

## SHORT COMMUNICATIONS

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### GOLDEN EAGLE PREDATION ON PRONGHORNS IN WYOMING'S GREAT DIVIDE BASIN

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From 1980–85, while studying pronghorn antelope in Wyoming's Great Divide Basin, we recorded seven incidents of golden eagles (*Aquila chrysaetos*) attacking pronghorns (*Antilocapra americana*). Most reported observations of golden eagle predation on pronghorns involve newborn fawns during spring and summer (Beale and Smith 1973, Barrett 1978, Beale 1978, Bodie 1978, Von Gunten 1978, Autenrieth 1980), but a few attacks have been recorded in winter (Lehti 1947, Thompson 1949, Bruns 1970, Goodwin 1978) when two adult males, one adult female and four fawns were killed. Herein, we provide further evidence for golden eagle predation on pronghorns, particularly during the winter.

The study was conducted in the Great Divide Basin, an area of shrubsteppe habitat located northwest of Rawlins, Wyoming. Golden eagles utilize the area preying on pronghorns, white-tailed jackrabbits (*Lepus townsendii*), desert cottontails (*Sylvilagus audubonii*) and sage grouse (*Centrocercus urophasianus*) (U.S. Dept. of Interior 1978).

We observed eagles in the study area throughout the year. Rabbits and sage grouse were observed almost daily. In late summer 1982, we conducted two strip-transect surveys to estimate lagomorph densities. These surveys were conducted by driving a vehicle at night and counting all lagomorphs in a transect defined by the width of the headlight beam. In March 1983, we attempted to count all pronghorns and eagles in the 182 km<sup>2</sup> area where we observed eagle attacks. Counts covered the entire area and were made using a Piper Supercub aircraft flown at an elevation of 60 m along 400-m-wide north-south transects. Surveys began 30 min after sunrise on days when visibility was excellent and used one observer who always looked away from the sun.

During our 1983 survey, we counted 3230 pronghorn

and 23 golden eagles for a density of 17.7 pronghorn and 0.13 golden eagles per km<sup>2</sup>. Data from our two strip-transects provided an estimate of 0.94 lagomorphs per ha. We considered these estimates to be accurate indicators of the relative abundance of predators and prey in our study area.

All but one of our observations of golden eagles attacking pronghorns were made from November through February 1981–84. Six observations were made from a vehicle and one from the air. We do not know if our aircraft influenced pronghorn or eagle behavior during this attack, but during all five winter observations made from the vehicle, we were parked, watching groups of pronghorns and they began to run from eagles, not from us. We were traveling along a two-track road when our summer observation was made and, because pronghorns were running when we first observed them, we do not know if our vehicle or the eagle first caused pronghorns to flee. Eagles were not marked, thus we do not know how many individual eagles were involved in attacks or if the same eagle may have been observed in more than one attack.

Each winter attack involved a single golden eagle and groups of 120 to 350 pronghorns. The pronghorns became alarmed when the eagle vocalized while circling a herd at an estimated elevation of 60 m. Pronghorns fled only when the eagle flew low (10 m or less above the ground) and directly toward them. In one instance, pronghorns fled when the eagle was seen flying at them from 300 m away. When running from an eagle, pronghorns appeared to group more closely than when we observed them escaping from coyotes (*Canis latrans*) or humans.

When circling pronghorns, eagles did not always attack. When they did attack, there was a consistent pattern of circling, vocalizing, and flying away from the group of pronghorns just prior to the initiation of a chase. During all five winter observations made from the ground, eagles vocalized. Pronghorns watched eagles fly away and continued to watch the area where they had disappeared. When an eagle reappeared flying low to the ground and directly toward them, the pronghorns bunched more closely together and then ran. When the pronghorns

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fled, the eagle targeted the last animal in the group, and all subsequent attacks were directed toward that isolated individual.

All attacks were similar and, after the eagle caught up to the pronghorn, it landed on its back at points varying from just posterior to the withers to slightly anterior to the white rump patch. Once an eagle landed on a fleeing pronghorn, the pronghorn fell or continued to run apparently trying to dislodge the bird. The longest time an eagle rode a pronghorn was approximately 20 sec for an estimated distance of 200 m. Eagles did not balance well on fleeing pronghorns and all attacks ended when the eagle and pronghorn fell to the ground. Prior to hitting the ground, the eagle folded its wings and after the fall, it remained standing on the ground for approximately 30 sec before attacking again. During each encounter we observed, the eagle attacked the same pronghorn from one to four times and, of the three pronghorns killed, one, two, and three attacks were involved before the pronghorn was killed. Kills we witnessed involved one female and one male fawn (estimated age 8–9 mo) and one male (estimated age 20–21 mo). Pronghorns that escaped did so by running back to the fleeing herd. We do not know the fate of these animals, but we did observe otherwise healthy looking pronghorns with dried blood on their backs.

