out and take over cougar kills, which may force cougars to increase
5 their kill rates to replace lost prey (Hornocker and Ruth 1997, Murphy 1998, Kunkel et al. 1999,
6 Kortello et al. 2007). In one area of central Idaho, cougars showed lower recruitment, fewer adults,
7 and a disrupted social structure several years after recolonization by wolves, but other factors
8 (declining prey populations, high hunter harvest, and a large forest fire) occurring simultaneously
9 probably contributed to these effects (Akenson et al. 2005). In Banff National Park, Alberta, a
10 largely wolf-related decline in the elk population resulted in cougars shifting their diets mainly
11 toward deer and bighorn sheep (Kortello et al. 2007). Cougars also exhibited low annual survival
12 and poor body condition during the period of wolf reestablishment.

13 Wolves can affect some other carnivores, such as wolverines, red foxes, and fishers, in the same
14 ways described above for bears and coyotes (Ballard et al. 2003). Increased availability of wolf-killed
15 carcasses may benefit these species by providing more food for scavenging, particularly during the
16 winter months. However, wolves sometimes kill some of these species during direct interactions.
17 In areas where coyote abundance is reduced by wolves, predators such as red foxes, lynx, and
18 bobcats may benefit from reduced competition with coyotes (Mech and Boitani 2003b).
19 Additionally, some prey species of coyotes may increase, which has the potential to enhance
20 populations of other medium-sized and small carnivores (Buskirk 1999).

21 ▪ **Common to All Alternatives:** It is doubtful that wolves would affect the overall
22 abundance or distribution of other carnivore species in Washington under any of these
23 alternatives. The presence of wolves could alter the local distributions and behaviors of
24 some carnivores as they attempt to avoid direct interactions with wolves or as they respond
25 to changes in food availability as influenced by wolves. Such changes could favor some
26 carnivore species over others. Wolves would also be likely to occasionally kill individuals of
27 some species. Wolves could reduce coyote abundance in some locations, although the
28 extent that this would occur outside of national parks is unknown. In some locations,
29 grizzly and black bears, red foxes, fishers, and wolverines might benefit from the increased
30 availability of carrion resulting from wolf kills of ungulates.

31 **4.1.3. Ungulates**

32 *Wolf Predation of Ungulates.* Ungulates are the primary food of wolves throughout their geographic
33 range. Wolves tend to concentrate on species that are easier to capture or offer greater reward for
34 the amount of capture effort expended, rather than on species that are most common. Diet can
35 vary greatly among locations in the same region or even among packs living in the same vicinity (e.g.,
36 Kunkel et al. 2004, Smith et al. 2004) in response to differences in prey populations, seasonality,
37 weather conditions, the presence of other predators, levels of human harvest, and other
38 circumstances (Smith et al. 2004). In the central and northern Rocky Mountains of the United

1 States and Canada, wolves commonly rely on elk as their primary prey, but deer and moose are more
2 important in some areas. Moose are the major prey in much of British Columbia, including
3 southern areas (G. Mowat, pers. comm.). Bighorn sheep and mountain goats are not regularly taken,
4 probably because of little habitat overlap with wolves (Huggard 1993). Wolf diets in Washington are
5 expected to be similar to those elsewhere in the region, with elk, deer, and moose being the primary
6 prey species.

7 Wolves are selective hunters and usually choose more vulnerable and less fit prey. Young-of-the-
8 year (especially in larger prey like elk and moose; Kunkel and Pletscher 1999, Boertje et al. 2009),
9 older animals, and diseased and injured animals are taken in greater proportion than healthy, prime-
10 aged individuals (Mech 1970, 2007, Kunkel et al. 1999, Mech and Peterson 2003, Smith et al. 2004,
11 Sand et al. 2008, Hamlin and Cunningham 2009). Hunting success of wolves can be influenced by
12 many factors, including pack size, terrain, habitat features, snow and other weather conditions, time
13 of day, prey species, age and condition of prey, season, and experience (Mech and Peterson 2003,
14 Hebblewhite 2005, Kauffman et al. 2007).

15 The impacts of wolves on prey abundance have been, and continue to be, widely debated (see
16 Boutin 1992). Some common conclusions on this topic have been drawn. A number of studies
17 indicate that wolf predation can limit ungulate prey populations (see citations in Chapter 5, Section
18 A, of the draft wolf conservation and management plan). Population-level effects result primarily
19 through predation on young-of-the-year and are frequently enhanced when occurring in
20 combination with other predators (e.g., bears) (Larsen et al. 1989, Barber-Meyer et al. 2008, Boertje
21 et al. 2009). However, Creel et al. (2009) reported that elk declines in the greater Yellowstone
22 ecosystem were not caused by actual wolf predation, but instead resulted simply from the threat of
23 wolf predation. Female elk responded to the presence of wolves by spending less time feeding and
24 moving to safer habitats of poorer nutritional quality, resulting in reduced nutrition and lowered calf
25 production that pushed the population downward.

26 As pointed out in many studies, numerous other factors (e.g., human harvest, severe winters,
27 variable forage quality, fluctuating abundance of other predators and prey, disease, human
28 disturbance/development, and vehicle collisions) also influence prey populations and complicate the
29 conclusions that can be drawn about wolf-related impacts. Several studies have detected little or no
30 effect from wolves on ungulate populations (Thompson and Peterson 1988, Bangs et al. 1989,
31 Peterson et al. 1998; see Mech and Peterson 2003). Several reasons exist for why researchers have
32 failed to reach agreement regarding the significance of wolf predation on the dynamics of prey
33 populations: (1) each predator-prey system has unique ecological conditions, (2) wolf-prey systems
34 are inherently complex, and (3) population data for wolves and their prey are imprecise and
35 predation rates are variable. Whether a prey population exists at or below its ecological carrying
36 capacity is another important element in assessing the results of such studies (D. W. Smith, pers.
37 comm.). In summary, wolf-prey interactions are probably best characterized as being exceedingly
38 complex and constantly changing, as seen at Isle Royale National Park, Michigan, where wolf-moose

1 relationships still cannot be predicted with confidence despite 50 years of detailed research on this
2 subject (Vucetich and Peterson 2009).

3 A recent finding by Eberhardt et al. (2007) is that predation by wolves has a much lower overall
4 impact on ungulate populations than does antlerless harvest by hunters. Wolves primarily prey on
5 young of the year and older individuals beyond their prime, both of which have lower reproductive
6 value, whereas antlerless removals by hunters are concentrated on adult females of prime age. Thus,
7 wolf predation has considerably less effect on reproductive rates and growth of populations.
8 Eberhardt et al. (2007) also remarked that conservative harvests of females are needed to maintain
9 ungulate populations exposed to hunting and predation by multiple species of large carnivores at or
10 near carrying capacity.

11 As with other predators, wolf predation has the potential to threaten some small populations of
12 prey, which often have a limited capacity to increase. In Washington, examples of such populations
13 potentially include mountain caribou and certain herds of bighorn sheep.

14 Broad predictions of the effect on ungulate populations from adding wolves to existing predation
15 levels and hunter harvest are difficult to make because of localized differences in predator and
16 ungulate abundance and harvest management practices within geographic areas. However,
17 information from Idaho, Montana, and Wyoming, each of which currently supports 300-850 wolves,
18 provides useful insight on impacts that can be expected in Washington as wolves reestablish. In
19 general, wolves have had little or no effect on elk and deer abundance or hunter harvest across large
20 areas of these states, where most populations remain stable or are above population objectives (see
21 Chapter 5, Section B, of the draft wolf conservation and management plan). Wolves have been
22 linked to declining elk herds in several areas, but often they are one of several factors affecting the
23 herds (e.g., changes in habitat, severe winter weather, and increasing populations of other predators).
24 In some wolf-occupied areas, hunter success rates may have reduced because of changes in elk
25 behavior and habitat use rather than by actual declines in elk abundance.

26 *Ungulate Populations in Washington.* Overviews of ungulate species (elk, deer, moose, bighorn sheep,
27 mountain goats, and mountain caribou) and populations occurring in Washington are presented in
28 Chapter 5, Section B, of Alternative 2, Draft Wlf Conservation and Management Plan.

29 ▪ **Common to All Alternatives.** Wolves are expected to have little or no effect on the
30 abundance of elk, deer, and moose across most of Washington while wolves remain a state
31 listed species, as suggested by findings in neighboring states. However, abundance of elk,
32 deer, and moose could decline in localized areas where wolves become numerous. In all
33 cases, a number of other contributing factors will affect the extent of wolf impacts to
34 ungulate populations. These include levels of human harvest, habitat quality, winter severity,
35 fluctuating abundance of other predators and prey, human disturbance/development, and
36 the amount of mortality from other sources such as disease and vehicle collisions. The
37 presence of wolves could alter the habitat use, and hence local distributions, of elk, deer, and
38 moose in some areas as they attempt to avoid direct interactions with wolves. Predation on

1 bighorn and mountain goats is expected to be minor. Potential impacts to mountain caribou
2 are discussed in Section 4.1.5.

- 3 ▪ **Alternative 1.** Under this alternative, WDFW could consider reducing wolf abundance in
4 localized areas where ungulate populations were below herd objectives, but not until wolves
5 were downlisted to sensitive status and research had demonstrated that wolf predation was a
6 key limiting factor for the ungulate population. This action could potentially benefit the
7 ungulate population by reducing predation on it, but could have an adverse impact on the
8 wolf population. Because this alternative would be less likely to result in the establishment
9 of wolf populations in far western Washington, any effects to ungulates from wolf recovery
10 would more likely occur in the Cascades and other areas of eastern Washington.
- 11 ▪ **Alternative 2 (Preferred Alternative).** Under this alternative, WDFW could consider
12 reducing wolf abundance in localized areas with at-risk ungulate populations (i.e., those
13 severely depressed and in danger of eventual extirpation) if research had determined that
14 wolf predation was a key limiting factor for the ungulate population. This could potentially
15 benefit the population by reducing predation levels on it. Because this alternative would be
16 less likely to result in the establishment of wolf populations in far western Washington, any
17 effects on ungulates from wolf recovery would be more likely to occur in the Cascades and
18 other areas of eastern Washington.
- 19 ▪ **Alternative 3.** Under this alternative, WDFW could consider reducing wolf abundance in
20 localized areas with at-risk ungulate populations (i.e., those severely depressed and in danger
21 of eventual extirpation) if research had determined that wolf predation was a key limiting
22 factor for the ungulate population. This could potentially benefit the population by reducing
23 predation levels on it. This alternative would require the establishment of a wolf population
24 in the Pacific Coast recovery region, meaning that effects to ungulates from wolf recovery
25 could occur to some extent in all regions of the state than under the other alternatives.
- 26 ▪ **Alternative 4.** This alternative would continue wolf conservation and management activities
27 as currently performed, without development of a wolf conservation and management plan.
28 Wolves would remain listed as endangered until a recovery plan was developed. Human-
29 caused mortality would probably remain relatively low because of protections for
30 endangered species which would limit use of lethal control measures. Non-lethal removal of
31 wolves to protect ungulates would not be expected. This alternative would continue current
32 management for healthy ungulate populations through habitat improvement, harvest
33 management, and reduction of illegal hunting using existing WDFW game management
34 plans. It is unknown what wolf numbers and their impacts on localized ungulate
35 populations would be. Because Alternative 4 would be less likely to result in the
36 establishment of a wolf population in a Pacific Coast recovery region, wolf-related impacts
37 to ungulates in this area would not be expected.

1 4.1.4. Ecosystem Effects

2
3 This element assesses the potential impacts that implementing Alternatives 1-4 could have on
4 ecosystems, including plant communities, scavengers, and other wildlife, in Washington. Gray
5 wolves affect ecosystem components through a variety of direct and indirect processes, including (1)
6 limitation of herbivore prey abundance and changes in prey behavior, (2) limitation of some non-
7 prey abundance, and (3) increasing food availability for scavengers and other carnivores (Mech and
8 Boitani 2003b). However, the ecological impacts of wolf predation on food webs are complex and
9 interact with other biotic and abiotic factors, especially at lower trophic levels, and therefore
10 generally remain poorly understood and difficult to predict (Berger and Smith 2005).

11
12 Regulation of large herbivore abundance and behavior by wolves can alter vegetation patterns
13 (structure, succession, productivity, species composition, and species diversity), thereby potentially
14 affecting many wildlife species residing in an ecosystem (Berger and Smith 2005). Substantial
15 evidence for this comes from Yellowstone National Park and other locations, where wolf predation
16 on elk and associated changes in elk behavior are believed to have resulted in localized resurgence of
17 woody browse species such as aspen, cottonwood, and willows (Smith et al. 2003, Ripple and
18 Beschta 2004, 2007, Beschta 2005). This in turn has allowed beaver numbers to increase and will
19 probably result in greater amounts of foraging and nesting habitat for various birds and other
20 species. At Grand Teton National Park, Berger et al. (2001) hypothesized that overbrowsing of
21 riparian zones by moose following the eradication of wolves and grizzly bears had produced changes
22 in vegetation structure resulting in pronounced reductions or elimination of a number of neotropical
23 migrant songbird species. Reduced tree and shrub coverage in riparian areas may also increase
24 stream temperatures and erosion, thereby potentially harming trout, salmon, and other fish.

25
26 Eradication of wolves has possibly produced a number of important ecological changes in Olympic
27 National Park in northwestern Washington. Initial research by Beschta and Ripple (2008) suggests
28 that overbrowsing by elk during the past century or so has caused substantial changes in riparian
29 plant communities, including severe declines in the recruitment of black cottonwood and bigleaf
30 maple. This in turn may have caused increased riverbank erosion and channel widening. Probable
31 reductions in the amount of large woody debris in river channels during this period have likely
32 reduced rearing habitat for salmon, steelhead, and resident fish. These changes in river ecology have
33 probably also lowered the amount of aquatic invertebrate prey (including emerging adult insects)
34 available for fish, birds, and bats. Confirmation of these impacts is needed through additional
35 research (P. Happe, pers. comm.).

36
37 Wolf-related reductions in coyote abundance (Section 4.1.2) may result in population changes
38 among other medium-sized and small carnivores, either directly through reduced predation by
39 coyotes or indirectly through adjustments in prey availability. For example, reduced interference
40 competition with coyotes may increase the abundance of red foxes (Mech and Boitani 2003b).

1 Similarly, wolf-related reductions in coyotes may result in increased survival for some prey species
2 consumed by coyotes (e.g., pronghorn; Berger et al. 2008, Berger and Conner 2008).
3 Increased availability of wolf-killed carcasses can benefit a number of scavenging species, such as
4 ravens, magpies, jays, golden eagles, bald eagles, and perhaps turkey vultures, especially during
5 winter when other foods become scarcer (Smith et al. 2003). At Yellowstone National Park, at least
6 12 vertebrate species scavenge at wolf-killed carcasses, with five (bald and golden eagles, coyotes,
7 ravens, and magpies) visiting nearly every wolf kill (Wilmers et al. 2003a, 2003b). Increased
8 availability of wolf-killed carcasses in Washington may be particularly beneficial for golden eagles,
9 which may currently be food limited because of declines in jackrabbits and perhaps other prey (J.
10 Watson, pers. comm.).

11 Most research on these topics has been conducted in national parks or other protected areas. It
12 remains unclear whether the ecological impacts of wolves are as perceptible in less pristine
13 landscapes that have been influenced by livestock grazing or other human activities, or in areas of
14 lower wolf densities (L. D. Mech, pers. comm.). Climate and habitat productivity are other factors
15 that also may affect the strength of ecological changes resulting from the reestablishment of wolves
16 (Rooney and Anderson 2009). Predictions about wolf-driven ecosystem changes and benefits in
17 Washington (i.e., where effects occur, species affected, magnitude of changes, etc.) are difficult to
18 make because of the uncertainty regarding the ultimate population size, density, and distribution of
19 wolves in the state. These types of changes and benefits would be most expected in areas where
20 wolves achieve stable populations at relatively high density, but it is unknown whether Washington
21 will support populations of this density under contemporary landscape conditions.

- 22 ▪ **Alternative 1.** The distribution of recovery objectives and more aggressive use of lethal
23 control at earlier stages of recovery to resolve wolf-related conflicts in Alternative 1 would
24 likely result in smaller numbers of wolves and greater instability of packs. This, in turn,
25 would limit opportunities for ecosystem effects of the types described in this section.
26 Because this alternative would be less likely to result in the establishment of wolf
27 populations in far western Washington, any ecosystem effects accompanying wolf recovery
28 would be more likely to occur in areas of eastern Washington and in the Cascades.
- 29 ▪ **Alternative 2 – Preferred alternative (Draft Wolf Conservation and Management**
30 **Plan).** The recovery objectives and management of wolf-related conflicts of this alternative
31 would likely result in moderate numbers of wolves and levels of pack stability in
32 Washington, thus allowing some opportunities for wolf-caused ecosystem effects to develop.
33 Because this alternative would be less likely to result in the establishment of wolf
34 populations in far western Washington, any ecosystem effects accompanying wolf recovery
35 would be more likely to occur in areas of eastern Washington and in the Cascades.
- 36 ▪ **Alternative 3.** Management of wolf-related conflicts would be less aggressive under
37 Alternative 3, with most types of lethal control delayed until the later stages of recovery or
38 delisting. This would likely result in larger numbers of wolves and greater pack stability,

1 which would increase opportunities for ecosystem effects of the types described in this
2 section. This alternative would require the establishment of a wolf population in the Pacific
3 Coast recovery region, making it more likely that wolf-generated ecosystem effects would
4 occur to some extent in all regions of the state.

- 5 ■ **Alternative 4 – No Action (Current Management).** It is unknown how wolf recovery
6 would progress under this alternative, but human-caused mortality resulting from control
7 actions would be expected to remain relatively low under this alternative because of
8 restrictions on lethal control by livestock owners or for the purpose of managing ungulate
9 populations. This could result in somewhat larger numbers of wolves and greater pack
10 stability, which would increase opportunities for ecosystem effects of the types described in
11 this section. Because this alternative would be much less likely to result in the establishment
12 of wolf populations in far western Washington, any ecosystem effects accompanying wolf
13 reestablishment would likely be limited to areas of eastern Washington and the Cascades.

14 4.1.5. Unique Species

15 Washington contains a number of state and federal listed species (endangered, threatened, sensitive),
16 candidate species, and species of concern, with some of these occurring in areas likely to be
17 eventually occupied by wolves. Interactions between wolves and these species are discussed in this
18 section. Additional discussion for listed or candidate carnivores and birds of prey (i.e., grizzly bears,
19 lynx, wolverines, fishers, bald eagles, and golden eagles) appears in Section 4.1.2.

20 Washington's only population of mountain caribou, the Selkirk Mountains herd, spends most of its
21 time in the British Columbia portion of its range, with members infrequently entering Washington.
22 The herd increased from 33 caribou in 2004 to 46 caribou in 2009. Distribution in Washington is
23 restricted primarily to the Salmo-Priest Wilderness Area in northeastern Pend Oreille County. The
24 area is characterized by high elevations and extensive closed canopy forests, and therefore supports
25 relatively low densities of other ungulate species. Hence, few wolves are expected to reside in the
26 Salmo-Priest, meaning that predation on caribou would probably occur infrequently. Nevertheless,
27 any wolf-related losses to the herd would have a significant impact on the population. In British
28 Columbia, recent declines of woodland caribou populations have been linked to the expansion of
29 moose and the subsequent increase of wolves, which has resulted in greater predation on caribou
30 (Wittmer et al. 2005, Stotyn et al. 2007). Loss of mature forests and fragmentation of winter habitat
31 may also make woodland caribou more vulnerable to wolves.

32 In Washington, Columbian white-tailed deer occur along the lower Columbia River in Wahkiakum
33 and Cowlitz counties (Figure 10). The population in Washington numbers about 600-800 animals
34 and is generally located near human habitation. Predation levels on this subspecies by wolves are
35 difficult to predict, but could potentially harm this deer's recovery in the state.

36 Wolves feed on many different small prey species (e.g., mice, tree squirrels, muskrats, woodchucks,
37 grouse, songbirds; van Ballenberghe et al. 1975, Fritts and Mech 1981, Boyd et al. 1994, Arjo et al.

1 2002), especially in the summer when ungulates become less available, but small prey never
2 comprises a significant portion of the diet. A number of listed and candidate species in Washington
3 fall into this size category and might be rarely caught and eaten by wolves. These include Merriam's
4 shrew, pygmy rabbit, white-tailed jackrabbit, black-tailed jackrabbit, western gray squirrel,
5 Washington ground squirrel, Townsend's ground squirrel, Mazama pocket gopher, gray-tailed vole,
6 greater sage-grouse, and sharp-tailed grouse. Many of these species occur in open habitats (i.e.,
7 shrub-steppe, grasslands, prairies, farmland) that are unlikely to be recolonized to any significant
8 extent by wolves in Washington. Although not state or federally listed, Olympic marmots have been
9 declining in recent years and are now estimated to total fewer than 1,000 animals (Griffin et al.
10 2008). Coyote predation is probably the main threat to the species (S. C. Griffin, pers. comm.).
11 Coyotes were historically rare or absent from the Olympic Peninsula when wolves were widespread
12 in western Washington (Taylor and Shaw 1929, Scheffer 1995). Although recolonization of the
13 Olympic Mountains by wolves might result in additional predation pressure on Olympic marmots, it
14 more likely could benefit marmots by reducing coyote abundance.

15 Impacts of wolves on federal or state listed or candidate species or other species of concern would
16 likely be relatively similar under all alternatives, with wolves probably having few significant adverse
17 impacts on any of these species in Washington in the foreseeable future, with the possible exception
18 of mountain caribou. Recovery of wolves could benefit some species through the ecosystem
19 processes described in Section 4.1.4, although this is difficult to predict and would depend on where
20 wolves become reestablished and in what numbers.

- 21 ▪ **Common to All Alternatives.** Under all alternatives, research would be used to identify
22 and determine the extent of conflicts between wolves and federal or state listed or candidate
23 species or other species of concern. Where conflicts exist, response plans would be
24 developed to resolve conflicts. Consultation and coordination with the U.S. Fish and
25 Wildlife Service would be necessary in planning and implementing appropriate responses if
26 wolves remained federally listed or if conflicts involved federally listed species.
- 27 ▪ **Alternative 1.** In this alternative, potential response options for addressing conflicts could
28 include non-lethal measures (e.g., moving of wolves) while wolves were listed as endangered
29 and threatened, and both non-lethal and lethal methods after wolves reached sensitive status.
30 Alternative 1 would continue existing efforts to maintain and restore landscape connectivity
31 for wolves and other large-ranging carnivores, including listed species such as grizzly bears,
32 lynx, wolverine, and fishers. This activity would be limited to existing efforts, and as such,
33 populations of listed carnivores would not be as likely to benefit from increased gene flow
34 among populations, increased immigration into existing populations with demographic
35 concerns (e.g., low survival or productivity), and increased dispersal into unoccupied areas
36 with suitable habitat. Because this alternative would be less likely to result in the
37 establishment of wolf populations in far western Washington, any effects to federal or state
38 listed or candidate species or other species of concern from wolf recovery would more likely
39 occur in eastern Washington and the Cascades.

- 1 ▪ **Alternative 2 – Preferred alternative (Draft Wolf Conservation and Management**
2 **Plan).** Under this alternative, potential response options for addressing conflicts could
3 include non-lethal measures (e.g., moving of wolves) while wolves were listed, and both non-
4 lethal and lethal response options after wolves were delisted. Alternative 2 would expand
5 efforts to maintain and restore landscape connectivity for wolves. Other listed species, such
6 as grizzly bears, lynx, wolverine, and fishers, would likely use the same corridors for travel.
7 This would benefit population viability in these species by increasing gene flow among
8 populations, increasing immigration into existing populations with demographic concerns
9 (e.g., low survival or productivity), and increasing dispersal into unoccupied areas with
10 suitable habitat. Because this alternative would be less likely to result in the establishment of
11 wolf populations in far western Washington, any effects to federal or state listed or candidate
12 species or other species of concern from wolf recovery would more likely occur in eastern
13 Washington and the Cascades.
- 14 ▪ **Alternative 3.** Alternative 3 would expand efforts to maintain and restore landscape
15 connectivity for wolves. Other listed species, such as grizzly bears, lynx, wolverine, and
16 fishers, would likely use the same corridors for travel. This would benefit population
17 viability in these species by increasing gene flow among populations, increasing immigration
18 into existing populations with demographic concerns (e.g., low survival or productivity), and
19 increasing dispersal into unoccupied areas with suitable habitat. This alternative would
20 require the establishment of wolves in a Pacific Coast recovery region, which could bring
21 wolves into greater contact with Olympic marmots in the Olympic Mountains and Columbia
22 white-tailed deer along the lower Columbia River. Olympic marmots might benefit from
23 wolf recovery, which could lead to reduced coyote abundance and predation, or might
24 experience additional predation pressure from wolves. Columbia white-tailed deer might
25 also experience additional predation pressure from wolves.
- 26 ▪ **Alternative 4 – No Action (Current Management).** Most types of lethal control of
27 wolves would be not be used until after delisting under the no action alternative. It is
28 unknown what wolf numbers and their impacts on other listed species might be under this
29 alternative. Alternative 4 would continue existing efforts to maintain and restore landscape
30 connectivity for wolves and other large-ranging carnivores, including listed species such as
31 grizzly bears, lynx, wolverine, and fishers. Because this activity would be limited to existing
32 efforts, populations of listed carnivores would not be as likely to benefit from increased gene
33 flow among populations, increased immigration into existing populations with demographic
34 concerns (e.g., low survival or productivity), and increased dispersal into unoccupied areas
35 with suitable habitat. Because this alternative would be unlikely to result in the
36 establishment of wolf populations in far western Washington, any effects to federal or state
37 listed or candidate species or other species of concern from wolf recovery would more likely
38 occur in areas of eastern Washington or the Cascades.

4.2. Built Environment

The “built environment” elements in WAC 197-444 address environmental impacts to (a) environmental health, (b) land and shoreline use, and (c) transportation. Related to the draft wolf conservation and management plan alternatives and for this analysis, these include: human safety, land use, recreation such as hunting, wildlife watching and other backcountry recreation, and agricultural crops (livestock). Because this is a non-project action, the analysis of environmental impacts resulting from development of the wolf conservation and management plan is broad and most effects are indirect. Possible indirect environmental impacts of the alternatives are speculative because the non-project aspects of these four plan alternatives lack very specific actions. The likely adverse or beneficial impacts to the built environment of Alternatives 1-4 are discussed below.

4.2.1. Human Safety

Although wolves are large carnivores capable of inflicting serious injury to people, wild wolves generally fear people and rarely pose a threat to human safety in North America. Attacks on humans by wolves are quite rare compared to those by other species, such as dogs, bears, and cougars (see Chapter 7 of the draft wolf conservation and management plan). Wolves can gradually lose their fear of people through increasingly frequent contact and access to human foods. Habituated wolves of this type are involved in the majority of cases of aggression toward people (Linnell et al. 2002, McNay 2002).

Because of the long absence of gray wolves from Washington, most people in the state are unfamiliar with wolves and wolf behavior. Hence, addressing public safety concerns and providing information on wolf behavior are important steps in achieving conservation and tolerance of wolves by citizens. Various groups of people with a higher likelihood of coming in contact with wolves in the wild include, but are not limited to, hunters, trappers, rural residents, recreationists, outfitters and guides, forest workers/contractors, and other natural resource workers. Some members of these groups may welcome seeing wolves and may seek them out, while others may consider wolves as problematic to their activities. Regardless, user groups should be informed about wolves. To reduce concerns over safety, efforts should be made to inform rural residents and backcountry users of ways for reducing the likelihood of encounters with wolves and methods for preventing habituation toward people.

- **Common to All Alternatives:** Under all alternatives, wolves would pose a very low risk to human safety. In each alternative, if wolves were to pose a threat to human safety, WDFW or cooperating agencies would take immediate action to resolve the situation. Outreach and education will be used to inform people about ways to avoid or respond to interactions with wolves, as well as actions that can be taken to prevent habituation of wolves. Alternatives 1 and 4 would continue outreach and education at existing levels, whereas Alternative 2 (Preferred Alternative) and Alternative 3 would expand these efforts using wolf specialists.

1 It is anticipated that increased outreach and education efforts would help reduce wolf-
2 human conflicts.

4 **4.2.2. Land Use**

6 Wolves are habitat generalists, but in the western United States occur most frequently in forests
7 (USFWS 2009). Wolves are also fairly tolerant of moderate amounts of human disturbance, even in
8 the vicinity of active wolf dens (Thiel et al. 1998, Frame et al. 2007). Hence, restrictions on land use
9 practices have not been necessary to achieve wolf conservation in Idaho, Montana, and Wyoming
10 (USFWS 2009). For these reasons, wolf reestablishment in Washington is not expected to result in
11 the imposition of any land use restrictions to protect and conserve wolves other than those that
12 occasionally may be needed to temporarily protect den sites from malicious or careless destruction
13 during the denning period.

15 In neighboring states with wolves, no restrictions have been placed on the forest products industry
16 with regard to timber management and logging to protect wolves. On private forestlands in
17 Washington, no restrictions are anticipated with the possible exception of delaying timber harvests
18 near occupied den sites until after the completion of the denning season. The Washington
19 Department of Natural Resources currently has a provision under the Washington State Forest
20 Practices Act Critical Habitats Rule for threatened and endangered species (WAC 222-16-080) for
21 gray wolves. Forest practices on state and private land where harvesting, road construction, or site
22 preparation is proposed within 1 mile of a known active wolf den, documented by WDFW, between
23 the dates of March 15 and July 30, or 0.25 mile from the den at other times of the year, are
24 designated as a Class IV-Special and require an extra 14 days of review, and are subject to State
25 Environmental Policy Act (SEPA) review. The rule was established in 1992, but much has been
26 learned since then about habitat issues involving wolves in neighboring states. Alternative 2
27 recommends that this newer information be reviewed to determine if the rule should be modified to
28 reflect current knowledge.

30 WDFW has no legal authority to implement land use restrictions on public land it does not manage
31 or on private land (with the exception of hydraulic permits). Land management agencies can and
32 may adopt seasonal or area restrictions independently from WDFW. However, experience in Idaho,
33 Montana, and Wyoming has shown that no restrictions, other than those occasionally needed to
34 temporarily prevent excessive disturbance of occupied den sites, have been necessary to conserve
35 wolves on public and private lands. If wolves were denning on private property, WDFW would
36 advise the landowner of the presence of the den and work with the landowner regarding planned
37 activities near the den site during the denning period. Under certain circumstances, a landowner
38 might be asked to temporarily delay an activity near a den during the denning period, especially while
39 wolves remain state-listed.

- 40 **Common to All Alternatives:** Wolf recovery and management activities in Washington
41 would not affect land use under any of the four alternatives. As described above, no

1 restrictions, other than those occasionally needed to temporarily prevent excessive
2 disturbance of occupied den sites, have been necessary to conserve wolves on public and
3 private lands in other western states. No such restrictions should be needed in Washington.
4

5 **4.2.3. Recreation**

6
7 Three types of recreation are analyzed with respect to possible indirect effects of the four
8 alternatives for a wolf conservation and management plan in Washington: hunting, wildlife
9 watching, and other types of backcountry recreation.
10

11 **4.2.3.1. Hunting**

12
13 Healthy and abundant prey populations are important for maintaining hunting opportunities that
14 contribute to many local economies in Washington, especially in more rural regions. The challenge
15 for wildlife managers is to manage for healthy ungulate population levels that also sustain wolves,
16 other carnivores, harvest opportunities for the public, and subsistence and ceremonial needs of
17 treaty tribes.
18

19 *Big Game Hunting in Washington.* Hunting, especially for big game (ungulates, cougar, bear), is an
20 important recreational activity in Washington. The 2006 National Survey of Fishing, Hunting, and
21 Wildlife-Associated Recreation, which is based on household interviews nationwide, estimated that
22 187,000 residents of Washington, or 3.8% of the state's population aged 16 years old and older, were
23 hunters (for either big or small game, or both; USFWS and USCB 2008). This is below the national
24 average of 5.5% of the population aged 16 years and older. An estimated 182,000 hunters hunted in
25 Washington in 2006, with an estimated 179,000 residents and 3,000 non-residents participating.
26 Hunters spent nearly 2.13 million days hunting for all species in the state in 2006. Big game hunting
27 represents some of the most highly valued hunting in Washington, with an estimated 90% of
28 hunters hunting ungulates in 2006 (USFWS and USCB 2008). By comparison, only an estimated
29 23% and 11% of hunters sought small game and migratory birds, respectively. Seventy-nine percent
30 of total hunter days involved big game hunting, 14% small game hunting, and 7% migratory birds in
31 2006.
32

33 Deer and elk hunting are the predominate forms of big game hunting in Washington, both in terms
34 of the number of hunters participating and total days spent hunting. Numbers of deer hunters and
35 deer hunting days have averaged about 141,500 and 845,000 per year, respectively, during the past
36 decade (WDFW 1997-2006). Despite some sizeable yearly increases and decreases, deer hunter
37 numbers remained almost stable (increase of 0.7%) from 1997 to 2006, whereas hunting days
38 decreased 18.8%. Deer harvest has remained robust, averaging 38,100 deer annually during the past
39 decade. For elk, numbers of hunters and hunting days have averaged about 74,400 and 412,400 per
40 year, respectively, during the past decade in Washington. Both figures have shown net increases of
41 15.4% and 19.0%, respectively, during this period, although both have been in gradual decline since

1 2000. Despite these declines, elk harvest has remained strong, averaging 7,390 animals annually over
2 the past decade. Hunting opportunities for moose, bighorn sheep, and mountain goats in
3 Washington are far more limited than for deer and elk. All three species are hunted only through
4 special permit drawings, with fewer than 100 permits issued annually for each.

5
6 *Recent Impacts of Wolves on Big Game Hunting in Neighboring States.* To date, wolves have caused any
7 sizable losses of hunter opportunity in Montana, although seasons for antlerless elk in some
8 locations have been reduced to compensate for mortality from multiple sources including wolves
9 (MFWP 2007a; C. Sime, pers. comm.). In southwestern Montana, some of the most liberal
10 opportunities for elk harvest over the past three decades are currently being offered in two-thirds of
11 the region's hunting districts, all of which support wolves. However, lethal wolf control in many of
12 these areas to reduce conflicts with livestock may keep local wolf densities low enough to minimize
13 impacts on elk herds. Recently, Montana Fish, Wildlife & Parks has reduced hunting limits for
14 antlerless elk in the northern Yellowstone herd, which has undergone a substantial decline since the
15 mid-1990s due to a large past antlerless harvest, drought, and predation by wolves and other
16 predators (Eberhardt et al. 2007). This is designed to enhance adult female elk survival and to
17 decrease the removal of animals with the highest reproductive potential. Wolf impacts on deer and
18 other ungulates have not been detected to date (C. Sime, pers. comm.). In the northern Yellowstone
19 area, no reductions in hunting permits, harvest size, or hunter success for mule deer or moose have
20 occurred as a result of wolves (White et al. 2003). Montana Fish, Wildlife & Parks has not
21 experienced any declines in hunting generated revenue, license sales, or hunter success on a
22 statewide level because of wolf presence (C. Sime, pers. comm.).

23
24 Wolf impacts on big game hunting in Idaho have not been well quantified. IDFG (2008) reported
25 that wolf predation may be causing reductions in the harvestable surplus of elk in some parts of the
26 state, even if elk populations are not declining. The Lolo region, where experimental wolf control is
27 proposed, has experienced a significant reduction in elk abundance, but this trend began in the mid-
28 1980s, well before wolves became common (IDFG 2006). The extent that wolves have contributed
29 to this decline in recent years is unknown but perhaps significant. IDFG (2008) has also reported
30 that wolves are possibly reducing success rates for some hunters in parts of the state by changing the
31 behavior and habitat use of elk during the hunting season. As observed in the greater Yellowstone
32 ecosystem (Creel and Winnie 2005, Mao et al. 2005), Idaho's elk may now be spending more time in
33 forested areas, on steeper slopes, and at higher elevations than before wolf reintroductions, making
34 it more difficult for hunters to find animals. Changes in herding behavior and movement rates
35 (Proffitt et al. 2009) may also affect hunting success. Other ungulates have not been impacted by
36 wolves in Idaho, with the possible exception of moose (S. Nadeau, pers. comm.). Declines in
37 moose in some areas are poorly understood and may in fact be related to habitat changes or other
38 causes. Big game revenue and tag sales to resident and non-resident hunters have remained stable in
39 recent years for the Idaho Department of Fish and Game (B. Compton, pers. comm.; S. Nadeau,
40 pers. comm.). Some hunters have indicated that they would not return to their hunting areas

1 because of real or perceived impacts of wolves, but whether this has produced significant changes in
2 hunter activity has been difficult to assess.

3 In Wyoming, at present, there are no definitive data showing decreased hunter harvest or
4 opportunity due to wolf predation on elk or moose (WGFC 2008).

5 *Impacts of Wolves on Hunting in Washington.* The effect on ungulate populations from adding wolves to
6 existing predation levels and hunter harvest is difficult to predict in the state because of localized
7 differences in predator and ungulate abundance and harvest management practices within each
8 geographic area. However, information from Idaho, Montana, and Wyoming, each of which
9 currently supports 300-850 wolves, provides useful insight on impacts that can be expected in
10 Washington as wolves reestablish. In general, wolves have had little or no effect on elk and deer
11 abundance or hunter harvest across large areas of Idaho, Montana, and Wyoming, where most
12 populations remain stable or are above population objectives. Wolves have been linked to declining
13 elk herds in several areas, but often they are one of several factors affecting the herds (e.g., changes
14 in habitat, severe winter weather, and increasing populations of other predators). In some wolf-
15 occupied areas, hunter success rates may have been reduced because of changes in elk behavior and
16 habitat use rather than by actual declines in elk abundance.

17 ▪ **Alternative 1.** Under Alternative 1, ungulates would be managed to maintain healthy
18 population levels through standard practices (as described in game management plans),
19 adjustments to recreational harvest levels to benefit wolf conservation would not occur, and
20 management of ungulate populations that are below herd objectives could consider removal
21 of wolves under certain limited circumstances after wolves reached sensitive status.
22 Together, these actions would likely result in smaller numbers of wolves, which would
23 probably result in fewer localized impacts to ungulate populations from wolves, and few
24 adjustments of harvest levels (e.g., reductions in antlerless take, shortened hunting seasons,
25 and reduced availability of special permits) to benefit wolves. Because Alternative 1 would
26 be less likely to result in the establishment of wolf populations in a Pacific Coast recovery
27 region, few if any wolf-related impacts to hunting would occur in that part of the state.

28 ▪ **Alternative 2 – Preferred alternative (Draft Wolf Conservation and Management**
29 **Plan).** Alternative 2 would manage for healthy ungulate prey populations through standard
30 practices, and would also allow for consideration of some adjustment of recreational harvest
31 levels, if needed, to benefit wolf conservation in certain limited situations. Both scenarios
32 could result in some management restrictions being placed on harvest levels (e.g., reductions
33 in antlerless take, shortened hunting seasons, and reduced availability of special permits) in
34 localized areas. Under this alternative, management of at-risk ungulate populations could
35 consider removal of wolves under certain limited circumstances after delisting occurs.
36 Although hunting of at-risk populations would likely already be prohibited or tightly
37 restricted, removal of wolves could enhance future hunting opportunities. Because
38 Alternative 2 would be less likely to result in the establishment of wolf populations in a

1 Pacific Coast recovery region, few if any wolf-related impacts to hunting would occur in that
2 part of the state.

3 ■ **Alternative 3.** Alternative 3 recommends managing for healthy ungulate prey populations
4 through standard practices, but would also consider reductions in levels of recreational
5 harvest (possibly through reductions in antlerless take, shortened hunting seasons, or
6 reduced availability of special permits) to benefit wolf conservation in wolf recovery regions
7 until recovery objectives for the region were met. Combined, these actions would likely
8 result in larger numbers of wolves, which would possibly result in greater localized impacts
9 to ungulate populations from wolves. Under this alternative, management of at-risk
10 ungulate populations could consider removal of wolves under certain limited circumstances
11 after delisting occurs. Although hunting of at-risk populations would likely already be
12 prohibited or tightly restricted, removal of wolves could enhance future hunting
13 opportunities. Under Alternative 3, wolf-related impacts to hunting could occur in the
14 Pacific Coast area of Washington as well as in other regions of the state because of recovery
15 objectives for wolves in that region.

16 ■ **Alternative 4 – No Action (Current Management).** Under this alternative, WDFW would
17 continue to manage for healthy ungulate populations through standard practices per game
18 management plans. Most types of lethal control of wolves would be not be used until after
19 delisting under this alternative. Under this alternative, it is difficult to predict wolf
20 abundance or what resultant impacts they might have on hunting. Game management plans
21 would likely adjust harvest levels if localized ungulate populations were declining below herd
22 objectives due to varied possible causes. Because Alternative 4 would be less likely to result
23 in the establishment of wolf populations in a Pacific Coast recovery region, wolf-related
24 impacts to hunting in this area would also be less likely.

25 4.2.3.2. Wildlife Watching

26 Wildlife viewing is hugely popular in the United States. According to the 2006 National Survey of
27 Fishing, Hunting, and Wildlife-Associated Recreation, more than 71 million Americans 16 years old
28 and older (31% of the U.S residents in this age bracket) participated in wildlife watching activities
29 (i.e., observing, feeding, photographing, etc.; includes fish viewing) in 2006 (USFWS and USCB
30 2007). Of these, almost 23 million people took trips more than one mile from their homes
31 specifically to see wildlife. Participation in wildlife viewing increased 8% nationally from 2001 to
32 2006, in contrast to fishing and hunting, which fell 12% and 4%, respectively. Seventy percent (16.2
33 million people) of the wildlife watchers traveling away from home observed, fed, or photographed
34 land mammals, with 56% (12.8 million people) specifically interested in large mammals such as deer,
35 bears, and coyotes.

36 In Washington during 2006, an estimated 2.33 million people 16 years old and older participated in
37 some form of wildlife watching, which ranked the state 11th in the nation for participation (USFWS
38 and USCB 2007, 2008). About 2 million participants were state residents (40% of the state's total

1 population in this age group), with the remainder being non-residents. An estimated 628,000
2 Washington residents and 331,000 non-residents in this age group traveled more than one mile away
3 from home to view wildlife in Washington during the year. Residents spent an estimated 8.0 million
4 days (88% of the total; average of 12.7 days per person) and non-residents spent an estimated 1.1
5 million days (12%; average of 3.4 days per person) away from home watching wildlife in Washington
6 during the year. Overall, wildlife watchers outnumbered hunters and anglers combined by nearly
7 three times in Washington.

8 In addition to the wildlife watching opportunities that already exist in the state, Washington has
9 potential to develop viewing opportunities for wolves (defined here as seeing, hearing, or otherwise
10 experiencing wolves), depending on where and how many wolves eventually become reestablished in
11 the state, their behavior, and human behavior in response to them (see Chapter 14, Section D, of
12 Alternative 2, the draft wolf conservation and management plan). Viewing potential could
13 eventually exist at several locations, such as Mt. St. Helens National Volcanic Monument and in the
14 Methow Valley. Wolf-based tourism also has some potential in other areas of the state (e.g., some
15 national forest lands) where wolves might not be frequently seen, but would be regularly present and
16 relatively safe from harassment. Modest numbers of visitors might be attracted to such areas in
17 hopes of possibly seeing or hearing a wolf or finding wolf sign.

18 In contrast to the scenario presented above, any substantial wolf-related declines in the public's
19 ability to view elk, deer, and other ungulates caused by changes in behavior could reduce overall
20 wildlife viewing opportunities in some localized areas. However, this problem has not been
21 reported from other localities with wolves in the lower 48 states and is not expected to occur over
22 large areas of Washington.

23 ▪ **Alternative 1.** The more aggressive management of wolf-related conflicts with livestock and
24 ungulates with lethal control implemented at earlier stages of recovery is likely to result in
25 smaller numbers of wolves and greater instability of packs, which could in turn limit
26 opportunities to see or hear wolves. However, it might retain recreational viewing
27 opportunities for some ungulate populations. Because Alternative 1 would be less likely to
28 result in the establishment of wolf populations in a Pacific Coast recovery region, any
29 opportunities for wolf watching would most likely occur in eastern Washington and the
30 Cascades. This alternative would also retain wolf-related education and outreach at current
31 levels, which might limit public interest in watching or hearing wolves.

32 ▪ **Alternative 2 – Preferred alternative (Draft Wolf Conservation and Management**
33 **Plan).** This alternative would result in moderate numbers of wolves and levels of pack
34 stability in Washington, which could allow the development of opportunities to see or hear
35 wolves in some areas. Because Alternative 2 would be less likely to result in the
36 establishment of wolf populations in a Pacific Coast recovery region, any wildlife watching
37 opportunities for wolves would most likely occur in eastern Washington and the Cascades.

1 This alternative would expand wolf-related education and outreach, which could increase
2 public interest in watching or hearing wolves.

- 3 ■ **Alternative 3.** Delays in lethal control until the later stages of recovery or delisting under
4 this alternative would likely result in larger numbers of wolves and greater pack stability,
5 which could increase opportunities to watch and hear wolves over larger portions of their
6 range in Washington. This alternative would require the establishment of wolves in a Pacific
7 Coast recovery region, which could bring wolf watching opportunities to this region,
8 including Olympic National Park. This alternative would expand wolf-related education and
9 outreach, which could increase public interest in watching or hearing wolves.

- 10 ■ **Alternative 4 – No Action (Current Management).** Most types of lethal control of
11 wolves would not be used until after delisting under the no action alternative. Management
12 of wolf-related conflicts involving livestock and ungulates would be less aggressive under
13 Alternative 4, with most types of lethal control delayed until after delisting. This could result
14 in somewhat larger numbers of wolves and greater pack stability, which could allow
15 opportunities for wolf watching to develop in some areas. Because this alternative would be
16 unlikely to result in the establishment of wolf populations in a Pacific Coast recovery region,
17 any wolf watching opportunities would most likely occur in eastern Washington and the
18 Cascades (as in Alternative 3). This alternative would also retain wolf-related education and
19 outreach at current levels, which might not increase public interest in watching or hearing
20 wolves.

21 4.2.3.3. Other Types of Backcountry Recreation

22 In addition to hunting and wildlife watching, wolves could potentially affect other forms of
23 backcountry recreation, such as hiking, camping, horse use, and cross country skiing. Some
24 members of these groups may welcome seeing wolves and may seek them out, while others may
25 consider wolves as problematic to their activities because of perceived concerns over personal safety.
26 Thus, wolf presence could possibly attract some visitors to national forests and other wildland areas,
27 while preventing others from visiting. Reduced visitation to backcountry areas because of wolves
28 has not been reported in other localities occupied by wolves in the lower 48 states and is therefore
29 unlikely to occur in Washington.

30 Backcountry recreationists should be informed about wolves to alleviate perceived concerns over
31 personal safety and to inform them of methods for reacting to wolves during encounters, reducing
32 the likelihood of encounters, and preventing wolf habituation toward people. Outreach and
33 education strategies for accomplishing these goals are essential to achieving the conservation and
34 management goals for wolves and are presented in greater detail in Chapter 12 of the draft wolf
35 conservation and management plan.

- 36 ■ **Alternative 1.** Management actions under this alternative that would result in smaller
37 numbers of wolves could in turn result in the public experiencing fewer backcountry

1 encounters with wolves. Alternative 1 would be less likely to result in the establishment of
2 wolf populations in a Pacific Coast recovery region, so backcountry encounters with wolves
3 would most likely occur in eastern Washington and the Cascades. Wolf-related outreach and
4 education would continue at current levels under this alternative, which would limit the
5 amount of information on wolves that backcountry users would receive.

- 6 ▪ **Alternative 2 – Preferred alternative (Draft Wolf Conservation and Management**
7 **Plan).** This alternative would result in moderate numbers of wolves in Washington, which
8 could result in the public experiencing some backcountry encounters with wolves. Because
9 Alternative 2 would be less likely to result in the establishment of wolf populations in a
10 Pacific Coast recovery region, backcountry encounters with wolves would most likely occur
11 in eastern Washington and the Cascades. This alternative would increase the amount of
12 wolf-related education and outreach provided to the public. This would expand the amount
13 of information on wolves that backcountry users would receive.
- 14 ▪ **Alternative 3.** Management of wolf-related conflicts under Alternative 3 would likely result
15 in the establishment of larger numbers of wolves, which would result in the public
16 experiencing greater numbers of backcountry encounters with wolves. Because Alternative 3
17 would be more likely to result in the establishment of wolf populations in a Pacific Coast
18 recovery region, backcountry encounters with wolves would likely occur in this region as
19 well as in eastern Washington and the Cascades. This alternative would increase the amount
20 of wolf-related education and outreach provided to the public, which would greatly expand
21 the amount of information on wolves that backcountry users would receive.
- 22 ▪ **Alternative 4 – No Action (Current Management).** Most types of lethal control of
23 wolves would not be used until after delisting under the no action alternative. It is unknown
24 how numerous wolves would be, but this could result in somewhat larger numbers of
25 wolves, which could result in the public experiencing greater numbers of backcountry
26 encounters with wolves. Because Alternative 4 would be less likely to result in the
27 establishment of wolf populations in a Pacific Coast recovery region, backcountry
28 encounters with wolves would most likely occur in eastern Washington and the Cascades.
29 This alternative would maintain outreach and education efforts at current levels, which
30 would limit the amount of information on wolves that backcountry users would receive.

31 4.2.4. Agricultural Crops - Livestock

32 Wolf reestablishment in Washington is a concern to livestock producers because of the potential of
33 wolves to kill, injure, or stress cattle, sheep, and other domestic animals. Financial losses may result
34 directly from wolf depredation whether confirmed or not, and indirect financial losses may
35 accumulate because of increased management activities or changes to ranching and farming
36 operations. While statewide impacts might not occur, these financial losses would accrue to
37 individual producers and may be significant to them.

1 *Livestock in Washington.* Estimated inventories of cattle and calves in Washington have remained
2 relatively stable at about 1.1-1.2 million head (including beef and dairy cattle, and cattle confined to
3 feedlots) during the past decade (NASS 2004, 2007a). Surveys from 2002, the most recent year for
4 which full data are available, reveal that cattle inventories per county are generally largest in counties
5 along the Cascade Mountains and in the Columbia Basin. Washington's sheep industry is far smaller
6 than its cattle industry, with estimated sheep numbers fluctuating between 46,000 and 58,000 head
7 during the past decade (NASS 2007a). Sheep inventories were largest in Yakima, Okanogan, Grant,
8 and Whitman counties in 2002. Other livestock vulnerable to wolf predation include goats, llamas,
9 and horses, but incidents involving these species are infrequent in other western states.

10 Many livestock producers in Washington rely entirely on private land for their annual operations,
11 whereas some depend on a combination of private land and public land grazing leases. In these
12 latter cases, animals are typically kept on private land during the winter, with most calving and
13 lambing occurring in late winter or early spring. During the warmer months, livestock are taken to
14 grazing allotments on public lands, many of which occur in more remote locations with rougher
15 topography and natural vegetative cover. Livestock are then gathered in the fall, with young shipped
16 to market and breeding stock returned to private land for winter.

17 About 2.2 million acres in 155 active grazing allotments currently exist on national forests in
18 Washington. This coverage represents about 24% of all national forest lands in the state. By far the
19 most allotments occur in the eastern Washington and are assigned for cattle. Considerable variation
20 exists in the percent of land designated as allotments within each national forest, ranging from a high
21 of 53% in Colville National Forest to 0% in Mt. Baker-Snoqualmie and Olympic National Forests.
22 Numbers of active allotments have declined substantially over the past 15 years primarily because of
23 economic and social reasons (W. Gaines, pers. comm.).

24 *Wolf Depredation on Livestock.* The recovery of wolves in other states has resulted in depredations on
25 cattle, sheep, and other livestock. However, despite significant increases in wolf populations,
26 confirmed losses to wolves have remained infrequent to date relative to total livestock numbers
27 (Bangs et al. 2005b, USFWS 2008a). Bangs et al. (2006) noted that while wolf depredations on
28 livestock were unimportant to the regional livestock industry, they could affect the economic
29 viability of some ranchers. Many factors influence depredation rates on livestock, including the
30 proximity of livestock to wolf home ranges, dens, and rendezvous sites; pack size; abundance of
31 natural prey and livestock; amount and type of vegetative cover; time of year; livestock husbandry
32 methods in both the area of concern and adjacent areas; the use of harassment tools and lethal take;
33 pasture size; and proximity to roads, dwellings, and other human presence (Mech et al. 2000, Fritts
34 et al. 2003, Treves et al. 2004, Bradley and Pletscher 2005). These factors make it difficult to predict
35 where and when depredations by wolves will occur.

36 Wolves don't necessarily attack livestock whenever livestock are encountered, but most wolf packs
37 that regularly encounter livestock are likely to depredate at some point (Bangs and Shivik 2001).
38 Some packs show increasingly frequent depredation behavior, while others may do so once or twice

1 a year, every other year, or even less frequently (USFWS et al. 2009). USFWS et al. (2009) reported
2 that on average 10-25% of all wolf packs in Montana were confirmed to have killed livestock in any
3 given year from 1999 to 2008. In comparison, 33-85% of the packs in Wyoming outside of
4 Yellowstone National Park were involved in depredations annually from 2005 to 2008 (USFWS et al.
5 2009).

6 In the northern United States, wolf depredation on livestock occurs more frequently from March to
7 October when livestock spend more time under open grazing conditions, calving is taking place, and
8 wolf litters are being raised (Fritts et al. 2003, Musiani et al. 2005, Sime et al. 2007). Untended
9 livestock, particularly young calves, appear to be more vulnerable, and the presence of livestock
10 carcasses on a property may increase risk as well (Fritts et al. 2003). Depredations occur on both
11 open grazing sites and inside fenced pastures. Sime et al. (2007) reported that among the 162
12 livestock producers suffering confirmed wolf depredation in Montana between 1987 and 2006, 62%
13 experienced a single incident, 20% experienced two incidents, and 17% experienced three or more
14 incidents.

15 In the northern Rocky Mountain states, calves are more commonly killed than other age groups of
16 cattle because of their greater vulnerability (Fritts et al. 2003; Bangs et al. 2005a; Unsworth et al.
17 2005; Sime et al. 2007; Stone et al. 2008; J. Timberlake, pers. comm.). Oakleaf et al. (2003) found
18 that wolves tend to choose the smallest calves and there is evidence that some depredated calves are
19 in poorer physical condition (Bradley and Pletscher 2005). In parts of Canada, wolves sometimes
20 kill yearling cattle more often than calves (Stone et al. 2008). In contrast, adult sheep appear to be
21 taken more frequently than lambs (Fritts et al. 2003). Depredations on sheep commonly involve
22 multiple individuals, whereas those on cattle usually involve single animals.

23 In Idaho, Montana, and Wyoming, significant variation in the number of cattle and sheep killed by
24 wolves occurs among states and sometimes between years. While the numbers of livestock killed by
25 wolves in these states have generally increased over time as wolf numbers have grown, these are
26 small compared to losses caused by coyotes, cougars, bobcats, dogs, bears, foxes, eagles, and other
27 predators (NASS 2005, 2006). Wolf depredations are also far fewer than the number of losses for
28 the combined non-predator losses (e.g., sickness, disease, weather, and birthing problems) in Idaho,
29 Montana, and Wyoming.

30 Figures for confirmed depredations caused by wolves represent minimum estimates of the livestock
31 actually killed by wolves. Probable losses, in which officials are unable to verify the cause of death,
32 are not included. Additionally, ranchers sometimes fail to locate carcasses or are unable to notify
33 authorities soon enough to obtain confirmation because of the rugged and vast terrain where
34 livestock graze, the extent of carcass consumption by predators and scavengers, or carcass
35 decomposition. In some instances, ranchers may choose not to report their losses.

36 *Methods for Resolving Wolf-Livestock Conflicts.* Managing wolf-livestock conflicts and wolf recovery
37 requires an integrated approach using a variety of non-lethal and lethal methods. Non-lethal
38 measures, especially when used in combination, often temporarily succeed in reducing the

1 vulnerability of livestock to wolf depredation, but are usually not considered permanent solutions by
2 themselves. These approaches offer a partial alternative to lethal control of wolves and can be
3 especially important when wolf numbers and distribution are small and recovery objectives have not
4 yet been achieved. These measures comprise a number of husbandry methods and non-lethal
5 deterrents to reduce the vulnerability of livestock, including: 1) using range riders to help keep cattle
6 more concentrated on grazing sites; 2) having herders with dogs present with sheep at night when
7 most sheep depredation occurs; 3) burying livestock carcasses rather than dumping them in
8 traditional bone yards to reduce scavenging opportunities for wolves; 4) moving sick or injured
9 livestock; 5) delaying turnout of cattle onto grazing sites until calving is finished or until young wild
10 ungulates are born; 6) allowing calves to reach at least 200 pounds before turning them out to
11 grazing sites (Oakleaf et al. 2003); 7) avoiding grazing livestock near the core areas of wolf
12 territories, especially dens and rendezvous sites, during the earlier portion of the grazing season; 8)
13 using guarding animals (primarily dogs) with livestock to alert herders when wolves are nearby; 9)
14 using light and noise scare devices to frighten wolves away from confined livestock and to alert
15 ranchers and herders to the presence of wolves; 10) hazing wolves with non-lethal munitions (e.g.,
16 cracker shells, rubber bullets) to frighten them away and teach them to avoid livestock; 11) using
17 permanent or temporary predator-resistant or electric fencing to confine livestock; and 12) using
18 fladry, which consists of numerous strips of flagging hung along a fence or rope to keep wolves out
19 of an area occupied by livestock. Implementation of these methods can result in higher costs to
20 livestock producers.

21 Lethal control of wolves may be necessary to resolve repeated wolf-livestock conflicts and is
22 performed to remove problem animals that jeopardize public tolerance for overall wolf recovery.
23 Nearly 1,000 wolves were killed in control actions in Idaho, Montana, and Wyoming from 1987 to
24 2008, with 7-16% of the population removed annually since 2002. While federally listed, most lethal
25 control of wolves in these states was performed by wildlife agency staff. As wolves became more
26 common, the U.S. Fish and Wildlife Service gradually loosened restrictions on lethal control to allow
27 increased take by agency staff and private citizens with a federal permit (Bangs et al. 2006). In
28 Idaho, Montana and Wyoming, agency decisions to lethally remove wolves are made on a case-by-
29 case basis, taking into account specific factors such as a pack's size and conflict history, status and
30 distribution of natural prey in the area, season, age and class of livestock, success or failure of non-
31 lethal tools, and potential for future losses (Sime et al. 2007). Where lethal removal is deemed
32 necessary, incremental control is usually attempted, with one or two offending animals removed
33 initially. If depredations continue, additional animals may be killed and eventual elimination of an
34 entire pack may occur (Sime et al. 2007).

35 Lethal control of wolves by agency staff can have the advantages of being swift, effective, and tightly
36 regulated. The benefits of allowing lethal removal by livestock producers are that offending wolves
37 are more likely to be targeted, it can eliminate the need for agency control, shooting at wolves may
38 teach them and other pack members to be more wary of humans and to avoid areas of high human
39 activity, it allows producers to address their own problems, and it may reduce animosity toward
40 government management of wolves (Bangs et al. 2006). Drawbacks of lethal control are that it is

1 controversial among much of the public, depredation may recur, wolves may respond by becoming
2 more active at night, it can be costly when performed by agencies, it is open to abuse when
3 conducted by the public, thereby requiring law enforcement follow-up, and excessive use can
4 preclude the recovery of wolf populations (Musiani et al. 2005, USFWS 2005, Bangs et al. 2006).

5 *Compensation for Wolf Depredation on Livestock.* Several compensation programs have been developed
6 in the western U.S. to help livestock producers recover some of the costs associated with wolf
7 predation, with the intention that this will build greater tolerance for wolf recovery. The Bailey
8 Wildlife Foundation Wolf Compensation Trust, which is operated by the Defenders of Wildlife, has
9 been the primary program offering compensation to ranchers for livestock losses (DOW 2008).
10 Under this fund, confirmed losses of livestock and herding/guarding dogs are reimbursed at 100%
11 of their current or projected market value up to \$3,000 per animal, whereas probable losses are
12 reimbursed at 50% of their current or projected market value up to \$1,500 per animal. Idaho and
13 Wyoming have implemented their own state programs to cover other types of losses. Idaho
14 compensates for above-normal mortality as well as lower-than-expected weight gains by livestock.
15 This program also provides partial reimbursement for proactive efforts. Wyoming uses a multiplier
16 for each confirmed depredation on calves and sheep to account for undocumented wolf-caused
17 losses. Calves and sheep are compensated up to seven times the number confirmed but only up to
18 the total number reported missing by a producer.

19 *Impacts of Wolves on Livestock Production in Washington.* The reestablishment of wolves in Washington
20 will affect some livestock producers through wolf-related depredation and/or changes in husbandry
21 and management methods needed for adapting to the presence of wolves. Projections of wolf-
22 caused losses of livestock in the state are described more fully in Chapter 14, Section B, of the draft
23 wolf conservation and management plan. During the endangered and threatened phases of
24 recovery, wolves should pose little detriment to the state's livestock industry as a whole. At the wolf
25 population levels associated with the early stages of recovery, the vast majority of producers will
26 probably experience few if any annual costs, whereas a few individual producers could be more
27 affected. Some of these costs would be offset by compensation from programs such as the Bailey
28 Wildlife Foundation Wolf Compensation Trust or state programs. As wolf populations become
29 larger and more widely distributed, financial impacts are likely to accrue to more producers. Where
30 and when depredations occur will depend on different factors, including the abundance and
31 distribution of wolves and the husbandry methods and locations of livestock in areas occupied by
32 wolves.

- 33 ▪ **Alternative 1.** Under this alternative, management of wolf-related conflicts involving
34 livestock and ungulates would be more aggressive. Non-lethal injurious harassment and
35 many forms of lethal control by livestock producers would be allowed during earlier stages
36 of recovery. Some of these actions would likely result in smaller numbers of wolves, which
37 could result in fewer localized wolf-livestock conflicts. Producers would receive lower
38 compensation payments for wolf-related livestock depredation under this alternative.
39 WDFW would also be less available to work with livestock producers in implementing

1 proactive measures to avoid depredation, which could increase depredation levels and costs
2 for producers. Wolf-related outreach and education directed at producers would continue at
3 current levels under this alternative, which would limit the amount of information they
4 receive about addressing impacts from wolves. Because Alternative 1 would be less likely to
5 result in the establishment of wolf populations in a Pacific Coast recovery region (as outlined
6 in Alternative 3), wolf-related impacts to livestock production would be unlikely to occur in
7 this part of the state.

8 ■ **Alternative 2 – Preferred alternative (Draft Wolf Conservation and Management**
9 **Plan).** Under this alternative, several types of lethal control that livestock producers would
10 be allowed to use would be delayed until later in the wolf recovery process. This would
11 likely allow moderate numbers of wolves to occur in Washington, which could result in
12 increased localized wolf-livestock conflicts. Under Alternative 2, producers would receive
13 generous compensation for wolf-related livestock depredation, which would be more likely
14 to cover the actual costs of their losses. WDFW would hire wolf specialists whose duties
15 would include working with livestock producers to implement proactive measures to avoid
16 depredation, which would help lower depredation levels and costs for producers. Wolf-
17 related outreach and education directed at producers would be a high priority under this
18 alternative and would give producers greater access to information for addressing impacts
19 from wolves. Because Alternative 2 would be less likely to result in the establishment of
20 wolf populations in a Pacific Coast recovery region (as outlined in Alternative 3), wolf-
21 related impacts to livestock production would be unlikely to occur in this part of the state.

22 ■ **Alternative 3.** Management of wolf-related conflicts involving livestock and ungulates
23 would be less aggressive under Alternative 3. Non-lethal injurious harassment and several
24 types of lethal control by livestock producers would be delayed until later into wolf recovery.
25 This would likely allow larger numbers of wolves to occur in Washington, which could result
26 in greater localized wolf-livestock conflicts. Under Alternative 3, producers would receive
27 the most generous compensation for wolf-related livestock depredation, which would be
28 more likely to cover the actual costs of their losses. WDFW would hire wolf specialists
29 whose duties would include working with livestock producers to implement proactive
30 measures to avoid depredation, which would help lower depredation levels and costs for
31 producers. Wolf-related outreach and education directed at producers would be a high
32 priority under this alternative, which would give producers greater access to information for
33 addressing impacts from wolves. Because Alternative 3 would be more likely to result in the
34 establishment of wolf populations in a Pacific Coast recovery region, wolf-related impacts to
35 livestock producers could occur in that part of the state as well as in other regions.

36 ■ **Alternative 4 – No Action (Current Management).** Livestock conflicts would be
37 addressed, but lethal control of wolves would be expected to be less aggressive under this
38 alternative, with most types of lethal control delayed until after delisting. It is unknown what
39 the impacts would be on wolf populations or conflicts with livestock. Livestock producers

1 would receive compensation for wolf-related livestock depredation under this alternative,
2 but it would be under current programs and would be less than that recommended in
3 Alternatives 2 and 3 and would only be on private lands. Wolf-related outreach and
4 education directed at livestock producers would continue at current levels, which would limit
5 the amount of information that producers receive on addressing impacts from wolves.
6 Under this alternative, WDFW would have fewer staff available to work with livestock
7 producers in implementing proactive measures to avoid depredation, which could increase
8 depredation levels and costs for producers. Because Alternative 4 would be less likely to
9 result in the establishment of wolf populations in a Pacific Coast recovery region, few if any
10 wolf-related impacts to livestock production would occur in this part of the state.

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6. Personal Communications

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| 42 | | | |
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| 44 | | | |

7. Glossary of Terms

For the purposes of this Draft Environmental Impact Statement, the following definitions apply:

Breeding pair – see Successful Breeding Pair.

Classify – to list or delist wildlife species to or from endangered, or to or from the protected wildlife subcategories threatened or sensitive.

Compensation – monetary payment to offset or replace the economic loss for a death or injury to livestock or guarding animals due to wolf activity.

Confirmed wolf depredation – any depredation where there is reasonable physical evidence that the dead or injured livestock was actually attacked or killed by a wolf. Primary confirmation would ordinarily be the presence of bite marks and associated subcutaneous hemorrhaging and tissue damage, indicating that the attack occurred while the victim was alive, as opposed to simply feeding on an already dead animal. Spacing between canine tooth punctures, feeding pattern on the carcass, fresh tracks, scat, hairs rubbed off on fences or brush, and/or eyewitness accounts of the attack may help identify the specific species or individual responsible for the depredation. Predation might also be confirmed in the absence of bite marks and associated hemorrhaging (i.e., if much of the carcass has already been consumed by the predator or scavengers) if there is other physical evidence to confirm predation on the live animal. This might include blood spilled or sprayed at a nearby attack site or other evidence of an attack or struggle. There may also be nearby remains of other victims for which there is still sufficient evidence to confirm predation, allowing reasonable inference of confirmed predation on an animal that has been largely consumed. Determination will be made by WDFW or other authorized personnel.

Delist – to change the classification of endangered, threatened, or sensitive species to a classification other than endangered, threatened, or sensitive.

Depredation – any death or injury of livestock, as defined in this plan, caused by a predator.

Downlist – to change the classification of an endangered or threatened species to a lower classification (e.g., from endangered to threatened, or from threatened to sensitive).

Endangered – as defined by Washington law, any wildlife species native to the state of Washington that is seriously threatened with extinction throughout all or a significant portion of its range within the state.

Extinct – a wildlife species that no longer exists anywhere; it has died out entirely, leaving no living representatives.

Fladry – a method of non-lethal wolf deterrent that involves attaching numerous strips of flagging material along a fence or other device for the purpose of keeping wolves out of an area occupied by livestock.

Guarding animals - any dog, llama, or other species actively used to defend livestock from predators.

Guarding dog – any dog actively used to defend livestock from predators.

- 1 **Habituation** – for wolves, this refers to individuals that have lost their natural fear of humans and
2 human activities, which allows them to live in proximity to humans. This often occurs through repeated
3 exposure to humans in non-threatening situations, especially where food has been made available.
4
- 5 **Herd dog** – any dog actively used to herd livestock.
6
- 7 **Hybrid** – the offspring of a mating between a wolf and a dog, a wolf and a hybrid, a dog and a hybrid,
8 or two hybrids.
9
- 10 **In the act of attacking** – actively biting, wounding, or killing.
11
- 12 **Lethal control** – management actions that result in the death of a wolf.
13
- 14 **List** – to change the classification status of a wildlife species to endangered, threatened, or sensitive.
15
- 16 **Livestock** – cattle, calves, pigs, horses, mules, sheep, lambs, llamas, goats, guarding animals, and herding
17 dogs.
18
- 19 **Non-lethal control** – management actions designed to frighten or threaten wolves, but that do not
20 result in the death of a wolf.
21
- 22 **Pack of wolves** – a group of wolves, usually consisting of a male, female, and their offspring from one
23 or more generations. For purposes of monitoring, a pack is defined as a group of two or more wolves
24 traveling together in winter.
25
- 26 **Proactive management** – non-lethal husbandry methods implemented to minimize the potential for
27 wolf-livestock conflicts. These may include, for example, modified husbandry methods, light and noise
28 scare devices, non-lethal munitions, fencing, fladry, guarding animals, and greater use of herders/riders.
29
- 30 **Probable wolf depredation** – there is sufficient evidence to suggest that the cause of death was
31 depredation, but not enough to clearly confirm that the depredation was caused by a wolf. A number of
32 other factors will help in reaching a conclusion, such as (1) any recently confirmed predation by wolves
33 in the same or nearby area, and (2) any evidence (e.g., telemetry monitoring data, sightings, howling,
34 fresh tracks, etc.) to suggest that wolves may have been in the area when the depredation occurred. All
35 of these factors and possibly others would be considered in the investigator’s best professional judgment.
36 Determination will be made by WDFW or other authorized personnel.
37
- 38 **Reintroduction** – capturing and moving animals from one area to another, usually for the purpose of
39 reestablishing a new population in an area that was formerly occupied. For this plan, reintroduction
40 implies moving wolves from locations outside of Washington to a site(s) inside Washington.
41
- 42 **Rendezvous site** – a specific resting and gathering area occupied by wolf packs during summer and
43 early fall after the natal den has been abandoned. A wolf pack will usually move from the natal den site
44 to the first rendezvous site when the pups are 6-10 weeks of age (late May-early July). The first
45 rendezvous site is usually within 1-6 miles of the natal den site. A succession of rendezvous sites are
46 used by the pack until the pups are mature enough to travel with the adults (usually September or early
47 October).
48

- 1 **Sensitive** – as defined by Washington law, any wildlife species native to the state of Washington that is
2 vulnerable or declining and is likely to become endangered or threatened in a significant portion of its
3 range within the state without cooperative management or removal of threats.
4
- 5 **Significant portion of its range** – that portion of a species’ range likely to be essential to the long-term
6 survival of the population in Washington.
7
- 8 **Source population** – a subpopulation whose reproductive success exceeds mortality and therefore
9 produces young that emigrate to other subpopulations and unoccupied areas. Source populations are
10 generally found in better quality habitats known as source habitats.
11
- 12 **Species** – as defined by Washington law, any group of animals classified as a species or subspecies as
13 commonly accepted by the scientific community.
14
- 15 **Successful breeding pair** – an adult male and an adult female wolf with at least two pups surviving to
16 December 31 of a given year, as documented under WDFW’s established protocols.
17
- 18 **Threatened** – as defined by Washington law, any wildlife species native to the state of Washington that
19 is likely to become an endangered species within the foreseeable future throughout a significant portion
20 of its range within the state without cooperative management or removal of threats.
21
- 22 **Translocation** – moving animals from one area to another for the purpose of establishing a new
23 population.
24
- 25 **Unknown loss** – with respect to compensation, the loss of livestock from an area with known wolf
26 activity without a carcass as evidence. This would be based on historical records of livestock return rates
27 prior to wolf presence/wolf depredation in the area.
28
- 29 **Ungulate** – any wild species of hoofed mammal, including deer, elk, moose, bighorn sheep, mountain
30 goat, and caribou. Cattle, sheep, pigs, horses, and llamas are also ungulates, but are referred to as
31 domestic livestock in this plan.
32
- 33 **Viable population** – one that is able to maintain its size, distribution, and genetic variation over time
34 without significant intervention requiring human conservation actions.
35
- 36 **Wolf recovery/conservation region** – any of three or four broad designated regions in Washington
37 where wolves need to become reestablished to meet the conservation goals of this plan. The regions are
38 illustrated in Figures 1 and 2.

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Appendix B. Summary of comments made during seven public scoping meetings in August 2007 and whether they were considered in developing the wolf conservation and management plan alternatives (√) or were outside the scope of the plan.

Comment	Considered in developing the plan alternatives
Conservation	
Establish wolf recovery objectives based on a minimum viable population	√
Ensure viable wolf populations prior to state delisting	√
Establish wolf recovery objectives using best available science	√
Establish wolf recovery objectives based on habitat capacity	√
Establish wolf recovery objectives based on ecosystem health, while protecting livestock	√
Establish recovery objectives based on ecological principles and the restoration of ecosystem function	√
Use the same wolf population numbers for delisting and relisting	√
Include distribution criteria in wolf recovery	√
Recover wolves to historical population numbers	Outside scope of the plan
Return wolves to restore ecosystem function	√
Consider the needs of the Okanogan region when setting wolf recovery objectives	√
Consider breeding pairs, but also consider packs or individuals, in establishing recovery objectives	√
Consider influence of high human population in setting wolf recovery objectives	√
Identify recovery areas based on potential habitat and minimal human conflict	√
Identify suitable wolf habitat statewide in wolf planning process	√
Recognize societal value of wolves in conservation planning	√
Include occupancy of ecoregions in down-listing and delisting criteria; e.g., 50% occupancy of ecoregions for down-listing to threatened and 80% occupancy of ecoregions for delisting	√
Include social and political factors, landownership patterns, and ecoregional targets in establishing recovery objectives	√
Maintain seasonal habitats for wolves in lowland areas	√
Consider ecological benefits of wolves to wildlife when developing recovery objectives	√
Develop wolf management units with population objectives that reflect habitat capacity within units	√
Establish wolf population recovery objectives by ecoregion or region	√
Include an objective for a viable population on the Olympic Peninsula	√
Address limiting factors that have prevented wolves from re-establishing in the state to optimize potential for recovery	√
Address why wolves were originally extirpated from the state	√
Assess the potential for impacts of wolves on other state species of concern and wildlife	√
Address criteria for translocation of wolves within the state	√
Don't allow translocations to occur	√
Translocate depredating wolves	√
Maintain genetic diversity in the wolf population	√

Appendix B. Summary of comments made during seven public scoping meetings in August 2007 and whether they were considered in developing the wolf conservation and management plan alternatives (√) or were outside the scope of the plan.

Comment	Considered in developing the plan alternatives
Address the wolf plan's development guideline of prohibiting translocation in national parks	√
Translocation should be an option in the southern Cascades and Olympic Peninsula due to barriers to natural dispersal	√
Identify geographic areas where wolves would be protected and areas for translocation, such as Olympic National Park and Gifford Pinchot National Forest	√
Report the wolf plan "sideboards" and who established them	√
Reintroduction should be an option at this time	Outside scope of the plan
Address any differences between the current wolf plan and past feasibility study to reintroduce wolves to Olympic National Park	√
Allow wolves to recover on their own with as little human involvement as possible	√
If hunting of wolves in Idaho prevents suitable dispersal in Washington, consider the need for reintroductions	√
Identify and maintain dispersal habitat that would allow movement among wolf occupied areas	√
Focus on dispersal of wolves for recovery until established	√
In recovery planning, recognize the long time frame involved in recovery	√
Hunting	
Manage wolves as a game species	√
Recover wolf populations so that they may be hunted	√
If wolves become a game species, do not allow aerial hunting, trapping, use of motorized vehicles, or poisons	√
When wolves are delisted, designate them as a game species for hunting and allow ranchers to kill wolves depredating livestock	√
When wolves are delisted, do not designate the wolf as a game species for hunting	√
Designating the wolf as a game species may result in poaching and other excessive mortality	√
Control problem wolves with hunting	√
Ungulate Conflicts	
Evaluate the impacts of wolves on game populations (elk, deer, and caribou). Include increased scientific monitoring to evaluate wolf-related impacts	√
Evaluate elk-wolf management objectives in game management plans, including triggers to address a wolf management action	√
Do not allow shortcomings in game management goals and objectives to drive wolf management objectives and goals.	√
Determine the effect of wolves on hunting opportunity of ungulates	√
Reduce hunting opportunity in areas where wolves have reduced deer/elk populations to compensate for reduced ungulate numbers	√
Manage hunting of wolf prey species around livestock areas to minimize potential wolf depredations on local livestock	√
Evaluate whether enhancement of wolf prey populations could reduce wolf depredations on livestock	√

Appendix B. Summary of comments made during seven public scoping meetings in August 2007 and whether they were considered in developing the wolf conservation and management plan alternatives (√) or were outside the scope of the plan.

Comment	Considered in developing the plan alternatives
Evaluate influence and role of big game populations in wolf recovery objectives	√
Manage wolves so that they do not negatively impact game populations	√
Recognize the many factors that may affect game populations (e.g. habitat changes) in addition to wolf predation, and recognize the ecological effects of not having wolves in Washington	√
Recognize the beneficial role of wolves in maintaining healthy deer and elk herds	√
Identify wolf management actions if wolves occur at elk winter feeding sites or other ungulate concentration areas	√
Conduct studies to evaluate predator-prey dynamics before and after wolf establishment, including cougar and black bear	√
Limit hunting of wolf prey species until wolf populations meet recovery objectives	√
Livestock Conflicts	
Include measures for protection of livestock and pets while wolves are state-listed	√
Develop guidelines for livestock owners on their response to wolf depredations and evaluate wolf control models from adjacent states	√
Consider compensation for wolf depredation occurring on private lands, but on public lands, livestock owners should be required to use best management practices to protect livestock, such as use of guard dogs	√
Given that grazing on public lands is already subsidized, should livestock producers receive additional compensation from the government for wolf depredations?	√
Identify best management practices for ranchers to prevent/minimize wolf depredations, such as requiring ranchers to properly dispose of livestock carcasses and not locating calving areas near wolf dens	√
Develop a process for reporting suspected depredations of livestock that is simple and includes a local response involving WDFW	√
Address public concern of game populations attracting wolves to nearby livestock	√
Train ranchers in the use of wolf deterrents, subsidize wolf deterrent process, and identify who ranchers contact for wolf deterrents	√
Provide ranchers with incentives to give up their grazing allotments, such as a buy-out program	√
Prohibit grazing on public lands if it leads to wolf-livestock conflicts	√
Federal agencies should identify which federal lands should not allow grazing	√
Limit livestock grazing on state lands to enhance foraging habitat for wolf prey (e.g., deer and elk)	√
Manage grazing and vegetation to enhance foraging habitat for wolf prey and identify funding source	√
Compensation	
Consider basing compensation for wolf depredations on degree of active management of livestock to prevent wolf depredations	√

Appendix B. Summary of comments made during seven public scoping meetings in August 2007 and whether they were considered in developing the wolf conservation and management plan alternatives (√) or were outside the scope of the plan.

Comment	Considered in developing the plan alternatives
Consider different compensation levels for livestock depredation on public vs. private lands	√
Explain why compensation is justified for losses of livestock	√
Livestock loss on public land needs to be verifiable; also need to consider how to address non-verifiable kills and compare to baseline loss rate	√
Establish a fund to compensate livestock owners for losses due to depredation, and determine whether compensation is based on current market value or projected market value	√
Compensation to ranchers should include losses associated with stress, disturbance, weight loss, change in distribution for livestock	√
Monitoring	
Provide up-to-date information on geographic distribution of wolves for access by the public	√
Use citizen science volunteers to help monitor wolves	√
Develop a mechanism for the public to report wolf sightings to WDFW; identify verification criteria, address landowner concerns regarding potential land use restrictions if they report wolf sightings on their property	√
Management	
Only individual problem wolves should be removed	√
Address alternatives to lethal control of problem wolves	√
Identify roles and responsibilities of state and federal agencies in wolf recovery	√
After delisting, establish criteria for allowing lethal control of wolves if homes, livestock or pets are threatened	√
Management of human/wolf conflict should only allow lethal control as a last resort	√
Do not allow bounties on wolves	√
Lethal control of depredating wolves needs to be acceptable	√
Only nonlethal control should be used to address livestock depredation, such as use of anti-wolf odors, noises, and fencing	√
Identify nonlethal incentives for ranchers to address wolf conflicts, including “biological fencing” that uses chemicals to stimulate scent marking to keep wolves away from designated areas	√
Address the potential for habituation resulting from feeding of wolves	√
Identify management actions for “nuisance” wolves	√
Establish guidelines/laws for shooting wolves if personal safety is at risk	√
Determine if people recreating in the backcountry will be excluded from wolf areas	√
Education and Outreach	
Engage the public in education and outreach about wolf ecology and behavior	√
Education outreach to ranchers and farmers is needed; consider using WSU extension agents	√
Education and outreach is needed for the general public on the role of predators in ecosystems, how the public values wolves, and how the public can distinguish a coyote from a wolf	√

Appendix B. Summary of comments made during seven public scoping meetings in August 2007 and whether they were considered in developing the wolf conservation and management plan alternatives (√) or were outside the scope of the plan.

Comment	Considered in developing the plan alternatives
Educate the public on how people should react to a wolf encounter when recreating in wolf areas, include incidence of wolf attacks on humans and pets, and address impacts of wolf viewing	√
Interagency Cooperation	
Work with other government agencies and tribes to reduce road densities in key wolf areas	√
Encourage tribal involvement	√
Establish and maintain cooperation and agreements between natural resource agencies in Washington and British Columbia that promote wolf recovery in Washington, including the issue of trapping and hunting on the border.	√
Economics	
Develop a market for “wolf friendly” beef	√
Develop ecotourism and “watchable wildlife” opportunities for wolves to promote economic benefits to communities	√
Consider the negative influence of wolves on property values	√
Funding	
Identify funding sources for wolf management, including enforcement, monitoring, wolf depredation, and post-delisting activities	√
Identify a funding source for non-lethal control measures, such as fencing	√
When wolves are delisted, consider trophy hunting of wolves as a funding source for wolf monitoring	√
Secure funding for wolf depredation compensation based on the public sector that benefits from wolves (e.g., tourists)	√
Evaluate potential funding from tribes	√
Develop a wolf license plate to provide a funding source for wolf management	√
Implement a statewide tax to fund nongame wildlife species to help fund wolf management activities	Outside scope of the plan
General	
Update the wolf plan to include best and most recent available science	√
Consider requiring wolf-dog hybrid breeders to register animals in a DNA database	√
Evaluate the potential for poaching of wolves	√
Integrate NGOs into the wolf management process	√
Evaluate sterilization of wolves to control their population	√
Evaluate potential for transmission of disease from wolves	√
Build on the knowledge and experience gained from other states	√

 Appendix C. Washington Administrative Code 197-11-444 - Elements of the environment.

- (1) Natural environment
 - (a) Earth
 - (i) Geology
 - (ii) Soils
 - (iii) Topography
 - (iv) Unique physical features
 - (v) Erosion/enlargement of land area (accretion)
 - (b) Air
 - (i) Air quality
 - (ii) Odor
 - (iii) Climate
 - (c) Water
 - (i) Surface water movement/quantity/quality
 - (ii) Runoff/absorption
 - (iii) Floods
 - (iv) Ground water movement/quantity/quality
 - (v) Public water supplies
 - (d) Plants and animals
 - (i) Habitat for and numbers or diversity of species of plants, fish, or other wildlife
 - (ii) Unique species
 - (iii) Fish or wildlife migration routes
 - (e) Energy and natural resources
 - (i) Amount required/rate of use/efficiency
 - (ii) Source/availability
 - (iii) Nonrenewable resources
 - (iv) Conservation and renewable resources
 - (v) Scenic resources
- (2) Built environment
 - (a) Environmental health
 - (i) Noise
 - (ii) Risk of explosion
 - (iii) Releases or potential releases to the environment affecting public health, such as toxic or hazardous materials
 - (b) Land and shoreline use
 - (i) Relationship to existing land use plans and to estimated population
 - (ii) Housing
 - (iii) Light and glare
 - (iv) Aesthetics
 - (v) Recreation
 - (vi) Historic and cultural preservation
 - (vii) Agricultural crops
 - (c) Transportation
 - (i) Transportation systems
 - (ii) Vehicular traffic
 - (iii) Waterborne, rail, and air traffic
 - (iv) Parking
 - (v) Movement/circulation of people or goods
 - (vi) Traffic hazards
 - (d) Public services and utilities
 - (i) Fire
 - (ii) Police
 - (iii) Schools
 - (iv) Parks or other recreational facilities
 - (v) Maintenance
 - (vi) Communications
 - (vii) Water/storm water
 - (viii) Sewer/solid waste
 - (ix) Other governmental services or utilities

(3) To simplify the EIS format, reduce paperwork and duplication, improve readability, and focus on the significant issues, some or all of the elements of the environment in WAC [197-11-444](#) may be combined.

[Statutory Authority: RCW [43.21C.110](#). 84-05-020 (Order DE 83-39), § 197-11-444, filed 2/10/84, effective 4/4/84.]

