Gray Wolf Restoration in the Northwestern United States

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Abstract

Gray wolf (Canis lupus) *populations were eliminated from Montana, Idaho, and Wyoming, as well as adjacent southwestern Canada by the 1930s. After human-caused mortality of wolves in southwestern Canada began to be regulated in the 1960s, populations began expanding southward. Dispersing individuals occasionally reached the northern Rocky Mountains of the United States, but lacked legal protection there until 1974, after passage of the Endangered Species Act of 1973. In 1986, wolves from Canada successfully raised a litter of pups in Glacier National Park, Montana, and a small population was soon established. In 1995 and 1996, wolves from*

western Canada were reintroduced to remote public lands in central Idaho and Yellowstone National Park. These wolves were designated as nonessential experimental populations to increase management flexibility and address local and state concerns. Wolf restoration is rapidly occurring in Montana, Idaho, and Wyoming, and there were at least 28 breeding pairs in December 2000. There are now about 63 adult wolves in northwestern Montana, 192 in central Idaho, and 177 in the Greater Yellowstone area. Dispersal of wolves between Canada, Montana, Idaho, and Wyoming has been documented. Occasional lone wolves may disperse into adjacent states, but population establishment outside of Montana, Idaho, and Wyoming is probably not imminent. The gray wolf population in the northwestern U.S. should be recovered and, depending on the completion of state and tribal wolf conservation plans, could be proposed to be removed from Act protection within three years. Wolf restoration has proceeded more quickly and with more benefits, such as public viewing than predicted. Problems, including confirmed livestock depredations, have been lower than estimated. The Service led interagency recovery program focuses its efforts on achieving wolf recovery while addressing the concerns of people who live near wolves. Wolves have restored an important ecological process to several large wild areas in the northern Rocky Mountains of the U.S. The program has been widely publicized and is generally viewed as highly successful.

Wolves in northwestern Montana

Sixty years after being nearly exterminated from the lower 48 states, the gray wolf *(Canis lupus)* was listed under the Endangered Species Act (ESA) in 1974 and was eventually restored to Montana, Idaho, and Wyoming. Wolves were once common throughout North America but were deliberately exterminated in the lower 48 states (except northeastern Minnesota). Wolves remained abundant in much of Canada and Alaska. Recovery began in northwestern (NW) Montana in the late 1970s by natural dispersal from nearby expanding Canadian wolf populations (Pletscher et al. 1997). Wolves first denned in NW Montana in Glacier National Park in 1986 (Ream et al. 1989). Wolf numbers steadily increased until 1996, when there were a minimum of 70 wolves in seven different packs that lived solely in NW Montana. An unusually severe winter in 1996-97 caused a 30 to 50% decline in the white-tailed deer (*Odocoileus virginanus*) populations, the primary prey of those wolves. The number of wolves dropped to just over 50 in five packs in 1997, largely as a result of agency wolf control actions in response to high livestock depredations and subsequent poor pup production (Bangs et al. 1998). Wolf numbers have only slightly increased since 1997. In 2000, there were an estimated 63 wolves in about a dozen groups, but only six of those successfully reproduced. Most wolves in NW Montana live in a mix of private and public land west of the Continental Divide.

Wolf reintroduction in Yellowstone National Park and central Idaho

In 1988 and 1990, Congress directed the National Park Service to prepare a series of reports on the potential effects of reintroducing wolves to Yellowstone National Park (YNP 1990). Wolf depredation on livestock, wolf predation on wildlife, land-use restrictions, tourism, other predators including grizzly bears (*Ursus arctos*), diseases, and a wide variety of other issues were evaluated. In 1990, Congress established a Wolf Management Committee, consisting of federal, state, and private special interest groups to try to forge a political compromise on the issue of wolf reintroduction in both Yellowstone and central Idaho. Their report was completed in May 1991, but Congress chose not to act on the Committee's recommendation, which included wolf reintroduction and more flexible wolf management than was normally allowed under the ESA. All these reports, and all subsequent investigations, made it clear that reintroducing wolves in Yellowstone National Park and central Idaho was feasible and would ultimately result in wolves attempting to recolonize areas throughout Montana, Idaho, and Wyoming and far outside the reintroduction areas.