Eagles began feeding on pronghorns after they fell. Two pronghorns appeared paralyzed, possibly from spinal injuries, but remained alive for at least 10 min after eagles began feeding. Eagles always began feeding dorsally on the carcass at the point where their talons had punctured the skin. Kills were quickly detected by other golden eagles and coyotes. On one occasion, a second eagle arrived within 8 min after a kill was made and, after 27 min, five golden eagles were feeding on the kill. We observed coyotes approaching golden eagles feeding on dead pronghorns, but eagles did not attack coyotes, nor did coyotes displace eagles from the carcasses.

We observed a fawn attacked by an eagle in July 1985. In this instance, approximately 10 pronghorns were running in front of our vehicle when a fawn (<1 mo. old, estimated weight 4 to 5 kg) in the rear of the group was attacked by a pursuing golden eagle. The eagle grasped the fawn in the back, lifted it approximately 10 m vertically then released its grip dropping the fawn. It rose, began to run with an awkward gait and the eagle initiated a second stoop, but appeared to shy from our vehicle. The fawn ran out of sight, and the eagle flew in the opposite direction.

During winter, pronghorns became concentrated in our study area which may, in part, explain why we observed more eagle predation in winter than in summer. Based on our field observations of jackrabbit, cottontail rabbits and sage grouse, these prey appeared to be available. Thus, we doubt that eagles were attacking pronghorns because alternate prey was unavailable. More likely, they were related to the winter conditions which made

pronghorns vulnerable to eagle predation. Snow depth ranged from 0–10 cm and did not impede pronghorn movement nor did it appear to influence eagles when they attacked pronghorns.

It was interesting that eagles prey on adult pronghorns nearly as frequently as on immatures. Nearly 50% of our observations involved attacks by single eagles on adults and fawns from the previous spring when they approach adult body size. Bruns (1970) observed a similar trend toward winter predation on adults by single eagles hunting herds of pronghorns. Tandem hunting has been reported in breeding areas (Collopy 1983), but this behavior is apparently rare in winter (Tjernberg 1986). Collopy (1983) reported two golden eagles preying on black-tailed jackrabbits (*Lepus californicus*) and smaller mammals. Hatch (1968) observed a pair of golden eagles successfully killing a red fox (*Vulpes fulva*). In both reports, one eagle either flushed the prey or diverted its attention while the second eagle attacked. Thompson (1949) observed two golden eagles simultaneously chasing two separate pronghorn herds but the size and relative conspicuousness of pronghorns may eliminate the need for tandem hunting of this species.

Bruns (1970) reported an eagle attacking two different pronghorns before successfully killing a female fawn. Eagles we observed attacking pronghorns directed their attention to a single animal and actually rode on their victims for as long as 20 sec. Bruns (1970) observed an eagle riding a pronghorn for nearly 5 min.

We observed a 50% success rate for golden eagles preying on pronghorns in winter. This estimate is higher than the 23–30.5% success rate reported by Collopy (1983) for eagles hunting small mammals in Idaho, and the 21% success rate for golden eagles hunting small animals in Sweden (Tjernberg 1986). Small mammals may be better able to find cover for their escape. Pronghorns are more conspicuous than small mammals and they live in open habitats where opportunity to use cover for escape is limited.

Pronghorns seem to recognize eagle hunting behavior and bunch tightly together when they flee from attacking eagles (Bruns 1970). Eagles we observed elicited this response by either vocalizing while circling immediately above pronghorns, or by flying close to the ground directly at herds. This behavior isolates an animal from the group that then becomes the focus of ensuing attack

RESUMEN.—Estudiamos a *Antilocapra americana* en la gran cuenca divisora de Wyoming, en un período de 57 meses, entre 1980 y 1985. Durante este tiempo, registramos siete ataques de *Aquila chrysaetos* sobre *A. americana*. Seis ataques en invierno involucraron un macho adulto, uno del año, una hembra adulta y tres cervatillos. En verano sólo se observó un ataque sobre un cervatillo. En invierno, las águilas mataron el 50% de las veces que atacaron, matando un macho y una hembra (ocho a nueve meses de edad) y un macho de 20 a 21 meses de edad. El

ataque realizado en verano sobre el cervatillo, no fue exitoso, posiblemente debido a nuestra presencia. En invierno, las águilas atacaron a *A. americana* desde la parte posterior de grupos que huían, aterrizaron sobre sus espaldas, derrivaban el grupo o liberaban sus garras antes que *A. americana* cayera. El mayor tiempo de persecución fue de 20 segundos. Cuando *A. americana*, se sentía amenazada por *A. chrysaetos*, corrían asociados en rebaños, una conducta que difiere de respuestas de escape suscitadas por otro tipo de peligros. Sugerimos que esta respuesta conductual única de *A. americana* puede indicar una interacción histórica depredador-presa.

[Traducción de Ivan Lazo]

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