

What good are wolves?

Compiled by Norman A. Bishop

In 1869, General Phil Sheridan said, “The only good Indians I ever saw were dead.” Others said, “The only good wolf is a dead wolf.”

Barry Lopez wrote of an American Pogrom, not only of Native Americans and wolves, but of the bison on which both depended. Between 1850 and 1890, 75 million bison were killed, mostly for their hides; perhaps one or two million wolves.

“Before about 1878, cattlemen were more worried about Indians killing their cattle than they were about wolves. As the land filled up with other ranchers, as water rights became an issue, and as the Indians were removed to reservations, however, the wolf became, as related in Barry Lopez’s book, *Of Wolves and Men*, ‘an object of pathological hatred.’” Lopez continues: “(T)he motive for wiping out wolves (as opposed to controlling them) proceeded from misunderstanding, from illusions of what constituted sport, from strident attachment to private property, from ignorance and irrational hatred.”

In 1884, Montana set a bounty on wolves; in the next three years, 10,261 wolves were bountied. “In 1887, the bounty was repealed by a legislature dominated by mining interests.”...“By 1893...desperate stockmen were reporting losses that were mathematical impossibilities. The effect of this exaggeration was contagious. The Montana sheep industry, which up to this time had lost more animals to bears and mountain lions than to wolves, began to blame its every downward economic trend on the wolf...Men in a speculative business like cattle ranching singled out one scapegoat for their financial losses.”

Not until wolves were functionally extinct from much of the West did anyone begin to ask, “What good are wolves?” to study wolves, and to report their beneficial effects on their prey species and on the ecosystems where they lived.

Adolph Murie realized that wolves selected weaker Dall sheep, “which may be of great importance to the sheep as a species.” His brother, Olaus J. Murie, thought predators may have an important influence during severe winters in reducing elk herds too large for their winter range. Douglas H. Pimlott pointed out that wolves control their own densities.

Yellowstone National Park wolf project leader Douglas W. Smith says that restoration of wolves there has added exponentially to our knowledge of how natural ecosystems work. It has also reminded us that predation is one of the dominant forces in all of nature, present in ecosystems worldwide over millions of years.

Bob Crabtree and Jennifer Sheldon note that predation by wolves is important to the integrity of the Yellowstone ecosystem, but we should realize that, before their return to Yellowstone’s northern range, 17 mountain lions there killed 611 elk per year, 60 grizzly bears killed 750 elk calves annually, and 400 coyotes killed between 1100 and 1400 elk per year.

P.J. White et al wrote that climate and human harvest account for most of the recent decline of the northern Yellowstone elk herd, coupled with the effects of five predators: wolves, grizzly bears, black bears, cougars, and coyotes. These are parts of a system unique in North America by its completeness.

Joel Berger et al demonstrated “a cascade of ecological events that were triggered by the local extinction of grizzly bears...and wolves from the southern greater Yellowstone ecosystem.” In about 75 years, moose in Grand Teton National Park erupted to five times the population outside the park, changed willow structure and density, and eliminated Neotropical birds: Gray Catbirds and MacGillivray’s Warblers.

Dan Tyers informs us that wolves haven’t eliminated moose from Yellowstone. Instead, burning of tens of thousands of acres of moose habitat in 1988 (mature forests with their subalpine fir) hit the moose population hard, and it won’t recover until the forests mature again.

Mark Hebblewhite and Doug Smith documented that wolves change species abundance, community composition, and physical structure of the vegetation, preventing overuse of woody plants like willow, and reducing severity of browsing on willows that provide nesting for songbirds. In Banff, songbird diversity and abundance were double in areas of high wolf densities, compared to that of areas with fewer wolves. Fewer browsers lead to more willows, providing habitat for beaver, a keystone species, which in turn create aquatic habitat for other plants and animals.

By reducing coyotes, which were consuming 85% of the production of mice in Lamar Valley, restored wolves divert more food to raptors, foxes, and weasels. By concentrating on killing vulnerable calf elk and very old female elk, wolves reduce competition for forage by post-breeding females, and enhance the nutrition of breeding-age females. Wolves promote biological diversity, affecting 20 vertebrate species, and feeding many scavengers (ravens, magpies, pine martens, wolverines, bald eagles, gray jays, golden eagles, three weasel species, mink, lynx, cougar, grizzly bear, chickadees, Clark’s nutcracker, masked shrew and great grey owl). In Yellowstone, grizzly bears prevailed at 85% of encounters over carcasses, and they usurp nearly every kill made by wolves in Pelican Valley from March to October. Some 445 species of beetle scavengers benefit from the largess of wolf-killed prey. In Banff and Yellowstone, no other predator feeds as many other species as do wolves. Wolf-killed elk carcasses enhance local levels of soil nutrients; adding 20-500% greater nitrogen, phosphorous and potassium.

