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SHORT COMMUNICATIONS

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GOLDEN EAGLE PREDATION ON EXPERIMENTAL SANDHILL AND WHOOPING CRANES¹

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Abstract. During experiments to lead cranes on migration behind motorized craft in the western United States, our cranes experienced 15 attacks (4 fatal) by Golden Eagles. We believe many more attacks would have occurred (and more would have been fatal) without human intervention. We recognize eagle predation as an important risk to cranes especially during migration.

Key words: *Aquila chrysaetos*, *Golden Eagle*, *Grus americana*, *Grus canadensis*, *predation*, *Sandhill Crane*, *Whooping Crane*.

That Golden Eagles (*Aquila chrysaetos*) in Asia regularly prey upon small cranes when migrating was demonstrated by Thiollay's (1979) account of Demoiselle Cranes (*Anthropoides virgo*) taken on the wing as they crossed mountain passes in the Himalayas. Golden Eagles also may prey on larger cranes in winter and summer in Eurasia (Muñoz-Pulido et al. 1993), and three adult-sized Demoiselle Cranes were observed as prey in a Golden Eagle eyrie in Mongolia (Ellis et al. 1999). However, there are only six published observations of Golden Eagles taking adult-sized cranes in North America. Two extensive reviews of Golden Eagle prey did not report cranes at all (Olen-dorff 1976, Sherrod 1978). Recently, three wild adult Greater Sandhill Cranes (*Grus canadensis tabida*; GSHC) were reported as prey (details lacking) at Malheur National Wildlife Refuge, Oregon (Littlefield and Lindstedt 1992), and a single juvenile Whooping Crane (*G. americana*; WC) was killed by a Golden Eagle on its first southward migration in company with its GSHC foster parents (Windingstad et al. 1981). Johns (1977) reported an eagle attack on an adult SHC in Saskatchewan in October. Golden Eagle predation

on captive-reared GSHCs (released as juveniles and yearlings at Grays Lake, Idaho) is believed to have caused the failure of that effort (Bizeau et al. 1987; R. C. Drewien, pers. comm.). Surprisingly, crane chicks have been reported as prey of Golden Eagles only once in North America (Ivey and Scheuring 1997).

In preparing this manuscript, we learned of two unpublished instances of Golden Eagles killing cranes in the southeastern United States (S. G. Hereford, pers. comm.), and general observations that eagles attack cranes on migration in the Mississippi Valley (R. P. Urbanek, pers. comm.) and the Rio Grande Valley (R. C. Drewien, pers. comm.). Here, we provide data on Golden Eagle attacks on captive-reared cranes. Most of our observations are for attacks that occurred while our birds were in flight following motorized vehicles

METHODS

In an effort to develop techniques that could be used to re-establish a breeding population of WCs on the Prairie Provinces of Canada, we led two migrations (ca. 600 km each) by truck (10 GSHCs in 1995 and 12 in 1996 [Ellis et al. 1997, unpubl. data]) and three (ca. 1,200 km each) by ultralight aircraft (9 GSHCs in 1995, 8 GSHCs in 1996, and 5 GSHCs and 4 WCs in 1997 [Clegg et al. 1997, unpubl. data]).

We detail the frequency with which these cranes were attacked and occasionally killed by eagles. In all, we obtained 4 records for eagle attacks when the cranes were not migrating (on summering grounds) and 11 attacks during migration. Golden Eagles were seen in position to attack on many other occasions but were driven away in preemptive attacks by aircraft.

RESULTS

Of the four attacks on cranes when not migrating, all involved adult eagles. Of these, three occurred near Grace, Idaho and one at Mormon Lake, Arizona. Pairs of adult eagles were involved in three of the four at-

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FIGURE 1. Kent Clegg with a small flock of Sandhill Cranes during the first ultralight-led crane migration, October 1995. Photo by David H. Ellis.

tacks, although for one of these three, the actual kill was not seen. Two adult eagles were merely seen feeding on the freshly killed crane. Two attacks were fatal, the third resulted in a debilitating injury, and the fourth was ineffectual.

Of the 11 attacks during migration (all between 16 and 23 October), 2 were on GSHCs following a truck in central Arizona (Ellis et al. 1997), and 9 were on cranes following ultralight aircraft (Fig. 1) from Grace, Idaho to Bosque del Apache National Wildlife Refuge, New Mexico (Clegg et al. 1997, unpubl. data). Seven of these attacks involved small flocks (six to nine birds) of GSHCs and two attacks involved a small mixed flock of GSHCs and WCs (eight birds total). Both attacks on the trucking migration involved single adult eagles and neither resulted in mortality.

Of the nine attacks during the ultralight migrations, only two cranes (both GSHCs) were actually lost. While one of these cranes was being ridden into a mountain side by one adult eagle, the second crane was pursued out of sight by a second eagle and was presumed to have been killed. One of these cranes was retrieved dead and half eaten. Its flockmate was never seen again.

In one attack during the ultralight migrations, a WC was struck from behind, grasped, and ridden by an adult eagle almost to the ground. When the eagle released its grip, the crane slammed into the ground, then the eagle swept up to repeat its attack, but was inter-

cepted by an aircraft. The crane survived the collision with the ground, bled profusely from a thigh laceration, but recovered and was released in New Mexico.

DISCUSSION

Some generalizations surface: over half (8 of 15) of the attacks were by two or more eagles. Of these, six involved two birds, probably adult pairs. The seventh included one adult and one juvenile; the eighth included two juveniles and one adult. The attacks generally came from high above and always from behind the cranes. As far as we could tell, all attacks were focused on the trailing crane(s). All three cranes captured during migration were trailing birds. All were grasped from behind and held as they plummeted earthward. Although the long duration and long distance of some flights performed by our trained juvenile cranes indicate that they were physically fit, our migrations were peculiar in that they were led at lower altitudes than normally seen for wild crane migrations. Our birds were thereby more vulnerable to eagles than wild cranes would have been. This was especially true when our birds were low to the ground while crossing mountain passes. The cranes suffered several attacks over passes, and two of the three cranes struck on migration were at mountain passes. However, some attacks occurred in open habitat far from either canyons or mountains.

Some other trends were clear. Our migrating cranes

were normally (three exceptions) able to sideslip the first eagle stoop. Because some attacks involved several stoops, we could clearly see that our birds were consistently (100% of the time) able to avoid the subsequent stoops even when pursued by adult eagles. Our juvenile cranes also seemed to be faster in level flight than the eagles. The normal behavior of cranes under attack was to bunch under the wings of the ultralight. Unfortunately, the eagles were not afraid to approach the aircraft and often continued their pursuit even when an aircraft was intercepting. A second, faster ultralight aircraft proved essential in intercepting eagles and in thwarting repeated stoops. We are confident that many more cranes would have been lost had this aircraft not intervened.

Cooperative hunting by Golden Eagles is generally perceived as being less common than our data suggest. Nevertheless, about 37% (43 of 115) of capture attempts by Golden Eagles in an Idaho study were when hunting in tandem (Collopy 1983). Hunting by larger groups of Golden Eagles is probably chaotic or pseudo-cooperative (Ellis et al. 1993).

It is significant that extensive reviews of food habits for the Golden Eagle in North America (Olendorff 1976, Sherrod 1978) did not include cranes. It required the attention of students of crane biology to discover that eagle predation is a significant threat. As our observations reveal and as Walkinshaw (1949) suggested long ago, under certain conditions cranes are regularly preyed upon by Golden Eagles. The high soaring flights, characteristic of migrating cranes, may be not only an energy saving strategy, but also a means of placing them above hungry eagles.

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