SHORT COMMUNICATIONS

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EAGLE OWL PREDATION ON EGYPTIAN VULTURE AND NORTHERN GOSHAWK: POSSIBLE EFFECT OF A DECREASE IN EUROPEAN RABBIT AVAILABILITY

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Eagle Owls (*Bubo bubo*) occasionally prey upon small and medium-sized birds of prey (Mikkola 1983). Here we report observations of Eagle Owl nest predation on Egyptian Vulture (*Neophron percnopterus*) and Northern Goshawk (*Accipiter gentilis*) made during two intensive studies of these diurnal raptors in the Ebro basin, northeastern Spain. We monitored 178 breeding attempts of 58 pairs of Egyptian Vultures from 1980–91 and 101 breeding attempts from 26 pairs of goshawks from 1987–90.

Eagle Owl predation affected seven nests of Egyptian Vultures. On two occasions, nestlings older than 35–40 d were beheaded, which is a characteristic behavior of Eagle Owls (Cramp 1985, J.A. Donázar pers. comm.). Only their heads and some wing feathers were found in the nest. The remains of a decapitated adult bird, probably killed while incubating or brooding very small chicks, were found 50 m from another nest. Nestlings in the other four nests were very young and disappeared without leaving any trace. The nests were inaccessible to mammalian predators that can kill nestlings (e.g., the red fox *Vulpes vulpes*; Donázar and Ceballos 1989, Tella and Torre 1990), and Eagle Owl nests or roosting sites were detected nearby. Eagle Owl predation was the most plausible explanation for these losses.

Four goshawk nests with young between 13–38 d were depredated by Eagle Owls. In one case, a nestling aged 38 d was taken from a nest which contained three young. The remains and leg band of that bird were found in an Eagle Owl nest 3 km away. On another occasion, the remains of a 17–18 d old goshawk chick were found in the same Eagle Owl nest, 2 km away from a goshawk nest that had lost its 15–20 d old chicks on the same day. Although this chick was not marked, no other goshawk nest in the area lost nestlings of that particular age at the same time. The other two nests were found empty, except for a few feathers left in one of them. In nests where nestlings starved or were killed by humans, we never detected the action of scavengers or the parents removing the carcasses. Moreover, no signs of human robbery or mammalian predation were found, leaving Eagle Owl predation as the most plausible explanation for these losses. In one of these two nests, which contained three young, the predation of two chicks was detected 4 d after the first one had been taken. This is a common behavior of Eagle Owls, who can take several consecutive nights to kill and remove nestlings of a whole brood (Olsson 1979 *in* Cramp 1985).

No case of Eagle Owl predation on the Egyptian Vulture has been reported until now, and only a few cases on the goshawk (Mikkola 1983). In the study area, 31% of Egyptian Vulture nests were <200 m from Eagle Owl nests or roosts which may have increased the risk of predation (Real and Mañosa 1990). Nevertheless, no depredations were reported before 1989 ($N = 52$), while 7.1% ($N = 99$) of the nests with young were depredated after that year (Fisher's exact test, upper tail = 0.0478, lower tail = 0.0483), accounting for 50% of brood losses (Tella 1991). For goshawks, 6.1% ($N = 33$) of nests containing nestlings were affected by Eagle Owl predation in 1987–88, and this percentage increased to 18.2% ($N = 11$) in 1989 (Fisher's exact test, upper tail = 0.0000, lower tail = 0.2565).

In the Ebro Valley, the European rabbit (*Oryctolagus cuniculus*) is the main prey of the Eagle Owl (Donázar 1989), as it is in other Mediterranean areas (Donázar et al. 1989). Yearly peak abundances of European rabbits in the area were determined by following a 19.7 km transect at dusk 1–5 times each month in a vehicle at a maximum speed of 40 km/hr. All the rabbits seen on the transect were recorded and the monthly average number of rabbits per km was calculated. Peak rabbit abundances were 2.1 rabbits/km in 1987 and 2.9 in 1988, but numbers

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decreased to 0.7 in 1989 and 1990, and to 0.4 in 1991, probably due to the viral haemorrhagic disease (Tella 1991, Mañosa 1992). During this period, the diet of an Eagle Owl pair was determined by collecting prey remains at their nest during and after the nestling period. We detected an increase in the percentage of diurnal raptors consumed from 3.5% (N = 144 prey) in 1986–87 to 9.3% (N = 43 prey) in 1989 (Fisher's exact test, upper tail = 0.0897, lower tail = 0.1250).

Although our results do not provide conclusive evidence, we suggest that a diet shift of the Eagle Owl in response to the scarcity of its main prey may be responsible for the increased predation on nests of other species of raptors after 1989. A similar effect has been reported by McInvaille and Keith (1974) for the Great Grey Owl (*Strix nebulosa*) and Red-tailed Hawk (*Buteo jamaicensis*). This may be an important factor in the management of some endangered species of birds of prey, as well as for the dynamics of the predator–prey communities involved (Rohner and Doyle 1992, Polis and Myers 1989).

RESUMEN.—Se describen diversos casos de predación de nidos de alimoche (*Neophron percnopterus*) y azor (*Accipiter gentilis*) por parte del búho real (*Bubo bubo*) en el noreste de la Península Ibérica. Estas predaciones han aumentado a partir de 1989 coincidiendo con un importante descenso en las poblaciones de su presa principal, el conejo (*Oryctolagus cuniculus*), por lo que se sugiere un importante papel del búho real en la dinámica de las poblaciones de rapaces en períodos de escasez del lagomorfo.

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