

Predation by a golden eagle on a brown bear cub

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Abstract: During spring 2004 an adult female brown bear (*Ursus arctos*) and her 3 cubs-of-the-year were observed outside their den on a south-facing low-alpine slope in central Norway. They remained near the den for 8–10 days and were, except for one day, observed daily by Totsås and other wardens of the Norwegian Nature Inspectorate. On 25 April, as the family was moving along the edge of a steep, treeless slope and down a snowdrift, the smallest cub, at the back of the group, was attacked by a golden eagle (*Aquila chrysaetos*). The cub vocalized loudly as it was lifted off the ground and carried away. The eagle was still carrying the cub when it flew into cloud cover and was lost from view. Although no remains were found, it is probable that the eagle killed the cub. This paper describes the circumstances of the incident and relates it to other observations of attacks by eagles on young bears in Europe and North America.

Key words: *Aquila chrysaetos*, brown bear, cub mortality, golden eagle, Norway, predation, *Ursus arctos*

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The possibility that golden eagles (*Aquila chrysaetos*) occasionally prey on brown bear cubs (*Ursus arctos*) has been largely overlooked by researchers. Murie (1985a,b, 1990) described interactions between grizzly bears (*U. arctos*) and golden eagles in Alaska's Mount McKinley (now Denali) National Park. He observed grizzlies and eagles scavenging on the carcasses of other species, eagles feeding on a brown bear cub that had been killed by another bear, and

eagles attending bears. Murie hypothesized that eagles attending bears were waiting for opportunities to capture prey trying to escape from the bears. He also observed eagles swooping at and diving low over grizzlies and other carnivores, but interpreted this behavior as play or curiosity, rather than predation.

C. McIntyre (US National Park Service, Fairbanks, Alaska, USA, personal communication, 2008), a golden eagle researcher in Denali National Park for many years, has never seen an eagle attack a bear, although she has often observed eagles following bears in open terrain, perhaps positioning themselves to take prey escaping from the bear as suggested by Murie. Commensalistic hunting, as well as curious or play behavior by eagles in the vicinity of bears, could be misinterpreted as eagles hunting, attacking, or inspecting bears as possible prey. Predation by eagles on bear cubs does, however, occur. On 25 April 2004, Totsås and another warden of the Norwegian Nature Inspectorate (NNI) saw a golden eagle attack and carry off a brown bear cub. In this paper we describe this incident and relate it to other reports of attacks by eagles on young bears in Europe and North America.

Successful attack by golden eagle on brown bear cub in Norway

On 18 April 2004, NNI was informed that an adult female brown bear and 3 cubs of the year had been observed on some snow-free patches of a south-facing slope in a remote mountain valley in central Norway. The cubs were seen nursing, playing, and resting approximately 500 m from their den site on a treeless, low-alpine slope, slightly above the brushy birch (*Betula* spp.) shrubs that commonly form the upper forest edge in this area.

Observers from NNI watched the bears from a distance of 500 m for 1–5 hours daily (except one day) until 25 April. The bears showed no signs of awareness of human presence. The observers could often hear sounds made by the cubs. One of the cubs, estimated at 3 kg, was visibly smaller and appeared to be less mobile than its siblings. An adult golden eagle was observed passing 60 m above the bears on 20 April. On 25 April, the weather was overcast, the lowest clouds hanging just above where the family was resting. There was excellent visibility beneath the cloud layer. A large bird of prey was seen flying in

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the clouds at 14:00, but it was not identified with certainty. At 15:15 the female bear began to move away slowly. Two cubs followed her at a distance of 4–5 m; however, the smallest cub lagged behind and on at least 4 occasions, its mother returned up to distances of 30 m to retrieve it.

At 15:30, as the family group was traversing down a steep snowdrift and the small cub was approximately 10 m behind its mother, a golden eagle came gliding out of the clouds and down the mountain slope. It grabbed the small bear cub with both feet and lifted the vocalizing cub into the air. The mother detected the attack the instant it happened and made a short rush toward the flying eagle, which was already beyond her reach. She stopped and watched the eagle for about 5 seconds before continuing in her original direction with the other 2 cubs, now following closely behind her.

