



Management and Conservation Article

Considerations for Developing Wolf Harvesting Regulations in the Contiguous United States

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ABSTRACT As gray wolves (*Canis lupus*) are removed from the federal Endangered Species List, management reverts to the states. Eventually most states will probably allow public wolf harvesting. Open seasons between about 1 November and 1 March accord more with basic wolf biology than during other times. Managers who consider wolf biology and public sensitivities, adapt public-taking regulations accordingly, and adjust harvest regulations as they learn will be best able to maximize the recreational value of wolf harvesting, minimize public animosity toward it, and meet their harvest objectives.

KEY WORDS *Canis lupus*, conservation, endangered species, harvest, hunting, management, wolf.

Gray wolves (*Canis lupus*) that have been on the United States Endangered Species List (ESL) since 1967 and protected by the Endangered Species Act of 1973 have recovered in the western Great Lakes Area (GLA) and the Northern Rocky Mountains (NRM). Gray wolves have been removed from the ESL twice and then relisted based on litigation involving technical legal issues. Meanwhile, their populations continue to increase and have well exceeded biological recovery criteria. Estimates of wolf populations in the GLA are about 4,000 (Beyer et al. 2009, Erb and DonCarlos 2009, Wydeven et al. 2009) and in the NRM $\geq 1,700$ (U.S. Fish and Wildlife Service et al. 2010), far exceeding biological recovery criteria, so final delisting within a few years seems probable.

Thus, wolves in several states will be governed by state regulations. Six states with viable wolf populations (MN, WI, MI, MT, WY, ID) now have detailed wolf management plans, all of which envision public harvest sooner or later. In addition, Oregon and Washington now have breeding wolf populations, and single wolves have recently been found in Utah, Colorado, North Dakota, and South Dakota.

In 2009 Idaho and Montana began public hunting of wolves during a period when wolves there were delisted while a legal challenge to delisting was pending. Both states instituted several wolf-hunting zones with different quotas and seasons in each. Montana harbored ≥ 500 wolves in December 2008 and set a harvest quota of 75. In Montana, backcountry zones were open from 15 September through 29 November, the general season spanned 25 October through 29 November, and the winter season was to extend from 1 through 31 December if quotas were not yet met. However, 72 wolves were taken by 16 November and the season was closed (Montana Fish, Wildlife & Parks 2010). Idaho, with ≥ 850 wolves in December 2008 and $\geq 1,000$ estimated in December 2009, set a quota of 220 wolves plus 35 for tribal lands (Idaho Fish and Game 2010). The Idaho season ran from 1 September to 31 December

and was extended to 31 March when only about half the quota was taken by mid-December. By season's end 188 wolves were harvested (U.S. Fish and Wildlife Service et al. 2010). In both states wolves could only be taken by general fair-chase rules. More than 15,000 hunters purchased wolf tags at US\$19 for residents and US\$350 for nonresidents in Montana, and $>26,000$ licenses were purchased in Idaho, where resident licenses cost US\$11.50 and nonresident US\$186 (U.S. Fish and Wildlife Service et al. 2010). The proportion of hunters who purchased tags deliberately to hunt wolves, versus those who bought tags so they could shoot a wolf while elk- (*Cervus elaphus*) or deer- (*Odocoileus* sp.) hunting, is unknown. Still, only those 2 states outside of Alaska have had even limited experience with regulated public taking of wolves.

With wolves recently on the ESL, much of the public finds it hard to believe, distasteful, or dismaying that wolves can now be harvested. Conversely, many ranchers, outfitters, guides, and sportsmen living with recovered wolf populations are relieved that they can now help control or legally harvest wolves. Therefore, public taking of wolves is more controversial than taking most other species and probably will remain so. This divided public opinion makes it especially important for states to give special thought to developing their wolf-harvesting regulations, which must involve fair-chase taking that is also effective.

A BRIEF REVIEW OF WOLF BIOLOGY

Most wolves live in packs with a mated pair of adults (breeders or formerly "alphas"; Mech 1999) and their offspring of the previous summer (pups), the summer before (yearlings), and sometimes 2-year-old offspring. Eventually most of these offspring mature, disperse, and become lone wolves until they find mates, settle into their own territory, produce pups, and start a pack of their own. Packs are nomadic within territories averaging 116–344 km² (Fuller et al. 2003) in the GLA and up to 1,400 km² (calculated from Nadeau et al. 2009) in the NRM from about November through March. From April through September or October members radiate out from a den where pups are raised for

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about 8 weeks and then from a series of rendezvous sites where pups stay and are fed and tended by adults. Pups grow and develop rapidly and by November, if well fed, may almost reach adult weight (Van Ballenberghe and Mech 1975, Mech 2008). Pups begin to grow their winter guard hairs in late August and September and possess their winter coats by late November. Adults start shedding their winter coats in April and grow new winter coats by November.

