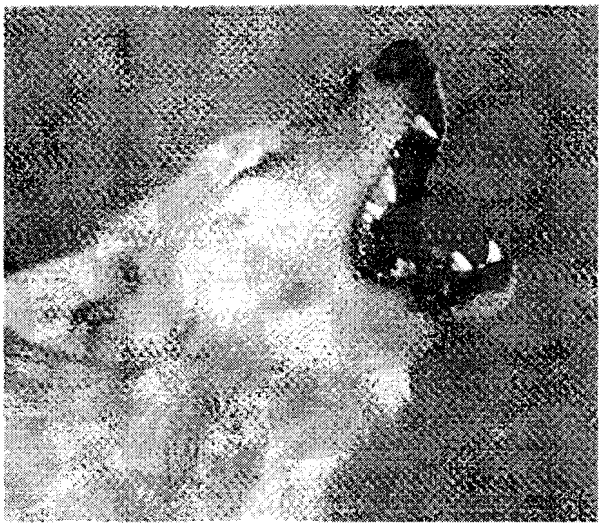

A new era for carnivore conservation

L. David Mech

Abstract Restoration has become an important technique in carnivore management. As the public becomes increasingly interested in carnivores, their management may become more contentious. Nevertheless, the value of this charismatic group of animals is high. Although carnivores will have to be controlled and regulated in some situations, wherever possible they should be nurtured. The greatest challenges to carnivore conservation are to control the human population and to preserve as many extensive natural areas as possible.

Key words bear, carnivore, cougar, fisher, marten, otter, reintroduction, restoration, wolf

As the first planeload of wolves (*Canis lupus*) to be reintroduced to Yellowstone National Park lifted off the runway at Hinton, Alberta, our entire crew shared a strong sense of elation at the momentous occasion. We had captured and handled each animal with great care and reverence, knowing that it bore the germ of a new wolf population that would someday inhabit most of the western wilderness.

These wolves also carried the aspirations of a new generation of people. Three generations before, humans had extirpated the wolves from Yellowstone (Fritts et al. 1995). Now we were making amends in an historic restoration project. As a carnivore, the wolf had incurred the wrath of a previous generation that set out to tame the wilderness. Although the animosity directed toward the wolf probably was more intense than that toward any other meat eater, no carnivorous creature from weasels (*Mustela* sp.) to grizzlies (*Ursus arctos horribilis*) was spared the persecution.

Today that mindset seems primitive, although it still persists. We now try to manage carnivore populations and distribution at socially acceptable levels. While the levels may not be as satisfactory to some members of our society as to others, it is generally a more satisfactory situation than when coyotes (*Canis latrans*) killed sheep by the thousands, and humans killed wolves in national parks. We learn as we go, and we learned as we went. Restoration of wolves to

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Yellowstone, albeit an historic event, is but one more adjustive stroke in improving and perfecting our carnivore management.

Wildlife managers have been restoring carnivores for many years. In some cases, e.g., the American marten (*Martes americana*) and fisher (*Martes pennanti*) in Minnesota, all it took was closed seasons. In others it took salvage trapping, captive breeding, and carefully managed reintroduction, as in the case of the red wolf (*Canis rufus*) in northeastern North Carolina (Phillips et al. 1995).

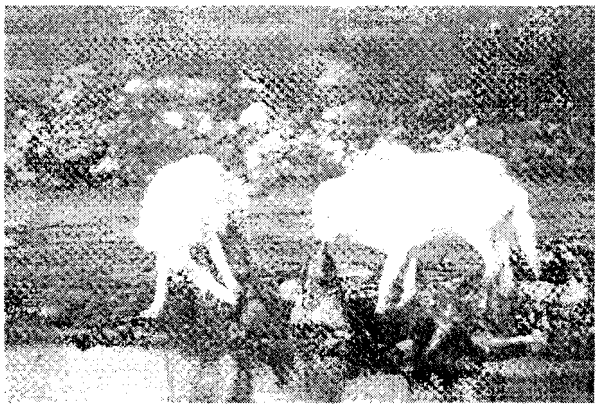
Why all this advocacy for creatures that kill our domestic livestock and occasionally even our children? What do we see in these animals, and what good are they? The first question is probably easier to answer than the second. People are intrigued by carnivores. We have a natural fascination with their extraordinary stealth, speed, and strength. Carnivore morphology tends to reflect these intriguing traits; the carnivores are generally sleek, lithe, and lanky. Except for felids, their noses and ears are pointed. Of course, they all have fangs, sharp teeth and pointed claws. Their growls, snarls, or screams are more intimidating than the softer grunts, bahs, and snorts of herbivores. Add to this the relative rarity of carnivores, and you have a recipe for the kind of creature people pay attention to.