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Public Review Draft
Alternative 2. Preferred Alternative

DRAFT WOLF CONSERVATION
AND MANAGEMENT PLAN
FOR WASHINGTON

Prepared by
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Washington Department of Fish and Wildlife
Wildlife Program
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Olympia, Washington

October 2009

1 The Public Review Draft Wolf Conservation and Management Plan for Washington was developed
2 by the Washington Department of Fish and Wildlife (WDFW) over the last two and a half years.
3 Initially, the Department received extensive input from the advisory Wolf Working Group, which is
4 comprised of 17 citizens from a broad range of perspectives and values (see Appendix A, Working
5 Group Membership). The group met eight times over a 15-month period in 2007 and 2008 to
6 develop a recommended plan that balanced wolf conservation and management. The Working
7 Group developed a letter at the conclusion of the eighth meeting (see Appendix B, June 30, 2008
8 letter from the Group) to accompany the peer review draft. The letter describes the many
9 considerations that went into their negotiations to craft a balanced package of conservation and
10 management recommendations that WDFW could use in the preparation of the peer review draft.
11 While the letter represented the Working Group's thoughts at that stage of the plan's development,
12 it still offers insights into the complex and diverse issues that must be addressed in crafting a
13 balanced, fair, and cost effective plan that has a high probability of success.

14
15 The August 2008 version of the draft plan, which included the Working Group's recommendations,
16 was sent out for peer review by WDFW. Forty-three reviewers with expertise on wolves, genetics,
17 economics, state and federal wolf management, and other topics responded with critical reviews,
18 comments, corrections, and suggestions (see Appendix C, List of Peer Reviewers). The results of
19 the peer review and internal WDFW review were then incorporated into a new version. The
20 Working Group met September 1-2, 2009 to review the revised version and offer more comments
21 which were then incorporated in the WDFW Public Review Draft being distributed now.

22
23 Wolf Working Group participation and discussions were especially helpful in the preparation of
24 Chapters 3 (wolf conservation) and 4 (wolf-livestock conflicts). The recovery objectives developed
25 by the Working Group for the plan included 6, 12, and 15 successful breeding pairs for downlisting
26 and delisting. However, some Working Group members representing the livestock/hunting
27 community indicated they would be hard pressed to agree to those numbers, although they were
28 able to live with the rest of the package. At the end of deliberations, six of the 17 members
29 submitted a minority report that proposed an alternative set of numbers: 3, 6, and 8 successful
30 breeding pairs (see Appendix D, Minority Report). Nonetheless, the entire Working Group
31 recognized that if the numbers of 6, 12, and 15 successful breeding pairs were changed as a result of
32 the peer review, public review, or WDFW agency processes, then agreement around the other
33 components of the plan would not necessarily remain. In particular, consensus on management
34 options for resolving wolf-livestock conflicts and compensation for wolf-caused losses of livestock
35 may be jeopardized. Working Group discussions on conservation aspects are summarized in
36 Appendix E (Working Group Discussions on Conservation Topics); and meeting summaries are at:
37 http://wdfw.wa.gov/wildlife/management/gray_wolf/working_group_meetings.html on the
38 WDFW website.

39
40 This draft plan includes consideration of the public scoping comments received in 2007, Wolf
41 Working Group recommendations from meetings 1 through 8, peer review comments, WDFW
42 review comments, and Working Group suggestions from meeting 9. The draft plan and draft
43 Environmental Impact Statement are now available for a three-month public review period. We
44 welcome your comments.

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7

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EXECUTIVE SUMMARY

1
2
3
4 Gray wolves were formerly common throughout most of Washington, but declined rapidly from
5 being aggressively killed as ranching and farming by Euro-American settlers expanded between 1850
6 and 1900. Wolves were essentially eliminated as a breeding species from the state by the 1930s,
7 although infrequent reports of animals continued in the following decades, suggesting that small
8 numbers of individuals continued to disperse into Washington from neighboring states and British
9 Columbia. Intensified survey work in the early to mid-1990s resulted in increased numbers of
10 confirmed and probable wolf records, with three likely breeding records. Reliable reports of wolves
11 have again increased since 2005, originating mostly from Pend Oreille and Stevens counties in the
12 northeast, Okanogan County in north-central, and the Blue Mountains in the southeast. Most
13 recent reports involve single animals. As of September 2009, Washington had two breeding packs
14 of wolves, one was confirmed in Okanogan/Chelan counties in 2008 and one in Pend Oreille
15 County in 2009. There are also indications of an additional pack in the Blue Mountains and a few
16 solitary wolves in other scattered locations.

17
18 Wolves were classified as endangered in Washington at the federal level in 1973 and at the state level
19 in 1980. They were delisted under federal law in 2009 in the eastern third of Washington, and
20 remain federally listed in the western two-thirds of the state. A final court decision is pending on
21 whether to relist the Northern Rocky Mountain population, including the eastern third of
22 Washington. Human-related mortality, particularly illegal killing and legal control actions to resolve
23 conflicts, is the largest source of mortality for the species in the northwestern United States. A
24 survey conducted in 2008 shows high overall support for wolf recovery in Washington among the
25 general public, with 75% either strongly or moderately in favor versus 17% in strong or moderate
26 opposition.

27
28 The eventual reestablishment of a breeding population in Washington is expected as a result of
29 increased dispersal of wolves from recovering populations in Idaho and Montana, and dispersers
30 from British Columbia. In response to this, and in anticipation of the eventual return of all wolf
31 management to the state, the Washington Department of Fish and Wildlife (WDFW) initiated
32 development of a state wolf conservation and management plan. WDFW Director Koenings
33 appointed an advisory Wolf Working Group comprised of 17 citizens to provide recommendations
34 on the plan to the Department. The members represent a broad range of perspectives and values
35 with regard to wolf conservation and management and are representative of the geographic scope of
36 Washington. Recommendations and suggestions of the Wolf Working Group, peer review
37 comments, and WDFW reviews have been incorporated into this draft plan, which is now available
38 for a 90-day public review, together with a draft Environmental Impact Statement.

39
40 The conservation and management plan addresses two major issues: (1) conservation/recovery
41 objectives and strategies for downlisting and delisting wolves at the state level, and (2) management
42 strategies to reduce and address wolf-livestock conflicts. Negotiations among members of the Wolf
43 Working Group helped frame both of these issues for the plan.

44
45 Three recovery regions were delineated for the state: Eastern Washington, Northern Cascades, and
46 Southern Cascades/Northwest Coast. Target numbers and distributions for downlisting and
47 delisting within these regions are:

- 1
- 2 • To reclassify from state endangered to state threatened status: 6 successful breeding pairs
- 3 present for 3 consecutive years, with at least 2 successful breeding pairs in each of the three
- 4 recovery regions.
- 5 • To reclassify from state threatened to state sensitive status: 12 successful breeding pairs
- 6 present for 3 consecutive years, with at least 2 successful breeding pairs each in the Eastern
- 7 Washington and Northern Cascades recovery regions, at least 5 successful breeding pairs in
- 8 the Southern Cascades/Northwest Coast Region, and 3 successful breeding pairs that can be
- 9 distributed in any of the three recovery regions.
- 10 • To delisting from state sensitive status: 15 successful breeding pairs present for 3
- 11 consecutive years, with at least 2 successful breeding pairs each in the Eastern Washington
- 12 and Northern Cascades recovery regions, at least 5 successful breeding pairs in the Southern
- 13 Cascades/Northwest Coast Region, and 6 successful breeding pairs that can be distributed in
- 14 any of the three recovery regions.
- 15

16 The objectives for delisting in this plan are considered minimal to achieve recovery and are
17 recognized as being a compromise between biological and social values. However, several
18 components of the delisting objectives serve to reduce the risk to long-term viability of a wolf
19 population in Washington. These include the broad geographic distribution requirements, the use of
20 successful breeding pairs as a measurement standard, and the three-year requirement for maintaining
21 population robustness on the landscape. It is further recognized that the long-term viability of the
22 state's wolf population will, in part, be dependent on maintaining its connectivity to the broader
23 regional wolf metapopulation comprising Idaho, Montana, British Columbia, and Oregon.

24
25 Translocation is a conservation tool in the plan that may be used to establish and expand wolf
26 populations in recovery regions that wolves have failed to reach through natural dispersal.
27 Translocation is a key element of the plan and was broadly supported among members of the Wolf
28 Working Group.

29
30 To build public tolerance for wolves, this plan outlines a range of proactive (e.g., modified
31 husbandry methods and non-lethal deterrents) and lethal management options to address wolf-
32 livestock conflicts. Implementation of these will be based on the status of wolves to ensure that
33 conservation/recovery objectives are met. Non-lethal management will be emphasized while the
34 species is recolonizing and will transition to more flexible approaches as wolves progress toward a
35 delisted status. The plan includes a program to compensate livestock producers for livestock losses
36 due to wolves. Compensation will be paid for confirmed and probable wolf losses. A two-tiered
37 system is recommended based on the size of the land being grazed to address the greater likelihood
38 of undetected carcasses on land parcels of 100 or more acres. It is also recommended that a
39 program be developed by WDFW and a multi-interest stakeholder group to compensate livestock
40 owners for unknown losses (i.e., where there is no direct evidence of depredation, but the owner can
41 demonstrate a loss ratio in excess of historical losses) in areas with wolves.

42
43 The effects that wolves will have on elk, deer, and other ungulate populations and hunter harvest are
44 difficult to predict. Observations from neighboring states suggest that as wolf populations increase,
45 they could have some localized impacts on ungulate abundance or habitat use in Washington, but
46 relatively little impact on a statewide level. Improved habitat management, flexibility in harvest

1 strategies, and greater prevention of illegal hunting are recommended as measures for sustaining
2 healthy ungulate populations that will support wolves and maintain harvest opportunities.
3 This plan recommends that information and training about the low risk of wolf attacks, preventing
4 habituation, and learning to live with wolves be provided to hunters, trappers, rural landowners,
5 outdoor recreationists, outfitters and guides, forest workers and contractors, and others who might
6 encounter wolves. Dog owners need to be informed on ways to reduce interactions between dogs
7 and wolves and the public should be made aware of the risks posed by wolf-dog hybrids and pet
8 wolves. Implementation of a public outreach and education program is a high priority for aiding
9 reestablishment of the species.

10
11 Wolves are habitat generalists, thus restrictions on human development and other land use practices
12 should not be necessary to recover wolves in Washington. Experience in Idaho, Montana, and
13 Wyoming has shown that no restrictions, other than those occasionally needed to temporarily
14 prevent excessive disturbance of occupied den sites, have been necessary to conserve wolves.

15
16 This plan provides an analysis of the potential economic impacts that wolves could have in the state.
17 At populations of 50 and 100 wolves, which roughly correspond with the upper levels of abundance
18 during the state endangered and threatened phases, a few individual livestock producers could be
19 affected. As wolf populations become larger and more widely distributed, financial impacts are
20 likely to accrue to more producers, although some of these costs would be offset by compensation
21 programs and assistance with proactive measures. Similarly, populations of 50 and 100 wolves
22 should have few negative effects on big game hunting. Larger populations are expected to have
23 somewhat greater impacts on game abundance and hunting opportunity, but such impacts become
24 increasingly difficult to predict. Washington could conceivably develop a wolf-related tourist
25 industry, depending on where wolves reestablish, the population levels they achieve, and the ability
26 of tourists to see or hear wolves. Wolf recolonization is anticipated to have no economic impact on
27 the state's forest products industry.

28
29 Adequate funding for implementing the activities described in this plan is vital to its success. The
30 draft plan includes estimated costs for new activities needed to accomplish important tasks in the
31 first six years of the plan. WDFW will seek funding from a variety of sources, including special state
32 or federal appropriations and private sources, and will initiate partnerships with universities,
33 agencies, non-governmental organizations, and other entities to carry out wolf conservation and
34 management actions in Washington.

1. INTRODUCTION

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5 The gray wolf (*Canis lupus*) is an endangered species in Washington under state law (WAC 232-12-014, Appendix F) and in the western two-thirds of Washington under federal law (Endangered Species Act). Wolves in the eastern third of Washington were removed from federal listing in May 2009 and are now under state management. Pending legal action will determine whether wolves in this portion of the state will continue to be federally delisted.

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11 Historically, wolves were found throughout most or all of Washington. They were essentially extirpated from the state by the 1930s through trapping, poisoning, and shooting. Although wolf populations have been absent from Washington for more than 70 years, small numbers of individuals have periodically dispersed into the state during that time to the present.

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16 This plan was developed as the first wolf packs were becoming reestablished in Washington. Increased dispersal of wolves into Washington, with the eventual reestablishment of a breeding population, is expected as a result of the recovery of wolf populations in the neighboring states of Idaho and Montana. Wolves are expected to disperse into northeastern Washington from Idaho, Montana, and British Columbia; into southeastern Washington from Idaho and Oregon; and into the North Cascades from northeastern Washington and British Columbia.

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23 The Washington Department of Fish and Wildlife (WDFW) initiated development of a Wolf Conservation and Management Plan for Washington in response to the anticipated dispersal of wolves into Washington and return to state management. In January 2007, WDFW Director Jeff Koenings, appointed 18 members to a Wolf Working Group (Appendix A) to advise WDFW in the development of the plan. The Working Group began meeting in February 2007. In giving direction to the group, Director Koenings noted that wolves are an important and valued component of a healthy ecosystem in Washington and that the reestablishment of a sustainable wolf population in Washington will only occur if there is a fair balance between conservation needs and the needs of the public. The expectation for the Working Group was that it would provide input to WDFW for key elements of the plan and critically review its content in light of biological, social, and political considerations. The 18 stakeholders selected represented a broad range of perspectives and geographic distribution in Washington, and were expected to present those values in the development of the plan. The Working Group was reduced to 17 members during the course of its meetings, when one person was no longer able to participate.

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38 The Director specified two “sideboards” for the group to work within:

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- First, the option of managing for no wolves in Washington was not a viable alternative, and
 - Second, WDFW would not reintroduce wolves to Washington from another state.

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47 He also noted that the plan would not attempt to recover wolves to historical population levels; this would be an unattainable goal given the many changes to Washington’s landscape during the past 150 years. The Working Group was asked to strive for consensus, as much as possible, to guide the plan. Working Group meetings were facilitated by a professional negotiator, Mr. Paul De Morgan of RESOLVE.

1
2 The group met six times during 2007 and twice in 2008; seven public scoping meetings were held
3 throughout the state during August 2007. Scientific peer review and the addressing of comments
4 was completed in July 2009. A Working Group meeting to review the changes resulting from peer
5 review was conducted in September 2009. The plan then underwent a 90-day public review under
6 the State Environmental Policy Act (SEPA) process from September to December 2009, including
7 12 public meetings throughout the state. The Working Group met an additional time prior to
8 completion of the final plan and presentation to the Washington Fish and Wildlife Commission for
9 final approval in 2010.

10
11 WDFW's Listing and Delisting Procedures (WAC 232-12-297, Appendix F) require the
12 development of recovery plans for species that are state listed as endangered or threatened and
13 management plans for species listed as sensitive. These plans identify measurable recovery
14 objectives and outline strategies to achieve those objectives so that the species can be downlisted
15 and eventually delisted in the state. The Washington Wolf Conservation and Management Plan will
16 meet the needs of a state recovery plan and at the same time will provide for management of wolves
17 while they are state listed as endangered, threatened, and sensitive. A wide range of perspectives and
18 values related to wolves and wolf management were heard in developing and refining the plan. The
19 result is a plan that is intended to serve the broad interests of the citizens of Washington for both
20 conservation and management of wolves in the state.

21
22 While this document is referred to throughout as “the plan”, “this plan”, or “the draft plan”, it is
23 Alternative 2 of the Draft Environmental Impact Statement (DEIS), and is a draft plan. The
24 recommendations given in this plan are for state planning purposes only and conform only to the
25 requirements of state law. They have not been evaluated under any possible federal requirements.
26 If wolves are still federally listed in parts of Washington, WDFW would consult and coordinate with
27 the U.S. Fish and Wildlife Service prior to implementing management actions to ensure consistency
28 with federal law. Washington was not included in the original Northern Rocky Mountain Wolf
29 Recovery Plan (USFWS 1987); only the states of Idaho, Montana, and Wyoming were included. The
30 federal requirements for delisting the Northern Rocky Mountain Distinct Population Segment
31 (DPS) required Idaho, Montana, and Wyoming to have state wolf conservation plans, but there was
32 no such requirement for Washington. As of 2009, there are no recovery objectives established for
33 federal delisting of the gray wolf outside the Northern Rocky Mountain DPS.

34
35 The purpose of the plan is to ensure the reestablishment of a self-sustaining population of gray
36 wolves in Washington and to encourage social tolerance for the species by addressing and reducing
37 conflicts. The goals of the Washington Wolf Conservation and Management Plan are to:

- 38
39
- 40 • Restore the wolf population in Washington to a self-sustaining size and geographic
41 distribution that will result in wolves having a high probability of persisting in the state
42 through the foreseeable future (>100 years).
 - 43 • Manage wolf-livestock conflicts in a way that minimizes livestock losses, while at the same
44 time not negatively impacting the recovery or long-term perpetuation of a sustainable wolf
45 population.
 - 46 • Manage ungulate populations in Washington to maintain harvest opportunities for hunters
and an adequate prey base for wolves so that wolf conservation goals can be met.

- Develop public understanding of the conservation and management needs of wolves in Washington, thereby promoting the public's coexistence with the species.

To meet these goals, the plan includes such tasks as identifying and managing toward population objectives, developing a response strategy for conflicts, engaging in public outreach and education, and conducting ongoing monitoring and research. As specified in WAC 232-12-297, section 11.1, recovery or management plans are to include, but not be limited to: (1) target population objectives, (2) criteria for reclassification, (3) an implementation plan for reaching population objectives that will promote cooperative management and are sensitive to landowner needs and property rights, (4) public education needs, and (5) a species monitoring plan. The overall plan will estimate resources needed from and impacts to WDFW, other agencies (including federal, state, and local), tribes, landowners, and other interest groups. The plan will consider various approaches to meeting recovery objectives including, but not limited to, regulation, mitigation, land acquisition, incentives, and compensation mechanisms.

In developing this plan, WDFW sought to establish a wolf conservation program that is achievable, realistic, fair, flexible, cost-effective, defensible, sustainable, fundable, engages the public, and provides incentives for meeting wolf conservation goals. Several aspects of the plan are critical to its success. One of the first and foremost is to have broad support to ensure sufficient funding for implementing the plan. Conservation tools and strategies will need to be implemented to achieve a healthy, self-sustaining wolf population. Because human tolerance has been and remains the primary limiting factor for wolf survival, tolerance and acceptance must be adequately addressed for citizens who will be directly affected by the presence of wolves. This makes technical assistance, compensation, and outreach some of the highest priorities for wolf conservation. Actions minimizing conflict and effective enforcement against illegal actions harming wolves also are key parts of achieving conservation goals. An active outreach and education program must offer guidance and information about living with wolves and about rules and regulations related to management. Recovery of wolves means recognizing them as a native species of Washington, with legal, social, cultural, and biological value, and an important ecological role in maintaining native ecosystem functions and processes. Wolves will need to be managed in concert with other species, particularly primary prey and other large carnivores. While many of these species have their own management or recovery plans, none can be managed in isolation.

After the conservation/recovery objectives for delisting are met, wolves could remain a protected species or be reclassified by the Fish and Wildlife Commission to a game animal. Reclassifying and managing the species as a game animal will require that wolves continue to be carefully managed to maintain a stable and healthy population level. After state delisting, WDFW will develop a new plan for managing wolves.

2. BACKGROUND

A. History of Wolves in Washington and Surrounding Areas

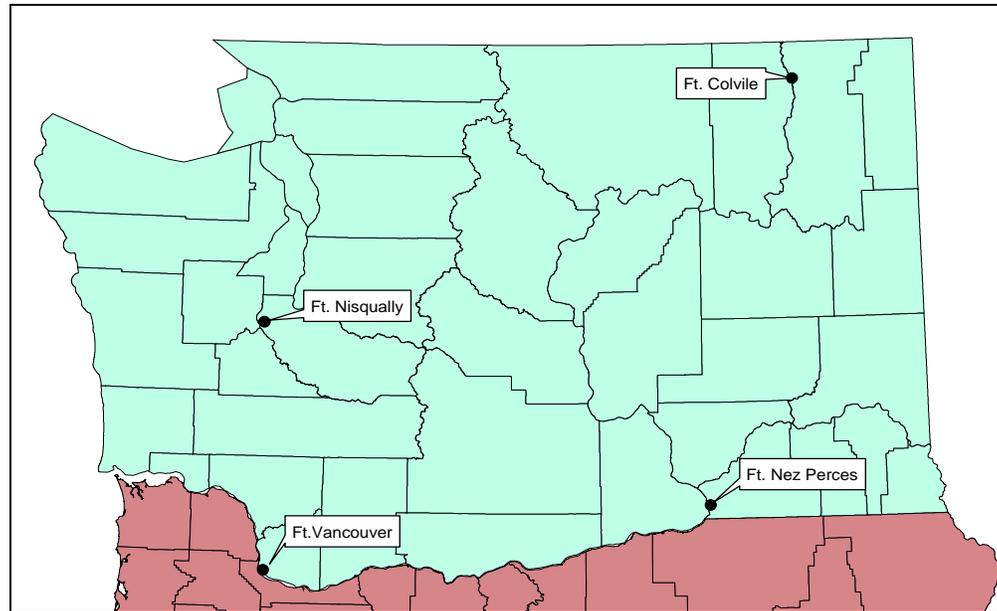
Gray wolves were common throughout most of Washington before 1800. Some authors have suggested that wolves did not occur in the Columbia Basin (Young and Goldman 1944, Booth 1947, Dalquest 1948), but this is seemingly contradicted by several reports. Douglas (1914) occasionally observed wolves while traveling in shrub-steppe areas between The Dalles, Oregon, and Walla Walla in March 1826, whereas Suckley and Cooper (1860) described them as abundant in this same area and habitat in the mid-1850s despite the absence of large ungulate prey. Records also exist of wolves in the vicinity of the Walla Walla Valley (Wilkes 1844) and in southern Grant County (Dalquest 1948; see Appendix G for a map of counties in Washington).

Typical winter wolf densities range from about 46-98 wolves/1,000 square miles across much of the northern United States and southern Canada (Fuller et al. 2003). Applying these densities to derive a historical population estimate for Washington (land size = 67,578 square miles), but using reduced estimates of 12-25 wolves/1,000 square miles for the Columbia Basin (size = 22,754 square miles), suggests that the state held about 2,300-5,000 wolves before Euro-American settlement.

Fur Trading, Bounties, and Extermination in Washington

Trapping of wolves as a commercial source of fur began in earnest during the 1820s following the establishment of the Hudson's Bay Company in the Pacific Northwest. The company initiated an elaborate trading system with Native Americans across the region. Fur trading occurred at four forts located in Washington (Figure 1). From 1821 to 1859, a total of 14,810 wolf pelts were traded at the following locations: Fort Nez Perces, located at the junction of the Columbia and Walla Walla Rivers, 8,234 pelts; Fort Colville located along the Columbia River in present-day Stevens County, 5,911 pelts; Fort Vancouver located at present-day Vancouver, Clark County, 416 pelts; and Fort Nisqually in southern Puget Sound, 249 pelts (Hudson's Bay Archives 1988, Laufer and Jenkins 1989). These totals include animals taken not only from Washington, but originating from parts of British Columbia, Idaho, Oregon, and perhaps western Montana as well.

Despite the fur trade, wolves remained common in many areas of Washington into at least the 1850s. In 1839, Elkanah Walker reported that wolves were "thick" at Tshimakain mission (near present-day Ford in Stevens County), making it necessary to corral horses at night for protection (Gibson 1985: 176). Wolves were also a problem at Cowlitz Farm (operated by the Hudson's Bay Company near present-day Toledo in Lewis County) in 1841 and required "large numbers of cattle [to be brought in each] night, which is a very necessary precaution in consequence of the numerous wolves that are prowling about; in some places it becomes necessary for the keeper to protect his beasts even in the daytime" (Wilkes 1844). Joseph Drayton of the Wilkes expedition remarked in 1841 that "wolves were very numerous ... and exceedingly troublesome" between Fort Walla Walla (at its initial site along the Columbia River) and the Whitman mission in present-day Walla Walla County (Wilkes 1844). Joseph Heath, an early resident of western Washington, noted that wolves were "very common" on the Nisqually Plains (present-day Pierce County) during the



1

2 Figure 1. Map of present-day Washington (with counties) showing locations of the four main fur trading
 3 posts operated by the Hudson's Bay Company from 1827 to 1859.

4

5

6 winter of 1844-1845 (Heath 1979:14-15). Suckley and Cooper (1860), who visited Oregon and
 7 Washington Territories from 1853 to 1857, described wolves as “exceedingly numerous from
 8 the Cascades to the Rocky Mountain Divide.” They also reported that wolves were abundant in the
 9 headwaters of the rivers flowing into the Columbia River from the Cascades and the Blue
 10 Mountains, and stated that abundance had increased after the introduction of sheep into the region.
 11 As late as 1889, Linsley (1889) described the region near the Pend Oreille River as being “..... full
 12 of black and silver gray wolves.....” He and his partner trapped or shot 40 wolves in the area
 13 during the winter of 1888-1889.

14

15 Euro-American settlement of the Pacific Northwest brought immediate efforts to control wolves.
 16 The Hudson's Bay Company used strychnine for poisoning wolves at its early farming operations in
 17 Washington and set high prices on wolf skins to encourage killing by Native Americans (Heath
 18 1979: 32; Gibson 1985: 120). Residents of the Oregon country (which included Washington)
 19 convened their first “Wolf Meeting” in 1843 and established a \$3.00 wolf bounty (Young 1946,
 20 Laufer and Jenkins 1989). During an 18-month period in 1841-1842, a shepherd at Nisqually Farm
 21 killed more than a hundred wolves (Gibson 1985: 120). By the mid-1850s, wolves had become
 22 “quite scarce” on the Nisqually Plains because of poisoning efforts to protect local sheep herds
 23 (Suckley and Cooper 1860).

24

25 Although poorly documented, wolves were heavily persecuted during the last half of the 1800s as
 26 ranching and farming became established in the state, and were eliminated from most areas by 1900
 27 (Dalquest 1948). Poisoning, trapping, and shooting were common control techniques. Populations
 28 held out somewhat longer in a few more remote locations. One of these was on the Olympic
 29 Peninsula, where estimates of 115 wolves in 1910 and 40-60 wolves in 1919 were made (Scheffer
 30 1995). However, this population declined rapidly thereafter and was nearly gone by the late 1930s
 31 (e.g., see Beebe no date). Adamire (1985) reported that bounties were paid on 46 wolves by the

1 Clallam County auditor's office from 1906-1929. Wolves remained in the southern Cascades until at
 2 least 1915, but had disappeared as a resident population by 1941 (Young and Goldman 1944). A
 3 few animals also persisted in the vicinity of Mt. Rainier until the 1920s, but Taylor and Shaw (1927,
 4 1929) considered them "rare and of irregular occurrence" in the national park. Macy (1934)
 5 reiterated the rarity of the species at the park. Dalquest (1948) reported that a few wolves might
 6 have survived in the northern Cascades between Lake Chelan and Mount Baker until at least the
 7 1940s. A "band of a dozen wolves" was reported in the Aeneas Valley of eastern Okanogan County
 8 in 1914 (Hansen 1986). Booth (1947) gave evidence that a few wolves remained in the Blue
 9 Mountains until 1915 or perhaps later. The U.S. Forest Service estimated that only about 10 wolves
 10 in total survived on all national forest lands in the state by 1939 (Young and Goldman 1944).

11
 12 Illustrating the rarity of wolves in Washington by the 1910s and 1920s, extensive predator control
 13 work by federal hunters from the U.S. Biological Survey operating throughout the state resulted in
 14 the killing of only two wolves between 1915 and 1929 (United State Congress 1929). Scattered
 15 records of wild wolves killed and reliable sightings were made from various localities in the state
 16 during this period and into the 1950s. A sampling of these appears in Table 1. It seems likely that
 17 many of these individuals were dispersers from neighboring states and British Columbia rather than
 18 the survivors from remnant breeding populations. Johnson and Johnson (1952) remarked that
 19 sightings by experienced observers suggested that a few wolves may have continued to persist in the
 20 Queets River drainage and perhaps elsewhere in the Olympic Mountains until as late as the early
 21 1950s.

22
 23
 24 Table 1. Miscellaneous reports of wolves in Washington from 1916 to the 1950s.
 25

Record	Location	Date	Source
Two seen	Sluiskin Falls, Mt. Rainier National Park	1916	Taylor and Shaw (1927)
One killed	Near Nisqually Glacier, Mt. Rainier National Park	1916	Taylor and Shaw (1927)
Three heard	Skate Mountain, Lewis County	1916	Taylor and Shaw (1927)
Two killed	Near the former community of Wahluke, Grant Co. ^a	1917	Dalquest (1948)
Tracks seen	Paradise Valley, Mt. Rainier National Park	1920	Taylor and Shaw (1927)
Two killed	North fork of the Quinault River, Jefferson Co.	About 1920	Dalquest (1948)
Two sightings	Whatcom Co.	1922	Edson (1931)
One killed	Skamania Co.	1924	Guenther (1952)
Bounty paid for one killed	Skagit Co.	1927	Edson (1931)
Bounty paid for one killed	Snohomish Co.	1927	Edson (1931)
One trapped	Near Tonasket, Okanogan Co.	1930	Guenther (1952)
One reported	Near Prouty Mountain, Pend Oreille Co.	1932	Hansen (1986)
One seen	Near Camp Muir at Mt. Rainier National Park	About 1933	Macy (1934)
One killed	Twin Peaks, Snohomish Co.	1936	Booth (1947)
One killed	Near Granite Falls, Snohomish Co.	About 1945	Larrison (1947) ^b
Tracks at several sites	Monte Cristo area, Snohomish Co.	1940s	Larrison (1947)
One killed	Taylor Ridge about 12 mi east of Republic, Ferry Co.	1950	Guenther (1952)
Two seen	Near Curlew, Ferry Co.	1951	Hansen (1986)
Four seen and heard	Sheep Creek drainage in northern Stevens Co.	Early 1950s	Hansen (1986)
One seen	North of Slate Creek, Pend Oreille Co.	1955	Layser (1970)

26 ^a Dalquest (1948) reported these as the last wolves killed in the Columbia Basin.

27 ^b Larrison (1947) also reported that he saw and heard a wolf near Pinnacle Lake, Mt. Pilchuck, Snohomish County, in August 1946,
 28 but the small size of the animal's tracks (2 inches by 3 inches) make this sighting doubtful.

1
2 Probable reports of wolves continued to occur in Washington during the next few decades, with
3 greater effort devoted to documentation of records during the 1970s and 1980s. Sixty-eight records
4 of the species held in the WDFW Heritage database for 1970-1989 were largely restricted to the
5 Cascade Mountains and parts of northeastern Washington. Hansen (1986) summarized 42 reports
6 from northeastern Washington made from before 1960 to 1985. Records were compiled from a
7 variety of sources, including unpublished accounts, reports from the public, and trapper
8 questionnaires. Twenty-four records were judged as probably accurate and 18 were possibly
9 accurate. Eighteen originated from before 1960 to 1973 and 24 were from 1974 to 1985. Five
10 records involved three or more wolves, 10 were of two wolves, and 27 were of single animals; most
11 reports of two or more wolves originated from 1973 or earlier. Two-thirds of the reports after 1973
12 came from the eastern half of the Colville National Forest, with most obtained from the Slate
13 Creek/Sullivan Creek area on the east side of the Pend Oreille River. One wolf was killed near
14 Mansfield, Douglas County, in 1975. Hansen (1986) gave brief descriptive accounts of many of
15 these records.

16
17 Laufer and Jenkins (1989) compiled a similar account of wolf records from the Cascades for 1946 to
18 1988. Reports from this area represented 70% of all reports from the state during this period. A
19 total of 49 reports came from the Cascades during 1973-1988. Thirty-one of these were analyzed in
20 greater detail, with 19 rated as probably accurate and 12 as possibly accurate. Two records involved
21 three or more wolves, five were of two wolves, and 24 were of single animals. These records were
22 concentrated in the Baker Lake and Ross Lake areas of the North Cascades and in the vicinity of
23 Mount Rainier.

24
25 Almack and Fitkin (1998) reviewed 913 reports of gray wolves in Washington from 1834 to 1994.
26 Of these reports, 78 were judged to be confirmed observations: 55 were primarily bounty records
27 from 1834 to 1929 (e.g., see Adamire 1985), three were from 1944 to 1975, and 20 were sighting or
28 howling reports from 1989 to 1994.

29 30 Native Americans and Wolves

31
32 There are several summaries on the strong cultural and spiritual ties of Native American tribes in
33 Washington to wolves (Laufer and Jenkins 1989, Ratti et al. 1999). Wolves are respected for their
34 intelligence, hunting ability, and devotion to other pack members (Ratti et al. 1999). These and
35 other values have been taught to generations of Native Americans through the telling of stories and
36 legends. Wolves play an important role in the creation stories and other legends of many tribes,
37 such as the Quinault, Quileute, Makah, and S'Klallam of the Olympic Peninsula (see Ratti et al.
38 1999). Wolves also have significant parts in the spiritual life of some tribes. For example, they serve
39 as spirit guides for tribal members and provide spiritual power to warriors and hunters (see Ratti et
40 al. 1999). Wolves are also featured in vision-quest stories, rituals, and ceremonial practices. Thus,
41 for many tribes, there is a general regard that wolves “help” humans to prosper both physically and
42 socially (Laufer and Jenkins 1989).

43
44 Although some tribes had taboos against killing wolves (Laufer and Jenkins 1989), others such as the
45 Salish and Quinault are known to have hunted them (Ratti et al. 1999). The Sanpoil and Nespelem
46 of northeastern Washington caught wolves and used their skins for robes or blankets (Ray 1933).
47 Wolves were also sometimes kept as pets.

History of Wolves in Neighboring States and British Columbia

As in Washington, wolves were formerly common and widely distributed in Oregon, Idaho, Montana, and Wyoming, but experienced serious declines following the arrival of Euro-American settlers and expansion of the livestock industry (Young and Goldman 1944). Bounties were enacted in the 1870s and 1880s in each of these states and helped reduce abundance. For example, 4,540 wolf hides were presented for payment in the first year of Montana's statewide bounty in 1884 (MFWP 2003). Prey scarcity caused by the elimination of bison and reductions of other ungulates also impacted wolves in Montana and Wyoming. Wolf numbers were severely reduced in these four states by the early 1900s and self-sustaining populations were virtually eliminated by 1930. One exception to this occurred on national forest lands in the Oregon Cascades, where an estimated 130 animals remained in 1939 (Young and Goldman 1944); these animals were gone too by the 1940s. Scattered reports of sightings, tracks, and scat continued in these states (especially Montana and Idaho) into the 1970s and 1980s, with most animals thought to represent dispersers from Canada. In 1986, the first documented wolf den in Montana in more than 50 years was discovered in Glacier National Park (MFWP 2003).

Wolves originally occurred throughout British Columbia, but were sufficiently pursued during the late 1800s and early 1900s to be eliminated from most of the southern portion of the province by 1930 and to become fairly uncommon in remaining areas (Pisano 1979, Tompa 1983, Boitani 2003). Province-wide populations fell to their lowest levels during the 1920s and 1930s (Tompa 1983, Hayes and Gunson 1995). Numbers generally began recovering thereafter (except during a period of resumed control during the 1950s) and most of British Columbia was again occupied by the early 1990s, with the exception of the southernmost mainland from Vancouver to Nelson (BCMELP 1988, Hayes and Gunson 1995). Reoccupation of the East Kootenay region in the southeastern portion of the province did not occur until about 1980 (G. Mowat, pers. comm.).

B. Current Status of Wolves

Washington

Washington experienced a flurry of reported wolf activity during the early 1990s, primarily in the North Cascades, which presumably involved animals originating mostly from southern British Columbia. Adult wolves with pups were detected at two locations in the North Cascades in the summer of 1990. One of these sites was in the Hozomeen area of the Ross Lake National Recreational Area, where animals were present for more than a month (Church 1996, Almack and Fitkin 1998) and were again documented (without breeding evidence) in 1991, 1992, and 1993. It was later learned that a pet wolf released in this area in the early 1990s (Martino 1997) was responsible for some of these sightings (S. Fitkin, pers. comm.). The second location occurred near the Pasayten Wilderness northwest of Winthrop (Anonymous 1990, Gaines et al. 2000). Howling surveys conducted in the Okanogan and Wenatchee National Forests from 1991 to 1993 resulted in two confirmed wolf responses in backcountry areas, with one involving multiple individuals in the Lake Chelan-Sawtooth Wilderness and the other being a lone individual in the Alpine Lakes Wilderness (Gaines et al. 1995; W. Gaines, pers. comm.). A sighting of a wolf with pups was also reported in the North Cascades in July 1996 (Church 1996), but this record could not be confirmed with genetic testing at the time (W. Gaines, pers. comm.). Additionally, one wolf was found dead

1 near Calispell Lake in southern Pend Oreille County in May 1994 (Palmquist 2002; WDFW, unpubl.
2 data). This animal was radio-collared and had immigrated from northwestern Montana.

3
4 Overall, from 1991 to 1995, Almack and Fitkin (1998) reported 20 confirmed wolf sightings in
5 Washington. Sixteen of these were made in the Cascades and four in Pend Oreille County, although
6 these records were probably biased towards observations in the Cascades. Almack and Fitkin (1998)
7 concluded that small numbers of wolves existed in Washington, mostly as individuals but with
8 several family units that had reproduced being present. No evidence of large packs or a recovering
9 population was detected. Almack and Fitkin (1998) also confirmed the presence of free-ranging
10 wolf-dog hybrids in the state and believed that a significant number of reported wolf observations
11 probably represented hybrid animals.

12
13 Wolf reports in Washington declined after 1995, probably due mainly to a reduced emphasis on data
14 collection. In February 2002, a radio-marked female spent several weeks in northern Pend Oreille
15 County, including sites near Metaline Falls and the Salmo-Priest Wilderness (Palmquist 2002). This
16 individual had also immigrated from northwestern Montana and soon departed for British
17 Columbia.

18
19 Reports of wolves and tracks have continued since 2002 and have increased in the past several years
20 (Appendix H), although this may partly reflect greater effort by agency biologists and others to
21 obtain and follow-up on wolf reports and to place remote cameras in the field. In most cases,
22 reports have involved single animals. Many have originated from Pend Oreille and Stevens counties,
23 including several individuals photographed by remote cameras at different locations in 2007 (S.
24 Zender, pers. comm.). A pair of wolves was also photographed by a remote camera in Pend Oreille
25 County in 2008 and a calf depredation in northernmost Stevens County in late August 2007 was
26 attributed to one or more wolves by USDA Wildlife Services (R. Woodruff, pers. comm.). In May
27 2009, a probable mated pair, including a lactating female, was photographed by remote cameras in
28 Pend Oreille County. DNA analysis of hair collected at a camera site verified the presence of a male
29 wolf linked genetically to the southern Alberta-northwestern Montana- northern Idaho population
30 (J. Pollinger, pers. comm.). Citizen reports, howling surveys, and remote cameras eventually
31 confirmed the presence of a pack (named the Diamond Pack) of about 8 wolves, including at least 3
32 pups, in July.

33
34 Wolf reports from Okanogan County increased dramatically in 2008 (Appendix H), with subsequent
35 investigation revealing suspected activity dating back a number of years at one or more locations (S.
36 Fitkin, pers. comm.). A pack with at least three adults/yearlings and six pups, designated as the
37 Lookout Pack, was confirmed in the western part of the county and adjacent northern Chelan
38 County in the summer of 2008, when the breeding male and female were captured and radio-
39 collared, and other pack members were photographed near a suspected rendezvous site by remote
40 cameras operated by Conservation Northwest, a non-governmental organization. This represented
41 the first fully documented (through photographs, howling responses, and genetic testing) breeding
42 by a wolf pack in Washington since the 1930s. Radio-tracking locations showed that the pack
43 occupied a geographic area totaling about 350 square miles during the remainder of 2008 and into
44 2009. Preliminary genetic testing of the breeding male and female suggests they are descended from
45 wolves occurring in (1) coastal British Columbia and (2) northeastern British Columbia,
46 northwestern Alberta, or the reintroduced populations in central Idaho and the greater Yellowstone
47 area (J. Pollinger, pers. comm.). The pack produced another litter of at least 4 pups in 2009, as well

1 as a probable litter in 2007 based on a sighting report of 6-8 animals in nearby northern Chelan
2 County in September 2007 (R. Kuntz, pers. comm.) and one of 7-9 animals in Okanogan County in
3 the winter of 2007-2008. A wolf believed to be a member of this pack was killed illegally in
4 December 2008.

5
6 There have also been multiple public reports of wolves in the Blue Mountains dating back to at least
7 2006, including several groups of 2-5 wolves made in Garfield/Asotin and Walla Walla counties in
8 2008 and 2009 (Appendix H; P. Wik, pers. comm.; P. Fowler, pers. comm.). However, so far,
9 howling surveys have not confirmed the presence of breeding wolves in this portion of the state.

10
11 In summary, reports of wolves in Washington have increased over the past several years. The state
12 currently holds single breeding packs in Pend Oreille and Okanogan counties, possibly an additional
13 pack in the Blue Mountains, and at least a few solitary wolves in other scattered locations. Wolves
14 occurring in northern Washington probably represent animals that have dispersed from areas of
15 northern Idaho and northwestern Montana that were naturally repopulated by wolves, or animals
16 that have come from British Columbia. By contrast, wolves present in the Blue Mountains probably
17 originate from central Idaho (via Oregon), where a population was reestablished through
18 reintroductions in 1995 and 1996.

19
20 Continued presence of released or escaped hybrid wolves and pet wolves in the wild in Washington
21 has also been confirmed (Appendix H; Martino 1997, Palmquist 2002).

22 23 Neighboring States and British Columbia

24
25 Wolf numbers in Montana, Idaho, and Wyoming have rapidly grown since the mid-1980s and
26 totaled at least 1,645 animals in 217 recognized packs in 2008 (USFWS et al. 2009). Recolonization
27 of these states began in 1979, when wolves reentered the area near Glacier National Park in
28 northwestern Montana from Alberta. Breeding in this population was first detected in 1986.
29 Dispersers from the park and neighboring areas of Canada gradually recolonized other parts of
30 northwestern Montana over the next decade. Wolves were reintroduced into Yellowstone National
31 Park and central Idaho by the USFWS in 1995 and 1996, and have also contributed to steadily
32 expanding populations in the three states (Bangs et al. 1998). This growth allowed the wolf
33 population in the northern Rocky Mountain states to meet the biological recovery levels set by the
34 USFWS by the end of 2002 (MFWP 2003). At the close of 2008, wolf numbers totaled 846 in
35 Idaho, 497 in Montana, and 302 in Wyoming (USFWS et al. 2009). Wolves are currently distributed
36 primarily in western Montana, central and northern Idaho, and western Wyoming. Two confirmed
37 or suspected packs in northern Idaho exist within a few miles of the Washington border and several
38 others occur to within about 30 miles of Washington (USFWS et al. 2009). Additionally, at least
39 nine sightings involving multiple wolves in northern Idaho were reported within 12 miles of
40 Washington in 2007 and 2008 (USFWS et al. 2008, 2009).

41
42 Pending the outcome of litigation against the federal delisting of wolves in Idaho and Montana,
43 these states have expressed their intentions to establish regulated hunting seasons that would set
44 target population levels at about 500 wolves in 15 to perhaps more than 20 breeding pairs in Idaho
45 and 400 wolves in at least 15 breeding pairs in Montana (USFWS 2009, USFWS et al. 2009). In
46 Wyoming, where wolves remain federally listed, a managed population level of 200-300 wolves
47 containing at least 15 breeding pairs is desired by the U.S. Fish and Wildlife Service (USFWS 2009).

1
2 Between 1999 and early 2008, verified reports of wolves in Oregon totaled five solitary animals and
3 one pair, all of which occurred in the northeastern corner of the state (ODFW 2005, Jacoby 2007,
4 Cockle 2008). At least four of these animals were immigrants from Idaho and either died from
5 human-related causes or were caught and returned to their original source. In July 2008, biologists
6 heard a pack with pups during a howling survey on the Umatilla National Forest in northern Union
7 County about 12 miles south of the Washington border (R. Morgan, pers. comm.). This represented
8 the first confirmed record of breeding in Oregon since the 1940s. Strong evidence of multiple
9 wolves without pups was also collected in western Union County and eastern Baker County in 2008
10 (Milstein 2008). Reports were also obtained of tracks, howling, and sightings of one or more wolves
11 in Wallowa County close to the activity reported in Washington's Asotin and Garfield counties from
12 2006 to 2008; evidence suggested these animals were not associated with the pack in Union County.
13 Three packs were likely present in northeastern Oregon in the summer of 2009, with pups
14 confirmed in one (R. Morgan, pers. comm.). A pack comprised of a yearling male and yearling
15 female had to be lethally removed in September 2009 after it committed multiple livestock
16 depredations in northeastern Baker County. In addition to these records, unconfirmed reports of
17 wolves are regularly made in Oregon (e.g., 204 were received by the Oregon Department of Fish and
18 Wildlife in 2008) and come primarily from several northeastern counties. These observations
19 combined suggest that a breeding population of wolves is in the early stages of forming in this
20 corner of the state. Under current state law, wolves are fully protected in Oregon.
21

22 Population estimates of wolves are not available for southern British Columbia, but anecdotal
23 evidence suggests that much of the southwestern mainland has experienced a recent increase in wolf
24 abundance (Pynn 2008; D. Reynolds, pers. comm.). Wolves in this region occur south to the
25 Washington border, with some breeding known in or near Skagit Valley Provincial Park. Wolves
26 remain largely absent in the zone along the Washington border from Manning Provincial Park
27 eastward to Creston, although a few animals are sporadically detected (B. Harris, pers. comm.; G.
28 Mowat, pers. comm.). Numbers appear to be growing north of Kelowna (B. Harris, pers. comm.).
29 Wolf recovery has continued in southeastern British Columbia, with harvest numbers suggesting
30 increased abundance since the mid-1990s (Mowat 2007). However, wolves remain quite scarce in
31 the West Kootenay region, including along the border of northeastern Washington (Mowat 2007; G.
32 Mowat, pers. comm.). Wolves are considered common on Vancouver Island (D. Reynolds, per.
33 comm.). Recent research indicates that wolves located along and near the coast of British Columbia
34 are genetically differentiated from those occurring in the interior of the province (Muñoz-Fuentes et
35 al. 2009a).
36

37 Current wolf management in southern British Columbia allows a 9-month hunting season in much
38 of the Kootenay region (including along the borders of Stevens and Pend Oreille counties of
39 Washington) and no closed season in the East Kootenay Trench, with bag limits of two animals.
40 There is also a 5.5-month trapping season with no bag limit. The province also has a policy of
41 removing wolf packs that threaten the recovery of mountain caribou. Wolves were killed for this
42 reason at several locations in 2008, including east of Creston near the Idaho border, but there are no
43 plans to do so near the Washington border (G. Mowat, pers. comm.). Wolves are currently
44 protected from hunting and trapping in the Okanagan region, but a hunting season may be
45 proposed (B. Harris, pers. comm.). Wolves are also protected from both types of harvest in the
46 southern portion of the management region covering the southwestern mainland.
47

C. Biology

Physical Characteristics

In Montana, male gray wolves weigh 90-110 pounds and females weigh 80-90 pounds. Wolves in the greater Yellowstone area (GYA) are slightly heavier, with winter-captured adult females averaging 108 pounds, immature females averaging 96 pounds, and immature males averaging 107 pounds (Smith et al. 2000). Smith and Ferguson (2005) reported a maximum weight of about 130 pounds among males at Yellowstone. About half of the wolves in Montana are black, most of the remainder are gray, and a few are white. Both black and gray color phases can be found in a pack or in one litter of pups. Animals with dark pelage sometimes progressively change to white over time, perhaps due to old age, physiological stress, or genetic factors (Gipson et al. 2002).

Observers sometimes confuse coyotes for wolves, but a number of physical features separate the two (Figure 2). Wolf tracks are typically 4.0-4.5 to 5.0-5.5 inches long (Harris and Ream 1983) and are noticeably larger than those of coyotes.

How to recognize a gray wolf

GRAY WOLF	COYOTE
Color: light gray to black	Color: light gray/brown
Dimensions: 2.5 feet tall, 5-6 feet long	Dimensions: 1.5 feet tall, 4 feet long
Broad snout	Narrow snout
Round ears	Tall pointed ears
80-120 pounds Paw size: 4" x 5"	20-50 pounds Paw size: 2" x 2.5"

Wolves are protected by federal law under the Endangered Species Act.
Source: U.S. Fish and Wildlife Service *The Salt Lake Tribune*

Figure 2. Identification characteristics used to distinguish wolves from coyotes.

1
2
3 Wolves also may be confused with some large domestic dog breeds and wolf-dog hybrids. Wolves
4 can be distinguished from dogs by their longer legs, larger feet, wider head and snout, narrow body,
5 and straight tail. Other identifying characteristics require closer examination than is possible in field
6 settings with live animals. Some wolf-dog hybrids are indistinguishable in appearance from wild
7 wolves. In many instances, behavior distinguishes wild wolves from hybrids and domestic dogs
8 (Boyd et al. 2001, Duman 2001).
9

10 Behavior

11
12 Gray wolves are highly social and live in packs (Mech and Boitani 2003a). Packs are formed when
13 male and female wolves develop a pair bond, breed, and produce pups. The pack typically consists
14 of a socially dominant breeding pair, their offspring from the previous year, and new pups. Other
15 breeding-aged adults may be present, but they may or may not be related to the others (Mech and
16 Boitani 2003a). The pack hunts, feeds, travels, and rests together. The pack also shares pup-rearing
17 responsibilities, including hunting and tending pups at the den or at a series of rendezvous sites.
18

19 Pack size is highly variable (Mech and Boitani 2003a). Populations that are rapidly growing and
20 expanding often consist of smaller packs, whereas those that are well established and have slow
21 growth rates tend to have larger packs if adequate food is available (Mitchell et al. 2008). Pack size
22 may also be related to prey size. Packs feeding primarily on deer tend to be smaller than those
23 preying on elk, while those feeding mainly on moose or bison are often the largest (Smith and
24 Ferguson 2005). In six regions of Idaho, Montana, and Wyoming, average pack size ranged from
25 5.1 ± 1.1 (SD) to 9.9 ± 2.6 wolves from the time of population reestablishment to 2005, with the
26 highest average occurring in Yellowstone National Park (YNP) (Mitchell et al. 2008). Smith and
27 Ferguson (2005) reported a maximum pack size of 37 animals at YNP. Packs in these states are
28 often dynamic and commonly fail to persist from one year to the next (Smith and Ferguson 2005,
29 USFWS et al. 2009). This can be due to a number of reasons, including mortalities to key pack
30 members, poor pup production, and lethal control actions.
31

32 Pack membership typifies the predominant manner in which wolves exist in the wild. The pack is
33 the mechanism by which wolves reproduce and populations grow. However, in most wolf
34 populations, some lone nomadic individuals exist as dispersers. These animals spend time looking
35 for vacant habitat, waiting to be found by a member of the opposite sex within a new home range,
36 or searching for an existing pack to join. Lone wolves typically comprise up to 10-15% of a
37 population (Fuller et al. 2003). This is a temporary transition. Lone animals in northwestern
38 Montana usually found other wolves in an average of 66 days (range 2-202 days) (Boyd and
39 Pletscher 1999).
40

41 Wolves display a number of behaviors that help populations maintain genetic diversity through
42 avoidance of inbreeding. These include a strong avoidance for mating with related pack members,
43 dispersal by males to established packs where mating can occur with unrelated individuals, females
44 remaining in their birth packs to become subordinate breeders, and females dispersing to form new
45 packs and becoming dominant breeders (vonHoldt et al. 2008).
46

1 Reproduction

2
3 Wolves normally do not breed until at least two years of age (Fuller et al. 2003). Breeding usually
4 occurs only between the dominant male and female in a pack. In the northern Rockies, mating
5 peaks in mid- to late February (Boyd et al. 1993). Wolves localize their movements around a den
6 site and give birth in late April after a 63-day gestation period. Dens are usually underground
7 burrows, but can occur in a variety of other situations, including abandoned beaver lodges, hollow
8 trees, and shallow rock caves. Dens are commonly located near the central core of territories in
9 elevated dry areas with loose soils near freshwater (Person and Russell 2009, Unger et al. 2009).
10 Wolves often tolerate some limited human disturbance of dens, especially when pups are younger
11 than six weeks of age, and regularly continue using disturbed den sites in subsequent years (Thiel et
12 al. 1998, Frame et al. 2007, Person and Russell 2009). However, wolves sometimes respond to
13 human disturbance near active dens by abandoning the location and moving their pups to other
14 sites. Pups are moved to a series of rendezvous sites after reaching about eight weeks of age, which
15 is about the time that weaning occurs.

16
17 Litters usually average four to six pups (Fuller et al. 2003, USFWS et al. 2009). Average litter sizes
18 of 5.3 (range 1-9) pups and 5.1 pups were reported from northwestern Montana in 1982-1994
19 (Pletscher et al. 1997) and from central Idaho in 1996-1998 (Mack and Laudon 1998), respectively.
20 In 2008, litter size averaged 9.3 pups in YNP, 5.7 pups in Wyoming outside of YNP, and at least 4.4
21 pups in Idaho (USFWS et al. 2009).

22
23 Most packs produce only one litter annually, but occasionally more than one female in a pack may
24 breed, resulting in multiple litters (Fuller et al. 2003). This phenomenon has been documented in
25 YNP, where for example 13 packs had 16 litters in 2000 (USFWS et al. 2001). In most cases, non-
26 dominant females breed with males from other packs (Smith and Ferguson 2005). Presence of more
27 than one litter can occasionally lead to the formation of new packs (Boyd et al. 1995).

28
29 Pup survival is highly variable and is largely influenced by disease, predation, and nutrition (Johnson
30 et al. 1994, Fuller et al. 2003, Mech et al. 2008). In northwestern Montana from 1982 to 1994, 85%
31 of pups survived on average until December, though survival varied year to year (Pletscher et al.
32 1997). In YNP, pup survival varied between 73 and 81% from 1996 to 1998, then declined to 45%
33 in 1999 because of a likely outbreak of canine distemper (Smith et al. 2000, Smith and Almberg
34 2007). However, pup survival rebounded to 77% in 2000.

35
36 Pack size is another important factor in determining whether or not a pack is successful in breeding
37 and raising pups. Recent analyses by Mitchell et al. (2008) reveal that larger packs of 10 or more
38 wolves in Idaho, Montana, and Wyoming have a 90% or greater chance of successfully rearing two
39 or more pups through December of a given year, whereas smaller packs are much less likely to do
40 so. For example, depending on location within these states, packs of 4-5 animals had only a 20-73%
41 chance of successfully raising at least two pups to year's end. Reduced reproductive output in wolf
42 populations can therefore result as a consequence of high levels of human-caused mortality leading
43 to smaller pack sizes (Brainerd et al. 2008, Mitchell et al. 2008).

Food Habits

Gray wolves are opportunistic carnivores that are keenly adapted to hunt large prey species, such as deer, elk, and moose. Ungulate species comprise different proportions of wolf diets, depending on their relative abundance and distribution within territories. In the central and northern Rocky Mountains of the United States and Canada, elk are often the primary prey of wolves, but deer and moose are more important in some areas (Table 2). Moose are the major prey in much of British Columbia, including southern areas (G. Mowat, pers. comm.).

Wolves also prey on smaller animals, scavenge carrion, and even eat vegetation. In addition to ungulates, wolf scat collected in YNP in 1998 contained the remains of voles, ground squirrels, snowshoe hares, coyotes, bears, insects, and plant matter (Smith 1998). Research in northwestern Montana has also documented non-ungulate prey such as tree squirrels, other small mammals, ruffed grouse, ravens, striped skunks, beavers, coyotes, porcupines, and golden eagles (Boyd et al. 1994, Arjo et al. 2002).

Table 2. Prey selection by wolves at various locations in the central and northern Rocky Mountains of the United States and Canada and other areas of British Columbia.

Location	Season ²	Prey species (% of diet ¹)								Source ⁴
		Elk	White-tailed deer	Mule deer	Black-tailed deer	Moose	Bison	Bighorn sheep	Other ³	
Glacier Natl Park	w	30	60	3	-	7	-	-	-	1
Glacier Natl Park area (Camas pack)	w	14	83	-	-	3	-	-	-	2
Glacier Natl Park area (Spruce pack)	w	35	4	-	-	61	-	-	-	2
Northwest Montana	y	23	49 ⁵	-	-	12	-	-	15	3
Madison Range, sw Montana	w, sp	70	26	4	-	-	-	-	-	4
Idaho	su	53	42 ⁵	.5	-	-	-	-	5	5
Yellowstone Natl Park	w	92	2 ⁵	.5	-	3	3	-	-	6
Yellowstone Natl Park	y	83	2 ⁵	.5	-	<1	6	<1	5	7
Banff Natl Park	w, su	78	7 ⁵	.5	-	10	-	2	3	8
N. Columbia Mtns, se British Columbia	sp, su, f	-	3 ⁵	.5	-	95	-	-	2	9
Vancouver Island	y	28	-	-	71	-	-	-	1	10
Vancouver Island	w, su	38	-	-	56	-	-	-	7	11
Central coastal British Columbia	sp, su, f	-	-	-	70	-	-	-	30	12

¹ Results reported as percent of total kills, frequency of occurrence in feces, or frequency of occurrence based on stable isotope analysis of hair.

² Season: w, winter; y, year-round; sp, spring; su, summer; f, fall.

³ Includes other wildlife, such as mountain goats, beaver, pronghorn, mountain caribou, smaller mammals, birds, and unknown species. For central coastal British Columbia, salmon and harbor seals comprised 10% and 6% of the diet, respectively, during the non-winter seasons combined (Darimont et al. (2008).

⁴ Source: 1, Boyd et al. (1994); 2, Kunkel et al. (2004); 3, Arjo et al. (2002); 4, Atwood et al. (2007); 5, Mack and Laudon (1998); 6, Smith et al. (2004); 7, USFWS et al. (2007, 2008, 2009; results presented as the mean of these studies); 8, Huggard (1993); 9, Stotyn (2008); 10, Scott and Shackleton (1980); 11, Milne et al. (1989); 12, Darimont et al. (2008).

⁵ Use of white-tailed deer and mule deer combined.

1
2 Wolves scavenge opportunistically on vehicle- and train-killed ungulates, winterkills, and on kills
3 made by other carnivores, particularly cougars. Wolves in northwestern Montana scavenge the
4 butchered remains of domestic livestock at rural bone yards and big game animals at carcass disposal
5 sites. Wolves also kill and feed on domestic livestock such as cattle, sheep, llamas, horses, and goats.
6 They also kill domestic dogs.

7 8 Territories 9

10 A pack establishes an annual home range or territory and defends it from trespassing wolves. From
11 late April until September, pack activity is centered at or near the den or rendezvous sites, as adults
12 hunt and bring food back to the pups. One or more rendezvous sites are used after pups emerge
13 from the den. These sites are often in meadows or forest openings near the den, but sometimes are
14 several miles away. Adults will carry small pups to a rendezvous site. Pups travel and hunt with the
15 pack by September. The pack hunts throughout its territory until the following spring.

16
17 Pack boundaries and territory sizes may vary from year to year. Similarly, a wolf pack may travel in
18 its territory differently from one year to the next because of changes in prey availability or
19 distribution, conflicts with neighboring packs, or the establishment of a new neighboring pack.
20 Other attributes such as elevation, land use, land ownership patterns, prey species present, and
21 relative prey abundance make each pack's territory unique. Pack size also affects territory size.
22 Thus, it is difficult to generalize about wolf territories and movements.

23
24 During the mid- to late 1980s, the earliest colonizing wolf packs in northwestern Montana had
25 territories averaging 382 square miles in size (Ream et al. 1991). Average territory size in this region
26 fell to 185 square miles (range = 24-614 square miles) by the late 1990s (USFWS et al. 2000),
27 probably as new territories filled in suitable unoccupied habitat. Throughout Montana, territory size
28 currently averages about 200 square miles per pack but can reach 300 square miles or larger (USFWS
29 et al. 2007). In 1999, Idaho wolf packs had average territory sizes of 360 square miles, with
30 individual pack territories ranging from 141 to 703 square miles (USFWS et al. 2000).

31 32 Habitat Use 33

34 As with other aspects of their ecology, wolves are generalists in their habitat use. Within their
35 historical geographic distribution, wolves occurred in every habitat with large ungulates, including
36 forests, deserts, prairies, swamps, tundra, and coasts (Fuller et al. 2003). Elevations ranging from sea
37 level to mountains were occupied. Wolves are adaptable enough that they will also enter and forage
38 in towns and farms, cross highways and open environments, and den near sites heavily disturbed by
39 people such as logging sites and military firing ranges (Fuller et al. 2003). Surviving wolf populations
40 in much of western North America, including the northern Rocky Mountain states and British
41 Columbia, predominantly inhabit forests and nearby open habitats, with prey availability and extent
42 of human tolerance strongly influencing occupancy.

43
44 Wolves in the northern Rocky Mountain states have demonstrated a greater tolerance of human
45 presence and disturbance than previously thought characteristic of the species. It previously was
46 believed that higher elevation public lands would comprise the primary occupied habitats (Fritts et

1 al. 1994), but most wolves in this region prefer lower elevations and gentle terrain where prey are
2 more abundant, particularly in winter (Boyd-Heger 1997, USFWS 2007a).

3
4 Use of public and private land by wolves has differed in Montana and Idaho. Of the 88
5 documented packs in Idaho that survived during 2008, nearly all territories were wholly or
6 predominantly on U.S. Forest Service (USFS) lands (USFWS et al. 2009). In contrast, most packs in
7 Montana exist on lands with a diversity of property owners and uses. These packs move through a
8 complex matrix of public, private, and corporate-owned lands, with the average territory in
9 northwestern Montana comprised of about 30% private land (USFWS et al. 2009). Landowner
10 acceptance of wolf presence and use of private lands is highly variable in space and time. Given the
11 mobility of the species and the extent to which these lands are intermingled, it is not unusual for
12 wolves to traverse each of these ownerships in a single day. Land uses range from dispersed
13 outdoor recreation, timber production, or livestock grazing to home sites within the rural-wildland
14 interface, hobby farming/livestock, or full-scale resort developments with golf courses.

15
16 Private lands may offer habitat features that are attractive to wolves, so some packs may use those
17 lands disproportionately more than other parts of their territories. In some settings, geography
18 dictates that wolf packs use or travel through private lands and co-exist in close proximity with
19 people and livestock. Land uses may predispose a pack to conflict with people or livestock,
20 although the presence of livestock does not make it a foregone conclusion that a pack will routinely
21 depredate (Bangs and Shivik 2001, Sime et al. 2007).

22 23 Dispersal

24
25 Upon reaching sexual maturity, most wolves leave their natal pack, looking for a mate to start a new
26 pack of their own (Mech and Boitani 2003a, Treves et al. 2009). Dispersal may be to unoccupied
27 habitat near their natal pack's territory or it may entail traveling much longer distances before
28 locating vacant habitat, a mate, or joining another pack. Wolves appear to disperse preferentially to
29 areas occupied by other wolves, using scent marking and howling to locate other animals (Ray et al.
30 1991). Boyd and Pletscher (1999) indicated that dispersers in their study moved toward areas with
31 higher wolf densities than found in their natal areas.

32
33 In northwestern Montana from 1985 to 1997, 53% of tagged wolves (30 of 58) dispersed from their
34 natal territories to establish new territories or join other existing packs; 59% of males (10 of 17) and
35 49% of females (20 of 41) dispersed (Boyd and Pletscher 1999). Males dispersed at an average age
36 of 28.7 months and traveled an average of 70 miles, whereas females averaged 38.4 months old at
37 dispersal and moved an average of 48 miles. Males and females combined traveled an average of 60
38 miles (range 10-158 miles), with 17% of dispersing individuals moving more than 100 miles. At
39 YNP from 1995 to 1999, dispersal distances averaged 54 miles in males and 40 miles in females
40 (Smith et al. 2000). Dispersals can occur in any month, but are somewhat more frequent in January-
41 February (courtship and breeding season) and May-June (Boyd and Pletscher 1999). Maximum
42 dispersal distances of more than 500 miles have been recorded (USFWS et al. 2009). Wolves are
43 capable of traveling such distances over periods of a few weeks or months. Dispersing individuals
44 typically have lower survival rates than non-dispersing wolves (Pletscher et al. 1997).

45
46 Dispersal has been regularly documented among and between populations in Montana, Idaho,
47 Wyoming, and bordering areas of British Columbia, thereby increasing genetic exchange across the

1 region (Bangs et al. 1998, Mack and Laudon 1998, Smith et al. 2000). Dispersal paths crossed
2 international boundaries, state boundaries, public and private land boundaries, different land uses,
3 and agency jurisdictions.

4 5 Mortality 6

7 Few wolves in the wild live more than 4-5 years (Fuller et al. 2003), although maximum age can
8 reach 15 years (Ausband et al. 2009a). Wolves die from a variety of causes, which are usually
9 classified as either natural or human-caused. Natural deaths result from territorial conflicts between
10 packs, injuries while hunting prey, old age, disease, starvation, or accidents. In populations
11 protected from human-caused mortality, most wolves die from being killed by other wolves usually
12 belonging to neighboring packs, disease, or starvation (Mech et al. 1998, Peterson et al. 1998,
13 USFWS et al. 2009). However, natural mortality probably does not regulate most populations in
14 Idaho, Montana, and Wyoming (USFWS 2000). Humans are the largest cause of wolf mortality in
15 this region as a whole (Mitchell et al. 2008) and are the only cause that can significantly affect
16 populations at recovery levels (USFWS 2000). Mitchell et al. (2008) reported that humans were
17 responsible for 71-87% of wolf deaths in five of six regions of Idaho, Montana, and Wyoming from
18 1979 through 2005, whereas only 23% of mortalities in YNP were human-related. Human-caused
19 mortality includes control actions to resolve conflicts, legal and illegal killings, and car or train
20 collisions (e.g., see USFWS 2009, USFWS et al. 2009). On average, an estimated 10% of the wolves
21 in the northern Rocky Mountain states die annually from control actions, 10% from illegal killing,
22 3% from human-related accidents, and 3% from natural causes (USFWS 2009).

23
24 Pletscher et al. (1997) studied survival and mortality patterns of wolves in the Glacier National Park
25 area from 1982 to 1994. Total annual survival for this semi-protected population was a relatively
26 high 80%. The survival rate for resident wolves was even higher (84%), whereas dispersers had a
27 64% chance of survival. Eighty-five percent of pups survived on average until December each year,
28 though survival varied year to year.

29
30 Wolves are susceptible to a number of viral and bacterial diseases, including rabies, canine
31 parvovirus, canine distemper, canine adenovirus (canine hepatitis), and leptospirosis (Kreeger 2003,
32 USFWS et al. 2007, Smith and Almborg 2007, Mech et al. 2008, USFWS 2009). None of these
33 appear to have produced significant mortality within Montana's wolves in recent decades (USFWS et
34 al. 2007). However, serological testing of wolves at YNP has linked years with high prevalence of
35 canine distemper to poor pup survival and population growth (Smith and Almborg 2007). Wolves at
36 the park have shown high and relatively constant levels of exposure to canine parvovirus and canine
37 adenovirus since their reintroduction in 1995, but it is unclear what effects these diseases have had
38 on the population (Smith and Almborg 2007, USFWS et al. 2009). Canine parvovirus is suspected to
39 have caused a decline in the wolf populations at Isle Royale National Park, Michigan (Kreeger 2003),
40 and to have limited population growth and expansion through reduced pup survival in Minnesota
41 (Mech et al. 2008). USFWS et al. (2009) speculated that outbreaks of canine distemper and canine
42 parvovirus will cause occasional periods of higher mortality among wolves in localized areas of the
43 northern Rocky Mountain states, but that neither disease likely threatens overall population viability.
44 Rabies may limit population growth in some situations (Kreeger 2003). Sarcocystis mangle has been
45 documented in wolves in Montana and Wyoming, but not Idaho (USFWS et al. 2009). Occurrence
46 of this disease increased noticeably among wolves at YNP in 2008 (USFWS et al. 2009). Mangle

1 outbreaks can be severe and persistent, and can occasionally produce mortalities, but are not
2 considered a serious threat to population persistence (USFWS et al. 2006, 2009).

3 4 Rates of Population Change

5
6 In the absence of human-caused mortality, wolf populations primarily increase or decrease through
7 the combination and interaction of wolf densities and prey densities (Keith 1983, Fuller 1989),
8 although other factors (e.g., disease) may sometimes play a role. Actual rates of change depend on
9 whether the wolf population is pioneering vacant habitat or whether the population is well
10 established. Degree and type of legal protection, agency control actions, and regulated harvest also
11 influence population trends. Once established, wolf populations can withstand high mortality rates
12 provided that reproductive rates are also high and immigration continues (Fuller et al. 2003). In
13 most locations, sustainable mortality rates range from about 32% to more than 50% (Fuller et al.
14 2003).

15
16 Low-density wolf populations can increase rapidly if protected and prey is abundant. Wolf
17 populations in the GYA and Idaho areas exceeded all expectations for reproduction and survival
18 after their initial reintroductions (Bangs et al. 1998). Populations became reestablished in both areas
19 within two years, rather than the predicted three to five years, and pup production and survival were
20 high. However, once densities become high enough, social interactions among packs intensify,
21 causing intraspecific conflict and increased competition for food. These factors eventually cause
22 populations to level off or decline (Keith 1983, Fuller 1989).

23
24 Wolf populations in six regions of Idaho, Montana, and Wyoming increased at mean annual rates of
25 16-56% through 2005 (Mitchell et al. 2008). At Glacier National Park, wolf numbers increased an
26 average of 23% annually from 1986 to 1993 (Fritts et al. 1995), but then leveled off (Pletscher et al.
27 1997). Dispersing individuals from packs in this area eventually recolonized vacant habitats in
28 northwestern Montana (USFWS unpubl. data). Some of the packs that formed in this region
29 persisted, but others did not due to illegal killing, control actions where livestock depredation was
30 repeated, and for unknown reasons.

31
32 Over a 26-year period, total wolf numbers in Montana increased from 8 in 1982 to 497 in 84 packs
33 in 2008 (USFWS et al. 2009) for an average annual rate of increase of about 17%. The population
34 remained fairly small (fewer than 20) for about 7 years, and then began a rapid increase that has
35 continued to the present. Numbers have grown in 13 of 19 years since 1989. Prey abundance has
36 influenced wolf population dynamics in northwestern Montana. Expanding white-tailed deer
37 populations during the late 1970s through the mid-1990s were partly responsible for increasing wolf
38 numbers and distribution. However, the population declined after the severe winter of 1996-1997,
39 when smaller prey populations resulted in greater predation on livestock in 1997 and 1998, forcing
40 an increase in the lethal control of wolves (C. Sime, unpubl. data).

41
42 Idaho's wolf population grew from fewer than 20 animals in 1995, when reintroductions first
43 occurred, to an estimated 846 wolves in 2008 (USFWS et al. 2009), which corresponds to a mean
44 annual growth rate of about 33%. Eighty-eight packs were documented in 2008 and had expanded
45 across much of the state from the Canadian border, south to the fringes of the Snake River plain,
46 and east to the Montana and Wyoming borders.

1 The population at YNP has shown annual increases in numbers in all but four years since its
2 reintroduction in 1995. Abundance peaked at 174 wolves in 2003, then fell 31% to 118 animals in
3 2005 (USFWS et al. 2006). Numbers grew 15% to 136 wolves in 2006 and another 26% to 171
4 wolves in 2007 (USFWS et al. 2007, 2008), but declined 27% to 124 wolves in 2008 (USFWS et al.
5 2009). It is likely that population growth rates have slowed for YNP and will do so for other areas
6 as the availability of suitable vacant habitat declines. Nevertheless, these populations will remain a
7 source of founders for new packs in neighboring regions as long as current population sizes are
8 maintained.

9 10 **D. Legal Status**

11
12 In Washington, gray wolves are subject to both the federal Endangered Species Act (ESA) and
13 Washington state law (RCW 77.15.120, WAC 232-12-014). These laws are independent but
14 somewhat parallel. So long as the wolf remains federally listed in part or all of Washington, both
15 federal and state law must be consulted to understand the protections that pertain to wolves in
16 Washington.

17 18 Federal

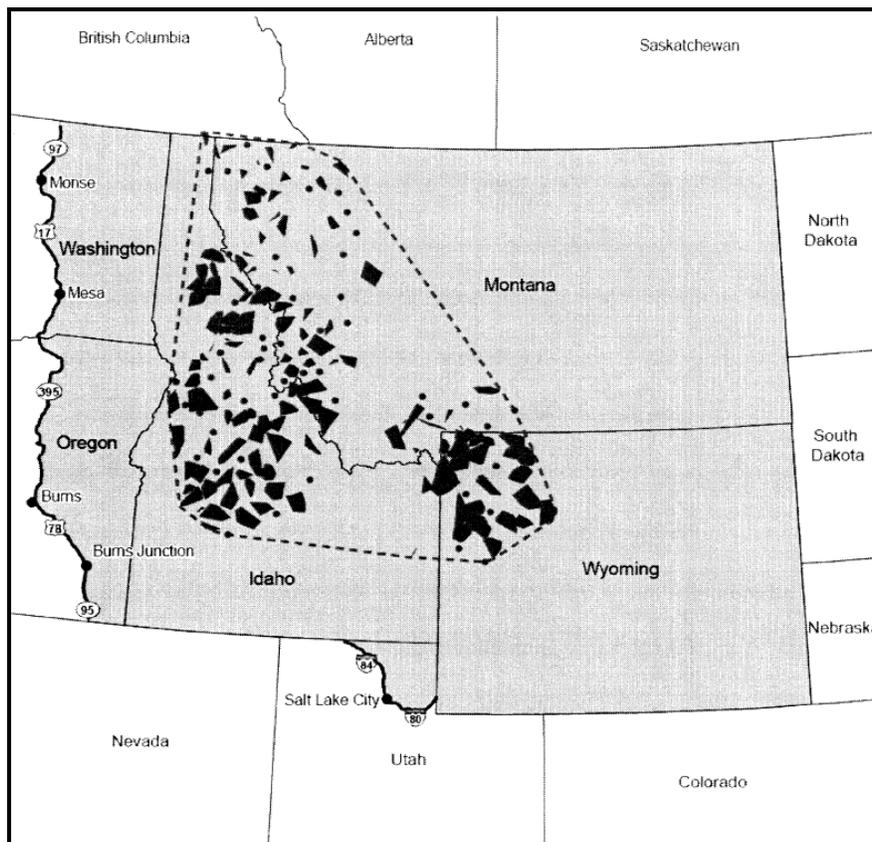
19
20 Wolves were listed as endangered in 1973 under the federal ESA, which is intended to conserve and
21 recover endangered and threatened species to levels where protection is no longer necessary. In
22 1980, the USFWS completed the Northern Rocky Mountain Wolf Recovery Plan, which was revised
23 in 1987 (USFWS 1987). The plan specified a recovery criterion of 10 breeding pairs (defined as two
24 adults of opposite sex capable of producing offspring) of wolves for three or more consecutive years
25 in each of three distinct recovery areas: (1) northwestern Montana, (2) central Idaho, and (3) the
26 Yellowstone National Park area. The plan stated that if two recovery areas maintained 10 successful
27 breeding pairs for three successive years, the population could be reclassified to threatened; and if all
28 three recovery areas maintained 10 successful breeding pairs for three consecutive years, the wolf
29 population could be considered fully recovered and considered for delisting. Washington is not
30 included in this recovery plan.

31
32 This recovery goal was modified in 1994 to better meet the needs for reestablishing a wolf
33 population with long-term viability. The goal now requires a total of 30 or more breeding pairs
34 (defined as an adult male and adult female that raise at least 2 pups until December 31) comprising
35 300 or more wolves in a metapopulation (USFWS 1994). A metapopulation can be thought of as a
36 group of partially isolated populations that interbreed and are able to recolonize sites of extirpated
37 population. The goal also requires that at least 10 breeding pairs and 100 wolves be maintained per
38 state (i.e., Idaho, Montana, and Wyoming) rather than per specified recovery area. As a safety
39 margin against relisting, all three states have committed to managing for 15 breeding pairs and 150
40 wolves in mid-winter (E. Bangs, pers. comm.). The requirement for 10 breeding pairs and
41 100 wolves per state for three successive years was met in 2002.

42
43 Based on scientific reviews and updated information, the USFWS began using entire states, in
44 addition to recovery areas, to measure progress toward recovery goals. Wolves reintroduced into
45 Yellowstone National Park and central Idaho in 1995 and 1996 were designated as “non-essential
46 experimental populations” under the federal ESA within a combined zone covering all of Idaho
47 south of Interstate 90, southwestern Montana, and all of Wyoming. Elsewhere (i.e., northwestern

1 Montana and northernmost Idaho), wolves remained listed as endangered. In addition to
 2 population objectives in the three states, the USFWS required approved state management plans to
 3 ensure the conservation of the species into the future as a condition of delisting the wolf in Idaho,
 4 Montana, and Wyoming. Washington was not required to have a state wolf conservation plan as a
 5 prerequisite for federal delisting because it was not part of the original Northern Rocky Mountain
 6 Wolf Recovery Plan (USFWS 1987). State wolf management plans were approved by the USFWS
 7 for Montana and Idaho in 2004 and Wyoming in 2007.

8
 9 In 2007, the USFWS proposed formation of a Northern Rocky Mountain distinct population
 10 segment (DPS) of the gray wolf and delisting of this DPS (USFWS 2007a). This proposal
 11 encompassed all of Montana, Idaho, and Wyoming, as well as the eastern one-third of Washington
 12 and Oregon and a small part of north-central Utah (Figure 3). A final delisting decision was
 13 published in the *Federal Register* on February 27, 2008, and became effective on March 28, 2008
 14 (USFWS 2008a). Under this rule, wolves became federally delisted east of Highways 97, 17, and 395
 15 in Washington, but remained federally listed in the state west of these highways (Figure 3). However,
 16
 17



18
 19 Figure 3. Map of the area (light gray shading) designated as the Northern Rocky Mountain distinct
 20 population segment of gray wolves (from USFWS 2009). Existing wolf pack territories as of 2007 are
 21 depicted in dark gray.
 22
 23

1 12 conservation groups challenged this determination by suing the USFWS to prevent delisting. On
2 July 18, 2008, a U.S. district judge granted a preliminary injunction restoring federal protection to
3 wolves in the DPS until the court case challenging the population's delisting could be decided.
4

5 On September 29, 2008, the USFWS asked the U.S. district judge that granted the preliminary
6 injunction to vacate its delisting rule for the DPS. The agency reopened the comment period to
7 again consider delisting wolves in the DPS on October 28, 2008 (USFWS 2008b). On January 14,
8 2009, the USFWS announced its intention to again delist the DPS, with the exception of Wyoming,
9 which no longer has an accepted management plan. The USFWS withdrew this action on January
10 20, 2009, pending further review, but announced its decision to proceed with delisting on March 6,
11 2009 (USFWS 2009). Delisting became effective on May 4, 2009, except in Wyoming. In June
12 2009, two lawsuits were filed by conservation groups opposing delisting, while two others were filed
13 by the state of Wyoming and a coalition of livestock groups and others seeking the delisting of
14 wolves in that state.
15

16 Where federal delisting of the wolf occurs, the USFWS is required under the Endangered Species
17 Act to continue monitoring delisted populations for at least five years to ensure that abundance
18 remains above a threshold for relisting.
19

20 State of Washington

21

22 Wolves were first listed as endangered by the Washington Department of Game in 1980 because of
23 their historical occurrence in the state and subsequent near-extirpation from the state, and because
24 of their existing status as endangered under the federal Endangered Species Act. State law RCW
25 77.15.120 protects endangered species from hunting, possession, malicious harassment, and killing,
26 with penalties described therein (Appendix F). State listing and delisting procedures for endangered,
27 threatened, and sensitive species in Washington are specified in WAC 232-12-297 (Appendix F).
28

29 Tribal

30

31 In the mid-1800s, eight treaties (known as the "Stevens Treaties") were negotiated with tribes in
32 what would become Washington State. The treaties established reservations for the exclusive use of
33 the tribes. Federally recognized tribes with reservations generally have authority to manage fish and
34 wildlife within their reservation. Not all of the state's tribes signed treaties with the federal
35 government. Several of these tribes have reservations designated by executive order. These include
36 the Colville, Spokane, and Kalispel reservations in eastern Washington, and the Chehalis and
37 Shoalwater reservations in western Washington.
38

39 *Wolf Management*

40

41 Wolf management may vary among tribes in Washington. Although some tribes have traditional
42 and cultural ties with wolves, there is also concern that wolves could reduce opportunities for
43 subsistence harvest of elk, deer, and moose. WDFW has established a Wolf Interagency Committee
44 composed of WDFW, tribes, federal and state land managers, and the USFWS to foster
45 coordination and collaboration on wolf management in the state. Individual tribes in Washington
46 may choose to develop their own wolf management plans. In areas where wolves remain federally
47 listed as endangered, tribes are subject to federal Endangered Species Act regulations. However, in

1 areas of Washington where wolves are federally delisted, there is the potential for tribes to develop
2 their own management plans and regulations regarding wolves. These may or may not be consistent
3 with the state wolf plan. If issues were to arise over inconsistencies, they would be discussed in
4 government-to-government consultations between WDFW and the tribes. With regard to hunting,
5 treaties generally preempt state regulation of tribal treaty hunting. However, the courts have created
6 a narrow exception to the general rule, which applies to situations where the state regulates the
7 hunting of a particular species in order to conserve that species. Below is some additional detail
8 describing off-reservation hunting rights in Washington.

9 10 *Off-Reservation Hunting*

11
12 In addition to the authority to manage on reservation lands, the Stevens Treaty tribes reserved their
13 rights to continue traditional activities on lands beyond these reserved areas. The treaties all contain
14 substantially similar language reserving the right to hunt, fish, and conduct other traditional activities
15 on lands off reservations. There are 24 tribes with off-reservation hunting rights in Washington.
16 Two of the tribes, the Confederated Tribes of the Umatilla Indian Reservation and the Nez Perce
17 Tribe, are located outside of the state, but have reserved hunting rights within Washington.

18
19 Tribal hunting rights for non-treaty tribes are typically limited to areas on the reservation, although
20 the Colville Confederated Tribes' hunting rights extend to an area that was formerly part of the
21 reservation known as the "North Half." The Colvilles' hunting rights to the North Half were
22 upheld by the U.S. Supreme Court's decision in *Antoine v. Washington* in 1975.

23
24 There are additional tribes that are recognized by the federal government, but have no specific off-
25 reservation hunting rights. Members of those tribes are subject to state hunting regulations.

26
27 As federal law, treaties preempt inconsistent state law under the Supremacy Clause of the Federal
28 Constitution. The courts have ruled that state regulation of tribal exercise of off-reservation hunting
29 rights on open and unclaimed land is preempted by the Stevens Treaties, except where state
30 regulation is necessary for conservation purposes.

31
32 The treaties do not expressly specify the geographical extent of the hunting right. In *State v.*
33 *Buchanan* (1999), the Washington State Supreme Court ruled that this right extends to (1) the lands
34 formally ceded by the tribes to the United States as those lands are described in the Treaties; and (2)
35 may include other areas where it can be shown that those areas were "actually used for hunting and
36 occupied [by the tribe] over an extended period of time." The court did not provide a formal
37 mechanism to evaluate and determine traditional hunting areas.

38
39 Federal and state courts have ruled that public land is "open and unclaimed" unless it is being put to
40 a use that is inconsistent with tribal hunting. For example, in *U.S. v. Hicks*, a federal district court
41 ruled that the Olympic National Park was not "open and unclaimed" because one of its purposes is
42 the preservation of native wildlife and because hunting is generally prohibited in the park. In
43 contrast, national forests have been held to be "open and unclaimed." In *State v. Chambers* (1973),
44 the Washington Supreme Court stated that private property is not "open and unclaimed," but such
45 private property must have outward indications of private ownership recognizable by a reasonable
46 person.

1 E. Social, Cultural, and Economic Values

2
3 Many aspects of the wolf-human relationship are based on long-held cultural perceptions. Modern
4 viewpoints on wolves also illustrate the fundamental differences in the ways that urban and rural
5 people view nature (Wicker 1996). As noted in the Montana Gray Wolf Conservation and
6 Management Plan Draft EIS (MFWP 2003), “the differences in attitudes towards wolves might be
7 summed up as the perceived chance of personal benefit or loss resulting from the presence of
8 wolves. Those who feel they will benefit either directly or vicariously tend to favor wolf recovery
9 and those who perceive the threat of personal loss oppose recovery” (MFWP 2003).

10
11 Decidedly negative views of wolves prevailed during the period of eradication in the United States
12 and continue today among some portions of the population, especially those who may be
13 economically impacted by wolf restoration (Wilmot and Clark 2005). Hunter groups also worry that
14 wolves may reduce harvestable game populations. Additionally, some citizens view wolves as highly
15 problematic in the greater context of preserving private property rights and achieving broader uses
16 of public lands.

