The Endangered Gray Wolf in Wyoming

Managing Wolf Populations after Endangered Species Act Delisting

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Introduction

The distinct howl of the gray wolf (*Canis lupus*) has been absent from the Northern Rocky Mountains for over sixty years. The United States government successfully exterminated the species from all of the lower forty-eight states but Minnesota and Michigan by the 1930s. The 1973 passage of the Endangered Species Act (ESA), however, instituted legal protection of the gray wolf. A recovery plan was developed throughout the 1980s and was officially implemented in 1995. Since then, the recovery plan has resulted in populations of gray wolves annually increasing in three designated recovery areas: Montana, Idaho, and Wyoming.

By the end of 2007, there was a total minimum estimate of 1,513 wolves: 830 wolves in the Central Idaho Recovery Area, 453 in the Greater Yellowstone Recovery Area, and 230 in the Northwest Montana Recovery Area. By state boundaries, there were an estimated 732 wolves in the state of Idaho, 359 in Wyoming, and 422 in Montana (USFWS 2008, 1).

Federal, state, and tribal governments ultimately strive to recover wolves such that they do not need the protections of the ESA (Nadeau et al. 2007, 8). On January 29, 2007, the U.S. Fish and Wildlife Service (USFWS) announced its proposal to delist the gray wolf from the endangered species list with an objective to devolve management to state governments after

meeting a set of federal criteria. To accomplish this, stakeholders must approve state management plans. Management includes the following essential elements of a recovery plan: (1) wolf inventory; (2) predator-prey programs; (3) hunt and trap monitoring; (4) cooperation among other state and federal agencies, tribal nations, border states/provinces, Canada, and citizens; (5) rights to control and reduce depredations; and (6) dissemination to the public of current and accurate information (IDFG 2002, 20).

USFWS approved the Idaho and Montana recovery plans, but rejected the Wyoming plan. The agency rejected the Wyoming plan in 2003 because it believed Wyoming's approach contradicted the management agenda. The plan did not reassure USFWS that Wyoming would conscientiously protect and conserve at least fifteen breeding pairs of wolves within the state. The language used to define wolves caused additional concern, as wolves residing in national parks and forests were classified "trophy game" and those outside were classified "predator."

The objective of this article is to develop an alternative for Wyoming's wolf recovery program that will be acceptable to all stakeholders. This article provides a historical overview of the extermination of wolf populations and subsequent reintroduction of wolves in the Northern Rocky Mountains. It examines the successful reintroduction and sustainability of wolf populations in the three states involved in wolf recovery programs—Idaho, Montana, and Wyoming—and analyzes alternatives Wyoming may consider in developing a new recovery plan. To ensure state management of its wolf populations, Wyoming should consider implementing a program that draws on the strengths of the Idaho and Montana plans and that will likely receive quick and favorable approval by USFWS. Wyoming should be able to move forward with management of its wolf population by using a recovery program consistent with this article's five recommendations:

1. Develop a new wolf recovery plan using an eleven to fifteen member advisory panel consisting of a diverse group of stakeholders, such as ranchers, conservationists, wildlife biologists, hunters, and other citizens;

2. Continue protecting wolves by state regulation initially to ensure population levels are sustained according to federal regulations, and retain the USFWS definition of a breeding pair;

3. Institute a hunting and trapping program, and develop a wolf education program targeting the general public and specific groups such as hunters and ranchers;

4. Create buffer zones for ranchers to legally kill wolves without a hunting tag or threat of prosecution under state law, provided that wolf packs causing economic harm or safety concerns in an area may be eliminated by Wyoming Fish and Game (WFG) or citizens but only once wolves are removed from state's protected list; and,

5. Continue utilizing the Defenders of Wildlife compensation program to repay ranchers for livestock depredation losses and develop the Northern Rocky Mountain Grizzly Bear and Gray Wolf Management Trust Fund to remove funding allocations from the annual federal appropriation process.

(On February 27, 2008, USFWS announced in the Federal Register the delisting of gray wolves from the ESA in the Northern Rocky Mountain recovery area. However, USFWS stated gray wolves in Wyoming would be removed from the ESA only if Wyoming follows through with plans to adopt state laws and a management plan within twenty days of the final rule coming into effect (Department of Interior 2008, 10514). The final rule became effective March 28, 2008. This article went to print before the twenty days came to pass.)

Background

Extirpation of the Gray Wolf

Official estimates of wolf populations in North America, before European settlement, have not been verified or researched by academics. Various wolf advocacy opponents, proponents, and government agencies have put the number between 400,000 to over two million (Humane Society 2007; Noecker 1997; Murray n.d.). The extermination of bison by 1884, westward settlement, and agriculture expansion led to the elimination of the gray wolf population (Ream 1982, 362). Wolves quickly gained a reputation as vicious and dangerous carnivores. Western ranchers feared for their

livestock and new homesteaders shared dreadful tales about the terror of wolf attacks. Bounty hunters were hired by the U.S. Biological Survey, known today as USFWS, to exterminate the "pest."