In late 1991, Congress directed the Fish and Wildlife Service (FWS) to lead preparation of an environmental impact statement (EIS) to examine the effect of reintroducing wolves to Yellowstone National Park and central Idaho (FWS 1994). The planning and public involvement effort took two years to complete. By the time it was finished the Service had distributed over 750,000 documents, conducted over 130 public meetings and hearings, and reviewed 170,000 public comments. The decision was to reintroduce wolves to both Yellowstone and central Idaho as nonessential experimental populations, the most flexible classification

for species listed under the ESA. The decision was approved in spring 1994 by both the Secretary of the Interior (FWS, National Park Service and Bureau of Land Management) and the Secretary of Agriculture (Wildlife Services and Forest Service).

The EIS predicted that a recovered wolf population (a minimum of 10 breeding pairs, estimated to be about 100 adult-sized wolves) in the Yellowstone area would kill an average of 19 cattle (*Bos* sp.), 68 sheep (*Ovis aries*), and up to 1,200 ungulates (primarily elk) annually. This would not affect hunter harvest of male ungulates, but could reduce hunter harvest of female elk (*Cervus elaphus*), deer (*Odocoileus* sp.), and moose (*Alces alces*) in some herds. Hunter harvests or populations of bighorn sheep (*Ovis Canadensis*), mountain goats (*Oreamnos americanus*), or antelope (*Antilopra americana*) would not be affected. Bison (*Bison bison*) would not be preferred prey. Wolf predation may reduce populations of elk five to 30%, deer three to 19%, moose seven percent, and bison up to 15%. The presence of wolves would not change uses of public or private land except for potential use of M-44 cyanide devices, used to control coyote (*Canis latrans*) damage, in areas occupied by wolves. Visitor use was predicted to increase five to 10%. At wolf recovery, annual economic losses were estimated to be $187,000 to $465,000 in hunter benefits (what hunters said hunting female elk was worth to them), $207,000 to $414,000 in potential reduced hunter expenditures (what hunters of female elk said they would have spent hunting), and $1,888 to $30,470 in potential livestock losses. Annual increased visitor expenditures were estimated at $23 million and the existence value of wolves was estimated at $8.3 million (what people believed having wolves in the Yellowstone area was worth to them). Similar predictions were made for the central Idaho area. Depending upon their distribution, more than 100 adult-sized wolves would proportionally increase impacts above those predicted in the EIS. To date, at least the trends in these predictions appear to have been fairly accurate. It will take time before wolf numbers and distribution stabilize and the true effect of having wolves back in these areas can be ascertained.

The restoration of wolves to public lands in the western United States, particularly Yellowstone National Park, was proposed as early as the 1940s. After years of direct involvement by Congress and exhaustive public involvement and planning, 35 wolves were reintroduced via hard (immediate) release to wilderness areas in central Idaho, and 31 were soft released in Yellowstone National Park, Wyoming in January 1995 and January 1996 (Fritts et al. 1997; Bangs et al. 1998). Those wolves, originally from Canada, were designated as nonessential experimental populations to increase management flexibility over what is normally allowable for species listed under the ESA. Examples of this flexibility are: landowners could harass wolves at any time; livestock producers could shoot wolves seen attacking livestock; wolves could be relocated if they significantly impacted wild ungulate herds (as defined in approved state wolf management plans); there would be virtually no land-use restrictions; the Service could use special permits to take wolves for various management reasons; and funding was offered for state and tribal leadership in wolf recovery actions (Bangs and Fritts 1996). Currently wolves in Wyoming and Montana are primarily managed by the FWS, National Park Service (in Parks), and USDA Wildlife Services. In Idaho, wolves are primarily managed by the Nez Perce Tribe and Wildlife Services, under a cooperative agreement with the FWS.