17
18 By contrast, many studies of human attitudes towards wolves in the United States have documented
19 strong public support for wolves in recent decades, even in the West (Fritts et al. 2003). These
20 attitudes are fostered by the fear of extinction and a desire to restore natural ecosystems to their
21 former function. Urban people and members of environmental organizations tend to hold the most
22 positive and protectionist views toward wolves (Fritts et al. 2003). Favorable attitudes towards
23 wolves also increase with geographic distance from occupied wolf range (Karlsson and Sjöström
24 2007). Wolf-related tourism has become an economic benefit in some areas, especially at
25 Yellowstone National Park, where wolves are plentiful, easily located, and viewed from park roads
26 (see Chapter 14, Section D).

27 28 Attitudes in Washington

29
30 Two recent studies conducted by Responsive Management, a professional public opinion and
31 attitude survey research firm specializing in natural resource and outdoor recreation issues, provide
32 information on citizen attitudes statewide on a variety of questions pertaining to hunting and wildlife
33 management in Washington, including wolves. The first of these (Duda et al. 2008a) examined
34 overall public opinion and entailed a telephone survey of 805 Washington residents 18 years old and
35 older in January 2008 (see Appendix I for greater detail on survey methods). The survey asked six
36 questions about wolves and related issues. Each question and the public’s responses to the question
37 appear in Appendix I. The following summary of results is reprinted from the survey’s final report:

- 38
39 • “The large majority of Washington residents (75%) support allowing wolves to recover in
40 Washington; meanwhile, 17% oppose it.
- 41
42 • “A cross tabulation found that those who live in urban and suburban areas are more likely to
43 support wolf recovery; while those residing in small city/town or rural areas are more likely
44 to oppose. Note that those living on ranches or farms are the most likely to *strongly* oppose.
45

-
- 1 • “When the stipulation is put on wolf recovery that it could result in localized declines in elk
2 and deer populations, support declines slightly: 61% support wolf recovery if it will result in
3 some localized declines in elk and deer populations, and 28% oppose.
4
- 5 • “Most Washington residents (61%) support some level of lethal wolf control to protect at-
6 risk livestock; however, 31% oppose. Additionally, a majority of residents (56%) support
7 having the state pay compensation out of the General Fund to ranchers who have
8 documented losses to livestock from wolves, but 35% oppose.
9
- 10 • “When asked how worried, while recreating outdoors, they would be about wolves,
11 respondents most commonly say that they would not be worried at all (39%), and 26%
12 would be only a little worried; in sum, 65% would be only a little worried or not worried at
13 all. On the other hand, 33% would be very or moderately worried, with 11% *very* worried.
14
- 15 • “In a question tangentially related to wolf management, the survey found that wildlife
16 viewing specifically of wild wolves would appear to be popular, as 54% of residents say that
17 they would travel to see or hear wild wolves in Washington. (Note that 2% of respondents
18 say that they would not need to travel, as they have wild wolves nearby already.)”
19

20 The second survey (Duda et al. 2008b) assessed hunter opinions only and entailed telephone
21 interviews with 931 Washington hunters 12 years old and older from December 2007 to February
22 2008 (see Appendix J for greater detail on survey methods). Interviewees in this study were
23 exclusive from those contacted by Duda et al. (2008a). The survey asked three questions about
24 wolves and related issues. Each question and hunters’ responses to the question appear in Appendix
25 J. The following summary of results is reprinted from the survey’s final report:
26

- 27 • “After being informed that wolves are highly likely to re-colonize Washington over the next
28 10 years, hunters were asked if they support or oppose having the Department manage
29 wolves to be a self-sustaining population. Support exceeds opposition among every type of
30 hunter except [those in a category combined for] sheep/moose/goat hunters.
31
- 32 • “Common reasons for supporting include that the hunter likes wolves/that all wildlife
33 deserves a chance to flourish, that wolves should be managed and controlled anyway, or that
34 wolves should be managed so that they do not overpopulate.
35
- 36 • “Common reasons for opposing include concerns about potential damage to livestock
37 and/or game and wildlife, that the respondent does not want wolves in the area, or that
38 wolves are not manageable.”
39

3. WOLF CONSERVATION

1
2
3
4
5 The conservation portion of this plan identifies the strategies to reestablish a naturally reproducing
6 and viable population of gray wolves distributed in a significant portion of the species' former range
7 in Washington. WAC 232.12.297 (Endangered, threatened, and sensitive wildlife species
8 classification; Appendix F) defines the process by which "listing, management, recovery, and
9 delisting of a species can be achieved." The process requires the preparation of a recovery plan for
10 species listed as endangered or threatened. At a minimum, recovery plans are to include target
11 population objectives, criteria for reclassification, and an implementation plan for reaching
12 population objectives. The Washington Wolf Conservation and Management Plan will satisfy the
13 requirements for a state gray wolf recovery plan.

14
15 Section A of this chapter provides the scientific basis for conservation planning principles and
16 genetic/population viability issues as related to the reestablishment of sustainable wolf populations.
17 Section B presents the conservation/recovery objectives to downlist and delist wolves in
18 Washington. It describes the numbers and distribution for wolf conservation/recovery objectives,
19 as well as important conservation tools such as translocation. Section C briefly discusses issues and
20 processes related to the management of wolves after delisting. A summary of Wolf Working Group
21 discussions on these topics appears in Appendix E.

22 23 **A. Scientific Basis for Conservation Planning**

24 25 Population Viability

26
27 Conservation/recovery objectives for downlisting and delisting a species need to be set at sufficient
28 numbers of individuals and levels of geographic distribution to ensure that a permanently viable
29 population is reestablished. For the purposes of this document, a "viable" population is one that is
30 able to sustain its size, distribution, and genetic variation in the long term without requiring human
31 intervention and conservation actions. Such populations must also be able to withstand fluctuations
32 in abundance and recruitment associated with variation in food supplies, predation, disease, and
33 habitat quality. For wolves, long-term persistence of a population in Washington will depend on
34 other factors as well, including proximity and connectivity to source populations (outside and
35 potentially within the state), competing carnivore populations, the extent of conflicts with livestock
36 production, and overall social tolerance by people.

37
38 The number of individuals needed to maintain the long-term viability of wolf populations is widely
39 debated. Assessments by both the U.S. Fish and Wildlife Service (1994) and the Wisconsin
40 Department of Natural Resources (1999) concluded that isolated or partially isolated wolf
41 populations with 300-500 individuals should have a good probability of maintaining long-term
42 population viability.

43
44 In 1994, the U.S. Fish and Wildlife Service (2008a) concluded that 30 or more breeding pairs
45 comprising 300 or more wolves in a metapopulation (a population made up of partially isolated sets
46 of subpopulations that are able to exchange individuals and recolonize sites in which the species has
47 recently become extirpated) should have a high probability of long-term persistence because:

1
2 “... such a population would contain enough individuals in successfully reproducing packs
3 distributed over distinct but somewhat connected large areas to be viable for the long-term
4 (USFWS 1994). A population at or above this size would contain at least 30 successfully
5 reproducing packs and ample individuals to ensure long-term population viability. In
6 addition, the metapopulation configuration and distribution throughout secure suitable
7 habitat would ensure that each core recovery area would include a recovered population
8 distributed over a large enough area to provide resilience to natural or human-caused
9 events that may temporarily affect one core recovery area. No wolf population of this size
10 and distribution has gone extinct in recent history unless it was deliberately eradicated by
11 humans (Boitani 2003)” (USFWS 2008a).
12

13 This population goal was reviewed in 2001-2002, with most (78%) queried experts strongly
14 supporting the 1994 conclusion that a metapopulation of at least 30 breeding pairs and at least 300
15 wolves would provide a viable wolf population (USFWS 2008a). However, the experts also
16 concluded that viability would be “enhanced by higher (500 or more wolves) rather than lower
17 population levels (300) and longer (more than 3 years) rather than shorter (3 years) demonstrated
18 time frames [because the] more numerous and widely distributed a species is, the higher its
19 probability of population viability will be” (USFWS 2008a).
20

21 In Wisconsin, population viability analysis similarly suggested that an isolated population of 300-500
22 wolves would have a high probability of persisting for 100 years under most of the scenarios tested
23 (WDNR 1999). However, simulations employing moderate to high levels of environmental
24 variation and catastrophic events resulted in substantially greater likelihood of extinction or the need
25 to relist the population.
26

27 State wildlife agencies have employed several approaches for setting recovery objectives for wolves
28 that are intended to ensure long-term viability. Wisconsin determined that its population objectives
29 needed to (1) represent a population level that could be supported by the available habitat, (2) be
30 compatible with existing information on wolf population viability analysis, and (3) be socially
31 tolerated to avoid development of strong negative attitudes toward wolves (WDNR 1999).
32 Oregon’s wolf advisory group established population objectives based on a compromise between
33 conservation and management perceptions (ODFW 2005).
34

35 At present, the number of wolves necessary for ensuring the recovery of Washington’s population is
36 difficult to determine. Specific information for Washington is lacking on wolf population dynamics,
37 pack densities, predator-prey relationships, immigration rates, and other relevant biological factors
38 for the state. Such data exist for wolves in other states (e.g., Montana, Idaho, Wisconsin), but may
39 not be adequate for establishing objectives for Washington because of differences in habitat quality,
40 prey availability, human densities, and perhaps other important factors. Therefore, establishment of
41 conservation/recovery objectives through a formal population viability analysis (PVA) is unlikely to
42 provide meaningful results at this time. The conservation/recovery objectives in this plan (Section
43 B) are established for the state of Washington, with recognition that the long-term viability of the
44 state’s wolf population will, in part, be dependent on maintaining its connectivity to the broader
45 regional wolf metapopulation comprising Idaho, Montana, British Columbia, and Oregon.
46

Genetic Diversity

1
2
3
4 An underlying tenet of endangered species recovery is that populations need to be functionally
5 connected so that genetic material can be exchanged. In isolation, no population of wolves is
6 expected to maintain its genetic viability (Fritts and Carbyn 1995, vonHoldt et al. 2008). Loss of
7 genetic variation can pose a conservation threat to wolves by causing decreased reproductive rates,
8 reduced disease resistance, and other problems. These can, in turn, hinder the long-term recovery of
9 populations regardless of other factors such as habitat and prey availability. Inbreeding depression
10 has been suggested as the cause of reproductive problems (e.g., reduced sperm quality, decreased
11 litter size, reduced pup survival) and other problems (congenital backbone deformities) noted in
12 several small wolf populations (Wayne and Vilà 2003, Liberg et al. 2005, Asa et al. 2007, Fredrickson
13 et al. 2007, Räikkönen et al. 2009). Nevertheless, many existing wolf populations have persisted for
14 decades or centuries with low genetic diversity (Fritts and Carbyn 1995, Boitani 2003). As a result,
15 wolf populations are broadly considered to be more threatened by issues relating to excessive
16 human-caused mortality than by genetic concerns (Boitani 2003).

17
18 Although wolves display a number of behaviors that help them avoid inbreeding (Chapter 2, Section
19 C), isolated populations that remain small in size and range can experience reductions in genetic
20 diversity because members have few opportunities for mating with unrelated individuals. Wolf
21 populations feature effective population sizes (i.e., the average number of individuals in a population
22 that breed and successfully pass their genes to succeeding generations; N_e) that are much smaller
23 than the total size of populations (N) (Aspi et al. 2006). This means that retaining adequate
24 numbers of successfully breeding adults is particularly important in preserving the long-term genetic
25 viability of wolf populations. Analyses by vonHoldt et al. (2008) suggested that isolated populations
26 maintaining at least 10 breeding pairs and at least 100 wolves will lose genetic variation and become
27 inbred over the long term. Bensch et al. (2006) reported that an isolated wolf population in
28 Scandinavia that grew from a founding breeding pair and one subsequent immigrant to about 140
29 wolves during a 21-year period lost genetic diversity at a rate of 2% per generation (i.e., about every
30 4 years). Other small wolf populations also possess reduced levels of genetic variability (Peterson et
31 al. 1998, Wayne and Vilà 2003, Fredrickson et al. 2007). Based on the genetic traits of wolves at
32 Yellowstone National Park, vonHoldt et al. (2008) predicted that without immigration, inbreeding
33 depression would cause the park's population of about 170 animals to experience an increase in pup
34 mortality from an average of 23 to 40% within 60 years.

35
36 To preserve the genetic diversity of isolated wolf populations, vonHoldt et al. (2008) suggested that
37 conservation efforts should discourage actions that interfere with pack formation and retention. For
38 example, intense control actions that result in the frequent removal of breeding pairs or severe
39 disruption of pack stability may lead to high breeder turnover and the possibility of reduced genetic
40 exchange through fewer mating choices with unrelated individuals. Genetic concerns in wolf
41 populations can be alleviated by management actions such as increased protection, restoration of
42 habitat, and augmentation of populations through translocation (vonHoldt et al. 2008, Kojola et al.
43 2009, USFWS 2009). The addition of even a single breeding immigrant can dramatically increase the
44 genetic variability of isolated populations (Vilà et al. 2003). Translocations reestablishing new
45 populations should emphasize adequate numbers of founders so that these populations start with
46 significant genetic diversity.

1 Current wolf populations in the northern Rocky Mountain states are characterized by high levels of
2 genetic variability (Forbes and Boyd 1996, 1997, vonHoldt et al. 2008), meaning that wolves arriving
3 in Washington from this source should possess adequate genetic diversity. In addition to wolves
4 dispersing into Washington from the Rocky Mountain states, the genetic makeup of wolves in the
5 state would be further diversified by breeding with wolves dispersing into the state from British
6 Columbia.

7 Distribution

8
9
10 One of the criteria for removing a species from state listed status in Washington is that it must
11 occupy a significant portion of its original geographic range. A “significant portion of the species’
12 historical range” is defined under WAC 232-12-297, section 2.9, as that portion of a species’ range
13 likely to be essential to the long-term survival of the population in Washington.

14
15 As a habitat generalist, wolves are capable of living in a variety of ecosystems having adequate prey
16 and sufficient human tolerance. Oakleaf et al. (2006) looked at potential wolf habitat in Idaho,
17 Montana, and Wyoming, using the following GIS data layers: roads accessible to two-wheel and
18 four-wheel vehicles, topography (slope and elevation), land ownership, relative ungulate density
19 (based on State harvest statistics), cattle and sheep density, vegetation characteristics, and human
20 density. From that analysis, they concluded, and the U.S. Fish and Wildlife Service (USFWS 2008a)
21 concurred, that the four primary factors related to wolf occupancy and persistence were:

- 22
- 23 1) increased forest cover
- 24 2) lower human population density
- 25 3) higher elk density
- 26 4) lower sheep density
- 27

28 Wolves are expected to persist in habitats with similar characteristics in Washington. Areas with
29 abundant deer, elk, and moose, reduced livestock use, and few potential human conflicts offer the
30 best chance for recovery success. These locations include national forests, national parks, wilderness
31 areas, national recreation areas, designated roadless areas on public lands, and areas with low
32 densities of open roads. In some areas, wolves are expected to follow their prey to lower elevations
33 during the winter.

34
35 Historically, wolf distribution in Washington included much of the state. During the 70 or so years
36 that wolves have been essentially absent from Washington, humans have significantly altered the
37 landscape throughout the state. Habitat once occupied by wolves has been reduced by development
38 and land conversion, with many areas now existing as fragments rather than as large contiguous
39 blocks. Road densities have increased dramatically and the human population has grown to more
40 than six million people.

41
42 Although these changes have reduced the amount of habitat now available to wolves, large areas of
43 Washington continue to have low human densities and are potentially suitable for the species.

44
45 There have been four recent modeling studies that have estimated potentially suitable wolf habitat in
46 Washington. They vary in approach, data layers that were used, and in predictions of amounts of
47 potentially suitable wolf habitat in the state, but most were consistent in predicting suitable habitat in

1 northeastern Washington, southeastern Washington, the Cascade Mountains, and the Olympic
2 Peninsula (Figures 4-7). The four studies include:

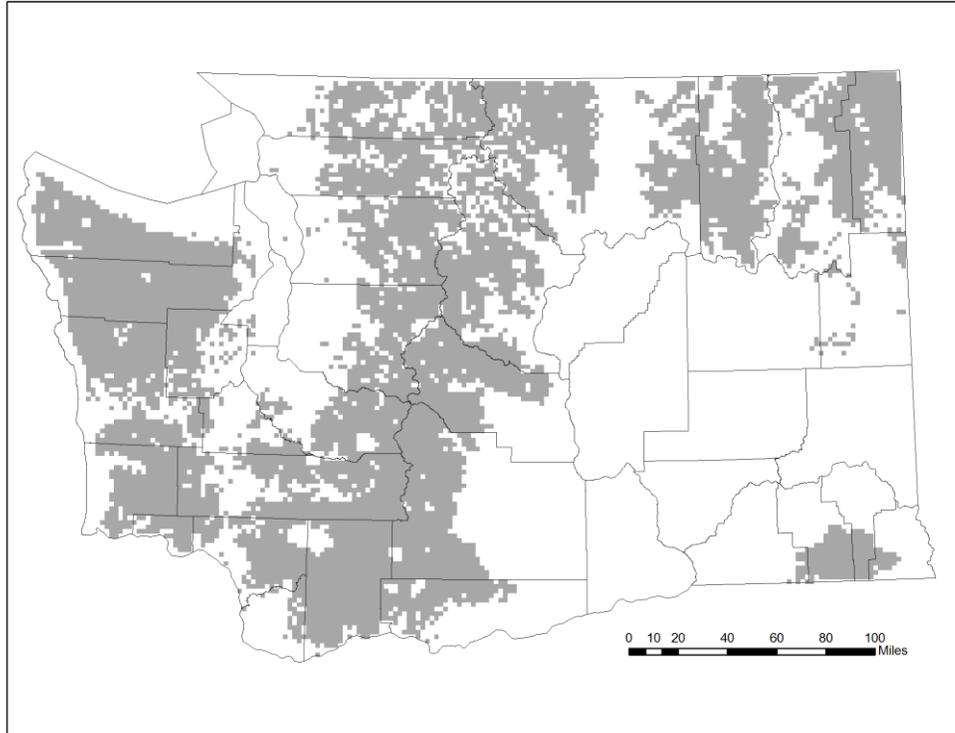
3
4 (1) B. Maletzky (unpubl. data) used GIS data layers for the four parameters found by Oakleaf et al.
5 (2006) to be the most important predictors of wolf occupancy and persistence in Montana, Idaho
6 and Wyoming. These included prey density, forest cover, human density, and presence of sheep
7 allotments. Using these parameters, he determined that potentially suitable wolf habitat occurs in
8 the northeastern portion of the state, the Blue Mountains, Cascade Mountains, southwest
9 Washington and the Olympic Peninsula (Figure 4). The model resulted in five different probabilities
10 of wolf occupancy. Figure 4 shows the proportion of suitable habitat likely ($\geq 50\%$ probability) to
11 be occupied. Oakleaf et al. (2006) considered habitat with $\geq 50\%$ probability of occupancy to be
12 high quality wolf habitat; Larsen and Ripple (2006) defined wolf habitat suitability as those lands that
13 predicted a $\geq 50\%$ probability of wolf occurrence (Figure 5).

14
15 (2) Larsen and Ripple (2006) used prey density and the extent of human presence, forest cover, and
16 public lands as parameters. The result projected more suitable habitat in the North Cascades than
17 the Maletzky model (Figure 4) and none in southwestern Washington (Figure 5).

18
19 (3) Carroll et al. (2006) conducted a series of analyses of suitable wolf habitat in the western US,
20 including Washington. The first analysis mapped much of western and northeastern Washington as
21 suitable habitat based on vegetation type (used as a measure of prey abundance) and terrain (Figure
22 6a). Further analysis predicted distribution and demography of wolves in the western U.S. using the
23 spatially-explicit PATCH model (Schumaker et al. 2004). This resulted in predictions of potential
24 distribution and demography of wolves in the western United States under five different landscape
25 scenarios portraying current and future conditions. The PATCH model predicted low probability of
26 occupancy and persistence in the state, under current conditions, except in the Blue Mountains and
27 the Olympic Peninsula (Figure 6b). Under this projection, USFWS (2008a, 2009) reported that the
28 Washington portion of the Northern Rocky Mountain DPS (i.e., eastern one-third of Washington)
29 contained only an estimated 297 square miles of potential wolf habitat.

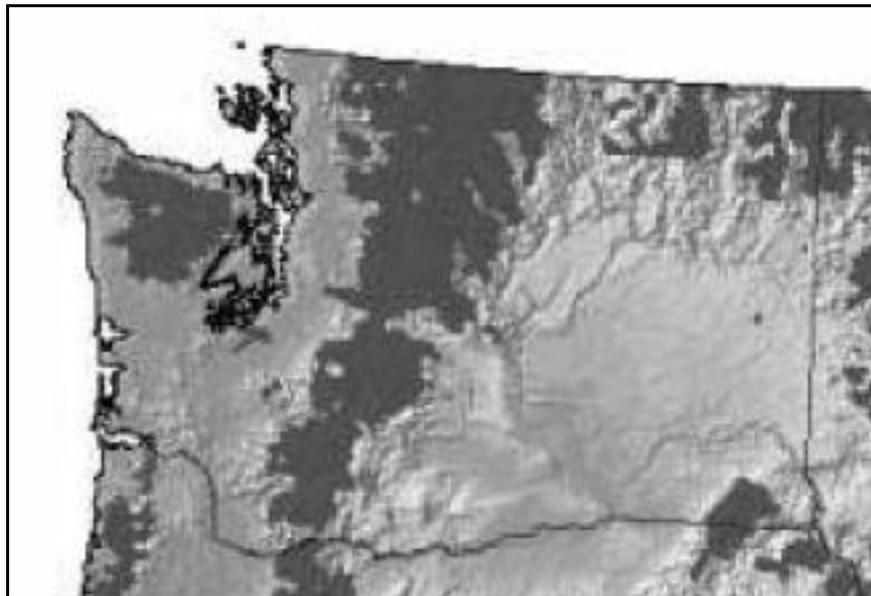
30
31 (4) In response to questions from the Wolf Working Group, Carroll (2007, unpubl. data)
32 subsequently expanded his analysis of suitable wolf habitat in Washington by considering the
33 influence of linkages with habitat in British Columbia and adjacent states on predicted wolf
34 distribution and demography. GIS data layers used were: (1) vegetative productivity; (2) road density
35 and type together with human population density and distribution, which were used as a measure of
36 wolf mortality (livestock density was not incorporated); and (3) habitat linkages with neighboring
37 states and British Columbia. The results identified areas of potential wolf habitat similar to those
38 indicated by Maletzky (unpubl. data) and Larsen and Ripple (2006), including the Cascades,
39 northeastern Washington, the Olympic Peninsula, and the Blue Mountains (Figure 7). However,
40 most of the habitat within these areas, especially in the North Cascades and northeastern
41 Washington, was considered to be lesser quality “sink” habitat, where resident wolf populations
42 would have difficulty persisting without ongoing immigration from neighboring “source”
43 populations. Sink habitat is nonetheless considered vital in enhancing regional population viability
44 by facilitating dispersal between source populations. In comparison, source habitats are higher
45 quality habitats that support growing populations (source populations) and produce dispersing
46 young. Source habitats therefore play a pivotal role in sustaining viable populations.

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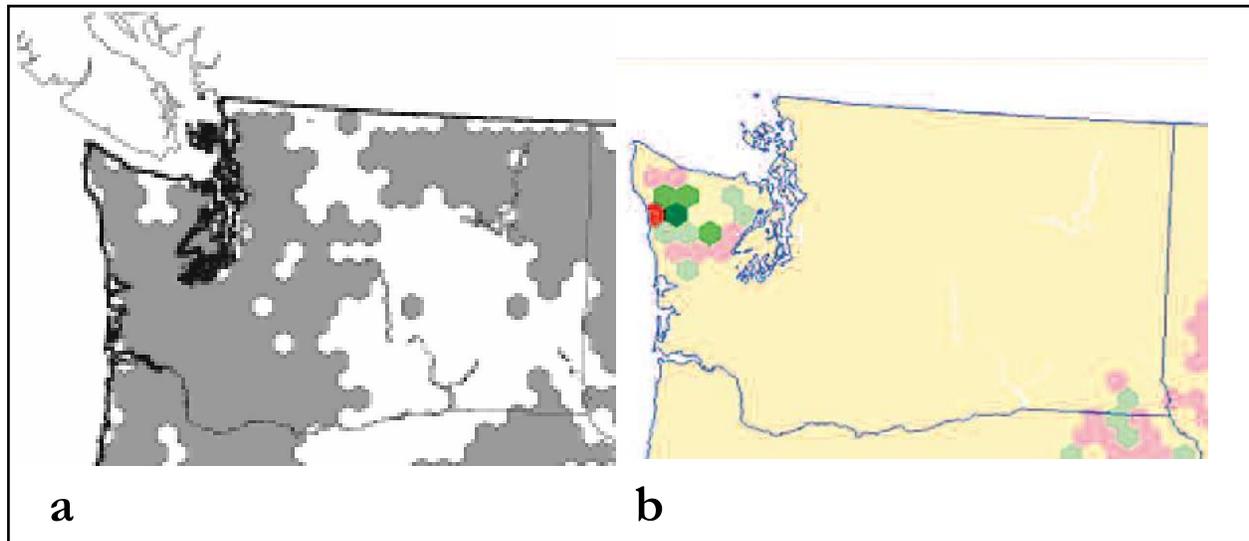
Figure 4. Estimated suitable wolf habitat likely ($\geq 50\%$ probability) to be occupied in Washington (gray shading), using the parameters of Oakleaf et al. (2006). Analyses were conducted by B. Maletzky.



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Figure 5. Estimated suitable wolf habitat in Washington (dark gray shading), where suitability is defined by those lands that equal or exceed a 50% probability of occurrence as predicted by Larsen and Ripple (2006).

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Figure 6. The estimates of Carroll et al. (2006) of (a) suitable wolf habitat in Washington (gray shading) based on vegetation parameters, and (b) potential wolf distribution predicted by the PATCH model under current habitat conditions. In (b), areas with predicted negative population growth rates are shown in pink and red, and are considered “sink” habitats. Those shown in shades of green have predicted positive growth rates and are considered “source” habitats. Areas in pale yellow are predicted to have low potential occupancy (less than 25%).

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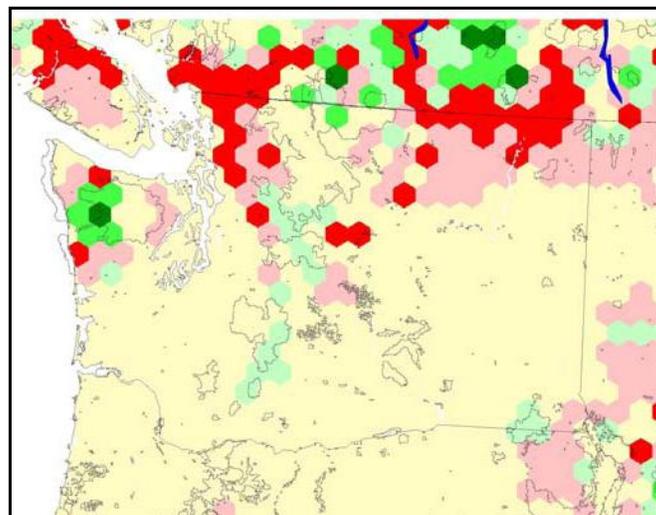


Figure 7. Potential wolf distribution in Washington and surrounding areas as predicted by Carroll (2007). Areas with predicted negative population growth rates are shown in pink and red, and are considered “sink” habitats. Those shown in shades of green have predicted positive growth rates and are considered “source” habitats. Areas in pale yellow are predicted to have low potential occupancy (less than 25%).

1 Models of suitable wolf habitat are most useful for understanding the relative proportions and
2 distributions of various habitat characteristics related to wolf survival and shouldn't be interpreted as
3 absolute predictors of areas that will be occupied by wolves (USFWS 2008a). Estimates of suitable
4 habitat calculated from the four different model results range from a low of about 16,900 square
5 miles (Carroll 2007) to a high of about 41,500 square miles (Carroll et al. 2006). Maletzky (unpubl.
6 data) results were about 26,700 square miles and Larsen and Ripple (2006) results were about 19,000
7 square miles. The average of the four was about 26,025 square miles. The Maletzky (unpubl. data)
8 projection may be the most realistic because it used the parameters identified by Oakleaf et al. 2006
9 as most important predictors of suitable wolf habitat, and it was able to use current WDFW GIS
10 data layers for elk densities in the state. Both Larsen and Ripple (2006) and Carroll (2007) projected
11 lower amounts of total suitable habitat because their results did not portray southwestern
12 Washington as potential wolf habitat. The Carroll et al. (2006) model results were highest because
13 they projected the Puget Sound lowlands as potential habitat. These differences in the models are
14 likely artifacts of the parameters and GIS data layers used.

15
16 Models and observations from Idaho, Montana, and Wyoming during the past 20 years (Bangs et al.
17 2004, USFWS et al. 2009) indicate the types of habitat not suitable for wolves. These include
18 non-forested rangeland and croplands associated with intensive agricultural use Carroll et al. 2003,
19 2006, Larsen and Ripple 2006, Oakleaf et al. 2006, Carroll 2007, unpubl. data; B. Maletzky, unpubl.
20 data). This unsuitability is due to high rates of wolf mortality, high densities of livestock compared
21 to wild ungulates, repeated conflict with livestock and pets, local cultural intolerance of large
22 predators, and wolf behavioral characteristics that make them vulnerable to human-caused mortality
23 in open landscapes (USFWS 2008a). Consequently, although a few wolves could potentially occupy
24 the Columbia Basin in Washington, the likelihood of them persisting and establishing a viable
25 breeding population is low. Lowland areas of the Puget Trough are similarly not expected to
26 support wolves because of the high human densities, lack of available prey, and reduced forest cover
27 found there.

28
29 It is not possible at this time to predict the eventual distribution of wolves in Washington or the
30 carrying capacity of landscapes to support them. However, future radio-tracking of a suitable
31 number of wolves reoccupying the state will make it possible to measure a variety of important
32 biological parameters, including habitat selection and territory sizes. This information can be used
33 to estimate carrying capacity and will help establish a range of wolf numbers that different regions of
34 Washington may be able to support based on prey abundance and distribution, human population
35 densities, livestock allotments, and extent of forested habitat.

36 37 Landscape Connectivity and Dispersal

38
39 Some landscape features allow easy passage by wildlife species, whereas others such as unsuitable
40 natural habitats, rugged topography, human development, and major highways may act as barriers
41 that constrain, prevent, or redirect movements (Singleton et al. 2002). Landscape features can
42 therefore influence: (1) levels of gene flow among populations; (2) rates of dispersal to unoccupied
43 areas with suitable habitat, which can affect the establishment of new populations; and (3) rates of
44 immigration into existing populations, which can affect the viability of populations, especially those
45 with low survival or productivity and those occupying fragmented habitats. Wolves are capable of
46 dispersing long distances rapidly through a variety of habitats and select mates to maximize genetic
47 diversity (USFWS 2008a). Nevertheless, maintaining connectivity between blocks of potentially

1 suitable habitat is important to wolf conservation in Washington because of the fragmented
2 condition of habitats in the state. Managing landscape permeability for the benefit of wolves will
3 speed recolonization and progress toward recovery goals and will reduce the need for costly
4 translocation efforts.

5
6 Singleton et al. (2002) analyzed landscape permeability for wolves in Washington and adjoining areas
7 of Idaho and British Columbia (the Blue Mountains and Oregon were excluded). They reported that
8 landscapes in the Cascades, north-central and northeastern Washington, and parts of the interior
9 lowlands of British Columbia were broadly conducive for travel by wolves. However, five zones
10 within the region were identified as impediments to movement, with the upper Columbia (Lake
11 Roosevelt)-Pend Oreille valleys being the least permeable of these, followed by Snoqualmie Pass,
12 Stevens Pass-Lake Chelan, the Fraser-Coquihalla region of British Columbia, and the Okanogan
13 Valley. These zones generally represent developed valley bottoms with discontinuous forest cover,
14 sizeable human populations, and high road densities, or reservoirs. Singleton et al. (2002) also
15 showed a broad band of south-central British Columbia extending north from a line between about
16 Osoyoos and Grand Forks as being of lower permeability for wolves, meaning that wolves
17 attempting to move between eastern Washington and the Washington Cascades could find better
18 travel conditions in the northern tier of Washington than in a sizeable portion of southernmost
19 British Columbia.

20
21 Singleton et al.'s (2002) conclusions are generally supported by the work of others who have
22 modeled potential wolf habitat in Washington (Carroll et al. 2006, Larsen and Ripple 2006; Carroll
23 2007, unpubl. data; B. Maletzky, unpubl. data). These studies variously showed the Okanogan,
24 upper Columbia, and Pend Oreille valleys, Snoqualmie Pass, and high elevation areas of the North
25 Cascades as being potential gaps in the distribution of wolves in eastern Washington (Figures 4-7)
26 that would have to be crossed by individuals dispersing between major blocks of suitable habitat.
27 Two additional areas, the I-5 corridor through Lewis and Cowlitz counties and the Chehalis River
28 valley through Grays Harbor County, represent potential barriers to dispersal in western
29 Washington. In contrast to Singleton et al. (2002), Carroll's (2007, unpubl. data) results suggested
30 that southernmost British Columbia may hold better dispersal habitat (as indicated by the presence
31 of "source" habitat) for wolves than northern Washington (Figure 7).

32
33 Maintaining cross-border habitat linkages between Washington and Idaho, British Columbia, and
34 Oregon is vital to the reestablishment and long-term viability of a wolf population in Washington
35 (Carroll 2007). Proximity to wolf populations in Idaho and Montana, which numbered a combined
36 1,343 animals in 2008 (USFWS et al. 2009), and good habitat connectivity along the northeastern
37 Washington-northwestern Idaho border (Singleton et al. 2002; Carroll et al. 2006; Oakleaf et al.
38 2006; Carroll 2007, unpubl. data) provides a high probability that dispersing wolves will periodically
39 enter Washington as long as this source population remains large. Important cross-boundary habitat
40 linkages also exist with British Columbia and Oregon and will benefit wolf recolonization in
41 Washington. However, both of these jurisdictions currently have much smaller wolf populations in
42 areas bordering Washington and therefore will likely be the source of fewer animals entering the
43 state. Any management programs that significantly reduce wolf numbers in Idaho, Montana, British
44 Columbia, and Oregon through regulated public hunting or other large-scale control actions will
45 likely reduce rates of dispersal into Washington. Such activities would create vacancies within
46 existing packs as well as areas of suitable habitat devoid of resident wolf packs, which will probably
47 become occupied by some dispersing wolves before they travel to more distant areas such as

1 Washington. The eventual formation of a source population of wolves in Washington will reduce
2 the dependence on wolf dispersal into the state from outside. Over time, better knowledge of
3 dispersal and immigration rates into Washington will emerge.

4 5 Comparisons between the Northern Rocky Mountain States and Washington for Wolves

6

7 During scientific peer review of this plan, several knowledgeable experts on wolves in the northern
8 Rocky Mountain states commented that wolf restoration in Washington may resemble that which
9 occurred in northwestern Montana from 1979 until well into the 1990s. In contrast to central Idaho
10 and the greater Yellowstone area, both northwestern Montana and Washington lack large core
11 refugia of secure habitat that has large numbers of overwintering wild prey and few livestock
12 (USFWS 2009). Instead, northwestern Montana and Washington feature much more fragmented
13 habitat and a mix of public and private ownership; northwestern Montana also has large holdings of
14 livestock, a natural prey base comprised mainly of deer, and less overall public support for wolf
15 recovery. Because of this combination of characteristics, the wolf population in northwestern
16 Montana grew relatively slowly in numbers and distribution (Bangs et al. 1998). After the first two
17 wolves were recorded in 1979, the first documented breeding pair did not occur until 1986 and the
18 region was not occupied by six successful breeding pairs until 1995.

19
20 Wolf numbers were dampened during this period by wolf-livestock conflicts resulting in significant
21 lethal control, deaths from cars and trains, illegal human-caused mortality, declining ungulate density
22 due to severe winter weather, disease, and an apparently slow rate of immigration from nearby areas
23 of Alberta and British Columbia, where management appeared to be aggressive enough that fewer
24 wolves than expected dispersed into Montana (Bangs et al. 1998, Sime et al. 2007; C. Sime, pers.
25 comm.). Additionally, Glacier National Park and large adjoining wilderness areas to the south did
26 not function as core secure habitat for wolves because their high elevations and harsh winters do not
27 allow significant numbers of ungulates to overwinter (D. Smith, pers. comm.). Wolves in
28 northwestern Montana had among the lowest average pack sizes and population growth rates in the
29 northern Rocky Mountain states through 2005 (Mitchell et al. 2008). Despite these characteristics,
30 the population showed stronger growth during the 1990s and 2000s, with immigration from central
31 Idaho helping supplement the population after about 2002. Because of the proportionally greater
32 level of conflicts with humans, management of wolves in northwestern Montana has required
33 greater agency intervention and cost than wolf restoration efforts in the greater Yellowstone area,
34 central Idaho, and the Great Lakes states (E. Bangs, pers. comm.).

35 36 **B. Conservation/Recovery Objectives for Washington**

37

38 Numbers and Distribution

39

40 This plan sets conservation/recovery objectives to downlist wolves from endangered to threatened,
41 threatened to sensitive, and to delist from sensitive status per WAC 232.12.297. The objectives that
42 were developed from a combination of sources: current scientific knowledge about wolves in other
43 locations, wildlife conservation principles, negotiations among the Wolf Working Group with input
44 from WDFW (see Appendix E), and input from scientific peer review. As such, the objectives
45 attempt to be both biologically and socially acceptable. As wolves recolonize Washington, the
46 population will be monitored to determine trends in abundance, demographic parameters, habitat
47 use, dietary relationships, outcomes of interactions with humans, and other factors pertaining to

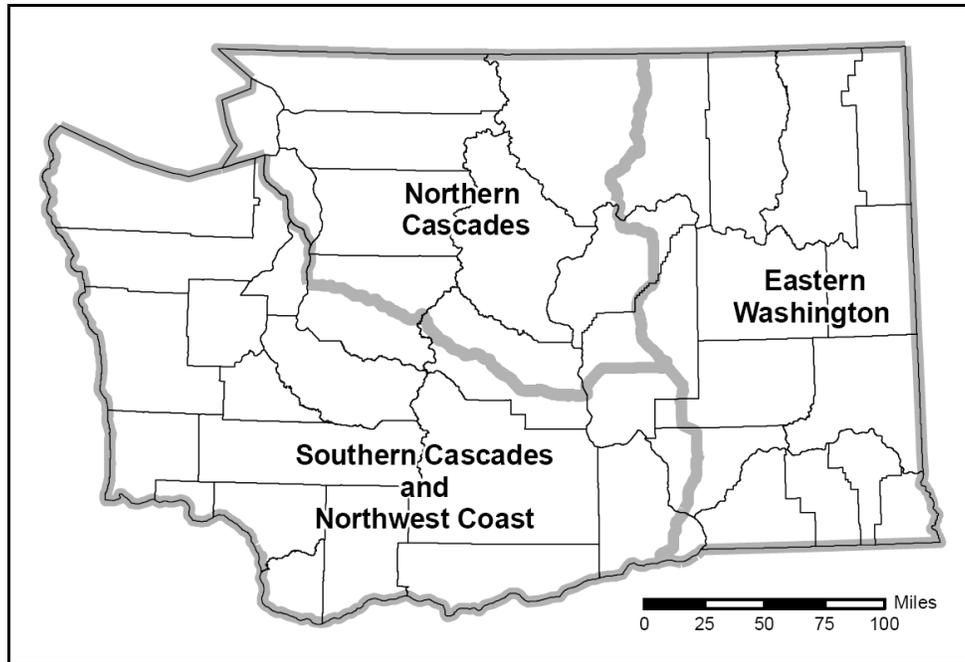
1 population viability. In addition, the status of successful natural migration between isolated
2 populations of wolves both within the state and between Washington and adjacent populations in
3 British Columbia, Idaho, and Oregon will be monitored. The status of wolf populations in areas
4 adjacent to Washington and the permeability of habitat in these areas will also be reviewed. This
5 information can then be used to revise the conservation/recovery objectives, if needed, through
6 methods such as population viability analysis.

7
8 Consistent with the recovery objectives for the Northern Rocky Mountain distinct population
9 segment, the conservation/recovery objectives in this plan are based on numbers of successful
10 breeding pairs rather than packs or individuals. “Successful breeding pair” is used as the unit of
11 measurement because it provides a higher level of certainty in assessing population status and
12 documenting reproduction. A successful breeding pair of wolves is defined as an adult male and an
13 adult female with at least two pups surviving to December 31 in a given year. (This term was
14 formerly known simply as “breeding pair,” but Mitchell et al. [2008] recommended use of
15 “successful breeding pair” as a more precise term to indicate that successful rearing of young had
16 occurred.) The U.S. Fish and Wildlife Service used successful breeding pair as their recovery
17 measure “because wolf populations are maintained by packs that successfully raise pups” (USFWS
18 1994, Mitchell et al. 2008). Success of breeding pairs is measured in winter because most wolf
19 mortality occurs from spring through fall, and winter is the beginning of the annual courtship and
20 breeding season (USFWS 2008a). In Washington, verification of successful breeding pairs will be
21 done by WDFW using established protocols.

22
23 Also consistent with the Northern Rocky Mountain objectives and state recovery plans for other
24 species in Washington, the objectives in this plan must be maintained for 3 consecutive years. This
25 is to ensure that numbers are being maintained over time.

26
27 The number and distribution objectives for wolves are expressed in terms of occupancy within three
28 defined recovery regions of the state. These regions are: the Eastern Washington Region, Northern
29 Cascades Region, and Southern Cascades and Northwest Coast Region (Figure 8). The western
30 boundary of the Eastern Washington Region follows Highways 97, 17, and 395 and matches the line
31 used by the U.S. Fish and Wildlife Service to demarcate the western edge of the Northern Rocky
32 Mountain distinct population segment for gray wolves in Washington (USFWS 2009).

33
34 Consistent with protocols used in the Northern Rocky Mountain states (Idaho, Montana,
35 Wyoming), and to avoid double-counting successful breeding pairs of wolves, packs with territories
36 straddling recovery region (or state) boundaries will be counted in the area where the den site is
37 located. If the den location is not known with certainty, then other criteria such as amount of time,
38 percent of territory, or number of wolf reports will be used to determine pack residency. Thus, a
39 pack will not be counted in more than one recovery region.



1
2 Figure 8. Three gray wolf recovery regions in Washington: Eastern Washington Region, Northern
3 Cascades Region, and Southern Cascades and Northwest Coast Region.
4
5
6

7 The following conservation/recovery objectives have been identified to transition from one
8 designation to the next:
9

10 **1. The gray wolf will be considered for downlisting from state endangered to threatened**
11 **when 6 successful breeding pairs are present for 3 consecutive years, with at least:**
12

- 13 • 2 successful breeding pairs in the Eastern Washington Region,
- 14 • 2 successful breeding pairs in the Northern Cascades Region, and
- 15 • 2 successful breeding pairs distributed in the Southern Cascades and Northwest Coast
16 Region.

17
18 **2. The gray wolf will be considered for downlisting from state threatened to sensitive when**
19 **12 successful breeding pairs are present for 3 consecutive years, with at least:**
20

- 21 • 2 successful breeding pairs in the Eastern Washington Region,
- 22 • 2 successful breeding pairs in the Northern Cascades Region,
- 23 • 5 successful breeding pairs distributed in the Southern Cascades and Northwest Coast
24 Region, and
- 25 • 3 successful breeding pairs that can be distributed in any of the three recovery regions.
26
27

1 **3. The gray wolf will be considered for delisting from state sensitive when 15 successful**
 2 **breeding pairs are present for 3 consecutive years, with at least:**

- 3
- 4 • 2 successful breeding pairs in the Eastern Washington Region,
 - 5 • 2 successful breeding pairs in the Northern Cascades Region,
 - 6 • 5 successful breeding pairs distributed in the Southern Cascades and Northwest Coast
 - 7 Region, and
 - 8 • 6 successful breeding pairs that can be distributed in any of the three recovery regions.
- 9

10 There is no requirement that wolves must go through each listed stage before downlisting or
 11 delisting if they meet the conservation/recovery objectives. If the wolf population increased rapidly
 12 in numbers and distribution, then it may be eligible for skipping a listing stage. For example, if 12 or
 13 more successful breeding pairs became reestablished in the state in the first year of the plan's
 14 implementation and met the distribution objectives for 3 consecutive years, then WDFW could skip
 15 efforts to downlist wolves to threatened status and move ahead with downlisting to sensitive status
 16 after the recovery objectives for that status were achieved. If 18 successful breeding pairs of wolves
 17 meeting the distribution criteria for delisting from sensitive are documented in any year during the 3-
 18 year period, then WDFW could begin the process to write a status review to prepare a delisting
 19 recommendation at that time, rather than wait for the 3-year period to conclude; however, wolves
 20 would not be proposed for delisting until they had achieved the delisting objectives for 3
 21 consecutive years.

22

23 The conservation/recovery objectives presented here for successful breeding pairs correspond with
 24 the following ranges in estimated numbers of wolves in the statewide population, as derived from
 25 data collected in Idaho, Montana, and Wyoming: 6 successful breeding pairs, 40 to 146 wolves; 12
 26 successful breeding pairs, 79 to 284 wolves; and 15 successful breeding pairs, 97 to 361 wolves
 27 (Table 3). The estimated equivalent number of packs also varies widely (Table 3), because the
 28

29

30 **Table 3. Estimated range in the number of successful breeding pairs, packs, and individual wolves**
 31 **projected to be in the Washington population as it transitions between different recovery stages**
 32 **associated with state listing.**
 33

	Endangered to threatened	Threatened to sensitive	Sensitive to delisted
No. of successful breeding pairs	6	12	15
Estimated equivalent no. of packs ^a	7-17	14-33	17-42
Estimated no. of wolves in all packs combined ^b	36-124	71-241	87-307
Estimated no. of lone wolves ^c	4-22	8-43	10-54
Total estimated no. of wolves present ^d	40-146	79-284	97-361

34 ^a Number ranges are based on the lowest and highest probabilities of a pack containing a successful breeding pair, as
 35 determined for five regions of Idaho, Montana, and Wyoming (excluding Yellowstone National Park) using data from 1979-
 36 2005 (Mitchell et al. 2008). Successful breeding pair numbers are typically smaller than pack numbers because not all
 37 packs breed or successfully rear pups, and because logistical difficulties may prevent the confirmation of breeding in some
 38 packs, especially as pack numbers become larger (USFWS et al. 2008).

39 ^b Number ranges are based on averages varying from a minimum of 5.1 ± 1.1 (SD) to a maximum of 7.3 ± 2.3 wolves per
 40 pack in five regions of Idaho, Montana, and Wyoming (excluding Yellowstone National Park) using data from 1979-2005
 41 (Mitchell et al. 2008).

42 ^c Number ranges are based on lone wolves comprising 10-15% of most populations (Fuller et al. 2003).

43 ^d Number ranges represent the sum of the estimated numbers of wolves in packs and lone wolves.
 44

1 number of successful breeding pairs can be substantially smaller than the total number of packs
2 present, especially as recovery progresses. Average pack size can vary greatly as well (Chapter 2,
3 Section C; Mitchell et al. 2008). Data from Idaho and Montana indicate that the number of
4 successful breeding pairs and packs are usually similar early in recovery (USFWS et al. 2009; C. Sime,
5 unpubl. data), when closer monitoring of each pack can be performed. Thus, expected numbers of
6 packs and wolves in Washington during the endangered and threatened stages are likely to be on the
7 smaller side of the range of estimates presented here.

8
9 This plan's conservation/recovery objectives for Washington are below those thought to be needed
10 for long-term persistence of an isolated population (30 or more successful breeding pairs containing
11 300 or more wolves in a metapopulation) (see Section A of this chapter; USFWS 2008a, WDNR
12 1999). However, Washington's objective of 15 successful breeding pairs distributed across three
13 recovery regions and maintained for 3 consecutive years is believed to be sufficient to result in the
14 reestablishment of a self-sustaining recovered wolf population for the state because of the
15 distribution and time requirements. The three-year criteria, distribution in three recovery regions,
16 and connectivity being maintained with populations in Idaho, Montana, British Columbia, and
17 Oregon, are factors that contribute to the 15 breeding pairs being considered a viable alternative,
18 even though minimal to achieve recovery.

19
20 Smaller downlisting and delisting objectives of 3, 6 and 8 successful breeding pairs for one year, with
21 no distribution requirements, were proposed in a Minority Opinion of the Wolf Working Group
22 (Appendix D). Based on the scientific information on wolf population viability presented in Section
23 A of this chapter, and initial peer reviews of the preferred alternative numbers, 15 breeding pairs is
24 considered minimal or barely adequate for population viability and achieving recovery. Additional
25 blind peer review during the public review process may provide additional information on the
26 adequacy of these numbers.

27
28 An objective of eight successful breeding pairs is that much further below what might be considered
29 adequate (see also Section A, Genetic Diversity of this Chapter). The proposal has the added risk of
30 requiring the number to be achieved for only one year. This would not allow for maintaining
31 robustness of population numbers on the landscape over time in light of fluctuations in numbers
32 between years. With the low numbers, lack of geographic distribution criteria, and single year for
33 the recovery objective to be met, the goal of this plan to "restore the wolf population in Washington
34 to a self-sustaining size and geographic distribution that will result in wolves having a high
35 probability of persisting in the state through the foreseeable future (>100 years)" is unlikely to be
36 met. For these reasons, it has a high risk of not achieving the conservation purpose of the plan and
37 was not considered to be a viable preferred alternative.

38
39 The conservation/recovery objectives presented here represent the numbers needed to achieve the
40 downlisting and delisting of wolves in Washington and do not carry implications for ultimate
41 numbers of wolves that will exist in the state. The delisting objective of 15 successful breeding pairs
42 (with adequate geographic distribution for 3 consecutive years) is not a population "cap" at which
43 the population will be limited. The plan does not place a limit on the numbers of wolves that will be
44 allowed to live in Washington.

45
46 When Washington's wolf population reaches the delisting objectives (15 breeding pairs for 3
47 consecutive years in appropriate distribution), WDFW will begin the process of proposing delisting

1 of the species. This process, described in WAC 232-12-297 (Appendix F), requires the preparation
2 of a status review that examines all pertinent information on abundance, the achievement of
3 recovery objectives, and ongoing threats. Review under the State Environmental Policy Act (SEPA)
4 and public review are also required as part of the delisting process. Delisting is based only on the
5 biological status of the species in Washington. Information from the status review is then presented
6 to the Washington Fish and Wildlife Commission to make the final determination on delisting.

7 8 Translocation

9
10 Wolves will be allowed to expand into unoccupied suitable habitat across ownerships and
11 administrative designations in the state, and natural dispersal is expected to be the primary means for
12 wolves to disperse across Washington and recolonize new areas of the state. It is recognized,
13 however, that there may be bottlenecks inhibiting natural dispersal and establishment of wolf packs,
14 particularly for wolves attempting to disperse across the existing mix of private and public lands
15 between northeastern Washington and the northern Cascades and from the southern Cascades to
16 the Pacific Coast due to distance, human-caused mortality, or other potential bottlenecks to natural
17 dispersal. Singleton et al. (2002) evaluated landscape permeability for wolves in Washington and
18 suggested that even the two areas likely representing the greatest impediments to wolf dispersal (i.e.,
19 the upper Columbia-Pend Oreille Rivers and Snoqualmie Pass) were nevertheless probably
20 permeable for wolves.

21
22 The overall timeframe for wolves to disperse into Washington and reach recovery objectives for
23 downlisting and delisting is difficult to predict, but it is likely to be slow (Carroll 2007) and could
24 take several decades. The first area colonized by breeding wolves in Washington was in the
25 northern Cascades and the next was northeastern Washington. Based on the current proximity of
26 wolf packs in neighboring states and British Columbia, the northeastern and southeastern corners of
27 Washington and the northern Cascades and Pasayten Wilderness will be the likely areas occupied by
28 wolves through natural dispersal. The southern Cascades and western Washington will take longer
29 to recolonize through natural dispersal.

30
31 Translocation (moving animals from one area of Washington to another to establish a new
32 population) is a conservation tool that is considered a key aspect of this plan (Appendix E). It is
33 included as a tool that could be used to establish and expand populations in recovery regions that
34 wolves have failed to reach through natural dispersal. Potential benefits of translocation are that it
35 could:

- 36
37 • Address impediments to natural dispersal such as extensive areas of private lands and
38 unsuitable habitat, or excessive mortality from illegal killing, lethal control, vehicle collisions,
39 or other human-related causes.
- 40 • Reduce wolf numbers in some regions where they may increase to carrying capacity prior to
41 downlisting and delisting objectives being met in other recovery regions,
- 42 • Hasten establishment of breeding pairs in areas that are potentially capable of supporting a
43 source population, thereby helping to ensure and maintain viable populations in a significant
44 portion of the state's historical range, as required to meet state recovery objectives.
- 45 • Help lower the overall costs of recovery by achieving population target levels more quickly,
46 thereby allowing downlisting and delisting to begin earlier. Costs would be reduced by

1 replacing the more expensive monitoring of breeding pairs that is needed while wolves are
2 listed with the less expensive monitoring of packs following delisting.

- 3 • Facilitate achieving recovery goals more quickly, thereby leading to greater management
4 flexibility in addressing conflicts.
5

6 The trigger for beginning to evaluate translocation efforts would be prompted when a recovery
7 region had exceeded its delisting requirements by at least one breeding pair (e.g. ≥ 3 breeding pairs
8 for 3 years in the Eastern Washington recovery region), while another recovery region was
9 unoccupied. Wolves would only be translocated out of a recovery region if that region exceeded
10 delisting objectives and removal would not cause the region's population to fall below delisting
11 objectives.
12

13 If translocation were to be considered to achieve delisting objectives in a recovery region that wolves
14 have failed to reoccupy, a planning process to determine feasibility and develop an implementation
15 plan would be initiated. These steps are described in Chapter 12, Task 3. The first step would be to
16 prepare a feasibility assessment to determine if sufficient suitable habitat and prey are available to
17 support wolves at potential translocation sites in regions without successful breeding pairs, and to
18 ensure that removal of wolves from a recovery region would not cause it to fall below delisting
19 objectives or jeopardize existing successful breeding pairs. If these conditions are met, an
20 implementation plan would be prepared, which would provide detailed information on translocation
21 methods and the selection of a release site(s).
22

23 A public review process would then be conducted to evaluate the translocation proposal. If the
24 proposed translocation site were on federal land, the review process would be conducted under the
25 National Environmental Policy Act (NEPA); if it were proposed on non-federal land, the State
26 Environmental Policy Act (SEPA) process would be used. State wildlife biologists would
27 coordinate with other land management agencies to determine a suitable location to release wolves.
28 Coordination with federal and other state agencies, tribal governments, landowners, and non-
29 governmental organizations would also take place throughout the process. It is recognized that if
30 wolves are still federally listed in portions of Washington when translocation is proposed,
31 collaborative discussions with the U.S. Fish and Wildlife Service will be needed for approval to
32 implement translocations (E. E. Bangs, pers. comm.).
33

34 If the translocation proposal is approved following the NEPA/SEPA process, the translocation
35 would then occur followed by post-release monitoring to evaluate success of the project. Two areas
36 that were identified where natural dispersal and recolonization may be slow or difficult were: (1) the
37 southern Cascade Mountain range, which the Wolf Working Group discussions recommended for
38 consideration as a recipient region (Appendix E); and (2) the Olympic Peninsula and Willapa Hills,
39 which scientific peer reviewers also recommended.
40

41 If a successful translocation proposal were not approved through the NEPA/SEPA process the
42 Wolf Working Group would be brought back together to work with WDFW to determine if there
43 were other strategies that could be developed to accomplish the recovery objectives.
44
45
46
47

Other Conservation and Management Tools

A variety of conservation strategies and management tools will be considered to meet conservation/recovery objectives while wolves remain state listed in Washington. These include translocation (discussed above) and other conservation measures that are discussed in later chapters including proactive measures to assist livestock producers in reducing wolf-livestock conflicts, compensation programs for wolf-related livestock losses and deterrence methods, and various harassment options and forms of limited lethal control (all discussed in Chapter 4); prevention of illegal killing, management of prey populations and their habitat, preservation and enhancement of habitat connectivity for wolves, management of human safety concerns and wolf-pet conflicts, and implementation of a comprehensive outreach and education program, and research (all in Chapter 12).

C. Management after Delisting

Reclassification upon delisting

After the conservation/recovery objectives for delisting are met, wolves could be reclassified to game animal or protected status. Reclassification to a game species would require the approval of the Washington Fish and Wildlife Commission through a public process. If reclassified to a game species, statewide management goals would be established to preserve, protect, perpetuate, and manage wolves and their habitats to ensure a healthy, productive population with long-term stability (D. Ware, pers. comm.). This is the population level that is viable and sustainable while also allowing hunting, and is not a population “cap” intended to keep numbers beneath a specific level.

Hunting

There may be proposals to hunt wolves following delisting. It is likely that conservative approaches would be used initially if hunting of wolves in Washington were proposed while population numbers were relatively low. These approaches may include no hunting or hunting on a limited permit-only basis, as is done for moose, bighorn sheep, and mountain goats in Washington, and was implemented for wolves in Idaho and Montana in Fall 2009. Minnesota adopted a phased approach management strategy, whereby wolves would not be hunted for five years post-delisting (MDNR 2001). This gives an opportunity to ensure that adequate population numbers are being maintained following delisting and prior to proposals for hunting.

With regard to hunting, Mitchell et al. (2008) recommended that consideration should be given to protecting wolves in some core habitat areas (e.g., in large blocks of public lands) to maintain pack size and structure, thereby potentially retaining successful breeding pairs and reproductive output. Hunting may also target areas of conflict to reduce the need for agency management and compensation, as is done for other species in Washington such as elk and geese.

Relisting

After delisting occurs, it is in the best interest of wolves and the citizens of Washington that the state takes whatever management steps are necessary to safeguard the species from a population decline that would necessitate relisting. Upon delisting, the wolf population will be expected to

1 increase across the landscape where suitable habitat and prey exist. However, it will continue to be
2 affected by natural and human-caused mortality factors.

3
4 WDFW will continue to monitor population status and trends after delisting. If the population were
5 to start declining, WDFW would assess the population's size, distribution, health, reproductive
6 status, and potential causal factors. It would also review factors such as the status of wolf
7 populations in adjacent states, successful natural migration, and continuing habitat permeability that
8 could influence immigration into Washington because maintaining this connectivity was a key
9 element of the adequacy of the original recovery objectives. The assessment would take into
10 account natural fluctuations in wildlife populations, and would also consider the severity and the
11 basis for the decline. If there are mortality factors causing the decline that can be controlled, such as
12 poaching, lethal control actions, or legal hunting, actions will be taken to reduce these sources of
13 mortality. This may include reducing lethal control and/or hunting and initiating methods to halt
14 illegal take, such as increased law enforcement efforts, imposition of higher penalties, and public
15 education. A decline due to changing habitat conditions, low prey numbers, or disease could
16 constitute underlying warning signs of a more serious situation that could warrant relisting.

17
18 In the event of a decline approaching the minimum population objectives for delisting (numbers of
19 successful breeding pairs for 3 consecutive years and distribution in the recovery regions), WDFW
20 may immediately initiate a status review to determine whether relisting is appropriate. WDFW's
21 listing procedures (WAC 232-12-297) also provide for emergency listing.
22

4. WOLF-LIVESTOCK CONFLICTS

1
2
3
4
5 Addressing gray wolf-livestock conflicts is an essential part of this plan. Based on experiences in
6 other western states with wolf populations, the return of wolves to Washington is expected to result
7 in conflicts with livestock. The ranching and farming industry is a vital component of the
8 Washington economy and provides important open space and habitats that support a wide variety of
9 wildlife, including deer and elk. In some areas of the state, concerns have been raised regarding the
10 effect that wolves will have on the livestock industry and in August 2007, a number of comments
11 received at the initial public scoping meetings involved concerns about conflicts with livestock.
12

13 The reestablishment of wolves in Washington will affect some livestock producers through wolf-
14 related depredation and/or changes in husbandry and management methods needed for adapting to
15 the presence of wolves. Projections of wolf-caused losses of livestock and related economic impacts
16 in the state are described more fully in Chapter 14, Section B. During the endangered and
17 threatened phases of recovery, wolves should pose little detriment to the state's livestock industry as
18 a whole. At the population levels associated with the early stages of recovery, the vast majority of
19 producers will probably experience few if any annual costs, whereas a few individual producers
20 could be more affected. Some of these costs would be offset by compensation from programs such
21 as the Bailey Wildlife Foundation Wolf Compensation Trust or state programs. As wolf populations
22 become larger and more widely distributed, financial impacts are likely to accrue to more producers.
23 Where and when depredations occur will depend on different factors, including the abundance and
24 distribution of wolves and the husbandry methods and locations of livestock in areas occupied by
25 wolves.
26

27 Conserving wolves in Washington and meeting the delisting criteria outlined in this plan will
28 necessitate tolerance for wolves on both public and private lands. This chapter of the plan outlines
29 a range of options to reduce or prevent conflicts between wolves and livestock and to address
30 losses.
31

A. Wolf Depredation on Livestock and Domestic Dogs

32
33
34 The recovery of wolves in other states has resulted in depredations on cattle, sheep, other livestock,
35 and domestic dogs. However, despite significant increases in wolf populations, confirmed losses to
36 wolves have remained infrequent to date relative to livestock numbers (Bangs et al. 2005b, USFWS
37 2008a). Bangs et al. (2006) noted that while wolf depredations on livestock were unimportant to the
38 regional livestock industry, they could affect the economic viability of some ranchers. Many factors
39 influence depredation rates on livestock, including the proximity of livestock to wolf home ranges,
40 dens, and rendezvous sites; pack size; abundance of natural prey and livestock; amount and type of
41 vegetative cover; time of year; livestock husbandry methods in both the area of concern and adjacent
42 areas; the use of harassment tools and lethal take; pasture size; and proximity to roads, dwellings,
43 and other human presence (Mech et al. 2000, Fritts et al. 2003, Treves et al. 2004, Bradley and
44 Pletscher 2005). These factors also make it difficult to predict where and when depredations by
45 wolves will occur.
46

1 USFWS et al. (2009) reported that on average 10-25% of all wolf packs in Montana were confirmed
2 to have killed livestock in any given year from 1999 to 2008. In comparison, 33-85% of the packs in
3 Wyoming outside of Yellowstone National Park were involved in depredations annually from 2005
4 to 2008 (USFWS et al. 2009). Wolves don't necessarily attack livestock whenever livestock are
5 encountered, but most wolf packs that regularly encounter livestock are likely to depredate at some
6 point (Bangs and Shivik 2001). Some packs show increasingly frequent depredation behavior, while
7 others may do so once or twice a year, every other year, or even less frequently (USFWS et al. 2009).

8
9 In the northern United States, wolf depredation on livestock occurs more frequently from March to
10 October when livestock spend more time under open-grazing conditions, calving is taking place, and
11 wolf litters are being raised (Fritts et al. 2003, Musiani et al. 2005, Sime et al. 2007). Untended
12 livestock, particularly young calves, appear to be more vulnerable, and the presence of livestock
13 carcasses on a property may increase risk as well (Fritts et al. 2003). Depredations occur on both
14 open grazing sites and inside fenced pastures. Sime et al. (2007) reported that among the 162
15 livestock producers suffering confirmed wolf depredation in Montana between 1987 and 2006, 62%
16 experienced a single incident, 20% experienced two incidents, and 17% experienced three or more
17 incidents.

18
19 In the northern Rocky Mountain states, calves are more commonly killed than other age groups of
20 cattle because of their greater vulnerability (Fritts et al. 2003; Bangs et al. 2005a; Unsworth et al.
21 2005; Sime et al. 2007; Stone et al. 2008; J. Timberlake, pers. comm.). Oakleaf et al. (2003) found
22 that wolves tend to choose the smallest calves and there is evidence that some depredated calves are
23 in poorer physical condition (Bradley and Pletscher 2005). In parts of Canada, wolves sometimes
24 kill yearling cattle more often than calves (Stone et al. 2008). In contrast, adult sheep appear to be
25 taken more frequently than lambs (Fritts et al. 2003). Depredations on sheep commonly involve
26 multiple individuals, whereas those on cattle usually involve single animals.

27
28 Among Idaho, Montana, and Wyoming, significant variation exists in the number of cattle and sheep
29 killed by wolves, and sometimes variation exists between years (Table 4). While the number of
30 livestock killed by wolves in these states has generally increased over time as wolf numbers have
31 grown, these are small compared to losses caused by coyotes, cougars, bobcats, dogs, bears, foxes,
32 eagles, and other predators. Coyotes and other predators were responsible for almost all of the
33 losses in which the predator was identified (98.8% of the cattle losses and 99.4% of the sheep losses)
34 during 2004 and 2005; wolves were responsible for 1.8% and 0.6% of the losses (Table 5). Most of
35 these predators, such as coyotes, cougars, bobcats, black bears, and foxes, can be legally hunted or
36 are subject to lethal control if depredating. Wolf depredations are also far smaller than combined
37 non-predator losses (e.g., sickness, disease, weather, and birthing problems) in Idaho, Montana, and
38 Wyoming, being less than 0.1% of these losses for cattle and 0.6% for sheep (NASS 2005, 2006).
39 Wolves have caused minor losses of other livestock species and dogs in these states (Table 4).

40
41 It is important to note that the figures presented in Table 4 represent minimum estimates of the
42 livestock actually killed by wolves. Probable losses, in which officials are unable to verify the cause
43 of death, are not included. Additionally, ranchers sometimes fail to locate carcasses or are unable to
44 notify authorities soon enough to obtain confirmation because of the rugged and vast terrain where
45 livestock graze, the extent of carcass consumption by predators and scavengers, or carcass
46 decomposition. In some instances, ranchers may choose not to report their losses. Determination
47 of the ratio of estimated total losses to confirmed kills continues to be debated (Kroeger et al. 2005)

1 and some wolf experts believe it is premature to set such ratios (C. Sime, pers. comm.). Loss ratios
2 probably vary considerably according to the characteristics of each grazing site, extent of rancher
3 supervision, and type, age and number of livestock. For example, Oakleaf et al. (2003) reported a
4 loss ratio of 8:1 for cattle in their study, which was conducted on a large allotment with densely
5 forested and mountainous terrain, no use of range riders, and poor rancher access. However,
6 Oakleaf et al. (2003) suggested that a ratio of about 2:1 was more realistic under less timbered or less
7 rugged conditions. Loss ratios closer to 1:1 probably occur for many smaller operations using
8 private lands, where livestock are more closely supervised. On sheep operations with shepherds,
9 most depredations are likely to be found because of the group herding behavior of sheep (C. Mack,
10 pers. comm.).

11
12 There is evidence that wolves may reduce other predators (see Chapter 6) that also prey on livestock,
13 such as coyotes and cougars. This could lead to fewer total depredations by predators and therefore
14 could potentially benefit some ranchers.

15 16 **B. Management Tools for Reducing Wolf Depredation**

17
18 Managing wolf-livestock conflicts and wolf recovery requires an integrated approach using a variety
19 of non-lethal and lethal methods, as described below. One of the important factors in reducing
20 wolf-livestock conflicts in the northern Rocky Mountains was maintaining a high level of radio-
21 collared wolves in the population while the species was listed, which allows agencies to monitor
22 problem situations (Bangs et al. 2006).

23 24 Proactive Measures

25
26 A variety of proactive management measures exist to help livestock producers reduce conflicts
27 between wolves and livestock, and offer a partial alternative to lethal control of wolves (Musiani et
28 al. 2003, Bangs et al. 2005a, 2006, Shivik 2006, Stone et al. 2008). Implementation of such measures
29 may be costly to producers, but there have been efforts in the northern Rocky Mountains to assist
30 ranchers with proactive measures and to offset some costs. These measures can be especially
31 important when wolf numbers and distribution are small and recovery objectives have not yet been
32 achieved.

33
34 Proactive deterrents, especially when used in combination, often temporarily succeed in reducing the
35 vulnerability of livestock to wolf depredation, but are usually not considered permanent solutions by
36 themselves. However, when combined with a fair and effective compensation program, they offer
37 the best solution for both limiting livestock losses and compensating producers for any unavoidable
38 losses. Some producers in Washington already use proactive deterrents to protect their livestock
39 from predators. Among producers using such measures in 2004-2005, the most frequently
40 employed tools were exclusion fencing, guarding animals, frequent checking of stock, night penning,
41 and use of lamb sheds (Table 6). Because the large majority of the state's cattle and sheep
42 operations are categorized as extra small or small in the numbers of animals owned (Chapter 14,
43 Section B), implementation of proactive deterrents to protect against wolves may be particularly
44 effective in Washington.

1
2 Table 4. Confirmed livestock and dog losses from wolf predation in Idaho, Montana, and Wyoming, 1987-2008 (USFWS et al. 2009)^{a,b}.

	87-90	91-94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	Total
<u>Idaho</u>																	
Cattle			0	1	1	9	11	15	10	9	6	19	20	29	53	96	279
Sheep			0	24	29	5	64	48	54	15	118	161	184	205	170	218	1,295
Other ^c			0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Dogs			0	1	4	1	7	0	2	4	5	3	9	4	8	12	60
Total wolves ^d			14	42	71	114	156	187	251	263	345	422	512	673	732	846	-
Wolves killed ^e			0	1	1	0	3	11	7	14	7	17	27	45	50	108	291
<u>Montana</u>																	
Cattle	14	9	3	10	19	10	20	14	12	20	24	36	23	32	75	77	398
Sheep	10	2	0	13	41	0	25	7	50	84	86	91	33	4	27	111	584
Other ^c	0	0	0	0	0	0	0	0	4	5	0	3	2	2	14	17	47
Dogs	1	0	4	1	0	1	2	5	2	5	1	4	1	4	3	2	36
Total wolves ^d	10-33	29-55	66	70	56	49	74	97	123	183	182	152	256	316	422	497	-
Wolves killed ^e	6	0	0	5	18	4	19	7	8	26	34	40	35	53	73	110	438
<u>Wyoming</u>																	
Cattle			0	0	2	2	2	3	18	23	34	75	54	123	55	41	432
Sheep			0	0	56	7	0	25	34	0	7	18	27	38	16	26	254
Other ^c			0	0	0	0	1	0	0	0	10	2	0	1	0	0	14
Dogs			0	0	0	3	6	6	2	0	0	2	1	0	2	0	22
Total wolves ^d			21	40	86	112	107	153	189	217	234	272	252	311	359	302	-
Wolves killed ^e			0	0	2	3	1	2	4	6	18	29	41	44	63	46	259
<u>Totals</u>																	
Cattle	14	9	3	11	22	21	33	32	40	52	64	130	97	184	183	214	1,109
Sheep	10	2	0	37	126	12	89	80	138	99	211	270	244	247	213	355	2,133
Other ^c	0	0	0	0	0	0	1	0	4	5	10	5	2	3	14	18	62
Dogs	1	0	4	2	4	5	15	11	6	9	6	9	11	8	13	14	118
Total wolves ^d	10-33	29-55	101	152	213	275	337	437	563	663	761	846	1,020	1,300	1,513	1,645	-
Wolves killed ^e	6	0	0	6	21	7	23	20	19	46	59	86	103	142	179	264	988

3 ^a Confirmed losses are defined as those losses verified through physical evidence to have been caused by wolves, as determined by USDA Wildlife Services or the U.S. Fish and
4 Wildlife Service.
5 ^b For a variety of reasons (see text), the figures presented here represent minimum estimates of the livestock actually killed by wolves.
6 ^c Includes livestock other than cattle and sheep. Losses from 1987-2008 totaled 28 goats, 21 llamas, and 10 horses.
7 ^d Minimum number of wolves living in the state(s) during autumn.
8 ^e Includes wolves killed by government control actions and those legally killed by ranchers.

1 Table 5. Numbers and percent of death losses of cattle in 2005 and sheep in 2004 by different predators
 2 in Idaho, Montana, and Wyoming (adapted from NASS 2005, 2006)^a.

Species	Cattle		Sheep	
	No. of losses	%	No. of losses	%
Coyotes	4,100	44.1	27,400	70.8
Other species ^b	2,750	29.6	1,950	5.0
Unknown predators	1,100	11.8	-	-
Cougars and bobcats	900	9.7	1,900	4.9
Dogs	300	3.3	2,300	5.9
Wolves	150	1.6	250	0.6
Bears	-	-	2,700	7.0
Foxes	-	-	1,100	2.8
Eagles	-	-	1,100	2.8
Total	9,300	100.1	38,700	99.8

4 ^a Specific data on wolf depredations were not listed in NASS (2005, 2006), but were generated using the mean
 5 annual confirmed losses in each of the three states combined during 2004-2007 (Table 3). These numbers
 6 were then separated out from the losses reported in the "other species" category.

7 ^b Species in this category were not identified for cattle (NASS 2006), but presumably include bears. For sheep,
 8 they include ravens, vultures, and other animals (NASS 2005).

10 Table 6. Percent use of different proactive methods among ranchers and farmers employing such
 11 techniques to prevent predation losses of livestock in Washington (NASS 2005, 2006).

Method	Cattle and calves (% of use) ^a	Sheep and lambs (% of use) ^a
Exclusion fencing	48.1	68.5
Guard animals	43.8	25.0
Frequent checks	43.1	2.5
Culling	14.1	4.0
Livestock carcass removal	13.6	1.0
Fright tactics	4.2	2.0
Night penning	0.2	36.6
Lamb shed	-	35.4
Llamas	-	16.4
Donkeys	-	6.7
Herding	-	2.4
Change bedding	-	0.1
Other methods	13.7	2.0

14 ^a Data for cattle and calves are from 2005, data for sheep and lambs are from 2004.

19 *Modified Husbandry Techniques*

20
 21 Bangs et al. (2006) and Stone et al. (2008) described a number of husbandry methods that are often
 22 useful in avoiding some wolf depredation of livestock. These include: the use of range riders to help
 23 keep cattle more concentrated on grazing sites; having herders with dogs present with sheep at night
 24 when most sheep depredation occurs; burying livestock carcasses rather than dumping them in
 25 traditional bone yards to reduce scavenging opportunities by wolves; moving sick or injured

1 livestock, which may be more vulnerable to wolves; delaying the turnout of cattle onto grazing sites
2 until calving is finished or until young wild ungulates are born to reduce opportunities for
3 depredation; allowing calves to reach at least 200 pounds before turning them out to grazing sites
4 can also lower their vulnerability (Oakleaf et al. 2003); and avoiding grazing livestock near wolf
5 territory core areas, especially dens and rendezvous sites, during the earlier portion of the grazing
6 season. Implementation of these methods may result in higher costs to livestock producers.

7
8 One type of proactive program that has been developed and tested in Montana is the Range Riders
9 Project. This program is a collaborative effort between ranchers, government agencies, and
10 conservationists (including the Montana Fish, Wildlife & Parks, Madison Valley Ranchlands Group,
11 Boulder Watershed Association, Turner Endangered Species Fund, USDA Forest Service, Predator
12 Conservation Alliance, the Sun Ranch, USDA Wildlife Services, USDA Natural Resources and
13 Conservation Service, Sweet Grass County Conservation District, and Montana State University
14 Extension Service). The main goal of the project is to reduce predator-livestock interactions.
15 Secondary goals are to (1) detect injured or dead livestock more rapidly, (2) preserve the evidence at
16 potential depredation sites so that investigators can better determine whether or not predation was
17 involved and which species was responsible, (3) improve livestock management and range
18 conditions, (4) increase knowledge about predator-livestock interactions in space and time, and (5)
19 build relationships among project partners. All project collaborators provide funding and in-kind
20 contributions. In particular, significant funding has come through the USDA Natural Resources and
21 Conservation Service's Environmental Quality Incentives Program.

22
23 In the Range Riders Project, cowhands are trained in methods to keep wolves and livestock apart.
24 Riders stay with livestock throughout the grazing season (generally June–October) and chase away
25 any wolves that come near the cattle. Projects were implemented beginning in 2004 on both public
26 grazing allotments and private lands in two valleys in Montana. Protocols varied from place to
27 place, but the underlying premise was continual human presence and immediate response to wolves
28 interacting with livestock. The use of horses and vehicles (where applicable) allowed riders to cover
29 as much ground as possible while checking on livestock. In 2006, areas with riders experienced no
30 confirmed or probable depredations, although wolves were present and were seen and/or chased
31 off. Due to high variability among sites, there is no clear evidence that these efforts have actually
32 prevented depredations. However, when surveyed, many participating producers believed the
33 project was helpful and indicated an interest to continue their participation. Additional range rider
34 projects implemented in Montana are briefly described in USFWS et al. (2009).

35 *Non-Lethal Deterrents*

36
37
38 A number of non-lethal deterrents have been developed for discouraging wolf predation on livestock,
39 including those developed in the Northern Rocky Mountains (Bangs et al. 2005a, 2006, Shivik 2006,
40 and Stone et al. 2008). These deterrents are available to livestock producers and are generally most
41 effective in small areas. The following non-lethal deterrents have been used:

- 42
43 • Guarding animals (primarily dogs) that are kept with livestock and alert herders when wolves
44 and other predators are nearby.
- 45 • Light and noise scare devices that are used to frighten wolves away from confined livestock
46 and alert ranchers and herders to the presence of wolves. These include propane cannons,

1 light systems, and radio-activated guard (RAG) systems that emit flashing lights and loud
2 sounds at the approach of a radio-collared wolf.

- 3 • Hazing with non-lethal munitions (e.g., cracker shells, rubber bullets, paintballs, and bean
4 bags) to frighten wolves seen near livestock.
- 5 • Predator-resistant or electric fencing that is used as a permanent or temporary barrier to
6 confine livestock and keep wolves away. Portable fencing can be effective as night pens
7 under open grazing conditions.
- 8 • Fladry, which consists of numerous strips of flagging hung along a fence or rope to keep
9 wolves out of an area occupied by livestock. Turbofladry is similar, but with the flagging
10 attached to an electric fence.

11 12 *Move Individual Wolves to Resolve Conflicts*

13
14 Relocation was used extensively by the USFWS as a non-lethal solution to mitigate livestock damage
15 in the early phases of wolf recovery in the northern Rocky Mountain states, but gradually became
16 less practical as the number of potential release sites declined with expansion of the region's wolf
17 population (Bangs et al. 1998, Bradley et al. 2005). Bradley et al.'s (2005) evaluation of the technique
18 revealed some important drawbacks with its use. These included (1) a lower average annual rate of
19 survival among relocated wolves (60%) than non-relocated wolves (73%), (2) the failure of most
20 (67%) relocated wolves to ever join or form a pack, (3) a strong tendency among relocated wolves to
21 depart their release site, including 20% that returned distances of 46-197 miles to their original
22 capture location, and (4) 18% of relocated wolves that resumed depredation of livestock near their
23 release site. Selection of release sites strongly affected survival of relocated individuals, with survival
24 being greatest in the high quality habitat of central Idaho and lowest in the more human-influenced
25 landscapes of northwestern Montana. Soft releases showed some promise in reducing homing
26 behavior among relocated wolves. Bradley et al. (2005) concluded that moving wolves was most
27 effective during the early stages of population recovery, and that other non-lethal techniques are
28 probably better for preventing or resolving conflicts when larger wolf populations exist.

29 30 Lethal Removal

31
32 Lethal control of wolves may be necessary to resolve repeated wolf-livestock conflicts and would be
33 performed to remove problem animals that jeopardize public tolerance for overall wolf recovery.
34 Nearly 1,000 wolves were killed in control actions in Idaho, Montana, and Wyoming from 1987 to
35 2008, with 7-16% of the population removed annually since 2002 (Table 4). While federally listed,
36 most lethal control of wolves in these states was performed by wildlife agency staff. As wolves
37 became more common, the U.S. Fish and Wildlife Service gradually loosened restrictions on this
38 activity to allow increased take by agency staff and private citizens with a federal permit (Bangs et al.
39 2006). After federal delisting, state management of wolves may allow the public in Idaho and
40 Montana to lethally control wolves "in the act" of attacking livestock. In Washington, if wolves are
41 federally listed in any part of the state, WDFW would consult with and coordinate with the U.S. Fish
42 and Wildlife Service prior to any lethal removal proposal to ensure consistency with federal law.

43
44 In Idaho, Montana, and Wyoming, agency decisions to lethally remove wolves have been made on a
45 case-by-case basis, taking into account specific factors such as a pack's size and conflict history,
46 status and distribution of natural prey in the area, season, age and class of livestock, success or
47 failure of non-lethal tools, and potential for future losses (Sime et al. 2007). Where lethal removal is

1 deemed necessary, incremental control is usually attempted, with one or two offending animals
2 removed initially. If depredations continue, additional animals may be killed. Stepwise incremental
3 control can result in the eventual elimination of entire packs if wolves repeatedly depredate livestock
4 (Sime et al. 2007).

5
6 Lethal control of wolves by agency staff can have the advantages of being swift, effective, and tightly
7 regulated. The benefits of allowing lethal removal by livestock producers are that offending wolves
8 are more likely to be targeted, it can eliminate the need for agency control, shooting at wolves may
9 teach them and other pack members to be more wary of humans and to avoid areas of high human
10 activity, it allows producers to address their own problems, and it may reduce animosity toward
11 government agencies and personnel (Bangs et al. 2006). Drawbacks of lethal control are that it is
12 always controversial among a sizeable segment of the public, depredation may recur, wolves may
13 respond by becoming more active at night to avoid people, it can be costly when performed by
14 agencies, and it is open to abuse when conducted by the public, thereby requiring law enforcement
15 follow-up (Musiani et al. 2005, Bangs et al. 2006).

16
17 Although lethal control is a necessary tool for reducing wolf depredation on livestock, excessive
18 levels of lethal removal can preclude the recovery of wolf populations, as noted with the Mexican
19 gray wolf in New Mexico and Arizona (USFWS 2005). Wolf managers must therefore monitor and,
20 if necessary, adjust the extent of lethal removals in Washington to meet both conservation and
21 management objectives. Constraints on lethal control have recently been recommended by Brainerd
22 et al. (2008) to minimize negative impacts on recolonizing wolf populations. They suggested that
23 lethal control be limited to solitary individuals or territorial pairs whenever possible, and that
24 removals from reproductive packs should occur when pups are more than six months old, the packs
25 contain six or more members (including three or more adults or yearlings), neighboring packs exist
26 nearby, and the population totals 75 or more wolves. Consideration should also be given to
27 minimizing lethal control around or between any core recovery areas that are eventually identified,
28 especially during denning and pup rearing periods (April to September) (E. Bangs, pers. comm.).

29 30 **C. Compensation Programs for Wolf-Related Losses and Deterrence in Other States**

31
32 Some livestock producers will experience financial losses due to wolves, particularly through
33 depredations on livestock. Other financial hardships may result from livestock becoming stressed or
34 injured, trampling of newborn young, or by changes in husbandry or management methods to
35 reduce risk of depredation. Some of these losses can be documented reliably but others cannot.

36
37 Several compensation programs currently exist or are under consideration in the western United
38 States to help producers recover some of the costs associated with wolf predation. The Bailey
39 Wildlife Foundation Wolf Compensation Trust, which is operated by the Defenders of Wildlife, has
40 compensated ranchers for wolf losses since 1987 (DOW 2008). Confirmed losses of livestock and
41 herding/guarding dogs are reimbursed at 100% of their current or projected market value up to
42 \$3,000 per animal, whereas probable losses are reimbursed at 50% of their current or projected
43 market value up to \$1,500 per animal. Appropriate documentation, such as a contract, previous sale
44 record, or current market reports, is required. Most claims are processed in less than six weeks. To
45 expedite processing and help clarify the eligibility guidelines for compensation, a standard
46 investigation report form is available. To remain eligible for compensation, livestock owners must
47 demonstrate reasonable use of non-lethal control measures and animal husbandry methods that do

1 not unnecessarily attract wolves. A total of \$1,221,000 was paid to producers in Idaho, Montana,
2 and Wyoming from 1987 through August 2009.

3
4 This program is available to livestock producers in areas where wolves are federally listed, including
5 Washington, but the program will be terminated in areas where wolves are federally delisted.
6 Defenders of Wildlife also operates the Bailey Wildlife Foundation Proactive Carnivore
7 Conservation Fund, which encourages greater use of preventative non-lethal deterrents and
8 appropriate management methods through cost-sharing grants to ranchers. This program is
9 expected to expand after federal delisting occurs in the northern Rocky Mountain states (J.
10 Timberlake, pers. comm.).

11
12 The Idaho Wolf Depredation Compensation Fund, which is operated by the state of Idaho,
13 reimburses producers for livestock losses in wolf-occupied areas of the state that are not covered by
14 Defenders of Wildlife (OSC 2008). This includes above-normal mortality as well as lower-than-
15 expected weight gains by livestock. This program also provides partial reimbursement for the
16 proactive efforts that some ranchers make to avoid wolf depredations on their livestock. Funding
17 limitations currently prevent the program from reimbursing all applicants seeking compensation.

18
19 Montana's Livestock Loss Reduction and Mitigation Board was created by the 2007 Montana
20 Legislature and appointed by the governor in the fall of 2007 (USFWS et al. 2009). The board
21 oversees the state's compensation program, which replaced the Defenders of Wildlife program,
22 irrespective of whether wolves were delisted and consistent with the Montana wolf plan. The
23 Montana Legislature appropriated \$30,000 and Defenders of Wildlife donated \$50,000 to Montana
24 for a total of \$80,000 for each of the first two years. The board makes payments for direct livestock
25 losses its first priority, but hopes to expand into other program elements called for in legislation as
26 funding becomes available.

