

## SHORT COMMUNICATIONS

ORNITOLOGIA NEOTROPICAL 11: 349–352, 2000  
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### THE DIET OF THE RUFOUS-TAILED HAWK (*BUTEO VENTRALIS*) DURING THE BREEDING SEASON IN SOUTHERN CHILE

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*Key words:* *Buteo ventralis*, Chile, diet, *Nothofagus* forests, Rufous-tailed Hawk.

The Rufous-tailed Hawk (*Buteo ventralis*) is a large-sized *Buteo* distributed in Chile and Argentina from 36°S in the north to the Strait of Magellan in the south. It inhabits dense, scattered and scrubby *Nothofagus* forests in rugged terrain and shrub-steppe flatlands (Bierregaard 1995). Although *B. ventralis* is considered rare (Clark 1986, Bierregaard 1998), its numbers appear to be increasing, perhaps due to the fragmentation of native forests as a result of human activities (Jaksic & Jiménez 1986). However, logging pressures on the remaining primary and secondary forests of southern Chile (Fuentes 1994) affect mainly the older trees that the Rufous-tailed Hawk uses for placing its nest, perching, mating, and hunting (Housse 1945, Goodall *et al.* 1951, this study). Another direct important threat on this raptor is hunt (Jaksic & Jiménez 1986).

The ecology of the Rufous-tailed Hawk is virtually unknown and the scant available information on its diet and reproduction is mostly anecdotal (Housse 1945, Clark 1986, Bierregaard 1998) or consists in brief reviews (Bierregaard 1995). In this paper, we describe

for the first time the diet of this little-known raptor during the breeding season in a forested landscape of southern Chile.

We conducted our observations on the diet of the Rufous-tailed Hawk on the northeastern edge of the Cerro Ñielol National Monument (38°43'S, 72°35'W), in south-central Chile. Cerro Ñielol is a small habitat island (89.5 ha) of native forest located on the northern edge of the sizable city of Temuco. The topography of the study site is rugged with elevations ranging from 120 to 322 m. The vegetation is composed of mixed southern beech: coigüe-boldo (*Nothofagus obliqua*–*Peumus boldus*), with olivillo (*Aextoxicon punctatum*), lingue (*Persea lingue*), and laurel (*Laurelia sempervirens*) and peumo-boldo (*P. boldus*–*Cryptocarya alba*) forests (Hauenstein *et al.* 1988). Trees are 20–25 m tall and cover 30–50% of the canopy. The peumo-boldo forest is dominated by peumo and boldo in association with huillipatagua (*Citronella mucronata*) and luma (*Amomyrtus luma*), which reach 10–15 m in height and made up 80% of the canopy cover. The understory is made up of murta negra (*Rhamnus diffusus*), quila bamboo

TABLE 1. Frequency of prey items in the diet of the Rufous-tailed Hawk during the breeding season in southern Chile. Identifiable birds were assigned to forest (F) or prairie (P) habitats.

Prey species	Habitat	Frequency of occurrence (%)
Mammals		38.0
Norwegian Rat ( <i>Rattus norvegicus</i> )		6.9
Unidentified rodent		24.1
European Rabbit ( <i>Oryctolagus cuniculus</i> )		3.5
European Hare ( <i>Lepus europaeus</i> )		3.5 <sup>1</sup>
Birds		55.3
Southern Lapwing ( <i>Vanellus chilensis</i> )	P	3.5
Chilean Pigeon ( <i>Columba araucana</i> )	F	13.8
Chilean Flicker ( <i>Colaptes pitius</i> )	F	3.5
Red-breasted Meadowlark ( <i>Sturnella loyca</i> )	P	20.7
Austral Thrush ( <i>Turdus falklandii</i> )	F	6.9
Unidentified bird		6.9
Reptiles		3.5
Short-tailed Snake ( <i>Tachymenis peruviana</i> )		3.5
Insects		3.5
Unidentified Coleoptera		3.5
Total pellets		14
Total prey items		29

<sup>1</sup>Hair remains found under a perch.

(*Chusquea quila*), colihue bamboo (*C. coleon*), and espino negro (*Rhaphitamnus spinosus*). Along the edges, the forest has been fragmented leaving scattered southern beeches and laurels and a mat of quila bamboos. The surrounding matrix is agricultural fields, eucalyptus (*Eucalyptus globulus*) and pine (*Pinus radiata*) plantations.