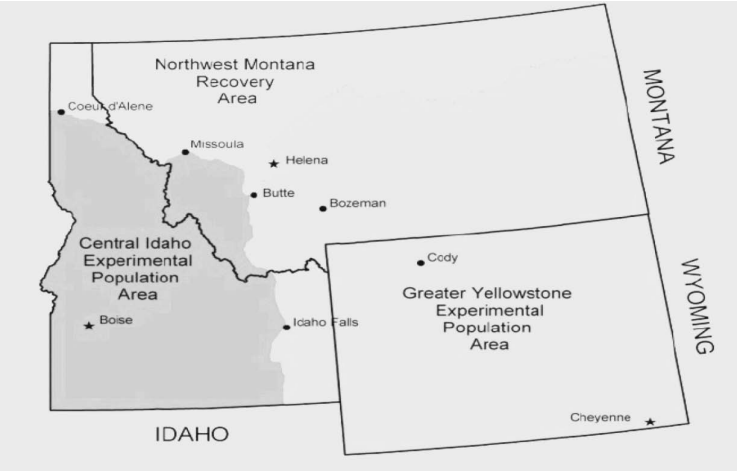
By the 1930s, gray wolf populations were eliminated from Montana, Idaho, and Wyoming, as well as from adjacent southwestern Canada (Ream 1982, 363). Gradually, wolves were almost entirely extirpated from the contiguous 48 states (Bangs 1996, 402). The 1960s ushered in strong public and political support for wildlife preservation. Between 1972 and 2000, numerous studies examined the public's perception of the gray wolf. In 2002, a meta-analysis assembled data from the thirty-eight public opinion surveys conducted over this twenty-eight-year period. The study found that a majority (51 percent) of the population showed positive attitudes toward wolves, 60 percent supported wolf restoration, and about 25 percent of respondents were neutral about wolves (Williams 2002, 578). The meta-analysis illustrated support or neutral opinions toward wolves—a change from past decades.

The discussion of protecting the gray wolf grew more serious after the passage of ESA. Congress placed wolves on the endangered species list in 1974, seeking to protect wolves under U.S. law. Ironically, the same government agency, USFWS, which oversaw the removal of wolves, soon championed the restoration of wolf populations.

The Start of Recovery

Once a species joins the endangered list, USFWS must designate a critical habitat and formulate a recovery plan. USFWS sketched protection strategies for wolf populations in 1980. By 1987, USFWS developed an updated Northern Rocky Mountain Wolf Recovery Plan, identifying northwestern Montana, central Idaho, and the Greater Yellowstone Ecosystem (GYE) as possible recovery areas. The plan set a biological goal of ten breeding pairs of wolves in each of those areas for three consecutive years (Bangs et al. 1998, 785) and recommended three criteria for the establishment of wolf recovery areas: (1) wolf recovery habitats should focus on areas that contained large blocks of public land; (2) recovery lands should contain

Figure 1:
Northern Rockies Gray Wolf Recovery Area, Montana, Idaho, and Wyoming



Source: Sime et al. 2007, 8.

abundant wild hoofed animals (also called ungulates) and prey; and (3) recovery areas should contain minimal livestock to reduce potential conflicts between ranchers and wolves.

Wild ungulate populations in the three identified areas consisted of elk (*Cervus elaphus*), white-tailed deer (*Odocoileus virginianus*), mule deer (*O. hemionus*), moose (*Alces alces*), mountain goats (*Oreamnos americanus*), bighorn sheep (*Ovis canadensis*), and, in the GYE, pronghorn antelope (*Antilocapra americana*) and bison (*Bison bison*). Smaller animals were also abundant in the three designated areas. Even with an estimated wild ungulate population of 100,000 to 250,000 in each designated recovery area, twice as many domestic ungulates, primarily cattle and sheep, existed on nearby public lands (Department of Interior 1994, 80). Conflict with ranchers and herders was inevitable, yet officials believed the three chosen areas lessened the private burden, as fewer livestock inhabit public land

than private land.

After significant controversy and debate, USFWS initiated an updated recovery plan in late autumn 1994. USFWS created provisions to reintroduce wolves into two experimental population areas. Fifteen wolves were introduced into each central Idaho and GYE annually for two years, beginning in 1995. USFWS sought to maintain thirty breeding pairs of wolves for three to five consecutive years, after which the program would be transferred to state control but continue to receive federal funding (Department of Interior 1994, 60253). A breeding pair is defined as an adult male and female raising two or more pups until December 31 of the respective year (USFWS 2004, 1).

The updated plan designated two recovery areas and termed the wolves "nonessential experimental populations" to allow the populations to be managed with less regulation than endangered populations. Both opponents and supporters of the updated plan criticized its undertakings and challenged the plan in court, delaying implementation by another year. In the fall seasons of 1995 and 1996, sixty-six wolves from southwestern Canada were reintroduced to Yellowstone National Park (thirty-one wolves) and central Idaho (thirty-five wolves).