The noted "bear jams" of Yellowstone (now augmented with "wolf jams") demonstrate this point. While bison (*Bison bison*), moose (*Alces alces*), deer (*Odocoileus* spp.), sheep (*Ovis* sp.) and other herbivores all draw their share of attention from wildlife-starved tourists, it is the bears (*Ursus* sp.) that commonly cause the longest traffic jams. Just think what kind of throng a cougar (*Puma concolor*) would generate standing along the side of a road.

Our natural fascination with carnivores is sufficient in itself to justify the lengths to which we are willing to go to save and restore them. Sometimes those lengths are long. Years ago when tigers (*Panthera tigris*) in India's Ranthambore Tiger Preserve were protected, the residents of several villages were displaced to other areas to make room for the tigers. Without these reserves, tigers would by now be extinct in India.

Another example of how much humans value carnivores comes from the International Wolf Center in Ely, Minnesota. This center is visited by about 50,000 people each year, boasts nearly 10,000 members, and has a new Internet web page (http://www.wolf.org) with more than 1 million hits. It produces a $3 million annual impact on the local economy and provides the equivalent of 66 full-time jobs, directly and indirectly (Schaller 1996).

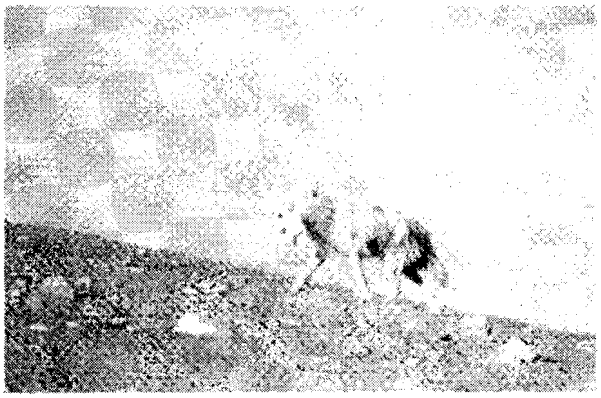
But what good are carnivores, besides just being fascinating to humans? That is a tougher question.



We could merely resort to the obvious, for example, and say that carnivores add to biodiversity. However that does not distinguish carnivores from any other biological group. Carnivores do play important and unique roles in the natural functioning of ecosystems. The uncertainty is not about whether they do, but how. Even though the wolf is probably the most-studied carnivore, we still debate the precise nature of its effects on its prey (Bergerud et al. 1983; Bergerud and Snider 1988 vs. Thompson and Peterson 1988; Van Ballenberghe 1985, 1989 and Eberhardt and Pitcher 1992 vs. Bergerud and Ballard 1988, 1989; Keith 1983 vs. Theberge 1990). And we are just beginning to understand other species in any detail (Ruggiero et al. 1994).

Nevertheless, does anyone doubt that without wolves in ecosystems, there would be more prey? The details being debated have to do with how much more prey there would be, the degree to which wolf predation compensates for other mortality, the role of other factors in affecting the wolf's impact on prey, and the degree, extent, or conditions under which wolves regulate their prey. It must be the same with other carnivores. The fact that they kill and eat other animals is one effect added to the sum of mortality factors impinging on a prey population. Except when they are purely scavenging, carnivores are reducing prey numbers.

A second major effect of carnivores involves the nature of the prey they take. This too is contentious, but again the contention is in the details. Is there anyone who questions that the deer's alertness and fleetness, the beaver's (*Castor canadensis*) dam-building expertise, or the musk oxen's (*Ovibos moschatus*) defense formation evolved in response to carnivores? Of course, these relationships took place over evolutionary time. Some well-meaning advocates of predators seem to believe that unless carnivores are immediately restored to all their habitats,



prey such as deer will readily revert to a cow-like state.

It is true that a high proportion, if not all, of the prey taken by wolves possess some trait that puts them at a disadvantage. This principle goes back to Darwin; we are still working out the details. Murie (1944) gave us the figures for wolves preying on Dall sheep (*Ovis dalli*), and Mech (1970) summarized similar information about other wolf-prey systems. Many factors that predispose prey to predation by wolves are obvious, such as old age, poor nutrition, injuries, parasites, diseases, and merely being newborn.

Nevertheless, I was convinced in 1970 (Mech 1970) and am even more convinced now that many traits predisposing prey to wolf predation are far more subtle and not easily measured by biologists. The "grandmother effect," in which the nutritional state of an individual's grandmother becomes a factor in its survival, is a good example (Mech et al. 1991).