27
28 In 2008, the Wyoming Legislature established a state compensation program for wolf-caused
29 livestock losses (USFWS et al. 2009). Under this program, damage claims are paid only in the
30 "trophy game" area of northwestern Wyoming. The program uses a multiplier for each confirmed
31 depredation on calves and sheep to account for undocumented wolf-caused losses. Calves and
32 sheep are compensated up to seven times the number confirmed but only up to the total number
33 reported missing by a producer.

34
35 Beginning in 2009, programs to compensate livestock owners for wolf losses and to expand the use
36 of proactive methods in Idaho, Montana, and Wyoming, will receive half their funding (up to a total
37 of \$1 million annually) through a 5-year demonstration program sponsored by the U.S. Departments
38 of Interior and Agriculture.

39 40 **D. Management of Wolf-Livestock Conflicts in Washington**

41
42 Any wolf-livestock management program should manage conflicts in a way that gives livestock
43 owners experiencing losses the tools to minimize future losses, while at the same time not harming
44 the recovery or long-term perpetuation of sustainable wolf populations. Strategies to address wolf-
45 livestock conflicts in Washington are described in Chapter 12, Section 4. Management approaches
46 are based on the status of wolves, ensuring that conservation/recovery objectives are met. Non-
47 lethal management techniques will be emphasized throughout the recovery period and beyond.

1 Actively informing and equipping landowners, livestock producers, and the public with tools to
2 implement proactive wolf management techniques will be an important aspect of this approach.
3 Lethal control will be used only as needed after case-specific evaluations are made, with use
4 becoming less restrictive as wolves progress toward delisting. Wherever wolves are federally listed in
5 Washington, WDFW will consult with and collaborate with U.S. Fish and Wildlife Service on
6 management decisions and actions. In areas where wolves are federally delisted, WDFW will be the
7 lead agency to respond to reports of wolf depredation, with potential assistance from USDA
8 Wildlife Services and other entities (Chapter 12, Section 4.3.3). Where wolves are federally listed,
9 the U.S. Fish and Wildlife Service and USDA Wildlife Services are the lead to respond.

10
11 Wolf-livestock conflicts will be managed using a range of options to prevent depredation, as
12 presented in Table 7. Descriptions of these options are as follows:

13
14 Wolf location information: WDFW will notify livestock producers if wolves are living near their
15 operations and will update them, as needed. This will assist livestock producers in implementing
16 proactive precautions, if they choose, to reduce the likelihood of depredation by wolves.

17
18 Non-injurious harassment: Livestock owners will be allowed to harass wolves with non-injurious
19 techniques when wolves are in close proximity to livestock or livestock grazing areas on both private
20 and public land. These techniques could include scaring off an animal(s) by firing shots or cracker
21 shells into the air, making loud noises, or other methods of confronting the animal(s) without doing
22 bodily harm.

23
24 Non-lethal injurious harassment: This form of harassment involves striking wolves with non-lethal
25 projectiles, such as rubber bullets specifically designed and approved for use on wolves, paintballs,
26 and beanbags (Bangs et al. 2006). Livestock owners and grazing allotment holders (or their
27 designated agents) may be issued a permit to use non-lethal injurious harassment on their own land
28 or their legally designated allotment, respectively, during all listed phases. This will require
29 authorization from WDFW and training in the use of the above listed projectiles. While wolves are
30 listed as endangered, this management tool will be reconsidered if used inappropriately or if a
31 mortality occurs under this provision.

32
33 Move individual wolves: As described in Section B of this chapter, moving an individual wolf is a
34 possible management tool to remove the animal from a conflict situation. This activity would be
35 evaluated on a case-specific basis under all management phases, but would especially be considered
36 during endangered and threatened status. Examples of when this might occur are when a wolf or
37 wolves become involved in depredation on livestock, or are present in an area that could result in
38 conflict with humans or harm to the wolf.

39
40 If a wolf were moved, it would be transported and released into suitable remote habitat on public
41 land, generally within the same recovery region. A relocated individual would be released into an
42 area unoccupied by an existing wolf pack; and would not be moved to an area that had livestock
43 present on the ground. Any relocation would be conducted by WDFW or USDA Wildlife Services
44 in consultation with the appropriate land management agency, and U.S. Fish and Wildlife Service, if
45 wolves are federally listed in that portion of the state. Moving an individual wolf does not require a
46 public review process and is not used to facilitate dispersal.

1 Table 7. Management options to address depredation of livestock and domestic dogs during wolf recovery phases in Washington.
2

Management Option	Endangered	Threatened	Sensitive	Delisted
Wolf location information to livestock owners	Provided	Provided	Provided	Provided
Non-injurious harassment	Allowed	Allowed	Allowed	Allowed
Non-lethal injurious harassment	Allowed with a permit and training from WDFW. This will be reconsidered if used inappropriately or a mortality occurs under this provision	Allowed with a permit and training from WDFW	Allowed with a permit and training from WDFW	Allowed with a permit and training from WDFW
Move individual wolves	May be used by state/federal agents to resolve conflicts on a case-by-case basis	May be used by state/federal agents to resolve conflicts on a case-by-case basis	-	-
Lethal control of wolves to resolve repeated wolf-livestock conflicts	Allowed by state/federal agents on a case-by-case basis	Allowed by state/federal agents on a case-by-case basis	Allowed by state/federal agents, and livestock owners (including family members and authorized employees) with an issued permit on private lands and public grazing allotments they own or lease	Allowed by state/federal agents, and livestock owners (including family members and authorized employees) with an issued permit on private lands and public grazing allotments they own or lease
Lethal take of wolves in the act of attacking (biting, wounding, or killing) livestock, including guarding/herding animals	Not allowed	Allowed by livestock owners (including family members and authorized employees) on private land they own or lease. This will be reconsidered if used inappropriately or more than 2 mortalities occur under this provision in a year	Allowed by livestock owners (including family members and authorized employees) on private land they own or lease	Allowed by livestock owners (including family members and authorized employees) on private and public land they own or lease

Management Option	Endangered	Threatened	Sensitive	Delisted
Lethal take of wolves in the act of attacking (biting, wounding, or killing) domestic dogs (see Chapter 7, Section D)	Not allowed	Not allowed	Allowed on private land. This will be reconsidered if used inappropriately or more than 2 mortalities occur under this provision in a year	Allowed on private and public land
Hunting	No	No	No	To be determined through public process. May range over time from no hunting to limited permit hunting to a general season depending on size and viability of population
Compensation	Yes	Yes	Yes	Yes
Assistance with the use of proactive non-lethal management tools	Yes	Yes	Yes	Yes

1 Lethal control: Lethal removal may be used to stop repeated depredation if it is documented that
2 livestock have clearly been killed by wolves, non-lethal methods have been tried but failed to resolve
3 the conflict, depredations are likely to continue, and there is no evidence of intentional feeding or
4 unnatural attraction of wolves by the livestock owner. Situations will have to be evaluated on a case-
5 specific basis, with management decisions based on pack history and size, pattern of depredations,
6 number of livestock killed, state listed status of wolves, extent of proactive management measures
7 being used on the property, and other considerations. If it is determined that lethal removal is
8 necessary, it will likely be used incrementally, as has been done in other states, with one or two
9 offending animals removed initially. If depredations continue, additional animals may be removed.

10
11 During endangered and threatened status, only WDFW or USDA Wildlife Services staff will
12 conduct lethal control. Lethal removal methods may include trapping and euthanizing, or shooting.
13 During sensitive and delisted status, WDFW may permit livestock owners (including their family
14 members and authorized employees) to lethally control a limited number of wolves during a specific
15 time period on private lands and public grazing allotments they own or lease. Wolves taken must be
16 reported to WDFW within 24 hours, with additional reasonable time allowed if there is limited
17 access to the take site.

18
19 Lethal take in the act of attacking livestock: This provision will allow lethal take of wolves “in the
20 act” of attacking livestock (defined as biting, wounding, or killing; not just chasing or pursuing) by
21 livestock owners, family members, and authorized employees on private land they own or lease after
22 wolves reach threatened status. While wolves are listed as state threatened, this management tool
23 will be reconsidered if used inappropriately or if more than two wolves are killed under this
24 provision in a year. WDFW will carefully monitor total statewide wolf mortality from all causes.
25 Failure to report wolves killed under this provision would be in violation of state law (RCW
26 77.15.120). State penalties for killing a state endangered species range up to \$5,000 and/or 1 year in
27 jail; federal penalties range up to \$100,000 and one year in jail.

28
29 After delisting, this provision will be expanded to include both private and public land that the
30 livestock producer owns or leases. It is critical to understand that wolves passing near or stalking
31 domestic animals are not considered to be in the act of attacking. Wolves passing near or stalking
32 domestic animals can and should be deterred with non-lethal methods; and wolves may not be
33 intentionally baited, fed, or deliberately attracted. Wolves killed under this provision must be
34 reported to WDFW within 24 hours, with additional reasonable time allowed if there is limited
35 access to the take site. The wolf carcass must be surrendered to WDFW and preservation of
36 physical evidence from the scene of the attack for inspection by WDFW is required.

37
38 Public education is necessary for this provision to be used appropriately and to not adversely affect
39 wolf recovery. Currently, endangered and threatened species in the act of damaging domestic
40 animals may not be killed (RCW 77.36.030). Allowing livestock owners to do so with wolves will
41 require a change in state law. The ability to kill wildlife causing property damage in Washington is
42 addressed in Section 61 of Substitute House Bill (SHB) 1778, effective on July 1, 2010 (Appendix
43 K). The details and limitations of this law will be established by the Fish and Wildlife Commission
44 through rulemaking. The law directs the Fish and Wildlife Commission to establish the limitations
45 and conditions of this section of the law, and states that this must include: “Appropriate protection
46 for threatened or endangered species”. It also states that in establishing the limitations and
47 conditions of this section, the Commission “shall take into consideration the recommendations of

1 the Washington state wolf conservation and management plan”. Wherever wolves remain federally
2 listed in Washington, WDFW will consult with and collaborate with U.S. Fish and Wildlife Service
3 on management decisions and actions to ensure consistency with federal law. Experience from the
4 northern Rocky Mountain states (Sime et al. 2007; E Bangs, pers. comm.) indicates that this
5 provision will be rarely used in Washington and will result in the killing of very few wolves,
6 especially during the early stages of recovery when total wolf numbers are small.

7
8 Lethal take in the act of attacking domestic dogs: Private citizens will be allowed to kill a wolf that is
9 “in the act” of attacking (defined as biting, wounding, or killing; not just chasing or pursuing)
10 domestic dogs on private land after wolves are downlisted to state sensitive status; and on private
11 and public lands after wolves are delisted.

12
13 It is critical to understand that wolves passing near or stalking domestic dogs are not considered to
14 be in the act of attacking. Wolves passing near or stalking domestic dogs can and should be deterred
15 with non-lethal methods; and wolves may not be intentionally baited, fed, or deliberately attracted.
16 Wolves killed under this provision must be reported to WDFW within 24 hours, with additional
17 reasonable time allowed if access to the take site is limited. The wolf carcass must be surrendered to
18 WDFW and preservation of physical evidence from the attack scene for inspection by WDFW is
19 required. During sensitive status, this provision will be reconsidered if used inappropriately or more
20 than 2 mortalities occur in a year.

21 22 **E. Proactive Measures to Reduce Wolf-Livestock Conflicts in Washington**

23
24 Use of proactive non-lethal tools by livestock producers will be encouraged as a way of reducing
25 depredations by wolves. Using outreach and education, WDFW will actively encourage livestock
26 producers to implement such management techniques, even after wolves are delisted. In addition to
27 building social tolerance of wolves and aiding wolf conservation, proactively reducing depredations
28 will also likely reduce the total compensation payments that will be necessary over the long-term.

29
30 WDFW wolf management specialists will work proactively with livestock producers to provide
31 technical assistance on non-lethal management techniques and technologies to minimize wolf-
32 livestock conflicts and depredations. It is recognized that these measures may result in higher costs
33 for livestock producers. Task 4.4.4 (Chapter 12) seeks funding to compensate producers for
34 livestock losses and could include funding for assistance with implementing proactive measures.
35 WDFW will also be open to partnerships with other organizations and agencies that are interested in
36 providing livestock producers with funding, additional training, and other resources needed to
37 implement this type of assistance. The Defenders of Wildlife Bailey Wildlife Foundation Proactive
38 Carnivore Conservation Fund is an example of such a possible partnership. As described in Section
39 C, this fund assists with conflict prevention between predators and humans by supporting the use of
40 preventative measures, including non-lethal deterrents and appropriate management methods.
41 Defenders of Wildlife has stated its intention to make its Bailey Fund available to producers in
42 Washington for this purpose. However, it is unclear how much funding will be available under this
43 program, so additional sources would be desirable.

1 **F. Compensation in Washington**

2
3 Defenders of Wildlife currently offers the only compensation program to individual ranchers and
4 farmers in Washington to help offset the costs of wolf-related depredations. A second source of
5 compensation may be available on July 1, 2010. Substitute House Bill (SHB) 1778 directs that
6 owners of commercial livestock (cattle, sheep, and horses held or raised by a person for sale) may be
7 compensated for livestock killed or injured by bears, cougars, and wolves (Appendix K). The
8 Washington Fish and Wildlife Commission will establish the limits and conditions of the
9 compensation program in SHB 1778 through rulemaking, which will take effect by July 1, 2010.
10 Under SHB 1778, claimants may receive no more than \$200 per sheep, \$1,500 per head of cattle,
11 and \$1,500 per horse up to a \$10,000 limit per claim. Other livestock are excluded from coverage.
12 Livestock compensation payments will be dependent on a specific legislative appropriation each
13 biennium. To qualify for compensation under SHB 1778, livestock owners must have (1) gross sales
14 of at least \$10,000 during the preceding tax year, (2) a minimum of \$500 in damage, (3) used self-
15 help preventative measures (including non-lethal methods and department-provided materials; some
16 exceptions may apply) prior to the depredation, and (4) exhausted other compensation options from
17 non-profit organizations. Compensation will not be redundant with payments made by non-profit
18 organizations and will not be paid if the damages are covered by insurance. Other conditions and
19 limitations will be developed through rule-making process described above. .

20
21 After approval of the wolf conservation and management plan, it is recommended that the
22 compensation provisions be incorporated into the existing state law (SHB 1778). It is also
23 recommended that a separate state-sponsored and state-guaranteed compensation fund be
24 developed for wolf-related depredations, which will manage state funds as well as private donations,
25 grants, and federal funds in an interest-bearing account. This account will provide compensation to
26 ranchers and farmers for confirmed and probable livestock depredations, and for unknown losses
27 when that program is developed. Contributions may include funds that WDFW already provides for
28 animal damage management (although these funds are not secure and demand for them regularly
29 exceeds needs). It may also include monies that the department receives from the State Legislature
30 for implementation of SHB 1778, as well as additional funding from the Legislature that may be
31 necessary. WDFW will also work with the livestock industry and conservation organizations to
32 identify additional funding from a diversity of sources, including special state or federal
33 appropriations, private foundations, and other private resources. These funding sources will
34 augment state compensation and may offer compensation for livestock losses related to wolf
35 conflicts not covered by a state compensation fund.

36 37 Recommendation for a State-Funded Compensation Program

38
39 The recommendation for a state-funded compensation program is based on the need for: (1) public
40 support, (2) fairness, and (3) a plan that meets the concerns of livestock producers. A plan that
41 meets these needs will build support for wolf conservation and be consistent with existing precedent
42 of compensation programs in other states and countries (Bangs et al. 2006). Public support for a
43 state-funded compensation program was expressed in comments generated during public scoping
44 meetings held around the state by WDFW in August 2007. Many people supporting wolf
45 restoration view compensation as an opportunity to share in the burden that livestock producers
46 endure and as a way to build public support for wolf recovery (see Montag et al. 2003). Many
47 livestock producers support payment for livestock losses as a trade-off for wolves returning to

1 Washington. An effective compensation program supported by the public and State Legislature can
2 also help increase the tolerance for wolves by some landowners and livestock producers, which can
3 help decrease illegal killings and aid wolf recovery.

4
5 The Washington Legislature will need to approve funding for a state-sponsored wolf compensation
6 program before it can be implemented. The details of a proposed livestock compensation program
7 will be developed through the Fish and Wildlife Commission rule process.

8 9 Compensation

10 11 *Eligibility*

12
13 To receive compensation, producers will be responsible for following appropriate management
14 methods that seek to limit wolf attractants in the vicinity of their livestock, including removal of
15 dead and dying animals and other proactive measures. Livestock producers who have already been
16 compensated for a depredation will also be required to demonstrate that they are implementing
17 appropriate management methods to be eligible for compensation for subsequent depredation
18 occurrences.

19
20 To qualify for compensation for direct losses, incidents of suspected wolf depredation must be
21 reported to WDFW and verified as confirmed or probable (as defined below) during a follow-up
22 investigation conducted by trained personnel authorized by WDFW. Prompt investigations are
23 critical for determining the validity of reported complaints, thus livestock producers need to report
24 suspected wolf depredations as soon as possible (see Appendix L for reporting guidelines and
25 associated information). Agency personnel will conduct their investigation within 48 hours of
26 receiving a report. After an investigation is completed, the complaint will be classified under one of
27 the following categories:

- 28
29 • Confirmed Wolf Depredation – There is reasonable physical evidence that the dead or injured
30 animal was actually attacked or killed by a wolf. Primary confirmation would ordinarily be the
31 presence of bite marks and associated subcutaneous hemorrhaging and tissue damage, indicating
32 that the attack occurred while the victim was alive, as opposed to simply feeding on an already
33 dead animal. Spacing between canine tooth punctures, feeding pattern on the carcass, fresh
34 tracks, scat, hairs rubbed off on fences or brush, and/or eyewitness accounts of the attack may
35 help identify the specific species or individual responsible for the depredation. Predation might
36 also be confirmed in the absence of bite marks and associated hemorrhaging (i.e., if much of the
37 carcass has already been consumed by the predator or scavengers) if there is other physical
38 evidence to confirm predation on the live animal. This might include evidence of an attack or
39 struggle. There may also be nearby remains of other victims for which there is still sufficient
40 evidence to confirm predation, allowing reasonable inference of confirmed predation on an
41 animal that has been largely consumed.
- 42
43 • Probable Wolf Depredation – There is sufficient evidence to suggest that the cause of death was
44 depredation, but not enough to clearly confirm that the depredation was caused by a wolf. A
45 number of other factors will help in reaching a conclusion, such as (1) any recently confirmed
46 predation by wolves in the same or nearby area, and (2) any evidence (e.g., telemetry monitoring
47 data, sightings, howling, fresh tracks, etc.) to suggest that wolves may have been in the area when

1 the depredation occurred. All of these factors and possibly others would be considered in the
2 investigator's best professional judgment.

- 3
- 4 • Confirmed Non-Wild Wolf Depredation – There is clear evidence that the depredation was
5 caused by another species (coyote, black bear, cougar, bobcat, domestic dog) or a wolf hybrid or
6 pet wolf.
 - 7
 - 8 • Unconfirmed Depredation – Any depredation where the predator responsible cannot be
9 determined.
 - 10
 - 11 • Non-Depredation – There is clear evidence that the animal died from or was injured by
12 something other than a predator (e.g. disease, inclement weather, or poisonous plants). This
13 determination may be made even in instances where the carcass was subsequently scavenged by
14 wolves.
 - 15
 - 16 • Unconfirmed Cause of Death – There is no clear evidence as to what caused the death of the
17 animal.
 - 18

19 *Recommended Payment Program for Confirmed and Probable Wolf Depredations*

20

21 It is recognized that the recommendations in this plan for both the definition of livestock and the
22 payment levels for compensation of losses due to wolves differ from those designated in SHB1778.
23 It would require changes to the current law to adopt the recommendations of this plan.

24

25 For this plan, it is recommended that the state compensation fund reimburse livestock owners for
26 confirmed and probable wolf-killed livestock which would include: cattle, calves, pigs, horses,
27 mules, sheep, lambs, llamas, goats, and guarding/herding animals. Appropriate documentation, such
28 as a contract, previous sales record, or current market reports, will be required. Domestic pets and
29 hunting dogs will not be covered for compensation; however, dogs used for animal control efforts
30 under contract with WDFW or other public entities may be eligible.

31

32 A two-tiered payment plan is recommended for confirmed and probable wolf-killed livestock on
33 private and public lands, as presented in Table 8. Recommended payments on grazing sites of 100
34 or more acres are higher because it is harder to find carcasses on larger acreages (see Section A of
35 this chapter). Thus, for each documented loss on sites of this size, a two-to-one ratio for payment is
36 used to account for a possible carcass that couldn't be located. Recommended payments on smaller
37 areas do not include payment for these unknown animals because livestock owners are typically able
38 to supervise their stock more closely and can find nearly all carcasses. Payment is based on current
39 market value, which is defined as the value of an animal at the time it would have normally gone to
40 market. Compensation for other unknown losses (see below, discussion of *Development of a*
41 *Compensation Program for Unknown Losses*) would not be additive or redundant to compensation for
42 confirmed and probable losses.

43

44 For each animal confirmed to have been killed by a wolf on grazing sites of 100 or more acres, the
45 owner will receive payment at the 2:1 ratio using the current market value. For each livestock
46 documented as a probable kill by a wolf on sites of this size, the owner will receive half the current
47 market value at the 2:1 ratio. For each animal confirmed to have been killed by a wolf on grazing

1
2 Table 8. Recommended compensation levels for each confirmed and probable wolf depredation of
3 livestock (cattle, calves, pigs, horses, mules, sheep, lambs, llamas, goats, and guarding/herding animals)
4 in Washington. Higher levels of payment (2:1 ratio) are recommended for larger acreages because of the
5 difficulty in finding all wolf-killed carcasses.
6

Depredation	Compensation on parcels of 100 or more acres	Compensation on parcels of less than 100 acres
Confirmed	2:1 ratio at full current market	1:1 ratio at full current market value
Probable	2:1 ratio at half current market value	1:1 ratio at half the current market value

7
8
9 sites of less than 100 acres, the owner will receive the full current market value of the animal. For
10 each livestock documented as a probable kill by a wolf on sites of this size, the owner will receive
11 half the current market value of the animal.

12
13 Compensation payment will be made in a timely manner using a system developed by WDFW
14 (Chapter 12, Tasks 4.3 and 4.4) Payments for wolf-caused depredation will be reduced by the
15 amounts received by the owner from insurance covering livestock losses or from any other source
16 for the same purpose, including a federal or private compensation program. Payment will also be
17 reduced by the amount received for any financial gain that the owner receives from the sale of a
18 partially salvageable carcass or other product.

19
20 *Recommended payment for injured animals*

21
22 Producers will be able to recoup veterinary treatment costs for injured animals, not exceeding their
23 current market value. If injured livestock need to be euthanized, owners will receive compensation
24 for the current market value of the animal. If livestock are injured to the extent that they must be
25 sold prematurely, the operator will receive the difference between the selling price and current
26 market value.

27
28 *Development of a Compensation Program for Unknown Losses*

29
30 WDFW will work with a multi-interest stakeholder group to develop a compensation program to
31 pay for unknown livestock losses where there is no direct evidence that wolf predation caused the
32 loss. The purpose of this program would be to compensate livestock producers for losses in areas
33 where wolves are confirmed to be present, documented wolf depredation is occurring nearby, and
34 differences exist between historical and current return rates of livestock that are not attributable to
35 other causes. Compensation for unknown losses would not be additive or redundant to
36 compensation for confirmed and probable losses.

37
38 The stakeholder group should contain an equal number of members representing conservation and
39 livestock producer interests. Some of the criteria that will need to be developed for the program
40 include: development of a method to validate historical losses as a baseline, demonstration of
41 current year losses, criteria for excluding payment for unusual levels of death losses from non-wolf-
42 related sources (e.g., other predators, weather, disease), and determining the best method for
43 reviewing and validating claims. As part of the accountability for the program, there should be a
44 mechanism established to review implementation. Key objectives of the review will be to maintain a

1 high degree of accountability and to review whether the compensation program is working
2 effectively.

3
4 Idaho and Wyoming have developed programs to compensate for unknown losses. Idaho has
5 encountered a number of limitations and problems in implementation (J. Allen, pers. comm.). For a
6 program of this type to succeed, it must establish a high degree of accountability and verifiability,
7 avoid creating a costly new bureaucracy, be as low cost as possible, be implementable, and be simple
8 to understand and use. If such a program meeting these conditions cannot be developed for
9 Washington, WDFW will work with a balanced advisory group to determine the need for an
10 alternative compensation program.

11 Accountability, Review, and Phasing Out

12
13
14 Both compensation programs will be subject to review, along with the rest of Washington's Wolf
15 Conservation and Management Plan, when the listing status of wolves changes from state
16 endangered to threatened and from threatened to sensitive. Upon delisting, compensation for
17 livestock depredations may transition to the provisions contained within SHB 1778, and could
18 eventually be phased out depending on the type of management tools that are authorized and the
19 flexibility of control options available to livestock owners. It is assumed that a new management
20 plan will accompany delisting and the need for continued compensation will be evaluated at that
21 time.

5. WOLF-UNGULATE INTERACTIONS

1
2
3
4
5 This chapter and related parts of Chapter 12 focus on interactions between gray wolves and wild
6 ungulates, current status and management of ungulates in Washington, and strategies for ensuring
7 the retention of healthy ungulate populations while achieving wolf recovery. Wolves dispersing into
8 Washington likely will settle in areas with abundant prey that already support multiple types of
9 predators and hunters. The effect on ungulate populations from adding wolves to existing predation
10 levels and hunter harvest is difficult to predict in the state because of localized differences in
11 predator and ungulate abundance and harvest management practices within each geographic area.
12 However, information from Idaho, Montana, and Wyoming, each of which currently supports 300-
13 850 wolves, provides useful insight on impacts that can be expected in Washington as wolves
14 reestablish. In general, wolves have had little or no effect on elk and deer abundance or hunter
15 harvest across large areas of these states, where most populations remain stable or are above
16 population objectives (see Section B of this chapter). Wolves have been linked to declining elk
17 herds in several areas, but often they are one of several factors affecting the herds (e.g., changes in
18 habitat, severe winter weather, and increasing populations of other predators). In some wolf-
19 occupied areas, hunter success rates may have declined because of changes in elk behavior and
20 habitat use rather than by actual declines in elk abundance.

21 22 **A. Wolf Predation of Ungulates**

23
24 Ungulates are the primary food of wolves throughout their geographic range. Prey selection by
25 wolves probably reflects a combination of capture efficiency and profitability versus risk (Mech and
26 Peterson 2003). Thus, wolves may concentrate on species that are easier to capture or offer greater
27 reward for the amount of capture effort expended rather than on species that are most common.
28 Diet can vary greatly among locations in the same region (Table 2) or even among packs living in the
29 same vicinity (e.g., Kunkel et al. 2004, Smith et al. 2004) in response to differences in prey
30 populations, seasonality, weather conditions, the presence of other predators, levels of human
31 harvest, and other circumstances (Smith et al. 2004). In the central and northern Rocky Mountains
32 of the United States and Canada, wolves commonly rely on elk as their primary prey, but deer and
33 moose are more important in some areas (Table 2). Moose are the major prey in much of British
34 Columbia, including southern areas (G. Mowat, pers. comm.). Bighorn sheep and mountain goats
35 are not regularly taken anywhere in the overall region, probably because of little habitat overlap with
36 wolves (Huggard 1993).

37
38 Wolf diets in Washington are expected to be similar to those elsewhere in the region, with elk and
39 deer being the primary prey species. Prey selection will likely vary among locations based on species
40 availability and vulnerability over time, season, local terrain, and other factors. In areas of the state
41 with few or no elk, deer will undoubtedly serve as the primary prey. Moose, which are widely
42 distributed in northeastern Washington, may also contribute significantly to diets in that area.
43 Predation on bighorn sheep and mountain goats will probably be minor. For goats, range overlap
44 with wolves is most likely to occur in the spring as wolves follow other prey to higher elevations and
45 encounter goats still lingering in mid- to high elevation forests used during winter (C. Rice, pers.
46 comm.).
47

1 The rates at which wolves kill and consume prey are highly variable with respect to time of year and
2 species taken. Both rates (usually expressed as biomass per wolf per day) have been investigated in
3 many North American studies and average about 7.2 kg/wolf/day for kill rate (winter only; Mech
4 and Peterson 2003) and 5.4 kg/wolf/day for consumption rate (winter only; Peterson and Ciucci
5 2003). The figure for kill rate roughly corresponds to about one 150-kg elk killed per 21 days per
6 wolf (or 17 elk per wolf per year) or one 60-kg deer killed per 8.3 days per wolf (or 44 deer per wolf
7 per year). However, these estimates are probably somewhat inaccurate because they are based on (1)
8 winter studies, when predation rates in terms of biomass consumed are highest causing annual take
9 to be overestimated, and (2) do not account well for the number of fawns and calves killed in
10 summer or supplementary prey (e.g., beavers, hares) taken in other seasons (Mech and Peterson
11 2003, Smith et al. 2004). In contrast, Sand et al. (2008) found that predation rates in terms of
12 numbers of prey killed by wolves in Scandinavia were much higher in summer than winter due to
13 the large number of juveniles taken, which would cause total annual kill to be underestimated when
14 extrapolating from winter-only data. White et al. (2003) attempted to overcome some of these
15 problems and estimated an annual kill rate of 25 ungulates per wolf in prey-rich Yellowstone
16 National Park. It should be noted that wolf kill rates are generally higher for reestablishing and
17 expanding wolf populations like those at Yellowstone than for long established and stable
18 populations (Jaffe 2001). Predicting predation rates for wolves in Washington is difficult because of
19 many uncertainties, including where wolves will become reestablished in the state and at what
20 population level.

21
22 Wolves are selective hunters and tend to choose more vulnerable and less fit prey. Young-of-the-
23 year (especially in larger prey like elk and moose; Kunkel and Pletscher 1999, Boertje et al. 2009),
24 older animals, and diseased and injured animals are taken in greater proportion than healthy, prime-
25 aged individuals (Mech 1970, 2007, Kunkel et al. 1999, Mech and Peterson 2003, Smith et al. 2004,
26 Sand et al. 2008, Hamlin and Cunningham 2009). In some areas and situations, wolves select adult
27 bull elk disproportionately. This may relate to the relatively poorer condition bull elk are in during
28 winter and their choice of habitat (Atwood et al. 2007, Winnie and Creel 2007, Hamlin and
29 Cunningham 2009). Similar to other coursing predators that chase prey over long distances, wolves
30 will test and evaluate available prey, and will focus on those animals that require the least energy to
31 capture and present the least risk of injury or death to pack members. When young and infirm
32 animals are not available, wolves are capable of killing healthy, prime-aged animals.

33
34 Prey species have evolved defensive techniques such as alertness, speed, herding behavior,
35 synchronous birthing of young, spacing, migration and retreating into water, all of which reduce
36 vulnerability to wolves (Mech and Peterson 2003). Because of these defense mechanisms, the
37 majority of hunts initiated by wolves are unsuccessful. Hunting success of wolves can be influenced
38 by many factors, including pack size, terrain, habitat features, snow and other weather conditions,
39 time of day, prey species, age and condition of prey, season, and experience (Mech and Peterson
40 2003, Hebblewhite 2005, Kauffman et al. 2007).

41
42 The impacts of wolves on prey abundance have been, and continue to be, widely debated (see
43 Boutin 1992). Some common conclusions on this topic have been drawn. A number of studies
44 indicate that wolf predation can limit ungulate prey populations (Bergerud and Snider 1988, Larsen
45 et al. 1989, Ballard et al. 1990, Skogland 1991, Gasaway et al. 1992, Dale et al. 1994, Messier 1994,
46 Van Ballenberghe and Ballard 1994, Adams et al. 1995, Boertje et al. 1996, National Research
47 Council 1997, Hayes and Harestad 2000, Hebblewhite et al. 2002, 2006, Hayes et al. 2003, Mech and

1 Peterson 2003, White and Garrott 2005, Hebblewhite and Merrill 2007). Population-level effects
2 result primarily through predation on young-of-the-year and are frequently enhanced when
3 occurring in combination with other predators (e.g., bears) (Larsen et al. 1989, Barber-Meyer et al.
4 2008, Boertje et al. 2009). However, Creel et al. (2009) reported that elk declines in the greater
5 Yellowstone ecosystem were not caused by actual wolf predation, but instead resulted simply from
6 the threat of wolf predation. Female elk responded to the presence of wolves by spending less time
7 feeding and moving to safer habitats of poorer nutritional quality, resulting in reduced nutrition and
8 lowered calf production that pushed the population downward. As pointed out in many studies,
9 numerous other factors (human harvest, severe winters, variable forage quality, fluctuating
10 abundance of other predators and prey, disease, human disturbance/development, and vehicle
11 collisions) also influence prey populations and complicate the ability to make solid conclusions
12 about wolf-related impacts. Several studies have detected little or no effect from wolves on ungulate
13 populations (Thompson and Peterson 1988, Bangs et al. 1989, Peterson et al. 1998; see Mech and
14 Peterson 2003). Mech and Peterson (2003) suggested three reasons why researchers have failed to
15 reach agreement regarding the significance of wolf predation on the dynamics of prey populations.
16 These are: (1) each predator-prey system has unique ecological conditions, (2) wolf-prey systems are
17 inherently complex, and (3) population data for wolves and their prey are imprecise and predation
18 rates are variable. Whether the prey population exists at or below its ecological carrying capacity is
19 another important element in assessing the results of such studies (D. W. Smith, pers. comm.). In
20 summary, wolf-prey interactions are probably best characterized as being exceedingly complex and
21 constantly changing, as seen at Isle Royale National Park, Michigan, where wolf-moose relationships
22 still cannot be predicted with confidence despite 50 years of detailed research on this subject
23 (Vucetich and Peterson 2009).

24
25 The question of whether wolf-caused mortality is “compensatory” or “additive” is another widely
26 debated topic. Predation is considered compensatory when it replaces other mortality sources
27 (starvation, disease, etc.) that would have otherwise occurred. Predation can be classified as additive
28 when prey are lost that would not have died of other causes in the short term. Mech and Peterson
29 (2003) concluded that in most cases wolf predation is probably a combination of both (e.g., see
30 Varley and Boyce 2006), making clear evidence even more difficult to discern. This holds especially
31 true for predation on young animals (calves and fawns), where because of their increased
32 vulnerability, some young killed by wolves would have likely survived to adulthood.

33
34 Recent analyses from Yellowstone National Park are contradictory on this topic. Vucetich et al.
35 (2005) reported that wolf predation on elk in the park was primarily compensatory and replaced
36 mortality that would have been caused by hunting and severe winter weather, but noted that wolf
37 predation could become more additive in the future as circumstances (e.g., weather patterns, overall
38 rates of predation) change. Others (White et al. 2003, White and Garrott 2005) have concluded that
39 take of female elk by wolves and hunters is probably additive because of the high survival rates of
40 females in the absence of hunting and major predators. In multi-predator ecosystems, where species
41 such as cougars, bears, and coyotes also exist, one might expect that wolf reestablishment would
42 result in declines in some other predators and that wolf predation would therefore be compensatory.
43 However, under recent conditions at Yellowstone, predation (primarily by bears, but also including
44 that by wolves and coyotes) on elk calves was considered mainly additive (Barber-Meyer et al. 2008).

45
46 At Glacier National Park, Kunkel and Pletscher (1999) reported that prey losses from wolves were
47 largely additive to those from other predators. A myriad of literature can be produced that presents

1 examples of each type of mortality in predator-prey systems involving mammals. Each is unique to
2 the ecosystem studied and the inherent strengths and weaknesses of the study design. However, one
3 major influence on the conclusions of such studies is whether or not the prey population occurred at
4 carrying capacity. Wolf predation is often determined to be compensatory for prey populations at or
5 near carrying capacity, but additive for those below carrying capacity (D. W. Smith, pers. comm.). It
6 is beyond the scope of this plan to attempt to evaluate these studies in the context of wolf
7 reestablishment in Washington, and would add little value in terms of a management plan. For a
8 more complete treatment on the theories of predator regulation, compensation, and other related
9 topics on population dynamics, see Sinclair and Pech (1996).

10
11 A recent finding by Eberhardt et al. (2007) is that predation by wolves has a much lower overall
12 impact on ungulate populations than does antlerless harvest by hunters. Wolves primarily prey on
13 young of the year and older individuals beyond their prime, both of which have lower reproductive
14 value, whereas antlerless removals by hunters result in a greater proportional take of adult females of
15 prime age. Thus, wolf predation has considerably less effect on reproductive rates and growth of
16 populations. Eberhardt et al. (2007) also remarked that to maintain ungulate populations exposed to
17 both hunting and predation by multiple species of large carnivores at or near carrying capacity,
18 hunter harvests of females need to be conservative.

19
20 As with other predators, wolf predation has the potential to threaten some small populations of
21 prey, which often have a limited capacity to increase. In Washington, examples of such populations
22 potentially include mountain caribou and certain herds of bighorn sheep.

23
24 Preliminary evidence suggests that wolf predation can reduce the occurrence of some diseases in
25 prey populations through the removal of infected individuals, thus perhaps imparting an overall
26 benefit to surviving animals (Barber-Meyer et al. 2007). However, increased prevalence of other
27 diseases can occur simultaneously if predation results in greater herding behavior, thereby enhancing
28 disease transmission.

29 30 **B. Recent Impacts of Wolves on Ungulates in Neighboring States**

31
32 Observations from Montana indicate that elk abundance has declined in a few areas due in part to
33 wolf predation, but has remained stable or increased in many other areas where wolves are present
34 (Garrott et al. 2005, MFWP 2007a, USFWS et al. 2008, Ballard 2009, Hamlin and Cunningham
35 2009). For example, two-thirds of the hunting districts in southwestern Montana (all of which
36 support wolves) currently offer the most liberal elk hunting opportunities seen in nearly 30 years
37 because of higher elk populations. However, lethal wolf control is practiced in many of these areas
38 to remedy conflicts with livestock and may keep local wolf densities low enough to minimize
39 impacts on elk populations. Where decreasing elk populations have occurred, evidence suggests that
40 these were caused by a combination of factors rather than wolf predation alone, although wolves
41 may have exacerbated the declines or lengthened recovery times. Elk declines have also occurred in
42 at least one area without wolves. Most information suggests that pregnancy rates, calf survival, and
43 adult female survival of elk in Montana have not been affected by wolves (Hamlin and Cunningham
44 2009). During the winter, wolves can have localized effects on elk distribution and movement rates,
45 but such impacts are less than those created by human hunting activity (Hamlin and Cunningham
46 2009). Data suggest the possibility that wolves may have some effects on the larger-scale seasonal
47 distribution of elk and the timing of elk migration in parts of southwestern Montana (Hamlin and

1 Cunningham 2009). Direct impacts on deer and other ungulates in Montana have not been detected
2 to date (C. Sime, pers. comm.), but an increase in mule deer abundance and recruitment has been
3 noted in parts of southwestern Montana where elk abundance and recruitment have declined
4 (Hamlin and Cunningham 2009).
5

6 In Idaho, where wolves are now widely present, overall elk abundance is considered fairly stable,
7 with populations in some parts of the state declining and others increasing or remaining stable (B.
8 Compton, cited in Ballard 2009). The Lolo region, where experimental wolf control is proposed,
9 has experienced a significant reduction in elk abundance, but this trend began in the mid-1980s well
10 before wolves became common (IDFG 2006). The extent that wolves have contributed to this
11 decline in recent years is unknown but perhaps significant. Declines in elk herds were detected in
12 2007 in several other parts of the state with wolves, but the role of wolves in these declines has not
13 been investigated (S. Nadeau, pers. comm.). IDFG (2008) has also reported that wolves are possibly
14 reducing success rates for some hunters in parts of the state without declining elk populations by
15 changing the behavior and habitat use of elk during the hunting season. As observed in the greater
16 Yellowstone ecosystem (Creel and Winnie 2004, Mao et al. 2005), Idaho's elk may now be spending
17 more time in forested areas, on steeper slopes, and at higher elevations than before wolf
18 reintroductions, making it more difficult for hunters to find animals. Changes in herding behavior
19 and movement rates (Proffitt et al. 2009) may also affect hunting success. Other ungulates have not
20 been impacted by wolves in Idaho, with the possible exception of moose (S. Nadeau, pers. comm.).
21 Declines in moose in some areas are poorly understood and may in fact be related to habitat changes
22 or other causes.
23

24 In Wyoming, all 25 elk herds surveyed during the winter of 2008-2009 were at or above population
25 objectives (Schilowsky 2009, J. Obrecht, cited in Ballard 2009), suggesting that wolves have had
26 relatively little, if any, impact on elk abundance statewide. However, wolf predation is one of several
27 causes, along with high human harvest, drought, and increased bear predation, contributing to a
28 roughly 50% decline in the elk population in and around northern Yellowstone National Park since
29 2000, where elk numbers have existed at artificially high levels for decades due to declines and
30 extirpations of large predators. As the wolf population has expanded, it has had an increasingly
31 greater impact on elk abundance in this portion of the park (Vucetich et al. 2005, White and Garrott
32 2005, Barber-Meyer et al. 2008). However, bear predation on elk calves has greatly expanded over
33 the last decade or two in the park and is currently having a much larger impact on recruitment into
34 the elk population than wolf predation (Barber-Meyer et al. 2008). There has not been enough time
35 to determine whether elk numbers at Yellowstone will increase in the future in response to
36 improved forage conditions and reduced predation pressure, both of which may result from the
37 current decline in elk. Wolf numbers were originally predicted to follow elk abundance, but have
38 instead continued to increase (USFWS et al. 2007) despite the lower elk population. Whether
39 wolves maintain high numbers or eventually decline in response remains to be seen. To date,
40 wolves have not had substantial effects on ungulates other than elk in and around Yellowstone
41 (White and Garrott 2005, White et al. 2008). Elsewhere in Wyoming, wolves are considered a
42 potential threat to important populations of bighorn sheep and moose on their wintering ranges, but
43 documented effects on such populations are lacking (WGFC 2008).
44

C. Ungulate Status in Washington

Elk

Elk are a highly valued resource in Washington. Ten major herds are recognized in the state (Figure 9) and range in size from estimates of 600 to 12,000 animals (Table 9). These total about 53,700 animals statewide, of which about 62% occur west of the Cascade crest. Additionally, smaller but unknown numbers of elk reside year-round on some tribal and federal lands (Figure 9), but are excluded from the herds recognized by WDFW. Elk are largely absent from a sizable portion of the state, including much of the Columbia Basin, much of Okanogan County, the North Cascades, and the Puget Trough (Figure 9). Elk are not uniformly distributed within identified herd ranges, but instead are concentrated in some areas and less abundant or absent in other areas. Many herds display distinct seasonal movements, which also influence distribution. Animals generally occupy higher elevations in the summer and lower elevations in the winter (usually November to April). Hunting mortality (including wounding loss and poaching) is by far the greatest source of elk mortality (64-82%) in those portions of the state examined thus far (Table 10). About 8,000 elk are harvested annually in Washington, excluding kill by treaty tribes. Marked reductions in timber harvest, especially in western Washington, increased exclusion of fire in eastern Washington, and increasing human populations in elk habitat have reduced the state's carrying capacity for elk compared to past decades. However, in eastern Washington, some of this reduced capacity has been offset in recent years by the occurrence of large high-severity fires, which have created significant

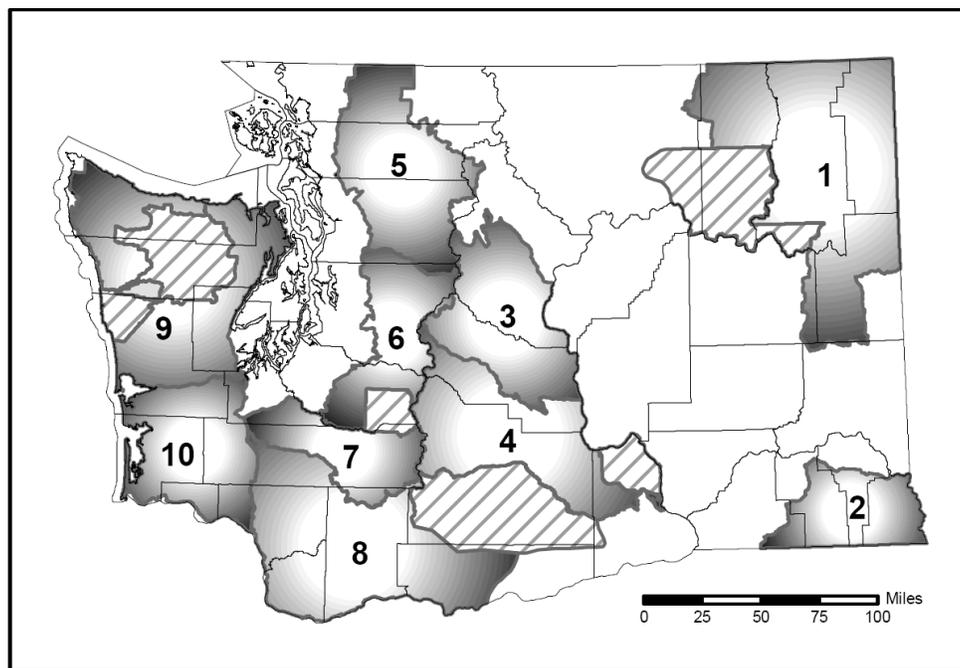


Figure 9. Ten major elk herds managed by WDFW in Washington (1, Selkirk herd; 2, Blue Mountains herd; 3, Colockum herd; 4, Yakima herd; 5, North Cascade (Nooksack) herd; 6, North Rainier herd; 7, South Rainier herd; 8, Mount St. Helens herd; 9, Olympic herd; and 10, Willapa Hills herd). Elk living year-round on some tribal and federal lands are not included in these herds, but their distribution is illustrated here (diagonal lines) to give a more complete depiction of elk distribution in the state.

Table 9. Current population estimates of the 10 major elk herds managed by WDFW in Washington (from WDFW 2008).

Elk herd ^b	Estimated herd size ^a	
	Eastern Washington	Western Washington
1. Selkirk	2,400	-
2. Blue Mountains	4,400	-
3. Colockum	3,900	-
4. Yakima	10,200 ^c	-
5. North Cascade (Nooksack)	-	600
6. North Rainier	-	1,845
7. South Rainier	-	2,100
8. Mount St. Helens	-	12,000
9. Olympic	-	8,620
10. Willapa Hills	-	7,600
Total	20,900	32,765

^a Excludes animals residing year-round on tribal and National Park Service lands. For example, an estimated 5,000 elk live full-time inside the Yakama Reservation (J. Bernatowicz, pers. comm.) and 3,060 elk are present inside Olympic National Park (Jenkins and Manley 2008).

^b The herd numbers used in this column correspond to those displayed in Figure 9.

^c Includes the Rattlesnake Hills sub-herd.

Table 10. Reported causes of elk mortality in Washington.

Herd(s) and age group	Cause of mortality (%)							Unknown causes	Source ^a
	Legal harvest	Wounding loss	Poaching	Malnutrition	Predation	Other natural causes	Vehicle and other accidents		
Adults, yearlings									
Mt. St. Helens, Olympic, Colockum	59	7	15	12	2	-	<2	3	1
Blue Mountains ^b	41	14	9	-	11 ^c	-	-	25	2
Blue Mountains	60	5	5	1	13 ^d	8	-	8	3
Yakima	56	13	13	13 ^e	5 ^e	-	-	-	4
Calves									
Blue Mountains	5	-	-	-	76 ^f	-	2	16	5

^a Source, dates of study, and sample size: 1, Smith et al. (1994), 1988-1993, 165 elk; 2, Myers et al. (1999a), 1990-1996, 47 elk; 3, McCorquodale et al. (2009), 2003-2006, 78 elk; 4, McCorquodale et al. (2003) and S. M. McCorquodale (pers. comm.), 1992-1999, 39 elk; 5, Myers et al. (1999b), 1992-1998, 113 elk.

^b Study results also included two capture-related mortalities and three cougar mortalities that were likely related to capture activities, but these are excluded here.

^c Predation was attributed to cougars in three instances and undetermined predators in two instances.

^d Cougar predation was confirmed in four instances and strongly suspected in five others (S. M. McCorquodale, pers. comm.). An undetermined predator was involved in one instance.

^e In addition to the hunting-related losses cited in McCorquodale et al. (2003), S. M. McCorquodale (pers. comm.) reported that five elk were considered winterkill and two were killed by cougars.

^f Predation was attributed to cougars (60% of predation losses), black bears (21%), coyotes (6%), and unknown predators (13%).

1 areas of early successional forest (i.e., good foraging habitat). Each herd is different and has
2 different management issues. Individual summaries of the 10 herds are provided below.

3
4 **1. Selkirk Herd** – Herd size currently totals about 2,400 elk, which represents substantial growth
5 from an estimate of 1,200 animals in 2001 (WDFW 2001a, WDFW 2008). The management
6 objective for this herd is being developed and will be finalized when the herd’s management plan is
7 completed. Nearly 70% of the herd occurs north of the Spokane River in the forested uplands of
8 eastern Ferry, Stevens, Pend Oreille, and northern Spokane counties. Habitat conditions in this
9 portion of the herd’s range appear favorable for continued population growth for at least the near
10 future (Zender and Base 2006). Localized populations also occur south of Spokane and in parts of
11 Lincoln counties (WDFW 2001a). Damage to agricultural crops has been an ongoing problem at
12 various sites south of the Spokane River and at a few farms in northern Pend Oreille County.

13
14 Current harvest management consists of:

- 15 1) A general hunting season for bulls or either-sex elk, depending on the Game Management
16 Unit (GMU) and weapon type.
- 17 2) A special permit season for a limited number of either-sex elk in GMUs having any bull
18 general seasons.
- 19 3) A tribal either-sex season conducted by the Colville, Spokane, and Kalispel tribes on their
20 respective reservations and on the “North Half” (GMUs 101 and 204) by the Colville tribe.

21
22 **2. Blue Mountains Herd** – Total numbers have averaged about 4,500 animals during the past
23 decade, which is below the management objective of 4,800-5,900 elk (WDFW 2001b, WDFW 2008).
24 Abundance has been limited by habitat changes, loss of habitat, and past levels of antlerless and
25 damage-related hunting. The herd occupies an area of about 900 mi². Elk damage to crops and
26 fences is a continuing problem on the lowland portions of the herd’s range.

27
28 Current harvest management consists of:

- 29 1) A general season for spike bulls or antlerless elk, depending on GMU and weapon type.
- 30 2) A special permit season for a limited number of any bulls, 3-point minimum bulls, or
31 antlerless elk, depending on GMU and weapon type.
- 32 3) A tribal either-sex season held by the Umatilla and Nez Perce tribes.

33
34 **3. Colockum Herd** – This herd has shown a declining trend since the late 1990s due to high
35 antlerless and damage-related harvest and hard winters in the early 1990s (WDFW 2006a). The
36 most recent herd estimate totals about 3,900 elk, which is beneath the desired population objective
37 of 4,100-5,000 animals (WDFW 2008). The herd inhabits about 1,600 mi², with most use occurring
38 in the eastern half of the area. Elk damage on private lands has been a problem at a number of
39 locations since the late 1980s.

40
41 Current harvest management consists of:

- 42 1) A general season for spike bulls or either-sex elk, depending on GMU and weapon type.
- 43 2) A special permit season for small numbers of bulls or antlerless elk, depending on GMU and
44 weapon type, mostly to address agricultural damage.
- 45 3) A tribal either-sex season held by the Yakama Nation.

1 **4. Yakima Herd** – Total numbers in this herd are currently about 10,200 elk. About 9,500 elk
2 (92% of the herd) occur in the Cascade Slope sub-herd that resides west of the Yakima River,
3 whereas the much smaller Rattlesnake Hills sub-herd, numbering about 630 animals, is centered on
4 the Arid Lands Ecology Reserve and Yakima Training Center east of the Yakima River (WDFW
5 2002a, 2008). The main sub-herd is considered at management objective (WDFW 2008). The herd
6 size estimate of 10,200 does not include an additional estimated 5,000 elk residing year-round on the
7 Yakama Reservation (J. Bernatowicz, pers. comm.). Two unique aspects of management of this
8 herd come from the extensive crop damage that it has caused dating back to the early 1900s. This
9 has resulted in the building and maintenance of more than 100 miles of elk-proof fencing to keep
10 animals out of high value croplands and orchards. Because the fences block elk from their historical
11 winter range, WDFW conducts a large-scale winter-feeding program at nine sites to keep animals at
12 higher elevations (see Section D, this chapter, for more information on the winter-feeding of this
13 herd).

14
15 Current harvest management consists of:

- 16 1) A general season for spike bulls or antlerless elk, depending on GMU and weapon type.
- 17 2) A special permit season for a limited number of bulls, antlerless elk, or either-sex elk,
18 depending on GMU and weapon type.
- 19 3) Some tribal either-sex hunting by the Yakama nation and Umatilla tribe.

20
21 **5. North Cascade Herd** – This herd, also known as the Nooksack herd, is the smallest in
22 Washington and currently numbers about 600 elk. The herd has shown positive growth in recent
23 years, but remains well below the stated population objective of 1,750-2,150 animals (WDFW
24 2002b, WDFW 2008). Augmentation efforts in 2003 and 2005 added reproductive-aged females
25 and calves to the herd. The core population currently inhabits about 500 mi² between the Skagit
26 River and Mt. Baker (WDFW 2002b). Intensive logging and loss of winter range from urban
27 development and agricultural conversion are the main threats to the herd. Elk cause some
28 agricultural damage in the Skagit River valley.

29
30 Current harvest management consists of:

- 31 1) A general season for 3-point minimum bulls or antlerless elk, depending on GMU and
32 weapon type.
- 33 2) A special permit season for a small number (less than 20 at this writing) of any bulls,
34 depending on GMU and weapon type.
- 35 3) An equally limited number of elk permits authorized by the Point Elliot Treaty tribes for
36 tribal members.

37
38 **6. North Rainier Herd** – Herd size totals about 1,845 elk, which is below the management
39 objective of 2,520-3,080 animals (WDFW 2002c, WDFW 2008). The bulk of the herd ranges over a
40 2,800-mi² area of eastern King and Pierce counties. Herd numbers declined 46% from 1989 to 2000
41 (WDFW 2002c), but have since stabilized. The decline was attributed to several interrelated factors
42 including antlerless harvest, predation, a decline in habitat quantity/quality due to forest succession,
43 low calf survival, and poor nutrition.

44
45 Current harvest management consists of:

- 46 1) A general season for any bull, 3-point minimum bulls, or antlerless elk, depending on GMU
47 and weapon type.

- 2) A special permit season for a small number of bulls in GMUs 485 and 653.
- 3) Tribal either-sex or bull-only hunts (depending on GMU) by the Medicine Creek Treaty and Point Elliot Treaty tribes.

7. South Rainier Herd – This herd contains about 2,100 elk, which is below the desired objective of 2,700-3,300 animals (WDFW 2002d, WDFW 2008). Most of the herd occupies a 1,000-mi² area of northern Lewis and southern Thurston counties and southern Mt. Rainier National Park. WDFW has tried to balance the desire to meet the current population objective, maintain hunting opportunity, and address depredation on crops. Agricultural and property damage by the elk herd has increased over the past 10-15 years.

Current harvest management consists of:

- 1) A general season for 3-point minimum bulls or antlerless elk, depending on GMU and weapon type.
- 2) A tribal either-sex season by the Medicine Creek Treaty tribes.

8. Mount St. Helens Herd – This is one of the largest herds in the state, with an estimated 12,000 elk (WDFW 2006b, WDFW 2008). Management objectives call for numbers to be reduced to 9,000-11,000 animals by 2015, primarily through expanded antlerless harvest. Abundance is highest in south-central Lewis, Cowlitz, and northern and central Skamania counties (WDFW 2006b). Numbers are relatively low in the southern portion of the herd's range (GMUs 564, 568, 574, 578, and 388), where liberal harvests of elk are conducted to enhance deer abundance and minimize conflicts. Wintering elk in the Toutle River valley, which typically comprise only about 3-6% of the herd, occasionally suffer substantial mortality from malnutrition caused by winter weather conditions and declining forage quality (WDFW 2006b). Chronic elk damage to agriculture and commercial forestlands occurs in several areas and has become more widespread in recent years.

Current harvest management consists of:

- 1) A general season for 3-point minimum bulls, antlerless elk, or either-sex elk, depending on GMU and weapon type.
- 2) A special permit season for bulls or antlerless elk, depending on GMU and weapon type.
- 3) No tribal harvest currently occurs.

9. Olympic Herd – This herd holds an estimated 8,620 elk and has shown some recent population growth, but remains below the management objective of 10,200-12,500 animals (WDFW 2005b, WDFW 2008). These numbers exclude Olympic National Park, where an additional 3,060 elk are estimated to reside year-round (Jenkins and Manley 2008). Elk abundance is highest on the west side of the Olympic Mountains, followed by several southern drainages (WDFW 2005b, Jenkins and Manley 2008). Elk are less common on the northeast and east sides of the Olympic Peninsula, where small groups are generally present. Restrictions on antlerless harvest have allowed the herd to increase over the past decade. Damage caused by the herd is generally restricted to a few localized areas.

Current harvest management consists of:

- 1) A general season for 3-point minimum bulls or antlerless elk, depending on GMU and weapon type.

- 2) A special permit season for small numbers of any bull or 3-point minimum bulls, depending on GMU and weapon type, mostly to address agricultural damage issues.
- 3) A tribal either-sex hunt by nine treaty tribes on the Olympic Peninsula.

10. Willapa Hills Herd – This herd occurs almost entirely on private industrial timberland and holds an estimated 7,600 animals, which meets the current management goal of 7,200-8,800 elk (WDFW 2008). Little research has been conducted on the biology of this herd, but one current study suggests that survival among adult bulls is below herd objectives. The herd causes only minor agricultural damage. A herd management plan has not yet been prepared by WDFW.

Current harvest management consists of:

- 1) A general season for 3-point minimum bulls, antlerless elk, or either-sex elk, depending on GMU and weapon type.
- 2) A special permit season for small numbers of antlerless elk, depending on GMU and weapon type, mostly to address agricultural damage issues.
- 3) No tribal harvest currently occurs.

Deer

Two species of deer, represented by four subspecies, occur in Washington: mule deer, black-tailed deer, white-tailed deer, and Columbian white-tailed deer (Figure 10). Total deer numbers in the state are estimated at roughly 300,000 animals (J. Nelson, pers. comm.), with population trends varying by species and location. From 1996 to 2005, hunters harvested an average of about 38,000 (range of

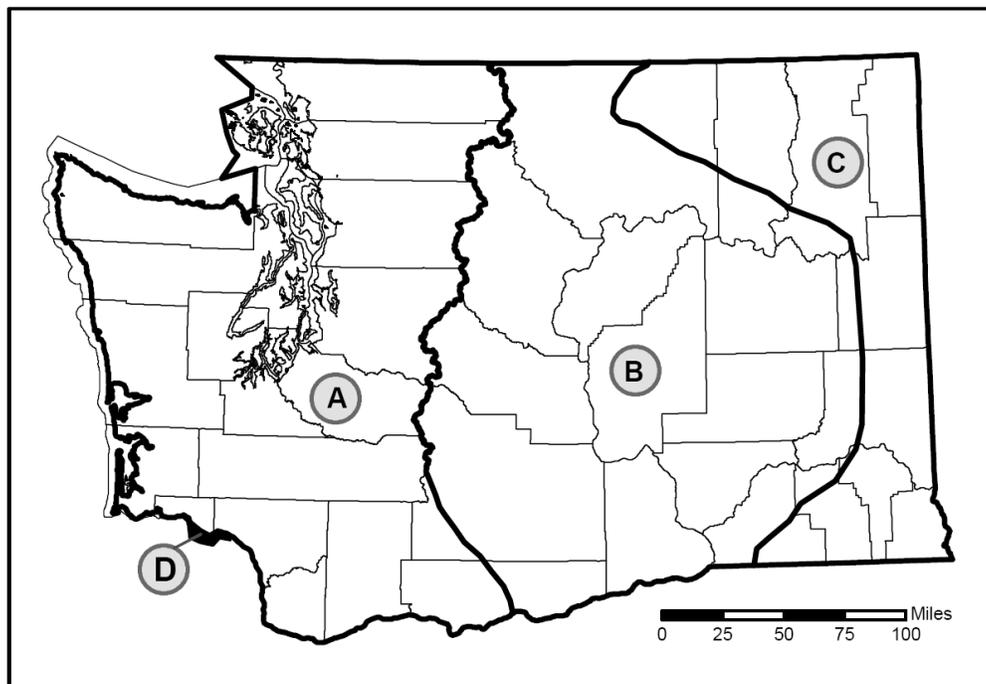


Figure 10. Distribution of four deer subspecies in Washington (A = black-tailed deer; B = mule deer, C = mule deer and white-tailed deer, D = Columbian white-tailed deer and black-tailed deer). Some overlap of subspecies occurs along the depicted range boundaries.

1
2 30,300 to 44,600) deer annually in Washington, which was divided fairly equally among black-tailed
3 deer, white-tailed deer, and mule deer (Nelson 2006). Deer generally prefer habitat in early to mid-
4 successional stages. Reductions in clear-cutting, fire exclusion in eastern Washington, and other
5 changes in forest management practices on public lands and expanding human development in low
6 elevation habitats have caused a decline in deer abundance in Washington since the early 1990s
7 (Nelson 2006). However, some of the loss of suitable habitat for deer has been offset in recent
8 years by the increased occurrence of large fires of severe intensity in eastern Washington, which
9 have created large areas of early successional forest.

10
11 Unlike elk, deer in Washington are not currently assigned to or managed as herds. Instead, WDFW
12 manages deer harvest by Population Management Units (PMU), which are defined geographic areas
13 usually comprised of multiple game management units. Population estimates are generally
14 unavailable for specific PMUs, but population trends are tracked using harvest and survey data.
15 WDFW's goal for managing black-tailed deer, mule deer, and white-tailed deer populations is to
16 maintain numbers within habitat limitations, while taking into account landowner tolerance, a
17 sustainable harvest objective, and interests in non-consumptive opportunities. Deer-related damage
18 to agricultural land and residential properties is widespread and will continue to increase as human
19 activity expands across traditional deer habitat. Deer-vehicle collisions are a problem in some areas.

20 21 *White-tailed Deer*

22
23 White-tailed deer occur primarily in the eastern quarter of Washington (Figure 10). Total population
24 estimates are beyond the scope of WDFW's budget and staffing resources, but white-tailed deer
25 numbers statewide are probably somewhat higher than for mule deer or black-tailed deer.
26 Population trends are generally stable or somewhat declining in northeastern Washington (S.
27 Zender, pers. comm.) and stable or increasing elsewhere (Nelson 2006, WDFW 2006c, WDFW
28 2008). Densities are highest in Pend Oreille, Stevens, and Ferry counties.

29
30 White-tailed deer commonly undertake seasonal movements in elevation in many areas of their
31 Washington distribution. Populations are influenced significantly by winter severity and tend to
32 increase during years with mild winters and experience major declines during severe or protracted
33 winters. Outbreaks of epizootic hemorrhagic disease have also produced some temporary localized
34 declines. White-tailed deer have one of the highest potential maximum rates of increase of any
35 North American ungulate due to their early age at first reproduction and ability to produce twins
36 when nutritionally fit. Coupled with a higher tolerance for human disturbance and agriculture,
37 white-tailed deer can persist and thrive in Washington. These traits make the white-tailed deer
38 somewhat less susceptible to harvest level than mule deer.

39
40 Estimated numbers of white-tailed deer harvested in Washington have gradually increased since
41 1995, with an average annual kill of about 13,500 animals from 2001 to 2005 (Nelson 2006).

42 Current harvest management consists of:

- 43 1) An early general season in October for bucks as well as either-sex hunts in many locations
44 for youth, seniors, and hunters with disabilities. Some GMUs have 3-point antler
45 restrictions.
- 46 2) A late general season for bucks in November, with some antlerless opportunity for youth,
47 seniors, and hunters with disabilities.

- 3) Early (September) and late (November-December) archery seasons for either-sex or antlerless deer, or 3-point minimum bucks.
- 4) Early (September) and late (November-December, with a limited number of GMUs) muzzleloader seasons for either-sex or antlerless deer, or 3-point minimum or any bucks.
- 5) A late (December) general season for antlerless deer in a limited number of GMUs.
- 6) A substantial number of special permits are offered for antlerless or any deer, with a more limited number of late season buck special permits for quality hunts.
- 7) Tribal either-sex seasons held by the Colville, Spokane, Umatilla, and Nez Perce tribes.

Columbian white-tailed deer

This subspecies is state and federally listed as endangered in Washington. Information on population size and distribution is presented in Chapter 6.

Mule Deer

Mule deer are distributed throughout eastern Washington (Figure 10). Total population size is unknown. Densities are currently highest in Okanogan and Chelan counties, whereas populations in northeastern Washington, the Blue Mountains, and Kittitas and Yakima counties are declining or remain below management objectives (Nelson 2006, WDFW 2006c, WDFW 2008). Although populations in Okanogan County are in relatively good condition, abundance has nevertheless shown a gradual long-term decline that suggests a reduction in landscape carrying capacity (Fitkin 2006). Populations have also been declining in the southern Cascades since about 2006 (WDFW 2008). Most mule deer in Washington undertake seasonal elevational movements and the species is considered more reliant on access to winter range than other deer in the state. Population levels are closely tied to winter severity and are sensitive to overharvest. The species is also more vulnerable than white-tailed deer to suburban sprawl, agricultural expansion, fire suppression, and ecological succession of younger-aged habitat. These factors suggest that mule deer in Washington may experience declining trends in the future.

Statewide harvest of mule deer has remained fairly steady since 2000, averaging about 12,900 animals per year (Nelson 2006). Current harvest management consists of:

- 1) An early general season in October for bucks having at least three antler points on one side.
- 2) Early (September) and late (November-December) archery seasons for antlerless deer or 3-point minimum bucks. Antlerless hunting is allowed during archery if population numbers can sustain the pressure. Currently, antlerless hunting is not offered in central Washington due to low mule deer numbers.
- 3) Early (September) and late (November-December) muzzleloader seasons primarily for 3-point minimum bucks, with a very limited number of GMUs open for late muzzleloader (November-December).
- 4) Antlerless special permits are offered when populations can sustain the pressure. A limited number of late season buck special permits are offered for quality hunts, mostly in Chelan, Okanogan, and Douglas counties.
- 5) Tribal harvest by the Colville, Spokane, and Yakama tribes.

1 *Black-tailed Deer*

2
3 Black-tailed deer occur throughout western Washington (Figure 10). No estimates of total
4 population size exist, but harvest data suggest that densities are highest in Cowlitz, Lewis, San Juan,
5 and portions of Thurston and Grays Harbor counties. Black-tailed deer numbers appear to be
6 stable throughout their range in Washington (WDFW 2008). Some animals move elevationally in
7 response to seasonal conditions, but the extent of this behavior is less than in either mule deer or
8 white-tailed deer. Hairloss syndrome has had some localized impacts on abundance in recent
9 decades, but the effects are usually short-term. Habitat for black-tailed deer has been reduced in
10 western Washington due to reductions in timber harvest, natural succession of aging timber stands,
11 and expansion of human development. These changes are expected to result in a gradual decline in
12 overall abundance in the future. Black-tailed deer readily hybridize with mule deer where their
13 ranges meet in Washington, especially in the southeastern Cascades and parts of Klickitat County.

14
15 Estimated numbers of black-tailed deer harvested in Washington have been fairly constant during
16 the past decade, with an average annual kill of about 14,300 animals between 2001 and 2005 (Nelson
17 2006). Current harvest management consists of:

- 18 1) Early (October) and late (November) general seasons primarily for bucks. Some GMUs are
19 restricted to 2-point minimum bucks or either-sex deer.
- 20 2) Early (September) and late (November-December) archery seasons for either-sex deer, 2-
21 point minimum bucks, or bucks only.
- 22 3) Early (October) and late (November-December) muzzleloader seasons for bucks only or
23 either-sex deer.
- 24 4) Antlerless special permits are offered when populations can sustain the pressure. A limited
25 number of late season special permits for bucks are offered for quality hunts.

26 27 Moose

28
29 Numbers of moose in Washington increased from about 60 in 1972 to about 1,500-2,000 in 2007 (S.
30 Zender and H. Ferguson, pers. comm. in WDFW 2008), corresponding to an average annual
31 increase in population size of 9.6-10.5%. This growth is the result of greater moose density in prime
32 habitats and colonization of animals into new areas. Moose primarily occur in Pend Oreille,
33 Spokane, Stevens, Ferry, and Okanogan counties (Figure 11). They are occasionally recorded in
34 Chelan, Lincoln, Whitman, and Whatcom counties, with a few dispersing animals documented in
35 more distant areas. Small numbers of moose are in the process of colonizing the Blue Mountains in
36 Asotin, Garfield, Columbia, and Walla Walla counties, but have not yet formed a breeding
37 population there. Moose generally occur above 3,000 feet in elevation (S. Zender, pers. comm.) and
38 prefer dense thickets of willows and other hardwood shrubs that are frequently associated with 15-
39 25-year-old clear cuts or thinnings on mesic sites (Base and Zender 2006). Forest successional
40 conditions in northeastern Washington generally appear to be excellent for moose and will likely
41 remain so over the next few decades, thus moose numbers are expected to continue at current levels
42 or gradually increase for some time. Harvests are currently by permit only and have totaled about
43 90-100 animals annually in recent years (Base and Zender 2006; D. A. Martorello, unpubl. data).
44 Moose occasionally become a nuisance or create problems for human safety, but agricultural damage
45 has not been reported.

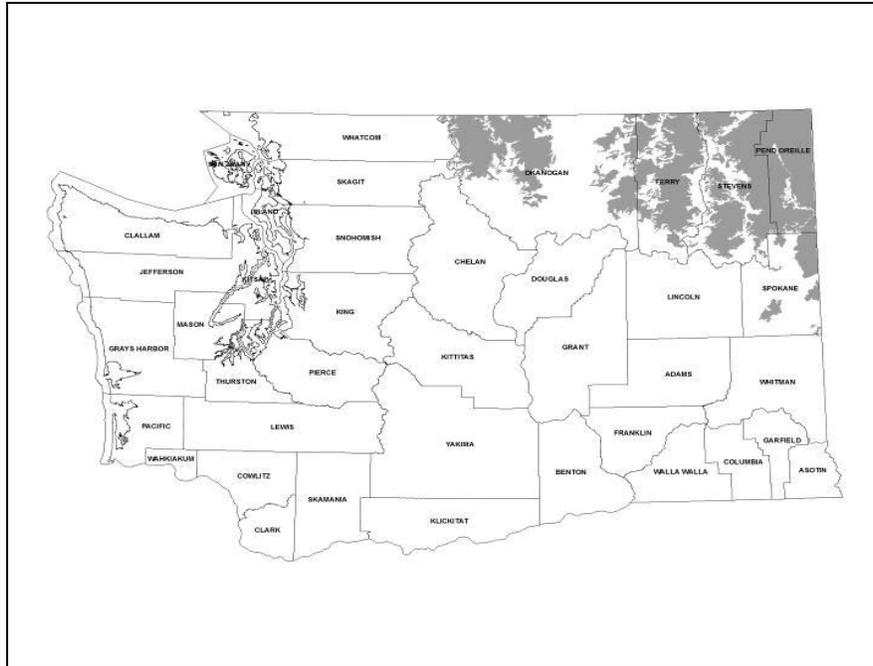


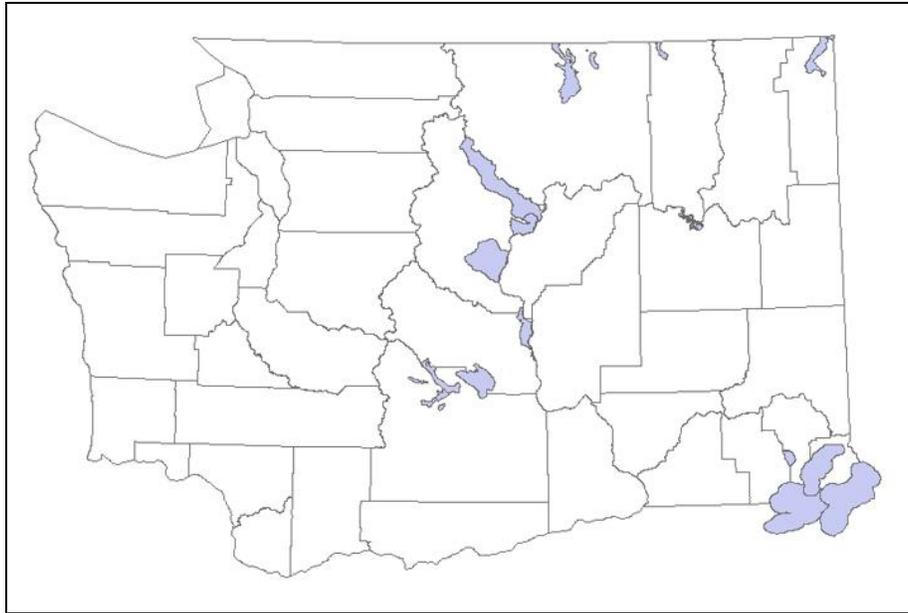
Figure 11. Primary distribution (shaded area) of moose in Washington.

Bighorn Sheep

Washington's population of bighorn sheep currently numbers about 1,500-1,600 animals distributed in 16 isolated herds distributed in the Cascades, northeastern Washington, and the Blue Mountains (Figure 12; WDFW 2007). Herd size averages about 95 sheep and ranges from about 10 to 275. Populations are stable to increasing in 13 herds and declining in three herds. The statewide population estimate is beneath the desired objective of 1,750-2,130 sheep, which is based on potential habitat capacity (WDFW 2008). Diseases and parasites from domestic sheep are the primary causes for decline (e.g., Fowler and Wik 2006), but many herds are also limited by habitat availability. Harvests are currently by permit only and have totaled about 20-25 animals annually in recent years (D. A. Martorello, unpubl. data).

Mountain Goats

Mountain goat populations have been declining in Washington for many years. Current numbers total about 2,400-3,200 animals, with nearly all populations located in the Cascade and Olympic Mountains (Figure 13; Martorello 2006; C. Rice, pers. comm.). A few populations appear to be stable or slightly increasing, including those in the southern Cascades, along the north shore of Lake Chelan, around Mt. Baker, in the Methow region, and in the Olympics. Historical overharvest, impacts of timber harvest on wintering habitat, degradation and loss of alpine meadows, and increasing human recreational use and disturbance of alpine habitat likely have had the greatest negative impacts on abundance. Hunting opportunity and total harvest have decreased with falling populations. Harvests are currently by permit only and total about 20 goats annually (D. A. Martorello, unpubl. data).



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Figure 12. Distribution (shaded areas) of bighorn sheep in Washington.



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Figure 13. Approximate distribution (shaded areas) of mountain goats in Washington.

Mountain Caribou

Washington's population of mountain caribou is state and federally listed as endangered. Information on numbers and distribution is presented in Chapter 6.

1 **D. Wolf-Ungulate Interactions on Wintering Grounds**

2
3 WDFW is mandated by statute (RCW 77.36) to address damage to commercial agricultural crops,
4 orchards, and vineyards caused by elk and deer, which occurs primarily in the winter. Two of the
5 methods used to accomplish this have been fencing and supplemental winter-feeding to keep
6 animals at higher elevations away from agricultural sites. About 100 miles of 8-ft-tall elk-proof fence
7 exist in Yakima and Kittitas counties and border nine permanent feeding stations. An additional 27
8 miles of elk fence run between the Wooten and Asotin Wildlife Areas in the northern Blue
9 Mountains to segregate elk from agricultural lands. Fencing along Highway 97A north of
10 Wenatchee is also being built to keep mule deer and bighorn sheep off the highway. WDFW
11 conducts winter elk feeding operations at nine permanent feeding stations in Yakima and Kittitas
12 counties. Feeding starts as soon as elk arrive in significant numbers (usually in December) and lasts
13 until animals depart during spring green-up. An estimated 70% of the main Yakima sub-herd, or
14 about 6,500-6,800 elk, is fed during typical winters (J. Bernatowicz, pers. comm.), although up to
15 90% of the sub-herd visits feeding sites during harsh winters with extreme snow depths. Sub-herd
16 use of these feeding stations is predicted to gradually increase in the future. Up to 200 bighorn
17 sheep also make use of one feeding site.

18
19 How wolves will interact with ungulates at fenced sites and winter-feeding stations in Washington is
20 mostly speculative. Fencing will likely impede ungulate escape and facilitate capture by wolves.
21 Presence of wolves near feeding stations and at other fenced locations will probably increase
22 management costs for WDFW (e.g., see discussion below for Wyoming). Reasons for this may
23 include (1) increased fence maintenance if elk are pushed into or break through fences by wolf
24 activity, (2) increased transport and manpower costs associated with hauling feed to more dispersed
25 locations, (3) higher costs for conducting winter population surveys, and (4) changes in disposal or
26 burial practices for elk carcasses at feeding stations. Some nearby landowners may also experience
27 financial losses if elk break through fences and enter croplands. Furthermore, wolves could
28 potentially follow elk onto farmlands, thereby possibly increasing wolf-livestock conflicts. These
29 situations will be evaluated on a case-specific basis to determine if management responses are
30 needed and, if so, what the responses should be (Chapter 12, Section 5.3).

31
32 Observations from Wyoming, which is the only state or province with wolves and elk interacting at
33 winter-feeding stations, may be instructive for determining the types of interactions that could occur
34 at these locations in Washington. Dean et al. (2003) reported that wolf visitation increased from one
35 of Wyoming's 22 feeding sites in 1999 to 14 sites by 2003. Total numbers of elk killed by wolves at
36 these sites were insignificant when compared to herd size. In four of the five years between 1999
37 and 2003, wolves killed fewer than 30 elk per year. Wolves tended to select for elk calves when
38 hunting at feeding stations. Attempted predation by wolves often temporarily displaced elk less than
39 3 miles from feeding sites for as long as a day. On occasion, elk moved up to 30 miles away and
40 relocated to another feeding station, or were displaced onto private lands, where they created
41 conflicts with livestock and landowners. None of the feeding sites were ever completely abandoned
42 by elk during any given winter.

43
44 Elk commonly responded to the presence of wolves by banding together in larger than normal
45 herds, which increased the potential competition between elk, damage to soil and vegetation, and
46 possibly disease transmission. However, there were also some management benefits gained because
47 elk diversified their use of feeding stations. The unpredictable movements of elk in response to

1 wolf activity created logistical problems for the Wyoming Game and Fish Department, which
2 needed to increase the amount of hay purchased and stored for the program. During mild winters,
3 elk made less use of feeding stations and more animals were dispersed in the surrounding landscape.
4 In response, wolf packs made fewer visits to stations and preyed more frequently on animals in
5 poorer condition than those being fed. Wolves and coyotes are known to key in on fence lines and
6 follow them while searching for prey (M. D. Jimenez, pers. comm.). However, increased fence
7 breaching by elk has not been noted in wolf-occupied areas in Wyoming.

6. WOLF INTERACTIONS WITH OTHER SPECIES

This chapter describes potential interactions between gray wolves and other species, ESA-listed species, and potential changes to ecosystems following the reestablishment of wolves. With the prospect of wolves entering Washington, much of the overall discussion and concern about wolves has centered on interactions with livestock and ungulates. However, wolves will also interact with a host of other species, including other carnivores such as cougars and coyotes, as well as other mammals and birds. Many of these interactions will have immediate implications for either wolves or the species in question. Other interactions, such as those with plant communities and ecosystems in general, may be more subtle, long-term, and difficult to directly relate to wolves. As with livestock and ungulates, the extent of wolf-related impacts on non-prey species and ecosystems in Washington will depend on where and how many wolves eventually inhabit the state. Many of the ecological effects of wolves described in this chapter are likely density dependent, with less dense wolf populations creating fewer impacts than populations at carrying capacity (Campbell et al. 2006).

A. Wolves and Other Carnivores

As with ungulates, gray wolves in North America and elsewhere have co-existed for centuries with a variety of other carnivore species in many different habitats. How different carnivores interact with wolves varies depending on the extent of dietary overlap, habitat, environmental conditions, and other factors. To date, no definitive research exists on the effects that wolves have on carnivore community structure or populations (USFWS 1994, Ballard et al. 2003). Information regarding the interactions between other carnivores and wolves is primarily observational and subject to interpretation when attempting to make predictions at the population or community level. Because wolves are wide-ranging and many carnivores are secretive in nature, collecting data on interactions is difficult. Observations to date suggest that wolves can reduce, or in rare cases eliminate, certain carnivores (such as coyotes) locally, but no evidence of long-term spatial partitioning of resources within an area has yet been detected (Ballard et al. 2003).

In Washington, wolves will share habitats occupied by a number of other carnivores, including cougars, coyotes, black bears, grizzly bears, bobcats, lynx, red foxes, river otters, mink, martens, weasels, skunks, wolverines, badgers, raccoons, and fishers. Direct interactions almost certainly will occur as wolves begin to reoccupy portions of their historical range in Washington and reestablish packs.

A review of the scientific literature offers clues to what may occur in Washington when wolves interact with the carnivore species noted above. Cougars and wolves both rely on ungulates as their main food source, but use different hunting techniques. Wolves hunt in packs and generally course or test prey, whereas cougars are solitary hunters and rely on ambush of unsuspecting prey. Few observations of direct wolf-cougar interactions have been reported, but the two species do occasionally kill each other. During winter, wolves and cougars often occupy the same range and may have similar diets (Kunkel et al. 1999, Akenson et al. 2005, Kortello et al. 2007). However, cougars have been noted moving away from kills to avoid wolf contact (Akenson et al. 2005) and in general may avoid areas recently used by wolves (Kortello et al. 2007). Wolves also seek out and take over cougar kills, which may force cougars to increase their kill rates to replace lost prey

1 (Hornocker and Ruth 1997, Murphy 1998, Kunkel et al. 1999, Kortello et al. 2007). In one area of
2 central Idaho, cougars showed lower recruitment, fewer adults, and a disrupted social structure
3 several years after recolonization by wolves, but other factors (declining prey populations, high
4 hunter harvest, and a large forest fire) occurring simultaneously probably contributed to these effects
5 (Akenson et al. 2005). Recent information from Yellowstone National Park indicates that cougar
6 abundance there has declined slightly since the reestablishment of wolves and that cougars now
7 focus more of their hunting behavior in denser habitats that are more conducive to their hunting
8 style (K. Murphy, unpubl. data). In one area of Banff National Park, Alberta, a largely wolf-related
9 decline in the elk population resulted in cougars shifting their diets toward mainly deer and bighorn
10 sheep (Kortello et al. 2007). Cougars also exhibited low annual survival and poor body condition
11 during the period of wolf reestablishment.

12
13 Ballard et al. (2003) summarized wolf-bear interactions in North America. Most reported
14 encounters between wolves and black bears involved fighting or chasing one another, or wolves
15 killing black bears. In a smaller number of interactions, wolves displaced black bears from kills.
16 Wolves will seek out and kill black bears in their dens but often do not consume them, suggesting
17 that interference competition exists between the two species. One observation of a black bear
18 killing a wolf has also been made. Most wolf-grizzly bear interactions also involve fighting and
19 chasing, which often take place at kill sites. Encounters at kill sites always appear to be won by
20 grizzlies, whereas wolves usually win those at wolf dens. Both species are occasionally recorded
21 killing the other. Because grizzlies readily usurp ungulate kills made by wolves, Servheen and Knight
22 (1993) speculated that the presence of wolves might be beneficial to threatened populations of
23 grizzlies by supplementing their diet with greater amounts of protein through increased availability
24 of ungulate carcasses. This may be especially true following mild winters, when ungulate carrion is
25 normally far less available.

26
27 Interactions between wolves and coyotes have been discussed in the scientific literature more often
28 than for other carnivores. Reestablishment of wolves has led to reductions in coyotes in some areas
29 (e.g., Yellowstone and Grand Teton National Parks), but not at others (Ballard et al. 2003).
30 Extirpation of coyotes by wolves can occur rarely (e.g., at Isle Royale National Park; Kresting 1969),
31 but probably only under limited ecological circumstances, such as where immigration is prevented.
32 Recent studies at Grand Teton and Yellowstone National Parks have detected declines in coyote
33 densities of 33% and 39%, respectively, in areas reoccupied by wolves and are reflective of
34 competition between the two species (Berger and Gese 2007). Localized or short-term decreases in
35 coyote abundance can be even higher, such as a 50% loss in the Lamar Valley population of
36 Yellowstone from 1996 to 1998 (Crabtree and Sheldon 1999).