Reintroduced wolves adapted better than predicted and only two years of reintroduction were required rather than the three to five years that were predicted (Fritts et al. 1997). In December 2000, the population estimate was 177 wolves in 13 breeding groups in the Yellowstone area and 192 wolves in 9 breeding groups in Idaho. To date, wolves have settled primarily on remote public lands, but that will change as the population expands and more wolves disperse beyond where wolf packs currently exist. Dispersing wolves will increasingly try to occupy private lands used for livestock production; this will increase the rate of livestock depredations and agency control. Except for a few temporary closures to protect wolf viewing opportunities around active dens in Yellowstone National Park, and restricting some M-44 use, the wolf restoration program has caused no land-use restrictions that might disrupt traditional human activities such as logging, mining, livestock grazing, hunting, trapping, or wildland recreation. Over 70,000 visitors to Yellowstone National Park have seen wolves and public interest in them is extremely high.

Wolf research

Between 1979 and the late 1990s, extensive research on wolves in NW Montana was supported by a host of state and federal resource management agencies. Field work and data analysis were carried out largely by graduate students and the University of Montana. Those studies investigated the relationships between wolves and other wildlife, including white-tailed deer, elk, and moose, other predators such as mountain lions (*Felis concolor*) and coyotes, and livestock (Kunkel and Pletscher 1999; Kunkel et al. 1999; Kunkel

1997). This research indicated wolves were just another predator on wild ungulates, neither much less nor much more effective than other native predators, such as mountain lions, black (*Ursus americanus*) and grizzly bears, or coyotes. Wild predators, including wolves, typically killed more of the most vulnerable of ungulates (injured, sick, or very young and very old individuals) than did human hunters. Wolf predation in combination with other factors such as winter weather, human hunting, other predators, and habitat conditions, contributed to a decline in white-tailed deer and elk in the North Fork of the Flathead River. Moose populations apparently were not as affected by these same circumstances. As a result of that prey decline, wolf numbers in that area dramatically declined, from nearly 30 wolves in three packs during the most intensive research in the early 1990s to a few individuals that did not produce pups in 1999 or 2000. Wolves often trailed mountain lions to take over their kills and killed a few lions. Direct competition for the types of ungulates that are most vulnerable to predation was likely the main impact that wolves would have on lions. Wolves also killed a few coyotes. While wolves displaced lions and coyotes from ungulate carcasses, wolf kills were often usurped by grizzly bears. Studies of wolf genetics and dispersal indicated that genetic diversity was high and likely not a management concern, as long as opportunity for occasional dispersal from wolf populations in Canada and other U.S. recovery areas in Idaho and Wyoming was maintained (Boyd and Pletscher 1999).

Research indicated that although wolves often lived near livestock (primarily cattle) and other domestic animals, conflicts were uncommon. Dogs, almost exclusively hunting hounds and livestock guard and herding dogs, were apparently killed as competitors rather than prey. Wolves commonly fed on carrion of both livestock (carcass dumps) and wild ungulates (road and train kills, unretrieved hunter-killed game, and gut piles). In some instances, abundance of natural prey and relative vulnerability of livestock affected how often wolves attempted to attack livestock. Sick or wounded livestock or small livestock, such as calves or sheep, appeared particularly vulnerable to wolf predation. But often, wolves appeared to attack livestock without any predisposing factors and nearly all wolf packs with regular exposure to livestock sporadically caused depredations.

A large number of studies and research are currently being conducted on wolves in the Yellowstone and central Idaho experimental areas so that accurate information can be used to better manage wolf populations and expand the level of knowledge about wolves. Wolf predation studies indicated elk were more than 90% of the prey killed by wolves in Yellowstone. Kill rates were about 15 elk per wolf per year. In Idaho, wolves also preyed mainly on elk, but wolves there killed a higher proportion of mule deer (*Odocoileus hemionus*). Wolf kills were more likely to be in open habitats and the remains scattered, compared to mountain lion kills that were often covered and hidden in thick cover. This gave a visual impression that wolves killed more deer and elk than mountain lions, but a lion actually kills more ungulates per year than does a wolf. Annual wolf kill rates typically average about 20 adult deer or 12 adult female elk per year, while adult lion kill rates can be twice as high. Both wolves and lions tended to prey on the most vulnerable wild ungulates such as calves and very old females. Calf elk killed by lions in Idaho were in better condition than calf elk killed by wolves. Bison are difficult to kill and few wolves have learned to do so effectively (Smith et al. 2000). Somewhat surprisingly, to date no Bighorn Sheep have been confirmed killed by wolves in either area.

