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ABSTRACT: By 1930, wolves were extirpated from the western United States for livestock protection. In 1973, the Endangered Species Act protected wolves, and by 1980, wolf recolonization began in Montana. Confirmed livestock losses have been 17 cattle and 12 sheep with 16 wolves controlled as part of a program to enhance the recovery of non-offending wolves. ADC has: 1) controlled problem wolves, 2) improved communication with affected publics and governmental agencies, and 3) enhanced wolf recovery in Montana.

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"Isn't it a pity the old boy can't change his ways so as to be more tolerated by man? But, on the other hand, if he did so, he just would not be a wolf." (Young 1970, p. 305). This simple statement captures the essence of the relationship between man and wolves. We describe a program designed to manage problem gray wolves *(Canus lupus)* in a naturally recovering wolf population in the northwestern United States. While wolf management and control is controversial, it is necessary to alleviate conflicts and reduce the indiscriminate killing of wolves. (Fritts et al. 1992, Gunson 1983, Tompa 1983, Dorrance 1982).

HISTORY

Gray wolves inhabited the northern Rocky Mountains prior to 1870 (Curnow 1969). After bison *(Bison bison),* elk *(Cervus canadensis),* deer *(Odocoileus spp.),* and other wild ungulates were decimated by unregulated hunting and human settlement, wolves and other predators threatened the expanding livestock industry. By 1930, predator control programs had eliminated wolves from most of their range in the lower 48 states, including Montana and southern portions of the Canadian provinces (Young and Goldman 1944, Curnow 1969).

Wolf populations, however, persisted in northern Canada and Alaska. Because remnant wolf populations in Minnesota were small and at risk of disappearing, the U. S. Fish and Wildlife Service (FWS) listed wolves as endangered under the Endangered Species Act of 1973 (ESA). Wolves are now also afforded protection by Montana (1973) and Idaho (1977) state laws. One of the purposes of the ESA is to provide a program for the conservation and recovery of listed species. The Act further declares that "all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purpose of the Act."

Scientific management of wolves, changes in public attitudes, and increases in ungulate populations have allowed for wolf population growth. Naturally dispersing wolves have reestablished a population of 65 individuals in northwestern Montana (Ream et al. 1991). Wolves have also been occasionally reported in central Idaho, North Dakota, and Yellowstone National Park (YNP).

POLICY AND OBJECTIVES

Management of wolves is directed by the Northern Rocky Mountain Wolf Recovery Plan (Recovery Plan) (FWS 1987). The plan recommends that wolves be managed by: 1) promoting natural dispersal from Canada into Montana and central Idaho, 2) reintroducing wolves into YNP (designated as an experimental non-essential population), and 3) controlling wolves that prey on livestock. Depredations must be resolved if wolf recovery is to be tolerated by rural dwellers, many of whom are livestock producers (Bangs, et al. 1994, Fritts, et al. 1992, Gunson 1983, Tompa 1983, Dorrance 1982). In 1988, a wolf control policy was developed by the FWS and implemented jointly by Animal Damage Control (ADC) of the U.S. Department of Agriculture, Animal and Plant Health Inspection Service and the FWS (FWS 1988). The policy is designed to enhance wolf recovery by resolving wolf depredations on livestock.

In October 1990, Congress appropriated funds to the FWS to resolve complaints of wolf depredations on livestock and to initiate a conservation program for wolves. ADC and the FWS entered into an Interagency Agreement whereby ADC assists the FWS in controlling wolf depredations on livestock on private and public lands in the northern Rocky Mountain region. The program is conducted in close cooperation with other federal, state, and tribal agencies in Montana, Wyoming, Idaho, North Dakota, and Washington.

In April 1991, ADC established a Wolf Management Specialist position (WMS) in Helena, Montana. The ADC WMS works closely with the FWS when control actions are required and also implements a wolf control educational program. The WMS also represents ADC on interagency teams working on wolf recovery issues in the western U.S.