37
38 In contrast to these locations, Berger and Gese (2007) hypothesized that wolves may have little or
39 no effect on coyote densities outside of protected areas (where overall wolf densities are likely to be
40 lower because of conflicts with humans), although this observation was based on few data.
41 Transient coyotes are especially vulnerable to wolves and exhibit poorer survival and greater rates of
42 dispersal when wolves are present (Berger and Gese 2007, Berger et al. 2008). Although records of
43 wolves killing coyotes are common in the literature (e.g., Seton 1929, Young and Goldman 1944,
44 Carbyn 1982, Thurber et al. 1992, Ballard et al. 2003), coyote mortality from wolves is usually fairly
45 low (3-16%; see Berger and Gese 2007, Merkle et al. 2009). Wolf-coyote interactions typically occur
46 near wolf kills as coyotes attempt to scavenge ungulate carcasses (Crabtree and Sheldon 1999,
47 Merkle et al. 2009). Switalski (2003) found that coyotes quickly learn to avoid interactions with

1 wolves by becoming more vigilant and waiting to feed at carcasses until after wolves have departed.
2 Other behavioral changes by coyotes, such as denning closer to roads and reducing their
3 vocalizations, presumably also help avoid detection by wolves (Switalski 2003). Additionally,
4 increased group size makes coyotes less susceptible to wolf-caused mortality (Merkle et al. 2009).
5 Resident coyote home ranges often overlap extensively with those of wolves, suggesting that coyotes
6 may in fact derive some benefit from wolves by having a year-round source of ungulate carcasses on
7 which to scavenge (Switalski 2003, Berger and Gese 2007, Merkle et al. 2009). Carrera et al. (2008)
8 hypothesized that competition between the two species may be especially high where their diets
9 substantially overlap.

10
11 Wolves can affect some other carnivores, such as wolverines, red foxes, and fishers, in the same
12 ways described above for bears and coyotes (Ballard et al. 2003). Increased availability of wolf-killed
13 carcasses may benefit these species by providing more food for scavenging, particularly during the
14 winter months. However, wolves sometimes kill these species during direct interactions. In areas
15 where coyote abundance is reduced by wolves, predators such as red foxes, lynx, and bobcats may
16 benefit from reduced competition with coyotes (Mech and Boitani 2003b). Additionally, some prey
17 species of coyotes may increase, which has the potential to enhance populations of other medium-
18 sized and small carnivores (Buskirk 1999).

19
20 It is doubtful that wolves will greatly affect the overall numbers or distribution of other carnivore
21 species in Washington. However, the presence of wolves likely will change the local distributions
22 and behaviors of some carnivores as they attempt to avoid direct interactions with wolves or as they
23 respond to changes in food availability. Such changes could favor some carnivore species over
24 others.

25 26 **B. Wolves and Scavengers**

27
28 Increased availability of wolf-killed carcasses can benefit a number of scavenging species, such as
29 ravens, magpies, jays, golden eagles, bald eagles, and perhaps turkey vultures, especially during
30 winter when other foods become scarcer (Smith et al. 2003). At Yellowstone National Park, at least
31 12 vertebrate species scavenge at wolf-killed carcasses, with five (bald and golden eagles, coyotes,
32 ravens, and magpies) visiting nearly every wolf kill (Wilmers et al. 2003a, 2003b).

33 34 **C. Wolves and Listed/Candidate Species**

35
36 Gray wolves are likely to have few significant adverse impacts on any current federal or state listed
37 (endangered, threatened, sensitive) or candidate species (see Appendix F) in Washington in the
38 foreseeable future, with the possible exception of mountain caribou. Interactions with listed or
39 candidate carnivores and birds of prey (i.e., grizzly bears, lynx, wolverines, fishers, bald eagles, and
40 golden eagles) are briefly discussed in Sections A and B.

41
42 Washington's only population of mountain caribou, the Selkirk Mountains herd, spends most of its
43 time in the British Columbia portion of its range, with members infrequently entering Washington.
44 The herd increased from 33 caribou in 2004 to 46 caribou in 2009. Distribution in Washington is
45 restricted primarily to the Salmo-Priest Wilderness Area in northeastern Pend Oreille County. The
46 area is characterized by high elevations and extensive closed canopy forests, and therefore supports
47 relatively low densities of other ungulate species. Hence, few wolves are expected to reside in the

1 Salmo-Priest, meaning that predation on caribou would probably occur infrequently. Nevertheless,
2 any wolf-related losses to the herd would have a significant impact on the population.

3
4 Recent declines of woodland caribou populations in British Columbia have been linked to the
5 expansion of moose and the subsequent increase of wolves, which has resulted in greater predation
6 on caribou (Wittmer et al. 2005, Stotyn et al. 2007). To reduce the threat of predation, woodland
7 caribou attempt to isolate themselves from predators and other more abundant prey species by
8 selecting old forests and alpine areas, and avoiding areas near roads during all seasons (Stotyn et al.
9 2007). However, loss of mature forests and fragmentation of winter habitat may compromise this
10 strategy. Habitat overlap between caribou and wolves is greatest in the spring and calving season,
11 resulting in increased risk of predation for caribou. Localized reductions of specific wolf packs and
12 other large predators have been used to reduce the impact of predation on mountain caribou
13 populations in the province (G. Mowat, pers. comm.), but regular use of this type of management
14 may carry unacceptable ethical implications for the recovery of rare species in the United States
15 (Wittmer et al. 2005).

16
17 In Washington, Columbian white-tailed deer occur along the lower Columbia River in Wahkiakum
18 and Cowlitz counties (Figure 10). The population in Washington numbers about 600-800 animals
19 and is generally located near human habitation. Predation levels on this subspecies by wolves are
20 difficult to predict, but could potentially harm this deer's recovery in the state.

21
22 Golden eagles and bald eagles may both benefit from the presence of wolves through greater
23 availability of wolf-killed ungulate carcasses, especially during winter. Golden eagles in particular
24 may currently be food limited because of declines in jackrabbits and perhaps other prey species in
25 Washington (J. Watson, pers. comm.).

26
27 Wolves feed on many different small prey species (e.g., mice, tree squirrels, muskrats, woodchucks,
28 grouse, songbirds; van Ballenberghe et al. 1975, Fritts and Mech 1981, Boyd et al. 1994, Arjo et al.
29 2002), especially in the summer when ungulates become less available, but small prey never
30 comprises a significant portion of the diet. A number of listed and candidate species in Washington
31 fall into this size category and might be rarely caught and eaten by wolves. These include Merriam's
32 shrew, pygmy rabbit, white-tailed jackrabbit, black-tailed jackrabbit, western gray squirrel,
33 Washington ground squirrel, Townsend's ground squirrel, Mazama pocket gopher, gray-tailed vole,
34 greater sage-grouse, and sharp-tailed grouse. Many of these species occur in open habitats (i.e.,
35 shrub-steppe, grasslands, prairies, farmland) that are unlikely to be recolonized to any significant
36 extent by wolves in Washington.

37
38 Although not state or federally listed, Olympic marmots have been declining in recent years and are
39 now estimated to total fewer than 1,000 animals (Griffin et al. 2008). Coyote predation is probably
40 the main threat to the species (S. C. Griffin, pers. comm.). Coyotes were historically rare or absent
41 from the Olympic Peninsula when wolves were widespread in western Washington (Taylor and
42 Shaw 1929, Scheffer 1995). Although recolonization of the Olympic Mountains by wolves might
43 result in additional predation pressure on Olympic marmots, it more likely could benefit marmots by
44 reducing coyote abundance.

1 **D. Ecosystem Responses to Wolf Presence**

2
3 Gray wolves affect ecosystem components through a variety of direct and indirect processes,
4 including (1) limitation of herbivore prey abundance and changes in prey behavior, (2) removal of
5 inferior prey individuals and stimulation of prey productivity, (3) limitation of some non-prey
6 abundance, and (4) increasing food availability for scavengers and small carnivores (Mech and
7 Boitani 2003b). However, the ecological impacts of wolf predation on food webs are complex and
8 interact with other biotic and abiotic factors, especially at lower trophic levels, and therefore
9 generally remain poorly understood and difficult to predict (Berger and Smith 2005).

10
11 Regulation of large herbivore abundance and behavior by wolves can alter vegetation patterns
12 (structure, succession, productivity, species composition, and species diversity), thereby potentially
13 affecting many wildlife species residing in an ecosystem (Berger and Smith 2005). Substantial
14 evidence for this comes from Yellowstone National Park and other locations, where wolf predation
15 on elk and associated changes in elk behavior are believed to have resulted in localized resurgence of
16 woody browse species such as aspen, cottonwood, and willows (Smith et al. 2003, Ripple and
17 Beschta 2004, 2007, Beschta 2005). This in turn has allowed beaver numbers to increase and will
18 probably result in greater amounts of foraging and nesting habitat for various birds and other
19 species. At Grand Teton National Park, Berger et al. (2001) hypothesized that overbrowsing of
20 riparian zones by moose following the eradication of wolves and grizzly bears had produced changes
21 in vegetation structure resulting in pronounced reductions or elimination of a number of neotropical
22 migrant bird species (e.g., calliope hummingbird, willow flycatcher, gray catbird, yellow warbler,
23 MacGillivray's warbler, fox sparrow, and black-headed grosbeak). Reduced tree and shrub coverage
24 in riparian areas may also increase stream temperatures and erosion, thereby potentially harming
25 trout, salmon, and other fish.

26
27 Eradication of wolves has possibly produced a number of important ecological changes in Olympic
28 National Park in northwestern Washington. Initial research by Beschta and Ripple (2008) suggests
29 that overbrowsing by elk during the past century or so has caused substantial changes in riparian
30 plant communities, including severe declines in the recruitment of black cottonwood and bigleaf
31 maple. This in turn may have caused increased riverbank erosion and channel widening. Probable
32 reductions in the amount of large woody debris in river channels during this period have likely
33 reduced rearing habitat for salmon, steelhead, and resident fish. These changes in river ecology have
34 probably also lowered the amount of aquatic invertebrate prey (including emerging adult insects)
35 available for fish, birds, and bats. These impacts should be confirmed through additional research
36 (P. Happe, pers. comm.).

37
38 Wolves tend to prey mainly on younger, older, and debilitated animals (Mech 1970, 2007, Kunkel et
39 al. 1999, Mech and Peterson 2003, Smith et al. 2004). Removal of such individuals can leave prey
40 herds comprised of a greater proportion of animals of prime age and in good health, which may in
41 turn result in higher productivity in prey populations (Mech and Boitani 2003b). Preliminary
42 evidence suggests that wolf predation can also change the occurrence of some diseases in prey
43 populations, causing either reduced prevalence through the removal of infected individuals or
44 increased prevalence where greater herding behavior enhances transmission (Barber-Meyer et al.
45 2007).

1 Wolf-related reductions in coyote abundance (see Section A) may result in population changes
2 among other medium-sized and small carnivores, either directly through reduced predation by
3 coyotes or indirectly through adjustments in prey availability. For example, reduced interference
4 competition with coyotes may increase the abundance of red foxes (Mech and Boitani 2003b).
5 Similarly, wolf-related reductions in coyotes may result in increased survival for some prey species
6 consumed by coyotes (e.g., pronghorn; Berger et al. 2008, Berger and Conner 2008).

7
8 It should be noted that most research on these topics has been conducted in national parks or other
9 protected areas. It remains unclear whether the beneficial ecological impacts of wolves are as
10 extensive in less pristine landscapes that have been influenced by livestock grazing or other human
11 activities (L. D. Mech, pers. comm.). Climate and habitat productivity are other factors that also
12 may affect the strength of ecological changes resulting from wolves (Rooney and Anderson 2009).

7. WOLF-HUMAN INTERACTIONS

1
2
3
4
5 Because of the long absence of gray wolves from Washington, most people in the state are
6 unfamiliar with wolves and wolf behavior. Hence, addressing public safety concerns and providing
7 information on wolf behavior are important steps in achieving conservation and tolerance of wolves
8 by citizens.
9

10 **A. Human Safety**

11 Background

12
13
14 Wild wolves generally fear people and rarely pose a threat to human safety. Attacks on humans by
15 wolves are quite rare compared to those by other species. Since 1950, wolves are known to have
16 killed nine people in Europe (where current wolf numbers total about 10,000-20,000), eight in
17 Russia (about 40,000 wolves) (Linnell et al. 2002, Boitani 2003). Human deaths have also been
18 reported in India, where conditions have deprived wolves of wild prey and livestock is heavily
19 guarded (Fritts et al. 2003). In North America, where there are about 60,000 wolves, there has been
20 only one death apparently caused by a wolf (Linnell et al. 2002, Boitani 2003, NPS 2003, McNay
21 2007), which occurred in Saskatchewan, Canada, in 2007. There continues to be some debate about
22 the predator responsible in this incident (P. Paquet, unpubl. data). It appears to have been a situation
23 where wolves became habituated to people, possibly being fed or attracted to garbage. Injuries from
24 wolves have also been extremely rare in North America (Linnell et al. 2002, McNay 2002a, 2002b).
25 By comparison, domestic dogs in the United States are responsible for 4.7 million bites resulting in
26 500,000-800,000 hospital visits and 15-20 fatalities per year (Sacks et al. 1996, Centers of Disease
27 Control 2003). Dogs also are the single most important vector for the transmission of rabies to
28 humans (Moore et al. 2000).
29

30 Annual numbers of interactions between humans and other wildlife species in the United States
31 average about 27,000 bites/injuries and an unknown number of fatalities by rodents, 8,000
32 bites/injuries and 15 fatalities by venomous snakes, 750 bites/injuries by skunks, 500 bites/injuries
33 by foxes (Conover 2001), and 40-50 fatalities by bees (Cyr and Johnson 2006). Among other large
34 carnivores, grizzly/brown bears killed about 36 people in Europe, 206 in Asia, and 71 in North
35 America during the 20th century (Swenson et al. 1996). An estimated 25 attacks by black bears
36 occur annually in North America, with one being fatal about every third year on average (Conover
37 2001). For cougars, there were 17 fatal and 72 injurious attacks from 1890 to 2001 in North
38 America (Beier 1991; L. Fitzhugh unpublished data in Linnell et al. 2002).
39

40 About half of the human fatalities from wolf attacks worldwide since about 1950 have involved
41 wolves infected with rabies (Linnell et al. 2002). Wolves are not a major reservoir of rabies, but
42 contract it from contact with other wildlife harboring the disease. The severity of sporadic attacks
43 by rabid wolves in Europe and Asia in past centuries likely contributed to a perception brought to
44 North America by European settlers that all wolves were violently dangerous animals. However, in
45 the United States and Canada, interactions involving rabid wolves and humans have rarely occurred
46 due to the low overall incidence of rabies on the continent (Linnell et al. 2002).
47

1 Attacks by non-rabid wolves typically involve captive wolves, healthy wild wolves that became
2 habituated to humans (with or without food being present), territorial attacks by wolves on pet dogs
3 where the dog owner tried to intervene, defensive attacks by wolves when trapped or cornered or
4 when den sites with pups were threatened, wolves acting as predators under unique circumstances,
5 and wolf-dog hybrids (Linnell et al. 2002, McNay 2002a). Only 18 reports of unprovoked
6 aggression by wolves were documented in North America between 1969 and 2000, with just seven
7 of these involving wolves not habituated to humans (McNay 2002a). McNay (2002b) mentioned six
8 cases of non-habituated wolves being aggressive toward people accompanied by dogs. The dogs
9 may have been the primary reason for the wolves' aggression, with attacks on the people occurring
10 secondarily. An unusual number (at least eight) of wolf-human encounters, including several attacks,
11 occurred in Ontario in 2006-2007, but many of these apparently involved animals habituated to
12 people (Grooms 2007).

13
14 McNay (2002a) reported a substantial increase in unprovoked aggression by wolves toward humans
15 from 1969 to 2000, as compared with 1900 to 1968, and noted that this corresponded with increased
16 protections for wolves, larger wolf populations, and greater numbers of humans visiting parks and
17 other areas inhabited by wolves. As with other wildlife species, these factors provided more
18 opportunities for wolves to become conditioned to humans and their foods.

19
20 Habituation of wolves to humans can occur in locations where wolves commonly encounter people
21 and may or may not involve conditioning to human foods (McNay 2002a, NPS 2003). Instances of
22 camp robbing by wolves have long been known (Young and Goldman 1944) and may develop from
23 wolves finding novel or chewable items (e.g., camping equipment, clothing) on a repeated basis in a
24 human setting. This type of conditioning does not involve the presence of food, but can
25 nevertheless lead to unprovoked aggression toward humans (see Linnell et al. 2002 for examples).
26 Wolves can quickly develop persistent aggressive approach behavior in situations where they receive
27 food directly from people (McNay 2002a). Habituated wolves can remain non-aggressive toward
28 humans for extended periods, but can quickly transition to strong aggressive or predatory behavior
29 depending on the behavioral stimuli shown by humans (McNay 2002a).

30 31 Avoidance of Close Encounters with Wolves

32
33 Because wolves are large carnivores capable of inflicting serious injury to people, wolves should be
34 respected for their capabilities and humans should avoid close contact at all times. Wolves are best
35 left wild and observed from a safe distance. Wolves can gradually lose their fear of people through
36 increasingly frequent contact and receiving food rewards for their boldness (NPS 2003, MFWP
37 2007b). Bold wolves are more likely to approach humans and human-populated areas when
38 positively rewarded for doing so.

39
40 To prevent wolves from becoming habituated, people should:

- 41 • Resist the temptation to approach wolves.
- 42 • Not entice or allow wolves to come nearby.
- 43 • Not feed wolves or leave food outdoors, including pet food.
- 44 • Not approach fresh wolf kills, dens, or rendezvous sites.
- 45 • Not let wolves become comfortable near human-inhabited areas.

- Notify authorities about wolves that seem comfortable around people, seek human food, or frequent human areas. Early intervention can keep a problem from getting worse.

During a close encounter with a wolf, people should do the following to frighten the animal away:

- Stand tall and make themselves look larger.
- Act aggressively towards it -- make noise, throw objects, and wave clothing.
- Calmly but slowly back away and maintain eye contact.
- If the wolf does not run away immediately, continue making themselves large, keeping eye contact, and backing away.
- Not turn their back on the wolf or run away.
- If a person with a dog encounters a wolf, the dog should be brought to heel at the person's side as quickly as possible. Standing between the dog and the wolf often ends the encounter. To avoid risk of injury to themselves, a person should not attempt to break up a physical fight between a wolf and a dog.

Currently, Washington law does not specifically address defense of human life from wildlife attacks. The federal ESA provides that "...any person may take endangered wildlife in defense of his own life or the lives of others." (50 CFR 17.21(c)(2)). The ability to kill wildlife threatening human safety is addressed in Substitute House Bill (SHB) 1778 (Appendix K), which becomes law on July 1, 2010. The details and limitations of this law will be established by the Fish and Wildlife Commission through rulemaking.

B. Interactions with the Public

In Washington, various groups of people with a higher than average likelihood of coming in contact with wolves in the wild include, but are not limited to, hunters, trappers, rural residents, recreationists, outfitters and guides, forest workers/contractors, and other natural resource workers. Some members of these groups may welcome seeing wolves and may seek them out, while others may consider wolves as problematic to their activities. Regardless, user groups should be informed about wolves. To reduce concerns over safety, efforts should be made to inform rural residents and backcountry users of ways for reducing the likelihood of encounters with wolves and methods for preventing habituation toward people. Strategies for accomplishing this are presented in greater detail in Chapter 12 and will be essential to achieving the conservation and management goals for wolves.

C. Interactions with Domestic Dogs

Situations where wolves and domestic dogs encounter each other can result in deaths and injuries to the dogs. In some instances, wolves may alter their regular movements or activities to seek out and confront domestic dogs. Usually, attacks on dogs are believed to represent conflicts related to inter-species competition for territories rather than acts of predation (Bangs et al. 2005a). Wolves killed at least 118 dogs in Idaho, Montana, and Wyoming from 1987 to 2008 (Table 4; USFWS et al. 2009). Dogs used for livestock guarding, herding, and hunting are most vulnerable to attack (see Chapter 4 regarding herding/guarding dogs), but pet dogs are also at some risk (McNay 2002b, Treves et al. 2002, Bangs et al. 2005a). None of the dogs killed in these states through 2006 were accompanied by their owners at the time of attack (USFWS 2007b). Most attacks on dogs in Idaho, Montana, and

1 Wyoming occur in remote areas away from homes (Bangs et al. 2005a), but in a few cases, wolves
2 have come close to homes to fight with dogs, even when people were present close by. Domestic
3 dogs are also vulnerable to attack or killing by a variety of predators other than wolves, such as
4 coyotes, cougars, bears, and feral dogs.
5

6 As wolves expand their range in Washington, dog owners will need to be aware of the potential risks
7 to their animals. Some wolves are likely to occupy areas near human habitation or areas used
8 recreationally (e.g., national forests), which could put hunting or pet dogs at risk of depredation,
9 especially those running at large.

10 Hunting Dogs

11
12
13 Hunting for cougars, bears, and bobcats with hounds was banned in Washington by state initiative
14 (I-655) in 1996. Through legislative authorization and exceptions provided in the initiative, hounds
15 may currently be used to pursue three game species in Washington: cougars in a pilot study for six
16 counties (Pend Oreille, Stevens, Ferry, Okanogan, Chelan, and Klickitat); raccoons statewide; and
17 black bears causing timber damage in western Washington (by permit only). Hounds are susceptible
18 to wolf attacks, as seen in Idaho and Montana, where one or two fatal attacks have been reported in
19 most years since 2000 (USFWS et al. 2009 and older annual reports; S. Nadeau, pers. comm.).
20 Together, these have resulted in the deaths of at least 13 dogs total, all of which were involved in
21 cougar hunts.
22

23 The six counties in northeastern and north-central Washington where hound hunting of cougars
24 occurs are among those likely to have wolves recolonizing in the future. Thus, houndsmen should
25 be trained on steps that can be taken to reduce interactions between their dogs and wolves. These
26 include releasing hounds only on fresh sign to avoid longer chases, avoiding releases in areas with
27 fresh evidence of wolves, reaching hounds at trees as quickly as possible so they are not unattended
28 for long periods, and placing bells or beeper collars on hounds (IDFG, no date). Outreach on
29 similar measures that can be taken by forest grouse hunters using dogs (IDFG, no date) should also
30 be conducted.
31

32 **D. Management of Wolf-Domestic Dog Conflicts in Washington**

33
34 As referenced in Chapter 4, private citizens will be allowed to kill a wolf that is “in the act” of
35 attacking (defined as biting, wounding, or killing; not just chasing or pursuing) domestic dogs on
36 private land after wolves are downlisted to state sensitive status. It is critical to understand that
37 wolves passing near or stalking domestic dogs are not considered to be in the act of attacking.
38 Wolves passing near or stalking domestic dogs can and should be deterred with non-lethal methods.
39 Wolves killed under this provision must be reported to WDFW within 24 hours, with additional
40 reasonable time allowed if access to the take site is limited. The wolf carcass must be surrendered to
41 WDFW and preservation of physical evidence from the attack scene for inspection by WDFW is
42 required. Wolves killed in the act of attacking cannot be intentionally baited, fed, or deliberately
43 attracted. During sensitive status, this provision will be reconsidered if used inappropriately or more
44 than 2 mortalities occur in a year.
45

46 Public education is necessary for this provision to be used appropriately and to not adversely affect
47 wolf recovery. No records exist of wolves being killed while attacking domestic dogs in the

1 northern Rocky Mountain states (E. Bangs, pers. comm.), indicating that use of this provision and
2 resulting wolf mortalities would be extremely rare in Washington.

4 **E. Wolf Hybrids and Pet Wolves**

6 Wolves are capable of hybridizing with other canid species and have been documented breeding
7 with coyotes, domestic dogs, and feral dogs. However, behavioral differences between wolves,
8 coyotes, dogs, and wolf hybrids usually keep the populations distinct. Possession of wolf hybrids
9 and wolves as pets should be discouraged because of the potential threat to human safety. Hybrids
10 and pet wolves are dangerous to people because of their physical strength, lack of shyness, and
11 predatory instincts, which make their behavior unpredictable in many situations (Fritts et al. 2003).
12 Hybrids and pet wolves killed at least 13 children and injured at least 43 others in North America
13 from 1981 to 1999 (Linnell et al. 2002). Wolf hybrids and pet wolves regularly end up in the wild
14 when their owners allow them to run free, abandon them, permanently release them, or when the
15 animals escape. Washington has had a number of instances of hybrids being killed on roads in
16 vehicle collisions, or released in national forests or other areas. These are commonly reported as
17 wolf sightings by the public (Appendix H).

19 Because wolf hybrids can be difficult to distinguish from wild wolves, negative encounters between
20 humans, and hybrids often are attributed to wild wolves and therefore can impede efforts to
21 reestablish and conserve wolves. There is also potential for the genetic pollution of wild wolf
22 populations, although the risk is low considering the poor survival of wolf hybrids released into the
23 wild. Genetic evidence of hybridization between wolves and dogs or hybrids was recently described
24 from Vancouver Island, British Columbia (Muñoz-Fuentes et al. 2009b). A domestic dog
25 mitochondrial DNA haplotype was detected in three females (2 adults, 1 immature) that were
26 morphologically identified as wolves in 1986. The data suggested that a female dog or hybrid with
27 dog mitochondrial DNA must have mated with a male wolf and produced at least one female
28 offspring that subsequently reproduced. Muñoz-Fuentes et al. (2009b) attributed this hybridization
29 event to the small size of the population and lack of available mates when wolves were recolonizing.
30 Wolves were virtually eliminated from the island by 1950 as a result of eradication efforts, and slowly
31 re-colonized from mainland British Columbia beginning in the mid to late-1970s. Their findings
32 exemplify how small wolf populations are at risk of hybridization.

34 A new state law (RCW 16.30) prohibiting the ownership, possession, and breeding of pet wolves
35 and other potentially dangerous wildlife species was enacted on July 22, 2007. Provisions of the law
36 allow current owners of pet wolves to retain their animals until the death of the animals; and allow
37 licensed facilities to possess wolves. The law is enforced by local animal control authorities and law
38 enforcement officers or, in their absence, WDFW law enforcement officers. Wolf hybrids, also
39 known as wolf dogs, were excluded from RCW 16.30 and are regulated as domestic dogs in
40 Washington; hence WDFW has no jurisdiction over wolf hybrids. Authority to regulate the
41 ownership, possession, and breeding of wolf hybrids currently lies with individual Washington
42 counties and cities. King County, Tacoma, and Puyallup are among the jurisdictions that have
43 adopted ordinances prohibiting possession of wolf hybrids (and wolves) as pets by private citizens.
44 Wolf hybrids are commonly kept as pets in Washington, with an estimated 10,000 animals present in
45 the state in the late 1990s (P. Joslin, pers. comm., cited in Gaines et al. 2000).

8. LAND MANAGEMENT

1
2
3
4
5 Gray wolves are habitat generalists and one of the most adaptable large predators in the world
6 (USFWS 2009). They require only a sufficient year-round prey base and protection from excessive
7 human-caused mortality. Wolf populations are able to persist in many parts of the world featuring
8 greater human development than the northwestern United States (Boitani 2003). Even active wolf
9 dens can be resilient to non-lethal disturbance by people (Thiel et al. 1998, Frame et al. 2007, Person
10 and Russell 2009). In parts of the species' range (e.g., in northwestern Montana), wolf packs use a
11 matrix of public, private, and corporate-owned lands where a variety of land uses occur, including
12 dispersed outdoor recreation, timber production, livestock grazing, home sites within the rural-
13 wildland interface, hobby farming/livestock, and even full-scale resort developments with golf
14 courses.

15
16 Restrictions on human development and other land use practices have not been necessary to achieve
17 wolf recovery in Idaho, Montana, and Wyoming (USFWS 2009), and the U.S. Fish and Wildlife
18 Service did not designate critical habitat for wolves in the western United States. With the exception
19 of some temporary area closures near den sites in national parks, there have been no restrictions on
20 grazing methods, road use, timber management and logging, mining, recreation (e.g., camping,
21 hiking, and backcountry horse use), public access, or other activities due to the presence of wolves.
22 Outside of national parks, no wolf-related restrictions have been placed on public or private lands in
23 Montana (C. Sime, pers. comm.).

24
25 Based on the habitat use and large home ranges of wolves in Idaho, Montana, and Wyoming, it is
26 expected that wolves will use a matrix of public, private, and corporate-owned lands in Washington,
27 but with primary occupancy on public lands (see Chapter 2, Section C, for further background on
28 habitat use). In some areas, expanded use of private lands may occur in the winter as wolves follow
29 their prey to lower elevations. As in Idaho, Montana, and Wyoming, wolf reestablishment is not
30 expected to result in any additional land use restrictions in Washington.

A. Federal Land

31
32
33
34 Responsibility for managing federal lands resides with the federal administering agencies. WDFW
35 has no legal authority to implement land use restrictions on land it does not manage and land
36 management agencies can and may adopt seasonal or localized area restrictions independently from
37 WDFW. Therefore, it will be important for federal agencies and WDFW to coordinate on land use
38 issues as they relate to wolf management, especially the administration of livestock grazing permits.

39
40 Wolf activity on national forest lands in Montana has not generally prompted any area closures or
41 travel restrictions, primarily because recreational use of these lands is often dispersed and sporadic
42 (MFWP 2003). Temporary area closures are sometimes established around occupied den or
43 rendezvous sites in national parks because of the strong public desire to view wolves and the high
44 visitation of areas with wolf activity that would otherwise occur. At Yellowstone National Park,
45 areas around dens are closed until June 30, but at Glacier National Park, this type of seasonal closure
46 has been implemented for only one wolf pack (MFWP 2003).

1 In Wyoming, the U.S. Fish and Wildlife Service always discouraged other agencies from placing any
2 restrictions on federal lands to protect wolves (M. Jimenez, pers. comm.). The only exception would
3 have been potential take involving a den site. For example, if an agency planned a controlled burn
4 in April, the U.S. Fish and Wildlife Service would have asked the agency to wait until the wolves
5 were out of the affected den later that summer. No other restrictions on federal lands have been
6 added by other agencies.

7 8 **B. State Land** 9

10 As with federal lands, responsibility for managing state lands resides with the state administering
11 agencies. WDFW has no legal authority to implement land use restrictions on land it does not
12 manage and land management agencies can and may adopt seasonal or localized area restrictions
13 independently from WDFW. The only lands that WDFW has management authority over are 32
14 designated wildlife areas totaling nearly a million acres that are located across the state.

15
16 The Washington Department of Natural Resources administers the Washington State Forest
17 Practices Act Critical Habitats Rule for threatened and endangered species (WAC 222-16-080),
18 which contains a provision for wolves. The rule applies to timber harvest permit applications on
19 state and private lands. Forest practices where harvesting, road construction, or site preparation is
20 proposed within 1 mile of a known active wolf den, as documented by WDFW, between the dates
21 of March 15 and July 30, or 0.25 mile from the den at other times of the year, are designated as a
22 Class IV-Special and require an extra 14 days of review, and are subject to State Environmental
23 Policy Act (SEPA) review. The lack of confirmed wolf dens in Washington has meant that no forest
24 practice applications for state lands have been affected to date by the wolf critical habitat rule. The
25 rule was established in 1992, but much has been learned since then about habitat issues involving
26 wolves in neighboring states, in particular that large disturbance buffers are not necessary for
27 conservation of the species. This newer information suggests that the rule should be reviewed and
28 modified to reflect prevention of excessive disturbance of occupied dens only during the denning
29 period.

30 31 **C. Private Land** 32

33 As noted above, private lands in Idaho, Montana, and Wyoming have never had wolf-related
34 restrictions placed on them by federal or state agencies. Therefore, minimal impacts to private land
35 uses in Washington are expected due to the presence of wolves. Although WDFW has no legal
36 authority to implement land use restrictions on private lands (with the exception of hydraulic
37 permits), it may nevertheless ask a private landowner to temporarily delay an activity near a den
38 during the denning period, especially while wolves remain state listed.

39
40 The Washington State Forest Practices Act Critical Habitats Rule for threatened and endangered
41 species (WAC 222-16-080), discussed above in Section B, also applies to timber harvest permit
42 applications on private lands. No forest practice applications for private lands have been affected to
43 date by the wolf critical habitat rule.

9. INFORMATION AND EDUCATION

1
2
3
4
5 A well-informed public is essential to gray wolf conservation and some authorities consider outreach
6 efforts to be the highest priority in restoring the species (Fritts et al. 1995, 2003). It is crucial that
7 wolves and wolf management issues be portrayed in an objective and unbiased manner, and that the
8 public receives accurate information on the species. Conflicts with wolves and the solutions and
9 compromises needed to resolve those conflicts must be discussed fairly (Fritts et al. 2003).

10
11 Extensive public outreach was conducted before and during wolf recovery in Montana, Idaho, and
12 Wyoming, with a broad mix of approaches used (Fritts et al. 1995). These efforts conveyed a factual
13 and balanced view of wolves, stressed the differences between wolves and other canids, described
14 the legal and biological rationale for recovery, pointed out that some wolf control must accompany
15 recovery, and emphasized that very few restrictions on use of public or private lands are necessary
16 for wolf recovery. The success of wolf recovery in these states is at least in part due to these
17 information and education efforts.

18
19 Washington's citizens need access to factual information about wolves and wolf management from
20 wildlife managers; and wildlife managers need information from the public on sightings, depredation
21 events, and wolf behavior to effectively manage wolves in the state. With this two-way
22 communication, implementation of the Wolf Conservation and Management Plan will have a higher
23 probability of success and both managers and the public will have the necessary information to
24 make conservation and management decisions to achieve plan objectives. Two-way communication
25 depends on a public that is informed about wolves and ongoing management activities and agency
26 staff who are well informed and willing to listen to the real and perceived concerns of residents
27 about wolves.

28
29 An outreach campaign that is aggressive, rather than passive, in reaching specific groups will best
30 benefit wolf conservation. Information and education strategies must be adaptive, reflecting the
31 adaptive wolf conservation and management strategies described in the overall plan.
32 Communication tools and education methods should be flexible and based on ongoing conservation
33 and management activities, feedback from public attitude surveys, and available funding. To avoid
34 problems with misinformation and perceived bias, agency staff should be well trained about wolves
35 before engaging in education and outreach efforts.

36
37 WDFW has two groups that work on information and education. Most official information
38 dissemination is coordinated by the Public Affairs staff, who work with the news media and update
39 website information. Outreach and Education staff, working with schools, community groups, and
40 other organizations, coordinate most formal education efforts. Strategies and tasks for informing
41 and educating people about wolf behavior, conservation, and management in Washington are
42 presented in Chapter 12.

10. RESEARCH

1
2
3
4
5 Development and implementation of research programs are essential parts of any successful wildlife
6 conservation and management plan. Such programs should provide information that can promote
7 adaptive management and process improvement over time. Future conservation and management
8 actions involving Washington's gray wolves will depend on accurate and complete data related to a
9 broad range of biological and social topics, including population status and impacts on affected
10 resources and human activities.

11
12 Extensive research on wolves and their impacts has been conducted in recent decades in Idaho,
13 Montana, and Wyoming, and has provided excellent information for directing wolf recovery and
14 management in those states. This body of work will be useful in guiding future wolf investigations
15 in Washington. In some instances, the results of this research will be directly applicable to
16 Washington, but in many cases similar studies will be needed in-state because of differences among
17 states in habitat quality, prey availability, human densities, and other characteristics.

18
19 Research will be needed to clarify the understanding of wolves in Washington, their impacts on
20 other species, and to guide the development of longer-term area-specific conservation and
21 management objectives for wolves. Research will likely be conducted by WDFW, other federal (and
22 state agencies, tribes, universities, and other scientists and will rely on cooperative relationships
23 among these entities.

24
25 Important research needs relating to wolf conservation and management in Washington are
26 identified in Chapter 12. Availability of funding and personnel will determine the rate at which
27 research is conducted. Long-term commitments of funding and support will be needed to do this
28 work. Efforts will be made to obtain funding from multiple sources to conduct the needed research.
29

11. REPORTING AND EVALUATION

1
2
3
4
5 The purpose of reporting and evaluation is to determine the success of the plan in meeting the
6 established goals and objectives. Measurements of positive and negative outcomes for wolves and
7 other groups must be identified, compiled, and compared to a standard. Tracking the status and
8 trend of various measurements against a standard will indicate whether implementation of the plan
9 is meeting its goals. An adaptive management approach will be used so that new information can be
10 incorporated into management strategies, which can then be changed if warranted. Strategies for
11 monitoring, evaluating, and reporting the effectiveness of the wolf plan's implementation are
12 presented in Chapter 12. These strategies will begin after this plan goes into effect.

13
14 Benchmarks for measuring progress toward achieving wolf conservation and management in
15 Washington will be whether objectives are being met for recovery (population numbers and
16 distribution), for managing wolf-livestock conflicts and wolf-ungulate conflicts, for public outreach
17 and education, and for law enforcement. While benchmarks measure results, not effort, monitoring
18 those results can help determine whether to modify program objectives or management practices.
19 The Washington Wolf Interagency Committee and a citizen advisory group could assist WDFW in
20 evaluating the effectiveness of wolf conservation and management in Washington. An evaluation
21 could include measuring how well each portion of the plan is being implemented.
22

12. GOALS, OBJECTIVES, STRATEGIES, AND TASKS

The purpose of the Washington Wolf Conservation and Management Plan is to ensure a self-sustaining population of gray wolves in the state and to encourage social tolerance for the species by reducing and addressing conflicts. The following goals, objectives, strategies, and tasks are intended to meet this purpose.

A. Goals

The goals of the Washington Wolf Conservation and Management Plan are to:

- Restore the wolf population in Washington to a self-sustaining size and geographic distribution that will result in wolves having a high probability of persisting in the state through the foreseeable future (>100 years).
- Manage wolf-livestock conflicts in a way that minimizes livestock losses, while at the same time not negatively impacting the recovery or long-term perpetuation of a sustainable wolf population.
- Manage ungulate populations in Washington to maintain harvest opportunities for hunters and an adequate prey base for wolves so that wolf conservation goals can be met.
- Develop public understanding of the conservation and management needs of wolves in Washington, thereby promoting the public's coexistence with the species.

B. Objectives, Strategies, and Tasks

This section identifies objectives, strategies, and tasks associated with the recovery and management of wolves so that the species can be removed from state listed status in Washington.

1. Develop and implement a program to monitor the population status, trends, and conservation and management needs of wolves in Washington.

A comprehensive population monitoring program is an essential part of the wolf conservation and management program and will be conducted throughout the implementation of this plan. Monitoring will begin as wolves become reestablished and be most intense while the species remains classified as state endangered, threatened, and sensitive. Upon delisting, monitoring should transition from counting numbers of successful breeding pairs to numbers of packs or total wolves.

WDFW will have primary responsibility for monitoring wolves, but collaboration with tribes, other state, federal, and provincial agencies, jurisdictions, universities, landowners, local governments, and the public will be necessary for a successful monitoring program. This coordination will be especially important when monitoring animals located on or near federal, tribal, and private lands, and along state borders. In areas where wolves are federally delisted, the U.S. Fish and Wildlife Service will continue its monitoring and reporting for five years, as required by the Endangered Species Act. WDFW will work with the U.S. Fish and Wildlife Service to coordinate monitoring activities during this period.

1
2 1.1. Establish and maintain a minimum of two wolf specialist positions within WDFW to
3 locate wolf packs, monitor wolf movements, and conduct other wolf-related activities.
4

5 1.2. Monitor locations of wolves dispersing into Washington and determine when resident
6 packs and territories become reestablished.
7

8 1.2.1. Use howling and “howlbox” surveys, winter tracking, remote camera surveys,
9 trapping, genetic testing, and other methods to determine locations of
10 recolonizing wolves.
11

12 Refinements in survey methodology developed and tested in other states will be
13 employed in Washington when appropriate.
14

15 1.2.2. Solicit, collect, and evaluate sighting reports by the public and cooperators and
16 conduct follow-up investigations, where warranted, to locate colonizing wolves
17 and packs.
18

19 The public will be encouraged to submit reports of wolf activity and sightings
20 (Appendix L). Outreach will be conducted to encourage the public to provide
21 credible wolf sighting reports. Information on wolf identification and where to
22 report sightings will be included in WDFW publications and on the agency’s
23 webpage. All recent and current sighting reports will be mapped and reviewed to
24 evaluate their accuracy and to look for clusters of reports.
25

26 1.3. Determine the status, trends, distribution, and other population parameters of wolves
27 while listed.
28

29 1.3.1. Trap and radio-collar members of each pack as packs become reestablished.
30

31 Radio telemetry will be an important tool for monitoring wolves while listed.
32 The goal will be to collar the breeding male and female, and as many remaining
33 members of each pack as feasible. An attempt will be made to track at least one
34 member of each pack via radio collars using satellite technology to locate and
35 record an individual’s movements. Captured animals will be genotyped using
36 collected DNA to allow identification and may be marked with a pit tag.
37

38 1.3.2. Determine the locations and numbers of successful breeding pairs, packs, and
39 individual wolves each year.
40

41 Numbers of successful breeding pairs (pups surviving until December 31), packs,
42 and total wolves will be determined annually using the results of radio-tracking
43 and other survey techniques. Packs with territories straddling recovery region (or
44 state) boundaries will be counted only in the area where the den site is located. If
45 the den location is not known with certainty, then other criteria such as amount
46 of time, percent of territory, or number of wolf reports will be used to determine

1 pack residency. Thus, a pack will not be counted in more than one
2 administrative area.

- 3
4 1.3.3. Determine home ranges, mortality, reproductive success, habitat selection,
5 dispersal, and animal health.

6
7 Information from radio tracking and other survey methods will be used to
8 determine ecological and biological characteristics of each pack, such as habitat
9 use, prey selection, locations of den sites and rendezvous sites, number of pups,
10 survival, and mortality.

- 11
12 1.3.4. Assess the genetic characteristics and monitor their health through the collection
13 and analyses of biological samples from live-captured and dead wolves.

- 14
15 1.3.5. Publish an annual report with monitoring results, including status, trends,
16 distribution, and other population parameters for wolves each year, and assess
17 progress toward meeting conservation/recovery objectives.

- 18
19 1.4. Determine the status, trends, distribution, and other population parameters of wolves
20 after delisting.

21
22 Following delisting, wolf populations will be monitored to determine annual population
23 status and trends. Because of the difficulty in validating successful breeding pair status
24 as numbers of packs increase, monitoring efforts will change from determining numbers
25 of successful breeding pairs to numbers of packs or total number of wolves. These
26 efforts may provide an indirect estimator of breeding pairs or alternative measures to
27 assist with determining population size. Some newer techniques (e.g., genetic testing of
28 scat and hair, greater deployment of remote cameras, and use of “howlboxes” and
29 hunter surveys) may prove to be more cost-effective and less intrusive than trapping and
30 radio-collaring (Ausband et al. 2009b, USFWS et al. 2009). Collaring may be used in
31 select situations, such as with wolves that appear in new locations.

- 32
33 1.5. If needed, move individual wolves within Washington for genetic purposes.

34
35 If the results of genetic research (Task 11.2) determine that an isolated wolf population
36 has reduced genetic diversity, an individual wolf from another population/pack may be
37 moved into the population to increase genetic diversity, in an effort to increase
38 population viability. This activity would be conducted solely to facilitate genetic
39 exchange with other populations in the state. Because wolves would already be present
40 in the release area, this would not require a feasibility assessment or reviews under SEPA
41 or NEPA.

42
43 **2. Protect wolves from sources of mortality and disturbance at den sites.**

- 44
45 2.1. Identify human-related and natural sources of mortality.

46

1 Intensive monitoring and research activities will be the primary means of identifying
2 both human-related and natural mortality factors for wolves.

3
4 2.2. Minimize factors contributing to wolf mortality.

5
6 2.2.1. Minimize mortality from lethal control.

7
8 Although lethal control is a necessary tool for reducing wolf depredation on
9 livestock, excessive levels of lethal removal can preclude the recovery of wolf
10 populations, as noted with the Mexican gray wolf in New Mexico and Arizona
11 (USFWS 2005). WDFW will therefore monitor and, if necessary, adjust the
12 extent of lethal removals (including mortalities from lethal take of wolves “in the
13 act” of attacking livestock and domestic dogs) to meet both conservation and
14 management needs. Constraints on lethal control have recently been
15 recommended by Brainerd et al. (2008) to minimize negative impacts on
16 recolonizing wolf populations. They suggested that lethal control be limited to
17 solitary individuals or territorial pairs whenever possible, and that removals from
18 reproductive packs should not occur until pups are more than six months old,
19 the packs contain six or more members (including three or more adults or
20 yearlings), neighboring packs exist nearby, and the population totals 75 or more
21 wolves. Consideration should also be given to minimizing lethal control around
22 or between any core recovery areas that are identified, especially during the
23 denning and pup rearing periods (April to September) (E. Bangs, pers. comm.).
24

25 2.2.2. Minimize mortality from illegal killing.

26
27 Illegal killing is expected to be a source of mortality as wolves recolonize
28 Washington, based on findings from other western states (USFWS 2009).
29 Programs that increase social tolerance for wolves will help reduce this type of
30 mortality. Effective management programs that respond to and limit livestock
31 depredation and provide compensation for losses will be especially important in
32 reducing illegal killing. Education programs that provide accurate information
33 about wolves to the public are equally necessary to reduce this threat. In areas
34 where wolves are federally delisted, the WDFW Enforcement Program will be
35 the lead for investigating illegal killings.
36

37 2.2.3. Minimize mortality from accidental killing.

38
39 Strategies will be implemented to minimize mortality of wolves from incidental
40 shooting and trapping. Information and education efforts are needed to inform
41 hunters and trappers about the presence of wolves in occupied areas of the state.
42 Use hunting, fishing, and trapping regulation pamphlets and other means to
43 provide educational messages and identification materials about wolves,
44 including how to avoid accidental shooting during legal hunting seasons. These
45 programs will assist hunters in becoming proficient at distinguishing wolves from
46 coyotes, and trappers in learning methods for avoiding accidental capture of
47 wolves and what to do if a wolf is inadvertently caught. Incidental trapping of

wolves is expected to be minimal because, with the exception of tribal trappers, licensed trappers in Washington are only allowed to use box and cage traps.

2.3. Minimize disturbance at active wolf den sites.

2.3.1. Review information pertaining to human disturbance of wolf den sites in other states to determine what protective measures may be appropriate in Washington.

Implementation of such measures around wolf den sites would likely be case-specific. Provide information to landowners where den sites are located on timing and duration of denning, and how to avoid disturbance at the den site.

2.3.2. Evaluate the state's Forest Practices Act Critical Habitats Rule for the gray wolf and determine if it should be revised.

The critical habitat rule protecting the den sites of wolves from disturbance or possible adverse impacts from forest practice activities was established in 1992 under the Washington State Forest Practices Act Critical Habitats Rule for threatened and endangered species (WAC 222-16-080). Since that time, a great deal of information and data on these concerns has been collected on wolves in Idaho, Montana, and Wyoming. This information should be used to evaluate whether the rule is still appropriate or if changes should be recommended.

3. Translocate wolves, if needed, to help achieve conservation/recovery objectives.

The overall timeframe for wolves to disperse naturally into Washington and reestablish a population is difficult to predict, but it could take several decades to reach downlisting and delisting objectives. If wolves have exceeded recovery objectives in some recovery regions and not others, then the process will be initiated to evaluate potential translocation of wolves to areas not achieving recovery objectives. Funding for both a feasibility assessment and an implementation plan should be a high priority.

3.1. Determine if wolves are successfully dispersing to each recovery region and establishing successful breeding pairs.

Howling surveys, monitoring of radio-collared individuals, and other methods will be used to determine whether (1) wolves are successfully dispersing to new areas of the state and (2) sufficient numbers of wolves exist in a recovery region to be used as a source for translocation.

3.2. Prepare a feasibility assessment for translocating wolves into recovery areas where recovery objectives have not been met.

The feasibility assessment will investigate whether an adequate amount and configuration of suitable habitat and prey are available to support successful breeding pairs of wolves at potential translocation sites. Federal and state lands will be targeted for inclusion in the assessment, especially those that are forested and have low densities of people and

1 livestock. The connectivity of the potential translocation sites to other locations with
2 wolves will also be considered.

3
4 3.3. Develop an implementation plan for a translocation.
5

6 The implementation plan will be initiated following completion of the feasibility
7 assessment, if it concludes translocation is feasible. If wolves are still federally listed in
8 Washington, WDFW will seek approval from the U.S. Fish and Wildlife Service to
9 translocate wolves within the state. Coordination with the appropriate land management
10 agencies will also occur.

11
12 The implementation plan will investigate and determine the best methods for conducting
13 a translocation (e.g., release methods, disease testing protocols, etc.) and identify and
14 prioritize core release areas. Based on translocations in Idaho and Yellowstone National
15 Park during the 1990s, a genetically diverse founding stock of wolves should be used in
16 the translocation and a location capable of holding several packs and receiving
17 immigrants from other populations should be selected (vonHoldt et al. 2008).

18
19 3.4. Conduct the environmental review process required to evaluate the proposal to
20 translocate wolves.
21

22 If translocation is proposed on federal land, work with the federal land managers to
23 conduct a National Environmental Policy Act (NEPA) review process. If wolves remain
24 federally listed, this will also include a Section 7 consultation with the U.S. Fish and
25 Wildlife Service. A NEPA review would preclude the need for a State Environmental
26 Policy Act (SEPA) review. If the proposal is to translocate wolves onto non-federal
27 land, a SEPA review process would be conducted.
28

29 3.5. Coordinate with federal and state agencies, tribal governments, landowners, and non-
30 governmental organizations on translocation activities.
31

32 3.6. Translocate wolves within Washington.
33

34 Upon completion of SEPA or NEPA review and a decision to implement a
35 translocation, wolves will be captured, radio-collared and permanently marked, and
36 translocated, as specified in an implementation plan.
37

38 3.7. Conduct post-release monitoring of wolves to evaluate translocation success.
39

40 The implementation plan will describe the monitoring needed to evaluate the
41 translocation success. Success will be defined in terms of establishing successful
42 breeding pairs of wolves within the targeted recovery region.
43
44
45
46

1 **4. Develop and implement a comprehensive program to manage wolf-livestock conflicts in**
2 **cooperation with livestock producers.**
3

4 Based on experiences in other states, wolf depredation on livestock is expected to occur in
5 Washington as wolves become reestablished. Resolving wolf-livestock conflicts will require
6 both non-lethal and lethal control responses. Resolution of conflicts will need to be managed
7 in a way that does not jeopardize recovery of the species or require relisting. This approach for
8 managing a listed species is highly unusual, but is required because of the desire to reduce
9 conflicts and build social tolerance for wolves, thereby enhancing the chances for reestablishing
10 the species in the state. It is recognized that there will be some economic costs to producers
11 when conflicts occur. Depredation concerns will be addressed by investigating reported
12 complaints, verifying depredations accurately, implementing depredation management actions
13 to abate or prevent damage, and providing adequate compensation for documented losses in a
14 timely manner.
15

16 4.1. Work with livestock producers to resolve conflicts with wolves.
17

18 The two wolf management specialist positions will work directly with livestock
19 producers in resolving conflicts with wolves. The specialists will also train existing
20 biologists and enforcement staff to work with livestock producers in resolving conflicts.
21

22 4.2. Manage wolf-livestock conflicts using a range of options to reduce the occurrence of
23 depredations and to resolve conflicts associated with depredations.
24

25 4.2.1. Respond to and resolve reported wolf depredation events in a timely period and
26 work with livestock owners to reduce potential conflicts with wolves.
27

28 Depredation management approaches are described in Chapter 4 and
29 summarized in Table 7. Responses to specific depredation events will be based
30 on the local status of wolves to ensure that conservation/recovery objectives are
31 met. Management responses will emphasize non-lethal techniques while wolves
32 are recolonizing and will transition to more flexible approaches as wolves
33 progress toward a delisted status. Livestock producers and the public will be
34 actively informed of and given technical assistance, training, and other resources
35 as available to implement proactive non-lethal wolf management techniques.
36 State personnel and cooperators will receive regular training for investigating
37 complaints and resolving conflicts.
38

39 4.2.2. Provide information and assist livestock owners with obtaining resources
40 necessary to implement non-injurious wolf control techniques such as fladry,
41 hazing supplies, radio-activated guard devices, electric fences, and
42 guarding/herding animals.
43

44 4.2.3. Work with livestock producer organizations, county extension services, the
45 Washington Department of Agriculture, local governments, conservation
46 organizations, and other appropriate groups and agencies to develop and
47 conduct a comprehensive outreach and educational program on methods to

discourage wolf depredation through the use of media materials, workshops, website resources, site reviews, evaluations, and other tools.

4.2.4. Work with state and federal land managers who administer grazing permits in areas of wolf activity to provide permittees with information on resolving wolf-livestock conflicts.

4.2.5. Provide livestock owners with information on how to report suspected livestock depredation and protect the site so that the cause of death can be determined.

4.2.6. Inform public and private land managers of wolf activities on their respective lands.

4.3. Verify reported wolf depredations.

Verification of reported wolf depredations is a critical step in the process of managing depredation problems. Documenting losses is necessary for both the livestock owner and WDFW to understand the severity of the problem, to plan appropriate action, to pay compensation, and to foster good relations between agencies and livestock-owners. Rapid notification of agencies by the livestock owner about suspected depredations is crucial for verification, and a timely response to suspected livestock depredation reports by state or federal staff is critical for accurately determining the cause of death.

4.3.1. Establish a contract with USDA Wildlife Services to assist WDFW staff in responding to wolf depredation calls where wolves are not federally listed.

Prompt response by personnel trained in depredation investigation techniques is important for determining the validity of reported complaints. Either WDFW personnel or USDA Wildlife Services personnel will conduct wolf depredation investigations.

4.3.2. Provide the public with contact numbers so that complaints of suspected wolf depredation can be promptly reported.

If livestock are suspected to have been killed or injured by a wolf, complaints should be reported to WDFW or USDA Wildlife Services as soon as possible, preferably within 24 hours of finding the animal. See Appendix L and the WDFW wolf website for current contact telephone numbers, reporting guidelines, and associated information.

4.3.3. Respond to complaints of suspected wolf depredation in a timely manner.

Upon receiving a complaint involving suspected wolf depredation, WDFW or USDA Wildlife Services will contact the complainant by phone within 24 hours. If agency staff determine that a field investigation is warranted, an on-site inspection will be made within 24 hours of the telephone consultation. In the interim, the livestock operator should be given instructions on how to protect

1 the site. In addition to an on-site inspection, an investigation into a reported
2 wolf complaint may include examination of wolf pack location data and
3 interviews with the complainant, adjacent landowners, and veterinarians.
4

- 5 4.3.4. Complete the investigation about the suspected wolf depredation and provide
6 the final results.
7

8 Upon completion of the investigation, the complaint will be classified as one of
9 the following: confirmed wolf depredation, probable wolf depredation,
10 confirmed non-wolf depredation, unconfirmed depredation, non-depredation, or
11 unconfirmed cause of death (see definitions in Chapter 4, Section G). Results of
12 the investigation will be provided to the complainant. Confirmed and probable
13 wolf depredations will be eligible for compensation under this plan. Where
14 appropriate, land management agencies will also be notified of the results of
15 depredation investigations. If a reported complaint is determined by trained
16 personnel authorized by WDFW to be a confirmed non-wolf depredation or
17 unconfirmed depredation, the incident will be recorded. If wild animals other
18 than wolves are determined to be the cause of the depredation, WDFW or other
19 authorized personnel will provide the appropriate assistance. Appropriate
20 assistance depends on the species involved and may include providing technical
21 or operational assistance.
22

- 23 4.4. Provide compensation for livestock losses due to wolves and to implement proactive
24 deterrents to reduce such depredations.
25

- 26 4.4.1. Develop a program to compensate livestock operators for confirmed and
27 probable wolf livestock losses.
28

29 WDFW will develop a program and process to implement the recommended
30 compensation rates for the two-tiered payment plans identified in Chapter 4,
31 Section G, for confirmed and probable depredation by wolves.
32

- 33 4.4.2. Process and reimburse valid compensation claims for confirmed and probable
34 wolf depredations within a timely period.
35

36 4.4.2.1. Develop an application and reimbursement process, including forms
37 and instructions to applicants.
38

39 4.4.2.2. Provide technical assistance to help applicants apply for
40 reimbursement.
41

42 4.4.2.3. Respond to applications within a reasonable time frame, e.g., 14 days,
43 by either affirming the claim and initiating payment or seeking
44 additional justification for the claim.
45
46

- 1 4.4.3. Develop a program to compensate livestock operators for unknown livestock
2 losses.

3
4 WDFW will work with a multi-interest stakeholder group to consider a
5 compensation program for unknown losses based on the criteria provided in
6 Chapter 4, Section G. If such a program is developed, it should include
7 standards for devising appropriate procedures for documenting historical and
8 current-year livestock losses, determining the validity of claims, and paying valid
9 claims.

- 10
11 4.4.4. Secure a funding source to provide compensation for confirmed, probable, and
12 unknown livestock losses from wolves.

13
14 WDFW will work with livestock producers and other members of the public to
15 explore funding sources for the compensation program, including state
16 appropriations (such as those authorized under Substitute House Bill 1778),
17 foundations, and other sources. Legislative support for funding for
18 compensation will be sought.

- 19
20 4.4.5. Ensure a high degree of accountability within the compensation programs.

21
22 A compensation program for unknown losses will need to include as part of that
23 process a mechanism to ensure that the program has a high degree of
24 accountability. This may involve some sort of multi-interest review board to
25 determine valid claims, or strict criteria that are agreed upon by a multi-interest
26 group.

- 27
28 4.4.6. Secure a funding source for implementing proactive non-lethal deterrents to
29 reduce livestock losses from wolves.

30
31 Use of proactive non-lethal tools by livestock producers will be encouraged as a
32 way of reducing depredations by wolves. Funding for this activity could be
33 included as part of Task 4.4.4, which seeks funding to compensate producers for
34 livestock losses. Defenders of Wildlife has stated its intention to make its Bailey
35 Proactive Carnivore Conservation Fund available to producers in Washington
36 for this purpose. However, it is unclear how much funding will be available
37 under this program, so additional sources would be desirable.

- 38
39 4.5. Cooperate with other entities to resolve wolf-livestock conflicts.

40
41 Cooperative relationships and agreements with other state, federal, and provincial
42 agencies, tribes, landowners, local governments, and non-governmental entities will be
43 developed and implemented to address depredation concerns. Close coordination with
44 USDA Wildlife Services will be necessary to respond to wolf damage problems in a
45 timely manner. Details regarding who will respond and what protocols are followed will
46 be essential to successfully address wolf conflicts. Non-governmental organizations
47 such as Defenders of Wildlife, Washington Cattlemen's Association, and Washington

1 State Sheep Producers will be engaged to assist on aspects of wolf-livestock conflict
2 management.

3
4 **5. Manage ungulate populations and habitats in Washington to provide an adequate prey**
5 **base for wolves and to maintain harvest opportunities for hunters.**

6
7 5.1. Monitor ungulate populations in areas occupied by wolves.

8
9 WDFW and its cooperators already conduct surveys of annual production, recruitment,
10 and harvest of ungulate populations in the state. These data are used to monitor
11 population abundance, and trends, and to make recommendations for hunting seasons
12 and other management actions. Nevertheless, management of many populations would
13 benefit from increased survey intensity to improve the precision and accuracy of
14 information. Improvements in survey protocols may enhance efforts to assess the
15 impacts of wolves on prey and to determine if changes in ungulate management
16 strategies are needed.

17
18 5.2. Enhance ungulate populations wherever possible, subject to habitat limitations and
19 landowner tolerance.

20
21 Maintaining robust prey populations will result in three key benefits for wolf
22 conservation in Washington: (1) providing wolves with an adequate prey base, (2)
23 supplying hunters and recreational viewers of wildlife with continued opportunities to
24 hunt and observe game, and (3) reducing the potential for livestock depredation by
25 providing an alternative to domestic animals. Implement management plans for deer
26 and elk to increase their abundance in areas occupied or likely to be occupied by wolves.

27
28 5.2.1. Improve habitat for ungulate populations.

29
30 Healthy ungulate populations rely on adequate summer and winter habitat. Deer
31 and elk are generally most abundant in early successional forests, but this habitat
32 has declined in many parts of Washington in recent decades due to reduced
33 timber harvest, fire exclusion, intensification of reforestation methods,
34 development, and other causes.

35
36 WDFW will work with other public land agencies, private landowners, non-
37 governmental organizations (e.g., Rocky Mountain Elk Foundation, Mule Deer
38 Foundation), and tribal governments to cooperatively manage forestlands and
39 winter habitat for the benefit of ungulate populations and wolves. This will
40 include the use of appropriate management practices to improve forage quality in
41 various habitats; manage some habitats preferentially for ungulates; reduce road
42 densities and off-road vehicle use in critical habitat; maintain open habitats (e.g.,
43 meadows), winter habitats, and productive early successional habitat; improve
44 control of noxious weeds; and protect valuable lands through acquisitions, leases,
45 landowner agreements, and other methods.

46

- 1 5.2.2. Manage recreational hunting to ensure sufficient prey for viable wolf populations
2 while maintaining hunting opportunities for hunters.
3

4 Recreational hunting comprises the largest mortality source for elk and deer
5 populations in Washington (Smith et al. 1994, McCorquodale et al. 2003).
6 Hunter take of antlerless animals is one of the primary tools used to manage
7 ungulate population levels in the state. In some cases, management requires
8 adjustment of harvest levels if localized ungulate populations decline due to any
9 of a variety of factors such as severe weather, disease, overharvest, predation, or
10 habitat loss. In the future, situations may arise where consideration would be
11 given to adjusting recreational harvest levels to maintain ungulate populations at
12 desired management objectives and provide adequate prey for wolves. Greater
13 restrictions on antlerless hunting and increased road closures (e.g.,
14 McCorquodale et al. 2003) are two means of achieving this goal.
15

- 16 5.2.3. Reduce illegal hunting of ungulate populations in wolf-occupied areas.
17

18 Illegal hunting remains a significant source of mortality among elk and deer
19 populations in Washington (Table 10). Smith et al. (1994) recommended
20 increased patrolling during October, November, and December, when most elk
21 poaching occurs. They also recommended concentrating patrols within 30 miles
22 of human population centers and in locations with high hunter and road
23 densities because most poaching occurs in these areas.
24

- 25 5.3. Manage wolf-ungulate conflicts
26

- 27 5.3.1. Manage conflicts at winter-feeding stations and sites with game fencing.
28

29 Wolves could eventually be attracted to WDFW-operated winter-feeding stations
30 for elk and bighorn sheep and to other locations where fences have been built to
31 keep ungulates off croplands and highways. If wolf disturbance at these sites
32 proves serious, it could cause some elk to disperse into agricultural lands and
33 highway rights-of-way. These situations will be evaluated on a case-specific basis
34 to determine if management responses are needed and, if so, what the responses
35 should be. In some cases, it may be desirable to develop a response plan in
36 advance to address an anticipated conflict.
37

- 38 5.3.2. Manage conflicts with ungulate populations.
39

40 Wolf predation is not expected to harm ungulate populations across broad
41 geographic areas of the state. While it is possible for wolf predation to have an
42 effect on ungulate abundance in localized areas, this most often occurs where
43 ungulate populations are already compromised. Other factors such as declining
44 habitat quality, hunter harvest, severe weather conditions, and predation by other
45 carnivores are expected to exert far greater influence on ungulate abundance. In
46 the future, following delisting, if research determines that wolf predation is
47 significantly contributing to declines in specific localized at-risk ungulate

1 populations, site-specific strategies may be developed to address predation
2 effects. These may include consideration of moving wolves, lethal control, or
3 other non-lethal control techniques.

4
5 5.4. Integrate management of multiple species.

6
7 Management of ungulate and carnivore populations should be integrated on an
8 ecological basis. The statewide Game Management Plan includes chapters for each of
9 Washington's major ungulate and carnivore species (WDFW 2008) and management
10 plans exist for eight of the state's 10 elk herds and for bighorn sheep (WDFW 1995,
11 2001b, 2002a, b, c, d, 2005, 2006a, b). Achieving management goals for all of these
12 species will be enhanced if the plans are considered collectively. Coordination among
13 public agencies, landowners, tribes, and non-governmental organizations is also
14 necessary to meet management goals.

15
16 **6. Manage wolf-human interactions to reduce human safety concerns, prevent habituation**
17 **of wild wolves, decrease the risk of conflicts between domestic dogs and wolves, and to**
18 **build awareness of the risks posed by wolf hybrids and pet wolves.**

19
20 6.1. Respond to human safety concerns.

21
22 Attacks on humans by healthy wild wolves are extremely rare events. However, when
23 necessary, WDFW or a cooperating agency will take action if the continued presence of a
24 wolf or wolves poses concerns for human safety, consistent with existing policy for black
25 bears and cougars.

26
27 6.1.1. Provide information to the public on the low risk of attacks on humans by
28 wolves, how to prevent and react to wolf attacks, and other concerns.

29
30 In particular, provide information to people who might encounter wolves,
31 including hunters, trappers, rural landowners, outdoor recreationists, outfitters
32 and guides, forest workers and contractors, other natural resource workers.

33
34 6.1.2. Respond to reported wolf-human interactions of concern in a timely manner.

35
36 Reports of wolf-human interactions of concern will receive a high priority and be
37 investigated by trained personnel authorized by WDFW. Reported wolf-human
38 safety concerns will be verified and evaluated on a case-by-case basis before
39 management actions are initiated, unless circumstances necessitate immediate
40 action.

41
42 6.1.3. Develop WDFW response protocols for reported wolf-human conflicts.

43
44 Protocols similar to those used in responding to human safety concerns
45 involving cougars and black bears will be prepared and implemented. Non-lethal
46 methods will be used first unless the situation dictates a more aggressive
47 response, including immediate lethal control (NPS 2003).

1
2 6.1.4. Move individual wolves if needed to resolve conflicts.
3

4 As described in Chapter 4, Section B, relocation could occur proactively when a
5 wolf or wolves are present in an area that could result in conflict with humans or
6 harm to the wolf. Wolves would be moved to suitable remote habitat on public
7 land, generally within the same recovery region, at the direction of WDFW and
8 in collaboration with responsible land managers. Relocated individuals will be
9 released in areas unoccupied by other wolves. This could be near, but not
10 within, the territories of existing wolf packs.
11

12 6.2. Take actions to reduce the chances that wolves will become habituated to humans.
13

14 6.2.1. Inform the public on the risks of habituation and the actions that can be taken to
15 prevent it from occurring.
16

17 A number of recommendations exist for people to prevent the habituation of
18 wolves, such as not letting wolves become comfortable around humans or
19 human-inhabited areas, not leaving food outdoors, and not feeding wolves
20 (Chapter 7, Section A).
21

22 6.2.2. Work with land management agencies on actions that can be taken to reduce the
23 chances of wolves becoming habituated to humans.
24

25 Examples of such actions would include, where appropriate, the installation of
26 wildlife resistant food and garbage storage structures at recreation sites and the
27 posting of signs and other educational materials at trailheads and campgrounds.
28

29 6.2.3. Provide information on avoiding wolf habituation to humans, thereby
30 minimizing the need for lethal management responses.
31

32 6.3. Manage wolf-pet conflicts.
33

34 Situations where wolves and pet dogs (including hunting and service dogs) encounter
35 each other can result in dog mortality. As wolves expand their range in Washington, dog
36 owners must be made aware of the potential risks to their animals and become informed
37 on methods for avoiding interactions with wolves. WDFW wolf specialists should
38 provide informational materials to dog owners who live or recreate in wolf habitat,
39 which explains how to prevent and react to wolf attacks on dogs. Because dogs can
40 transmit disease into wolf populations, the public should be informed and educated
41 regarding the importance of keeping pets vaccinated against rabies, canine parvovirus,
42 and other canid diseases.
43

44 6.4. Address issues regarding wolf hybrids and pet wolves.
45

46 6.4.1. Work with local jurisdictions, veterinarians, and non-governmental organizations
47 to discourage the ownership of wolf hybrids by members of the public and to

1 prevent the release of wolf hybrids into the wild. Ownership of pet wolves is no
2 longer allowed in Washington unless the animal was possessed prior to the
3 passage of state law RCW 16.30 in July, 2007. Provide information to the public
4 and local jurisdictions about the new law. Develop and deliver educational
5 messages for wolf hybrid and pet wolf owners about the dangers that hybrids
6 and pet wolves pose to wild wolf recovery and human safety. Information
7 efforts should be aimed at communities where wolf hybrids and pet wolves
8 might be confused with wild wolves.

9
10 6.4.2. Explore options for having a voluntary registration of wolf hybrids in
11 Washington, similar to Montana Fish, Wildlife & Park's program.

12
13 6.4.3. Support efforts to further regulate wolf hybrids in Washington.

14 15 **7. Maintain and restore habitat connectivity for wolves in Washington.**

16
17 Safe passage within and between habitat areas is vital for allowing wolves to recolonize
18 unoccupied habitat and for promoting genetic and demographic exchange between
19 subpopulations.

20
21 7.1. When evaluating lands within landscapes that might provide connectivity for large-
22 ranging carnivores, consider areas that would benefit wolf dispersal and connectivity
23 between populations.

24
25 In Washington, areas of greatest importance for restoring or maintaining connectivity
26 between regions of suitable wolf habitat currently include the upper Columbia-Pend
27 Oreille valleys, Okanogan Valley, Steven Pass-Lake Chelan, Snoqualmie Pass, and the I-5
28 corridor between the southern Cascades and the Willapa Hills-Olympic Peninsula
29 (Singleton et al. 2002; S. Fitkin, pers. comm.). Other areas may be recognized in the
30 future. Mechanisms to conserve lands and maintain working landscapes include
31 conservation easements, agreements or land acquisitions with willing landowners, and
32 other methods.

33
34 7.2. Coordinate with neighboring states and British Columbia to ensure cross-border
35 connectivity between wolf populations.

36
37 7.3. Increase opportunities for wolves to safely move across landscapes.

38
39 Where appropriate, work with the Washington Department of Transportation to create
40 wildlife crossing structures for assisting wolf movement across highways that act as
41 barriers. Use education and enforcement programs to help reduce illegal and accidental
42 killing of wolves in landscapes used by dispersing wolves.

43 44 **8. Manage conflicts between wolves and state and federal listed/candidate species.**

45
46 Conflicts between wolves and other listed/candidate species may occur in the future.

47

1 8.1. If conflicts between wolves and other state and federal listed/candidate species occur,
2 make case-specific evaluations to determine if management responses are needed and, if
3 so, what the responses should be.
4

5 If wolves are federally listed, or if conflicts involve federally listed species, work with
6 U.S. Fish and Wildlife Service to plan and implement appropriate responses.
7

8 8.2. If determined to be needed, develop a response plan in advance to address an anticipated
9 conflict.
10

11 For some species (e.g., mountain caribou), it may be desirable to have a response plan
12 already developed. Determine appropriate potential response options.
13

14 **9. Develop and implement a comprehensive outreach and education program.** 15

16 A comprehensive outreach and education program will be needed to provide accurate and
17 updated information on wolf conservation and management and to prepare Washington
18 residents to coexist with wolves. Such a program will have many aspects to address the varied
19 types of information needs.
20

21 9.1. Provide information to the public about ongoing wolf conservation and management
22 activities.
23

24 9.1.1. Develop a wolf outreach and information plan for Washington.
25

26 9.1.2. Implement wolf outreach and education efforts with programs and materials
27 appropriate for key audiences.
28

29 9.1.3. Provide information on wolf biology, habitat use, history in Washington, status,
30 and threats. As information becomes available, and is appropriate (i.e.,
31 information must be non-sensitive), have maps of current wolf pack territory
32 polygons on the WDFW website. Include links to the websites of other
33 government agencies and non-government organizations with additional wolf
34 information. Update the WDFW website with information on implementation
35 of the wolf plan and adaptive management, including public feedback tools such
36 as surveys and blogs.
37

38 9.1.4. Issue news releases to news media and e-subscribers, as needed, about significant
39 wolf activity or plan implementation, including field activities, new research,
40 management responses, and public conduct advisories.
41

42 9.1.5. Work with local communities, land management agencies, and others to develop
43 safe and unobtrusive wildlife viewing opportunities for wolves, as they may
44 develop in the future.
45
46

-
- 1 9.2. Develop and provide training, information, and education programs to address concerns
2 over wolf-livestock conflicts.
3
- 4 9.2.1. Provide livestock producers with training in methods to prevent, reduce, and
5 respond to wolf-livestock conflicts or depredations, using USDA Wildlife
6 Services staff in Washington and the experience of USDA Wildlife Services field
7 staff in Idaho, Montana, and Wyoming.
8
- 9 9.2.2. Provide livestock producers with information on response options that they can
10 take to protect their livestock from wolves, as described Chapter 4, Section E,
11 and summarized in Table 7. Provide updates on these options as wolf listing
12 designations change.
13
- 14 9.2.3. Inform livestock producers on how to report suspected wolf depredations.
15
- 16 9.2.4. Contact public and private land managers about wolf activities on their lands.
17 Provide ongoing wolf monitoring information to livestock producers as needed.
18
- 19 9.3. Develop and provide information and education programs for hunters, people viewing
20 ungulates, and others to address concerns over wolf-ungulate interactions.
21
- 22 9.3.1. Provide information on ungulate population status and trends in Washington.
23 Provide research results from Washington or elsewhere on wolf diet, wolf-
24 ungulate relationships, and wolf-ungulate population studies.
25
- 26 9.3.2. Communicate information for hunters and wildlife viewers through the WDFW
27 website (e.g., Wolf, “Living with Wildlife,” and wildlife viewing webpages);
28 presentations to the WDFW Game Management and Wildlife Diversity Advisory
29 Councils, hunting groups, and wildlife viewing organizations; and WDFW hunter
30 education course materials.
31
- 32 9.4. Develop and provide training, information, and education programs for the public on
33 how to co-exist with wolves.
34
- 35 9.4.1. Produce and distribute informational materials and give presentations and
36 workshops on how to safely live, work, and recreate in areas occupied by wolves.
37 When possible, integrate training and educational opportunities about wolves
38 with information about living with other carnivores in Washington, such as
39 cougars, bears, and coyotes. A similar program that has been conducted in
40 Washington, Oregon, and Idaho is the “Living with Carnivores” program. Such
41 programs can be sponsored cooperatively by multiple agencies and organizations.
42
- 43 9.4.2. Distribute information at backcountry trailheads and other appropriate outlets
44 on wolf identification, behavior, dealing with wolf encounters, methods for
45 avoiding wolf habituation, and the potential for negative interactions with
46 domestic dogs.
47

1 9.4.3. Give presentations to provide information to the public about coexisting with
2 wolves in Washington.
3

4 Before conducting outreach, it is important that any potential staff that might be
5 giving presentations (including WDFW) receive accurate background
6 information about wolves on an ongoing basis so that they can present
7 consistent and factual messages about wolf conservation and management to the
8 public. Target communities closest to the most wolf activity and conduct open
9 houses, town hall meetings, or other events to teach co-existence with wolves.
10

11 9.4.4. Work with other agencies and organizations to promote wolf outreach.
12

13 Work with agencies and a variety of non-governmental and tribal organizations
14 to conduct effective information and education programs about living,
15 recreating, and working with wolves in Washington. These entities could assist
16 in the development and presentation of wolf education materials to the public.
17

18 A potential model for community outreach is the Grizzly Bear Outreach Project
19 (GBOP), a non-governmental organization (<http://www.bearinfo.org>). The
20 project engages community members in a process of education and multi-party
21 dialogue and provides a non-advocacy setting for the involvement of all
22 stakeholder groups. The approach includes:

- 23 • Assessing the knowledge and attitudes of community members prior to
24 implementing education components.
- 25 • One-on-one meetings between project staff and community members to
26 gauge concerns and share information.
- 27 • Small focus group meetings to discuss grizzly bear issues with 4–6 people
28 at a time in informal settings.
- 29 • A coalition of community members to provide a local information source
30 and extend the reach of project staff.
- 31 • A project brochure containing information about grizzly bear ecology,
32 and sanitation and safety tips for the home, ranch, and campsite for
33 distribution to hikers, horse packers, hunters, fishers, and communities.
- 34 • A modular slide show paralleling the content of the brochure.
- 35 • A project website for distribution of information and solicitation of
36 comments from the public.
37

38 A similar program for wolves could be developed for selected local communities.
39

40 9.5. Develop and provide informational material about wolves and co-existing with them for
41 use in school classrooms, environmental learning centers, and other appropriate outlets.
42

43 9.5.1. Develop and distribute materials for K-12 classrooms.
44

45 Develop lesson plan kits that include sets of materials and activities for students
46 to learn about wolves (identification, biology, behavior, habitat use, history in

1 state, etc.), using WDFW education webpages and as many already established
2 wolf education resources as available and appropriate.

3
4 9.5.2. Develop a wolf education webpage.

5
6 Work with outreach and education staff to develop a wolf education webpage to
7 assist with lesson planning and presentations, serve as a clearinghouse for
8 approved and appropriate links to more wolf education materials, and provide
9 online learning games and activities.

10
11 9.6. Determine public attitudes towards wolves and their recovery in the state.

12
13 Conduct public attitude surveys in Washington to determine current perceptions about
14 wolves and needs for information and education. Make follow-up surveys to determine
15 the effectiveness of outreach programs relating to wolves and whether changes are
16 needed in these programs.

17
18 **10. Coordinate and cooperate with public agencies, landowners, tribes, and non-**
19 **governmental organizations to help achieve wolf conservation and management**
20 **objectives.**

21
22 10.1. Coordinate and communicate with other entities and jurisdictions to share resources,
23 reduce costs, and avoid potential duplication of effort.

24
25 10.1.1. Develop memoranda of understanding or cooperative agreements, if appropriate,
26 to spell out roles and responsibilities and to ensure that certain actions are
27 conducted in a timely manner.

28
29 It will be desirable to have key contact people identified in advance to facilitate
30 rapid responses and decision making during conflict situations. Coordination
31 with the following agencies and entities will be important: USDA Wildlife
32 Services; U.S. Fish and Wildlife Service; U.S. Forest Service; National Park
33 Service; Bureau of Land Management; tribal governments; Washington
34 Department of Natural Resources; Washington Department of Agriculture;
35 Washington Department of Transportation; other Washington state agencies;
36 county governments; private landowners; law enforcement entities including the
37 U.S. Fish and Wildlife Service, U.S. Forest Service, and county sheriff
38 departments; natural resource agencies in neighboring states and British
39 Columbia; and non-governmental organizations such as the Defenders of
40 Wildlife, Washington Cattlemen's Association, Washington State Sheep
41 Producers, Washington Farm Bureau, and hunting organizations.

42
43 10.1.2. Work with adjacent states and British Columbia to encourage maintenance of
44 populations and habitat connectivity to support long-term viability of wolf
45 populations in Washington.

46
47

1 10.2. Cooperate with other entities to secure funding for wolf conservation and management.
2

3 Recovery of wolves in Washington through the conservation and management activities
4 described in this plan will be expensive and require long-term funding from new sources.
5 WDFW will seek funding from a variety of sources, including special state or federal
6 appropriations, private foundations, and other private sources. Coordination with other
7 agencies and non-governmental organizations will ensure the optimal use of resources
8 devoted to wolf conservation and management.
9

10 **11. Conduct research on wolf biology, conservation, and management in Washington.**
11

12 Seek funding and initiate partnerships with universities and other entities to carry out research
13 on wolf biology, conservation, and management in Washington. The WDFW will initiate wolf
14 research if important management questions arise that could be answered through research and
15 monitoring. Universities and other entities may also be interested in partnering and/or
16 initiating research on the following topics and/or on more purely science-based questions.
17

18 11.1. Determine wolf population status, pack sizes and distribution, mortality rates and causes,
19 productivity, rates of recolonization, dispersal behavior, and disease/health status in
20 Washington.
21

22 Long-term research should be conducted on pack establishment, home ranges and
23 movements of packs and lone animals, diet, habitat use, population dynamics, sources of
24 mortality, diseases, threats to wolves and other factors limiting the reestablishment of
25 populations, and related topics. Data from these studies and monitoring efforts should
26 then be used to model the estimated size, viability, and habitat use of the state's wolf
27 population, as well as to identify information gaps for additional surveys and research.
28

29 11.2. Determine the genetic relationships of recolonizing and established wolves to assess
30 rates of gene flow, genetic diversity, risk of inbreeding, and sources of recolonizing
31 individuals.
32

33 11.3. Determine the impacts of wolves on prey and other carnivore populations as wolves
34 become reestablished.
35

36 Predator-prey relationships are inherently complex, especially in systems with multiple
37 prey and predator species, as will be the case with wolves and their ungulate prey in
38 Washington. These studies will require baseline data on prey and carnivore populations
39 prior to wolf recolonization to help assess the impacts of wolves during and after their
40 reestablishment. Such studies should also examine landscape-level effects.
41

42 11.3.1. Determine the prey selection of wolves in Washington.
43

44 The year-round food habits of wolves should be identified in multiple regions of
45 the state. Elk and/or deer are expected to comprise the vast majority of prey in
46 most locations, but the contribution of other species (e.g., moose, bighorn sheep,
47 mountain goats) is also of interest. Prey selection will likely vary with season,

1 location, and species availability. Age and sex of prey should also be investigated
2 and compared with availability.

3
4 11.3.2. Investigate the dynamics of ungulate populations in areas occupied by wolves.

5
6 If management questions arise about the status of ungulate populations in areas
7 occupied by wolves, the ungulate populations in those areas should be
8 investigated in greater detail to obtain improved information on abundance,
9 demographic parameters, and sources of mortality. This information would
10 provide a strong foundation for determining the extent that wolves or other
11 factors affect prey populations and for making sound management decisions.

12
13 11.4. If it is determined to be needed, conduct research on wolf depredation of livestock and
14 domestic animals.

15
16 As wolves become reestablished, investigations may be needed on the levels and effects
17 of depredation on livestock and other domestic animals, and the factors influencing
18 depredation. Improved baseline data on depredation levels by other carnivores prior to
19 wolf recolonization will be necessary to assess the impacts of wolves during and after
20 their reestablishment. There is also a strong need to conduct research on non-lethal
21 control methods to reduce wolf depredation on livestock.

22
23 11.5. Conduct research on the broader ecological impacts that wolves have on plant and
24 wildlife communities.

25
26 As noted at Yellowstone National Park, wolves have the potential to affect ecosystems
27 through regulation of ungulate abundance, thereby benefiting a variety of plants,
28 habitats, and animals. These types of ecological interactions should be investigated in
29 the future as wolves become reestablished in Washington.

30
31 **12. Report on and evaluate implementation of the plan.**

32
33 12.1. Centralize data collected during the wolf monitoring program.

34
35 WDFW will maintain a centralized database of wolf monitoring data and results to
36 ensure accurate and consistent information is shared with wolf co-managers and the
37 public. WDFW maintains a centralized database (Wildlife Resource Data System) and
38 will retain copies of data collected during annual monitoring activities.

39
40 12.2. Publish an annual report summarizing information from wolf conservation and
41 management activities.

42
43 Because of the intense interest in wolves and the implementation of this plan, WDFW
44 will produce an annual report summarizing all the activities and results of wolf
45 conservation and management that occurred in Washington during the previous year.
46 The first report will be written one year after adoption of this plan. Reports will be
47 similar to those produced by other western states (e.g., USFWS et al. 2009) and will

1 provide summaries of monitoring results with information on population status,
2 distribution, reproduction, population growth, and mortality; documented depredation
3 on domestic animals and management responses; law enforcement; research; outreach;
4 and other activities pertinent to wolves. The annual report will be available to the public
5 on the WDFW agency website and provided to the Washington Fish and Wildlife
6 Commission, elected officials, and any others requesting copies. Upon request, the
7 Commission, Legislature, and others will be briefed and updated regarding the plan's
8 implementation.

- 9
10 12.3. Evaluate WDFW's effectiveness in meeting the wolf plan goals, objectives, and
11 strategies.

12
13 12.3.1. Develop measures to track progress toward meeting the objectives of this plan.

14
15 Measures to track progress might include: estimates and trends over time in the
16 numbers and distribution of successful breeding pairs, packs, and total wolves;
17 numbers and success of responses to wolf-livestock conflicts, numbers of wolf-
18 human interactions, and extent of impacts on ungulate populations.

19
20 12.3.2. Review the effectiveness of the plan's implementation every five years.

21
22 WDFW will evaluate the status of Washington's wolves and the effectiveness of
23 implementing the conservation and management plan every five years, with the
24 first review expected in 2014. Measures identified under Task 12.3.1 will be used
25 to assess progress in implementing the plan's objectives and areas where
26 improvements and adaptive management are needed. The Washington Wolf
27 Interagency Committee and a citizen advisory group will be asked to provide
28 feedback on the evaluation.

- 29
30 12.4. Use the Washington Wolf Interagency Committee to help coordinate implementation
31 and monitoring of the wolf plan.

32
33 There is currently a Washington Wolf Interagency Committee, consisting of members
34 from WDFW, USDA Wildlife Services, U.S. Fish and Wildlife Service, U.S. Forest
35 Service; National Park Service, tribal governments, Washington Department of Natural
36 Resources, and Washington Department of Transportation. In the future, participation
37 could be expanded to include other state, federal, and local agencies, as well as wildlife
38 management agencies in Idaho, British Columbia, and Oregon. The purpose of the
39 committee is to coordinate wolf management across land ownerships in the state.
40 Meetings are open and available to the public. The group should prepare an annual
41 report of its activities and contribute to five-year evaluations assessing the effectiveness
42 of the wolf plan's implementation.

1 12.5. Form a citizen advisory group to provide public feedback on implementation of wolf
2 conservation and management in Washington.

3
4 A citizen advisory group will be formed to provide feedback to WDFW on
5 implementation of the conservation and management plan. Aspects addressed might
6 include wolf conservation activities, depredation control activities, the impacts of
7 outreach and education, reviewing problems, and determining needs for new adaptive
8 management procedures. Membership of the advisory group should include a balanced
9 representation of the range of stakeholder values regarding wolf reestablishment in
10 Washington.

