

Diet of Common buzzard (*Buteo buteo*) (Linnaeus, 1758) in an area of Northwestern Spain as assessed by direct observation from blinds

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Abstract

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Accuracy of raptor diet assessments can vary depending on the technique employed. In the available studies in Spain, the Common buzzard (*Buteo buteo*) shows a diverse and non-specialized diet, reflecting local and seasonal variation in the prey availability. This study reports information on the diet of the Common buzzard in an area of Northwestern Spain, on the basis of direct observation during 308 h. of four nests from blinds. The delivery prey rate to the nest was of 0.49 ± 0.04 items per hour. From a total of 145 prey delivered to the nests, 64.7% could be determined to the taxonomic level of class, 34.5% to the levels of species, genus or suborder and a 34.5% were undetermined prey items. Mammals and reptiles were the most frequent preys in their diet, while amphibians and birds were much less frequent. These results obtained are in agreement with those from previous studies carried out in the North of Spain based on other assessments raptor diet techniques.

Keywords: *Buteo buteo*, Common buzzard, diet, Northwestern Spain.

Resumen

TAPIA, L., DOMÍNGUEZ, J. & ROMEU, M. (2007). Dieta del Busardo ratonero (*Buteo buteo*) (Linnaeus, 1758) en un área del noroeste de España analizada por observación directa desde escondites. *Nova Acta Científica Compostelana (Biología)*, **16**: 145-149

La exactitud de los análisis de la dieta de las rapaces puede variar dependiendo de la técnica empleada. En los estudios disponibles en España, el Busardo ratonero (*Buteo buteo*) mostró una dieta diversa y no especializada indicativa de variaciones locales y estacionales en la disponibilidad de presas. Este estudio aporta información sobre su dieta en un área del noroeste de España, en base a la observación directa de cuatro nidos durante 308 h. De un total de 145 presas aportadas se determinó el 64.7% a nivel de clase, 34.5% a nivel de especie, género o suborden y el 34.5% fueron indeterminadas. Mamíferos y reptiles fueron las presas más frecuentes, siendo más escasas anfibios y aves. Los resultados obtenidos son similares a los obtenidos en estudios previos realizados en el norte de España con otras técnicas de estudio.

Palabras clave: *Buteo buteo*, Busardo ratonero, dieta, noroeste de España.

INTRODUCTION

Information on diet is important in understanding different aspects of raptor biology and for management of their populations (MARTI, 1987; REDPATH *et al.*, 2001). Diet assessment in raptors is usually done indirectly, by recovering pellets and prey remains, or directly, by observing prey deliveries from blinds or with more recent technologies using remote cameras at raptor nests (e.g. COLLOPY, 1984; MAÑOSA, 1994; TORNERBERG, 1997; ROGERS *et al.*, 2005; SVEEN, 2006; SELĀS *et al.*, 2007); however, assessments of raptor diet can vary depending on the technique employed (MARTI, 1987; ROGERS *et al.*, 2005; SVEEN, 2006).

Direct observation is an accurate method for investigating diet in species that do not swallow their prey whole. Observation can be done from a blind within the nesting area; however, observations near nests can disturb hawks, are labour-intensive, and require dawn-to-dusk observation to obtain complete samples. Moreover, direct observation requires positioning of the blind so that a view inside the nest bowl is possible (COLLOPY, 1983; MARTI, 1987; DYKSTRA *et al.*, 2003).

The majority of studies on the diet of Common buzzard (*Buteo buteo*) conducted in northern, eastern and central Europe have identified voles as the most important prey, with birds as an important alternative (e.g. GOSZCZYNSKI & PILATWSKI, 1986; REIF *et al.*, 2001; SELĀS *et al.*, 2007). Studies in northern Spain indicate that the diet is seasonal (BUSTAMANTE, 1985; MAÑOSA & CORDERO, 1992), with relatively large items such as young rabbits (*Oryctolagus cuniculus*) and Ocellated lizards (*Lacerta lepida*) predominating in the breeding season (MAÑOSA & CORDERO, 1992). In northern Spain was indicated an increase in the proportion of mammals in the winter diet, and an increase in invertebrates in the spring and summer (BUSTAMANTE, 1985).

This study reports information on the diet of the Common buzzard in an area of northwestern Spain, on the basis of direct observation of nests

from blinds. We also report data on rates of delivery of prey to the nest.

MATERIAL AND METHODS

The study area comprises the Baixa Limia Site of Community Importance (SCI) (34,627 ha), which includes the Baixa Limia-Serra do Xurés Natural Park (20,920 ha) (NW Spain). The climate in the area is temperate sub-Mediterranean oceanic, with a mean temperature of 8-12°C, and a mean annual precipitation of 1200-1600 mm. The most common vegetation types are scrub communities (*Ulex* spp., *Chamaespartium tridentatum*, *Erica* spp., *Genista* spp. and *Cytisus* spp.). Woods are very fragmented, and are dominated by oaks (*Quercus robur*, *Q. pyrenaica*) and pines (*Pinus pinaster*, *P. sylvestris*). The Common buzzard is the most abundant raptor in the area, with about 20-25 pairs (TAPIA, 2004; DOMÍNGUEZ *et al.*, 2005).