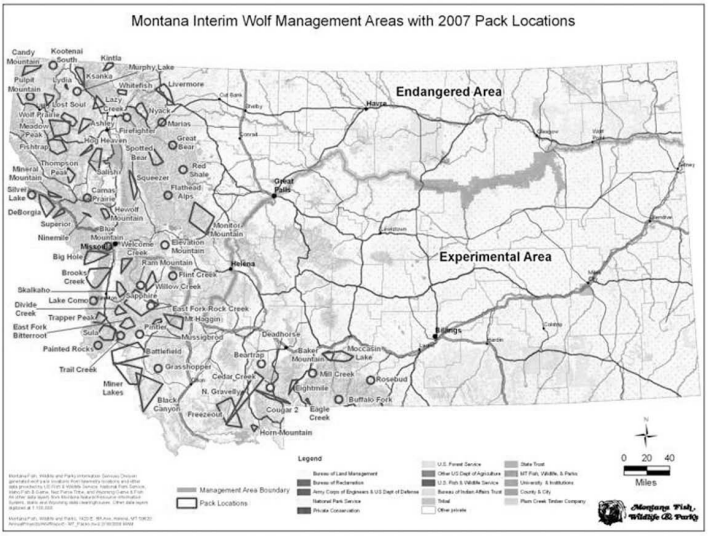
By spring 1999, the experimental population areas in central Idaho and GYE reached USFWS's goal by maintaining fifteen breeding pairs in each area. By early 2004, the two areas had maintained at least thirty breeding pairs for five consecutive years. In fact, sixty-six groups met the definition of breeding pair and 105 packs developed groups of two or more wolves (USFWS 2004, 1). The process to de-list the gray wolf from the endangered list and prepare for state acquisition of the program clearly gained momentum. In 2003, Montana finished its wolf management plan, and Idaho and Wyoming presented their plans to USFWS.

Northwest Montana Recovery Area

In 1986, a wolf pack from Canada successfully raised a litter of pups in Glacier National Park, Montana, and a small population was soon reestablished there (Ream et al. 1991). The natural repopulation of wolves in

Figure 2:

Verified Wolf Pack Distribution in Montana, December 31, 2006

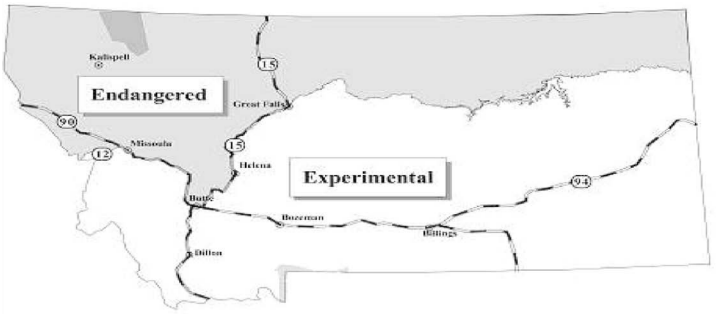


Source: Sime et al. 2007, 12.

the Northwest Montana Recovery Area (NWMT), defined as north and northwest Montana and the northern portion of the Idaho panhandle, consisted of litters averaging 5.3 pups annually (Pletscher et al. 1997, 462). By 1993, the number of wolves had grown by approximately 22 percent annually to eighty-eight wolves in seven packs (Department of Interior 1994, 80).

In early 2004, USFWS enthusiastically approved the Montana Gray Wolf Conservation and Management Plan and agreed to devolve wolf management powers to Montana (USFWS 2007, 7). Montana adopted "laws and management plans that would conserve a recovered wolf population into the foreseeable future," the federal agency decided (Department of Interior 2007, 6106). The agreement allowed Montana to implement its USFWS-approved state plan within the limits of federal regulations (Sime et al. 2007, 7). The wolves in the NWMT are still listed as endangered due to U.S. District Court rulings in Oregon and Vermont (*Defenders of*

Figure 3:
Federal Management Areas, Montana



Note: Map shows the endangered NWMT area administered by the State of Montana but under federal ESA regulations and the experimental area administered by the State of Montana under the state's USFWS-approved wolf management plan beginning March 28, 2008.

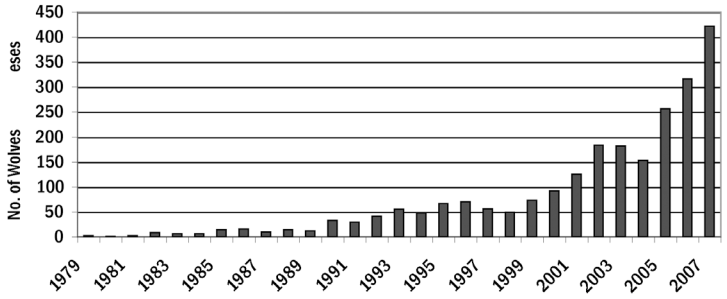
Source: Sime et al. 2008, 8.

Wildlife v. Norton, Civ. 03-1348-JO [2005]; *National Wildlife Federation v. Norton*, 03-CV-340 [2005]5). These cases involved the April 2003 reclassification of the gray wolf under the ESA from "endangered" to "threatened" across most of the contiguous United States. In late January 2005, both courts determined the reclassification was "arbitrary and capricious" and violated the ESA, effectively invalidating the recent policy change. All gray wolf populations excluding Minnesota and areas designated nonessential experimental populations, such as the Central Idaho Experimental Population Area and Greater Yellowstone Experimental Population Area, reverted back to the pre-2003 classification of endangered.

Therefore, while Montana manages wolves living in the NWMT these wolf populations are classified as endangered under the ESA and their management must follow federal regulations as dictated by the courts. However, in areas of Montana designated experimental, the state's wolf management recovery plan applies (see Figure 3).