Carcasses of elk killed by wolves were utilized by a wide variety of other wildlife species and provided a year-long food source that would likely increase overall wildlife diversity. Coyote numbers in some areas may have been reduced by half because of wolves killing coyotes. Mountain lions and wolves tend to kill the same types of prey, but lions are usually confined to more rugged steep and vegetated terrain, while wolves preferred flatter terrain and made more use of open habitat. Grizzly bears often usurped wolf killed ungulates. Studies are investigating the effect of wolves on elk distribution on winter feeding grounds in Wyoming, but tentative results suggest little effect other than elk appear to be more wary and may prefer larger groups and more open habitat when wolves are present. Earlier studies in Montana indicated that wolves did not change ungulate distribution on natural winter ranges, but apparently caused ungulates to be more wary and to temporarily retreat to thicker cover when wolves were present.

A recent study funded and initiated by the Nez Perce Tribe and a host of federal agencies and local livestock producers found that confirmed livestock losses may be a fraction of actual losses under some circumstances. That study determined the cause of death and detection rate of 220 radio-tagged livestock calves of about 700 on large, very remote, and heavily forested USDA Forest Service grazing allotments. After two years, pneumonia killed the most marked calves, but wolf predation was the second leading cause of

death. Sample sizes were very small, but as many as 5.7 calves may have died from wolf predation for every one discovered by normal livestock herding practices. Wolves killed calves that were the lowest weight, least guarded by people, nearest to an active wolf den, and in the heaviest forest cover, suggesting that wolves tested and hunted cattle like wild prey and attacked the most vulnerable animals.

Livestock depredations

Since 1987, annual confirmed minimum livestock losses in NW Montana totaled 82 cattle, 68 sheep and seven dogs. As a result, 41 wolves were killed and 32 were moved. Depredations averaged 5.8 cattle, 4.8 sheep, and less than one dog annually. Agency control killed an average of three wolves per year. On average, less than six percent of the wolf population is annually affected by agency wolf control actions (Bangs et al. 1995). Minimum confirmed livestock losses have annually averaged about 3.6 cattle, 27.8 sheep, and 3.8 dogs in the Yellowstone area, and 9.2 cattle, 29.4 sheep, and 1.8 dogs in central Idaho. In addition, one newborn horse (*Equus* sp.) was killed in the Yellowstone area. In total there have been 146 cattle, 356 sheep and 35 dogs confirmed killed by wolves from 1987 until January 2001. Since 1987, the Service and USDA Wildlife Services have killed 41 wolves in NW Montana, 18 in central Idaho, and 26 in the Yellowstone area because of conflicts with livestock. The rate of confirmed wolf-caused livestock losses and the number of wolves that have been removed in agency control actions is one-third to one-half of the levels predicted in the EIS. Despite lower than expected losses and less wolf control than predicted, wolf depredations and control remain inordinately controversial. Even the most routine wolf depredation and control actions still result in major local news coverage. To the general public, this probably greatly exaggerates both the role of wolves as livestock predators and the level of agency control. Since 1987, livestock producers who experienced confirmed or highly probable wolf-caused losses in Montana, Idaho, and Wyoming have been compensated about $155,000 by a private compensation fund administered by the Defenders of Wildlife, who support wolf recovery and management efforts.