The observers used binoculars to watch the eagle carrying the bear cub away. It passed them at a distance of 100 m and they could see the cub struggling, its feet and head waving from side to side as it vocalized loudly. The eagle, carrying the cub, gained altitude and was lost from view when it flew into clouds covering the mountains at higher elevations. The observers heard the cub crying for 3–4 minutes. For some time before they ceased, the sounds seemed to be coming from a location approximately 800 m away from the observers, suggesting that the eagle had landed with the cub. This area was later searched twice, but no sign was found of the eagle or the cub.

The female and her remaining cubs were observed for an additional 2 hours as they moved 1 km along the slope. The 2 cubs kept close to their mother during this time. She stopped twice to allow the cubs to suckle before entering a stand of shrubby birch and spruce (*Picea abies*).

The area was revisited on 28 April. Based on tracks in the snow, the family had moved back to the spot where the eagle had captured the cub, then left the area. No trace of the missing cub was found.

Incidents suggestive of eagles pursuing or consuming bear cubs in the Alps and Tatra Mountains

Only a few observations of predation, predation attempts, or scavenging of dead bear cubs have been reported. Genovesi and Cetto (2003) reported

finding a dead 6-kg brown bear cub in the Italian Alps on 16 April 2003. A veterinarian who necropsied the cub concluded that the cub had been killed by a large bird of prey, presumably an eagle. A 2004 request to bear biologists around the world posted in International Bear News (Issue 13(3)) for observations of eagles preying successfully on bear cubs did not result in additional confirmed instances of similar behavior.

Three subsequent incidents that were suggestive of golden eagle attacks on brown bears, but could have had alternative explanations, were reported in Slovakia and Poland. Two of these occurred in Slovakia in 2005, approximately 28 km from each other. The first was described by Kralik (2005:11): a Slovakia National Park ranger who interpreted an observation on 5 April 2005 of an interaction between a golden eagle and a “weak” yearling brown bear (estimated to be 25 kg with a track size of 10 x 8 cm) to be an attack by the eagle. The bear was feeding on overwintered cowberries (*Vaccinium vitis-idaea*) on a low-alpine meadow in the Tatras National Park when the eagle appeared from behind a ridge and immediately flew after it. The bear fled, but the eagle pursued it for a distance of 400 m. The bear, calling loudly, evaded the eagle by changing direction 7 times before entering forest cover.

The second observation in Slovakia was made on 27 June 2005 during a census of Tatra chamois (*Rupicapra rupicapra tatrica*) in the Low Tatras National Park by J. Bradley (Slovak Wildlife Society, personal communication, Liptovsky Hradok, Slovakia, 2005), where he noticed a golden eagle flying very low over the ground in a low-alpine area. An adult brown bear with 2 cubs was seen running away from the eagle toward vegetation cover. No attack was observed, but the behavior of the bears and the eagle could be interpreted as the bears trying to escape from perceived danger.

In Polish Tatras National Park, fragments of a yearling brown bear’s skull were found in an eagle nest in 2002, but there was no evidence to indicate whether the bear was killed or scavenged (F. Zieba, Polish Tatras National Park, Zakopane, Poland, personal communication, 2007).

Eagle predation on bears in North America

Nelson (1957) described an event which took place near Tagetochelain Lake, British Columbia, Canada,

in April 1956. In an open poplar (*Populus* sp.) landscape with rolling hills, observers heard loud cries and then observed, within 30 m distance, a large eagle flying 6 m above the ground, carrying an American black bear (*Ursus americanus*) cub, judged to weigh 4–5 kg. The eagle rose to a height of 40 m above the ground before dropping the cub onto a rock-bed at the lakeshore. The cries stopped as the cub was released; it landed with a loud thump, apparently dead. The eagle landed in the top of a tall spruce tree, watched the cub for 5 seconds before swooping down to retrieve it and then flew across the lake to its nest, a distance of about 400 m. The cub's mother, 200 m away, ran in various directions for 2–3 minutes as if she could not locate her cub. Then she brought her 2 remaining cubs into a nearby fringe of timber where she left them in a tree. The eagle was thought to be a golden eagle, but this was not verified; it may have been a young bald eagle (*Haliaeetus leucocephalus*).

