# GRIZZLY BEARS THAT KILL LIVESTOCK

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*Abstract:* Thirty-seven grizzly bears (*Ursus arctos*) equipped with radio transmitters were monitored in and around Yellowstone National Park between 1974 and 1979. Ten of the bears were known or suspected to kill livestock; 3 preyed on cattle, 6 on sheep, and 1 on both. Bears that killed livestock ranged widely in and out of Yellowstone Park and normally exhibited foraging habits similar to those of other bears. All subadult and adult bears known to have the opportunity killed sheep. Most bears that came into contact with cattle did not make kills. All known cattle killers were adult bears, while 4 sheep killers were subadults. Sheep grazing should be reduced as much as possible on grizzly range, and cattle grazing allowed only if owners are willing to absorb predation losses.

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Investigations of grizzly bear ecology in and around Yellowstone National Park were begun by an interagency team in 1973. The relationship between grizzly bears and livestock on national forests was investigated as a subproject during the years 1975–1979.

Information on grizzly bear–livestock relationships was scarce. Hubbard and Harris (1960) published a popular account of historical incidents. Sarber (unpubl. rep., Alaska Coop. Wildl. Res. Unit, 1939) investigated cases of bears preying on cattle and found that many cattle died of other causes. Eide (1965) concluded that brown bears were an effective predator on cattle on Kodiak Island. Murie (1948) documented cases of grizzly bear predation on cattle in the southern portion of our study area and expressed concern about the effects of a general predator control policy on the grizzly bear population.

Data on movements and home ranges of the Yellowstone grizzly showed that they are very mobile and range widely throughout Yellowstone National Park and surrounding forests (Craighead 1980, Knight et al., 1976 Annual Rep. Interagency Study Team, Yellowstone grizzly bear investigations, 1977, Blanchard and Knight 1980). If, as a result of this mobility, bears were killing livestock and in return being killed by stockmen, the entire population could be affected. This paper reports our findings on grizzly bear-livestock relationships.

The study area centered around Yellowstone National Park and included portions of Wyoming, Idaho, and Montana. Some of this area outside of the park was subjected to livestock grazing (Fig. 1). A complete description of the vegetation and physiography of the area was given by Knight et al. (1976 Annual Rep. Interagency Study Team, Yellowstone grizzly bear investigations, 1977). We wish to acknowledge the assistance of Mr. Ross Davis and Mr. William Enget, both sheepmen from St. Anthony, Idaho. Several sheepherders and cattle association riders contributed information and assistance, although sometimes unwittingly. Personnel of the Bridger Teton, Gallatin, Shoshone, and Targhee National Forests were cooperative and gave assistance when needed. Mr. Tom Toman, Wyoming Game and Fish Commission, was very cooperative as were all personnel from the State University, and Mr. Randall Hall, Supervisor, Shoshone National Forest, have reviewed the manuscript.

## METHODS

Grizzly bears were trapped in culvert traps or Aldrich foot snares. Bears were tranquilized and fitted with radio transmitters. Age was determined by removing and sectioning a rudimentary premolar (J.W. Lentfer et al., unpubl. rep., Alaska Fed. Aid Proj. W-15-R-W, 1967).

Bears were monitored from aircraft (Judd and Knight 1977) 3 times a week until the bears hibernated. Study area size, mountainous terrain, and and weather conditions sometimes resulted in losing track of some bears for periods of 1 week to 6 months. All relocation records included a description of major habitat features of the site to the extent that these could be recognized from the air. After a bear was located, 2-person crews were dispatched to examine individual sites and determine bear activity. These examinations