The most recent figures, collected in 2007, totaled thirty-one packs of two or more wolves, yielding a minimum estimate of 213 wolves in the

Figure 4:
Wolves in Montana, 1979–2007



Note: Graph shows the minimum estimated number of wolves in the State of Montana on December 31 between the years 1979–2007.

Source: Author's calculations from U.S. Fish and Wildlife Service annual wolf reports.

Montana portion of the NWMT Area (Sime et al. 2007, 1). Twenty-three packs were classified as breeding pairs.

Montana Recovery Plan

When devolution of the federal program is completed, gray wolves will be classified under Montana state law as a "species in need of management" rather than "endangered." Reclassification will allow wolves to receive sufficient protections under state law. Montana recognizes the gray wolf as a native species and will integrate wolves as a valuable part of the state's wildlife heritage (MFWP 2004, i). As noted, USFWS requires a minimum of fifteen breeding pairs. Under the Montana plan, the state will take proactive steps toward managing its wolf population if the number of breeding pairs drops below fifteen. The management and conflict resolution tools employed to conserve the wolves will depend on the impact that wolf populations have on Montana citizens. The plan calls for more conservative strategies when wolf populations decline and flexible strategies when

wolf populations increase. Wild ungulate populations will be monitored to make sure depredation does not harm game populations. If numbers increase as anticipated, the state will reclassify wolves to "big game animal" and/or "furbearer," and will begin a well-regulated trap and hunt program. Unlawful taking of a wolf will result in a state misdemeanor offense.

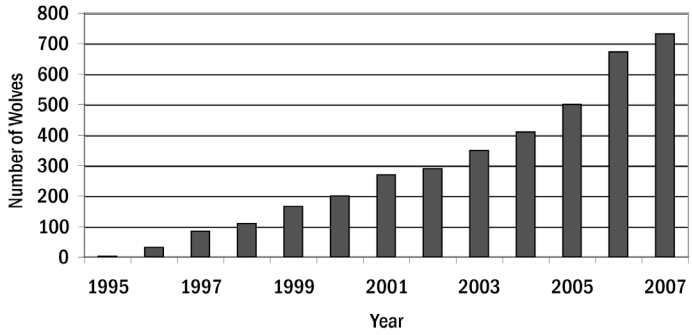
The Montana approach is expected to be very effective. Wolf population management will include a range of tools from non-lethal to lethal, and the approach will incorporate public outreach, conservation education, law enforcement, and landowner relations programs. USFWS believes this approach will succeed in maintaining wolf populations above the minimum of fifteen breeding pairs in nonessential experimental areas (USFWS 2006, 3-59). Wolves residing in the northwest portion of the state will continue to receive ESA protection because of court rulings.

Political support for the Montana plan is strong at both national and local levels. By continuing to protect wolves after removing them from the endangered species list, Montana has secured federal support for its recovery plan. The plan won local political approval, in part because it was developed by a diverse twelve-member citizen commission (MFWP 2004, ii). The commission consisted of a group of citizens, including educators, wildlife biologists, a veterinarian, a medical doctor, a Native American, an outfitter, a hunter, ranchers, and a former Defenders of Wildlife representative. The public process strengthened the plan and helped it achieve strong support from USFWS in 2004.

The Montana plan will likely garner further political support because the plan contains a specific predator-prey program that will develop as wolf populations stabilize. In 2007, seventy-five cattle, twenty-seven sheep, three domestic dogs, and one llama were killed by wolves (Sime 2008, 1). The predator-prey component seeks to decrease these figures in future years.

The cost of the Montana plan is anticipated to be similar to that of the other plans, with an overall federal allocation of $2,995,000 dispersed among the three states. Based on FY 2007 numbers, Montana received $781,000 from the federal government to maintain operations (USFWS 2008, 86). In FY 2007, $183,000 was spent investigating depredation claims by ranchers for livestock losses due to wolf attacks from the U.S.

Figure 5:
Estimated number of wolves in Idaho, 1995–2007



Note: Annual numbers were based on best information available and were retroactively updated as new information became available.

Source: Author's calculations from U.S. Fish and Wildlife Service annual wolf reports.