During the 1980s in Denali National Park in Alaska, F. Dean (University of Alaska, Fairbanks, Alaska, USA, personal communication, 2008) reported an observation described to him by a bus driver who allegedly saw a golden eagle swoop down a slope and attack a brown bear cub of the year. The cub was with its mother and another cub. It is unclear whether the cub was carried away.

Discussion

The diet of golden eagles consists of a variety of bird and mammal species (Glutz von Blotzheim et al. 1971). The mountain hare (*Lepus timidus*), with an adult live weight of 2.5–5.0 kg, is a common, important prey item. Other common prey species, depending on availability, include almost all kinds of grouse and pheasants (Tetraonidae and Phasianidae), geese and ducks; various birds of prey and passerines as well as mammals such as marmots (*Marmota* spp.), ground squirrels (*Spermophilus* spp.), microtine rodents (*Microtus* spp.), rabbits (*Leporidae*); carnivores including martens (*Martes* spp.), badgers (*Meles meles*), and young red foxes (*Vulpes vulpes*); sheep (*Ovis* spp.), deer fawns and, less often, adult roe deer (*Capreolus capreolus*), reindeer or caribou (*Rangifer tarandus*), and white-tailed deer (*Odocoileus virginianus*). Dementev et al. (1951) mentioned the wolf (*Canis lupus*) as a prey species, but gave no information about the size or age of individuals preyed upon.

At the time they normally leave their dens, bear cubs conform to the common prey size of golden eagles, and yet we found no previous observations of brown bears falling prey to golden eagles documented in the literature available to us (Bent 1937; Dementev et al. 1951; Hagen 1952; Glutz von Blotzheim et al. 1971; Haftorn 1971; Murie 1985a,b, 1990; Craighead et al. 1995). Considering the size of prey they normally take, it is very likely that golden eagles have the ability to kill brown bear cubs. Why, then, have incidents of the type described in this paper not been previously documented or even considered?

Some of the literature on golden eagles and their diet comes from a time or place with sparse distribution of bears. It is only during the last few decades that brown bear populations in Europe have increased in size and become better studied (Zedrosser et al. 2001). However, this situation is different from North America and Russia, where golden eagles and bears commonly shared the same habitats undisturbed by human persecution. Low probability of detection of such rare events is a plausible explanation for Russia, where enormous wilderness areas with very low human population densities are remote from scientific researchers. However, even in North America we have found only 2 observations of attacks on bear cubs by eagles (including the killing of the black bear cub in British Columbia), which indicates that this kind of predation is rare.

The incident we observed can be explained by a combination of unusual circumstances. First, the mother and her young cubs left their den by about 17 April, which is 3–4 weeks earlier than mean date for den emergence for females with cubs in central Sweden (Friebe et al. 2001). Second, mean temperatures during 16–19 April were approximately 10°C warmer (+14°C) than average for central Norway, with daytime maxima up to 20°C (Meteorological Institute of Norway 2004). These temperatures must have started rapid and intense snow melting on the south-facing slope where the den was located. Third, the den had been dug into earth and gravel in a willow (*Salix* spp.)-dominated meadow. Inspection of the site in both April and July showed that the den had been flooded with water emerging from the ground and the bottom of the den chamber (small-sized gravel had erupted from the floor of the den). There was evidence that the bears had enlarged the den to avoid the wet floor, but were unsuccessful and left their water-logged home. Fourth, one of the cubs

was noticeably smaller than its siblings, probably weighing only 3 kg. It vocalized more often than its siblings and clearly had difficulties following its mother. Fifth, by staying in an open landscape, the family was easily detectable by any bird of prey. Finally, the attack happened when the cub was behind the rest of the family group and, due to the terrain, probably also out of their view. The terrain and the very low-hanging clouds allowed the eagle to safely attack the cub.

