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### FOOD HABITS OF THE SHORT-EARED OWL (*Asio flammeus*) IN SOUTHERN SOUTH AMERICA

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Although the Short-eared Owl (*Asio flammeus*) is distributed throughout the Americas, its food habits have received considerable study only in North America (Clark 1975 and references therein). Currently, there is no published quantitative information on its food habits in all of South America, except for a report made by Fulk (1976) from central Chile, who unfortunately pooled the pellets of both Short-eared and Common Barn Owls (*Tyto alba*).

We report the prey identified in 53 pellets of the Short-eared Owl, collected May-June (Winter) 1986 and September (early Spring) 1987-89 at Fundo Quirislahuén, Alberto Hott Siebert Airport and Isla Teja island. The first two places are pasture grasslands located at the outskirts of the city of Osorno, southern Chile (40°34'S 73°08'W). The third site consists of marshland in the city of Valdivia (39°48'S 73°14'W). Seven of the 53 pellets contained no identifiable prey remains, 17 were weathered and 29 were fresh. Prey remains (mostly native cricetid rodents) were identified using keys for tooth rows (Reise 1973).

The 29 fresh pellets measured 33.5 (SD = 1.9) by 18.1 (SD = 0.9 mm) ( $\bar{x} \pm 2$  SE length times maximum width) and the mean dry weight was  $3.0 \pm 0.4$  g. All measurements were lower than those reported by Holt et al. (1987), possibly because of our small sample (29 compared to 180 pellets).

To increase the sample size, we pooled pellets from different areas. Among 46 pellets, we found 69 vertebrate prey items (96%) and only three invertebrates (4%). The diet of the Short-eared Owl by number of occurrences was as follows: 34 (47%) Olivaceous Field-mice (*Akodon olivaceus*), 8 (11%) Austral Greater Mice (*Auliscomys micropus*), 8 (11%) Long-haired Field-mice (*Akodon longipilus*),

2 (3%) Long-tailed Rice Rats (*Oryzomys longicaudatus*), 2 (3%) unidentified members of *Akodon*, 3 (4%) Black Rats *Rattus rattus*, 1 (1%) Darwin's Leaf-eared Mouse (*Phyllotis darwini*), 11 (16%) unidentified cricetids, 1 (1%) Gryllid and 2 (3%) unidentified insects. The most frequent mammalian prey of Short-eared Owls, Olivaceous Field-mice, Long-haired Field-mice and Austral Greater Mice weighed  $23.9 \pm 0.5$ ,  $34.7 \pm 0.3$ , and  $57.6 \pm 1.9$  g, respectively (Pearson 1983). Overall, the mean number of prey items/pellet was  $1.7 \pm 0.2$  ( $N = 29$ , range 1-4).

The high consumption of the Olivaceous Field-mouse by Short-eared Owls was in close agreement with the fall peak of this vole-like mouse at the prairie-scrublands of San Martín, Valdivia (Murúa and González 1986), a site located approximately 192 km north by road from Osorno.

Judging from previous records in North America (Clark 1975 and references therein), the food habits of the Short-eared Owl in southern South America are very similar to those in the northern hemisphere.

RESUMEN.—Aunque el nuco (*Asio flammeus*) tiene una amplia distribución, su dieta ha sido estudiada sólo en América del norte. Analizamos 46 egagrópilas colectadas en dos áreas del sur de Chile durante invierno (1986) y primavera (1987-89). Se identificaron 72 presas, de las cuales un 96% correspondió a vertebrados. El roedor *Akodon olivaceus* constituyó casi la mitad de la dieta. En Sudamérica meridional, la estenofagia del nuco es similar a la documentada para el hemisferio norte.

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### GOLDEN EAGLES FEEDING ON FISH

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Prey of Golden Eagles (*Aquila chrysaetos*) in western North America consists primarily of small mammals such as lagomorphs and rodents (Carnie 1954, Mollhagen et al. 1972, Olenдорff 1976, Bloom and Hawks 1982, Eakle and Grubb 1986). Fish comprised only 0.4% of individual food items found in nests across North America (Olenдорff 1976). Most authors of studies of Golden Eagle food habits reported no fish (e.g., Collopy 1983, Eakle and Grubb 1986), while others indicated that fish comprised from 0.2% (Kochert 1972) to 3.6% (Carnie 1954) of individual food items in their diet, and only for eagles nesting near lakes or rivers. Migrant Golden Eagles may feed on fish carrion, such as dead salmon (*Oncorhynchus* spp.) in the northwestern United States (Palmer 1988), but most food habit studies were conducted during the nesting season when spawning fish were generally unavailable. No observations of capture of live fish have been published. This study reports on the strategy and success of Golden Eagles foraging on spawning Rainbow Trout (*Oncorhynchus mykiss*) in Arizona.

#### STUDY AREA AND METHODS

The 1 km<sup>2</sup> study area consisted of the most downstream 600 m of Nankoweap Creek at its confluence with the Colorado River in Grand Canyon National Park, Arizona. The creek was 1-2 m wide and about 30 cm deep, with winter flows typically 0.05-0.20 m<sup>3</sup>/sec (Brown et al. 1989).

The creek mouth (elevation 880 m) was located in a desert river canyon, with adjacent vertical cliffs rising over 1000 m

Trout were introduced into the Colorado River following completion of Glen Canyon Dam, 112 km upstream of Nankoweap Creek, in 1963 and the subsequent transformation of the river to conditions suitable for a cold-water fishery. The most downstream 0.5 km of Nankoweap Creek has supported spawning rainbow trout since the mid-1970s. Up to 1500 trout may enter the creek at peak times during spawn, which may last from November through April (Brown et al. 1989).

Observations of Golden Eagle prey capture attempts and feeding activity were made from 6 February to 20 March 1990, and from 24 January to 13 March 1991. Continuous, daily observations were made from 0.5 hr before sunrise to 0.5 hr after sunset, except at times when recreational activity in the study area precluded eagle feeding activity (ca. 10% of daylight hours). Observations were made from an uncamoouflaged observation post located 800 m west of and 100 m above the creek mouth, using 10-45× spotting scopes. A prey capture attempt was defined as any effort to secure prey, including both single and multiple pounces for an individual trout.

#### RESULTS AND DISCUSSION

Golden Eagles were present on 32 (76%) of 42 d in 1990 and 39 (80%) of 49 d in 1991, with one to four individuals present on any one day. At least five individuals were recorded on 10-11 March 1990 (three adults on 10 March, two subadults on 11 March). I suspect that more than five Golden Eagles were present each year, but individuals were not marked.

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