13. IMPLEMENTATION SCHEDULE AND COSTS

1
2
3
4
5 This chapter includes preliminary annual cost estimates beyond those already expended by existing
6 resources to implement some of the most important tasks in the Wolf Conservation and
7 Management Plan during the next six years (fiscal years 2010-2015). Adequate funding for
8 implementing conservation and management activities is key to the long-term success of the overall
9 plan. Overall program costs are expected to be smaller during the initial years of wolf
10 reestablishment when there are fewer wolves to monitor and few claims for compensation of
11 livestock losses, and are expected to expand over time. Some sources of funding for these activities
12 will be federal endangered species recovery grants, shared costs with partner agencies and non-
13 governmental organizations, research grants, and state nongame and endangered species funding.
14 Suggestions have also been made to create a wolf license plate that would fund wolf management
15 activities (this would have to wait until a moratorium on creating new background license plates is
16 lifted). Revenues from hunting licenses and game program funds would be used for managing game
17 populations, but would not be used for the wolf management program. If wolves become a game
18 species following delisting, game funds would be used for management. Some parts of the
19 recommended program, such as funding for compensation, will likely come from non-profit
20 organizations as well as from the Washington State Legislature.

21
22 Table 11 identifies the conservation and management tasks, task priorities, parties responsible for
23 actions (either carrying out or funding), and annual estimated costs for the tasks over the next six
24 fiscal years. Responsible parties are agencies or organizations with authority, responsibility, or
25 expressed interest to implement a specific conservation or management action. When more than
26 one party has been identified, the proposed lead is the first party listed. The listing of a party in the
27 table does not require them to implement the action(s) or to secure funding for implementing the
28 action(s). Costs are estimates per fiscal year in thousands of dollars and are not corrected for
29 inflation.

30
31 Estimates of costs came from a variety of sources including comments submitted during comment
32 periods, discussion with government agencies and organizations about current expenditures and
33 readily available budget information for ongoing programs. There are several ongoing programs in
34 place that benefit wolves that would be carried out regardless of the status of wolves. Only some
35 estimates of partial costs of these ongoing programs (e.g., habitat management for ungulates) that
36 can be directly linked to the conservation and management of wolves are included at this time.

37
38 **Cost estimates in Table 11 do not mean that funds have been designated or are necessarily**
39 **available to complete the recovery tasks; they are an estimate of the level of new funding**
40 **needed to carry out the task. Implementation of conservation and management strategies is**
41 **contingent upon availability of sufficient funds to undertake recovery tasks.**
42
43
44
45
46
47

1	Acronyms for landowners and agencies are:
2	
3	BCME British Columbia Ministry of Environment
4	BLM USDA Bureau of Land Management
5	CES County extension services
6	CMG County and municipal governments
7	DA Washington Department of Agriculture
8	DFW Washington Department of Fish and Wildlife
9	DNR Washington Department of Natural Resources
10	DOT Washington Department of Transportation
11	FS USDA Forest Service
12	FWS USDI Fish and Wildlife Service
13	IDFG Idaho Department of Fish and Game
14	LE Law enforcement agencies, such as the Washington State Patrol, county sheriff
15	departments, and municipal police departments
16	MFWP Montana Fish, Wildlife and Parks
17	NGO Non-governmental organizations, such as the Defenders of Wildlife, Washington
18	Cattlemen’s Association, Conservation Northwest, Washington Sheep Producers,
19	Washington Farm Bureau, hunting organizations, and The Nature Conservancy
20	NPS USDI National Park Service
21	ODFW Oregon Department of Fish and Wildlife
22	PL Private landowners (e.g., large timber companies as well as ranchers and smaller forest
23	landowners, etc.)
24	TR Interested tribal governments
25	UN Universities
26	WS USDA Wildlife Services

1

Table 11. Preliminary cost estimates for initial implementation of important tasks in the Washington Wolf Conservation and Management Plan. Costs are estimates per fiscal year in thousands of dollars and are not corrected for inflation. Cost estimates do not mean that funds have been designated or are necessarily available to complete the recovery tasks; they are estimates of the level of funding needed to carry out the task. The listing of a party in the table does not require them to implement the action(s) or to secure funding for implementing the action(s), but indicates partners that may be interested in collaborating, cost sharing, and conducting wolf conservation and management tasks.

Task No.	Recovery Task Description	Responsible Parties	Comments	2010	2011	2012	2013	2014	2015
1	Monitor wolves								
1.1	Establish and maintain a minimum of two wolf specialist positions	DFW	Establish one in 2010, second in 2011	100	200	200	200	200	200
1.2	Monitor locations of wolves dispersing into Washington	DFW, FS, DNR, FWS, NPS, NGO, TR	To be done by wolf specialists, DFW wildlife staff, and partners	50	50	75	75	75	75
2	Protect wolves								
2.2	Minimize factors contributing to wolf mortality	DFW, FS, DNR, FWS, NPS, NGO, TR, WS, LE, PL		10	10	20	20	30	30
3.0	Translocate wolves, if needed, to help achieve conservation/ recovery objectives								
3.2	Prepare a feasibility assessment for translocating wolves	DFW, FS, DNR, FWS, NPS, NGO, TR		-	-	-	-	-	50
4	Manage wolf-livestock conflicts								
4.1	Work with livestock producers to resolve conflicts with wolves	DFW, WS, FWS	To be done by wolf specialists (Task 1.1), DFW enforcement staff, WS	-	-	-	-	-	-
4.2	Manage wolf-livestock conflicts using a range of options to reduce and resolve depredations	DFW, WS, FS, DNR, FWS, NGO, TR, PL, DA, CES	To be done by wolf specialists	25	25	50	50	50	50
4.3	Verify reported wolf depredations	DFW, WS, FWS	To be done by wolf specialists (Task 1.1), WS	-	-	-	5	10	10

Table 11. Preliminary cost estimates for initial implementation of important tasks in the Washington Wolf Conservation and Management Plan. Costs are estimates per fiscal year in thousands of dollars and are not corrected for inflation. Cost estimates do not mean that funds have been designated or are necessarily available to complete the recovery tasks; they are estimates of the level of funding needed to carry out the task. The listing of a party in the table does not require them to implement the action(s) or to secure funding for implementing the action(s), but indicates partners that may be interested in collaborating, cost sharing, and conducting wolf conservation and management tasks.

Task No.	Recovery Task Description	Responsible Parties	Comments	2010	2011	2012	2013	2014	2015
4.4	Provide compensation for livestock losses from wolves and to implement proactive deterrents	DFW, NGO, PL, TR	Losses expected to be low early in recovery (see Table 16); based on payment at 2:1 ratio	4	8	12	16	20	25
5.0	Manage ungulate populations and habitats								
5.1	Monitor ungulate populations in areas occupied by wolves	DFW, FS, DNR, FWS, NPS, NGO, TR	Annual surveys ongoing by DFW. Will intensify as needed	-	-	-	-	-	-
6	Manage wolf-human interactions								
6.1	Respond to human safety concerns	DFW, FS, DNR, FWS, NPS, NGO, TR, CES, CMG	Ongoing with wolf specialists and existing staff	-	-	-	-	-	-
7.0	Maintain and restore habitat connectivity								
7.1	Evaluate and conserve areas that would benefit wolf dispersal and connectivity between populations.	DFW, FS, DNR, FWS, NPS, NGO, TR, PL, BLM, DOT, CMG	Programs are ongoing	-	-	-	-	-	-
8.0	Manage conflicts between wolves and other listed species								
8.1	If conflicts occur, determine if management responses are needed and, if so, what the responses should be	DFW, FS, DNR, FWS, NPS, NGO, TR	May be cooperative studies with FWS	TBD	TBD	TBD	-	-	-
8.2	Develop response plans in advance, if needed	DFW, FS, DNR, FWS, NPS, NGO, TR	Would be collaborative with FWS	20	10	-	-	-	-
9.0	Outreach and education								

Table 11. Preliminary cost estimates for initial implementation of important tasks in the Washington Wolf Conservation and Management Plan. Costs are estimates per fiscal year in thousands of dollars and are not corrected for inflation. Cost estimates do not mean that funds have been designated or are necessarily available to complete the recovery tasks; they are estimates of the level of funding needed to carry out the task. The listing of a party in the table does not require them to implement the action(s) or to secure funding for implementing the action(s), but indicates partners that may be interested in collaborating, cost sharing, and conducting wolf conservation and management tasks.

Task No.	Recovery Task Description	Responsible Parties	Comments	2010	2011	2012	2013	2014	2015
9.1	Provide information to the public about ongoing wolf conservation and management activities	DFW, FS, DNR, FWS, NPS, NGO, TR, CES, CMG	Includes one-time cost to develop an outreach plan in 2010	60	25	15	15	15	15
9.2 9.3 9.4	Develop and provide training, information, and education programs to address concerns over wolf-livestock conflicts, wolf-ungulate interactions, and for the public on how to co-exist with wolves	DFW, FS, DNR, FWS, NPS, NGO, TR, WS	To be done by wolf specialists and other DFW staff, and other partners	45	35	30	30	30	30
9.6	Determine public attitudes towards wolves and recovery in the state	DFW, FS, DNR, FWS, NPS, NGO, TR, UN	Ongoing; follow-up to initial information gathered in 2010	-	-	-	-	-	50
10	Coordinate with agencies, landowners, tribes, and non-governmental organizations								
10.2	Cooperate with other entities to secure funding for wolf conservation and management	DFW, FS, DNR, FWS, NPS, NGO, TR, WS, BLM, DA, DOT	Ongoing	-	-	-	-	-	-
11	Conduct research								
11.1	Determine wolf population status, pack sizes and distribution, mortality rates and causes, productivity, rates of recolonization, dispersal behavior, and disease/health status in WA	DFW, FS, DNR, FWS, NPS, NGO, TR, UN	Research project would be initiated, <u>if needed</u> , to address management issues	-	-	250	250	250	250
12.0	Report on and evaluate implementation of the plan								
12.1	Centralize data collected during the wolf monitoring program	DFW		5	5	5	5	8	8
12.2	Publish an annual report summarizing wolf conservation and management activities	DFW		5	5	5	5	8	8
12.3	Evaluate WDFW's effectiveness in meeting the wolf plan goals, objectives, and strategies	DFW		-	-	-	-	10	-

Table 11. Preliminary cost estimates for initial implementation of important tasks in the Washington Wolf Conservation and Management Plan. Costs are estimates per fiscal year in thousands of dollars and are not corrected for inflation. Cost estimates do not mean that funds have been designated or are necessarily available to complete the recovery tasks; they are estimates of the level of funding needed to carry out the task. The listing of a party in the table does not require them to implement the action(s) or to secure funding for implementing the action(s), but indicates partners that may be interested in collaborating, cost sharing, and conducting wolf conservation and management tasks.

Task No.	Recovery Task Description	Responsible Parties	Comments	2010	2011	2012	2013	2014	2015
12.4	Use Washington Wolf Interagency Committee to help coordinate and oversee implementation and monitoring of the wolf plan	DFW, FS, DNR, FWS, NPS, WS, TR	Meet 2 times per year	1	1	1	1	1	1
12.5	Form a citizen advisory group to provide feedback on implementation of wolf conservation and management in Washington	DFW	Meet once per year	1	2	2	2	2	2
TOTALS				326	376	665	674	709	804

14. ECONOMIC ANALYSIS

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3
4
5 This chapter focuses on economic values and impacts associated with wolf conservation and
6 management, with particular emphasis on livestock, hunting, the forest products industry, and
7 wildlife viewing values. The main objectives of the chapter are to describe and assess potential
8 economic impacts (both negative and positive) to specific sectors as wolves become reestablished in
9 Washington.

10
11 Values of wildlife are reflected in social attitudes and actions associated with wildlife use and
12 management. Until recently the negative economic impacts of wolves, such as livestock depredation
13 and wild game losses, dominated social perceptions of the species. Yet, economic activities and their
14 relative importance change as social norms and practices change. This chapter provides recent data
15 on a number of pertinent topics, including (1) economic activity in Washington, (2) statewide
16 livestock production, (3) wolf depredation in neighboring states, (4) big game status and hunting in
17 Washington, (5) WDFW license revenues and hunting tag sales, (6) wildlife watching in the state, (7)
18 wolf viewing in other states, and (8) the forest products industry in Washington. This background
19 information comes from many sources, but primarily from economic evaluations of wolf
20 reintroductions in other states (e.g., MFWP 2003, Kroeger et al. 2005, Unsworth et al. 2005,
21 Duffield et al. 2006, 2008), other literature on wolves from elsewhere in the United States, published
22 and unpublished data from WDFW and other state and federal agencies, and interviews and
23 correspondence with state and federal officials, especially state wolf managers in Idaho and
24 Montana, and others such as the president of the Washington Outfitters and Guides Association.
25 Data limitations have required that some information be presented on a broader statewide or
26 subregional basis rather than on a county level, where wolf-related impacts are most likely to be felt.

27
28 Many of the (negative) costs and (positive) benefits that could result from the presence of wolves are
29 included in this chapter. This discussion employs a regional economic accounting approach that
30 focuses on expenditures and market prices to evaluate the economic impacts of wolves returning to
31 Washington. It does not use a full benefit-cost framework wherein the net benefits and costs to
32 society as a whole are examined. Under this latter approach, non-market values would also be
33 considered (Duffield and Neher 1996, MFWP 2003) and would include, for example, the personal
34 benefits that hunters derive from the experience of going hunting. Passive use or non-use values,
35 such as those that some individuals may place on knowing that wolves are being restored in
36 Washington, also fall under this approach.

37
38 Additionally, this chapter does not make use of multiplier values because they have not been reliably
39 estimated for many of the economic sectors discussed. Multipliers reflect the total spending impact
40 throughout an economy that can be expected from a specific activity through resulting “ripple
41 effects” or spin-off activities.

42 43 **A. Washington’s Population and Economy**

44
45 Washington had an estimated human population of 6.49 million people in 2007, which is the second
46 largest of any western state (OFM 2007a, USCB 2007). Seventy-eight percent of the population, or
47 about 5.07 million people, live in western Washington, whereas 22%, or about 1.42 million people,

1 reside in eastern Washington. Total population size has expanded 10.2% since 2000 and is projected
2 to grow another 33% by 2030, reaching 8.64 million people. Current overall human density (97.5
3 people per square mile) is higher than in any other state in the West aside from California. Average
4 density is substantially higher in western Washington (204.9 people per square mile) than in eastern
5 Washington (34.0 people per square mile). Seventeen of the state's 39 counties have average human
6 densities of fewer than 25 people per square mile (OFM 2008). Average human density for the state
7 is expected to reach 129.8 people per square mile by 2030 (OFM 2006a).

8
9 Median household income in Washington was \$53,439 in 2004-2006, which was 10.9% greater than
10 in the nation as a whole (ERFC 2007a). The state's median household income increased at a faster
11 rate than the U.S. median in most years since 1996. In 2006, mean per capita personal income for
12 the state was \$38,067, which ranked 16th in the nation. Per capita income has increased steadily
13 over the past decade at 3.0% annually and is also above the national average. Total personal income
14 in the state was \$243.5 billion in 2006.

15
16 Washington ranks fairly high nationally in most categories pertaining to quality of life (ERFC 2007a).
17 It ranks well above the national averages for air and water quality, various health indices, availability
18 and use of state parks and recreation areas, and public library service, and ranks well below the
19 national averages for rates of violent crime, homicide, and amounts of environmental toxins
20 released. However, the state rates relatively poorly for cost of housing in urban areas and funding
21 for the arts. Washington also ranks in the upper half of the country in educational skills and
22 accomplishments of its residents (ERFC 2007a).

23 24 **B. Livestock Production**

25
26 A concern about the reestablishment of wolves in Washington is their potential to kill, injure, or
27 stress cattle, sheep, and other domestic animals. Financial losses may result directly from wolf
28 depredation whether confirmed or not, and indirect financial losses may accumulate because of
29 increased management activities or changes to ranching and farming operations. These financial
30 losses would accrue to individual producers and may be significant to them.

31 32 Overview of Livestock Production in Washington

33
34 The total value of agricultural production for all crops and livestock in Washington was \$6.67 billion
35 in 2006 (NASS 2007a), representing an estimated 2.3% of the state's economic output. Livestock
36 accounted for 23% of the value of all farm products sold (NASS 2007a). Farm income comprised
37 0.5% of the total personal income in the state (ERFC 2007b).

38
39 Production value of cattle and milk totaled \$1.28 billion and accounted for 82% of all livestock-
40 related output in Washington in 2006. Estimated inventories of cattle and calves in the state have
41 remained relatively stable at about 1.1-1.2 million head during the past decade (NASS 2004, 2007a).
42 These estimates include both beef and dairy cattle, as well as about 300,000 cattle confined to
43 feedlots. Surveys from 2002, the most recent year for which full data are available, reveal that cattle
44 inventories per county are generally largest in counties along the Cascade Mountains and in the
45 Columbia Basin (Table 12). Most of the state's cattle operations are categorized as extra small (1-49
46 head; 80% of total), whereas 13% of operations hold 100 or more head (Table 13). The three
47 geographic regions where wolves are most likely to first reestablish (i.e., northeastern Washington,

southeastern Washington, and the Cascades) held about 669,000 cattle and 6,100 cattle ranching and farming operations in 2002, or 61% and 63% of the state's totals in these categories, respectively (Tables 12, 13). Within these regions, cattle numbers were largest in Yakima, Whatcom, and Okanogan counties and smallest in Skamania and Chelan counties (Table 12). The vast majority of non-confined cattle in the state are produced in eastern Washington.

Washington's sheep industry is far smaller than its cattle industry, with the statewide production value of sheep and wool totaling \$3.9 million in 2006 and accounting for 0.3% of all livestock-related output. Historical sheep production peaked in the early 1900s, when more than 800,000 head were present, but has declined greatly since then. Estimated numbers have fluctuated between 46,000 and 58,000 head during the past decade (NASS 2007a). In 2002, the last year for which full data are available, sheep inventories totaled 58,000 head statewide and were largest in Yakima, Okanogan, Grant, and Whitman counties (Table 12). Most sheep operations in the state are categorized as extra small (1-24 head; 71% of total), whereas 5% of operations held 100 or more head (Table 13). The three geographic regions where wolves are most likely to first reestablish (i.e., northeastern Washington, southeastern Washington, and the Cascades) held about 35,000 sheep and 960 sheep ranching operations in 2002, or 60% and 56% of the state's totals in these categories, respectively. Among the counties in these regions, sheep numbers were largest in Yakima and Okanogan counties and smallest in Skamania, Pend Oreille, Garfield, Columbia, and Asotin counties (Table 13).

Other livestock that are vulnerable to wolf predation include goats, llamas, and horses. Inventories of these animals in Washington in 2002 were as follows: horses, nearly 76,000 head, most numerous in Spokane, Yakima, King, and Okanogan counties; goats, about 23,200 head, most numerous in Yakima, Benton, and Snohomish counties; and llamas, 12,700 head, most numerous in Clark, Spokane, and King counties (Table 12). Goats are the only livestock species to have significantly

Table 12. Inventories of livestock and farmland in Washington's 39 counties in 2002 (NASS 2004).

	Number of animals					Total farmland (acres) ^d	% of county in farmland
	Cattle ^a	Sheep ^b	Horses	Goats ^c	Llamas		
Washington total	1,100,181	58,470	75,951	23,217	12,701	15,318,008	36.0
Average per county	28,210	1,499	1,947	595	326	392,769	33.0
<u>Northeastern Washington</u>							
Ferry	8,891	511	1,259	9	136	799,435	56.7
Okanogan	43,602	3,490	5,084	925	196	1,241,316	36.8
Pend Oreille	5,001	209	640	D ^e	59	61,239	6.8
Stevens	30,009	2,244	3,437	693	265	528,402	33.3
Average	22,626	1,614	2,605	542	164	657,598	33.4
<u>Southeastern Washington</u>							
Asotin	9,939	537	431	181	5	280,393	69.0
Columbia	5,709	384	326	94	D ^e	294,661	53.0
Garfield	10,520	376	273	51	-	312,425	68.7
Average	8,723	432	343	109	3	295,826	63.6

	Number of animals					Total farmland (acres) ^d	% of county in farmland
	Cattle ^a	Sheep ^b	Horses	Goats ^c	Llamas		
<u>Columbia Basin</u>							
Adams	36,462	981	508	115	37	1,067,079	86.6
Benton	28,513	2,116	2,434	1,855	144	607,963	55.8
Douglas	11,389	154	742	311	42	878,867	75.4
Franklin	43,745	1,477	1,221	558	143	664,875	83.6
Grant	156,999	3,369	2,929	956	169	1,074,074	62.6
Lincoln	22,706	940	1,412	814	14	1,233,377	83.4
Spokane	25,821	2,430	5,623	1,033	1,306	643,377	57.0
Walla Walla	24,358	1,131	1,356	910	208	700,560	86.2
Whitman	15,721	3,213	908	527	83	1,328,337	96.1
Average	40,635	1,757	1,904	787	238	910,945	76.3
<u>Cascades</u>							
Chelan	1,404	D ^e	836	104	105	112,023	6.0
Clark	16,068	1,993	3,433	1,362	1,396	70,694	17.6
Cowlitz	4,546	824	1,066	117	178	39,582	5.4
King	22,529	1,780	5,227	423	1,054	41,769	3.1
Kittitas	31,415	2,284	3,749	369	6	230,646	15.7
Klickitat	22,719	2,669	1,525	1,429	315	606,794	50.6
Lewis	31,917	1,658	2,891	660	442	130,950	8.5
Pierce	14,090	2,013	4,621	1,146	683	57,224	5.3
Skagit	36,059	766	1,394	403	294	113,821	10.2
Skamania	626	157	142	64	31	5,712	0.5
Snohomish	32,165	1,676	4,907	1,536	584	68,612	5.1
Whatcom	112,417	691	2,350	1,069	408	148,027	10.9
Yakima	230,275	10,786	5,616	3,130	685	1,678,984	61.1
Average	42,787	2,275	2,904	909	475	254,218	15.4
<u>Other Western Washington Counties</u>							
Clallam	5,744	1,071	929	304	493	22,372	2.0
Grays Harbor	10,543	574	808	141	281	53,594	4.4
Island	5,217	388	707	102	846	15,018	11.3
Jefferson	3,306	442	385	110	142	12,274	1.1
Kitsap	1,300	682	1,837	341	323	16,094	6.4
Mason	1,552	188	502	240	75	21,641	3.5
Pacific	7,108	D ^e	321	D ^e	D ^e	51,824	8.7
San Juan	2,333	2,731	347	148	820	17,145	15.3
Thurston	23,928	860	3,639	868	687	74,442	16.0
Wahkiakum	3,535	558	136	104	D ^e	12,386	7.3
Average	6,457	833	961	262	458	29,679	7.6

^a Includes cattle and calves for both beef and dairy cattle. Total numbers in the state for 2007 were estimated at 1,140,000 head (NASS 2007a).

^b Includes sheep and lambs. Total numbers in the state for 2007 were estimated at 51,000 head (NASS 2007a).

^c Includes angora, milk, and meat goats. Total numbers in the state for 2007 were estimated at 33,200 head (NASS 2007a).

^d Farms are defined as any location from which \$1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the census year.

^e Figures are withheld in USDA (2004) to avoid disclosing data for individual farming operations.

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Table 13. Numbers of cattle and sheep operations by size category and geographic region for Washington’s 39 counties in 2002 (NASS 2004).

	Numbers of cattle operations ^{a,b}					Numbers of sheep operations ^{b,c}				
	Total operations	Extra small (<50 head)	Small (50-99 head)	Medium (100-499 head)	Large (≥500 head)	Total operations	Extra small (<25 head)	Small (25-99 head)	Medium (100-999 head)	Large (≥1,000 head)
Washington total	12,215	9,711	866	1,273	365	1,709	1,221	405	79	4
Percent of total	100%	80%	7%	10%	3%	100%	71%	24%	5%	<1%
Average no. per county	313	249	22	33	9	44	31	10	2	<1
<u>Northeastern Washington</u>										
Ferry	101	72	8	18	3	17	5	11	1	-
Okanogan	451	324	41	59	6	74	44	27	2	1
Pend Oreille	147	123	12	11	1	15	11	4	-	-
Stevens	569	441	66	60	2	53	38	13	1	1
Average	317	240	32	37	3	40	25	14	1	1
<u>Southeastern Washington</u>										
Asotin	101	55	16	27	3	7	4	2	1	-
Columbia	97	73	10	12	2	13	10	3	-	-
Garfield	71	38	11	16	6	11	6	4	1	-
Average	90	55	12	18	4	10	7	3	1	-
<u>Columbia Basin</u>										
Adams	172	114	15	29	14	20	13	4	3	-
Benton	468	422	23	18	5	68	48	15	5	-
Douglas	95	59	10	23	3	7	5	2	-	-
Franklin	211	137	17	32	25	36	17	16	3	-
Grant	516	353	43	82	38	66	41	15	10	-
Lincoln	211	115	37	53	6	28	17	11	-	-
Spokane	649	546	46	52	5	93	77	12	4	-
Walla Walla	239	192	24	18	5	54	41	12	1	-
Whitman	238	165	37	30	6	67	43	20	3	1
Average	311	234	28	37	12	49	34	12	3	-
<u>Cascades</u>										
Chelan	66	57	5	4	-	11	10	1	-	-
Clark	693	648	24	15	6	83	55	24	4	-

Table 13. Numbers of cattle and sheep operations by size category and geographic region for Washington's 39 counties in 2002 (NASS 2004).

	Numbers of cattle operations ^{a,b}					Numbers of sheep operations ^{b,c}				
	Total operations	Extra small (<50 head)	Small (50-99 head)	Medium (100-499 head)	Large (≥500 head)	Total operations	Extra small (<25 head)	Small (25-99 head)	Medium (100-999 head)	Large (≥1,000 head)
Cowlitz	261	247	8	4	2	29	21	6	2	-
King	418	351	19	36	12	89	65	23	1	-
Kittitas	339	242	30	55	12	64	47	15	2	-
Klickitat	267	168	36	58	5	61	43	10	8	-
Lewis	756	645	46	59	6	81	59	19	3	-
Pierce	629	594	17	14	4	90	74	14	2	-
Skagit	402	296	25	63	18	32	25	5	2	-
Skamania	35	30	4	1	-	6	4	2	-	-
Snohomish	561	485	12	45	19	73	51	20	2	-
Whatcom	813	502	66	183	62	58	52	6	-	-
Yakima	916	697	66	88	65	97	78	14	4	1
Average	472	382	28	48	16	60	45	12	2	-
<u>Other Western Washington Counties</u>										
Clallam	186	160	10	15	1	37	27	7	3	-
Grays Harbor	271	233	19	16	3	66	41	15	10	-
Island	166	152	6	4	4	25	20	5	-	-
Jefferson	76	57	10	7	2	11	5	4	2	-
Kitsap	168	166	2	-	-	49	39	10	-	-
Mason	73	65	3	5	-	16	16	-	-	-
Pacific	130	103	13	12	2	2	2	-	-	-
San Juan	81	72	3	6	-	77	41	30	6	-
Thurston	485	439	19	20	7	60	49	11	-	-
Wahkiakum	91	73	7	11	-	12	4	6	2	-
Average	173	152	9	10	2	36	24	9	2	-

^a Includes cattle and calves for both beef and dairy cattle.

^b An operation is defined as any location from which \$1,000 or more of livestock-related products were produced and sold, or normally would have been sold, during the census year.

^c Includes sheep and lambs.

1 expanded in abundance over the past decade, with numbers more than doubling from 16,000 head
2 in 1997 to 33,200 goats in 2007 (NASS 2004, 2007a). Horses, goats, llamas, and other livestock are
3 kept mainly by hobby owners rather than for commercial production. Statewide sales figures totaled
4 \$18.6 million for horses (combined with small numbers of ponies, mules, burros, and donkeys) in
5 2002 (NASS 2004), but do not exist for goats and llamas. Swine are excluded from this discussion
6 because they have not been depredated by wolves in neighboring states and are therefore not
7 considered at risk.

8
9 Many livestock producers in Washington rely entirely on private land for their annual operations,
10 whereas some depend on a combination of private land and public land grazing leases. In these
11 latter cases, animals are typically kept on private land during the winter, with most calving and
12 lambing occurring in late winter or early spring. During the warmer months, livestock are taken to
13 grazing allotments on public lands, many of which occur in more remote locations with rougher
14 topography and natural vegetative cover. Livestock are then gathered in the fall, with young shipped
15 to market and breeding stock returned to private land for winter.

16
17 About 2.2 million acres in 155 active grazing allotments currently exist on national forests in
18 Washington (Table 14). This coverage represents about 24.0% of all national forest lands in the
19 state. By far the most allotments occur in the eastern Washington and are assigned for cattle.
20 Considerable variation exists in the percent of land designated as allotments within each national
21 forest, ranging from a high of 52.7% in Colville National Forest to 0% in Mt. Baker-Snoqualmie
22 and Olympic National Forests (Table 14). Numbers of active allotments have declined substantially
23 over the past 15 years primarily because of economic and social reasons (W. Gaines, pers. comm.).
24

25 Producers can lose livestock to a variety of natural and non-natural causes, including disease,
26 weather, birthing problems, and predation. In Washington, death losses from all causes totaled
27 44,000 cattle and calves in 2005 and 5,000 sheep and lambs in 2004 (Table 15). These represented
28 4.1% of all cattle and calves and 10.9% of all sheep and lambs raised in the state. Ninety-four
29 percent of cattle and calf death losses were non-predator related and were valued at \$28.7 million
30 (Table 15). For sheep and lambs, 54% of death losses were non-predator related and were valued at
31 \$293,000. Predators (primarily coyotes and cougars) killed an estimated 2,500 cattle and calves
32 worth \$1.53 million and 2,300 sheep and lambs worth \$192,000 (Table 15).

33 34 Wolf Depredation on Ranch Animals

35
36 Background information on this topic appears in Chapter 4, Sections A and B.

37 38 Compensation Programs for Wolf-Related Losses and Deterrence

39
40 Several compensation programs currently exist or are under consideration in the western United
41 States to help producers recover some of the costs associated with wolf predation. These are
42 described in Chapter 4, Section C.

1 Table 14. Numbers and acreages of active grazing allotments by livestock category on national forests in
 2 Washington in 2004-2007 (J. Begley, U.S. Forest Service, unpubl. data)^a.
 3

National Forest	Cattle		Sheep		Unassigned by species		Total		Percent of National Forest ^b
	No.	Acreage	No.	Acreage	No.	Acreage	No.	Acreage	
Okanogan	69	770,563	-	-	1	11,427	70	781,990	45.1
Colville	52	714,990	-	-	1	2,333	53	717,323	52.7
Wenatchee	14	147,937	10	266,108	-	-	24	414,045	16.4
Gifford Pinchot	3	188,531	-	-	-	-	3	188,531	13.8
Umatilla	5	85,010	-	-	-	-	5	85,010	27.3
Total	143	1,907,031	10	266,108	2	13,760	155	2,186,899	-

4 ^a Two other national forests, Mt. Baker-Snoqualmie and Olympic, no longer have active grazing allotments.

5 ^b Allotment coverage as a percent of the total land area of each National Forest. For Umatilla National Forest, this represents
 6 land coverage within Washington only.

7
 8
 9 Table 15. Annual death losses of livestock from different causes and their monetary values for
 10 Washington in 2004-2005 (NASS 2005, 2006).
 11

Causes of losses	Cattle ^{a,b}	Calves ^a	Sheep ^a	Lambs ^a
Non-predator losses (no. of head)				
Digestive problems	4,000	5,200	200	100
Respiratory problems	3,000	8,500	200	200
Metabolic Problems	2,600	300	100	100
Mastitis	1,400	-	-	-
Other diseases	1,200	400	-	-
Calving/lambing problems	1,300	3,200	200	-
Lameness/injury	2,400	300	-	-
Weather-related	300	800	-	-
Old age	-	-	800	-
Theft	300	-	-	-
Poisoning	100	-	-	-
Other non-predator ^c	1,400	700	400	100
Unknown non-predator ^d	2,100	2,000	200	100
Total non-predator losses	20,100	21,400	2,100	600
Value of all non-predator losses (\$)	20,703,000	8,025,000	258,000	35,000
Predator losses (no. of head)				
Coyotes	-	600	500	1,000
Dogs	-	-	100	300
Cougars and bobcats	200	600	200	-
Bears	-	-	-	100
Other predators	300	300	100	-
Unknown predators ^e	400	100	-	-
Total predator losses	900	1,600	900	1,400
Value of all predator losses (\$)	927,000	600,000	111,000	81,000
Losses from all causes (no. of head)	21,000	23,000	3,000	2,000
Value of all losses (\$)	21,630,000	8,625,000	369,000	116,000

12 ^a Data for cattle and calves are from 2005; data for sheep and lambs are from 2004. Cattle include beef and dairy
 13 cattle as well as cattle in feedlots.

14 ^b Cattle are defined here as all cows, bulls, steers, and heifers weighing over 500 pounds.

15 ^c Includes accidents, fire, starvation, dehydration, etc.

16 ^d Exact cause of death was unidentifiable.

17 ^e Species of predator was not determined.
 18

Economic Concerns of Washington's Ranching Industry over Wolves

The reestablishment of wolves in Washington will affect some ranchers living in or near wolf-occupied areas through impacts to their livestock and/or property management (Unsworth et al. 2005). Concerns about possible economic impacts that have been expressed by ranchers include:

- 1) Depredation of ranch animals, including possible deaths and injuries of cattle, sheep, dogs, and other ranch animals resulting from wolf attacks.
- 2) Possible non-lethal physiological impacts on ranch animals, including possible weight loss, stress, and lower birth rates in ranch animals resulting from the presence of wolves nearby.
- 3) Changes in forage use, if ranchers needed to move livestock more often or had to move them to alternative grazing sites to avoid depredation.
- 4) Need for additional labor, if they had to increase supervision of ranch animals and invest time in reporting depredation losses.
- 5) Increased expenditures, including purchasing of replacement stock and proactive non-lethal control measures, such as herding and guarding dogs, fencing, fladry, and noise deterrents, as well as increased wear on vehicles and fuel use.
- 6) That ranches affected disproportionately by wolves might go out of business or experience reduced market values.

In many cases, wolf-related losses may cause disproportionately greater financial hardship for extra small or small producers (which comprise the large majority of the cattle and sheep operations in Washington; see Section B) than for larger producers.

In addition to these possible costs, some positive impacts for livestock operations could result from wolf presence. These could include reducing populations of coyotes and other predators, thereby reducing predation on livestock by those species. Improved forage conditions for livestock could result if elk and deer populations were redistributed off ranch properties by wolves; however, if elk and deer were moved onto grazing land by wolf presence, then there could be negative impacts to livestock forage availability.

Wool, meat, and other products can be marketed for higher prices when certified as being raised using "predator friendly" practices (Predator Friendly 2008). Under this approach, livestock producers commit to not kill wolves and other predators during their ranching operations and instead deal with conflicts using non-lethal means. Although operators may incur some additional losses in their herds or flocks, higher prices for the product are intended to offset the difference. The number of producers using this type of marketing remains quite small, but there is potential for expansion.

Predicted Losses of Ranch Animals in Washington Due to Wolves

Predicting the numbers of ranch animals that might be killed annually in Washington as wolves become reestablished is difficult because of the many uncertainties over where and how many wolves will eventually inhabit the state, the frequency that they will interact with livestock, problems in determining actual versus confirmed numbers of livestock killed, and ongoing improvements in the adaptive management responses of ranchers and wildlife agencies. Nevertheless, this section presents some rough estimates of confirmable losses and their monetary value that might be expected to occur based on analyses of depredation data from Idaho, Montana, and Wyoming for 1987 to 2007 (Table 4). To obtain these estimates, separate regression lines were fitted to the loss data for cattle, sheep, and dogs from each state (Figure 14). Low and high estimates of losses for Washington were then derived for four population size categories (50, 100, 200, and 300) of wolves using the shallowest and steepest of the three regression lines for Idaho, Montana, and Wyoming, respectively. These population size categories roughly correspond to the following numbers of packs and successful breeding pairs, as described in Table 16: 50 wolves, 5-8 packs, and 5-7 successful breeding pairs; 100 wolves, 9-16 packs, and 8-13 successful breeding pairs; 200 wolves, 18-33 packs, and 12-21 successful breeding pairs; 300 wolves, 27-49 packs, and 19-34 successful breeding pairs.

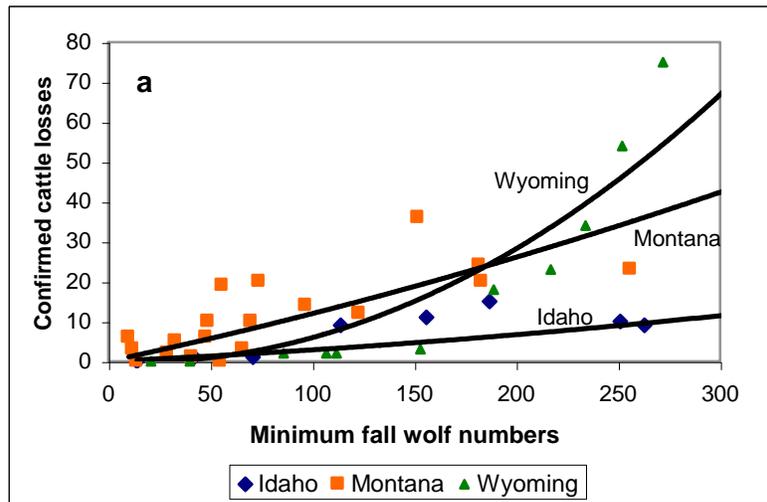
The projections of depredations presented here assume that interactions between livestock and wolves in Washington will be similar to those in neighboring states. However, this assumption must be viewed cautiously because of differences in livestock numbers (especially sheep) and distribution, husbandry methods, availability of natural prey, land use, and human densities. In addition, these projections represent average expected losses per year and do not demonstrate the annual variation in depredations that commonly occurs in Idaho, Montana, and Wyoming.

Low and high predictions of confirmable annual losses of ranch animals for Washington are presented in Table 16 for each of four population size categories of wolves. Total populations of 50 and 100 wolves are expected to depredate very small numbers of livestock. Fifty wolves may kill about 1-6 cattle and 7-16 sheep per year, with annual take perhaps doubling for 100 wolves. Larger wolf populations will likely kill greater numbers of livestock, with projections of 6-28 cattle and 20-60 sheep killed annually by 200 wolves, and 12-67 cattle and 22-92 sheep killed annually if 300 wolves became reestablished (Table 16). However, sheep losses are expected to be on the low end of these estimates because sheep numbers are much smaller in Washington than in Idaho, Montana, and Wyoming (see NASS 2004). Even at a population of 300 wolves, these levels of depredations represent 4% or less of the annual predator-caused death losses experienced by Washington cattle and sheep producers. Depredations on horses, other livestock, and guarding/herding dogs are expected to be minor for each of the four wolf population size categories.

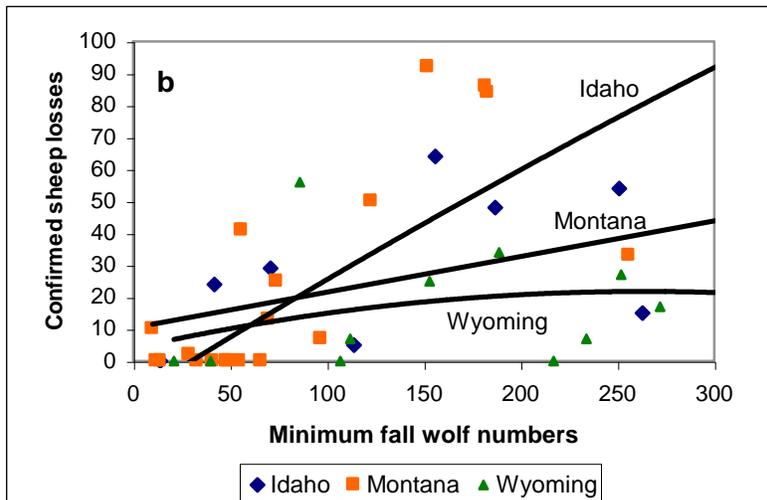
The annual monetary worth of ranch animals confirmed as being killed by wolves in Washington is estimated in Table 16. To determine this value, average monetary values (in current dollars for 2007) of livestock and dogs were assigned as follows:

- **Cattle** - \$669 per head, based on the average fall (September to November) value of 600-pound calves using Washington auction prices for 500- to 600-pound steer calves during

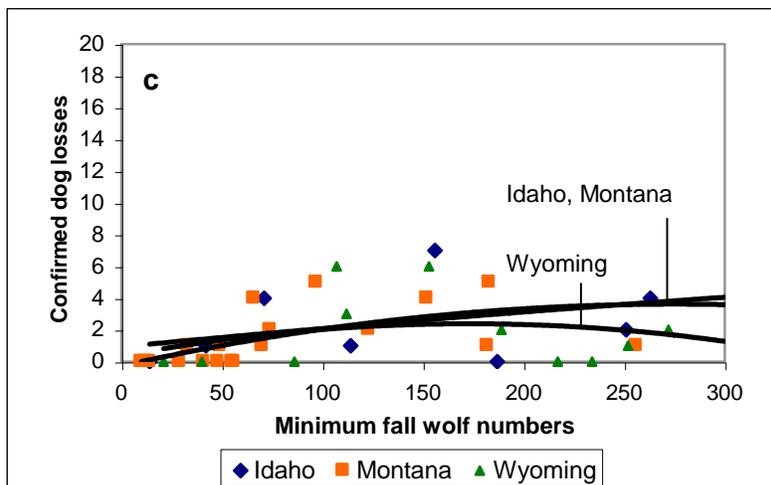
1 Figure 14. Relationships between confirmed losses of (a) cattle, (b) sheep, and (c) dogs and minimum
2 fall wolf numbers in Idaho, Montana, and Idaho through 2007 (plotted from data in Table 4).



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1 Table 16. Projected annual levels of confirmed depredations of livestock and domestic dogs and their
 2 estimated monetary values (in current dollars for 2007) for four different population size categories of
 3 wolves in Washington. Because of the absence of biological and depredation data on wolves living in
 4 Washington, numbers presented here should be considered as very rough approximations.
 5

	Population size category			
	50	100	200	300
Number of wolves present	50	100	200	300
Estimated no. of confirmed cattle depredations per year ^a	1-6	2-12	6-28	12-67
Total value of losses per year ^b	\$669-8,028	\$1,338-16,056	\$4,014-37,464	\$8,028-89,646
Estimated no. of confirmed sheep depredations per year ^a	7-16	14-35	20-60	22-92
Total value of losses per year ^b	\$960-2,190	\$1,920-4,795	\$2,740-8,220	\$3,010-12,600
Estimated no. of confirmed horse and other livestock depredations per year ^a	0-1	0-1	0-2	0-2
Total value of losses per year ^b	\$0-1,775	\$0-1,775	\$0-3,550	\$0-3,550
Estimated no. of confirmed dog depredations per year ^a	1-2	2	2-3	1-4
Total value of losses per year ^b	\$625-1,250	\$1,250	\$1,250-1,875	\$625-2,500
Total value of all confirmed losses per year	\$2,254-13,243	\$4,508-23,876	\$8,004-51,109	\$11,663-108,296

6 ^a Numbers represent the estimated confirmed numbers of livestock and dogs killed annually by different sizes of wolf
 7 populations. Confirmed losses are those determined by USDA Wildlife Services, WDFW, or another authorized entity.
 8 Unconfirmed kills are excluded from these estimates.

9 ^b Numbers represent the combined estimated monetary value of all losses annually per category in current dollars for
 10 2007. Average values per species are described in the text. For cattle, the maximum value of losses is doubled to
 11 reflect the value of compensation payments that would be required if all losses occur on grazing sites of 100 acres or
 12 more (Chapter 4, Section G).
 13
 14
 15

16 2004-2007 (data from Livestock Market Information Center; J. S. Neiberger, pers. comm.).
 17 This represents the earning potential of the animal rather than its value at the time of death.
 18 Calf value is used because calves are expected to be the age class of cattle most commonly
 19 killed by wolves (Chapter 4, Section A).
 20

- 21 • **Sheep** - \$137 per head, based on the average value of sheep sold across all size and weight
 22 classes in Washington in 2007 (NASS 2007c). This represents the earning potential of the
 23 animal rather than its value at the time of death.
 24
- 25 • **Horses** - \$1,775 per animal, based on an average value in 2004 of \$1,620 for ranch horses
 26 reported by Unsworth et al. (2005) and converted to current dollars for 2007.
 27
- 28 • **Dogs** - \$625 per animal, based on the approximate cost of a 6-month-old guarding dog
 29 (Great Pyrenees, Akbash, or Great Pyrenees-Akbash cross) in Idaho, Montana, and
 30 Wyoming in 2008 (J. Timberlake, pers. comm.).

1
2 For smaller populations of 50 and 100 wolves, the annual monetary value of confirmed losses of
3 livestock and ranch dogs (including the higher compensation payments for cattle killed on grazing
4 sites of 100 acres or more; Chapter 4, Section G) is expected to range from about \$2,254-13,243 and
5 \$4,508-23,876, respectively. Monetary losses are expected to increase as wolf populations become
6 larger and are projected to reach an estimated \$11,663-108,296 for about 300 wolves. As noted
7 above, these values are probably overestimated because not all cattle losses are expected to occur on
8 grazing sites of 100 acres or more and because sheep losses are expected to be at the lower end of
9 the range of estimates presented here. Overall, most of the monetary value of losses is expected to
10 result from cattle deaths, especially when larger wolf populations are present.

11 Physiological Impacts on Livestock

12
13
14 In addition to depredation, the presence of wolves near livestock may cause behavioral changes in
15 livestock that result in physical effects. Livestock may lose weight because wolves force them away
16 from suitable grazing habitat and water sources or because of greater energy expenditures due to
17 wolf-related agitation. These problems may also lower birth rates by reducing conception levels and
18 causing miscarriages. Although these outcomes are possible, their occurrence has not yet been
19 verified under field conditions. These same problems can result from other causes, such as poor
20 forage or weather conditions, making it difficult to measure the true impacts of wolves. Because of
21 these uncertainties, this analysis does not attempt to quantify the economic impacts of such
22 outcomes.

23 Changes in Grazing Methods

24
25
26 Some ranchers may feel compelled to modify their grazing methods in an effort to avoid problems
27 with wolves. This could involve herding or hauling livestock to different portions of grazing
28 allotments, which in some instances may result in penalties from land management agencies for
29 violating allotment grazing plans. Avoidance of wolves may lead some ranchers to bring livestock
30 off the range prematurely or to provide supplemental feeding to delay turnout. Estimates of the
31 extent and frequency of these activities do not exist for other areas with wolves, such as Idaho,
32 Montana, and Wyoming. Therefore, this analysis does not attempt to quantify the economic
33 impacts of modifying grazing activities in response to the reestablishment of wolves in Washington.

34 Need for Additional Ranch Labor

35
36
37 Ranchers and their employees frequently spend additional time managing livestock operations to
38 avoid depredations by wolves. This can include increased supervision of herds, moving livestock to
39 different grazing areas, implementing non-lethal techniques to reduce conflicts, treating injured
40 livestock, and checking animals for pregnancy that may have aborted due to wolves (Unsworth et al.
41 2005). These activities may require that less time be spent on other important activities such as
42 ranch maintenance and improvement. Some ranchers may hire additional employees specifically to
43 herd livestock when wolves are in the area. Estimates of the extent and frequency of these types of
44 responses are not available for neighboring states. Therefore, this analysis does not attempt to
45 quantify these future costs for Washington.

1 To receive compensation for depredations, ranchers also spend time contacting wildlife agents,
2 waiting for them to inspect a kill, completing the necessary paperwork, and conducting any further
3 correspondence or negotiations to ensure payment. Thompson (1993) estimated that for each
4 confirmed and probable kill, this process required an average of 10 hrs of time by a rancher or an
5 employee. Based on hourly wage rates of \$11.07 for livestock workers in Washington (NASS
6 2007b), each confirmed or probable wolf kill would require that a rancher spend on average \$110
7 preparing compensation claims. However, this figure is an underestimate for two reasons
8 (Unsworth et al. 2005). First, it does not consider the higher wages of ranch managers, who are
9 probably more likely to fill out compensation claims. Second, it does not consider time spent by
10 ranchers investigating unconfirmed kills, although these would require less time because they do not
11 qualify for compensation and therefore do not result in claims being filed.

12 13 Additional Expenditures on Ranch Supplies

14
15 Some ranchers may devote extra resources to protecting their livestock from wolves. Non-lethal
16 control methods may require the purchasing of fencing, non-lethal munitions, electronic hazing
17 devices, fladry, or other equipment, as well as additional herding and guarding dogs and associated
18 supplies (Bangs et al. 2006, Shivik 2006, Stone et al. 2008). Increased efforts to inspect livestock on
19 ranges with wolves, haul livestock to different grazing sites, and remove livestock carcasses likely
20 require greater use of fuel and increased wear on ranch vehicles. Ranchers may need to buy camping
21 equipment to outfit herdsmen or range riders for remaining on the range with livestock. Livestock
22 agitated by wolves may damage fencing, which then needs to be repaired. Cost estimates for these
23 types of expenditures do not exist for other areas with wolves, such as Idaho, Montana, and
24 Wyoming. Therefore, this analysis does not attempt to calculate the economic costs for material
25 acquisitions and costs.

26 27 Property Value Impacts

28
29 Some ranchers believe that ranches disproportionately affected by wolf depredation may be forced
30 out of business and that the market values of ranches experiencing wolf impacts will be reduced
31 because of the perception that these properties are of lower desirability (Unsworth et al. 2005).
32 There is no confirmed evidence of either of these situations occurring in Idaho, Montana, or
33 Wyoming (S. Nadeau, pers. comm.; C. Sime, pers. comm., M. Jimenez, pers. comm.), therefore
34 neither is expected to occur in Washington. Furthermore, the presence of wolves has not resulted in
35 the implementation of any endangered species-related restrictions on the uses of private land in
36 Idaho, Montana, or Wyoming that might result in lowered land values. Such restrictions are also not
37 expected to occur in Washington.

38 39 Positive Impacts from Wolf Reestablishment

40
41 Most of the potential economic impacts from wolves represent costs to ranchers and farmers.
42 However, wolves may also benefit some livestock operations by reducing the abundance of coyotes,
43 thereby lowering coyote predation on livestock. Coyotes were responsible for 40% of the
44 confirmed calf death losses (valued at \$225,000), 56% of the sheep death losses (\$62,000), and 71%
45 of the lamb death losses (\$58,000) in Washington in 2004 or 2005 (Table 15). A second possible
46 benefit could come from wolves redistributing elk and deer on ranchlands and grazing allotments,
47 potentially resulting in reduced use of grass and other forage and thereby leaving more food for

1 livestock. Both of these scenarios have been detected in natural habitats at Yellowstone National
2 Park (see Chapter 6) and could possibly occur in Washington. However, neither benefit has been
3 quantified in economic terms for any location, making it difficult to place a value on these benefits.
4 Many coyote-caused losses probably occur in parts of the state that are unlikely to be recolonized by
5 wolves. The benefits from these two impacts would probably be localized and relatively minor.

6 7 Summary

8
9 Reestablishment of wolves in Washington will likely result in differing costs for livestock producers
10 living in or near occupied wolf range, with some producers more affected than others. Financial
11 impacts to individual producers will depend not only on the numbers of depredations experienced
12 but also on non-lethal physiological impacts on livestock, increased expenditures on ranch supplies,
13 and additional labor needs. This analysis provides cost approximations only for confirmed losses of
14 ranch animals and time spent preparing compensation claims. For populations of 50-300 wolves,
15 these costs together could range from several thousand dollars to possibly more than \$110,000
16 annually for producers as a whole in the state. Costs of other impacts are not quantified in this
17 analysis due to a lack of adequate information. These costs would be partially offset by
18 compensation payments for confirmed and probable wolf-caused livestock deaths through the
19 Defenders of Wildlife's Bailey Wildlife Foundation Wolf Compensation Trust for areas where
20 wolves remain federally listed or other sources, such as the state of Washington. The Bailey Wildlife
21 Foundation Proactive Carnivore Conservation Fund, also operated by Defenders of Wildlife, is
22 available to help defray the costs of non-lethal deterrents for small numbers of producers in
23 Washington, including those in areas where federal delisting has occurred. In addition, there may be
24 a state compensation program developed in Washington in the future.

25
26 Wolf numbers between 50 and 100 animals should pose little detriment to the state's livestock
27 industry as a whole. At these population levels, the vast majority of producers will probably
28 experience few if any annual costs, whereas a few individual producers could be more affected. As
29 wolf populations become larger and more widely distributed, financial impacts are likely to accrue to
30 more producers.

31 32 **C. Big Game Hunting**

33
34 Healthy and abundant prey populations are important for maintaining hunting opportunities that
35 contribute to many local economies in Washington, especially in more rural regions. The challenge
36 for wildlife managers is to manage for healthy ungulate population levels that also sustain wolves,
37 other carnivores, harvest opportunities for the public, and subsistence and ceremonial needs of
38 treaty tribes.

39 40 Big Game Hunting Statistics for Washington

41
42 Hunting, especially for big game, is an important recreational activity in Washington. The 2006
43 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, which is based on
44 household interviews nationwide, estimated that 187,000 residents of Washington, or 3.8% of the
45 state's population aged 16 years old and older, were hunters (for either big or small game, or both;
46 USFWS and USCB 2008). This is below the national average of 5.5% of the population aged 16
47 years and older. An estimated 182,000 hunters hunted in Washington in 2006, with an estimated

1 179,000 residents and 3,000 non-residents participating. Hunters spent nearly 2.13 million days
2 hunting for all species in the state in 2006. Washington residents spent an additional 285,000
3 hunting days, or 12% of their total effort, hunting outside of the state. These numbers are slightly
4 lower than those derived from WDFW's data files, which indicate that about 196,000 residents and
5 4,900 non-residents bought hunting licenses, special permits, and special hunt applications in 2006.
6 However, these figures include buyers who did not actually participate in hunting during the year.

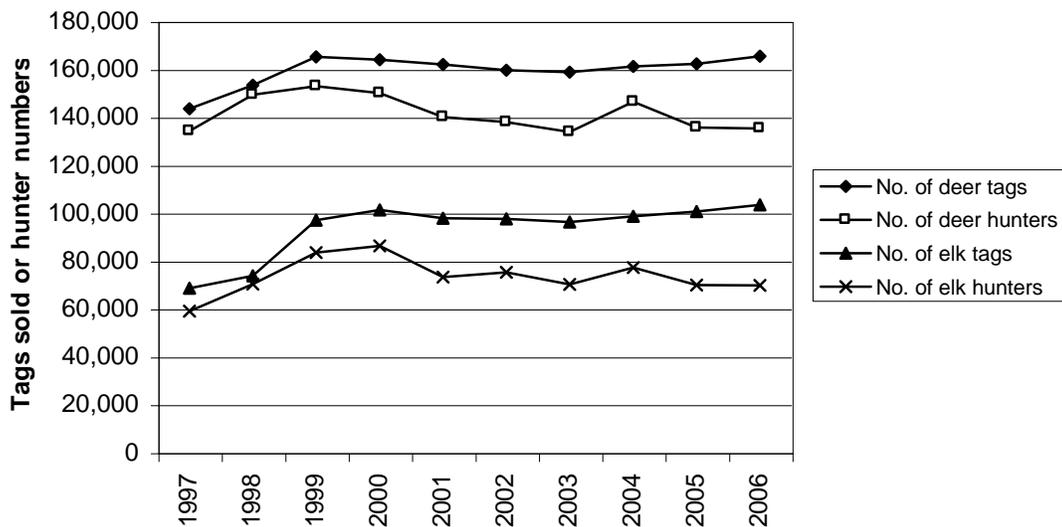
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8 Big game hunting represents some of the most highly valued hunting in Washington, with an
9 estimated 90% of hunters hunting ungulates in 2006 (USFWS and USCB 2008). By comparison,
10 only an estimated 23% and 11% of hunters sought small game and migratory birds, respectively.
11 Seventy-nine percent of total hunter days involved big game hunting, 14% small game hunting, and
12 7% migratory birds in 2006.

13
14 Deer and elk hunting are the predominate forms of big game hunting in Washington, both in terms
15 of the number of hunters participating and total days spent hunting. Numbers of deer hunters and
16 deer hunting days have averaged about 141,500 and 845,000 per year, respectively, during the past
17 decade (WDFW 1997-2006). Despite some sizeable yearly increases and decreases, deer hunter
18 numbers remained almost stable (increase of 0.7%) from 1997 to 2006, whereas hunting days
19 decreased 18.8% (Figures 15, 16). Deer harvest has remained robust, averaging 38,100 deer annually
20 during the past decade, which included a 47% increase from 1998 to 2004 (Figure 17). Hunter
21 success rates (i.e., combined for general and special permit seasons, all weapon types, and antlered
22 and antlerless harvest) closely tracked harvest trends during this decade, with success averaging
23 27.0% and strongly increasing from 1998 (20.3%) to 2004 (30.4%) (Figure 17). Annual harvest data
24 for each type of deer are available only from 2001 to 2006, when an average of 14,082 black-tailed
25 deer, 13,709 white-tailed deer, and 12,584 mule deer were killed per year. During the past decade,
26 combined deer harvests were highest in WDFW's eastern (30% of the statewide harvest) and
27 southwestern (25%) regions, and lowest in the south-central (9%) and North Puget Sound (6%)
28 regions (Figures 18, 19).

29
30 For elk, numbers of hunters and hunting days have averaged about 74,400 and 412,400 per year,
31 respectively, during the past decade in Washington. Both figures have shown net increases of 15.4%
32 and 19.0%, respectively, during this period, although both have been in gradual decline since 2000
33 (Figures 15, 16). Despite these declines, elk harvest has remained strong, averaging 7,390 animals
34 annually over the past decade. Harvests were lowest in 1997 (4,919 elk) and 1998 (5,858 elk), but
35 have varied between about 7,100 and 8,700 animals since then, with a 48.6% increase occurring
36 between 1998 and 2003 (Figure 17). Overall hunter success rates (i.e., combined for general and
37 special permit seasons, all weapon types, and antlered and antlerless harvest) tracked harvest trends
38 during this decade, with success averaging 10.1% overall and increasing from an average of 8.4% in
39 1997-1999 to an average of 10.8% in 2000-2006 (Figure 17). Elk harvests were highest in WDFW's
40 south-central (37% of the statewide harvest) and southwestern (37%) regions, and lowest in the
41 North Puget Sound (2%) and north-central (1%) regions (Figures 18, 19).

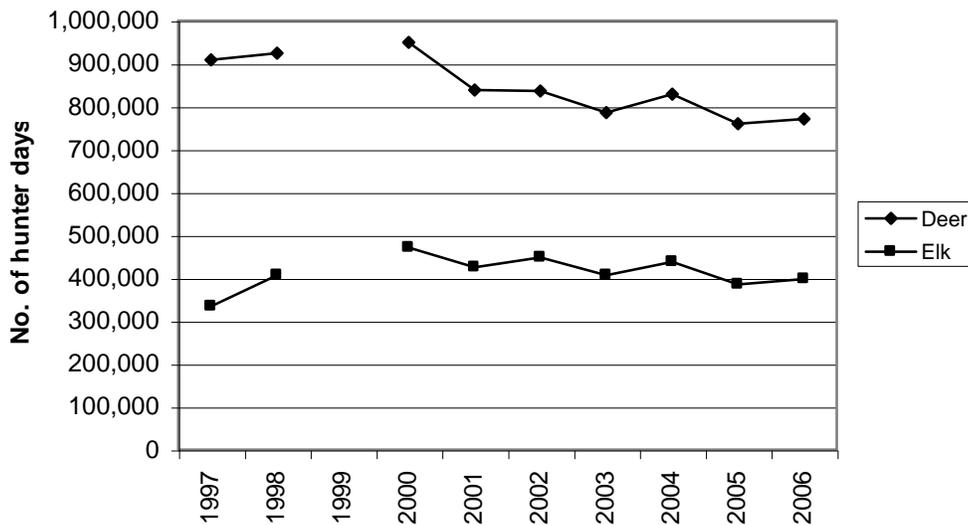
42
43 Hunting opportunities for moose, bighorn sheep, and mountain goats in Washington are far more
44 limited than for deer and elk. All three species are hunted only through special permit drawings,
45 with fewer than 100 licenses issued annually for each (Figure 20). Numbers of licenses issued since
46 1997 have increased for moose and sheep, but have decreased for goats. Numbers of hunter days
47 per species are also small, totaling fewer than 900 days per year for moose with an increasing trend

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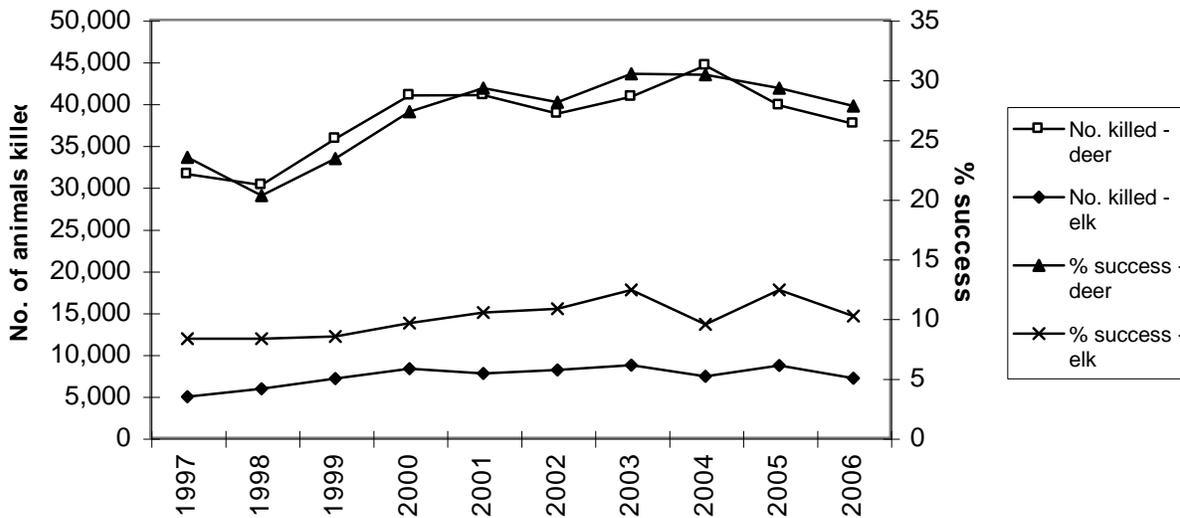
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Figure 15. Trends in numbers of tags sold and hunters participating in general deer and elk seasons (all weapons) statewide in Washington, 1997-2006.

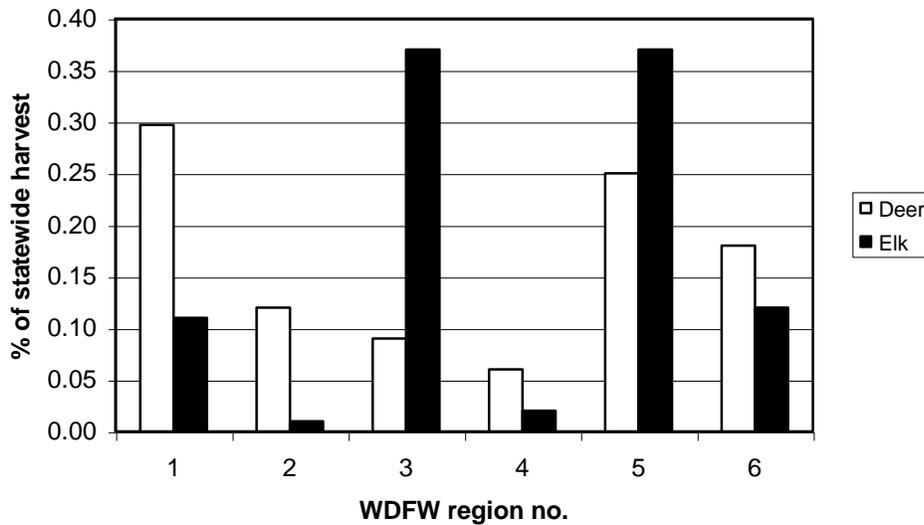


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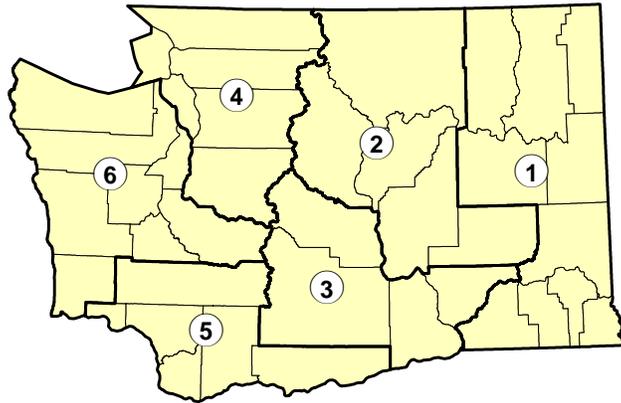
Figure 16. Trends in numbers of hunter days during general deer and elk seasons (all weapons) statewide in Washington, 1997-2006 (excluding 1999).



1
2 Figure 17. Trends in statewide numbers of deer and elk killed and hunter success during general and
3 permit seasons (all weapons) combined in Washington, 1997-2006.
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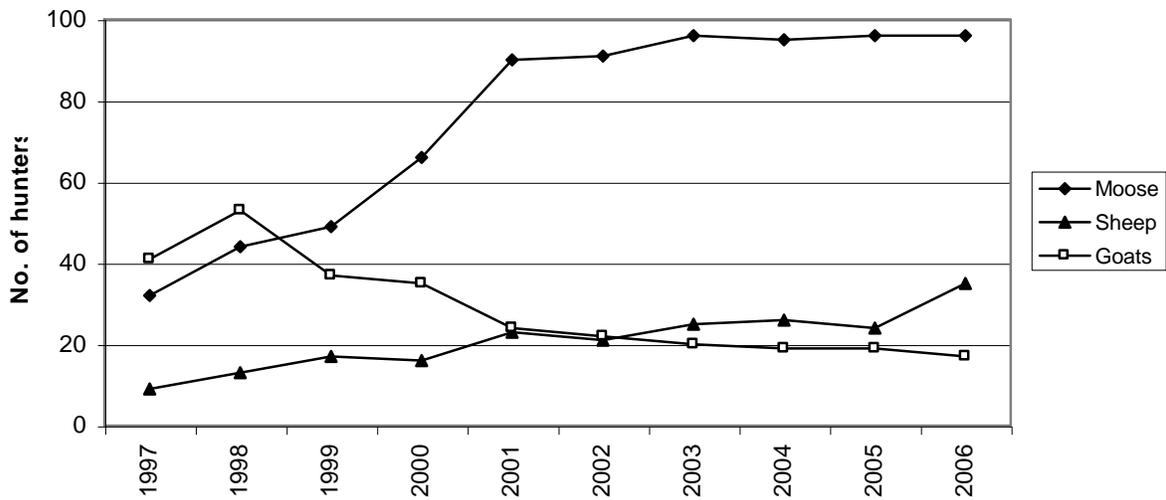


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9 Figure 18. Percent of statewide deer and elk harvest (all weapons) according to WDFW region number,
10 1997-2006. Region boundaries are depicted in Figure 19.



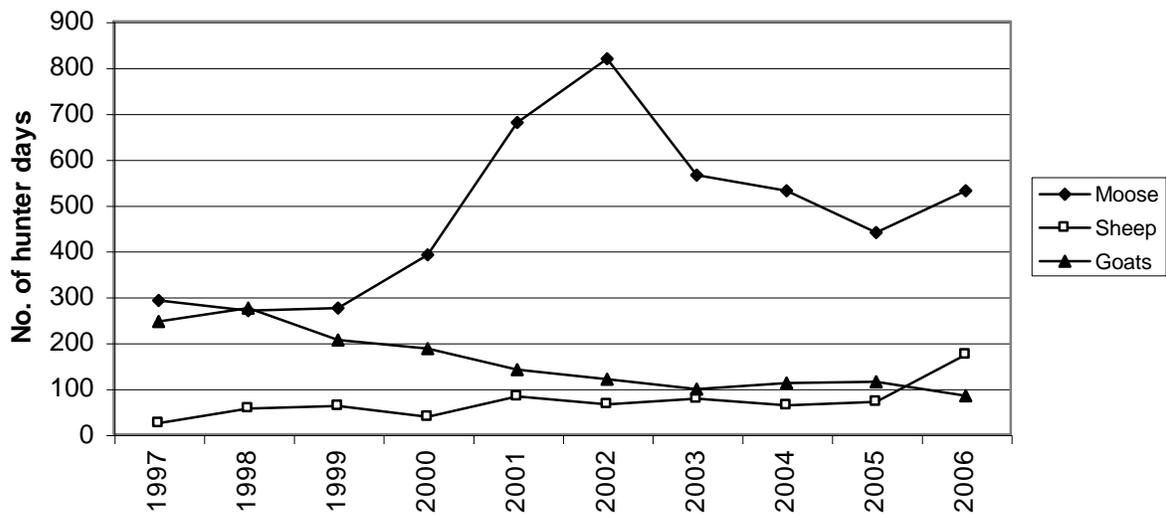
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Figure 19. Map of WDFW’s six administrative regions. Map numbers correspond to designated region numbers.



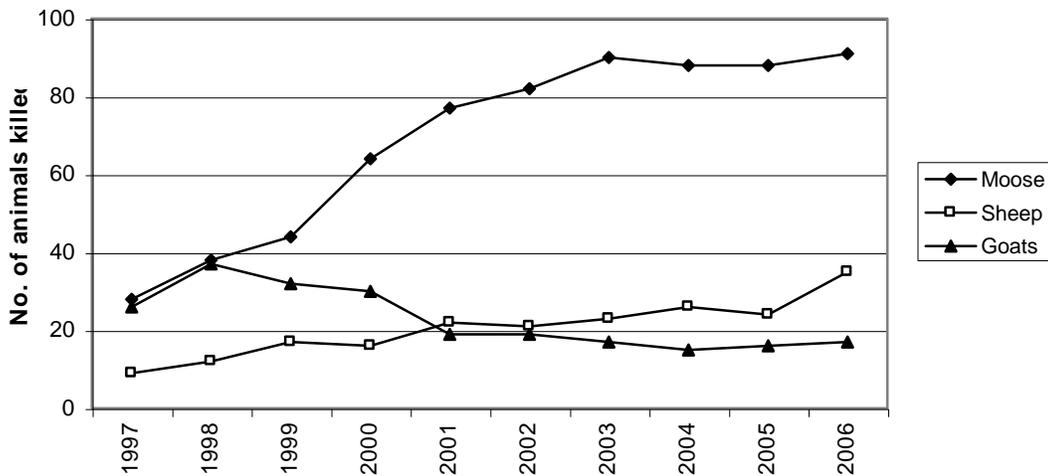
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Figure 20. Trends in hunter numbers for moose, bighorn sheep, and mountain goats in Washington, 1997-2006.



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Figure 21. Trends in numbers of hunter days for moose, bighorn sheep, and mountain goats in Washington, 1997-2006.



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Figure 22. Trends in hunter harvest of moose, bighorn sheep, and mountain goats in Washington, 1997-2006.

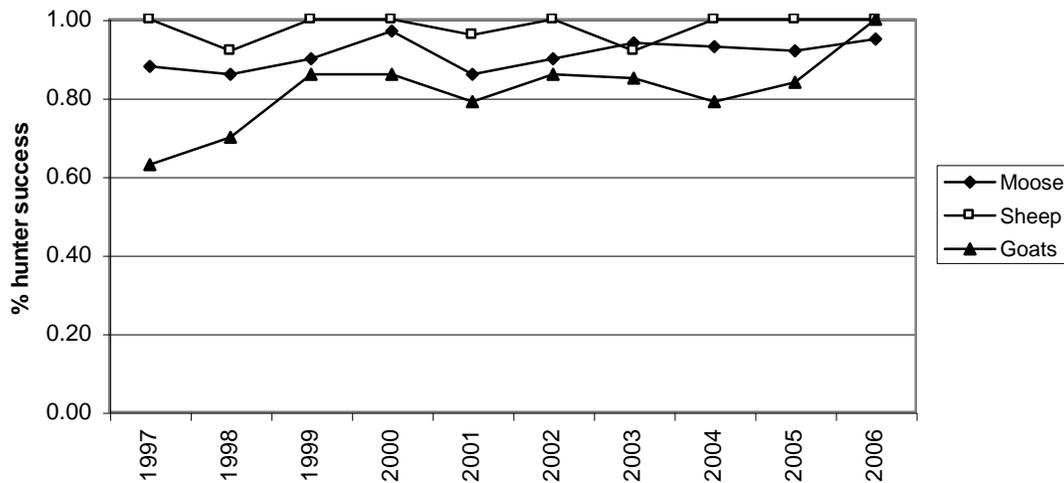


Figure 23. Trends in hunter success for moose, bighorn sheep, and mountain goats in Washington, 1997-2006.

over the past decade, fewer than 300 days per year for goats and declining, and fewer than 200 days per year for sheep and increasing (Figure 21). During the past decade, annual harvests have numbered fewer than 100 moose and are increasing, fewer than 40 sheep and are increasing, and fewer than 40 goats and are decreasing (Figure 22). Hunter success rates have reached 80-100% for all three species in nearly every year since 1997 (Figure 23).

Hunter Expenditures in Washington

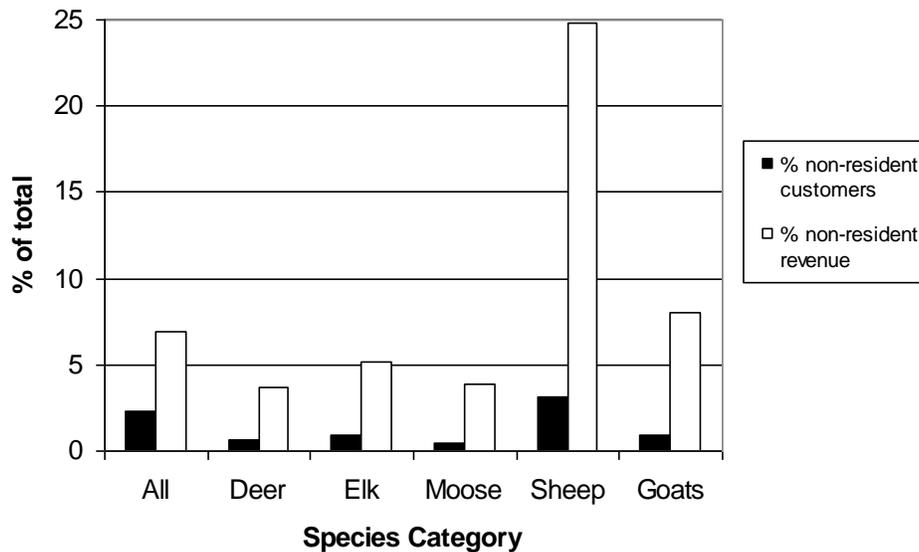
Washington's hunting community spent an estimated \$313 million on hunting-related expenses in 2006 (Table 17; USFWS and USCB 2008). This corresponds to an average of \$1,598 per hunter per year or about \$147 per hunter day. Equipment and trip-related costs accounted for about 60% and 24% of all expenses, respectively (Table 17). Hunting-related expenditures in 2006 were strongly skewed toward big game (86% of total expenditures), with smaller amounts for small game (5%), migratory birds (4%), and others (USFWS and USCB 2008).

Washington attracts few out-of-state hunters compared with nearby states. Non-resident hunters comprise fewer than 2% of the hunters and about 0.1% of the hunter days expended in Washington, whereas in 10 other western states (excluding California and Hawaii), non-residents comprise on average 28% (range = 8-51%) of the hunters and 20% (range = 3-48%) of the hunter days expended (Figure 24; USFWS and USCB 2007). Washington's non-resident license fees are competitive with other states and the state has no special restrictions limiting the number of out-of-state hunters. However, out-of-state big-game hunters are more likely to visit other western states such as Idaho, Colorado, Wyoming, and Montana, where larger ungulate populations, land mass, and lower human populations allow for more opportunity, higher success rates, and better overall hunting value. As a result, non-resident hunters contribute less to Washington's economy than they do to other western states' economies.

1 Table 17. Estimated total expenditures by hunters and average expenditures per hunter for all types of
 2 hunting combined in Washington in 2006 (from USFWS and USCB 2008).
 3

Category of expenditure	Total amount	Average amount per hunter ^a
Food and lodging	\$33,083,000	\$169
Transportation	36,528,000	186
Other trip costs (land use fees, guide fees, heating and cooking fuel, other)	4,622,000	24
Total trip related	74,233,000	379
Hunting equipment (guns, ammunition, bows, dogs, other)	66,625,000	340
Auxiliary equipment (clothing, processing and taxidermy, optics, camping equipment, other)	44,120,000	225
Special equipment (boats, campers, cabins, trail bikes, other)	77,994,000	398
Total equipment	188,739,000	963
Other items (land leasing and ownership, licenses, other)	50,163,000	256
Total expenditures	\$313,134,000	\$1,598

4 ^a Based on an estimated total of 196,000 resident and non-resident hunters hunting each year in Washington.
 5 This number presumably includes some people who spent money on hunting activities and equipment, but did
 6 not actually hunt.
 7
 8
 9
 10



11 Figure 24. Representation of non-resident hunters as a percentage of total hunting customers in
 12 Washington and their contribution to WDFW hunting revenues, according to species and averaged for
 13 fiscal years 2002-2007. Customers are defined as anyone buying a hunting license or applying for a
 14 special permit, with no individual counted more than once. Some customers may not have hunted during
 15 the year. Revenue figures are based on fees collected for licenses, permits, and applications, but
 16 exclude monies from auctions and raffles.
 17

Hunting Revenue for WDFW

Revenues generated by WDFW’s hunting program totaled about \$13.3 million in fiscal year 2007 and have expanded 9.8% since 2002 (Figure 25). License and other sales involving deer and elk are the two largest sources of hunting-related revenue for the agency and have also gradually increased since 2002 (6.8% for deer, 11.4% for elk; Figure 25). The existence of multi-species combination licenses makes it difficult to determine revenue generated by each species, but estimates based on the full cost of each license type involving these species indicate that deer hunting provides WDFW with more revenue than elk hunting (Figure 25). Revenues associated with both species have gradually increased since 2002. The agency derives considerably smaller amounts of revenue from the hunting of bighorn sheep, moose, and mountain goats (Figure 26). Revenues have been expanding for each of these species since 2002, especially for sheep.

About 7% of total WDFW hunting revenues comes from non-resident hunters (Figure 24). For big game species, non-resident hunters contribute about 4% (for deer and moose) to 25% (for bighorn sheep) of the hunting revenues gathered per species by the agency.

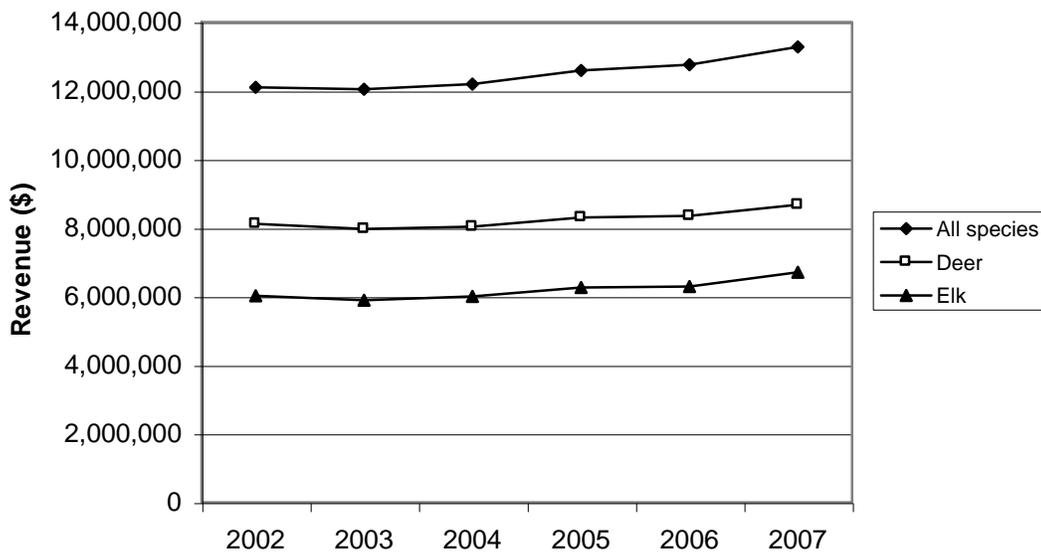
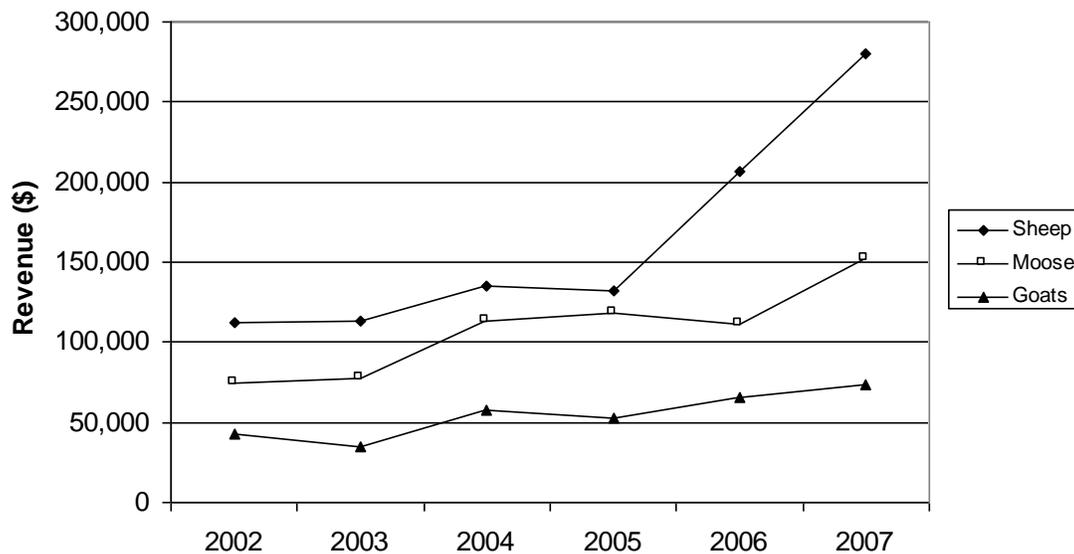


Figure 25. Trends in hunting revenues generated by the WDFW hunting program for all species combined (i.e., big game, small game, and migratory birds) and separately for deer and elk for fiscal years 2002-2007. Revenue figures come from both general and special permit seasons, and include monies collected from license fees, permit fees, application fees, raffles, and auctions. Revenues for deer and elk hunting overlap because they are summed from the full values of all license types (including multi-species combination licenses) involving each particular species.



1
2 Figure 26. Trends in hunting revenues generated by WDFW for bighorn sheep, moose, and mountain
3 goats for fiscal years 2002-2007. Revenue figures include monies collected from permit fees, application
4 fees, raffles, and auctions.
5
6
7

8 Outfitted Hunting 9

10 Commercial outfitters are primarily small independently owned businesses offering a variety of
11 guided services (e.g., river running, fishing, hunting, camping, trail riding, packing, hiking, biking,
12 climbing, and outdoor photography trips) to paying clients. Lodging is also provided by some
13 outfitters. Outfitted trips usually qualify as a form of sustainable tourism because of their low
14 impact on the environment and local culture, while helping to generate income and employment and
15 benefiting the conservation of local ecosystems.
16

17 Washington's outfitter industry is considerably smaller than in some neighboring states such as
18 Montana (see Nickerson et al. 2007) and Idaho, but quantified information on the size and
19 economic contributions of outfitting in Washington is lacking. Detailed information is also lacking
20 on the industry's client base, types of services rendered, and use of public versus private lands.
21

22 The Washington Outfitters and Guides Association (WOGA) represents a number of outfitting
23 companies in the state, with membership currently totaling 29 companies (WOGA 2007). Nearly all
24 members market multiple activities to clients, including 26 companies offering non-fishing and non-
25 hunting activities, 12 offering hunting (mostly big game), 11 offering fishing, and nine offering river
26 running and other water-related activities. Outfitter activities in general tend to be concentrated in
27 eastern Washington (G. Ulin, pers. comm.). Among WOGA outfitters, north-central Washington
28 (northeastern Cascades and the Okanogan), south-central Washington (southeastern Cascades), and
29 Puget Sound are the three main regions of operation (WOGA 2007). Washington residents are
30 thought to represent the majority, perhaps 60-67%, of the customer base for in-state outfitters (G.
31 Ulin, pers. comm.). The establishment of several new companies during the past few years suggests
32 that the industry as a whole is slowly growing.