Minimizing livestock conflicts

The Service is evaluating a wide variety of alternative methods to prevent or reduce conflicts with livestock in addition to relocating or killing problem wolves. The experimental population rules and the recently proposed special rule for wolves listed as threatened would allow for harassment and killing of problem wolves. In cooperation with USDA Wildlife Services and private conservation organizations we have: used light and siren devices, including models triggered by the signals from individual radio-collared wolves; established barriers to wolves using guard animals, flagging and fencing; provided extra surveillance of livestock with herders or agency personnel; harassed and moved and/or provided supplemental food to wolves that established dens and rendezvous sites in livestock grazing pastures; initiated research using electronic dog training collars to teach wolves not to attack livestock; provided livestock producers radio telemetry receivers so they could closely monitor wolves near their livestock; and helped provide alternative pasture to reduce livestock and wolf encounters. We have permitted livestock producers to shoot wolves actually seen attacking livestock, and in a few chronic cases of depredation on private property, to shoot wolves on-sight. We have allowed landowners to non-injuriously harass wolves at any time. We have trained and then issued cracker shells and less-than-lethal munitions (12-gauge beanbag or rubber bullet shells) to private landowners so they could injuriously harass any wolves near their livestock or property.

Litigation

Several lawsuits were filed over the reintroduction program, by a wide variety of groups, including the Sierra Club Legal Defense Fund who supported and the American Farm Bureau Federation who opposed wolf restoration. The lawsuits were pooled into a single case that questioned whether the Service's use of an experimental population designation for reintroduced wolves illegally reduced protection of wolves that might naturally wander into the experimental areas. To date, no naturally dispersing wolves have been found in the Yellowstone area, but at least three wolves from NW Montana have dispersed into the central Idaho area. The Wyoming District Court eventually ruled against the Service's position in December 1998 and ordered all the reintroduced wolves removed, but stayed its own decision pending appeal. That case was then reviewed by the Tenth Circuit Court of Appeals in Denver, Colorado. Their ruling in January 2000 overturned the Wyoming lower court ruling. The Tenth Circuit endorsed and validated the legality of the Service's authority and the wolf reintroduction program. None of the losing parties appealed to the Supreme Court perhaps because several months earlier, in a closely related case that involved the illegal killing of an reintroduced wolf, the Ninth Circuit Court of Appeals in California had also ruled strongly in favor of the Service's authority and the Supreme Court had

refused to hear an appeal. The only unresolved litigation involves a Wyoming rancher who suffered several confirmed wolf-caused livestock and pet depredations, and suspects he had many other unconfirmed losses. He claims that the government reintroduction program resulted in an uncompensated "taking" of his private property and lifestyle. Other litigation on a wide variety of wolf management issues is almost certain because of the strong symbolism of wolves to various special interest groups and the public, both at the local and national level.

The Service-led interagency wolf recovery program focuses its efforts on achieving the wolf recovery goal while addressing the concerns of people who live near wolves. Over 85% of all known wolf mortalities are caused by people, and the majority of those are a result of agency wolf control actions (Bangs et al. 1998). The key to successfully completing wolf restoration efforts will depend on maintaining some connectivity between the few remaining areas of large wild habitat remaining in the western U.S. and tolerance of wolves by the local rural residents (Fritts and Carbyn 1995).

Wolf recovery

Wolf populations should be fully recovered (30 breeding pairs with equitable distribution throughout the three recovery areas for three successive years) and will no longer need protection under the ESA by 2003. As a result of dispersal by wolves from Canada and the combination of reintroduction from two areas in Canada, genetics should not be a factor in wolf population viability as long as some connectivity is maintained (Boyd and Pletscher 1999). Once the recovery goal is achieved, wolves could be proposed to be delisted. After extensive public and professional review of the Service's delisting proposal, including assurance that state wolf management plans would conserve wolves above recovery levels, the affected states and tribes could manage wolves without federal oversight, except for the five-year post recovery monitoring period that is required by the ESA. State and tribal management programs will likely allow wolves to be killed in defense of life and property and in regulated public harvest programs, just as other large predators in these states are managed. Ultimately, wolf numbers (above minimum recovery levels) and wolf pack distribution will be determined by state and tribal wildlife management agencies. Once recovery goals have been achieved, delisting and a return to sole state and tribal management will signal the final success of the ESA at recovering the once imperiled gray wolf in the northern Rocky Mountains of the U.S.

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