Are wolves different from all other carnivores in preying primarily, or perhaps exclusively, on prey that are in some way predisposed to predation? Or is it simply that these relationships have been studied more thoroughly in wolf-prey systems than in other carnivore-prey systems? I believe the latter.

The subtleties of predator-prey systems are only beginning to emerge. Thirty years ago, who would have thought that prey animals not only detect the urine and feces of the carnivores that prey on them but specifically identify them (Muller-Schwarze 1972; Steinberg 1977; Sullivan 1986; Sullivan et al. 1990). Who would have thought that caribou (*Rangifer tarandus*) cows could assess wolf abundance and adjust their calving to minimize exposure to wolf predation (Adams et al. 1995)? Or that white-tailed does would change their fawn's bedding sites in response to coyote urine (Ozoga and Verme 1986)?

When we study other carnivore-prey systems as thoroughly as wolf-prey systems, we may well find similar types of interrelationships. Certainly Paul Errington's (1967) mink (*Mustela vison*) and muskrat (*Ondatra zibethicus*) studies would lead us to that conclusion. The very contest between carnivore and prey seems to imply that far more prey will escape than get caught and that usually the least fit individuals will succumb quickest to the jaws or claws of their predators.

Beneficial effects of this culling by carnivores, however, are not immediately obvious. If a moose herd preyed upon by wolves is younger than a herd that is not, so what? If a deer herd subject to wolf and bear predation includes fewer light-weight fawns (Kunkel and Mech 1995), what does this mean? Does it really make any difference? The answer, of course, is that we don't know.

Philosophically, one can argue that an ecosystem that includes its full complement of carnivores is more natural and therefore better. Certainly the nature of the energy flow and biogeochemical cycling in a carnivore-free ecosystem would be different from that in an ecosystem with its natural carnivore complement. The problem again is the time scale. Carnivores, like other orders of mammals, have exerted their influence in ecosystems in minuscule increments over millions of years. During our species' short lifespan, a few minuscule increments will hardly be missed, even if they could be measured.

But this is idle speculation. What if we are wrong? What if we were to lose our carnivores without ever finding out? Are there perhaps some diseases that would become more prevalent without predators? Would genetic abnormalities crop up? Would overpopulations of prey such as deer in suburbs, geese (*Anser* sp.) on golf courses, and beavers in the barnyard, which are now commonplace, become worse? Carnivores don't solve all these problems, but they help.

Thus, for various reasons we have been restoring carnivores such as fishers, martens, wolves, and otters (*Lontra canadensis*) to their natural habitats.

Some carnivore species, such as mountain lions, have been protected to the point that they are threatening hikers in a national park or people living in the suburbs. Still others, like the coyote, skunk (*Mephitis mephitis*), and raccoon (*Procyon lotor*), have adapted so well to human development, which often removed their competitors and enemies, that they are now, no doubt, more numerous than ever.

So, we are entering a new era in carnivore management. This era may be more contentious than in the past because when carnivores interfere with human activities, they aren't merely an aggravation like deer eating rosebushes; they eat pets and livestock. In some places, coyotes have even injured and almost killed young children (Carbyn 1989). In most cases, conflicts of people with carnivores represent a more serious and urgent problem to management agencies than other kinds of complaints. This may more than offset the creatures' charisma.

When these factors are added to the growing trend toward wildlife management by public referendum (Eisler and Buckley 1996), inequities and conflicts are inevitable. For example, the multitudes of voters in cities who are unaffected by any of the negative impacts of carnivores can simply outvote rural residents who bear the brunt of the damage. A recent referendum in California is a case in point. Because of recent attacks on humans, the restoration of public taking of cougars was proposed but was defeated.

It is ironic that this simple majority-rule type of wildlife management is basically the same approach that extirpated carnivores many years ago. Although there were no actual referendums at that time, there were bureaucrats acting contrary to scientific opinion but bending to the public will (Grinnell and Storer 1916, Dice 1925, Albright 1931).

The lesson to be learned is that public sentiment is fickle. If major carnivore management decisions are determined by public mood rather than by the knowledge of professionals, we could end up with California full of carnivores and North Dakota with none.

If society would not countenance bison herds running through wheat fields, should it allow bears in the suburbs? For everyone's sake, it seems better to keep carnivores under control in areas where they cause an unreasonable amount of interference with human activities, and conversely, to nurture and restore them in areas where they do not.

Of course, this implies that there will always be areas where carnivores can be nurtured. And that raises the 2 greatest challenges to carnivore conservation: (1) the need to control the human population, and (2) the need to preserve as much as we still can of the natural world.

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