A bear cub is a risky prey item for an eagle due to a female bear's instinctive, aggressive, and protective behavior of her offspring. An eagle attempting to kill a bear cub and remaining with it on the ground, even for only a few seconds, would be highly vulnerable to attack by the mother. It is likely that an eagle could only succeed in such an attack if the cub could be easily carried away as part of the attack, as was the case in the incident observed in Norway. There are some similarities in the circumstances of our observation in Norway and those involving the black bear cub in British Columbia in 1956 and the pursuit observed in the Tatra Mountains in 2005. It could be significant that all of these incidents occurred in April when the cubs were small. Eagles scavenging on a grizzly bear cub-of-the-year on 10 July 1950 had difficulties flying off with the carcass, even after it was already partially consumed (Murie 1990).

Predation on bear cubs by eagles might be more common than it appears from these few observations because the opportunities for direct observations by humans are very limited. Nevertheless, we believe it accounts for only a small fraction of the mortality rates of cubs in their first year of life. Such predation is likely to be only an occasional occurrence in most bear populations, with no practical effect on population dynamics.

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Literature cited

- BENT, A.C. 1937. Life histories of North American birds of prey, Part 1. Smithsonian Institution, US National Museum Bulletin 167.
- CRAIGHEAD, J.J., J.S. SUMNER, AND J.A. MITCHELL. 1995. The grizzly bears of Yellowstone: Their ecology in the Yellowstone ecosystem, 1959–1992. Island Press, Washington, DC, USA.
- DEMENTEV, G.P., N.A. GLADKOV, E.S. PTUSHENKO, AND E.P. SPANGENBERG. 1951. The golden eagle. In *Birds of the Soviet Union, Volume 1*. Moscow, USSR. (Translated from Russian by the Israel Scientific Translations, Jerusalem, Israel, 1966).
- FRIEBE, A., J.E. SWENSON, AND F. SANDEGREN. 2001. Denning chronology of female brown bears in central Sweden. *Ursus* 12:37–46.
- GENOVESI, P., AND E. CETTO. 2003. Predation by a golden eagle on a bear cub in Trentino. *International Bear News* 12(3):11.
- GLUTZ VON BLOTZHEIM, U.N., K.M. BAUER, AND E. BEZZEL. 1971. *Handbuch der Vögel Mitteleuropas. Band 4. Falconiformes*. Akademische Verlagsgesellschaft, Frankfurt am Main, Germany. (In German.)
- HAFTORN, S. 1971. *Norges Fugler*. Universitetsforlaget, Oslo, Norway. (In Norwegian.)
- HAGEN, Y. 1952. *Rovfuglene og viltpleien*. Gyldendal Norsk Forlag, Oslo, Norway. (In Norwegian.)
- KRALIK, M. 2005. Medvieda s orlom v patach. *Nase polovnictvo II* (7):11. (In Slovak.)
- METEOROLOGICAL INSTITUTE OF NORWAY. 2004. Været i Norge, Klimatologisk månedsoversikt—April 2004. *Klima* 04/2004. (ISSN 1503-8017). Accessed 5 July 2005, www.met.no. (In Norwegian.)
- MURIE, A. 1985a. *The wolves of Mount McKinley*. University of Washington Press, Seattle, Washington, USA.
- . 1985b. *The grizzlies of Mount McKinley*. University of Washington Press, Seattle, Washington, USA.
- . 1990. *A naturalist in Alaska*. The University of Arizona Press, Tucson, Arizona, USA.
- NELSON, J.N. 1957. Bear cub taken by an eagle. *Victoria Naturalist* 14:62–63.
- ZEDROSSER, A., B. DAHLE, J.E. SWENSON, AND N. GERSTL. 2001. Status and management of the brown bear in Europe. *Ursus* 12:9–20.

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