1
2 Summer trips offering fishing, packing, camping, and other family- or group-related outdoor
3 activities are the largest source of revenue for most land-based outfitters in Washington (G. Ulin,
4 pers. comm.). Hunting trips are of lower importance as a source of income for most outfitters.
5

6 Hound Hunting 7

8 An estimated 500-700 hunters participate in hound hunting in Washington (D. Martorello, pers.
9 comm.). Use of hounds is currently restricted to three game species (see Chapter 7), with cougars
10 being the most popular quarry. Cougar hunting with hounds is largely limited to six counties (Pend
11 Oreille, Stevens, Ferry, Okanogan, Chelan, and Klickitat) in the state. Hound hunters typically
12 employ two to five dogs per party. Hounds can be either registered purebreds (e.g., Black & Tan,
13 Walker, Redbone) or of mixed ancestry. Monetary values per dog range from several hundred
14 dollars to more than \$5,000, but average about \$2,500 (D. Martorello, pers. comm.). In Idaho,
15 Montana, and Wyoming, losses of hunting hounds to wolves are not reimbursed by Defenders of
16 Wildlife or any other compensation program.
17

18 Recent Impacts of Wolves on Big Game Hunting in Neighboring States 19

20 To date, wolves have not resulted in any sizable losses of hunter opportunity in Montana, although
21 seasons for antlerless elk in some locations have been reduced to compensate for mortality from
22 multiple sources including wolves (MFWP 2007a; C. Sime, pers. comm.). In southwestern
23 Montana, some of the most liberal opportunities for elk harvest over the past three decades are
24 currently being offered in two-thirds of the region's hunting districts, all of which support wolves.
25 However, lethal wolf control in many of these areas to reduce conflicts with livestock may keep local
26 wolf densities low enough to minimize impacts on elk herds. Recently, Montana Fish, Wildlife &
27 Parks has reduced hunting limits for antlerless elk in the northern Yellowstone herd, which has
28 undergone a substantial decline since the mid-1990s due to a large past antlerless harvest, drought,
29 and predation by wolves and other predators (Eberhardt et al. 2007). This is designed to enhance
30 adult female elk survival and to decrease the removal of animals with the highest reproductive
31 potential. Wolf impacts on deer and other ungulates have not been detected to date (C. Sime, pers.
32 comm.). In the northern Yellowstone area, no reductions in hunting permits, harvest size, or hunter
33 success for mule deer or moose have occurred as a result of wolves (White et al. 2005). Montana
34 Fish, Wildlife & Parks has not experienced any declines in hunting generated revenue, license sales,
35 or hunter success on a statewide level because of wolf presence (C. Sime, pers. comm.).
36

37 Wolf impacts on big game hunting in Idaho have not been well quantified. IDFG (2008) reported
38 that wolf predation may be causing reductions in the harvestable surplus of elk in some parts of the
39 state, even if elk populations are not declining. The Lolo region, where experimental wolf control is
40 proposed, has experienced a significant reduction in elk abundance, but this trend began in the mid-
41 1980s well before wolves became common (IDFG 2006). The extent that wolves have contributed
42 to this decline in recent years is unknown but perhaps significant. IDFG (2008) has also reported
43 that wolves are possibly reducing success rates for some hunters in parts of the state by changing the
44 behavior and habitat use of elk during the hunting season. As observed in the greater Yellowstone
45 ecosystem (Creel and Winnie 2004, Mao et al. 2005), Idaho's elk may now be spending more time in
46 forested areas, on steeper slopes, and at higher elevations than before wolf reintroductions, making
47 it more difficult for hunters to find animals. Changes in herding behavior and movement rates

1 (Proffitt et al. 2009) may also affect hunting success. Other ungulates have not been impacted by
2 wolves in Idaho, with the possible exception of moose (S. Nadeau, pers. comm.). Declines in
3 moose in some areas are poorly understood and may in fact be related to habitat changes or other
4 causes.

5
6 Big game revenue and tag sales to resident and non-resident hunters have remained stable in recent
7 years for the Idaho Department of Fish and Game (B. Compton, pers. comm.; S. Nadeau, pers.
8 comm.). Some hunters have indicated that they would not return to their hunting areas because of
9 real or perceived impacts of wolves, but whether this has produced significant changes in hunter
10 activity has been difficult to assess. Hound hunting permit sales have also remained level or slightly
11 increased in the state (S. Nadeau, pers. comm.).

12
13 In Wyoming, at present, there are no definitive data showing decreased hunter harvest or
14 opportunity due to wolf predation on elk or moose (WGFC 2008).

15
16 Mexican gray wolves were reintroduced to a portion of western New Mexico and eastern Arizona
17 beginning in 1998 and numbered 44-50 animals by 2004 and 2005. Unsworth et al. (2005) reported
18 that this level of abundance caused no measurable changes in elk harvest or outfitter income
19 between 1998 and 2004, and that numbers of elk and deer hunters and hunter days to the area
20 actually increased. Elk and deer populations declined in the area during this period, but this was
21 likely due to changes in forage conditions and game management decisions rather than predation by
22 wolves.

23 24 Summary

25
26 The possible impacts of wolf predation on ungulate populations are debated by both the general
27 public and the scientific community (see Chapter 5, Section A). Big game hunters in Washington are
28 concerned that wolves will cause declining ungulate populations and opportunities for hunting. As
29 described in Chapter 5, many factors affect the population sizes and trends of elk, deer, and other
30 big game species, including habitat quantity and quality, severe weather, levels of hunter harvest,
31 predation, and disease. Thus, it is difficult to determine the effect that wolf predation has on
32 ungulate populations and hunter success.

33
34 It is very difficult to predict with confidence the impacts that different population sizes of wolves
35 will have on ungulate populations and hunter harvest in Washington. This is due largely to the many
36 uncertainties involving where and how rapidly wolves become reestablished, their eventual
37 abundance and diet composition, prey species behavior and population changes, hunter responses,
38 and other influences. For these reasons, the effects of wolf predation on ungulate populations are
39 highly situation-specific (Garrott et al. 2005).

40
41 Keeping these limitations in mind, some general approximations of wolf predation levels are
42 presented in Table 18 using dietary information from neighboring states. Total populations of 50
43 and 100 wolves are expected to have minor overall impacts on Washington's ungulate populations.
44 Fifty wolves may kill about 425-630 elk and 700-1,050 deer per year, with annual take doubling for
45 100 wolves (see Table 18 for an explanation of these estimates). These levels of predation could
46 result in
47

1
2 Table 18. Projected numbers of packs, successful breeding pairs, lone wolves, and ungulate prey for four
3 different population size categories of wolves in Washington. Because of the absence of biological data
4 on wolves living in Washington, numbers presented here should be considered as very rough
5 approximations.
6

Number of wolves present	Population size category			
	50	100	200	300
Estimated total no. of prey killed per year ^a	1,130-1,675	2,260-3,350	4,520-6,700	6,780-10,050
Estimated no. of elk killed per year ^a	425-630	850-1,260	1,700-2,520	2,550-3,780
Estimated no. of deer killed per year ^a	705-1,045	1,410-2,090	2,820-4,180	4,230-6,270

7
8 ^a Numbers represents the estimated range in numbers of prey killed by different sizes of wolf populations based
9 arbitrarily on (1) an average kill rate of 7.2 kg/wolf/day (derived from Table 5.5 in Mech and Peterson [2003]) plus or
10 minus 20%, (2) average body weights of 150 kg per elk and 60 per deer, and (3) a diet of 60% elk and 40% deer by
11 biomass (see Table 2, Chapter 2). Because of the large differences in body weight between elk and deer (Chapter
12 5), fewer elk than deer are expected to be killed. Estimates given here are based on an average annual kill rate of
13 8.5-12.6 elk and 14.1-20.9 deer per wolf, or about 22.6-33.5 ungulates total per wolf.
14
15

16 noticeable effects on elk and deer abundance in some localized areas occupied by wolf packs, but
17 should not have broad-scale impacts. These levels of loss potentially represent 1-2% of the state's
18 elk population and less than 1% of the combined deer population. With larger populations of
19 wolves, greater numbers of ungulates would be removed annually, with perhaps 1,700-3,800 elk and
20 2,800-6,300 deer taken if 200-300 wolves became reestablished (Table 18). Predation levels on
21 moose are also difficult to estimate, but may be significant if wolves become numerous in
22 northeastern Washington. Wolf take of bighorn sheep and mountain goats is expected to be minor.
23

24 The estimates presented above come with many caveats. For example, wolf expansion may result in
25 lowered coyote and cougar populations, thereby reducing ungulate and other game (e.g., upland
26 birds, rabbits) losses caused by these predators. Changes in harvest strategies (e.g., reduced
27 antlerless take, shortened hunting seasons, etc.) and further efforts to manage habitat for elk and
28 deer may be necessary to offset some wolf-related losses and keep game populations at their
29 intended management objectives. In areas without severe winter snowpack and without full
30 protection for wolves, Garrott et al. (2005) has suggested that wolf impacts on elk may be lower
31 than expected.
32

33 Populations of 50 to 100 wolves should have few negative effects on big game hunting in
34 Washington, as demonstrated by the relatively small estimated take of ungulates described above.
35 As in the Yellowstone region (Creel and Winnie 2004, Mao et al. 2005, Proffitt et al. 2009), wolves
36 may also cause some redistribution of game, which could make these species somewhat less
37 vulnerable to harvest. However, these impacts together would be restricted to the relatively few
38 areas occupied by packs during these recovery stages and would probably not reduce statewide
39 harvests of elk and deer by more than 1-3%. If these outcomes discouraged a similar proportion of
40 hunters from hunting, then big game-related hunting expenditures in the state, including the
41 revenues generated by WDFW, could decrease by a comparable amount (about \$100,000 to 300,000
42 annually). Whether or not the loss of a small percent of the state's elk and deer would affect hunter
43 participation and by how much is unknown. Some outfitters catering to hunters would perhaps be
44 negatively affected, but because this industry is small in Washington, the overall financial impact

1 would be small. If some non-resident hunters decided not to hunt in Washington, this effect would
2 be negligible because non-resident elk and deer hunters comprise a small fraction of total hunters in
3 the state (Figure 24). Losses of hunting hounds to wolves are not expected to exceed one or two
4 animals per year, as noted in Idaho and Montana (S. Nadeau, pers. comm.; C. Sime, pers. comm.),
5 where much larger wolf populations exist.

6
7 Larger wolf populations would be expected to have greater impacts on game and hunting
8 opportunity, but such impacts become increasingly difficult to predict or measure. To
9 accommodate larger elk and deer losses from wolves, reductions in antlerless take and perhaps other
10 restrictions such as shortened hunting seasons or reduced availability of special permits may be
11 needed in some areas where wolves become common. Given the stable or increasing numbers of
12 hunters, tag sales, numbers of animals killed, levels of hunter success, and amount of revenue
13 generated in association with elk and deer hunting in Washington during the past decade (Figures
14 15, 17, 25), there appears to be some capacity for the state to absorb the game losses caused by
15 wolves.

16
17 In the future, there could be revenue generated for WDFW if wolves recover to the point that they
18 are delisted and eventually become a hunted species. Revenue could be generated through special
19 permit application sales, auctions, and raffles. It is unknown how much revenue would be generated
20 from these sources. Such sales might be similar to those obtained for bighorn sheep, moose, and
21 mountain goats during most of the past decade (Figure 26), an estimated \$50,000 to \$150,000 per
22 year, or could be substantially lower at \$10,000 to \$50,000 (D. Ware, pers. comm.).

23
24 The presence of wolves may provide an additional benefit for some hunters by enhancing their
25 overall hunting experience. The possibility of seeing or hearing wolves, finding wolf tracks or a wolf
26 kill, or hunting among wolves could give considerable enjoyment to these hunters.

27 28 **D. Wildlife Tourism**

29
30 Ecotourism, or travel to natural areas for environmentally responsible outdoor experiences, is one of
31 the fastest growing segments of the overall world tourism industry. Wildlife viewing is a large part
32 of this business and is hugely popular in the United States.

33
34 According to the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation,
35 more than 71 million Americans 16 years old and older (31% of the U.S residents in this age
36 bracket) participated in wildlife watching activities (i.e., observing, feeding, photographing, etc.;
37 includes fish viewing) in 2006 (USFWS and USCB 2007). Of these, almost 23 million people took
38 trips more than one mile from their homes specifically to see wildlife. Participation in wildlife
39 viewing increased 8% nationally from 2001 to 2006, in contrast to fishing and hunting, which fell
40 12% and 4%, respectively. Wildlife watchers spent nearly \$46 billion in 2006, or about \$650 per
41 participant, with trip-related expenditures increasing 38% between 2001 and 2006. Seventy percent
42 (16.2 million people) of the wildlife watchers traveling away from home observed, fed, or
43 photographed land mammals, with 56% (12.8 million people) specifically interested in large
44 mammals such as deer, bears, and coyotes. Eighty-three percent of wildlife watchers traveling away
45 from home did so in their home state; 33% visited other states.

1 In Washington during 2006, an estimated 2.33 million people 16 years old and older participated in
 2 some form of wildlife watching, which ranked the state 11th in the nation for participation (USFWS
 3 and USCB 2007, 2008). About 2.00 million participants were state residents (40% of the state's total
 4 population in this age group), with the remainder being non-residents. An estimated 628,000
 5 residents and 331,000 non-residents in this age group traveled more than one mile away from home
 6 to view wildlife in Washington during the year. Residents spent an estimated 8.0 million days (88%
 7 of the total; average of 12.7 days per person) and non-residents spent an estimated 1.1 million days
 8 (12%; average of 3.4 days per person) watching wildlife away from home in the state during the year.
 9 Washington residents spent an additional 1.48 million days watching wildlife in other states in 2006.
 10 Overall, wildlife watchers outnumbered hunters and anglers combined by nearly three times in
 11 Washington.

12
 13 Annual spending in Washington by resident and non-resident wildlife watchers on travel, food,
 14 lodging, equipment, and other goods and services totaled an estimated \$1.5 billion in 2006, ranking
 15 the state seventh in the nation behind California, Florida, Texas, Michigan, Georgia, and New York
 16 (USFWS and USCB 2007, 2008). About \$595 million was spent during the year on equipment, \$442
 17 million on trip-related costs, and \$466 million on other costs (Table 19). Annual spending by
 18 wildlife watchers in the state rose 53% from 2001 to 2006 (USFWS and USCB 2003, 2007, 2008).
 19 Participants spent an average of \$645 per person in 2006 (Table 19). Overall, wildlife watchers
 20 outspent hunters and anglers combined by 5% (\$1.43 billion vs. \$1.36 billion) in Washington
 21 (USFWS and USCB 2008). Wildlife viewing generated an estimated 22,439 jobs in Washington in
 22 2001 (USFWS 2003). However, revenue to WDFW for wildlife conservation and management
 23 generated by wildlife watchers is minimal.

24
 25
 26 **Table 19. Estimated total expenditures and average expenditures per participant for all types of wildlife-**
 27 **watching activities in Washington in 2006, including both those around the home and away from home**
 28 **(from USFWS and USCB 2007, 2008). Estimates are for state residents and non-residents combined.**
 29

Category of expenditure	Total amount	Average amount per participant ^a
Food and lodging	\$227,721,000	\$98
Transportation	157,045,000	67
Other trip costs (boating costs, guide/outfitter fees, public and private land use fees, equipment rental, other)	56,886,000	24
Total trip related	441,652,000	189
Wildlife-watching equipment (wildlife feed, cameras, binoculars, hiking equipment, other)	262,335,000	113
Auxiliary equipment (camping equipment, other)	29,797,000	13
Special equipment (off-road vehicles, campers, boats, other)	302,574,000	130
Total equipment	594,706,000	255
Other items (land leasing and ownership, plantings around homes that benefit wildlife, membership dues, contributions, literature, other)	465,953,000	200
Total expenditures	\$1,502,311,000	\$645

30
 31 ^a Based on an estimated total of 2,331,000 wildlife-watching participants in Washington.

Wolf-Related Ecotourism in North America

Commercial wolf watching has grown in significance in North America over the past several decades, especially in the lower 48 states, and has resulted in regional economic benefits. Yellowstone National Park has become the premier wolf viewing location on the continent, with a thriving and rapidly growing wolf-watching business since the species was reintroduced in 1995 and 1996. Visitor surveys in 2005 showed that the opportunity to see or hear wolves increased annual rates of park visitation by almost 4% and spending on lodging, food, and other services by an estimated \$35.5 million among people coming from outside Wyoming, Montana, and Idaho (Duffield et al. 2006, 2008). Wolves have joined grizzly bears as the marquee species most sought after at Yellowstone, with about 44% of visitors hoping to see wolves (Duffield et al. 2008). Many wolf-watchers at the park are repeat visitors. Even visitors who fail to see wolves are often satisfied with their experiences through hearing wolves, seeing their tracks and scat, or simply knowing that wolves were nearby (Montag et al. 2005). Duffield et al. (2008) estimated that more than 300,000 visitors saw wolves at the park in 2005 alone.

National Park Service officials had originally expected Yellowstone's wolves to be far more secretive and less visible, as at Isle Royale (Michigan) and Denali (Alaska) National Parks, and therefore did not anticipate these levels of recreational and economic impacts. However, the park's wolves quickly became accustomed to roads, traffic, and people, and readily occupied more open terrain. The local tourism industry and business community seized the opportunity by offering guided trips to find wolves. Guides explain wolf behavior and biology, and increase the likelihood of visitors seeing wolves. More than 50 organizations now offer wolf trips (Kirkwood 2006) and at least one tour company advertises a 97% success rate in seeing animals. Wolves are more easily observed from fall through spring and therefore help attract visitors to the region during the months of lowest visitation. Most greater Yellowstone area wolf watching remains within the national park itself. Outfitters and guides in outlying areas, where wolves are also thriving on both public and private lands, haven't been as successful in organizing as many wolf-watching trips.

In other parts of North America, wolf-related tourism has expanded in different ways:

- The International Wolf Center in Ely, Minnesota, brings about \$3 million per year to the area and creates as many as 66 jobs in tourism-related businesses and other industries (Schaller 1996). The center, which specializes in wolf education and tourism, opened in 1993 on the edge of the Boundary Waters Canoe Area Wilderness in the heart of the largest wolf population in the lower 48 states. A 2004 survey showed that a third of all tourists to northeastern Minnesota visited the center, resulting in a major economic benefit for the surrounding two-county area. Visitation totaled 42,000 people in 2005.
- After red wolves were reintroduced to northeastern North Carolina in 1987 and grew to an estimated population of 100 by 2005, a study found interest in developing a fledgling wolf tourism business (Lash and Black 2005). Weekly wolf howling tours at the Alligator River National Wildlife Refuge drew about 900 visitors from across the country in 2005. A planned Red Wolf Visitor and Education Center, partnered with existing ecotourism activities (e.g., hiking, fishing, other wildlife viewing) in the Outer Banks region is estimated to potentially attract over 25,000 households annually, boost tourism by up to 19%, and

1 bring in about \$37.5 million in direct and indirect tourist spending to North Carolina (Lash
2 and Black 2005).

- 3
- 4 • Wolf howling expeditions in Algonquin Provincial Park in Ontario, Canada, where dense
5 forest cover makes wolves more likely to be heard than seen, have drawn more than 2,000
6 participants every summer since 1963, contributing almost \$1.9 million to Ontario's yearly
7 economy (Bowman and Eagle 2004).
8
 - 9 • The 1998 reintroduction of Mexican gray wolves to eastern Arizona and western New
10 Mexico, including the Gila and Apache National Forests, has triggered wolf-related tours by
11 the Arizona Heritage Alliance, Grand Canyon Chapter of the Sierra Club, and other private
12 parties (Unsworth et al. 2005). The lack of comprehensive annual visitation estimates for the
13 area's national forests prior to the arrival of wolves makes it impossible to measure wolf-
14 related increases in tourist numbers and expenditures.
15
 - 16 • Wolf-related ecotourism has the potential to succeed in central Idaho (Druzin 2007), but
17 remains in the very early stages of development. Hunting outfitters have teamed up with
18 environmental interpreters to give visitors glimpses of wolves in the Frank Church River of
19 No Return Wilderness and the Sawtooth National Recreation Area. One outfitter (M.
20 Branson, Wind River Outfitters) who guides hunters north of the Salmon River in the
21 Wilderness believes that wolves have made it harder to hunt elk, but that their presence adds
22 to the mystique of the Idaho wilderness that his customers are willing to pay for (Barker
23 2008). According to this outfitter, some hunters find wolf encounters to be the high point
24 of their trips. Wolves have also made this company's summer pack trips more popular.
25
 - 26 • Several private landowners have shown recent interest in developing small-scale wolf
27 watching at locations in western Montana away from Yellowstone and Glacier National
28 Parks (C. Sime, pers. comm.). In these cases, landowners have the potential to attract high
29 paying clients by offering opportunities to see wolves and enjoy the outdoors away from the
30 more crowded conditions of the national parks. If successful, these enterprises would
31 broaden the economic benefits of viewing wolves to a larger geographic portion of the state.
32

33 Summary

34
35 As with the other economic outcomes discussed in this chapter, Washington's ability to develop a
36 viable wolf-related tourism industry will depend on where and how many wolves eventually become
37 reestablished in the state, their behavior, and human behavior in response to them. However,
38 Washington appears to have potential for receiving at least modest economic benefits from wolf
39 watching for the following reasons:

- 40
- 41 1) Wildlife watching is already a highly popular activity among Washington's residents and
42 visitors, as shown by the number of participants and money generated (USFWS and USCB
43 2007, 2008). As a result, the state has one of the larger wildlife-watching constituencies in
44 the nation. Specific interest in viewing wolves is demonstrated by a 2008 telephone survey
45 of 805 Washington residents 18 years old and older that found that 54% of respondents
46 would travel to see or hear wild wolves in the state (Appendix I; Duda et al. 2008a).
47

- 1 2) As noted in locations such as Yellowstone National Park, wolves undoubtedly would be
2 highly popular among wildlife watchers in Washington, providing that animals can be seen
3 or heard, or that other evidence (tracks, scat) of their presence can be encountered on a
4 fairly reliable basis.
5
- 6 3) Large population centers in the greater Seattle, Portland, Vancouver, B.C., and Spokane
7 areas provide nearby sources of tourists. Each is within several driving hours of at least one
8 area where wolf recovery is expected to occur (i.e., the northern Cascades, southern
9 Cascades, northeastern Washington, and the Blue Mountains) and within a day's driving
10 distance of the entire state. Depending on the quality of viewing, visitors from outside the
11 Pacific Northwest will also likely come to Washington to see wolves.
12
- 13 4) Washington includes large amounts of public land administered primarily by the U.S. Forest
14 Service, National Park Service, and other federal and state agencies. Not only are these lands
15 conducive to wolf recovery, but as seen elsewhere in North America, public land ownership
16 lends itself to wolf-related tourism much better than private land ownership.
17
- 18 5) Outfitting and guiding businesses in Washington already include wildlife-viewing recreational
19 activities that provide the infrastructure needed to expand into commercial wolf viewing and
20 listening.
21
- 22 6) Washington offers many high quality outdoor activities (e.g., fishing, hunting, hiking,
23 camping, river running, viewing of other wildlife, and visiting national parks, national forests,
24 and federal and state wildlife areas) in a scenic setting that would be complementary to wolf
25 watching and help attract visitors to areas supporting wolves.
26

27 Although difficult to estimate, the experiences of Minnesota and Ontario (where money values have
28 been calculated) suggest that Washington could reasonably expect to derive economic benefits of
29 perhaps several million dollars annually from wolf-related activities by the time the species could be
30 delisted. Larger wolf populations in the state would likely expand viewing opportunities and
31 economic benefits. Depending on the extent to which communities and wildlife-viewing guiding
32 businesses use these opportunities, Washington could conceivably develop a sizable wolf-related
33 tourist industry.
34

35 The economic gain from wolf tourism has the potential to offset or exceed the combined costs of
36 livestock depredation and reduced hunting opportunities. Monies generated by wolf watching
37 would largely go to the counties where wolf recovery is most likely to occur, such as those in
38 northeastern and southeastern Washington and those along the Cascades. This would benefit many
39 of the more rural counties among these that have lower median household incomes and higher
40 unemployment than elsewhere in the state (see OFM 2007b, WSDOT 2008).
41

42 To achieve this potential, Washington will need to have some areas where wolves are safe from
43 harassment, and are therefore less afraid of people and more likely to use open terrain. The state
44 has at least two locations that could potentially offer good wolf viewing. Mt. St. Helens National
45 Volcanic Monument features a large open volcanic plain created by the 1980 eruption of Mt. St.
46 Helens. The plain and its sizable elk herd are easily viewed from various places along Johnson Ridge
47 (including the Forest Service's Johnson Ridge Observatory) and elsewhere. The Methow Valley in

1 Okanogan County supports large wintering deer herds in open habitats on both public and private
2 lands, and could attract wolves at that time of the year. Both of these locations are already popular
3 tourist destinations, so it may be difficult to quantify the economic benefits derived solely from wolf
4 viewing.

5
6 Wolf-based tourism also has some potential in other areas of the state (e.g., some national forest
7 lands) where wolves are not frequently seen, but are regularly present and relatively safe from
8 harassment. Modest numbers of visitors without high expectations might still be attracted to such
9 areas in hopes of possibly seeing or hearing a wolf or finding wolf sign. Wolf tourism in such
10 locations could be developed in various innovative ways, such as through the use of remote cameras
11 and websites, tracking and howling trips, or even development of a wolf visitor center similar to that
12 in Minnesota, where deeply wooded terrain also makes wolves difficult to see.

13
14 Offsetting these projected benefits to tourism, wolf presence may possibly scare some visitors away
15 from visiting national forests and other wildland areas through fears over personal safety. However,
16 this problem has not been reported in other localities with wolves in the lower 48 states.
17 Additionally, any substantial wolf-related declines in the viewability of elk, deer, and other ungulates,
18 caused either by changes in behavior or population declines, could possibly lower the viewing
19 opportunities for these species in some localized areas. The extent of lost revenues from this impact
20 is difficult to project.

21 22 **E. Forest Products Industry**

23 24 Overview of the Forest Products Industry in Washington

25
26 The total value of Washington's forest products industry (including lumber, wood products, paper,
27 and wood-related manufacturing production) was \$15.9 billion in 2006 (WFPA 2007), which
28 represented an estimated 5.4% of the state's economic output. Washington is the second largest
29 producer of softwood lumber in the nation, accounting for 13% of total U.S. production.

30
31 More than half (52%, 22.1 million acres) of Washington is forested (WFPA 2007). Sixty-four
32 percent (14.3 million acres) of the state's forestlands are managed by federal, state, tribal, county,
33 and municipal concerns, with the U.S. Forest Service being by far the largest holder (58%, 8.2
34 million acres) among these. The rest (36%, 7.9 million acres) are privately owned, of which 59%
35 (4.6 million acres) are considered industrial forestlands. In total, 73% (16.2 million acres) of the
36 state's forests are used commercially. From 2000 to 2005, 71% of the timber harvested in
37 Washington came from private forestland, whereas just 2% originated from federal land (WFPA
38 2007). About 7 billion board feet of lumber were harvested annually in the late 1980s, but this figure
39 has declined to about 4 billion board feet since the mid-1990s due to federal and state policy
40 changes. Based on timber tax revenues, the 15 largest timber-producing counties in the state in 2006
41 were (in order) Lewis, Grays Harbor, Pacific, Cowlitz, Clallam, Pierce, Stevens, Mason, Jefferson,
42 Thurston, Klickitat, Skagit, King, Snohomish, and Clark counties (WSDOR 2007). Thirteen of
43 these counties are located in western Washington.

1 Summary

2
3 Wolves are habitat generalists, but in the western United States occur most frequently in forests
4 (USFWS 2009). Wolves are also fairly tolerant of moderate amounts of human disturbance, even in
5 the vicinity of active wolf dens (Thiel et al. 1998, Frame et al. 2007). Hence, restrictions on land use
6 practices have not been necessary to achieve wolf conservation in Idaho, Montana, and Wyoming
7 (USFWS 2009). For these reasons, wolf reestablishment in Washington is not expected to result in
8 the imposition of any land use restrictions to protect and conserve wolves other than those that
9 occasionally may be needed to temporarily protect den sites from malicious or careless destruction
10 during the denning period (see Chapter 8).

11
12 In neighboring states with wolves, no restrictions have been placed on the forest products industry
13 regarding timber management and logging to protect wolves. On private forestlands in Washington,
14 no restrictions are anticipated with the possible exception of delaying timber harvests near occupied
15 den sites until after the completion of the denning season. The Washington Department of Natural
16 Resources currently has a provision under the Washington State Forest Practices Act Critical
17 Habitats Rule for threatened and endangered species (WAC 222-16-080) for gray wolves. Forest
18 practices on state and private land where harvesting, road construction, or site preparation is
19 proposed within 1 mile of a known active wolf den, documented by WDFW, between the dates of
20 March 15 and July 30, or 0.25 mile from the den at other times of the year, are designated as a Class
21 IV-Special and require an extra 14 days of review, and are subject to State Environmental Policy Act
22 (SEPA) review. The rule was established in 1992, but much has been learned since then about
23 habitat issues involving wolves in neighboring states. This newer information suggests that the rule
24 should be reviewed and perhaps modified to reflect current knowledge.

25
26 On public forestlands, WDFW has no legal authority to implement timber harvest and other land
27 use restrictions on land it does not manage; land management agencies can and may adopt seasonal
28 or area restrictions independently from WDFW. However, experience in Idaho, Montana, and
29 Wyoming has shown that no restrictions, other than those occasionally needed to temporarily
30 prevent excessive disturbance of occupied den sites, have been necessary to conserve wolves.

31
32 In summary, wolf reestablishment in Washington is anticipated to have no economic impact on the
33 state's forest products industry.

34 **F. Other Potential Economic Impacts**

35
36
37 In addition to concerns over potential hunting-related impacts, commercial outfitters in Washington
38 have expressed concern that agency-dictated area closures related to wolf presence (especially during
39 the denning period) may preclude access to or through some desirable areas on federal and state
40 lands (G. Ulin, pers. comm.). Even temporary closures under this scenario could result in significant
41 financial impacts to effected outfitters. As described elsewhere in this plan (Chapter 8; Chapter 14,
42 Section E), very few area closures of this type have occurred in Idaho, Montana, or Wyoming, thus
43 few if any are expected in Washington. However, WDFW has no legal authority over land it does
44 not manage; land management agencies can and may adopt seasonal or area restrictions
45 independently from WDFW. Thus, there is minor potential for wolf-related area closures to occur
46 in the state. However, if this should occur, the number of areas affected would likely be very small,
47 hence few outfitting companies are expected to be impacted.

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GLOSSARY OF TERMS

For the purposes of this conservation and management plan, the following definitions apply:

Breeding pair – see Successful Breeding Pair.

Classify – to list or delist wildlife species to or from endangered, or to or from the protected wildlife subcategories threatened or sensitive.

Compensation – monetary payment to offset or replace the economic loss for a death or injury to livestock or guarding animals due to wolf activity.

Confirmed non-wild wolf depredation – any depredation where there is clear physical evidence that the predator was another species (e.g., coyote, black bear, cougar, bobcat, domestic dog), or a wolf hybrid, or pet wolf, as determined by USDA Wildlife Services, WDFW, or an authorized agency representative.

Confirmed wolf depredation – any depredation where there is reasonable physical evidence that the dead or injured livestock was actually attacked or killed by a wolf. Primary confirmation would ordinarily be the presence of bite marks and associated subcutaneous hemorrhaging and tissue damage, indicating that the attack occurred while the victim was alive, as opposed to simply feeding on an already dead animal. Spacing between canine tooth punctures, feeding pattern on the carcass, fresh tracks, scat, hairs rubbed off on fences or brush, and/or eyewitness accounts of the attack may help identify the specific species or individual responsible for the depredation. Predation might also be confirmed in the absence of bite marks and associated hemorrhaging (i.e., if much of the carcass has already been consumed by the predator or scavengers) if there is other physical evidence to confirm predation on the live animal. This might include blood spilled or sprayed at a nearby attack site or other evidence of an attack or struggle. There may also be nearby remains of other victims for which there is still sufficient evidence to confirm predation, allowing reasonable inference of confirmed predation on an animal that has been largely consumed. Determination will be made by WDFW or other authorized personnel.

Delist – to change the classification of endangered, threatened, or sensitive species to a classification other than endangered, threatened, or sensitive.

Depredation – any death or injury of livestock, as defined in this plan, caused by a predator.

Dispersal – generally refers to the natural movement of an animal from one area to another.

Distinct population segment – a discrete and significant subgroup within a species that is treated as a species for purposes of listing under the federal Endangered Species Act.

Downlist – to change the classification of an endangered or threatened species to a lower classification (e.g., from endangered to threatened, or from threatened to sensitive).

Elk herd – defined as a population within a recognized boundary as described by a combination of Game Management Units established by WDFW. Ten defined elk herds occur in the state.

-
- 1 **Endangered** – as defined by Washington law, any wildlife species native to the state of Washington
2 that is seriously threatened with extinction throughout all or a significant portion of its range within
3 the state.
4
- 5 **Extinct** – a wildlife species that no longer exists anywhere; it has died out entirely, leaving no living
6 representatives.
7
- 8 **Extirpated** – a wildlife species that no longer occurs in the wild in Washington, but exists
9 elsewhere.
10
- 11 **Fladry** – a method of non-lethal wolf deterrent that involves attaching numerous strips of flagging
12 material along a fence or other device for the purpose of keeping wolves out of an area occupied by
13 livestock.
14
- 15 **Game animal** – a wildlife species that can only be hunted as authorized by the Washington Fish
16 and Wildlife Commission.
17
- 18 **Guarding animals** - any dog, llama, or other species actively used to defend livestock from
19 predators.
20
- 21 **Guarding dog** – any dog actively used to defend livestock from predators.
22
- 23 **Habituation** – for wolves, this refers to individuals that have lost their natural fear of humans and
24 human activities, which allows them to live in proximity to humans. This often occurs through
25 repeated exposure to humans in non-threatening situations, especially where food has been made
26 available.
27
- 28 **Herding dog** – any dog actively used to herd livestock.
29
- 30 **Heterozygosity** – refers to the desirable condition of maintaining genetic variation in populations
31 through the retention of two different alleles at loci on chromosomes.
32
- 33 **Hybrid** – the offspring of a mating between a wolf and a dog, a wolf and a hybrid, a dog and a
34 hybrid, or two hybrids.
35
- 36 **In the act of attacking** – actively biting, wounding, or killing.
37
- 38 **Intraspecific** – occurring within a species or involving members of one species.
39
- 40 **Lethal control** – management actions that result in the death of a wolf.
41
- 42 **List** – to change the classification status of a wildlife species to endangered, threatened, or sensitive.
43
- 44 **Livestock** – cattle, calves, pigs, horses, mules, sheep, lambs, llamas, goats, guarding animals, and
45 herding dogs.
46

1 **Metapopulation** – a set of partially isolated populations of the same species. The populations are
2 able to exchange individuals and recolonize sites in which the species has recently become
3 extirpated.

4
5 **Native** – any wildlife species naturally occurring in Washington for the purposes of breeding,
6 resting, or foraging, excluding introduced species not found historically in the state. Native species
7 are presumed to have been present in the state prior to the arrival of Euro-Americans.

8
9 **Non-depredation** – there is clear evidence that livestock died from or was injured by a cause other
10 than predation, such as disease, inclement weather, or poisonous plants. This determination may be
11 made even in instances where the carcass was subsequently scavenged by wolves. It will be made by
12 WDFW or other authorized personnel.

13
14 **Nongame animal** – any species of fish or wildlife that is not hunted, fished, or trapped.

15
16 **Non-lethal control** – management actions designed to frighten or threaten wolves, but that do not
17 result in the death of a wolf.

18
19 **Pack of wolves** – a group of wolves, usually consisting of a male, female, and their offspring from
20 one or more generations. For purposes of monitoring, a pack is defined as a group of two or more
21 wolves traveling together in winter.

22
23 **Proactive management** – non-lethal husbandry methods implemented to minimize the potential
24 for wolf-livestock conflicts. These may include, for example, modified husbandry methods, light
25 and noise scare devices, non-lethal munitions, fencing, fladry, guarding animals, and greater use of
26 herders/riders.

27
28 **Probable wolf depredation** – there is sufficient evidence to suggest that the cause of death was
29 depredation, but not enough to clearly confirm that the depredation was caused by a wolf. A
30 number of other factors will help in reaching a conclusion, such as (1) any recently confirmed
31 predation by wolves in the same or nearby area, and (2) any evidence (e.g., telemetry monitoring
32 data, sightings, howling, fresh tracks, etc.) to suggest that wolves may have been in the area when the
33 depredation occurred. All of these factors and possibly others would be considered in the
34 investigator's best professional judgment. Determination will be made by WDFW or other
35 authorized personnel.

36
37 **Reintroduction** – capturing and moving animals from one area to another, usually for the purpose
38 of reestablishing a new population in an area that was formerly occupied. For this plan,
39 reintroduction implies moving wolves from locations outside of Washington to a site(s) inside
40 Washington.

41
42 **Rendezvous site** – a specific resting and gathering area occupied by wolf packs during summer and
43 early fall after the natal den has been abandoned. A wolf pack will usually move from the natal den
44 site to the first rendezvous site when the pups are 6-10 weeks of age (late May-early July). The first
45 rendezvous site is usually within 1-6 miles of the natal den site. A succession of rendezvous sites are
46 used by the pack until the pups are mature enough to travel with the adults (usually September or
47 early October).

-
- 1 **Sensitive** – as defined by Washington law, any wildlife species native to the state of Washington
2 that is vulnerable or declining and is likely to become endangered or threatened in a significant
3 portion of its range within the state without cooperative management or removal of threats.
4
- 5 **Significant portion of its range** – that portion of a species’ range likely to be essential to the long-
6 term survival of the population in Washington.
7
- 8 **Sink population** – a subpopulation where mortality exceeds reproductive success and therefore has
9 difficulty sustaining itself without continual immigration. Sink populations are generally found in
10 lower quality habitats known as sink habitats.
11
- 12 **Source population** – a subpopulation whose reproductive success exceeds mortality and therefore
13 produces young that emigrate to other subpopulations and unoccupied areas. Source populations
14 are generally found in better quality habitats known as source habitats.
15
- 16 **Species** – as defined by Washington law, any group of animals classified as a species or subspecies
17 as commonly accepted by the scientific community.
18
- 19 **Successful breeding pair** – an adult male and an adult female wolf with at least two pups surviving
20 to December 31 of a given year, as documented under WDFW’s established protocols.
21
- 22 **Threatened** – as defined by Washington law, any wildlife species native to the state of Washington
23 that is likely to become an endangered species within the foreseeable future throughout a significant
24 portion of its range within the state without cooperative management or removal of threats.
25
- 26 **Translocation** – moving animals from one area to another for the purpose of establishing a new
27 population.
28
- 29 **Turbofladry** – a method of non-lethal wolf deterrent that involves attaching numerous strips of
30 flagging material along an electrified fence for the purpose of keeping wolves out of an area
31 occupied by livestock.
32
- 33 **Unconfirmed cause of death** – any depredation where there is no clear evidence as to what caused
34 the death of the animal, as determined by WDFW or other authorized personnel.
35
- 36 **Unconfirmed depredation** – any depredation where the predator responsible cannot be
37 determined by WDFW or other authorized personnel.
38
- 39 **Unknown loss** – with respect to compensation, the loss of livestock from an area with known wolf
40 activity without a carcass as evidence. This would be based on historical records of livestock return
41 rates prior to wolf presence/wolf depredation in the area.
42
- 43 **Ungulate** – any wild species of hoofed mammal, including deer, elk, moose, bighorn sheep,
44 mountain goat, and caribou. Cattle, sheep, pigs, horses, and llamas are also ungulates, but are
45 referred to as domestic livestock in this plan.
46
- 47 **Viable population** – one that is able to maintain its size, distribution, and genetic variation over
48 time without significant intervention requiring human conservation actions.

1
2 **Wildlife** – as defined by Washington law, “wildlife” means all species of the animal kingdom whose
3 members exist in Washington in a wild state. This includes but is not limited to mammals, birds,
4 reptiles, amphibians, fish, and invertebrates. The term “wildlife” does not include feral domestic
5 mammals, old world rats and mice of the family Muridae of the order Rodentia, or those fish,
6 shellfish, and marine invertebrates classified as food fish or shellfish by the director of WDFW. The
7 term “wildlife” includes all stages of development and the bodily parts of wildlife members.

8
9 **Wolf recovery/conservation region** – any of three broad designated regions in Washington where
10 wolves need to become reestablished to meet the conservation goals of this plan. The regions are
11 illustrated in Figure 8.

12
13 **Working dog** – any dog actively used to guard, herd, or otherwise manage livestock (i.e., guarding
14 dogs, herding dogs).

Appendix A. WDFW Wolf Working Group members.

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Appendix A. Continued.

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Appendix B. The Wolf Working Group letter from June 30, 2008, that accompanied the August 2008 peer review draft of the Wolf Conservation and Management Plan.

Wolf Working Group Letter

June 30, 2008

To the citizens of Washington,

The Washington Wolf Working Group (WWG) consists of 17 citizens appointed by Washington Department of Fish and Wildlife (WDFW) Director Jeff Koenings to advise WDFW in developing a Washington Wolf Conservation and Management Plan. WWG members represent a broad range of perspectives, from those concerned that wolf recovery would negatively affect their livelihood or interests to those who believe that wolves are a valued part of Washington's natural heritage and play a role in healthy functioning ecosystems.

The WWG made every effort to understand the complex and diverse issues surrounding wolf recovery in depth, and to carefully craft management approaches that achieve plan objectives in a way that is balanced, fair, cost effective, and that has a high probability of success. Extensive discussion by WWG members focused on how to achieve two key strongly linked objectives (described in the plan as follows):

1. Implementing conservation strategies that will result in the reestablishment of a naturally reproducing and viable wolf population distributed in a significant portion of the species' former range in Washington, and
2. Managing wolf-livestock conflicts in a way that gives livestock owners who are experiencing losses tools to minimize future losses, while at the same time not negatively impacting the recovery or long-term perpetuation of sustainable wolf populations.

Efforts by the WWG to forge a consensus were shaped by shared points of understanding, including the need to assess the entire state in terms of the strengths and weaknesses to support wolf recovery. From the wolf recovery experience in the Northern Rockies, we recognize that large contiguous blocks of public land with abundant ungulate prey not only play an important role in sustaining a viable wolf population, but are also areas with comparatively lower levels of wolf/human conflicts. WWG members share the sentiment that one region or interest group should not unfairly bear the impacts of wolf recovery. WWG members support developing a compensation program to offset livestock losses with the understanding that a high degree of accountability and verification are needed to avoid problems occurring in other state compensation programs. WWG members support taking proactive measures that would lead to faster recovery of wolves, thus allowing greater management flexibility and reducing costs over the long-term. WWG members understand that secure long-term funds will be required to implement this plan, achieve the objectives, and provide the responsiveness needed to maintain public support.

Following many hours of dedicated work and compromise, the WWG has achieved a consensus on all aspects of this draft plan, with the exception of the number of established breeding pairs needed to downlist and delist wolves in Washington (see Appendix D, Minority Report). This draft plan was developed as a "package" and it is critical to recognize that many of the components are linked and have been carefully balanced to meet multiple objectives. As a result, WWG members were

Appendix B. Continued.

willing to pursue innovative proactive approaches (such as promoting “within state” translocation of wolves and defining restricted circumstances where lethal take of wolves would be allowed) to achieve the conservation and management objectives in a timely assured way. Eliminating an individual component would change the overall balance of the package, adversely affect the ability to meet plan objectives, and reduce the level of collective support by the WWG.

The WWG understands that this plan will be reviewed over time and that adaptive management will guide future changes in direction. Our work over the past year represents a “good faith” effort to anticipate where problems may occur in meeting plan objectives and to suggest reasonable approaches to mitigate potential problems. We recognize that public understanding of the issues surrounding wolf recovery can be hampered because of underlying misconceptions, partial truths, and fears. We have worked especially hard to accurately identify potential impacts, to frame issues within a clear and understandable context, and to be as specific as possible to conditions in Washington state.

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Duane Cocking
Jeff Dawson
Jack Field
George Halekas
Kim Holt
Derrick Knowles
Colleen McShane
Ken Oliver
Tommy Petrie, Jr.
Gerry Ring Erickson
John Stuhlmiller
Arthur Swannack
Bob Tuck
Greta Wiegand
Georg Ziegltrum

Appendix C. A list of the 43 reviewers submitting comments on the draft Wolf Conservation and Management Plan during the scientific peer review period conducted from August 25 to October 27, 2008.

Name	Affiliation	Title
Dr. David Mech	University of Minnesota	Wolf Research Scientist
Dr. James Peek	University of Idaho	Emeritus Professor, Wildlife Management
Dr. Carlos Carroll	Klamath Center for Conservation Research	Research Scientist
Dr. Richard Fredrickson	University of Montana	Faculty Affiliate, Genetics
Dr. John Duffield	University of Montana	Professor, Economics
Dr. Shannon Neibergs	Washington State University	Associate Professor, Economics
Dr. Doug Smith	Yellowstone National Park	Wolf Project Lead Scientist
Ed Bangs	U.S. Fish and Wildlife Service	Federal Wolf Coordinator
John Oakleaf	U.S. Fish and Wildlife Service	Mexican Wolf Field Coordinator
Mike Jimenez	U.S. Fish and Wildlife Service	Federal Wolf Project Leader for Wyoming
Dan Trochta	U.S. Fish and Wildlife Service	Wildlife Biologist – Spokane Field Office
Carolyn Sime	Montana Fish, Wildlife and Parks	State Wolf Coordinator
Russ Morgan	Oregon Department of Fish and Wildlife	State Wolf Coordinator
Carter Niemeyer	U.S. Fish and Wildlife Service (former) and USDA Wildlife Services (former); Idaho Department of Fish and Game	Idaho Wolf Project Leader (former)
Curt Mack	Nez Perce Nation	Wolf Research Biologist
Jim Holyan	Nez Perce Nation	Wolf Research Biologist
Garth Mowat	British Columbia Ministry of Environment	Senior Wildlife Biologist
Roger Woodruff	USDA Wildlife Services (Washington)	State Director
Dr. Bill Gaines	Okanogan-Wenatchee National Forests	Forest Wildlife Ecologist and Forest Service Region 6 Wolf Lead
Mark Henjum	Umatilla National Forest	Biologist (former Oregon DFW Wolf Plan lead)
Dr. Patti Happe	Olympic National Park	Chief, Wildlife Branch
Jeanne Jerred	Colville Confederated Tribes	Chair
Francis Charles	Lower Elwha Klallam Tribe	Chair
David Vales	Muckleshoot Tribe	Wildlife Biologist
Tim Cullinan	Pt. Gamble S'Klallam Tribe	Wildlife Biologist
Jennifer Sevigny	Stillaquamish Tribe	Wildlife Biologist
Mark Nuetzmann	Yakama Nation	Wildlife Biologist
John Pierce	WDFW (Olympia)	Chief Scientist, Wildlife Research Division
Dave Ware	WDFW (Olympia)	Game Division Manager
Dr. Cliff Rice	WDFW (Olympia)	Ungulate Research Scientist
Anthony Novack	WDFW (Ellensburg)	Deer-Elk Conflict Specialist
David Anderson	WDFW (Trout Lake)	District Biologist
Dana Base	WDFW (Colville)	District Biologist
Jeff Bernatowitz	WDFW (Yakima)	District Biologist
Scott Fitkin	WDFW (Winthrop)	District Biologist
Mike Livingston	WDFW (Tri-Cities)	District Biologist
Will Moore	WDFW (Yakima)	Assistant District Biologist
Jon Gallie	WDFW (Wenatchee)	Assistant District Biologist
Chris Hammond	WDFW (Colville) (former)	Assistant District Biologist (former)
Jeff Heinlen	WDFW (Tonasket)	Assistant District Biologist
Eric Holman	WDFW (Vancouver)	Assistant District Biologist
Paul Wik	WDFW (Clarkston)	Assistant District Biologist
Ella Rowan	WDFW (Spokane)	Wildlife Biologist

Appendix D. The minority report on proposed numbers of successful breeding pairs for achieving the downlisting and delisting of wolves in Washington, which was submitted by six members of the state's Wolf Working Group.

May 27, 2008

The following represents a minority position held by the following members of the Wolf Working Group (WWG) Jack Field, Duane Cocking, Tommy Petrie, Daryl Asmussen, Jeff Dawson and Ken Oliver (We) on one critical component of the Wolf Working Group Plan; the number of Breeding Pairs (BP) of wolves that the state can support. We are "unable to live with" the proposed numbers in the WWG Draft Plan. We believe the numbers are too high and will result in direct conflict with the Livestock and Sportsman Communities.

Currently the plan calls for 6 BP's to down list to Threatened, 12 BP's to down list to State Sensitive and at least 15 BP's for 3 years before they can be considered for limited hunting(p. 41 WWG draft). During this time period wolf populations could increase 24% per year (Bangs, conversation). Plus at the end of the 3 year time period, there is a very definite probability of one or more lawsuits as is now occurring after the Federal delisting of wolves in the Northern Rocky Mountain (NRM) area. It is estimated that it will take a minimum of 18 months for these challenges to work their way through the court system.

This same scenario will probably occur in this state. Consequently we could be looking at as many as 28 to 35 BP's before control measures could be taken to control their growth. All of this in a state with Washington's Population of 6,490,000 people and a population density of 97.5 people/sq mi (WWG Draft Plan). This is 5 to 6 times the human population density of the 3 principle states in the NRM area, MT, ID, and WY. (WA, WY, ID, and MT state web sites). According to the Federal Register, Feb. 8, 2007, Vol.72, number 26, this state has only 297 square miles of suitable wolf habitat in the eastern third of the state (p.6117 Federal Register). It should be noted that this same source shows the following amounts of suitable habitat in each of the states comprising the NRM are, MT. 40924 sq. mi., WY. 29808 sq. mi., ID. 31,586 sq. mi., OR. 2556 sq. mi. and, UT. 1635 sq. mi. This same report indicates that if the 3 major states (ID, MT, and WY) can support 10 BP's for 3 years that the species can be considered to be fully recovered and can be considered for delisting (p.6107 Federal Register). That criteria was met in 2002 (p. 6111 Federal Register).

The amount of suitable wolf habitat in the remaining two thirds of the state as depicted in the "Application of habitat models to wolf recovery planning in WA" by Carroll indicates scattered habitat in small isolated areas of the Okanogan, larger amounts of marginal habitat both North and South of Mt. Rainier, and a large area of habitat in and around the Olympic National Park, an area that strongly opposed wolf reintroduction several years ago.

Therefore we feel that the WWG's desired number of BP's is unrealistic given the lack of suitable habitat and the much higher human population density of this state and that the requirement of 15 BP's for 3 years (50% Higher than the USFW criteria for recovery in WY, MT, and ID,) defies common sense. This is further compounded by a recent recommendation from the Idaho Department of Fish and Game Commissioners to set the limit for a wolf hunt at 2005 levels which could mean 500 wolves could be killed this year. Idaho Fish and Game biologists estimate there are

Appendix D. Continued.

currently about 750 wolves in the state, but after the breeding season this spring they expect more than 1,000. The commissioners on the higher figures because they did not believe that hunting would bring the wolf population numbers down to the levels they wanted to see.

We therefore propose the following numbers of BP's statewide: 3 BP's to down list to Threatened, 6 BP's to down list to State Sensitive, and 8 BP's to change to a Big Game Animal. And we would eliminate the 3 year period since the state was not considered essential for recovery of wolves in the NRM (p.6119 Federal Register). This total number of 8 BP's or approximately 80 wolves would fit in the states economic analysis as outlined in Chapter 14, "Economics" which states "Wolf numbers between 50 and 100 animals should pose little detriment to the states livestock industry as a whole...As wolf populations become larger and more widely distributed, financial impacts are likely to accrue to more producers" (p.126). "Populations of 50 to 100 wolves should not have negative effects on big game hunting in Washington" (p.139).

The advantages of going with a lower number of BP's are: the sooner wolves can be removed from endangered and threatened status, the more tools stockmen and rural residents will have at their disposal to deal with problem wolves.

The sooner we can get wolves de-listed, the sooner our Fish and Wildlife Department can begin to manage them, until then their hands are tied. The sooner we can get them listed as a Big Game Species, the sooner our Fish and Wildlife can turn them from a liability into an asset through the sale of raffle tags, permits, and Governors Tags.

We believe that these numbers are far too high and do not accurately represent the concerns that the livestock production community has with wolves. The livestock community has preferred zero wolves from the beginning however, due to ESA and WDFW requirements zero is not an option. We support the Minority Opinion Numbers of 3 breeding pairs to downlist to threatened, 6 breeding pairs to downlist to sensitive, and 8 breeding pairs to delist from sensitive and managed as a Big Game Species. The higher numbers that the WWG Draft Plan includes will result in far more individual wolves than Washington has habitat to support thus causing a severe negative impact on private landowners and livestock producers. Livestock producers must be able to protect their property regardless of the wolf's status. We are also concerned that the WDFW has not effectively demonstrated its ability to secure long-term funds that will be a requirement in Management and Compensation. Without funding there is **NO Support** of any plan!!

The remainder of the WWG plan is acceptable to the supporters of the minority position.

Jack Field
Duane Cocking
Ken Oliver
Daryl Asmussen
Jeff Dawson
Tommy Petrie

1 Appendix E. Summary of the Wolf Working Group's discussions related to the conservation/recovery
2 objectives presented in this plan. Discussions by the Working Groups on other aspects of the plan can be
3 found in the meeting summaries posted at
4 http://wdfw.wa.gov/wildlife/management/gray_wolf/working_group_meetings.html.
5

6
7 The Wolf Working Group provided input to WDFW on key elements of the conservation/recovery
8 objectives appearing in Chapter 3 of this plan. A summary of the group's discussions on the
9 numbers of successful breeding pairs needed to achieve downlisting and delisting of wolves, the
10 designation of recovery regions, and the use of translocation as a conservation tool is given below.
11

12 Numbers of Successful Breeding Pairs

13
14 Throughout the Wolf Working Group deliberations, the issue of numbers of successful breeding
15 pairs, as criteria for moving from one listing designation to another, was a point of significant
16 discussion. Originally, WDFW suggested that specific numbers be excluded from the plan until
17 after some wolf packs had settled in the state. Modeling of the habitat use and demographics of
18 these animals and genetic considerations could then be used to derive scientifically based estimates
19 of the wolf numbers needed for recovery, which would then be placed in a future version of the
20 plan. All Working Group members rejected this approach and preferred the inclusion of specific
21 numbers in the current plan, as done by other states and as needed to meet the criteria for
22 Washington state recovery plans. Furthermore, specific numbers would give Working Group
23 members a starting place for their deliberations. WDFW researched other state wolf plans and
24 applied their understanding of wildlife biology to the question. It then proposed the numbers of 8
25 successful breeding pairs for transitioning from endangered to threatened and 15 successful breeding
26 pairs for transitioning from threatened to sensitive as a starting point for the Working Group's
27 consideration.
28

29 Eventually, the Working Group collectively settled on an approach that called for 6 successful
30 breeding pairs for transitioning from endangered to threatened, 12 successful breeding pairs for
31 transitioning from threatened to sensitive, and 15 successful breeding pairs for delisting from
32 sensitive. [NOTE: the transition from one listing designation to another also requires that the
33 minimum number of successful breeding pairs be in place for 3 years (though there are exceptions;
34 see Section B of this chapter) and distribution across four regions as laid out in Section B.]
35

36 The deliberation around numbers was a negotiation where each participant attempted to balance his
37 or her own interests with everyone else's in the group. The final numbers included in this plan were
38 not viewed as "ideal" by anyone on the Working Group; however, these numbers represented the
39 balance point among the different interests around the table. It should be emphasized that these
40 numbers represent only the criteria for downlisting and delisting, and do not represent a population
41 cap or ceiling at which wolves will ultimately be managed.
42

43 For Working Group members from the conservation community, the numbers were viewed as
44 being close to ecologically defensible, though lower than they would have set if they were the only
45 ones writing the plan. For the livestock community, wolves represent a threat to their livelihood,
46 and the numbers were higher than they would have recommended if they were the only ones writing
47 the plan. Working Group members ultimately recognized that having certainty around a set of
48

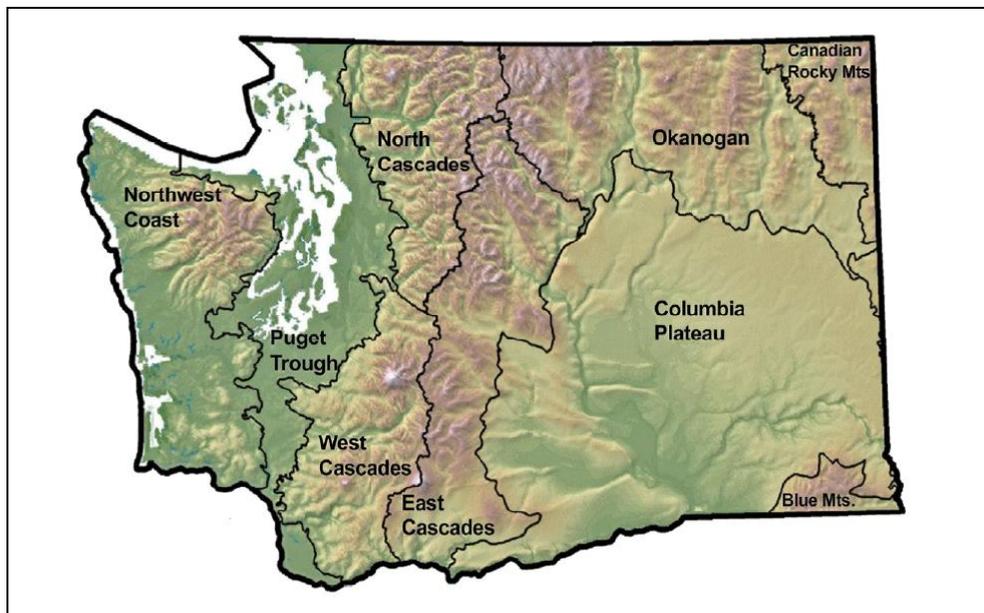
1 Appendix E. Continued.

2
3 numbers they could live with, along with the other specific components of the package that each
4 party viewed as desirable, made more sense than deferring the decision to others. The group further
5 understood that to obtain the necessary external support (e.g., legislative) for funding and operation
6 of the plan, their final product needed support by a cross section of interests.

7
8 Throughout the process, some Working Group members representing the livestock/hunting
9 community indicated they would be hard pressed to agree to the 6/12/15 numbers. At the end of
10 the deliberations, while they were able to live with the rest of the package, six of the 17 members
11 indicated they needed to submit a minority report on the numbers and proposed an alternative set of
12 3/6/8 (see Appendix D for more detail). They further proposed that there be no 3-year time
13 requirement, but did not address regional distribution. However, the package agreed to by the
14 group is based on the 6/12/15 numbers and if those numbers are changed as a result of the peer
15 review, public review, and other agency processes, then agreement around other components of the
16 plan will not necessarily remain. In particular, consensus on management options for resolving
17 wolf-livestock conflicts and compensation for wolf-caused losses of livestock may be jeopardized.

18
19 Recovery Regions

20
21 During the Working Group discussions, there was an evolution in the design and agreement of wolf
22 recovery regions for the state. As one possibility, WDFW initially suggested that Washington's nine
23 "ecoregions" (Figure 27) be considered for recovery regions. WDFW and other conservation
24 organizations have adopted an ecoregional approach for landscape-level conservation planning in
25 Washington, as described in the state's Comprehensive Wildlife Conservation Strategy (WDFW
26 2005a). Ecoregions are relatively large areas of land and water that contain geographically discrete
27 assemblages of natural plant and animal communities and have distinctive environmental conditions.

30
31 Figure 27. Nine ecoregions recognized in Washington.

1 Appendix E. Continued.

2
3 Each ecoregion has unique strengths and weaknesses affecting wolf recovery, such as differing
4 amounts of large contiguous forested public land blocks, varying abundance of ungulate prey and
5 locations of winter range, human population density and distribution, distance from colonizing
6 sources, and challenges to successful natural dispersal. Some ecoregions (or groupings of
7 ecoregions) contain an abundance of higher quality habitats that could potentially support a growing
8 wolf population with dispersing young (source populations), while others have lower habitat quality
9 where resident packs would have difficulty sustaining themselves without immigration (sink
10 populations).

11
12 Some members of the Working Group felt that nine ecoregions were too many and too complex for
13 addressing wolf distribution needs in the state. The group considered a number of variations on the
14 ecoregional approach (including combinations of ecoregions, modifications of ecoregions, and an
15 eastside-westside division of the state) and other factors before arriving at three consolidated regions
16 chosen for use in the conservation/recovery objectives. [Note that the three recovery regions (these
17 combined the Southern Cascades and Pacific Coast recovery regions into one region) recommended
18 by the Working Group were subsequently expanded into four regions by WDFW (Figure 8).]

19
20 Like the nine ecoregions, the consolidated wolf recovery regions (Figure 8) also have unique
21 strengths and weaknesses affecting wolf recovery. For example, when comparing wolf recovery
22 regions, the Southern Cascades and Pacific Coast recovery regions are the most distant from
23 colonizing sources with greater hurdles to successful natural dispersal, yet these regions contain
24 nearly 80% of the state's elk population.

25
26 Translocation

27
28 Translocation was discussed extensively by the Working Group and was largely supported for a
29 variety of reasons. Translocation within Washington was proposed as a tool if wolves were not
30 naturally dispersing into regions needed for recovery, or if it was desired to move wolves from
31 regions that had already achieved conservation/recovery objectives to other regions that had not yet
32 met their objectives. Conservation groups supported the concept to achieve conservation/recovery
33 objectives and establish source populations within the state. County, hunting, and livestock interests
34 also supported the concept, which would enable moving wolves out of areas after sufficient
35 numbers of breeding pairs were reestablished to achieve recovery objectives, thereby speeding up
36 the delisting process and access to more flexible management tools. Overall, there was broad
37 support and recognition within the Working Group that translocation is a key management tool to
38 ensure that both conservation and management goals are achieved. Translocation is considered an
39 essential part of the “negotiated package” developed by the Working Group.

40
41 The primary area suggested and discussed for translocation by the Working Group was the southern
42 Cascade Mountain range based on insights gained from the experiences of wolf recovery in the
43 northern Rocky Mountain states (USFWS 2009). These included the strong correlation between
44 large contiguous blocks of public land and wolf recovery. This is due to large areas of public land
45 generally experiencing lower levels of conflict between wolves and livestock, as well as supporting
46 larger populations of elk.

1 Appendix E. Continued.

2
3 Discussions on translocation focused on the southern Cascade Mountains for the following reasons:

- 4
5 • The southern Cascades have the potential to support a source population of wolves, a factor
6 of importance for maintaining a sustainable viable population in Washington.
7 • The southern Cascades contain about half of Washington's elk population and large
8 contiguous blocks of public land. Consequently, there is abundant natural prey for wolves
9 combined with potentially lower levels of conflict with livestock when compared to areas
10 with extensive private landholdings.
11 • The southern Cascades are distant from colonizing areas in Idaho and British Columbia, and
12 there are more potential barriers to overcome for successful natural dispersal. However,
13 once wolves are reestablished in the southern Cascades, extensive contiguous forested public
14 lands will facilitate natural dispersal within this area.
15 • Elk populations fluctuate in response to a number of environmental conditions, including
16 forest succession. Portions of the Mount St. Helens elk herd, which is the largest herd in the
17 state, are currently experiencing problems due to advanced forest succession. Wolf recovery
18 in the southern Cascades could help restore and contribute to ecological balance and
19 integrity in these types of situations.
20

21 To date there have not been any discussions of translocations to other areas; the primary focus has
22 been the southern Cascade Mountains.
23

24 This package contains carefully balanced strategies and management tools to achieve key objectives.
25 There are strong concerns among Working Group members that if translocation is precluded for
26 any reason, then:
27

- 28 • The carefully crafted "negotiated package" would become unbalanced in ways that adversely
29 affect achieving primary goals.
30 • Barriers to the natural dispersal of wolves into the southern Cascade Mountains may result in
31 increasing conflict with livestock in eastern Washington and delayed recovery.
32 • Eastern and northern Washington would unfairly bear the costs and challenges of wolf
33 recovery.
34

35 The Working Group therefore recommends that if translocation is removed from the management
36 tools available to WDFW, the Fish and Wildlife Commission or WDFW shall immediately
37 reconvene the Working Group (to the extent possible with the original membership) to advise
38 WDFW on how to manage wolves without this critical tool to address these concerns.
39

Appendix F. Washington laws: Washington Administrative Code 232-12- 011. Wildlife classified as protected shall not be hunted or fished; Washington Administrative Code 232-12- 014. Wildlife classified as endangered species; Washington Administrative Code 232-12-297. Endangered, threatened and sensitive wildlife species classification; and Revised Code of Washington 77.15.120. Endangered fish or wildlife – unlawful taking – penalty.

WAC 232-12-011 Wildlife classified as protected shall not be hunted or fished.

Protected wildlife are designated into three subcategories: threatened, sensitive, and other.

(1) Threatened species are any wildlife species native to the state of Washington that are likely to become endangered within the foreseeable future throughout a significant portion of their range within the state without cooperative management or removal of threats. Protected wildlife designated as threatened include:

Common Name	Scientific Name
Mazama pocket gopher	<i>Thomomys mazama</i>
western gray squirrel	<i>Sciurus griseus</i>
Steller (northern) sea lion	<i>Eumetopias jubatus</i>
North American lynx	<i>Lynx canadensis</i>
ferruginous hawk	<i>Buteo regalis</i>
marbled murrelet	<i>Brachyramphus marmoratus</i>
green sea turtle	<i>Chelonia mydas</i>
loggerhead sea turtle	<i>Caretta caretta</i>
greater sage-grouse	<i>Centrocercus urophasianus</i>
sharp-tailed grouse	<i>Phasianus columbianus</i>

(2) Sensitive species are any wildlife species native to the state of Washington that are vulnerable or declining and are likely to become endangered or threatened in a significant portion of their range within the state without cooperative management or removal of threats. Protected wildlife designated as sensitive include:

Common Name	Scientific Name
gray whale	<i>Eschrichtius gibbosus</i>
common Loon	<i>Gavia immer</i>
peregrine falcon	<i>Falco peregrinus</i>
bald eagle	<i>Haliaeetus leucocephalus</i>
Larch Mountain salamander	<i>Plethodon larselli</i>
pygmy whitefish	<i>Prosopium coulteri</i>
marginated sculpin	<i>Cottus marginatus</i>
Olympic mudminnow	<i>Novumbra hubbsi</i>

(3) Other protected wildlife include:

Common Name	Scientific Name
coney or pika	<i>Ochotona princeps</i>
least chipmunk	<i>Tamias minimus</i>
yellow-pine chipmunk	<i>Tamias amoenus</i>
Townsend's chipmunk	<i>Tamias townsendii</i>
red-tailed chipmunk	<i>Tamias ruficaudus</i>
hoary marmot	<i>Marmota caligata</i>
Olympic marmot	<i>Marmota olympus</i>
Cascade golden-mantled ground squirrel	<i>Spermophilus saturatus</i>
golden-mantled ground squirrel	<i>Spermophilus lateralis</i>
Washington ground squirrel	<i>Spermophilus washingtoni</i>
red squirrel	<i>Tamiasciurus hudsonicus</i>
Douglas squirrel	<i>Tamiasciurus douglasii</i>
northern flying squirrel	<i>Glaucomys sabrinus</i>
Wolverine	<i>Gulo gulo</i>
Painted turtle	<i>Chrysemys picta</i>
California mountain kingsnake	<i>Lampropeltis zonata</i>

All birds not classified as game birds, predatory birds or endangered species, or designated as threatened species or sensitive species; all bats, except when found in or immediately adjacent to a dwelling or other occupied building; mammals of the order Cetacea, including whales, porpoises, and mammals of the order Pinnipedia not otherwise classified as endangered species, or designated as threatened species or sensitive species. This section shall not apply to hair seals and sea lions which are threatening to damage or are damaging commercial fishing gear being utilized in a lawful manner or when said mammals are damaging or threatening to damage commercial fish being lawfully taken with commercial gear.

[Statutory Authority: RCW 77.12.047, 77.12.020. 08-03-068 (Order 08-09), § 232-12-011, filed 1/14/08, effective 2/14/08; 06-04-066 (Order 06-09), § 232-12-011, filed 1/30/06, effective 3/2/06. Statutory Authority: RCW 77.12.047, 77.12.655, 77.12.020. 02-11-069 (Order 02-98), § 232-12-011, filed 5/10/02, effective 6/10/02. Statutory Authority: RCW 77.12.047. 02-08-048 (Order 02-53), § 232-12-011, filed 3/29/02, effective 5/1/02; 00-17-106 (Order 00-149), § 232-12-011, filed 8/16/00, effective 9/16/00. Statutory Authority: RCW 77.12.040, 77.12.010, 77.12.020, 77.12.770. 00-10-001 (Order 00-47), § 232-12-011, filed 4/19/00, effective 5/20/00. Statutory Authority: RCW 77.12.040, 77.12.010, 77.12.020, 77.12.770, 77.12.780. 00-04-017 (Order 00-05), § 232-12-011, filed 1/24/00, effective 2/24/00. Statutory Authority: RCW 77.12.020. 98-23-013 (Order 98-232), § 232-12-011, filed 11/6/98, effective 12/7/98. Statutory Authority: RCW 77.12.040. 98-10-021 (Order 98-71), § 232-12-011, filed 4/22/98, effective 5/23/98. Statutory Authority: RCW 77.12.040 and 75.08.080. 98-06-031, § 232-12-011, filed 2/26/98, effective 5/1/98. Statutory Authority: RCW 77.12.020. 97-18-019 (Order 97-167), § 232-12-011, filed 8/25/97, effective 9/25/97. Statutory Authority: RCW 77.12.040, 77.12.020, 77.12.030 and 77.32.220. 97-12-048, § 232-12-011, filed 6/2/97, effective 7/3/97. Statutory Authority: RCW 77.12.020. 93-21-027 (Order 615), § 232-12-011, filed 10/14/93, effective 11/14/93; 90-11-065 (Order 441), § 232-12-011, filed 5/15/90, effective 6/15/90. Statutory Authority: RCW 77.12.040. 89-11-061 (Order 392), § 232-12-011, filed 5/18/89; 82-19-026 (Order 192), § 232-12-011, filed 9/9/82; 81-22-002 (Order 174), § 232-12-011, filed 10/22/81; 81-12-029 (Order 165), § 232-12-011, filed 6/1/81.]

WAC 232-12-014 Wildlife classified as endangered species. Endangered species include:

Common Name	Scientific Name
pygmy rabbit	<i>Brachylagus idahoensis</i>
Fisher	<i>Martes pennanti</i>
gray wolf	<i>Canis lupus</i>
grizzly bear	<i>Ursus arctos</i>
sea otter	<i>Enhydra lutris</i>
sei whale	<i>Balaenoptera borealis</i>
fin whale	<i>Balaenoptera physalus</i>
blue whale	<i>Balaenoptera musculus</i>
humpback whale	<i>Megaptera novaeangliae</i>
black right whale	<i>Balaena glacialis</i>
sperm whale	<i>Physeter macrocephalus</i>
killer whale	<i>Orcinus orca</i>
Columbian white-tailed deer	<i>Odocoileus virginianus leucurus</i>
woodland caribou	<i>Rangifer tarandus caribou</i>
American white pelican	<i>Pelecanus erythrorhynchos</i>
brown pelican	<i>Pelecanus occidentalis</i>
sandhill crane	<i>Grus canadensis</i>
snowy plover	<i>Charadrius alexandrinus</i>
upland sandpiper	<i>Bartramia longicauda</i>
spotted owl	<i>Strix occidentalis</i>
Streaked horned lark	<i>Eremophila alpestris strigata</i>
western pond turtle	<i>Clemmys marmorata</i>
leatherback sea turtle	<i>Dermochelys coriacea</i>
mardon skipper	<i>Polites mardon</i>
Oregon silverspot butterfly	<i>Speyeria zerene hippolyta</i>
Taylor's checkerspot	<i>Euphydryas editha taylora</i>
Oregon spotted frog	<i>Rana pretiosa</i>
northern leopard frog	<i>Rana pipiens</i>

[Statutory Authority: RCW 77.12.047, 77.12.655, 77.12.020. 06-04-066 (Order 06-09), § 232-12-014, filed 1/30/06, effective 3/2/06. Statutory Authority: RCW 77.12.047, 77.12.655, 77.12.020. 02-11-069 (Order 02-98), § 232-12-014, filed 5/10/02, effective 6/10/02. Statutory Authority: RCW 77.12.040, 77.12.010, 77.12.020, 77.12.770, 77.12.780. 00-04-017 (Order 00-05), § 232-12-014, filed 1/24/00, effective 2/24/00. Statutory Authority: RCW 77.12.020. 98-23-013 (Order 98-232), § 232-12-014, filed 11/6/98, effective 12/7/98; 97-18-019 (Order 97-167), § 232-12-014, filed 8/25/97, effective 9/25/97; 93-21-026 (Order 616), § 232-12-014, filed 10/14/93, effective 11/14/93. Statutory Authority: RCW 77.12.020(6). 88-05-032 (Order 305), § 232-12-014, filed 2/12/88. Statutory Authority: RCW 77.12.040. 82-19-026 (Order 192), § 232-12-014, filed 9/9/82; 81-22-002 (Order 174), § 232-12-014, filed 10/22/81; 81-12-029 (Order 165), § 232-12-014, filed 6/1/81.]

WAC 232-12-297 Endangered, threatened, and sensitive wildlife species classification.PURPOSE

- 1.1 The purpose of this rule is to identify and classify native wildlife species that have need of protection and/or management to ensure their survival as free-ranging populations in Washington and to define the process by which listing, management, recovery, and delisting of a species can be achieved. These rules are established to ensure that consistent procedures and criteria are followed when classifying wildlife as endangered, or the protected wildlife subcategories threatened or sensitive.

DEFINITIONS

For purposes of this rule, the following definitions apply:

- 2.1 "Classify" and all derivatives means to list or delist wildlife species to or from endangered, or to or from the protected wildlife subcategories threatened or sensitive.
- 2.2 "List" and all derivatives means to change the classification status of a wildlife species to endangered, threatened, or sensitive.
- 2.3 "Delist" and its derivatives means to change the classification of endangered, threatened, or sensitive species to a classification other than endangered, threatened, or sensitive.
- 2.4 "Endangered" means any wildlife species native to the state of Washington that is seriously threatened with extinction throughout all or a significant portion of its range within the state.
- 2.5 "Threatened" means any wildlife species native to the state of Washington that is likely to become an endangered species within the foreseeable future throughout a significant portion of its range within the state without cooperative management or removal of threats.
- 2.6 "Sensitive" means any wildlife species native to the state of Washington that is vulnerable or declining and is likely to become endangered or threatened in a significant portion of its range within the state without cooperative management or removal of threats.
- 2.7 "Species" means any group of animals classified as a species or subspecies as commonly accepted by the scientific community.
- 2.8 "Native" means any wildlife species naturally occurring in Washington for purposes of breeding, resting, or foraging, excluding introduced species not found historically in this state.
- 2.9 "Significant portion of its range" means that portion of a species' range likely to be essential to the long term survival of the population in Washington.

LISTING CRITERIA

- 3.1 The commission shall list a wildlife species as endangered, threatened, or sensitive solely on the basis of the biological status of the species being considered, based on the preponderance of scientific data available, except as noted in section 3.4.
- 3.2 If a species is listed as endangered or threatened under the federal Endangered Species Act, the agency will recommend to the commission that it be listed as endangered or threatened as specified in section 9.1. If listed, the agency will proceed with development of a recovery plan pursuant to section 11.1.
- 3.3 Species may be listed as endangered, threatened, or sensitive only when populations are in danger of failing, declining, or are vulnerable, due to factors including but not restricted to limited numbers, disease, predation, exploitation, or habitat loss or change, pursuant to section 7.1.
- 3.4 Where a species of the class Insecta, based on substantial evidence, is determined to present an unreasonable risk to public health, the commission may make the determination that the species need not be listed as endangered, threatened, or sensitive.

DELISTING CRITERIA

- 4.1 The commission shall delist a wildlife species from endangered, threatened, or sensitive solely on the basis of the biological status of the species being considered, based on the preponderance of scientific data available.
- 4.2 A species may be delisted from endangered, threatened, or sensitive only when populations are no longer in danger of failing, declining, are no longer vulnerable, pursuant to section 3.3, or meet recovery plan goals, and when it no longer meets the definitions in sections 2.4, 2.5, or 2.6.

INITIATION OF LISTING PROCESS

- 5.1 Any one of the following events may initiate the listing process.
- 5.1.1 The agency determines that a species population may be in danger of failing, declining, or vulnerable, pursuant to section 3.3.
- 5.1.2 A petition is received at the agency from an interested person. The petition should be addressed to the director. It should set forth specific evidence and scientific data which shows that the species may be failing, declining, or vulnerable, pursuant to section 3.3. Within 60 days, the agency shall either deny the petition, stating the reasons, or initiate the classification process.
- 5.1.3 An emergency, as defined by the Administrative Procedure Act, chapter 34.05 RCW. The listing of any species previously classified under

emergency rule shall be governed by the provisions of this section.

- 5.1.4 The commission requests the agency review a species of concern.
- 5.2 Upon initiation of the listing process the agency shall publish a public notice in the Washington Register, and notify those parties who have expressed their interest to the department, announcing the initiation of the classification process and calling for scientific information relevant to the species status report under consideration pursuant to section 7.1.

INITIATION OF DELISTING PROCESS

- 6.1 Any one of the following events may initiate the delisting process:
- 6.1.1 The agency determines that a species population may no longer be in danger of failing, declining, or vulnerable, pursuant to section 3.3.
- 6.1.2 The agency receives a petition from an interested person. The petition should be addressed to the director. It should set forth specific evidence and scientific data which shows that the species may no longer be failing, declining, or vulnerable, pursuant to section 3.3. Within 60 days, the agency shall either deny the petition, stating the reasons, or initiate the delisting process.
- 6.1.3 The commission requests the agency review a species of concern.
- 6.2 Upon initiation of the delisting process the agency shall publish a public notice in the Washington Register, and notify those parties who have expressed their interest to the department, announcing the initiation of the delisting process and calling for scientific information relevant to the species status report under consideration pursuant to section 7.1.

SPECIES STATUS REVIEW AND AGENCY RECOMMENDATIONS

- 7.1 Except in an emergency under 5.1.3 above, prior to making a classification recommendation to the commission, the agency shall prepare a preliminary species status report. The report will include a review of information relevant to the species' status in Washington and address factors affecting its status, including those given under section 3.3. The status report shall be reviewed by the public and scientific community. The status report will include, but not be limited to an analysis of:
- 7.1.1 Historic, current, and future species population trends.
- 7.1.2 Natural history, including ecological relationships (e.g., food habits, home range, habitat selection patterns).
- 7.1.3 Historic and current habitat trends.

7.1.4 Population demographics (e.g., survival and mortality rates, reproductive success) and their relationship to long term sustainability.

7.1.5 Historic and current species management activities.

7.2 Except in an emergency under 5.1.3 above, the agency shall prepare recommendations for species classification, based upon scientific data contained in the status report. Documents shall be prepared to determine the environmental consequences of adopting the recommendations pursuant to requirements of the State Environmental Policy Act (SEPA).

7.3 For the purpose of delisting, the status report will include a review of recovery plan goals.

PUBLIC REVIEW

- 8.1 Except in an emergency under 5.1.3 above, prior to making a recommendation to the commission, the agency shall provide an opportunity for interested parties to submit new scientific data relevant to the status report, classification recommendation, and any SEPA findings.
- 8.1.1 The agency shall allow at least 90 days for public comment.
- 8.1.2 The agency will hold at least one public meeting in each of its administrative regions during the public review period.

FINAL RECOMMENDATIONS AND COMMISSION ACTION

- 9.1 After the close of the public comment period, the agency shall complete a final status report and classification recommendation. SEPA documents will be prepared, as necessary, for the final agency recommendation for classification. The classification recommendation will be presented to the commission for action. The final species status report, agency classification recommendation, and SEPA documents will be made available to the public at least 30 days prior to the commission meeting.
- 9.2 Notice of the proposed commission action will be published at least 30 days prior to the commission meeting.

PERIODIC SPECIES STATUS REVIEW

- 10.1 The agency shall conduct a review of each endangered, threatened, or sensitive wildlife species at least every five years after the date of its listing. This review shall include an update of the species status report to determine whether the status of the species warrants its current listing status or deserves reclassification.
- 10.1.1 The agency shall notify any parties who have expressed their interest to the department of the periodic status review. This notice shall occur at

- least one year prior to end of the five year period required by section 10.1.
- 10.2 The status of all delisted species shall be reviewed at least once, five years following the date of delisting.
- 10.3 The department shall evaluate the necessity of changing the classification of the species being reviewed. The agency shall report its findings to the commission at a commission meeting. The agency shall notify the public of its findings at least 30 days prior to presenting the findings to the commission.
- 10.3.1 If the agency determines that new information suggests that classification of a species should be changed from its present state, the agency shall initiate classification procedures provided for in these rules starting with section 5.1.
- 10.3.2 If the agency determines that conditions have not changed significantly and that the classification of the species should remain unchanged, the agency shall recommend to the commission that the species being reviewed shall retain its present classification status.
- 10.4 Nothing in these rules shall be construed to automatically delist a species without formal commission action.

RECOVERY AND MANAGEMENT OF LISTED SPECIES

- 11.1 The agency shall write a recovery plan for species listed as endangered or threatened. The agency will write a management plan for species listed as sensitive. Recovery and management plans shall address the listing criteria described in sections 3.1 and 3.3, and shall include, but are not limited to:
- 11.1.1 Target population objectives.
- 11.1.2 Criteria for reclassification.
- 11.1.3 An implementation plan for reaching population objectives which will promote cooperative management and be sensitive to landowner needs and property rights. The plan will specify resources needed from and impacts to the department, other agencies (including federal, state, and local), tribes, landowners, and other interest groups. The plan shall consider various approaches to meeting recovery objectives including, but not limited to regulation, mitigation, acquisition, incentive, and compensation mechanisms.
- 11.1.4 Public education needs.
- 11.1.5 A species monitoring plan, which requires periodic review to allow the incorporation of new information into the status report.
- 11.2 Preparation of recovery and management plans will be initiated by the agency within one year after the date of listing.
- 11.2.1 Recovery and management plans for species listed prior to 1990 or during the five years following the adoption of these rules shall be completed within five years after the date of listing or adoption of these rules, whichever comes later. Development of recovery plans for endangered species will receive higher priority than threatened or sensitive species.
- 11.2.2 Recovery and management plans for species listed after five years following the adoption of these rules shall be completed within three years after the date of listing.
- 11.2.3 The agency will publish a notice in the Washington Register and notify any parties who have expressed interest to the department interested parties of the initiation of recovery plan development.
- 11.2.4 If the deadlines defined in sections 11.2.1 and 11.2.2 are not met the department shall notify the public and report the reasons for missing the deadline and the strategy for completing the plan at a commission meeting. The intent of this section is to recognize current department personnel resources are limiting and that development of recovery plans for some of the species may require significant involvement by interests outside of the department, and therefore take longer to complete.
- 11.3 The agency shall provide an opportunity for interested public to comment on the recovery plan and any SEPA documents.

CLASSIFICATION PROCEDURES REVIEW

- 12.1 The agency and an ad hoc public group with members representing a broad spectrum of interests, shall meet as needed to accomplish the following:
- 12.1.1 Monitor the progress of the development of recovery and management plans and status reviews, highlight problems, and make recommendations to the department and other interested parties to improve the effectiveness of these processes.
- 12.1.2 Review these classification procedures six years after the adoption of these rules and report its findings to the commission.

AUTHORITY

- 13.1 The commission has the authority to classify wildlife as endangered under RCW 77.12.020. Species classified as endangered are listed under WAC 232-12-014, as amended.
- 13.2 Threatened and sensitive species shall be classified as subcategories of protected wildlife. The commission has the authority to classify wildlife as protected under RCW 77.12.020. Species classified as protected are

listed under WAC 232-12-011, as amended. [Statutory
Authority: RCW 77.12.020. 90-11-066 (Order 442), § 232-

12-297, filed 5/15/90, effective 6/15/90.]

RCW 77.15.120 Endangered fish or wildlife – Unlawful taking – Penalty.

(1) A person is guilty of unlawful taking of endangered fish or wildlife in the second degree if the person hunts, fishes, possesses, maliciously harasses or kills fish or wildlife, or maliciously destroys the nests or eggs of fish or wildlife and the fish or wildlife is designated by the commission as endangered, and the taking has not been authorized by rule of the commission.