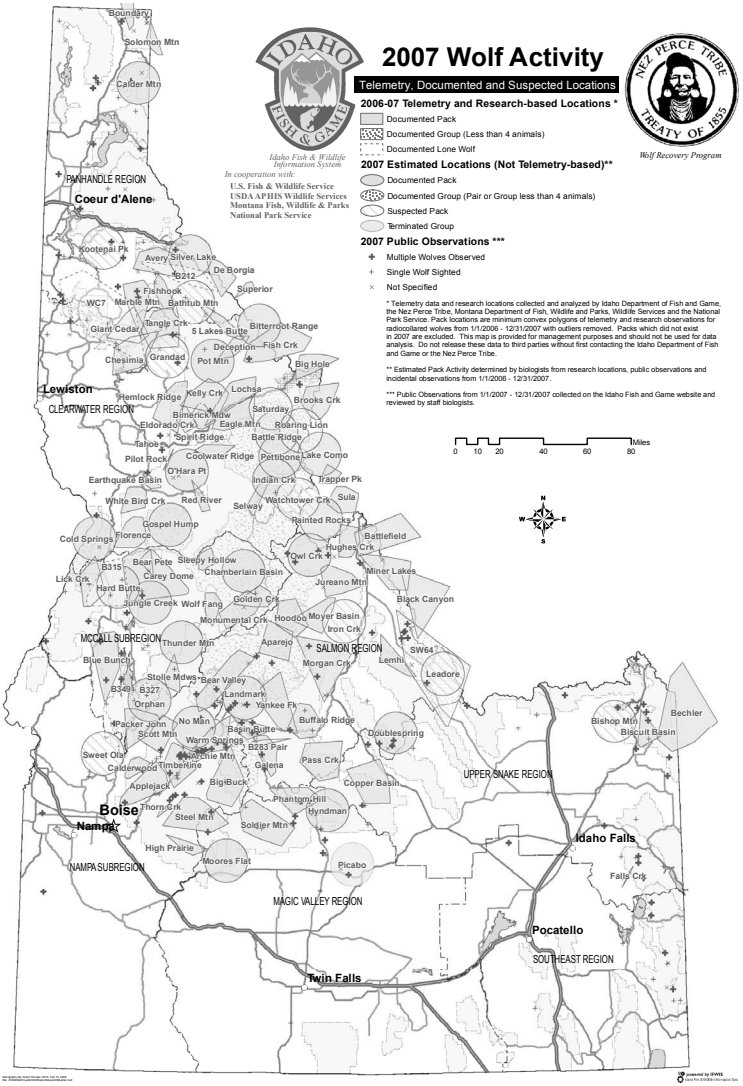
Department of Agriculture Wildlife Services though the Animal and Plant Health Inspection Service bureau (APHIS-WS), which investigated 2007 depredation claims by ranchers for livestock claimed to have been killed by wolf attacks (USFWS 2008, 239). Defenders of Wildlife will continue to provide compensation for livestock killed by wolves (MFWP 2004, 72; Defenders of Wildlife 2008a).

Central Idaho Experimental Population Area

The Central Idaho Experimental Population Area (CID) consists of two government jurisdictions, the State of Idaho and the Nez Perce Native American Nation. None of the original thirty-five wolves introduced from Canada in 1995 and 1996 survived, but the population has continued to increase from the original wolves' progeny. Today, the minimum population estimate of Idaho wolves is 732. Fifty-nine packs have been recorded, including forty-three that qualify as breeding pairs. The packs had an esti-

Figure 6:

Distribution of Documented and Suspected Wolf Packs, Other Documented Groups, and Public Wolf Reports in Idaho, 2007



Source: Nadeau et al. 2008, 10.

mated 200 pups in the summer of 2007 (Nadeau et al. 2008, ii).

The Idaho legislature initially rejected its 1995 draft plan and forbade the Idaho Department of Fish and Game (IDFG) from negotiating with USFWS. In March 2002, however, the state legislature accepted the Idaho Wolf Conservation and Management Plan. USFWS approved the Idaho recovery plan as "adequate" (Mack 2004, 19).

In 2006, the U.S. Secretary of the Interior and Idaho's governor signed an agreement that transferred most wolf management responsibilities to the state. The Nez Perce Native American Nation and Idaho also formed an agreement regarding management of the wolf population, specifying that the Clearwater region and McCall sub-region would fall within the jurisdiction of the Nez Perce Nation (IDFG 2008).

The northern portion of the Idaho panhandle, as seen in Figure 1, is treated differently than the nonessential experimental population of wolves in the rest of the state, but the agreement with USFWS also transferred management of the portion of the panhandle north of Interstate 90 to the State of Idaho. The wolves are treated as endangered and protected under the ESA in this area because of the court decisions discussed earlier.

Idaho Recovery Plan

Idaho's wolf conservation plan focuses on education as one of its main management objectives. The education component emphasizes wolf biology, management, and conservation, and presents a balanced view of the societal impacts and costs of wolf reintroduction (IDFG 2002). The program's minimum breeding pair population is fifteen wolf packs, similar to Montana's plan and USFWS's requested minimum. If the number of breeding pairs drops below fifteen, measures will be taken to quickly reverse the decline to prevent the gray wolf's return to the endangered species list. The Idaho plan takes proactive steps to ensure the safety of both wild and domestic ungulate prey populations by lethally removing wolves involved in depredation. Upon delisting the wolves from the endangered species list and transferring wolf management to Idaho, the wolf will be classified as either a "big game animal," "furbearer," or a special classification

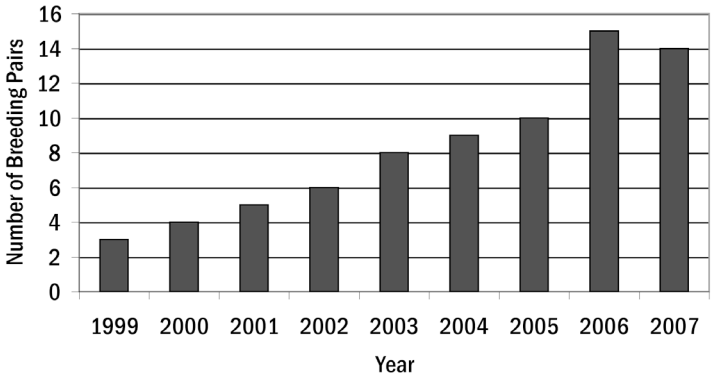
of predator that provides for controlled take after delisting (IDFG 2002, 7). Eventually, when stable populations are reached, the Idaho plan will allow legal taking of wolves to help regulate wolf populations and to manage prey animal populations.