While nomadic, a wolf pack travels far and wide within its territory, hunting primarily ungulates. Wolves are basically crepuscular but are often active day or night (Packard 2003). They travel up to 72 km/day, averaging about 27 km/day in some areas (Mech and Boitani 2003), but when they make a kill, they may remain at or within a few kilometers of it for up to 3 days (Mech 1966). Wolf densities in the GLA range from 20 wolves to 67 wolves/1,000 km² (Fuller et al. 2003) and in the NRM about 12 wolves/1,000 km² (calculated from U.S. Fish and Wildlife Service et al. 2009). However, during their nomadic phase, pack density is more relevant to hunting than is individual wolf density because most members of a pack will then be in the same location. In the GLA, there are 4–9 packs/1,000 km² (Fuller et al. 2003) and in the NRM about 1.5 packs/1,000 km² of wolf range (calculated from U.S. Fish and Wildlife Service et al. 2009).

EFFECTIVENESS OF WOLF HARVEST

Given these biological realities, managers are faced with developing harvest regulations that satisfy 2 opposing main requirements: 1) that they are liberal enough to allow the public a reasonable chance of taking the desired number of wolves to meet harvest objectives, and 2) that they are conservative enough to maximize public acceptance. It is not clear which of these requirements will be more easily met.

Harvesting many wolves is not always easy, which is why in regions where they were not extirpated but have long been harvested, extraordinary methods have been used, although not all are necessarily used now. Such methods include aerial shooting (also currently employed for livestock depredation control by Wildlife Services in the NRM), tracking by snowmobile (Canada), and spotting from aircraft and then landing to shoot wolves (i.e., land and shoot) in Alaska. These approaches appear unfair to much of the public who are unaware of the difficulties of taking wolves and are bitterly opposed. Hunting wolves with fair-chase standards had never been tried in the contiguous 48 states until 2009. Such standards succeeded better than some expected in Montana and worse than some expected in Idaho. However, there is reason to believe that in most extensive forested areas with low road density fair-chase hunting deliberately for wolves will not be very productive given the low density of packs and the crepuscular and extensive travels of wolves. Chances are high that most wolves taken by fair chase will be shot incidental to big-game hunting, primarily because of many hunters afield during those seasons. Currently, such seasons end by December in most states that harbor sufficient wolves where public taking could open.

Deliberately seeking to shoot a wolf is even harder than going out to see one. Furthermore, after the novelty wears off in a few years there might be little incentive for hunters in most states to deliberately seek wolves. Wolf pelts, when prime (mid-Nov through Feb) and with no mange, may bring US\$100 to US\$300, and many hunters will consider 1 or 2 trophy wolf rugs for their wall as all they need. Given the low chance of success, hunting would not be lucrative for many even if each person were allowed to take several wolves. In Minnesota, when wolves could be killed year-round and were hunted, trapped, and snared for bounty, only about 200 wolves were taken annually (Leirfallom 1970). Alaska, with 7,000–11,000 wolves, harvests about 1,000 wolves/year (Titus 2009).

This leaves trapping with steel-foothold traps or snaring as possible wolf-harvest techniques. These techniques are used successfully in Alaska and much of Canada, as well as for wolf livestock-depredation control during summer and autumn in the GLA and the NRM. Trapping and snaring are also opposed by much of the public but have been accepted as control techniques by many wolf advocates who oppose aerial hunting, land and shoot, and snowmobile tracking. Nevertheless, such trapping is also very difficult, expensive, and time-consuming. Even during summer when trapping success rates are much higher than in winter, the Wildlife Services cost is about US\$1,400/wolf (Mech 1998). Within a few years after seasons are established, probably few people will have the motivation to trap, hunt, or snare many wolves, although many hunters may persist enough to each take a few.

Conceivably, hunters in some states might develop methods for taking wolves more efficiently. Possibly hunters of cougars (*Puma concolor*), black bears (*Ursus americanus*), coyotes (*Canis latrans*), or bobcats (*Lynx rufus*) who currently use dogs could also train dogs to track wolves. However, wolves kill and eat dogs (Fritts and Paul 1989), so probably few hunters would risk trying this method. Artificial howling or predator calling can attract wolves, and some hunters will succeed with this technique. Nevertheless, because wolf pack density is so low, much less success with this method can be expected than with predators whose density is many times higher. Prebaiting as is used with bears in Minnesota might work, but the large amount of meat necessary and the long wait during cold weather probably would discourage most hunters. (Bears are baited with readily available stale bakery products during September).

