

## POTENTIAL INTERACTIONS BETWEEN BLACK BEARS, GRIZZLY BEARS, AND GRAY WOLVES IN YELLOWSTONE NATIONAL PARK

With the reintroduction of gray wolves (*Canis lupus*) to Yellowstone National Park (YNP), much interest has been shown regarding the effects of a restored wolf population on both grizzly bears (*Ursus arctos horribilis*) and black bears (*Ursus americanus*). Grizzly bears, black bears, and gray wolves have historically coexisted in much of the same range throughout a large portion of North America (Brown 1993).

Most interactions between the three species involve food sources and are usually characterized by mutual avoidance (Servheen and Knight 1990). The behavior of bears and wolves during interactions with each other are dependent upon many variables such as age, sex and reproductive status, prey availability, hunger and aggressiveness, numbers of animals, and previous experience in interacting with the other species (Servheen and Knight 1990). Most serious interactions between the species occur around wolf dens (Peterson et al. 1984). A wolf pack in Alaska was observed keeping a sow brown bear with yearlings at bay and eventually driving them away from the den site. The same pack was also observed driving a large, male brown bear away from the den site (Mech 1981). These bears were attracted by a recent wolf kill and ventured too close to the wolf den. From 1966-1974, Haber (1987) recorded 36 wolf-brown bear interactions in wolf pack territories in Denali National Park. Of the 36 interactions, 19 took place at ungulate carcasses in which wolves "won" 9 of the 19. Seventeen of the interactions were not at carcasses. In those cases, wolves harassed the bears or tried to take cubs, and the bears retreated. Steve Fritts (U.S. Fish & Wildlife Service) collected 70 unpublished accounts of bear-wolf interactions (Servheen and Knight 1990). The results showed no negative trends for wolves or bears due to these interactions. Few instances of direct mortality to either species have been documented. Instances of wolves killing bears and bears killing wolves have been reported, but such events are rare and considered the exception. According to Mech (1981), wolves sometimes kill bears, but likely only young, old, or otherwise weakened bears. Paquet and Carbyn (1986) reported three cases of wolves digging up and killing cubs of hibernating black bears in Riding Mountain National Park in Manitoba, Canada but thought it was not a common occurrence as over 2000 wolf scats in the area did not contain any evidence of bear remains. Bears will also occasionally kill wolves as Joslin (1966), and Pimlott et al. (1969) reported in Ontario, Canada. In both instances, black bears were responsible for the deaths of individual wolves. According to Joslin (1966), a black bear killed a female wolf protecting her pups at a den site. In general, most reported interactions are stand-offs with serious confrontations taking place in defense of food or young.

Wolves prey on ungulates year-round while bears feed on ungulates primarily as winter-killed carcasses and ungulate calves in spring, and weakened or injured male ungulates during the fall rut (Mattson et al. 1991). Grasses, sedges, forbs, berries, nuts, and roots comprise a large portion of a bear's diet throughout the year. After den emergence, both black bears and grizzly bears scavenge winter-killed carcasses. The availability of fewer early-winter ungulate carcasses to bears in the spring, due to wolf populations, would be little change from the present situation (Weaver 1986). Most early-winter ungulate carcasses in YNP are already consumed by coyotes before bears emerge from their dens (Mattson and Knight 1992). Weaver (1986) suggested bears may actually benefit from wolves inhabiting the park. Wolves prey on ungulates year-round, and because bears readily displace wolves from their kills, bears may find more ungulate carcasses during a larger portion of the year. This would provide bears a more reliable source of useful nutrients from July through October. If a bear wants a wolf-kill, the wolves will try to defend it, but they usually fail to chase the bear away (Mech 1981). Murie (1981) witnessed single, adult bears usurping carcasses from as many as 5 wolves. In the Soviet Far East, there is no competition between bears and wolves due to the high biomass of prey species. There are more than 250 wild ungulates/1 wolf in the Soviet Far East (Servheen and Knight 1990). Yellowstone National Park also has an extremely high biomass of ungulates. With a restored population of 100 wolves, the wolf to ungulate ratio would be approximately 225 ungulates/1 wolf in the winter and 378 ungulates/1 wolf in the summer (Singer 1990a). At these high ungulate densities, we would predict that, similar to the Soviet Far East, bears and wolves would coexist with few problems (D. Smith, Natl. Park Serv., Pers. Commun.).

So far in YNP, 5 of 14 wolf-kills ground-checked by biologists have had evidence of grizzly bear activity (D. Smith, Natl. Park Serv., Pers. Commun.). A grizzly bear was observed the day after a wolf-kill was made and possibly moved the wolves away as they were no longer in the area. In another instance, three wolves (a-male, a-female, and yearling male) were bedded down 50 meters from a fresh wolf-kill while a grizzly bear fed on the carcass. The wolves had been feeding on the carcass prior to the bear's arrival but relinquished the kill to the bear. Bears have undoubtedly visited, and possibly made use of, other wolf-kills in YNP. In an instance not involving a carcass, a sow and two-2-year-old grizzly bears were observed chasing, and being chased by, five wolves and gradually caused the wolf pack to vacate their day beds and move about 250 yards away; the sow was grazing nearby while the 2-year-olds interacted with the wolves (S. Consolo Murphy, Natl. Park Serv., Pers. Commun.). Neither the bears nor the wolves were injured during the interaction. Some observers thought it was actually a playful interaction between the species. These examples of interactions between bears and wolves in YNP further support the theory that bears and wolves can coexist without adversely affecting each other (D. Smith, Natl. Park Serv., Pers. Commun.).

In summary, a restored gray wolf population in YNP would probably have little, if any, effect on the grizzly bear and black bear populations and vice-versa. With the exception of encounters near carcasses and wolf dens, most bear-wolf interactions could be classified as non-confrontational with no injuries occurring to either species involved. Observations to date suggest bears may actually be benefitting from the presence of wolves by usurping wolf-kills.

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