From 6 through 11 January 1998, we collected 11 pellets under a 25-m tall laurel tree where a pair of birds have nested for at least 3 years (JEJ, pers. observ.). The nest location and the tree looked like the one photographed by F. Behn at Villarrica Lake, about 100 km SE from the study area (Goodall *et al.* 1951: 56). Three other pellets were found

under nearby southern beeches used by the hawks as perches. Pellets were produced by at least two adult birds. Bird prey remains were determined by examining the microscopic structure of the feathers (Reyes 1992) and by comparing the remains to voucher specimens deposited at Univ. Austral de Chile and the Natural History Museum in Santiago. Mammalian prey were determined by the teeth, bone remains, and hairs (Reise 1973); reptiles by the presence of scales, and beetles by their elytra. The hawks' diet was estimated as the percent by category out of the total number of prey items found.

We found remains of 29 prey items in 12 prey categories, including hairs from an Euro-

pean hare (*Lepus europaeus*) found under a perch (Table 1). Birds (55% of the prey found), followed by mammals (39% of the prey), were the most important prey items found in the diet of the Rufous-tailed Hawk. Among birds, the most frequent species eaten were Red-breasted Meadowlarks (*Sturnella loica*) and Chilean Pigeons (*Columba araucana*). Observations of hunting by Rufous-tailed Hawks in other southern beech forests also found Chilean Pigeons as one of their main prey (E. Krahmer, pers. com.). Our results of Austral Thrushes (*Turdus falklandii*) and Southern Lapwings (*Vanellus chilensis*) in the diet of the hawks concur with previous reports by Housse (1945) and Greer & Bullock (1966), respectively.

All the mammals detected in the diet of the Rufous-tailed Hawk were exotic species, rodents being the most frequent. Although we were unable to determine all rodent prey to the species level, bone and hair remains found in at least two pellets were of Norwegian rats (*Rattus norvegicus*). As documented by Housse (1945), we also found lagomorphs in the Rufous-tailed Hawk diet. Remains of European rabbits (*Oryctolagus cuniculus*) were detected in one pellet and remains of a European hare were found under a perching tree. The presence of snake scales in a pellet and the observation made by CAB in December 1997 of a hawk carrying a snake to a nest, which according to its size and color was a short-tailed snake (*Tachymenis peruviana*), suggest that reptiles are not unusual items in the hawks' diet.

The equal consumption of prairie (24%) and forest (24%) birds by the Rufous-tailed Hawk indicates that it is not an obligate forest hawk (Table 1). In addition, the consumption of rabbits and hares, which live in open habitats, reinforces the fact that the hawk also uses open lands. Rather, the Rufous-tailed Hawk appears to be an opportunistic raptor that hunts both in the forest and in open hab-

itats or along habitat edges. In this regard, more research is needed to determine whether the fragmentation of the forest and habitat conversion are indeed favorable to the Rufous-tailed Hawk, as implied by Jaksic & Jiménez (1986), or negative, as has been suggested, assuming the species is a forest specialist (Blake 1977). On the other hand, the slow recovery of one of the hawk's main prey, the Chilean Pigeon, after been decimated by the Newcastle virus (Johnson 1967: 67), might have resulted in population increase of Rufous-tailed Hawks.

So far, this species appears to be the only reported *Buteo* that feeds mainly on birds in Chile (Jaksic 1996). This is consistent with the absence of anything but small-sized mammals in the forests inhabited by the Rufous-tailed Hawk. Our findings show that the Rufous-tailed Hawk preys on a diverse array of medium-sized vertebrates, with a pronounced proportion of birds in its diet, at least during the breeding season.

#### ACKNOWLEDGMENTS

We are thankful to R. P. Schlatter and J. C. Torres-Mura for letting us examine voucher specimens under their care and to M. Saavedra for the information on plant species composition of the study site. The hospitality of the Bravo-Vivanco family and the cogent suggestions of Bob Bierregaard, Fabian Jaksic, Carl Marti, and Raymond McNeil are acknowledged.

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Accepted 28 July 2000.