The legal basis for controlling wolves is found in Section 10 of the ESA, where the Secretary of the Interior is permitted to allow particular actions. It is hypothesized that controlling depredating wolves as part

of a comprehensive conservation program will enhance the survival of the majority of wolves which do not prey on livestock.

Controlling problem wolves is an essential part of every wolf management program in North America (Fritts et al. 1992, Gunson 1983, Tompa 1983, Dorrance 1982). Wolf control in Minnesota has been tested in court and found to be an acceptable wildlife management practice (Fritts 1982). The legality of wolf control in the northern Rocky Mountains has not been tested in court. However, it has the approval of the FWS and Secretary of the Interior, and is modeled after the Minnesota program.

One objective of the comprehensive wolf conservation program is to expeditiously resolve wolf/livestock conflicts. Livestock producers are encouraged to report wolf activity before problems are suspected so wolves can be radio instrumented. This is part of a monitoring program to assist in detecting livestock losses and capturing problem wolves. These steps in conjunction with conflict resolution, education, and information are used to improve local tolerance of wolves (Bangs 1991, Pomerantz and Blanchard 1992).

PROCEDURES

Investigation and control of livestock damage in Montana is the responsibility of ADC. When livestock are suspected of being killed by wolves, a thorough investigation is initiated. The investigation includes field necropsy of livestock remains to determine if wounds are consistent with wolf predation and field searches for evidence of recent wolf activity. (Roy and Dorrance 1976).

Additional factors are also considered when livestock depredation has been verified to determine whether control will be conducted. These include: 1) whether the livestock is lawfully present if on public lands, 2) an examination of livestock husbandry practices (e.g., livestock carcasses must be removed to discourage livestock/wolf encounters), and 3) whether depredations have occurred within a designated wolf recovery area or in habitat critical to wolves. Non-compliance with any of these factors may delay or negate control of wolves.

Control activity within a proposed wolf recovery area is selective for individual problem wolves rather than local populations. Wolves involved in livestock depredations outside of recovery areas are removed as promptly as possible. The presence of dependent wolf pups can affect control decisions. Control activities may be delayed until at least August 1 to ensure survival of the pups.

Two methods are used to capture wolves: trapping or tranquilizer gun. When trapping wolves, a McBride #7 double long-spring steel trap* equipped with 8 to 10 feet of twist link chain attached to a two-prong, heavy duty drag has proven effective. The trap jaws are offset and have teeth to reduce injury. After capture, wolves are immobilized with Ketamine* (ketamine hydrochloride) administered with a jab stick.

The second method utilizes a helicopter and Cap Chur gun* (Palmer Chemical Co., Douglasville, Georgia). This, combined with radio telemetry, has proven particularly effective in capturing wolves (Ballard et al. 1982, Ballard et al. 1991). Wolves are located by radio tracking previously marked pack members. An aerial marksman in the helicopter fires darts containing Telazol* (tiletamine hydrochloride and zolazepam hydrochloride) at a target wolf. Immobilization normally occurs in 6 to 10 minutes.

Immobilized wolves are delivered to FWS personnel to be weighed, measured, aged, and sexed; and blood samples are taken. Wolves are then radio collared and ear-tagged prior to release. Depredating wolves have been relocated to Glacier National Park by the FWS. Second-time offenders are considered problem wolves and are removed from the population by either euthanasia or captivity. Five wolves have been captured using the helicopter darting technique.

In instances where all live capture efforts have failed and wolf depredations continue, as a last resort lethal control has been applied (FWS 1988). The 1988 Wolf Control Plan provides guidance when situations arise where lethal control is warranted. The lethal control of five wolves that occurred prior to 1988 was primarily because the Wolf Control Plan was incomplete.