The Idaho plan remains effective because it prioritizes protection of the gray wolf. USFWS appeared less enthusiastic about the Idaho approach, as compared to Montana's plan, but concluded that Idaho sincerely sought to protect its wolf population (USFWS 2007, 105–107). The Idaho approach aggressively protects domestic ungulate populations by using lethal strategies instead of non-lethal options. However, if the number of breeding pairs falls below the required minimum of fifteen, the state will take steps, such as removing nuisance wolves by trapping, to reverse the decline and will halt all lethal removal of wolves in the state (IDFG 2002, 31).

Idaho's plan has federal support, but the Montana plan has garnered significantly stronger approval. Although, USFWS approved the Idaho plan, it termed the plan merely "adequate" for the conservation of wolves (Mack 2004, 19). Likewise, local support for the Idaho plan is not as pronounced as the support found in Montana. The Idaho Legislative Wolf Oversight Committee consisted of only seven members. Idaho's Committee included members of the state legislature and representatives from several state agencies, but was not as diverse as that in Montana. Some local support for the plan derives from the inclusion of a predator-prey program. In 2007, 73 cattle, 185 sheep, and 14 domestic dogs were killed by wolves. The protections afforded to both livestock and wolves in the Idaho plan will help reduce opposition and unite support behind the recovery plan, though overall approval still may not reach Montana's level of public support for its program.

Similar to all the other plans, the fiscal feasibility for the entire program was $2,995,000 for FY 2007. Of this federal allocation, Idaho received $1,015,000, and $387,000 from the U.S. Department of Agriculture's APHIS-WS, which investigated 2007 depredation claims by ranchers for livestock claimed to have been killed by wolf attacks (USFWS 2008, 238). Defenders of Wildlife (2008b) have contributed to compensation for livestock killed by wolves.

Figure 7:
Number of Breeding Wolf Pairs in Wyoming Residing Outside Yellowstone National Park, 1999–2007



Source: Author's calculations from U.S. Fish and Wildlife Service annual wolf reports.

Wyoming: Greater Yellowstone Experimental Population Area

Between 2006 and 2007, the wolf population in the Wyoming Greater Yellowstone Experimental Population Area (GYA) increased by 15 percent (Jimenez et al. 2008, 15), but none of the original thirty-one wolves introduced into the Yellowstone area from Canada in 1995 and 1996 survives today. A 2007 report estimated the wolf population at 359 (15). Wolf recovery occurs primarily in the northwest portion of Wyoming. USFWS reported a total of thirty-four packs, twenty-four of which have been classified as breeding pairs—two less breeding pairs than in 2006 (USFWS 2008, 209).

Wyoming witnessed a drop in the population of wolves in 2005 due primarily to disease. Researchers also reported indications of social strife between competing packs. Although there was no evidence of disease outbreak in 2006, social strife continued. Pup survival rates were only 32 percent in 2005, but rates increased to 80 percent in 2006 within the Yellowstone National Park (Jimenez et al. 2007, 178–180).

Reports suggest that reduced availability of prey negatively affected wolf survival in 2005. Elk, the primary prey of wolves, constituted 95 percent of the animals killed by wolves during the winters between 1999 and 2006, and constituted 85 percent of killings in the spring, summer, and autumn of those years (Jimenez et al. 2007, 189). Since 1995 the park's elk populations have declined by 50 percent. Some studies show that the decline in the elk population began many years before the reintroduction of the gray wolf and that the Yellowstone National Park elk herd was approaching ecological carrying capacity before the reintroduction of the gray wolf in the spring of 1995, resulting in a natural population decline (Jimenez et al. 2007, 189; Singer et al. 1997, 20–22). Further studies are pending.

The Wyoming Recovery Plan

Under the Wyoming plan, the state was to maintain fifteen breeding pairs (ten at a minimum), seven of which would be located outside the state's national parks and the Wind River Native American Nation, but within protected zones called Wolf Management Units (WMUs). A designated WMU would surround known wolf packs and encompass seasonal movements of current packs (WFG 2007, 10). Wolf packs within national parks and the Wind River Native American Nation would be under the jurisdiction of USFWS since Wyoming Fish and Game (WFG) does not have jurisdiction in Yellowstone National Park and Native American territories.

Wolves would be designated "trophy animals" within a WMU in the northwestern portion of the state. Once sufficient levels are reached, regulated hunting and trapping seasons would be initiated and an education program would be used to inform the public about wolf issues. Wolves that leave the WMUs would be designated "predators" and lose all protections under Wyoming statutes even if sustainable populations have not been reached within the WMUs (WFG 2007, 10). Compensation to ranchers for domestic ungulate depredation would apply only to livestock losses within a WMU. Property owners and ranchers would be allowed to take wolves that harm livestock and private property, and the public must notify the WFG within ten business days if a wolf is taken outside the WMU. Agency employees may kill nuisance wolves and take them for studies. The

number of breeding pairs outside national parks would be kept near seven to keep the plan manageable and limit negative economic effects. The Wyoming plan proposes to change the definition of breeding pair to "maintenance of a certain number of individuals," a number to be determined at a later date (12).