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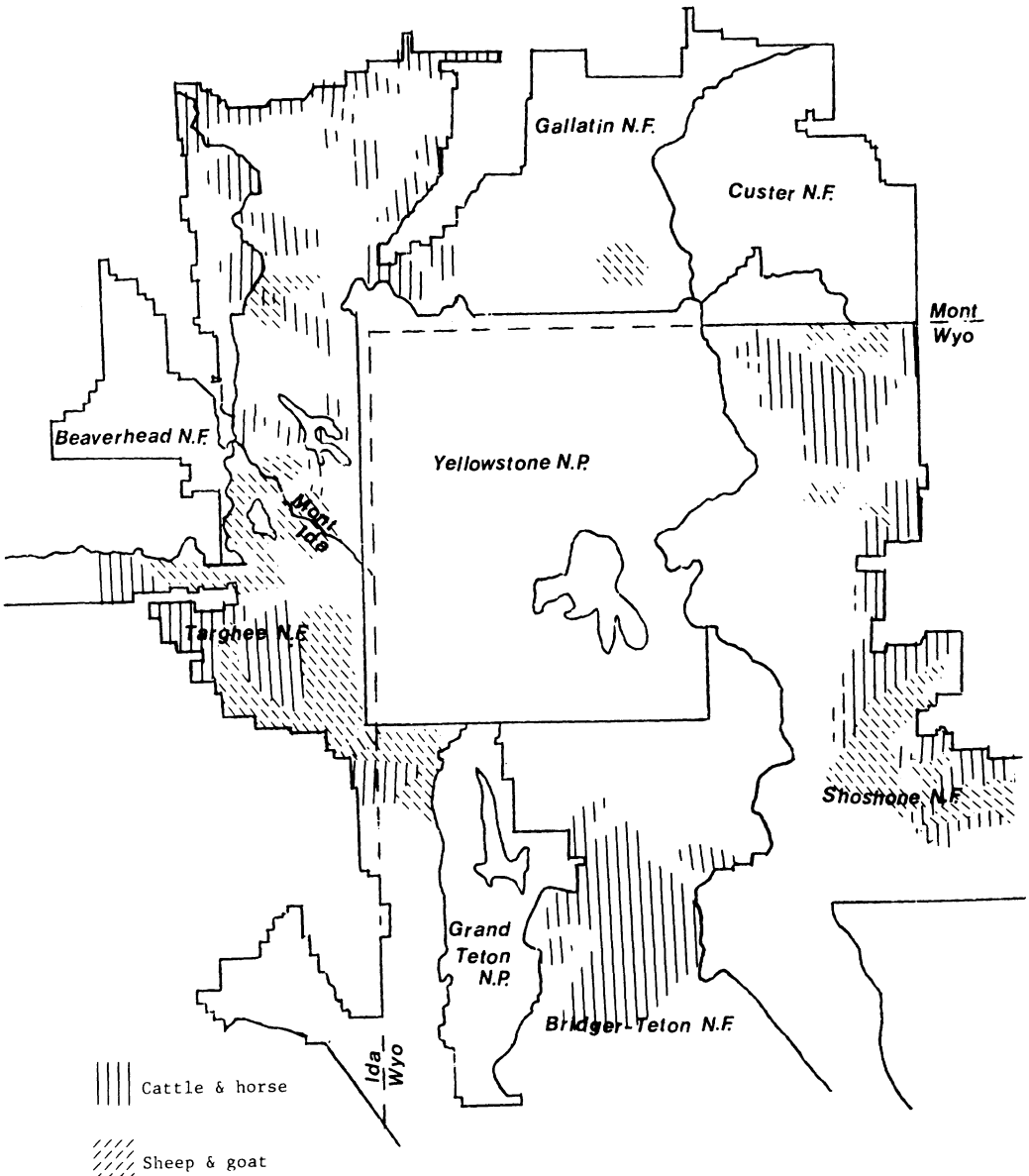


Fig. 1. Distribution of grazing allotments on forests adjacent to Yellowstone National Park.

also provided a basis for evaluating livestock depredations. The following criteria were used to determine if a bear killed the animal: (1) tooth and claw marks on the carcass when enough of the carcass remained to find them; (2) scattered distribution of blood of the dead animal in the area; and (3) loss of livestock when an instrumented bear was within a herd. Information was also taken from incidents involving bears that were not instrumented as opportunities arose.

Table 1. Number of instrumented grizzly bears trapped in Yellowstone National Park or surrounding National Forest (NF) lands and subsequently recorded on livestock grazing allotments or known to have killed livestock, 1974–79.

| Bears trapped and instrumented | | Number of instrumented bears recorded | | | |
|---|---|---|---|---|---|
| Locality | No. | On cattle allotments | On sheep allotments | Cattle killers | Sheep killers |
| Yellowstone Park | 9 | 0 | 0 | 0 | 0 |
| Gallatin NF | 14 | 7 | 1 | 1 | 1 |
| Shoshone NF | 6 | 6 | 1 | 3 | 1 |
| Targhee NF | 5 | 1 | 5 | 0 | 5 |
| Bridger–Teton NF | 3 | 3 | 0 | 0 | 0 |
| Total | 37 | 17 | 7 | 4 | 7 |

## RESULTS

### Movements of Bears

Between 1974 and 1979, 37 instrumented grizzly bears were followed during 1 or more grazing seasons. Nine of these were trapped in Yellowstone National Park and 28 on surrounding national forests (Table 1). The bears trapped in Yellowstone Park were not observed on livestock allotments. Of 28 bears trapped on national forests, 24 used grazing allotments and 10 killed livestock. Fourteen of these also spent part of the year in the Park and 9 denned there. The least overlap between bears and livestock occurred on the Gallatin National Forest where 8 of 14 bears occurred on livestock allotments and none killed livestock on the allotments. One bear trapped on the Gallatin National Forest killed cattle on the Shoshone National Forest, and another killed sheep on the Targhee National Forest. All bears trapped on the Shoshone, Targhee, and Bridger-Teton National Forests used livestock allotments. Thus, while bears may not occur or kill on livestock allotments in the locality where trapped, they may do so elsewhere. Livestock-killing bears used from 1 to 4 national forests or parks. Two bears that used only 1 national forest either died or had transmitter failures soon after tagging.

