

## LETTERS

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### AN ADULT MALE BONELLI'S EAGLE (*Hieraaetus fasciatus*) EATEN BY A SUBADULT GOLDEN EAGLE (*Aquila chrysaetos*)

KEY WORDS: *Golden Eagle*; *Aquila chrysaetos*; *Bonelli's Eagle*; *Hieraaetus fasciatus*.

During 2005 we radio-tracked four neighboring adult pairs of Bonelli's Eagles (*Hieraaetus fasciatus*) in the Montsant mountains, southern Catalonia, Spain, to study their home ranges and hunting behavior. Our methodology consisted of continuous daily tracking of each adult individual from sunrise to sunset, 3 d per mo. Eagles were equipped with a transmitter attached with a backpack harness (total mass: 45 g) and were tracked by one observer with a receiver (Communications Specialists, Inc., INC R-1000) and a Yagi antenna.

On 18 October 2005, at 0930 H, during regular tracking, the observer saw a pair of eagles (mass at capture: male, 1960 g; female, 2620 g) perched at the top of an oak (*Quercus humilis*) tree on a hill. The weather was foggy with light rain, so the behavior of the eagles was recorded as passive hunting. At 1000 H, the male swooped down in a foraging attempt behind the hill. Ten min later, the female flew toward the male and immediately began territorial flights and dives. Twenty minutes after that, the female flew toward her breeding area. Meanwhile, the observer continued to receive the signal from the transmitter on the male, indicating that it was on the ground, so he decided to approach and watch it. When he reached the signal source, a subadult Golden Eagle (*Aquila chrysaetos*) flew up from the ground, where the observer immediately found the dead male Bonelli's Eagle. The carcass was partially plucked and partially eaten (in the breast, crop, and one wing), in the manner of a raptor feeding. Approximately 2 m from the body, on the top of a rock, he found the partially eaten remains of a Common Wood-Pigeon (*Columba palumbus*).

The necropsy (done at the *Centre de recuperació de fauna salvatge de Torreferrussa, Generalitat de Catalunya*) showed that the carcass of the Bonelli's Eagle had been wounded with a pointed object (possibly a talon), and had bled, suggesting it was alive when captured. The stomach of the Bonelli's Eagle contained the head and some bones and feathers of the wood-pigeon, which were complementary to the remains found on the rock. These findings indicated that while the male Bonelli's Eagle was eating the wood-pigeon, it was attacked and killed by the subadult Golden Eagle, which later began to eat it.

The incident occurred at a site approximately 2 km from the usual breeding area of the Bonelli's Eagle pair and 9 km from the nearest Golden Eagle territory. By the next breeding season, the male Bonelli's Eagle that was killed had been replaced by a subadult male.

The Golden Eagle is more powerful than the Bonelli's Eagle and it sometimes captures raptors (Tjernberg 1981, *Holarct. Ecol.* 4:12–19; Watson et al. 1993, *Ibis* 137:387–393) when other more typical prey (lagomorphs, galliforms) are scarce. Thus, the importance of the predatory birds in the diet of the Golden Eagle increases in regions where numbers of other prey are low (Fernández 1991, *Rev. Ecol.-Terre Vie* 46:363–371). In the area of the present study, some potential prey (European rabbits [*Oryctolagus cuniculus*] and Red-legged Partridges [*Alectoris rufa*]) of these two sympatric species are scarce (R. Bosch unpubl. data), which might lead the Golden Eagle to consume alternative prey, and thus behave as a super-predator.

Other raptors (Accipitridae and Falconidae) made up 0–6.2% of the diet of Golden Eagles, as reported in 24 studies from continental Europe and Asia, and 0–8.8% of the diet in North America (13 studies; Watson 1997, *The Golden Eagle*. T and A.D. Poyser, London, U.K.). Observations of raptors killing raptors (intraguild predation) have been considered anomalies because of the high risk of injury to an attacking predator.

However, this phenomenon also may be explained in terms of the need to reduce competition (Rhoner and Doyle 1992, *J. Raptor Res.* 26:261–263). Several studies discuss the competition between Golden and Bonelli's eagles for food and nesting cliffs in the Mediterranean region (Cheylan 1973, *Alauda* 41:203–212; Fernández and Insausti 1990, *J. Raptor Res.* 24:124–125). Although differences in habitat selection, food requirements and anthropogenic mortality rates may have a greater effect on population trends in these two species (Carrete et al. 2005, *Oikos* 108:125–136), direct predation by the Golden Eagle on Bonelli's Eagle may have some influence in areas where the two eagles are sympatric.—**Rafel Bosch** (email address: rafel.bosch.janer@telefonica.net), **Joan Real**, **Albert Tintó**, and **Elena L. Zozaya**, **Departament de Biologia Animal, Facultat de Biologia de la Universitat de Barcelona, Avd. Diagonal 645, 08028 Barcelona, Catalunya, Spain.**

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