(2) A person is guilty of unlawful taking of endangered fish or wildlife in the first degree if the person has been:

(a) Convicted under subsection (1) of this section or convicted of any crime under this title involving the killing, possessing, harassing, or harming of endangered fish or wildlife; and

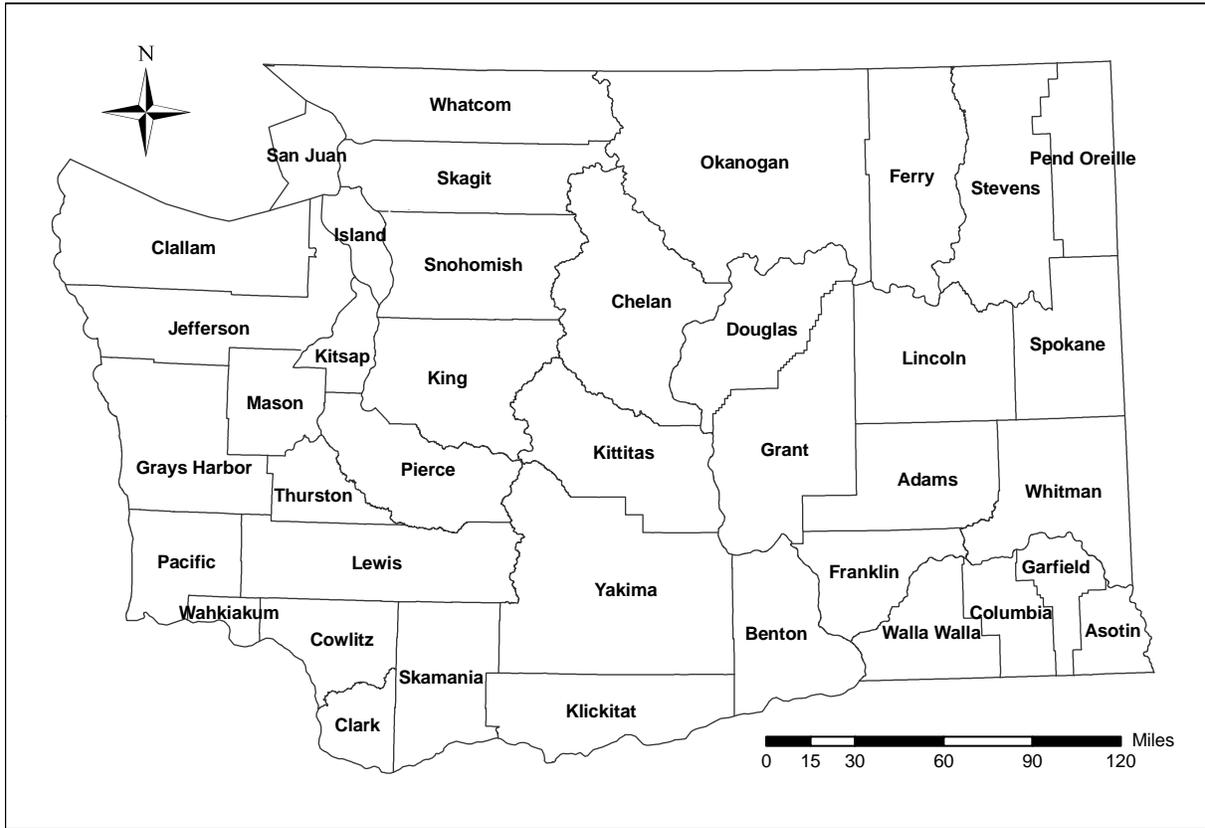
(b) Within five years of the date of the prior conviction the person commits the act described by subsection (1) of this section.

(3)(a) Unlawful taking of endangered fish or wildlife in the second degree is a gross misdemeanor.

(b) Unlawful taking of endangered fish or wildlife in the first degree is a class C felony. The department shall revoke any licenses or tags used in connection with the crime and order the person's privileges to hunt, fish, trap, or obtain licenses under this title to be suspended for two years.

[2000 c 107 § 236; 1998 c 190 § 13.]

Appendix G. A map of Washington's 39 counties.



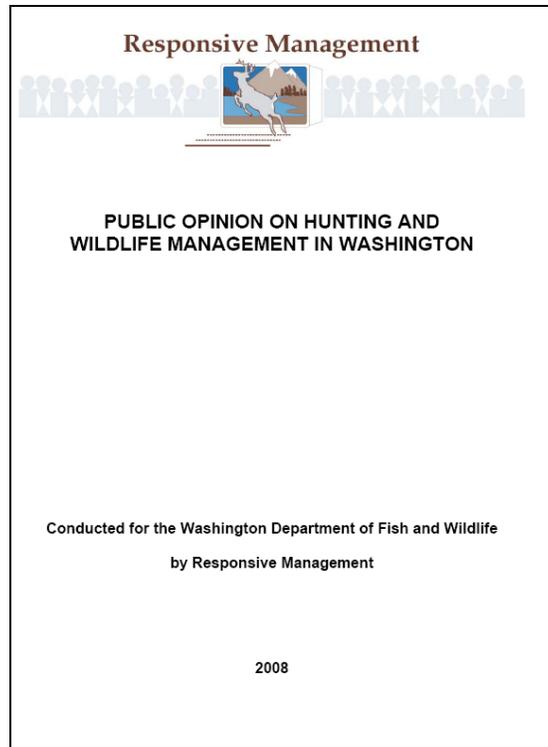
Appendix H. Reports of wolves in Washington received by WDFW from 2000 to 2009. Many of these could not be validated and therefore are considered unconfirmed records.

Date	County	Notes
Feb 15, 2007	Asotin	Tracks
Fall 2007	Asotin/Garfield	Howling heard
Winter 07-08	Asotin/Garfield	Tracks seen on multiple occasions
Feb 2008	Asotin/Garfield	Five animals seen together
Jun 10, 2007	Chelan	One road-killed animal found. Investigation proved it to be a hybrid.
Sep 2007	Chelan	Unconfirmed pack of 6-8 animals. A follow-up site visit did not confirm the presence of the animals.
Aug-Sept 2008	Chelan	Telemetry locations for two radio-collared members of the Lookout Pack (see listing for Okanogan Co., Jul 2008-Jun 2009)
Aug 25, 2008	Columbia	Multiple animals heard howling; a large black canid seen briefly in same area
Jul 3, 2009	Columbia	Multiple animals heard howling
Aug 5, 2009	Columbia	One animal seen
Nov 19, 2008	Ferry	Howling heard
May 1, 2008	Garfield	Two animals seen
Jan 21, 2009	Garfield	Two animals seen
Jun 19, 2003	King	Two animals seen on shoulder of I-90
Jan 10, 2005	Lincoln	One animal seen
May 12, 2008	Lincoln	One "white wolf" seen along Highway 2. Possibly a hybrid.
Jun 21, 2008	Lincoln	Road-killed animal. Genetic testing confirmed it to be a hybrid (J. Pollinger, pers. comm.).
Aug 16, 2000	Okanogan	Tracks
Jan 6, 2001	Okanogan	Tracks
Jan 29, 2001	Okanogan	Five animals seen approaching a deer herd
Oct 3-4, 2006	Okanogan	Howling heard, tracks of perhaps only one animal seen and photographed
Winter 07-08	Okanogan	Seven to nine wolves seen in a group
Apr 2, 2008	Okanogan	One animal photographed by a remote camera
Apr 26, 2008	Okanogan	One animal photographed by a remote camera
Apr 2008	Okanogan	Tracks
Apr 2008	Okanogan	Four animals seen together; follow-up investigation found tracks at the site
May/June 08	Okanogan	One animal photographed by a remote camera
Jun 8, 2008	Okanogan	One animal photographed by a remote camera. Expert examination of photo suggested it was a wolf or hybrid.
Jul 2008-Jul 2009	Okanogan	Pack (named the Lookout Pack) with a minimum of 3 adults and 6 pups confirmed in 2008, with the breeding male and female trapped and radio-collared. Captures followed earlier reports of sightings, remote camera photos, and responses during a howling survey. Two citizen reports suggest the pack was also present in 2007. Breeding confirmed in 2009.
Jul 22, 2008	Okanogan	One animal photographed by a remote camera
Jul 27, 2008	Okanogan	One animal (a probably yearling) photographed by a remote camera
Sep 29, 2008	Okanogan	One animal photographed by a remote camera
Oct 9, 2008	Okanogan	Tracks photographed
Oct 19, 2000	Pend Oreille	One animal seen
Feb 5, 2002	Pend Oreille	One radio-collared wolf seen from air at moose carcass; traveled from northwest Montana into northeast Washington, where it spent several weeks before moving to British Columbia
Feb 13, 2002	Pend Oreille	Same individual as above, seen from air at deer carcass
Nov 30, 2003	Pend Oreille	Four animals seen chasing a deer, tracks seen
Winter 04-05	Pend Oreille	Tracks
Aug 1, 2005	Pend Oreille	One animal seen
Nov 14, 2005	Pend Oreille	Tracks
Winter 05-06	Pend Oreille	Tracks
Winter 05-06	Pend Oreille	At least one animal and tracks seen

Date	County	Notes
Winter 05-06	Pend Oreille	At least one animal and tracks seen
2005-2006	Pend Oreille	Tracks
Mar 13, 2006	Pend Oreille	Tracks of one animal.
Jun 8, 2006	Pend Oreille	Part of one animal photographed by a remote camera
Aug 18, 2006	Pend Oreille	Multiple animals seen. Possible howling heard on Aug 3, 2006
Oct 6, 2006	Pend Oreille	Tracks photographed, howl heard.
Nov 2, 2006	Pend Oreille	Tracks photographed in one area, seen in second area
Winter 06-07	Pend Oreille	At least one animal and tracks seen
Winter 06-07	Pend Oreille	Three animals and tracks seen, howling heard
Winter 06-07	Pend Oreille	At least one animal and tracks seen on more than one occasion
Jan 27, 2007	Pend Oreille	Tracks of probably three animals
Feb 13, 2007	Pend Oreille	Tracks
Mar 6, 2007	Pend Oreille	One animal seen, many tracks in vicinity, including at dead mule deer
Mar 17, 2007	Pend Oreille	Tracks
Jun 13, 2007	Pend Oreille	Part of one animal photographed by a remote camera
Jun 24, 2007	Pend Oreille	One animal photographed by a remote camera
Jun 27, 2007	Pend Oreille	Part of one animal photographed by a remote camera
Aug 10, 2007	Pend Oreille	One animal photographed by a remote camera
Aug 30, 2007	Pend Oreille	One animal photographed by a remote camera
Summer 2007	Pend Oreille	One animal confirmed to be a hybrid
Nov 4, 2007	Pend Oreille	Tracks photographed
Mar 20, 2008	Pend Oreille	One animal seen dragging a deer
Aug 23, 2008	Pend Oreille	Two animals photographed by a remote camera
Oct 6, 2008	Pend Oreille	One animal seen, one or more others heard barking
Oct 2008	Pend Oreille	One animal seen
Apr 30, 2009	Pend Oreille	Tracks of 1-2 animals
May-Jul, 2009	Pend Oreille	Likely breeding pair, including a lactating female, photographed by remote cameras in May. DNA analysis of collected hair verified presence of a male wolf from the southern Alberta-northwestern Montana- northern Idaho population (J. Pollinger, pers. comm.). Citizen reports, howling surveys, and remote cameras confirmed the presence of a pack (named the Diamond Pack) of about 8 animals, including 3-5 pups, in July.
May 22, 2009	Pend Oreille	One animal seen
May 2009	Pend Oreille	One animal seen
Jun 22, 2009	Pend Oreille	Two or more animals heard howling
Jun 22, 2009	Pend Oreille	One animal seen
Jul-Aug 2009	Pend Oreille	Animals heard howling on 2 occasions: two in late July and one on August 9
Nov 11, 2006	Spokane	Five animals seen
Sep 30, 2000	Stevens	One animal seen
May 14, 2006	Stevens	Five animals seen in vehicle headlights
2006-2008	Stevens	Multiple animals, including pups, seen and photographed on different occasions. WDFW investigation found all were hybrids regularly released by their owner.
Jan 8, 2007	Stevens	Large canid tracks of 2-3 animals with elk kill, carcass eaten later. Tracks continued through Feb 15 in general area, with a deer eaten.
Jan 30, 2007	Stevens	Three animals photographed, one shot and killed on Feb 2. WDFW investigation found all were hybrids regularly released by their owner.
Aug 30, 2007	Stevens	Calf depredation and tracks
Sep 9, 2007	Stevens	Two animals seen
Fall 2007	Stevens	Six hybrids and pet wolves released into the wild and permanently abandoned by their owner
Dec 10, 2007	Stevens	Tracks of two animals
Dec 10, 2007	Stevens	Tracks
Dec 12, 2007	Stevens	Tracks

Date	County	Notes
Jun 5, 2008	Stevens	Road-killed animal. Genetic testing confirmed it to be a pure wolf originating from southern Alberta or northwestern Montana (J. Pollinger, pers. comm.).
Feb 27, 2009	Stevens	One animal seen and photographed
Nov 14, 2008	Walla Walla	Three animals, including one black individual, photographed by a remote camera
Dec 20, 2008	Walla Walla	Three animals seen
Jan 12, 2009	Walla Walla	Three animals, including two black individuals, photographed by a remote camera
Feb 7, 2009	Walla Walla	Two groups of multiple animals heard howling
Feb 16, 2009	Walla Walla	Tracks of two animals seen, photographed
Mar 8, 2009	Walla Walla	One animal photographed by a remote camera
May 16, 2007	Whatcom	One animal seen
May 23, 2008	Whatcom	Tracks photographed
May 27, 2009	Whatcom	Tracks photographed
Jun 18, 2009	Whatcom	One animal seen
Nov 2008	Whitman	Four animals seen
Oct 10, 2002	Yakima	One animal seen on highway running between cars

Appendix I. Public opinions on management of wolves, excerpted from a report prepared by Responsive Management (Duda et al. 2008a) for the Washington Department of Fish and Wildlife.



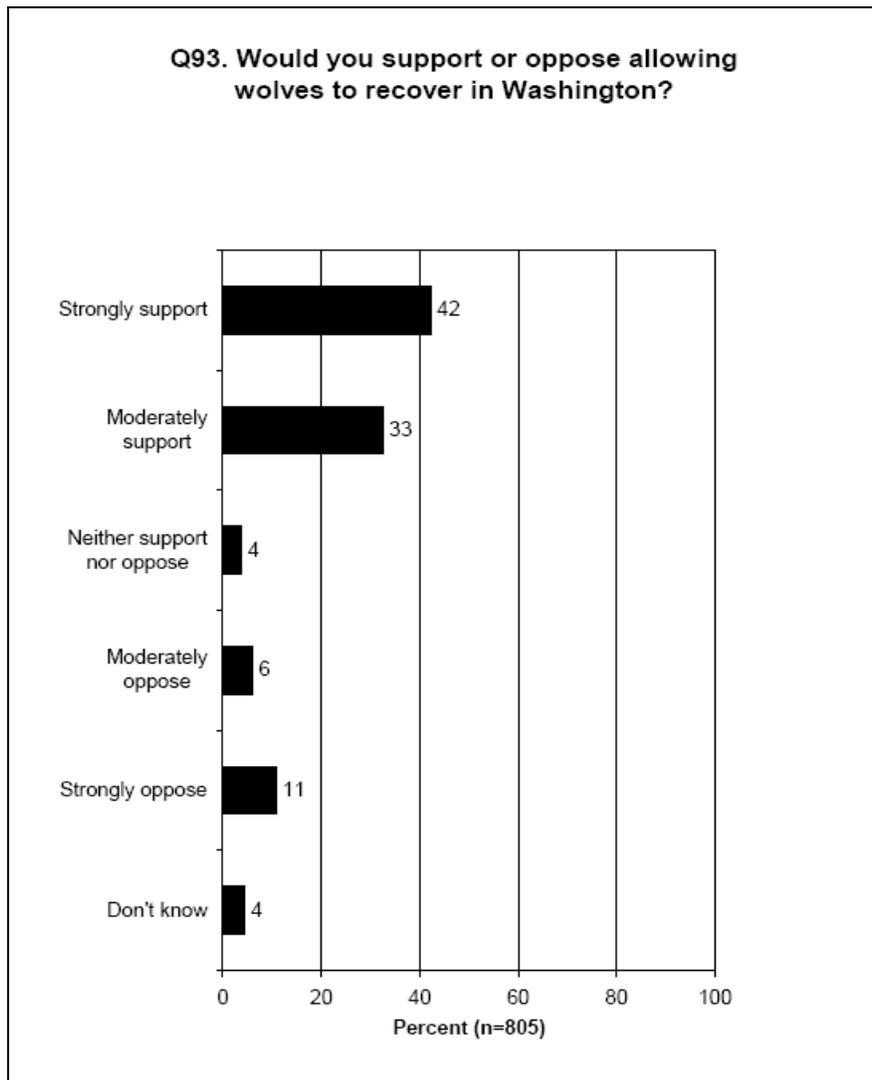
Responsive Management, a professional public opinion and attitude survey research firm specializing in natural resource and outdoor recreation issues, was contracted by WDFW to determine public opinion statewide on a variety of questions pertaining to hunting and wildlife management in Washington, including wolves (Duda et al. 2008a). The study entailed a telephone survey of 805 Washington residents 18 years old and older and was conducted in January 2008. Survey methods are fully described in Duda et al. (2008a). Interviewers were trained according to the standards established by the Council of American Survey Research Organizations. Results were reported at a 95% confidence interval; sampling error was at most plus or minus 3.45 percentage points. Results were weighted so that age groups were represented according to their actual proportion of the state's population. About 72.2% of respondents lived in western Washington, whereas 24.5% lived in eastern Washington and 3.5% did not report their county of residence. Thus, residents of eastern Washington, which comprise about 22.0% of the state's actual population, were slightly overrepresented in the survey. The survey asked six questions about wolves and related issues. Each question and the public's responses to the question are provided on the following pages. The entire survey can be viewed online at the following website: http://www.wdfw.wa.gov/wlm/game/management/2009-2015/hunt_populationreport.pdf.

Appendix I. Continued.

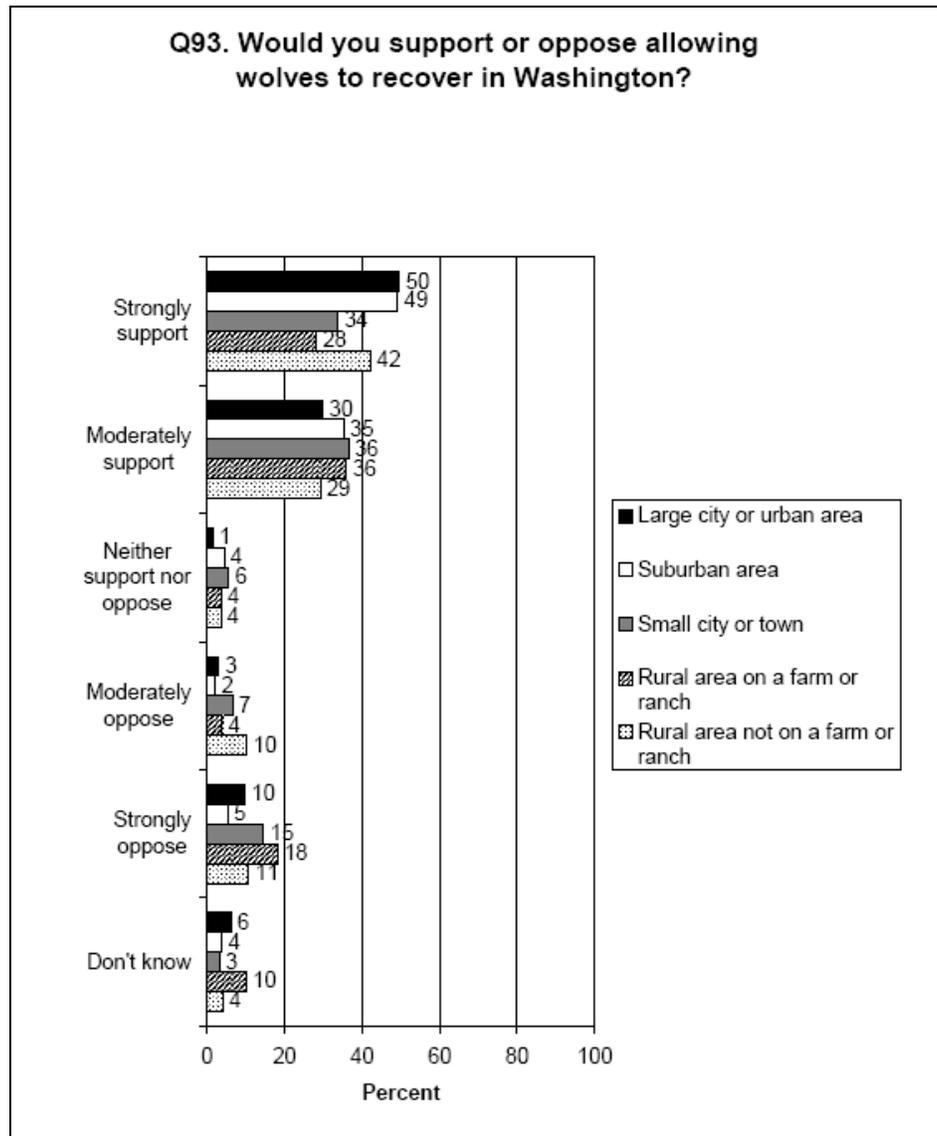
OPINIONS ON MANAGEMENT OF WOLVES

- The large majority of Washington residents (75%) support allowing wolves to recover in Washington; meanwhile, 17% oppose.
 - A crosstabulation found that those who live in urban and suburban areas are more likely to support wolf recovery; while those residing in small city/town or rural area are more likely to oppose. Note that those living on ranches or farms are the most likely to *strongly* oppose.
 - When the stipulation is put on wolf recovery that it could result in localized declines in elk and deer populations, support declines slightly: 61% support wolf recovery if it will result in some localized declines in elk and deer populations, and 28% oppose.
- Most Washington residents (61%) support some level of lethal wolf control to protect at-risk livestock; however, 31% oppose. Additionally, a majority of residents (56%) support having the state pay compensation out of the General Fund to ranchers who have documented losses to livestock from wolves, but 35% oppose.
- When asked how worried, while recreating outdoors, they would be about wolves, respondents most commonly say that they would not be worried at all (39%), and 26% would be only a little worried; in sum, 65% would be only a little worried or not worried at all. On the other hand, 33% would be very or moderately worried, with 11% *very* worried.
- In a question tangentially related to wolf management, the survey found that wildlife viewing specifically of wild wolves would appear to be popular, as 54% of residents say that they would travel to see or hear wild wolves in Washington. (Note that 2% of respondents say that they would not need to travel, as they have wild wolves nearby already.)

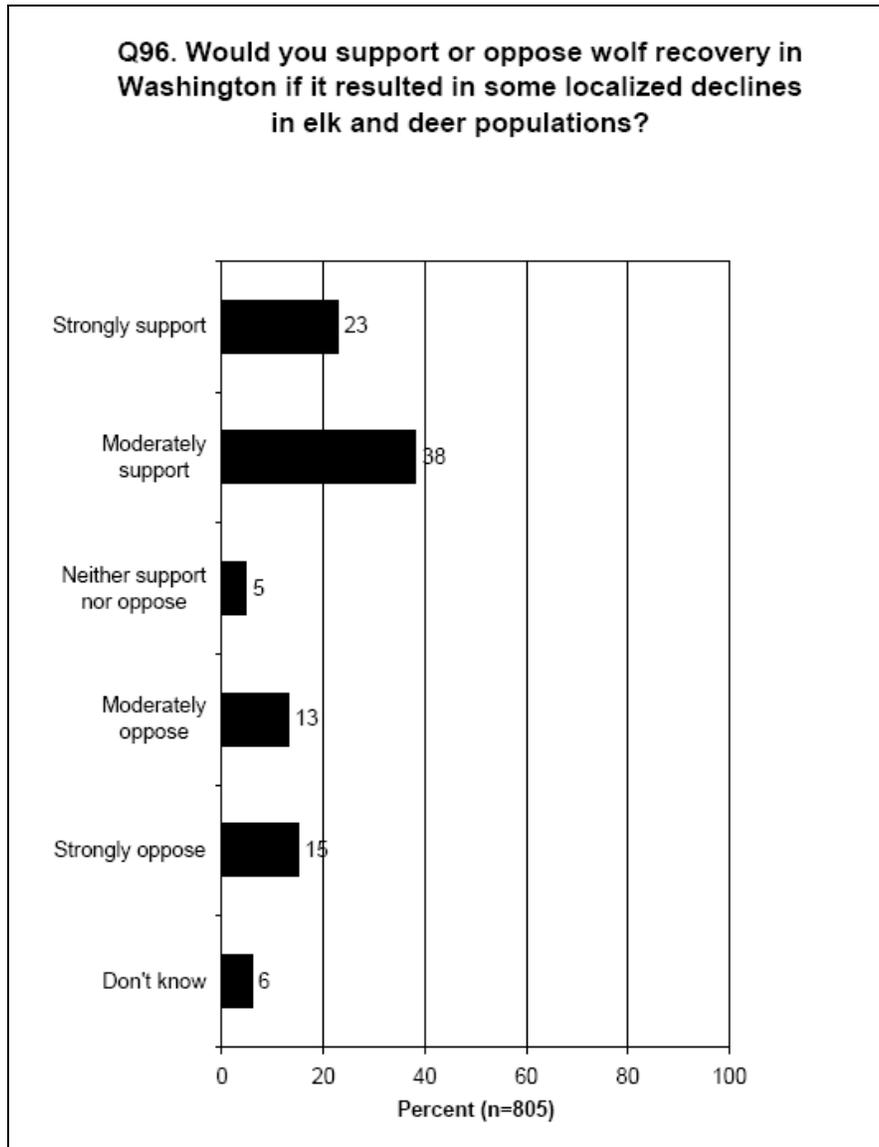
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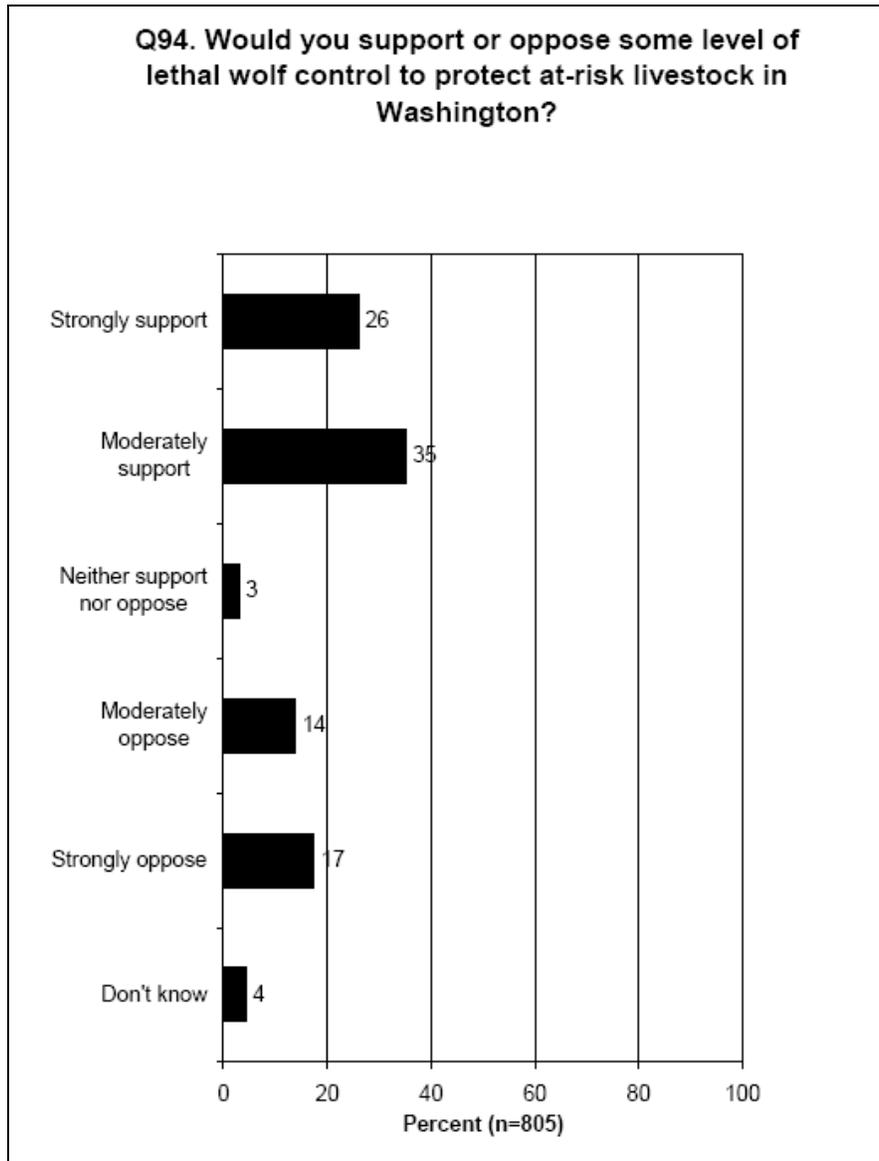
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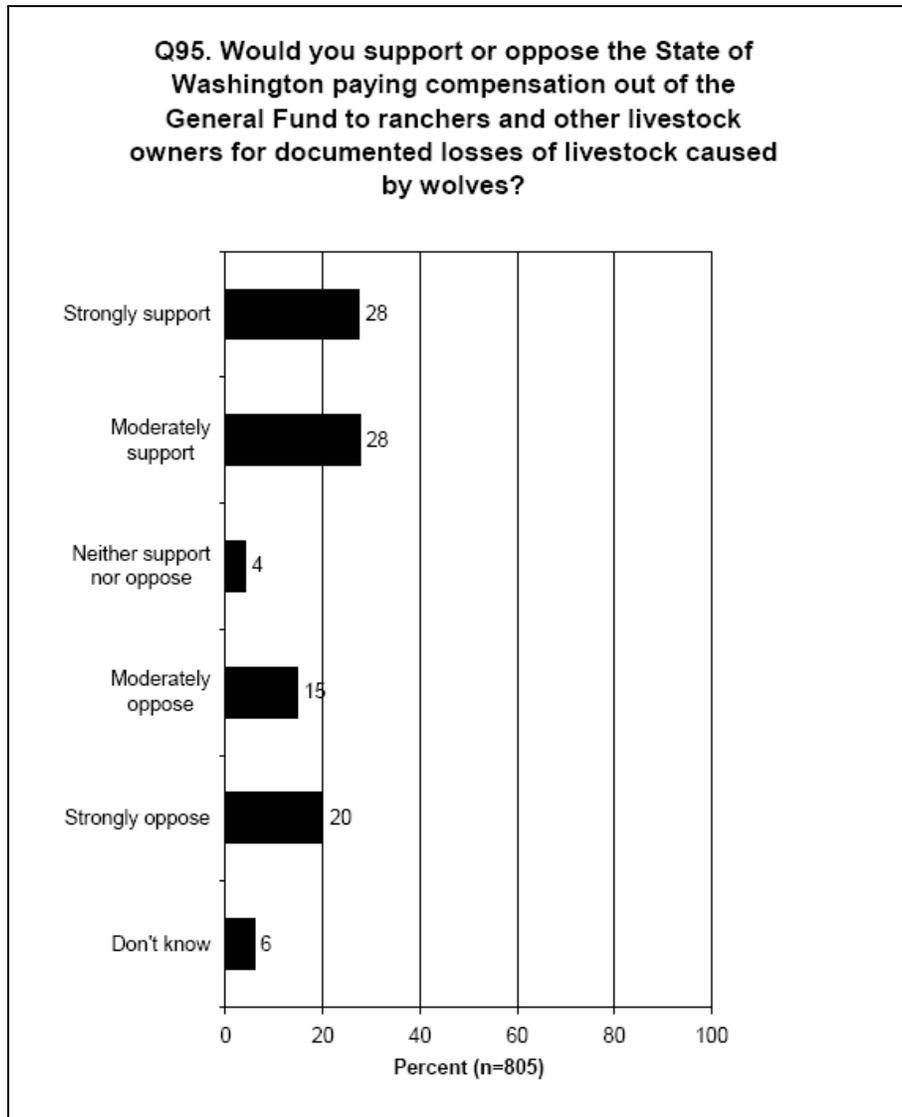
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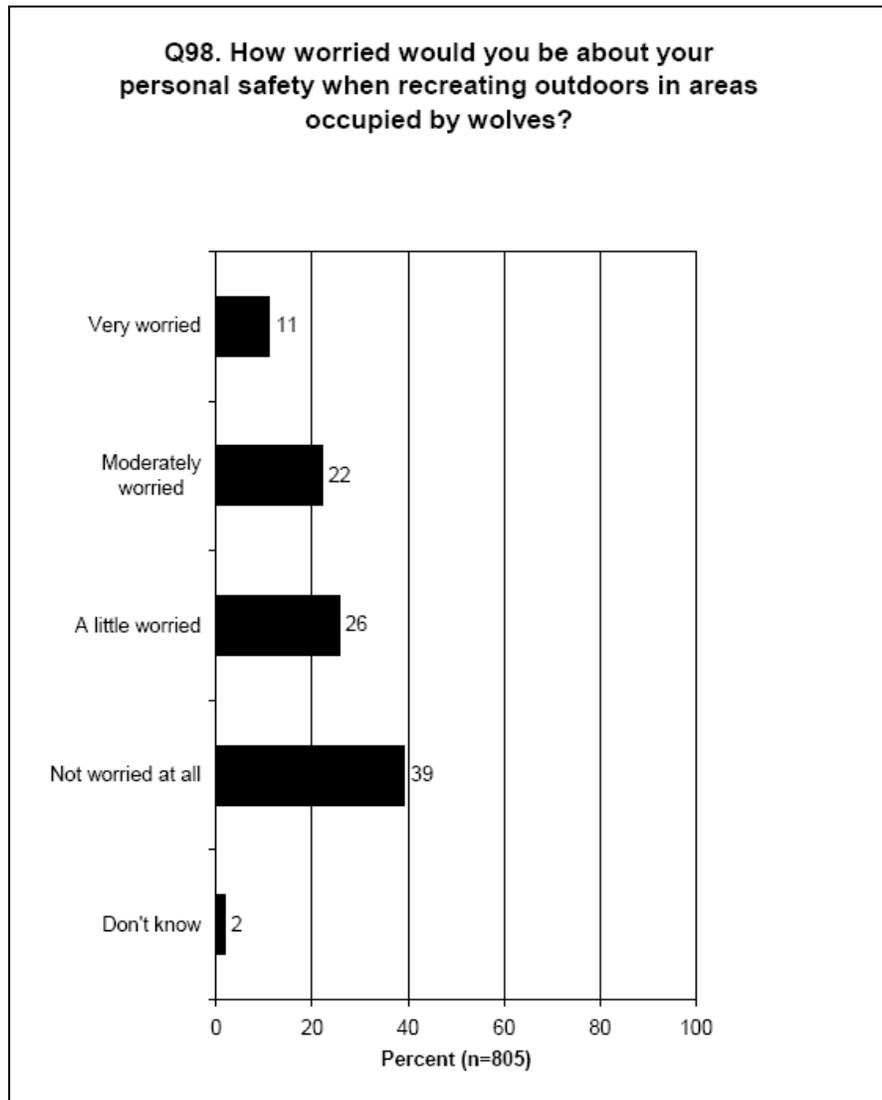
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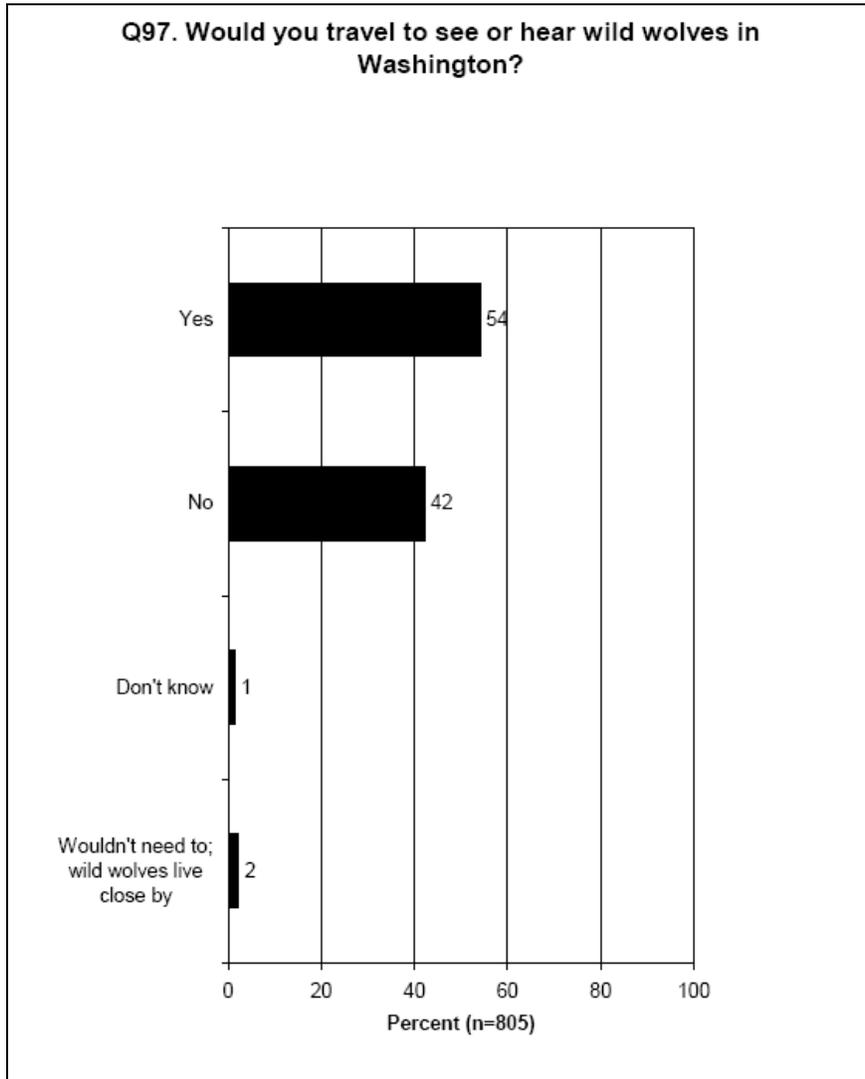
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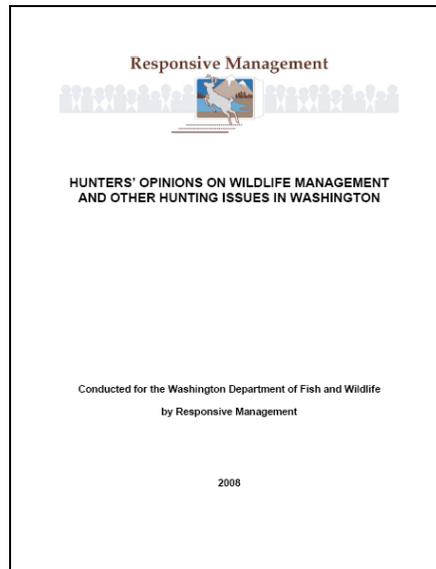
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Appendix I. Continued.



Appendix J. Hunter opinions on management of wolves, excerpted from a report prepared by Responsive Management (Duda et al. 2008b) for the Washington Department of Fish and Wildlife.



Responsive Management, a professional public opinion and attitude survey research firm specializing in natural resource and outdoor recreation issues, was contracted by WDFW to determine hunters' opinions statewide on a variety of questions pertaining to hunting and wildlife management in Washington, including wolves (Duda et al. 2008b). The study entailed a telephone survey of 931 Washington residents 12 years old and older and was conducted from December 2007 to February 2008. Survey methods are fully described in Duda et al. (2008b).

The survey was organized by species type, with questions designed specifically for deer, elk, game birds, waterfowl, black bears, cougars, and bighorn sheep/moose/mountain goats combined. Within the total pool of respondents, about 130 respondents were sampled for each species with two exceptions: first, for game birds, the sample was doubled to about 260 to ensure a large enough sample size for several species within this category, and second, the sample for bighorn sheep/moose/mountain goats was very small (18) because of the few hunters for these species.

Interviewers were trained according to the standards established by the Council of American Survey Research Organizations. Confidence intervals and sampling errors for the results were not reported. No attempt was made to weight respondent ages to the actual proportion of hunter ages in the state. The most common hunter age categories in the survey were 45-54 years old and 55-64 years old. About 60% of respondents were permanent residents of western Washington, about 35% were permanent residents of eastern Washington, about 3% lived outside the state, and 3% did not identify their county of residence.

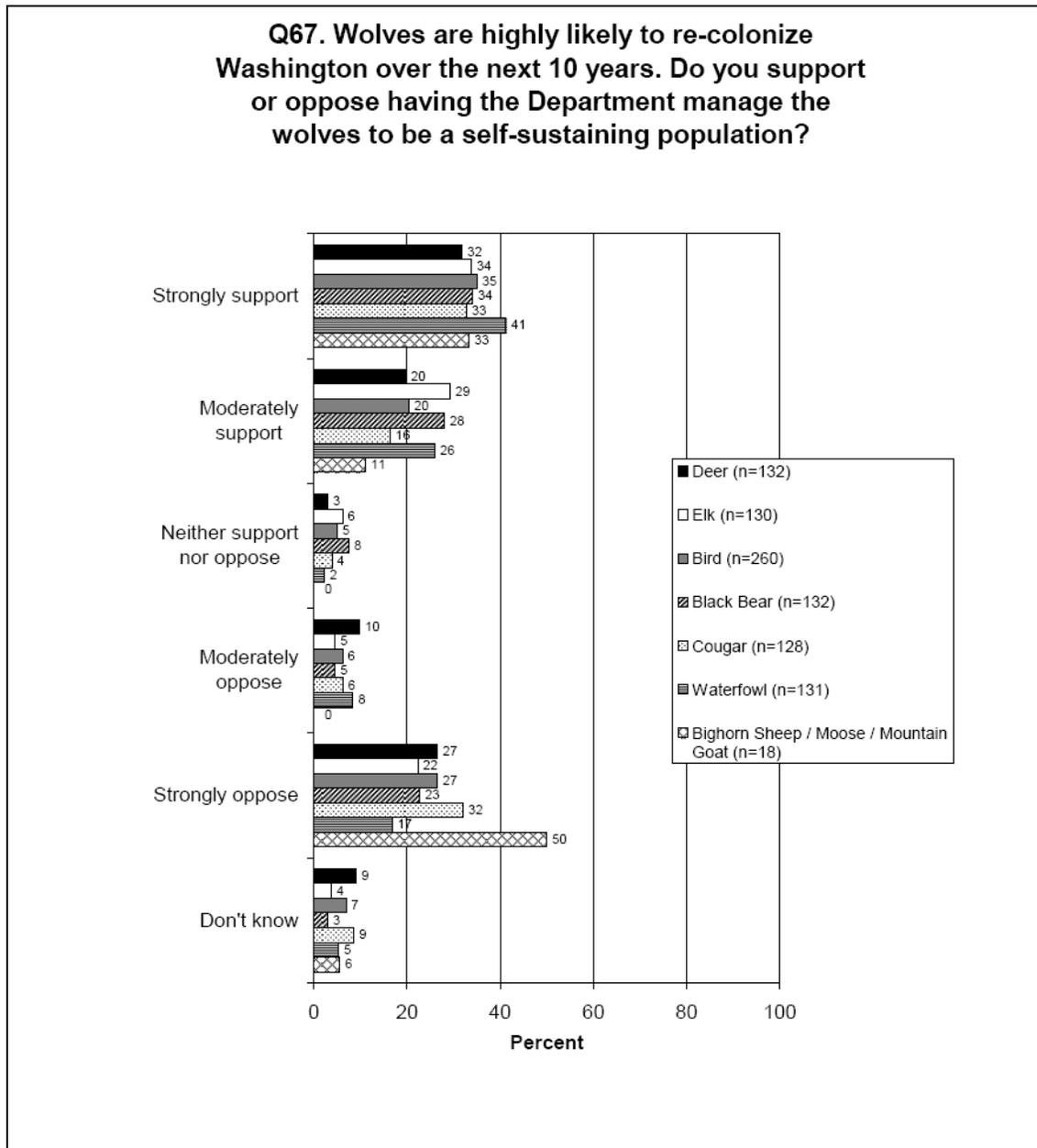
The survey asked three questions relating to hunter support or opposition for reestablishment of wolves in Washington. Each question and the public's responses to the question are provided on the following pages. The entire survey can be viewed online at the following website: http://www.wdfw.wa.gov/wlm/game/management/2009-2015/hunter_report.pdf.

Appendix J. Continued.

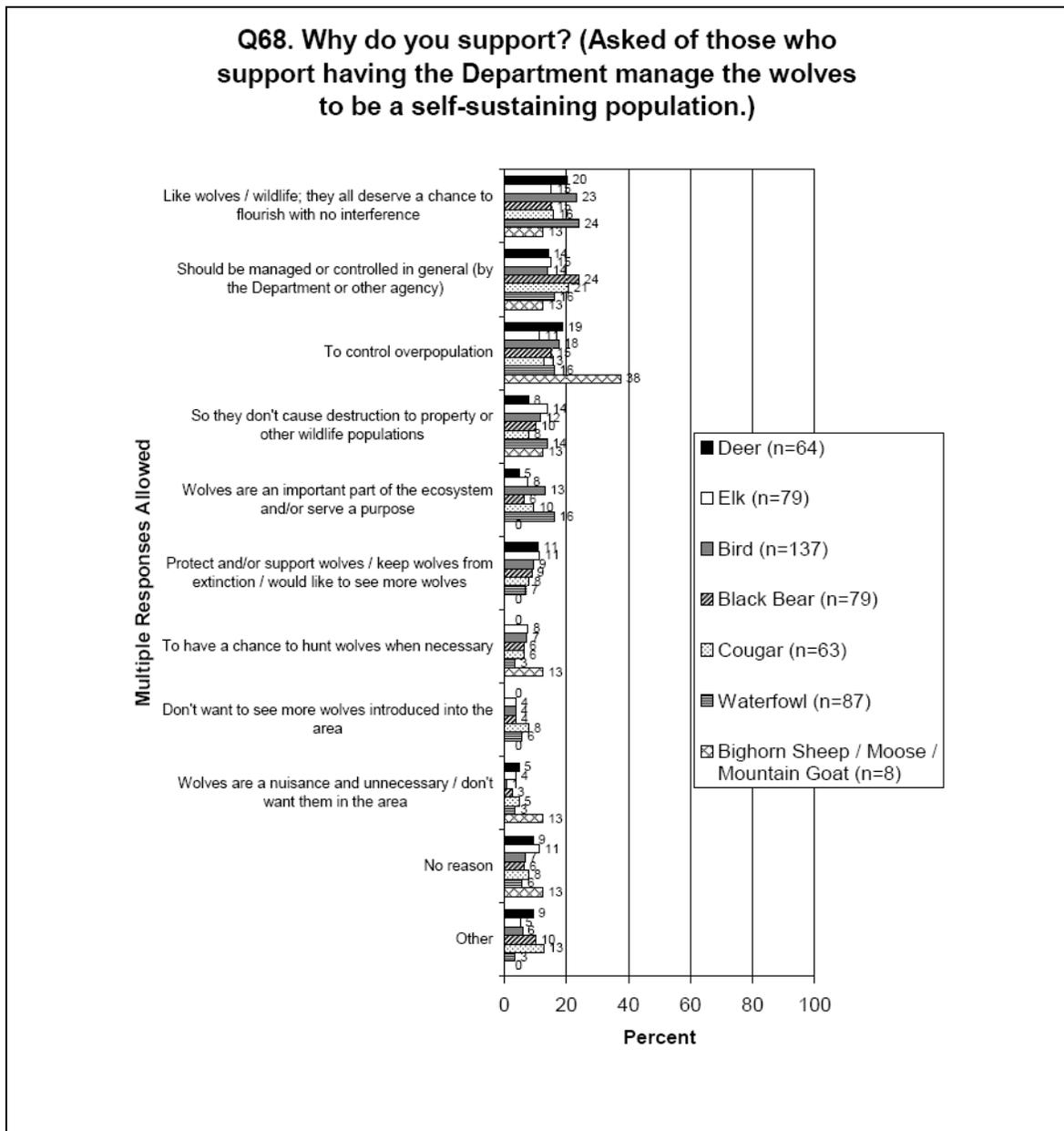
OPINIONS ON THE MANAGEMENT OF WOLVES

- After being informed that wolves are highly likely to re-colonize Washington over the next 10 years, hunters were asked if they support or oppose having the Department manage wolves to be a self-sustaining population. Support exceeds opposition among every type of hunter except sheep/moose/goat hunters.
 - Common reasons for supporting include that the hunter likes wolves/that all wildlife deserves a chance to flourish, that wolves should be managed and controlled anyway, or that wolves should be managed so that they do not overpopulate.
 - Common reasons for opposing include concerns about potential damage to livestock and/or game and wildlife, that the respondent does not want wolves in the area, or that wolves are not manageable.

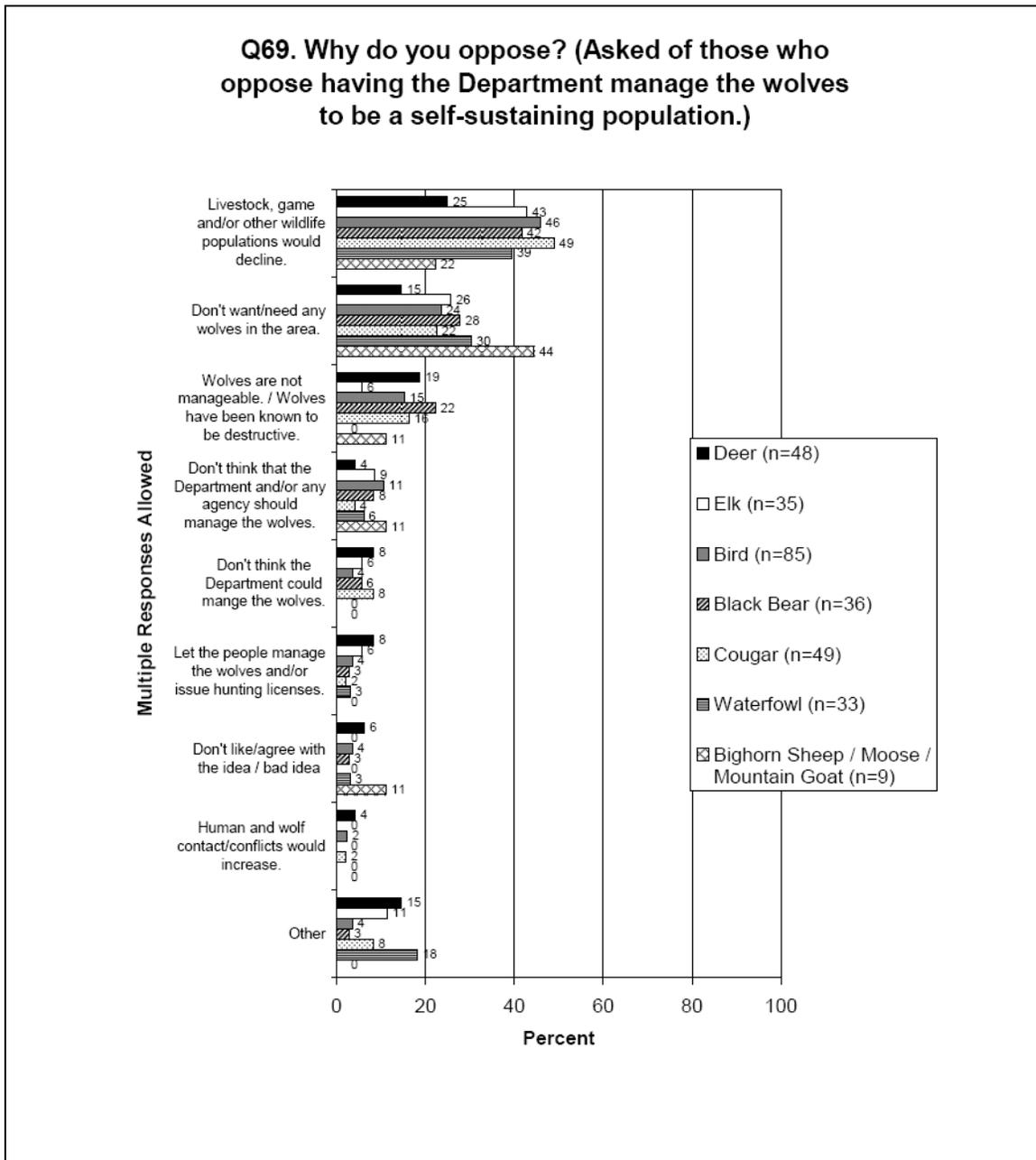
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Appendix J. Continued.



Appendix J. Continued.



1 Appendix K. Sections 54 to 68 from Substitute House Bill 1778, which pertain to compensation payments
2 for livestock killed or injured by bears, cougars, and wolves in Washington.
3

4
5 **Sec. 54.** RCW 77.36.010 and 1996 c 54 s 2 are each amended to read as follows:

6 The definitions in this section apply throughout this chapter unless the context clearly requires
7 otherwise.

8 (1) "Claim" means an application to the department for compensation under this chapter.

9 (2) "Commercial crop" means a horticultural or agricultural product, including the growing or
10 harvested product. For the purposes of this chapter all parts of horticultural trees shall be
11 considered a commercial crop and shall be eligible for claims.

12 (3) "Commercial livestock" means cattle, sheep, and horses held or raised by a person for sale.

13 (4) "Compensation" means a cash payment, materials, or service.

14 (5) "Damage" means economic losses caused by wildlife interactions.

15 (6) "Immediate family member" means spouse, state registered domestic partner, brother, sister,
16 grandparent, parent, child, or grandchild.

17 (7) "Owner" means a person who has a legal right to commercial crops, commercial livestock,
18 or other property that was damaged during a wildlife interaction.

19 (8) "Wildlife interaction" means the negative interaction and the resultant damage between
20 wildlife and commercial crops, commercial livestock, or other property.
21

22 **NEW SECTION. Sec. 55.** A new section is added to chapter 77.36 RCW to read as follows:

23 (1)(a) Except as limited by RCW 77.36.070 and 77.36.080, the department shall offer to
24 distribute money appropriated to pay claims to the owner of commercial crops for damage caused
25 by wild deer or elk or to the owners of commercial livestock that has been killed by bears, wolves, or
26 cougars, or injured by bears, wolves, or cougars to such a degree that the market value of the
27 commercial livestock has been diminished. Payments for claims for damage to commercial livestock
28 are not subject to the limitations of RCW 77.36.070 and 77.36.080, but may not exceed the total
29 amount specifically appropriated therefor.

30 (b) Owners of commercial crops or commercial livestock are only eligible for a claim under this
31 subsection if:

32 (i) The owner satisfies the definition of "eligible farmer" in RCW 82.08.855;

33 (ii) The conditions of section 56 of this act have been satisfied; and

34 (iii) The damage caused to the commercial crop or commercial livestock satisfies the criteria for
35 damage established by the commission under this subsection.

36 (c) The commission shall adopt and maintain by rule criteria that clarifies the damage to
37 commercial crops and commercial livestock qualifying for compensation under this subsection. An
38 owner of a commercial crop or commercial livestock must satisfy the criteria prior to receiving
39 compensation under this subsection. The criteria for damage adopted under this subsection must
40 include, but not be limited to, a required minimum economic loss to the owner of the commercial
41 crop or commercial livestock, which may not be set at a value of less than five hundred dollars.

42 (2)(a) The department may offer to provide noncash compensation only to offset wildlife
43 interactions to a person who applies to the department for compensation for damage to property
44 other than commercial crops or commercial livestock that is the result of a mammalian or avian
45 species of wildlife on a case-specific basis if the conditions of section 56 of this act have been
46 satisfied and if the damage satisfies the criteria for damage established by the commission under this
47 subsection.

1 (b) The commission shall adopt and maintain by rule criteria for damage to property other than
2 a commercial crop or commercial livestock that is damaged by wildlife and may be eligible for
3 compensation under this subsection, including criteria for filing a claim for compensation under this
4 subsection.

5 (3)(a) To prevent or offset wildlife interactions, the department may offer materials or services
6 to a person who applies to the department for assistance in providing mitigating actions designed to
7 reduce wildlife interactions if the actions are designed to address damage that satisfies the criteria for
8 damage established by the commission under this subsection.

9 (b) The commission shall adopt and maintain by rule criteria for mitigating actions designed to
10 address wildlife interactions that may be eligible for materials and services under this section,
11 including criteria for submitting an application under this section.

12 (4) An owner who files a claim under this section may appeal the decision of the department
13 pursuant to rules adopted by the commission if the claim:

14 (a) Is denied; or

15 (b) Is disputed by the owner and the owner disagrees with the amount of compensation
16 determined by the department.

17
18 NEW SECTION. **Sec. 56.** A new section is added to chapter 77.36 RCW to read as follows:

19 (1) No owner may receive compensation for wildlife interactions under this chapter unless the
20 owner has, as determined by the department, first:

21 (a) Utilized applicable legal and practicable self-help preventive measures available to prevent
22 the damage, including the use of nonlethal methods and department-provided materials and services
23 when available under section 55 of this act; and

24 (b) Exhausted all available compensation options available from nonprofit organizations that
25 provide compensation to private property owners due to financial losses caused by wildlife
26 interactions.

27 (2) In determining if the requirements of this section have been satisfied, the department may
28 recognize and consider the following:

29 (a) Property losses may occur without future or anticipated knowledge of potential problems
30 resulting in an owner being unable to take preemptive measures.

31 (b) Normal agricultural practices, animal husbandry practices, recognized standard management
32 techniques, and other industry-recognized management practices may represent adequate
33 preventative efforts.

34 (c) Under certain circumstances, as determined by the department, wildlife may not logistically
35 or practicably be managed by nonlethal efforts.

36 (d) Not all available legal preventative efforts are cost-effective for the owner to practicably
37 employ.

38 (e) There are certain effective preventative control options not available due to federal or state
39 restrictions.

40 (f) Under certain circumstances, as determined by the department, permitting public hunting
41 may not be a practicable self-help method due to the size and nature of the property, the property's
42 setting, or the ability of the landowner to accommodate public access.

43 (3) An owner is not eligible to receive compensation if the damages are covered by insurance.

44 (4) The commission shall adopt rules implementing this section, including requirements that
45 owners document nonlethal preventive efforts undertaken and all permits issued by the department
46 under RCW 77.12.240 and 77.12.150.

47

1 NEW SECTION. **Sec. 57.** A new section is added to chapter 77.36 RCW to read as follows:

2 The department shall establish:

- 3 (1) The form of affidavits or proof required to accompany all claims under this chapter;
- 4 (2) The process, time, and methods used to identify and assess damage, including the
5 anticipated timeline for the initiation and conclusion of department action;
- 6 (3) How claims will be prioritized when available funds for reimbursement are limited;
- 7 (4) Timelines after the discovery of damage by which an owner must file a claim or notify the
8 department;
- 9 (5) Protocols for an owner to follow if the owner wishes to undertake activities that would
10 complicate the determination of damages, such as harvesting damaged crops;
- 11 (6) The process for determining damage assessments, including the role and selection of
12 professional damage assessors and the responsibility for reimbursing third-party assessors for their
13 services;
- 14 (7) Timelines for a claimant to accept, reject, or appeal a determination made by the
15 department;
- 16 (8) The identification of instances when an owner would be ineligible for compensation;
- 17 (9) An appeals process for an owner eligible for compensation under section 55 of this act who
18 is denied a claim or feels the compensation is insufficient; and
- 19 (10) Other policies necessary for administering this chapter.

20
21 NEW SECTION. **Sec. 58.** A new section is added to chapter 77.36 RCW to read as follows:

22 (1) Except as otherwise provided in this section and as limited by section 55 of this act and
23 RCW 77.36.070 and 77.36.080, the cash compensation portion of each claim by the department
24 under this chapter is limited to the lesser of:

25 (a) The value of the damage to the property by wildlife reduced by the amount of compensation
26 provided to the claimant by any nonprofit organizations that provide compensation to private
27 property owners due to financial losses caused by wildlife interactions, except that, subject to
28 appropriation to pay compensation for damage to commercial livestock, the value of killed or
29 injured commercial livestock may be no more than two hundred dollars per sheep, one thousand
30 five hundred dollars per head of cattle, and one thousand five hundred dollars per horse; or

31 (b) Ten thousand dollars.

32 (2) The department may offer to pay a claim for an amount in excess of ten thousand dollars to
33 the owners of commercial crops or commercial livestock filing a claim under section 55 of this act
34 only if the outcome of an appeal filed by the claimant under section 55 of this act determines a
35 payment higher than ten thousand dollars.

36 (3) All payments of claims by the department under this chapter must be paid to the owner of
37 the damaged property and may not be assigned to a third party.

38 (4) The burden of proving all property damage, including damage to commercial crops and
39 commercial livestock, belongs to the claimant.

40
41 **Sec. 59.** RCW 77.36.070 and 1996 c 54 s 8 are each amended to read as follows:

42 The department may pay no more than one hundred twenty thousand dollars per fiscal year
43 from the state wildlife account created in RCW 77.12.170 for claims and assessment costs for
44 damage to commercial crops caused by wild deer or elk submitted under section 55 of this act.

45
46 **Sec. 60.** RCW 77.36.080 and 1996 c 54 s 9 are each amended to read as follows:

1 (1) Unless the legislature declares an emergency under this section, the department may pay no
2 more than thirty thousand dollars per fiscal year from the general fund for claims and assessment
3 costs for damage to commercial crops caused by wild deer or elk submitted under section 55 of this
4 act.

5 (2)(a) The legislature may declare an emergency if weather, fire, or other natural events result in
6 deer or elk causing excessive damage to commercial crops.

7 (b) After an emergency declaration, the department may pay as much as may be subsequently
8 appropriated, in addition to the funds authorized under subsection (1) of this section, for claims and
9 assessment costs under section 55 of this act. Such money shall be used to pay wildlife interaction
10 claims only if the claim meets the conditions of section 55 of this act and the department has
11 expended all funds authorized under RCW 77.36.070 or subsection (1) of this section.
12

13 **Sec. 61.** RCW 77.36.030 and 1996 c 54 s 4 are each amended to read as follows:

14 (1) Subject to limitations and conditions established by the commission, the owner, the owner's
15 immediate family member, the owner's documented employee, or a tenant of real property may trap,
16 consistent with RCW 77.15.194, or kill wildlife that is threatening human safety or causing property
17 damage on that property, without the licenses required under RCW 77.32.010 or authorization from
18 the director under RCW 77.12.240.

19 (2) The commission shall establish the limitations and conditions of this section by rule. The
20 rules must include:

21 (a) Appropriate protection for threatened or endangered species;

22 (b) Instances when verbal or written permission is required to kill wildlife;

23 (c) Species that may be killed under this section; and

24 (d) Requirements for the disposal of wildlife trapped or killed under this section.

25 (3) In establishing the limitations and conditions of this section, the commission shall take into
26 consideration the recommendations of the Washington state wolf conservation and management
27 plan.
28

29 **NEW SECTION. Sec. 62.** A new section is added to chapter 77.36 RCW to read as follows:

30 This chapter represents the exclusive remedy against the state for damage caused by wildlife
31 interactions.
32

33 **Sec. 63.** RCW 77.12.240 and 1989 c 197 s 1 are each amended to read as follows:

34 (1) The department may authorize the removal or killing of wildlife that is destroying or
35 injuring property, or when it is necessary for wildlife management or research.

36 (2) The department shall dispose of wildlife taken or possessed by them under this title in the
37 manner determined by the director to be in the best interest of the state. Proceeds from sales shall
38 be deposited in the state treasury to be credited to the state wildlife account created in RCW
39 77.12.170.
40

41 **NEW SECTION. Sec. 64.** The fish and wildlife commission shall formally review the rules
42 and policies adopted under sections 53 through 66 of this act. If, in the process of reviewing the
43 rules, the fish and wildlife commission identifies recommended statutory changes related to the
44 subject of sections 53 through 66 of this act and to the ability of the fish and wildlife commission to
45 fulfill the intent of sections 53 through 66 of this act, those recommendations must be forwarded to
46 the appropriate policy committees of the legislature during the regularly scheduled 2014 legislative
47 session.

1
2 NEW SECTION. **Sec. 65.** The following acts or parts of acts are each repealed:
3 (1) RCW 77.36.005 (Findings) and 1996 c 54 s 1;
4 (2) RCW 77.36.020 (Game damage control--Special hunt/remedial action) and 2003 c 385 s 1 &
5 1996 c 54 s 3;
6 (3) RCW 77.36.040 (Payment of claims for damages--Procedure--Limitations) and 1996 c 54 s 5;
7 (4) RCW 77.36.050 (Claimant refusal--Excessive claims) and 1996 c 54 s 6;
8 (5) RCW 77.36.060 (Claim refused--Posted property) and 1996 c 54 s 7; and
9 (6) RCW 77.12.260 (Agreements to prevent damage to private property) and 1987 c 506 s 34,
10 1980 c 78 s 43, & 1955 c 36 s 77.12.260.

11
12 NEW SECTION. **Sec. 66.** The following sections are each decodified:
13 RCW 77.36.900; and
14 RCW 77.36.901.

15
16 NEW SECTION. **Sec. 67.** Sections 53 through 66 of this act apply prospectively only and not
17 retroactively. Sections 53 through 66 of this act apply only to claims that arise on or after July 1,
18 2010. Claims under chapter 77.36 RCW that arise prior to July 1, 2010, must be adjudicated under
19 chapter 77.36 RCW as it existed prior to July 1, 2010.

20
21 NEW SECTION. **Sec. 68.** The fish and wildlife commission shall complete all initial rule-
22 making activities that are required in order to allow sections 53 through 66 of this act to take effect
23 on July 1, 2010.

Appendix L. Current response guidelines for reporting suspected wolf activity in Washington.

Response Guidelines

For

Reported Gray Wolf Activity

In Washington State

Coordinating Agencies:

U.S. Fish and Wildlife Service
Washington Department of Fish and Wildlife
USDA/APHIS – Wildlife Services

August 13, 2008

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PURPOSE

These response guidelines are a cooperative effort between the U. S. Fish and Wildlife Service (USFWS), Washington Department of Fish and Wildlife (WDFW) and U.S. Department of Agriculture Wildlife Services (WS). The purpose of the guidelines is to prepare for a coordinated and effective response to possible situations that may occur if wolf/human interactions take place in Washington State. **This is not a wolf management plan or recovery plan.** It does not contain any objectives for establishing wolves in Washington State. The guidelines adhere to Federal and, where appropriate, State law and policy and emphasize close interagency and inter-governmental coordination and a common understanding of specific roles and responsibilities between all involved agencies.

BACKGROUND

The following information provides some background on the legal status of wolves in Washington, management authorities, the history of wolves in Washington, and issues surrounding their migration into the State.

1. The gray wolf was long believed extirpated from Washington, meaning that the species, which is native to the state, was no longer thought to occur here. However, occasional unconfirmed sightings since the 1930s suggest that a few single dispersing wolves have continued to enter Washington from neighboring areas, although these animals were never successful in reestablishing a breeding population. The past few years have experienced an increase in wolf reports in northeastern, north-central, and southeastern Washington. Many of these are unconfirmed or represent sightings of wolf-dog hybrids. However, some are considered reliable and are single animals in most cases. In July 2008, a pack with pups was discovered in Okanogan County and is the first fully documented breeding by wolves in the state since the 1930s.

Wolves are adept at dispersing into new areas and establishing new packs, given an adequate prey source and protection from human persecution. Average pack size ranges from 5 to 10 animals in Idaho, Montana, and Wyoming.

2. The gray wolf is listed as endangered in Washington under the Federal Endangered Species Act (ESA). As long as the gray wolf remains Federally listed under the ESA, the USFWS has overall lead responsibility for wild wolves in Washington. Wild wolves that enter the State are fully protected by the ESA, which is administered and enforced by the USFWS. Wolf hybrids have no Federal or State legal status.

For species listed under the Federal ESA, activities that may result in “take” of endangered species are generally prohibited. The definition of take under the ESA includes to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.

3. The gray wolf is also listed as endangered by the State of Washington and receives protection under State law (WAC 232.12.014, RCW 77.15.120). The State may designate agents or enter into cooperative agreements with Federal agencies to enforce State law. The

Washington Fish and Wildlife Commission may also promulgate rules to authorize Federal and State agencies concerned with the management of fish and wildlife resources to lethally remove wolves under limited circumstances.

The WDFW currently has a cooperative agreement with the USFWS, under Section 6 of the Federal ESA, that provides WDFW authority to manage for the conservation of endangered or threatened species, including gray wolves, within the State, except for lethal take of those species.

4. The Federal gray wolf recovery program in the northwestern United States is focused on maintaining viable wolf populations in parts of Idaho, Montana, and Wyoming. There are no federally sponsored plans to promote wolf recovery in Washington. However, wolves may move into the State from the expanding central Idaho or northwestern Montana populations, or from Canada, and it is anticipated that more packs may become established in Washington in the future.
5. When the wolf is Federally delisted, management authority will revert to the State. In anticipation of this, the WDFW is initiating development of a state wolf conservation and management plan.
6. The WDFW strives to recover extirpated native species whenever possible. However, the agency has no plans to reintroduce wolves to Washington. As noted above, it is expected that wolves will disperse naturally into the State from surrounding populations.

In recognition that wolves may become established in the State in the future, the USFWS, WDFW and WS must be prepared to respond to incidents involving wolves.

7. Tribal governments manage wildlife on their reserved lands and they maintain certain rights to wildlife resources on ceded lands in the State.
8. Wolves sometimes depredate on livestock and/or other domesticated animals and these depredations must be investigated and controlled. Thus, Wildlife Services (WS), the Federal agency with nationwide responsibilities for managing wildlife damage problems, is also a key partner in wolf management in the State.

OVERVIEW OF POTENTIAL SITUATIONS

Discussed below are five situations that might arise in Washington and an overview of the recommended response strategy for each situation. The five situations are:

1. **Unconfirmed report of wolf activity or sightings.**
2. **Verified wolf activity, without a problem incident.**
3. **Report of possible wolf-caused livestock depredation.**
4. **Report of a wolf capture.**
5. **Report of an injured or dead wolf.**

Specific incidents will have unique circumstances and responses are likely to vary from case to case to account for individual situations. The cooperating agencies will coordinate their responses to the various wolf management situations as they arise. If wolf activity is discovered within or adjacent to tribal lands, government-to-government discussions with the affected Tribe will be initiated.

1. Unconfirmed Reports of Wolf Activity (Tracks or Sightings)

USFWS, WDFW and other agencies occasionally receive reports from people who have observed either large tracks or large animals that they think may be wolves. The response procedure is to interview the caller and fill out the observation form that documents details on the observation and where it was located. This information will be stored for future reference.

2. Verified Wolf Activity (Not Involving a Depredation or Conflict)

- Wolf activity in Washington will be considered verified when a State, Federal or Tribal wildlife biologist has been able to see and, to the extent possible, conclusively identify a wild wolf in the field. If current, highly credible reports are received from another source, or if multiple credible reports are received from the same area, appropriate personnel may be sent out to the area to verify it. If there is uncertainty about the identification, wolf experts may be brought in to assist in the confirmation process.
- If wild wolves are confirmed to be present in Washington and the animal(s) has not been implicated in a livestock depredation or other problem incident, USFWS, WS and WDFW will collaborate to monitor the wolf activity to the best of their ability, given available resources. Tribal wildlife agencies may also participate in monitoring activities. In addition, a WDFW local enforcement officer will coordinate with livestock producers in the local area to provide relevant information and what steps they may legally take to prevent depredation.
- The preferred monitoring approach is to capture and radio-collar wolves to facilitate regular tracking of movements. However, this can be difficult to accomplish with a lone wolf that is roaming across wide areas. Available funding and personnel may limit the ability to pursue this approach. Coordinating agencies would likely wait until there are multiple observations of wolf activity in an area – indicating the presence of one or more resident animals – before considering a concerted effort to capture and collar a wolf. A potential alternative approach would be to do periodic surveillance from the ground and air to document tracks and any observed wolf activity.
- The purpose of monitoring wolf activity, once verified, is to determine what areas wolves are using. Also, by knowing where the wolves are located, the agencies may be able to anticipate problem situations and utilize non-lethal techniques to possibly prevent or reduce conflicts. If problem situations do occur, the presence of radio-collared animals will increase the efficiency of subsequent actions.
- Both confirmed and unconfirmed reports of wolf sightings should be mapped, and reports stored by the agency wolf point of contact in their respective offices.

3. Report of Possible Wolf-Caused Livestock Depredation or Other Domestic Animal Conflict

WS is the lead Federal agency for animal damage control and, when authorized by USFWS, will implement wolf control actions in Washington. When a report is received claiming that a wolf has attacked livestock (cattle, sheep, horses, mules, herding or guarding animals such as llamas, donkeys and livestock guarding and herding dogs) or other domestic animals, agency response will include the following elements:

- WS investigates. Keys to a successful response include:
 - WS personnel are rapidly notified and respond promptly and determine whether or not it is a wolf depredation.
 - There is prompt coordination with the affected livestock producer to secure the scene.
 - Key individuals in USFWS and WDFW are promptly notified, including USFWS Office of Law Enforcement and WDFW Enforcement.
 - There is coordination between USFWS, WDFW, WS, and landowner to plan possible follow-up actions.
- If the WS investigation determines that the depredation was wolf-caused, a response action will be initiated. Site-specific circumstances will dictate what type of response action will be used. Response actions will become more aggressive, if needed, until depredations cease.

4. Wolf Capture

Wolves may be caught in traps or snares set for other animals. If a captured wolf is healthy, the responding agency will consult with partner agencies prior to initiating an action. Site-specific circumstances will influence how such captures are handled; however, a rapid response and decision will be necessary to ensure the health and well being of the animal. USFWS Office of Law Enforcement should immediately be consulted in this situation (to make a legal determination about the capture, properly document the event, and initiate further action if necessary).

Factors that will be considered when responding to a wolf capture include the following:

- If there is no history of wolf problems in the area where the animal is captured, the preferred approach is on-site release. However, decisions regarding how to manage the issue will be made on a case-by-case basis. An evaluation will be made to determine if there have been any reported wolf problems in the area prior to making a release decision. Interagency coordination will be initiated to determine what should be done with the animal.
- If an on-site release is being considered, an evaluation of the animal's health will be conducted prior to release. If the wolf is injured, depending on the severity of the injury, a decision will be made on whether or not to release the animal. Female wolves with pups captured on public lands prior to October 1 should be released in the same area as capture unless there have been repeated depredations in the area.

- If the animal is collared and released, collaborating agencies will monitor its movements as regularly as possible.
- If a decision is made to hold the animal, arrangements will be made with an appropriate kennel facility and veterinary care will be arranged, if needed.

5. Report of a Dead or Injured Wolf

USFWS Office of Law Enforcement and WDFW enforcement personnel will immediately be called in to investigate all reports of dead or injured wolves and make a determination about the cause of death or injury, properly document the event, and initiate further action as necessary. The USFWS is responsible for investigating cases that involve unauthorized take of a Federally listed species. The WDFW is responsible for investigating violations of State wildlife laws.

When an injured or dead wolf is found, response will include the following elements:

- USFWS and WDFW Law Enforcement will be immediately notified and they will determine and control all subsequent aspects of the response.
- Keys to a successful response include:
 - Law Enforcement officers are rapidly notified and respond promptly.
 - Scene where the animal was found is left undisturbed and effectively secured.
 - Key individuals in various agencies are promptly notified.
- If an injured wolf is found, actions will be taken immediately to stabilize its condition. Interagency coordination will be initiated to determine what should be done with the animal. Depending on the severity of the injury, a decision will be made on whether or not to release the animal.

RESPONSE STRATEGY

Response checklists have been developed for each of these five potential wolf situations to facilitate a smooth and organized response:

1. **Unconfirmed report of wolf activity or sightings.**
2. **Verified wolf activity, without a problem incident.**
3. **Report of possible wolf-caused livestock depredation.**
4. **Report of a wolf capture.**
5. **Report of an injured or dead wolf.**

RESPONSE CHECKLISTS:

UNCONFIRMED REPORT OF WOLF ACTIVITY

Recipient of report:

Take caller's name and call back information.

Contact the appropriate USFWS or WDFW office.

The USFWS or WDFW will interview the person(s) reporting the sighting and record all relevant information regarding the sighting on the appropriate form and mark the location on a map.

When warranted and resources are available, the WDFW or its designated agents will conduct a follow-up field investigation to try to determine if wolves are in fact in the area, particularly when multiple credible reports come in from the same area.

VERIFIED WOLF ACTIVITY, WITHOUT A PROBLEM INCIDENT

If the presence of wild wolves is confirmed, and there has not been a livestock or domestic animal depredation or other problem incident, the first recipient of the information will respond as follows:

Recipient of report:

- Take caller's name and call back information.
- Document the specific location(s) where activity has been observed.
- Contact the appropriate USFWS or WDFW office.

Agency Roles and Responsibilities

WDFW will investigate verified wolf sightings and monitor wolf activity.

USFWS may assist WDFW with investigating verified wolf sightings and monitoring wolf activity.

Wildlife Services personnel may provide assistance in trapping efforts for radio-collaring wolves.

1. The agencies will coordinate and share this information with all other appropriate agencies, e.g. USFWS or WDFW, WS, US Forest Service, BLM, National Park Service (NPS), and Washington Department of Natural Resources (WDNR).
2. If wolf activity is within or adjacent to Tribal lands, the USFWS office involved will share this information with the affected tribe.
3. All media inquiries should be referred to USFWS External Affairs contacts Tom Buckley (Spokane, east of the Cascade mountains), or Doug Zimmer (Lacey, west of the Cascade

mountains), and WDFW Public Affairs contacts Madonna Luers (Spokane, east of the Cascade mountains), or Margaret Ainscough (Olympia, west of the Cascade Mountains).

4. WDFW local Enforcement Officers will provide information updates to livestock producers in the area and describe what they can legally do to discourage wolves from frequenting their property or grazing allotment.
5. Monitoring of wolf activity will be coordinated among USFWS, WDFW and WS, using one or more of the following three approaches:
 - Compile information and map locations of sightings of animals and tracks through interviews with persons(s) reporting activity.
 - Conduct periodic ground surveys (i.e., scat and track surveys, howling surveys) and/or flyovers to monitor wolf activity.
 - Use radio-telemetry to regularly track collared animal(s).

REPORT OF POSSIBLE WOLF-CAUSED DEPREDATION ON LIVESTOCK OR DOMESTIC ANIMALS

Recipient of report:

Take caller's name and call back information and advise the caller to protect the scene. Ask for specific directions on how to reach the scene (street names, landmarks, gates, etc).

Give the caller the following instructions to protect the scene:

- Avoid walking in and around the area;
- Keep dogs and other animals from the area to protect evidence;
- Place tarp over carcass;
- If possible, use cans or other objects to cover tracks and scats that can confirm the depredating species;
- Inform caller that a Wildlife Services investigator will be notified of the incident.

Immediately contact the appropriate USFWS or WDFW office.

Agency Roles and Responsibilities

Wildlife Services is the lead agency for investigating livestock depredations and making the determination on cause of death.

1. USFWS, WDFW, or WS will interview the person(s) reporting the incident and record all relevant information regarding the incident on the appropriate form and mark the location on a map.
2. The USFWS or WDFW will contact WS and relay the information provided by the caller and request that an investigator be dispatched to the scene.
3. The responding agency will continue coordination with WS, WDFW or USFWS, and the livestock owner, as needed, to ensure someone responds and that the owner is kept informed.

4. The agency will notify law enforcement, and all other appropriate agencies (e.g. US Forest Service, BLM, NPS, WA DNR).
5. If wolf activity is within or adjacent to Tribal lands, the USFWS office involved will work with the affected tribe.
6. All media inquiries should be referred to USFWS External Affairs contacts Tom Buckley (Spokane, east of the Cascade Mountains), or Doug Zimmer (Lacey, west of the Cascade Mountains), and WDFW Public Affairs contacts Madonna Luers (Spokane, east of the Cascade Mountains), or Margaret Ainscough (Olympia, west of the Cascade Mountains).

IF WILDLIFE SERVICES DETERMINES THAT THE DEPREDATION WAS WOLF-CAUSED:

1. USFWS, WDFW, and WS will coordinate and consult with designated agency managers to evaluate possible response actions, assess the efficacy of non-lethal measures and document that process, and determine the appropriate response measure.
2. USFWS, in coordination with WDFW and WS, will authorize a course of action, with notification to USFWS and WDFW Law Enforcement prior to action being taken.
3. WS will implement the response efforts.
4. WDFW local enforcement officers will provide information updates to livestock producers in the area and describe what they can legally do to discourage wolves from frequenting their property or grazing allotment.

REPORT OF A WOLF CAPTURE

Recipient of report:

Take caller's name and call back information and get detailed description of the incident location from the caller. Ask about specific directions on how to reach the scene (street names, landmarks, gates, etc), provide them with instructions on what to do until someone arrives, and inform them that USFWS or WDFW personnel will respond to the scene immediately.

Immediately contact the appropriate USFWS or WDFW office.

Agency Roles and Responsibilities

WDFW will respond to wolf captures.

USFWS may assist in responding to wolf captures and will coordinate with WDFW and WS to decide on what course of action to take.

Wildlife Services may assist if conditions warrant.

1. The responding agency will interview the person(s) reporting the incident and record all relevant information regarding the incident on the appropriate form and map the location.

2. An agent from WS, or a biologist from WDFW or USFWS will be dispatched to confirm that the captured animal is a wolf and to evaluate the animal's condition.
3. If it is confirmed that the animal is a wolf, contact USFWS Office of Law Enforcement and advise them of the circumstances as soon as possible.
4. Initiate interagency coordination to determine what should be done with the animal. Depending on the severity of any injury to the animal, a decision will be made on whether or not to release the animal.
5. Upon the USFWS Office of Law Enforcement's determination that information can be released (if a wolf), the responding agency will notify all other appropriate agencies (e.g. US Forest Service, BLM, NPS, and WA DNR).
6. If wolf activity is within or adjacent to Tribal lands, the USFWS office involved will work with the affected tribe.
7. If the decision is to release the animal on site, WDFW Enforcement officers will provide information updates to livestock producers in the area and describe what they can legally do to discourage wolves from frequenting their property or grazing allotment.
8. In USFWS Office of Law Enforcement matters, refer media inquiries to the Redmond Office of Law Enforcement. In non-law enforcement matters, refer all media inquiries to USFWS External Affairs contacts Tom Buckley (Spokane, east of the Cascade Mountains), or Doug Zimmer (Lacey, west of the Cascade Mountains), and WDFW Public Affairs contacts Madonna Luers (Spokane, east of the Cascade Mountains), or Margaret Ainscough (Olympia, west of the Cascade Mountains).

REPORT OF A DEAD OR INJURED WOLF

Recipient of report:

Take caller's name and call back information and advise the caller to secure the scene. Ask about specific directions on how to reach the scene (street names, landmarks, gates, etc).

Give the caller the following instructions to protect the scene:

- Treat area as a potential crime scene.
- Do not touch anything and keep all people and animals from the area.
- A tarp can be placed over the wolf carcass.
- Cans or other items can be placed over footprints and animal tracks.

Immediately contacts the appropriate USFWS or WDFW office.

Agency Roles and Responsibilities

WDFW will respond to reports of dead or injured wolves.

USFWS will make decisions on euthanasia of injured wolves.

WS may respond to reports of injured wolves.

1. The USFWS or WDFW contacts caller to get a detailed description of the incident location.
2. USFWS or WDFW notifies USFWS and WDFW Law Enforcement. Relay information provided by the caller and request that an officer be sent to the scene.

IF THE WOLF IS DEAD: USFWS Law Enforcement personnel will take over the investigation and determine all subsequent aspects of the response. If there is an ongoing law enforcement investigation, refer all media inquiries to USFWS Office of Law Enforcement, Redmond.

IF THE WOLF IS INJURED:

1. Dispatch a USFWS, WS or WDFW biologist to the scene to evaluate the seriousness of injuries and recommend further action and continue coordination with USFWS law enforcement agent and on-site person.
2. With USFWS Office of Law Enforcement concurrence, the USFWS and WDFW will notify all other appropriate agencies (WDFW, WS, US Forest Service, BLM, NPS, and WA DNR).
3. Interagency coordination will be initiated to determine what should be done with the animal. Depending on the severity of the injury, a decision will be made on whether or not to release the animal.
4. If wolf activity is within or adjacent to Tribal lands, the USFWS will work with the affected tribe.
5. If there is an ongoing law enforcement investigation, refer all media inquiries to USFWS Office of Law Enforcement, Redmond. Otherwise, refer all media inquiries to USFWS External Affairs contacts Tom Buckley (Spokane, east of the Cascade Mountains), or Doug Zimmer (Lacey, east of the Cascade Mountains), and WDFW Public Affairs contacts Madonna Luers (Spokane, east of the Cascade Mountains), or Margaret Ainscough (Olympia, east of the Cascade Mountains).

Attachment A: Phone Contacts to Report Wolf Observation, Injury, or Suspected Depredation

U.S. Fish and Wildlife Service, Monday through Friday, 8:00 – 4:30 (except federal holidays):

Eastern Washington:

Spokane..... (509) 891-6839

Western Washington:

Lacey (360) 753-9440

USFWS Office of Law Enforcement to report dead or injured wolves:

Spokane (509) 928-6050

Lacey (360) 753-7764

Redmond (425) 883-8122

Bellingham (360) 733-0963

Burbank (Tri-Cities)..... (509) 546-8344

Portland (503) 780-9771

USFWS Office of Law Enforcement after hours:

Call Washington State Patrol Office (425-649-4370). Tell dispatcher which county is involved and ask to be connected to a USFWS Special Agent.

Washington Department of Fish and Wildlife, Monday through Friday, 8:00 – 5:00:

Spokane (509) 892-1001

Ephrata (509) 754-4624

Yakima (509) 575-2740

Vancouver (360) 696-6211

Mill Creek (425) 775-1311

Montesano (360) 249-4628

Olympia (360) 902-2200

USDA Wildlife Services, Statewide, Monday through Friday, 7:30 – 4:00:

Olympia (360) 753-9884

For Emergency and after-hours:

Contact your local State Patrol Office and ask to be connected to a local WDFW wildlife officer.

Washington State 24 hr Wolf Reporting Hotline..... 888-584-9038