Because wolves were recently on the ESL, many still carry radiocollars, and at least some states will continue to use such collars to monitor their wolf population. States currently prohibit hunters and trappers from using tracking receivers for taking wolves because this technique would not be considered fair chase. Use of snowmobiles, all-terrain vehicles, and horseback to track down and shoot wolves might be useful in more open areas for short periods before wind obscures tracks in snow. Effectiveness of these techniques and the regulations governing their use probably will vary by state.

ACCEPTANCE OF WOLF HARVEST

Maximizing public acceptance of wolf harvesting will be hard no matter what taking techniques are used. Nevertheless there are some considerations that can reduce public opposition. The primary consideration is to open the season only after most pups have reached adult size and are no longer readily identifiable as pups, usually about November. Killing animals that are obviously pups will invite much revulsion, even by sportsmen. Referring to these grown pups as young-of-the-year would help, and not opening the season until November would minimize possible harvest of obvious pups.

Delaying wolf-harvest seasons until November also minimizes pelt-preservation problems and would have 2 other public-relations advantages. First, pelts would then be prime and, thus, worth more, pre-empting claims that wolves are being killed when their pelts are economically worthless. Second, wolves will have left rendezvous sites. Although wolves will be harder to hunt then, this approach would prevent a hunter who happens to find a rendezvous site from informing others who could then kill the entire pack, even if each hunter only had one tag or permit.

A similar consideration that can be made toward the end of any annual hunting or trapping season would be to end the season before fetuses in gravid females are obvious. In most northern states that would be by 1 March, which also coincides with when wolf fur has lost its prime. Allowing harvest through February, however, would assist with wolf control by increasing chances that gravid wolves would be taken.

Managers can maximize good use of wolves taken by any method through a concerted campaign to educate hunters about care and handling of harvested wolves. Experience during the 2009–2010 hunts in Montana and Idaho indicates that many hunters do not know how to skin wolves or care for their pelts (C. Niemeyer, retired taxidermist and Wildlife Services biologist, personal communication). Merely freezing wolf carcasses is unsatisfactory for several reasons; thus, states should provide instructions for skinning wolves and preserving their pelts.

Whereas the above considerations focus primarily on public perception of the humaneness of hunting, some of the public will judge the success of wolf hunting by its ability to decrease conflicts between wolves and ranching. Wolf-taking regulations should, therefore, attempt to focus wolf harvest on areas where wolves kill the most livestock. Reducing wolf density there could reduce conflict with humans and the need for costly deliberate wolf control while also gaining more public support. Similarly, where states perceive the need to reduce wolves to increase wild prey, concentrating public taking there could reduce the need for deliberate control by state agencies, which tends to be opposed by certain segments of the public. In this respect, it also will be important for states to consider establishing restricted zones around areas sensitive to the public such as national parks. In 2009 Montana acted quickly to close an open hunting zone north of Yellowstone after more wolves

in an adjacent wilderness were taken than in an adjacent settled area. This desire and ability by states to adapt as they learn will be especially important during the first few years of public harvesting. As experience accumulates, states can refine their regulations to maximize taking wolves where they conflict most with human interests and where and when public concern about wolf taking is least.

The Minnesota Wolf Management Plan contains a provision for private citizens to assist with livestock-depredation control. Private trappers would be certified to trap livestock-depredating wolves in a given area for a specified period and would be paid on a per-wolf basis. Animal-rights and animal-welfare groups have characterized such payments as bounties, implying that such a payment is abhorrent. However, the proposed payments per wolf are for specific wolves at a specific location at a given time and for a specific reason. Historically the objectionable aspects of bounties were that any individual of a given species could be taken anywhere (a certain state or county) at any time even though livestock depredation only occurs by specific wolves in specific locations at a given time. From an objective standpoint it is hard to fathom a moral or ethical distinction in killing a wolf by someone being paid by salary, per hour, or per wolf. Thus the per-wolf payment that Minnesota proposes is not a bounty in the historical sense. Conceivably more states will attempt to model wolf livestock-depredation control programs after those in Minnesota, so it will be important for such states to explain this distinction to the public.

MANAGEMENT IMPLICATIONS

In the long run, it is doubtful that more than a few resident sportsmen will attempt to take many wolves deliberately. After the novelty wears off and enough sportsmen have their trophy rug, there probably will be little motivation to pursue wolves, except by a few trappers. Thus, most wolves ultimately will probably be taken incidental to big-game hunting and by guided hunts for nonresidents seeking a trophy. Managers who consider basic wolf biology and public sensitivities and who adapt public wolf-taking regulations accordingly will be best able to maximize the recreational value of wolf harvesting, minimize public animosity toward it, and accomplish wolf population management objectives.

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