### Livestock Kills by Instrumented Bears

Of the 10 bears that killed livestock, 5 killed sheep, 3 killed cattle, 1 killed sheep and cattle, and 1 killed sheep and a horse. The 5 bears that killed sheep were trapped and instrumented as a direct result of depredations. In these cases the bears were trapped and released at the site with the agreement of State and Federal officials, and the reluctant agreement of the sheep owners. Bears that were released at the site where trapped were not found killing sheep again until the next grazing season. None of the cattle-killing bears were trapped as a result of depredations. Because sheep were closely watched by a herder, sheep depredation was more detectable than cattle depredation. Cattle were not herded but allowed to distribute themselves on the range, where they were checked only periodically.

The 4 bears that killed cattle were adults. Two that killed adult cattle were males, 7 and 13 years old, weighing 169 kg and 140 kg, respectively. Two females only known to kill calves were 7 and 8 years old, weighing 106 kg and 99 kg, respectively. Two noninstrumented bears killed north of Yellowstone Park by U.S. Fish and Wildlife Service personnel were both large adult males that killed yearling and adult cattle. Six instrumented bears ate cattle that died of other causes but did not molest live animals.

Instrumented bears that come into contact with sheep killed them. The only exception was a cub that was instrumented after his mother killed sheep but probably did not do so himself. He returned alone, as a yearling, to the sheep allotment where he had been trapped but to our knowledge did not kill sheep. The fate of his mother and 2 siblings was not known.

Bears that killed sheep were from 1 to 13 years old and weighed 114 to 187 kg. The 13-year-old was the only instrumented bear known to have killed both sheep and cattle. A 7-year-old male was snared after killing sheep but broke the snare before he could be instrumented. He was recaught in central Yellowstone Park the next summer, still wearing the snare.

Although all age classes of grizzly bears killed sheep, apparently a learning process was necessary to be successful. Young bears did not exhibit the caution of older bears and were probably killed more often. One yearling and a 2-year-old traveling together killed over 30 sheep in 1 night and were easily snared afterward. The older bears appeared to kill 1 or 2 sheep at a time around the fringes of the herd and probably had experience in avoiding herders.

We recorded 2 cases when bears killed horses. One noninstrumented female with cubs killed a free-ranging horse north of Yellowstone Park. One instrumented male was accused of killing a

horse that he had eaten. This horse may have died anyway since 8 days elapsed before the owner of the horse could find where it had been tied. One case was reported to us where a grizzly bear unsuccessfully attacked 2 tied horses.

There was no indication any bears were exclusively livestock killers. Bears that killed livestock ranged widely through a variety of habitat types. Their normal food habits and behavior patterns were similar to those of the other instrumented bears that we monitored. Killing livestock probably represented simply another foraging opportunity. Three cattle-killing bears that we monitored for 2 years did exhibit a pattern of returning to the same area at approximately the same time each year. One sheep killer exhibited the pattern of returning to the same area at the same time for 4 years.

### Bear Mortalities

From 1970 through 1975 there are records of 20 bears that were killed on sheep allotments and 2 on cattle allotments. In 1975 the grizzly bear was declared a threatened species. Because of penalties associated with killing a grizzly bear, no mortalities on sheep ranges have been reported to us since that time. Mortality information has come from instrumented bears and conversations with sheepherders. Two mortalities of bears that killed cattle have been reported from private land.

Two instrumented bears have been killed on sheep allotments since 1975. One was found shot 3 times after a nearby sheepherder had been shooting at bears in the dark; and the other was shot from the road while the sheep were being moved off the forest, although the sheepherder admitted that the bear was not molesting sheep at the time. A young female bear disappeared from a sheep allotment shortly after she was instrumented. We feel that she may have been killed because the type of transmitter she was wearing had a very low failure rate and because another bear that she had been traveling with moved safely off the grazing allotment. Based on information gathered by undercover agents and volunteered by sheep-herders, at least 3 other grizzly bears and possibly as many as 14 were killed in the past 2 years. These deaths could not be verified.

No known or suspected grizzly bear mortalities have occurred on public land as a result of cattle depredations since 1975. We knew of 2 unsuccessful attempts to kill or capture bears accused of killing cattle. One instrumented female was apparently fatally wounded while killing calves on private land, but by the time we recovered her carcass it had been mostly consumed by her yearling cubs and cause of death could not be verified.

## DISCUSSION

Grizzly bears and sheep are not compatible. Although sheep losses to grizzly bears are not as high as from other causes, they are large enough to represent an economic loss to the owners. Johnson and Griffel (1982) found that predation by grizzly bears accounted for 14.6% of sheep losses on the Targhee National Forest in 1976 and 1977. This was 0.5% of the 15,707 sheep on the grazing allotments. This does not seem very significant when losses due to herding practices were over twice as great.