USFWS had concerns with the legitimacy and efficacy of this plan and rejected it in 2003 (USFWS 2007, 8). It reasoned that Wyoming's proposal to protect only seven packs was insufficient and worried that Wyoming would initiate controls only if the total state population dropped below ten breeding pairs. USFWS also disapproved of the new definition of "breeding pairs" because the plan's terminology failed to protect wolves outside WMUs. Furthermore, Wyoming classified wolves residing in national parks and forests as "trophy game" and termed those residing outside these areas as "predators." This labeling was not satisfactory to USFWS which rejected the proposal because the federal agency worried that the classification would result in a decrease of wolf populations. The delisting of wolves will not occur until Wyoming and USFWS agree on the labels placed on certain populations of wolves. Achieving any agreement will partly depend on developing a wolf recovery program that will be acceptable to Wyoming's stakeholders.

On February 8, 2007, the Department of Interior's USFWS published the following in the *Federal Register*:

> Wyoming State law and its wolf management plan are not sufficient to conserve Wyoming's portion of a recovered [Northern Rocky Mountain (NRM)] wolf population at this time. Therefore, if Wyoming fails to modify its management regime to adequately conserve wolves, we will keep a significant portion of the range in the Wyoming portion of the NRM [distinct population segment] because there are not adequate regulatory mechanisms in that area. In this situation, wolves in the significant portion of the range in northwestern Wyoming, outside the National Parks, will retain their nonessential experimental status under section 10(j)

of the [ESA] (Department of Interior 2007, 6016).

At the federal level, re-adoption of this plan is not politically feasible, but at the state level, political support for the original plan is high. A growing number of Wyoming residents want state control of the wolf protection program and are willing to negotiate the terms of the plan with USFWS. The original state plan did face some opposition at the state level because it did not utilize a public advisory commission; the state legislature had directed the WFG to develop the recovery plan with little public input. Recently, a wide variety of interest groups have sought implementation of a workable plan with state control. Ranchers, hunters, and conservationists would like to see a system in place to mitigate human-wolf conflicts. Confirmed livestock depredations included fifty-five cattle, sixteen sheep, and three domestic dogs in 2007 (Jimenez et al. 2008, 5). A system to compensate all livestock depredations outside of WMU and protect wolf populations likely will generate more political support.

Fiscal feasibility of readopting the plan mirrors the two other options in this study. The FY 2007 budget for all three states was $2,995,000 of which $240,000 supported USFWS operations in Wyoming, with $167,000 allocated to the National Park Service for its wolf-protection programs within Yellowstone National Park and Grand Teton National Park. APHIS-WS spent $222,000 in 2007 investigating wolf depredations (USFWS 2008, 239). Defenders of Wildlife (2008b) has provided compensation for livestock killed by wolves. In addition, in 2002 Wyoming proposed a Northern Rocky Mountain Grizzly Bear and Gray Wolf Management Trust to be funded by a one-time federal appropriation from Congress. This trust fund has been endorsed by the Wyoming and Montana state legislatures (WFG 2007, 30).

Challenges of the Status Quo

Wyoming could maintain the status quo by not adopting a wolf management plan. The result would be a continued federal program administered by USFWS with no formal input from the state on any decisions regarding wolf management, depredation issues, funding levels, or political participation. Furthermore, because no plan would be presented to USFWS, gray

wolves would continue to be listed as endangered or nonessential experimental populations and receive protection under the ESA. This alternative would allow the wolf population to continue increasing until its ecological carrying capacity is reached.

The status quo approach would be politically feasible at the national level because of positive public attitudes regarding federal management of wolf populations, support from USFWS, and Democratic control of Congress. At the local level, however, desire for a state-controlled plan—rather than a federal plan—is likely to increase as Wyoming residents, ranchers, and hunters demand that wolves be delisted. Additionally, the current federal program does not consider predator-prey interactions. Hunters and trappers are concerned about the decline in elk and other ungulate populations. Likewise, ranchers are concerned about livestock killed by wolves. Many Wyoming citizens will want a predator-prey component included in the management of wolves in the state, but the status quo does not offer such an option.

The cost to federal taxpayers will be approximately $2,995,000 for each year in which wolves remain listed as endangered (USFWS 2007, 203). FY 2008 estimates are similar to FY 2007 actual outlays. These figures assume $2,036,000 per year in USFWS expenditures and $167,000 per year in National Park Service funding. In 2007, APHIS-WS spent $1,300,000 in the three states investigating wolf attacks to confirm livestock kills; however, the FY 2008 President's Budget to Congress contained only $300,000 for this purpose (USFWS 2008, 238). Defenders of Wildlife will continue to provide compensation for livestock killed by wolves using the Bailey Wildlife Foundation Wolf Compensation Trust (USFWS 2008, 238).