Dan Stahler and his colleagues saw an average of four ravens on carcasses in Lamar Valley pre-wolf. Post-wolf, that increased to an average of 28, with as many as 135 seen on one carcass. Eagles seen on carcasses increased from an average of one per four carcasses to four per carcass.

P.J. White and Bob Garrott observed that, by lowering elk numbers, wolves may contribute to higher bison numbers; decreasing coyote populations result in higher pronghorn numbers. They also said wolves may ameliorate ungulate-caused landscape

simplification.

Daniel Fortin and others saw that wolves may cause elk to shift habitat, using less aspen, and favoring songbirds that nest in the aspen.

Christopher Wilmers and all tell us that hunting by humans does not benefit scavengers the way wolf kills do. Carrion from wolf kills is more dispersed spatially and temporally than that from hunter kills, resulting in three times the species diversity on wolf kills versus hunter kills. Wolves subsidize many scavengers by only partly consuming their prey; they increase the time over which carrion is available, and change the variability in scavenge from a late winter pulse (winterkill) to all winter. They decrease the variability in year-to-year and month to-month carrion availability.

Chris Wilmers and Wayne Getz write that wolves buffer the effects of climate change. In mild winters, fewer ungulates die of winterkill, causing loss of carrion for scavengers. Wolves mitigate late-winter reduction in carrion by killing ungulates all year.

Mid-sized predators can be destructive in the absence of large keystone predators. In the absence of wolves, pronghorn have been threatened with elimination by coyotes. Wolves have reduced coyotes, and promoted survival of pronghorn fawns. Pronghorn does actually choose the vicinity of wolf dens to give birth, because coyotes avoid those areas, according to Douglas W. Smith.

Mark Hebblewhite reviewed the effects of wolves on population dynamics of large-ungulate prey, other effects on mountain ecosystems, sensitivity of wolf-prey systems to top-down and bottom-up management, and how this may be constrained in national park settings. Then he discussed the implications of his research on ecosystem management and long-term ranges of variation in ungulate abundance. He cites literature that suggests that the long-term stable state under wolf recovery will be low migrant elk density in Western montane ecosystems, noting that wolves may be a keystone species, without which ungulate densities increase, vegetation communities become overbrowsed, moose and beaver decline, and biodiversity is reduced. But as elk decline, aspen and willow regeneration are enhanced. In this context, wolf predation should be viewed as a critical component of an ecosystem management approach across jurisdictions.

Chronic wasting disease (CWD) could wipe out our elk and deer. Tom Hobbs writes that increasing mortality rates in diseased populations can retard disease transmission and reduce disease prevalence. Reduced lifespan, in turn, can compress the time interval when animals are infectious, thereby reducing the number of infections produced per infected individual. Results from simulations suggest that predation by wolves has the potential to eliminate CWD from an infected elk population.

Wildlife veterinarian Mark R. Johnson writes that wolves scavenge carrion, such as aborted bison or elk calves. By eating them, they may reduce the spread of Brucellosis to other bison or elk.

Scott Creel and John Winnie, Jr. report that wolves also cause elk to congregate in smaller groups, potentially slowing the spread of diseases that thrive among dense populations of ungulates.

John Duffield and others report that restoration of wolves has cost about \$30 million, but has produced a \$35.5 million annual net benefit to greater Yellowstone area counties, based on increased visitation by wolf watchers. Some 325,000 park visitors saw wolves in 2005. In Lamar Valley alone, 174,252 visitors observed wolves from 2000 to 2009, where wolves were seen daily in summers for nine of those ten years.

Wolves cause us to examine our values and attitudes. Paul Errington wrote, "Of all the native biological constituents of a northern wilderness scene, I should say that the wolves present the greatest test of human wisdom and good intentions."

Aldo Leopold, father of game management in America, said, "Harmony with land is like harmony with a friend; you cannot cherish his right hand and chop off his left. That is to say, you cannot love game and hate predators; ... The land is one organism."

Leopold also pointed out that the first rule of intelligent tinkering with natural ecosystems was to keep all the pieces. Eliminating predators is counter to that advice.

Wolves remind us to consider what is ethically and esthetically right in dealing with natural systems. As Leopold wrote in his essay "The Land Ethic," "A land ethic ...does affirm (animals') right to continued existence...in a natural state." He concluded, "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."

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