Population consequences of bear mortality on grazing allotments are more serious. If our most optimistic population estimate of 350 bears is used with a conservative estimate of bear mortality on sheep allotments for the last 2 of 5 years, approximately 1.5% of the bear population has been lost during the last 2 years. If the most pessimistic population estimate (Craighead et al. 1974) of 84 or less is used, with the highest mortality estimate of 17, about 20% of the bear population has been lost over the last 2 years. The true figure probably lies between these 2 extremes and may be large enough to be significant to the maintenance of the Yellowstone grizzly population.

The number of bears killed on sheep allotments is unknown. Jorgenson (1979), referring to black and grizzly bear mortalities on sheep ranges south of Yellowstone Park stated, "Herders and permittees often shoot at bears without confirming their deaths." She reported that only 41% and 17% of known bear kills in 1976 and 1977, respectively, were reported through U.S. Fish and Wildlife Service Justification Reports.

Krott (1961) reported that bear populations in Italy had been reduced to very low levels because of poaching by shepherds. Roth (1976) estimated

a minimum of 8 bears in the same area and credited poaching as the primary factor causing the decline. Although poaching by sheepherders on the Yellowstone population is not likely to reduce the population to extinction, it is a significant mortality factor. We feel that any sheep allotments within 20 km of the Yellowstone Park boundary are a potential drain on the grizzly bear population and should be reduced as much as possible or eliminated altogether.

Cattle are less likely to cause conflict with grizzly bears than are sheep. They are killed less frequently, and many cattlemen do not kill bears if they are not threatening the cattle. Cattlemen often are not aware of the presence of a bear in the vicinity of their herd and may not be aware of cattle being killed. Thus, cattle allotments do not represent a serious threat to the grizzly bear. We believe that cattle allotments can be permitted in grizzly bear habitat if it is understood that the cattle owners are willing to absorb grizzly bear predation losses.

Bear-livestock conflicts have traditionally been resolved in favor of livestock. In view of the threatened status of the grizzly, it would seem appropriate to start resolving conflicts in its favor. In cases where bears do kill cattle and it is necessary to remove a troublesome individual, even from private land, they can sometimes be relocated to Yellowstone Park. This may be only a temporary solution since the individuals involved will probably soon return to their home range. However, as long as the grizzly bear remains a "threatened species," it seems advisable to give them every chance to survive.

## LITERATURE CITED

BLANCHARD, B.M., AND R.R. KNIGHT. 1980. Status of grizzly bears in the Yellowstone system. Trans. North Am. Wildl. and Nat. Resour. Conf. 45:263 – 267.

CRAIGHEAD, J.J. 1980. A proposed delineation of critical grizzly bear habitat in the Yellowstone Region. Bear Biol. Assoc. Monogr. 1. 20pp.

———, J.R. VARNEY, AND F.C. CRAIGHEAD, JR. 1974. A population analysis of the Yellowstone grizzly bears. Montana for. and Conserv. Exp. Stn. Bull. 40. Univ Montana, Missoula. 20pp.

EIDE, S. 1965. The nature of brown bear predation on cattle, Kodiak Island, Alaska. Proc. Conf. West. Assoc. Game and Fish Comm. 45:113 – 118.

HUBBARD, W.P., AND S. HARRIS. 1960. Notorious grizzly bears. Swallow Press, Inc., Chicago. 205pp.

JOHNSON, S.J., AND D. GRIFFEL. Sheep losses on grizzly bear range. J. Wildl. Manage. 46:786 – 790.

JORGENSON, C.. 1979. Bear – livestock interactions, Targhee National Forest. M.S. Thesis. Univ. Montana, Missoula. 162pp.

JUDD, S., AND R. KNIGHT. 1977. Determination and analysis of grizzly bear movement. Proc. Int. Conf. Wildl. Biotelem. 1:93 – 100.

KNIGHT, R., J. BASILE, K. GREER, S. JUDD, L. OLDENBURG, AND L. ROOP. 1977. Yellowstone grizzly bear investigations. Annual report of the Interagency Study Team, 1976. U.S. Dep. of Inter. Natl. Park Serv. Misc. Rep. 10. 75pp.

KROTT, V.P. 1961. Die auswirkungen der bejagung auf den Alpenbärenbestand. Sonderdruck aus Z. Jagdwiss. 7(3):89 – 93.

MURIE, A. 1948. Cattle on grizzly bear range. J. Wildl. Manage. 12:57 – 72.

ROTH, H.U. 1976. Status of the last brown bears of the Alps in the Trentino, Italy. Int. Cont. Bear Res. and Manage. 3:307 – 308.