RESULTS

Since 1987, 16 wolves have been controlled in Montana. Seven wolves were relocated, three placed in permanent captivity, two released at the capture site, and six were killed. Of the seven wolves that were relocated, two pups died of starvation, one adult was euthanized, one yearling was recaptured and placed in captivity due to continued livestock predation, and one adult and two yearlings were illegally killed. Only a single wolf has been killed since the implementation of the 1988 Wolf Control Plan. This occurred in part because of harassment activities by a radical environmental group during a live capture effort.

Forty-four suspected wolf depredations were reported to the WMS in 1991-92 in Montana. Four of these actually involved wolves. Livestock inventories in areas with known wolf populations in Montana are about 215,000 cattle and about 33,500 head of sheep (Montana Agricultural Statistics, 1992). Since 1987, 17 cattle and 12 sheep have been verified as being killed by wolves in Montana.

Defenders of Wildlife, a private organization, provides compensation payments to livestock producers when the WMS can verify that stock was killed or probably killed by wolves (Fisher 1989). Compensation is based on estimated market value of the livestock.

Since 1987, $12,000 in compensation has been provided to Montana ranchers for verified losses. This included two tons of hay for supplemental feeding for steers moved from pasture land to avoid further wolf predation. Evidence indicated that the adult wolves were caring for about three week-old pups in the area where the steers had originally been pastured.

PUBLIC OPINION

A major facet of wolf management is dealing with public perception and opinion. Many livestock producers believe that wolves are unnecessary predators. Wolves

*Reference to commercial products does not constitute endorsement by the U.S. Government.

are perceived to be more likely to prey upon livestock and big game animals than other predators (Bangs, et al. 1994). Cattlemen and sheepmen fear the wolf; some sportsmen are worried about impacts on big game herds; and some rural dwellers are concerned about the safety of their children and pets. Legendary livestock-killing wolves were difficult to capture and were perceived to be an economic hardship. Others believe that the endangered species status of wolves will ultimately close large tracts of land to other uses (e.g., logging, mining, hunting, and other recreation).

In contrast, public opinion polls indicate that a majority of Americans, even those in Idaho, Montana, and Wyoming, want wolf populations to recover (Bath 1992). Organizations are campaigning for the wolf through advertisements, letter campaigns, posters, T-shirts, and educational trunks containing materials directed to children. The accuracy of this information varies widely. Defenders of Wildlife raised over $100,000 in private donations to provide compensation to livestock producers who have suffered losses verified by the WMS (Fisher 1989). The public generally acknowledges that livestock-killing wolves must be controlled. Some environmental groups, however, believe that depredating wolves are a cost livestock producers should pay for doing business.

Wolves are also a major subject in the news media. Wolf events are "front page" news in Montana and many other places in the United States. Wolves were voted among the top ten news stories in Montana in 1992 by the Associated Press.

CONCLUSION

Responsible wolf control protects rural interests and promotes public tolerance and protection for wolves. As ADC gained experience in controlling wolves, efficiency has increased and costs for control have decreased. It appears that wolf recovery and management of wolf/livestock depredations have become less emotional since the establishment of an ADC WMS. Communication with livestock producers seem less polarized. Real issues are surfacing, and trust levels among ranchers and environmentalists with public resource agencies continue to improve.

Wolves are recovering in the northern Rocky Mountains. Their reappearance is raising philosophical questions, and the ultimate destiny of wolves will depend on our ability to reach a balance between diverse attitudes and values. A statement by Young (1970, pp. 307-308) is particularly insightful.

> "Hated, reviled, and feared, hunted, trapped and poisoned down through the centuries, always with a bounty on its head, to the extent of millions of dollars, as a symbol of the devil, and finally, as the progenitor of the domestic dog-man's best friend—no other carnivore rivals the wolf in the profound effect exerted on human affairs. May the wolf never cease to have a place in our North America fauna—a condition that, I am sure, can be made possible inview of the vast domain yet remaining in North and Middle America where it roams at will andwhere its presence is not in conflict with human welfare. In other regions of scant population it may be tolerated in reasonably controlled numbers. To that end, I have through the years given every support."

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