Recommendations for Wyoming's Wolves

Wyoming has an opportunity to implement a plan that will please numerous constituencies. These recommendations provide comfort to ranchers that their livelihood will not be in financial uncertainty; assure hunters and trappers that their hobby is protected; provide citizens with accurate information about gray wolves; and demonstrate to federal agencies and wildlife

activists that their wolf recovery efforts will not be in vain. Wyoming can combine the strengths of the Montana and Idaho plans in order to promote wolf recovery. Elements of both plans that are most relevant in Wyoming's case are condensed to form the following recommendations:

1. Develop a new wolf recovery plan using an eleven to fifteen member advisory panel consisting of a diverse group of stakeholders, such as ranchers, conservationists, wildlife biologists, hunters, and other citizens;
2. Continue protecting wolves by state regulation initially to ensure population levels are sustained according to federal regulations, and retain the USFWS definition of a breeding pair;
3. Institute a hunting and trapping program, and develop a wolf education program targeting the general public and specific groups such as hunters and ranchers;
4. Create buffer zones for ranchers to legally kill wolves without a hunting tag or threat of prosecution under state law, provided that wolf packs causing economic harm or safety concerns in an area may be eliminated by Wyoming Fish and Game or citizens but only once wolves are removed from the state's protected list; and,
5. Continue utilizing the Defenders of Wildlife compensation program to repay ranchers for livestock depredation losses and develop the Northern Rocky Mountain Grizzly Bear and Gray Wolf Management Trust Fund to remove funding allocations from the annual federal appropriation process.

Conclusion

Incorporation of elements from the Idaho and Montana plans offers Wyoming the best alternative to its original wolf recovery plan. Returning to the status quo is not an effective approach. Although the status quo assures wolf populations will continue to recover, continued conflict will occur between those who seek to protect wolves and ranchers, hunters, and trappers because livestock depredation is a chief concern of local stakeholders. The status quo does not offer the ability to effectively deal with domestic ungu-

late depredations, nor does it address the prey populations of wild ungulates. A state-run recovery program can and should include a predator-prey program. The Idaho and Montana plans include programs to study and maintain prey populations.

Wyoming cannot reinstitute its original recovery program. It must negotiate and compromise with more stakeholders, including USFWS. The process by which Wyoming developed its management plan did not include an adequate variety of stakeholders. Additionally, the original plan altered the definition of a breeding pair in a manner contrary to the management strategies of USFWS. To gain political support, Wyoming can learn from Montana's experience. The Montana recovery plan effectively brought all stakeholders to the table and negotiated a strategy that received support from all sides of the wolf recovery debate. The Idaho plan received limited support because many stakeholders were left out of the strategy-building process.

The Idaho and Montana plans both effectively institute taking programs. The ability to hunt and trap wolves is an essential part of an effective recovery plan because it generates political support and relieves the administrative burden that state agencies experience while maintaining wolf populations. Both Idaho and Montana provide protections to wolves until their populations are determined to be sustainable. Additionally, Montana uses politically acceptable language by referring to wolves as "species in need of management" rather than "endangered." Wolves should eventually be classified big game animals and treated like other large mammalian game, such as coyotes (*Canis lantos*), grizzly (*Ursus arctos*) and black (*Ursus americanus*) bears, and mountain lions (*Felis concolor*).

One issue raised by USFWS concerned the number of breeding pairs protected under the original Wyoming plan. Wyoming should consider protecting more than seven breeding pairs outside the national parks and would likely benefit by offering to protect ten breeding pairs. This effort will show USFWS that the state is serious about maintaining wolves in the GYE. The National Parks Service and Wind River Native American Nation can oversee and maintain the other ten breeding pairs in their respective jurisdictions. This way, the population of wolves is unlikely to drop

below the minimum level of fifteen breading pairs and may avoid being placed back on the endangered species list.

A comprehensive education program, similar to the proposals identified in the Idaho wolf recovery plan, are essential to an acceptable Wyoming proposal. To effectively manage the waning wolf population, educating stakeholders and citizens is essential. A thorough program should include information on the harm wolves may cause while lessening the damaging rumors associated with wolves. Furthermore, the education program can help inform ranchers about their rights when dealing with wolves, such as this article's proposal to allow a rancher to shoot a wolf when population levels are high and the animal comes within 300 yards of the rancher's herd or private land. Finally, the education program can be used to inform citizens about economic considerations concerning the wolf, such as losses due to depredation and gains from tourism.

Funding is not a serious problem for any of the proposals, nor is administrative feasibility. The federal government will continue to fund the state operations after delisting, and administrative tasks should remain similar to those under federal jurisdiction. Additional support will likely come from graduate students at local universities. Defenders of Wildlife or state initiatives will continue to reimburse ranchers for domestic ungulates killed by wolves, and the USFWS depredation confirmation program will continue to be maintained under any approach. Wyoming should follow up on a plan to create the Northern Rocky Mountain Grizzly Bear and Gray Wolf Management Trust Fund, a strength of the original Wyoming plan. Such a trust fund would help sustain funding by removing the necessity of allocations from the annual federal appropriations budget in an often politically charged process.

Wyoming has the opportunity to develop and institute a recovery program that will incorporate the considerations of all stakeholders and thus ensure that a well-rounded, all-encompassing proposal is submitted to USFWS. While the goals of the original plan were in line with the purposes of USFWS, the protections afforded to wolves were not sufficient for USFWS to consider Wyoming's efforts genuine. The five suggestions offered in this paper have proved successful through the acceptance of the Idaho

and Montana plans. Wyoming should adopt the recommendations because they would likely be approved by USFWS and, more importantly, specifically address the unique situation of Wyoming's wolf populations.

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