During the breeding seasons of 1997 and 1998 a total of four nests of Common buzzard were monitored. All the nests had two chicks during the monitoring period. Specifically, during May and June we conducted observations in 7- to 11-hr blocks each day, starting at 8 a.m. In total, the four nests were monitored for a total of 308 hours over 32 days during the two breeding seasons (Table I). A camouflaged blind was installed at an appropriate distance (40-50 m) from each nest, with the aim of not disturbing the behaviour of nestlings or adults. With the help of a 20 x 60 spotting scope, we recorded prey delivery to nestlings, and tried to identify all prey items by direct observation. Monitoring was carried out throughout the nestling period, until the fledglings abandoned the nest and prey was thus no longer delivered. We evaluated number of visits to the nest per hour, percentage of visits with prey, and prey delivery rates per hour. The importance of each prey species was expressed as a percentage of prey items delivered to the nest. The prey type data were pooled for all four nests. Given the limitations of the direct observation method (MARTI, 1987; ROGERS *et al.*, 2005), it was not

TABLE I. Times of direct observation (hours) of the four Common buzzard nests

Nests	Year	May (h)	June (h)	Total (h)	Number of days of observation
1	1997	48.3	31.5	79.8	8
2	1997	16.5	108.3	124.8	13
3	1998	43.5	12.0	55.5	6
4	1998	5.0	42.9	47.9	5
Total		113.3	194.7	308.0	32

TABLE II. Adult visits to the nest, prey delivery rates per hour, and percentage of prey items identified to class level and species-genus-suborder level during the monitoring period (mean \pm S.E.)

Nest	Visits to the nest per hour	% of visits with prey	Prey delivery rate averaged per hour	% of prey items identified to class level	% of prey items identified to species, genus or suborder level
1	0.58 \pm 0.03	85.4	0.52 \pm 0.04	62.14	39.39
2	0.56 \pm 0.08	84.2	0.46 \pm 0.09	64.83	36.50
3	0.69 \pm 0.14	63.7	0.41 \pm 0.12	53.68	36.36
4	0.75 \pm 0.13	88.0	0.60 \pm 0.06	66.80	44.40
Mean	0.64 \pm 0.04	80.32 \pm 5.59	0.49 \pm 0.04	61.86 \pm 2.88	39.16 \pm 1.88

possible to identify small prey items, and we must assume that this leads to a bias when estimating the importance of some prey types.

RESULTS

The mean frequency of visits of adults to the nest was 0.64 \pm 0.04 (\pm standard error) visits per hour. Of these about 80% included delivery of prey and the mean prey delivery rate was about 0.49 \pm 0.04 items per hour (Table II). Of the total of 145 prey items, 64.7% could be determined to class level, and 33.7% to species, genus or sub-order level (Tables II and III). We also obtained a high percentage of undetermined prey items, 34.5% of the total (Table III).

Mammals were the most common group of prey observed (34.5%), with the highest percentage corresponding to the Iberian mole (*Talpa occidentalis*). Reptiles also made up an important

part of the diet (24%), notably the Slow-worm (*Anguis fragilis*) and snakes. Amphibians and birds were much less frequent (Table III).

DISCUSSION

In spite of the methodological limitations and small sample size, however, the results obtained are in good accordance with former studies in different areas of the north of Spain based on stomach contents (BUSTAMANTE, 1985) and on pellets and prey remains (ÁLVAREZ-LAÓ *et al.*, 1996; ZUBEROGOITIA *et al.*, 2006). In all of these studies the Common buzzard has shown a diverse and non-specialized diet, reflecting local/seasonal variation in prey availability.

Reptiles, as in other parts of the Iberian Peninsula and Europe (MAÑOSA & CORDERO, 1992; ZUBEROGOITIA *et al.*, 2006; SELÂS *et al.*, 2007), also made up an important part of the diet.

TABLE III. Number of prey items delivered to the four Common buzzard nests

Prey type	Number of items
Unidentified mammals	36
<i>Talpa occidentalis</i>	11
<i>Oryctolagus cuniculus</i>	1
<i>Microtus</i> sp.	2
Unidentified Reptils	6
<i>Lacerta lepida</i>	5
<i>Lacerta schreiberi</i>	1
<i>Anguis fragilis</i>	9
<i>Elaphe scalaris</i>	1
<i>Lacerta</i> sp.	3
Sauria	2
Serpentes	9
Unidentified amphibians	2
<i>Bufo bufo</i>	2
<i>Rana</i> sp.	2
Unidentified birds	2
<i>Garrulus glandarius</i>	1
Unidentified items	50
Total	145

Amphibians and birds were much less frequent (Table III); though note that the percentage occurrence of amphibians was higher than in other studies in Spain (MAÑOSA & CORDERO, 1992), in line with the view that this prey group is underestimated when buzzard diets are analysed from prey remains (SELÅS *et al.*, 2007). We consider that an important proportion of the undetermined items were probably invertebrates, especially orthopterans and coleopterans, which have been documented as very frequent (sometimes more than 50%) in the Common buzzard diet in the north of Spain in general (BUSTAMANTE, 1985). But due their small size, their taxonomic determination using techniques like that of the present study is very difficult (MARTI, 1987).

As noted, in the present study birds made up only a small proportion of prey items (Table III), as reported for the north of Spain (BUSTAMANTE, 1985). This is as expected because the Common buzzard is not morphologically well adapted for hunting birds (TUBBS & TUBBS,

1985), so that the diet is made up of other more frequent and more energy-profitable prey items (e.g. NEWTON, 1979). In fact the percentage of bird prey items in the present study was even lower than in a previous study of other regions of the Iberian Peninsula (ZUBEROGOITIA *et al.*, 2006). This may reflect seasonal differences as seen in the north of Europe, when voles and other common high-profitability prey items are scarce (SWANN & ETHERIDGE, 1995; SELÅS, 2001). However, at more southern latitudes, the pressure to capture alternative prey types (like birds) would be expected to be weaker than at higher latitudes.

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