

## BREEDING-SEASON DIET OF A PAIR OF BARKING OWLS NEAR ARMIDALE, NEW SOUTH WALES

S. J. S. DEBUS<sup>1</sup>, J. A. FORD<sup>2</sup> and A. B. ROSE<sup>3</sup>

<sup>1</sup>Division of Zoology, University of New England, Armidale, New South Wales 2351

<sup>2</sup>359 Dumaresq Dam Road, Armidale, New South Wales 2350

<sup>3</sup>Associate, The Australian Museum, 6 College Street, Sydney, New South Wales 2010

(Present address: 61 Boundary Street, Forster, New South Wales 2428)

Received: 1 July 2004

The diet of the Barking Owl *Ninox connivens* in various parts of Australia was summarized by Higgins (1999), with additional data for sites in temperate Victoria and arid western Queensland provided by Taylor *et al.* (2002) and Debus and Rose (2003), respectively. The owl's diet in the Armidale district, on the Northern Tablelands of New South Wales, was documented by Debus (1997, 2001) — mainly the breeding and non-breeding diet of a family of owls on Boorolong Creek 25 kilometres west of Armidale. The owl preys on vertebrates (varying proportions of birds and mammals according to season and locality), supplemented with arthropods in the warmer months. This paper describes the diet of a pair of Barking Owls at Dumaresq Dam ten kilometres north-west of Armidale (30°30'S, 151°40'E), in spring-summer September 2003 to February 2004 and again in spring (September-early December) 2004.

JAF located the owls' roost in mid-September 2003 by the calls of the pair around sunset. The presumed male and female were roosting together about 12 metres above the ground, on a horizontal branch in the crown of a dense Silvertop Stringybark *Eucalyptus laevopinea* amid eucalypt woodland, about 60 metres from the shore of Dumaresq Dam. The site is in partly cleared farmland and extensive eucalypt woodland: stringybark on granitic slopes, Mountain Gum *E. dalrympleana* in gullies, with Yellow Box *E. melliodora* and Blakely's Red Gum *E. blakelyi* on lower slopes and flats, and New England Peppermint *E. nova-anglica* in riparian areas. The owls' roosting area is contiguous with the forested Mt Duval of greater than 1 000 hectares.

JAF and SD collected 12 intact pellets and some fragments on 22–23 September; only one owl was at the roost on the second day. Nearby was a hollow dead spout in a live Mountain Gum, in which the owls probably nested (see below). Two pellets and a fragment of a third were collected beneath the roost by SD on 2 October, and about 21 pellets (mostly fragmented) were collected by SD on 8 February 2004 (the next site inspection). No owls were present at the roost on either occasion, but there were fresh pellets and excreta at the site in early February when JAF heard the owls at night near his residence in farmland about two kilometres away.

The site was checked once in March and twice in mid and late April, but there were no owls, pellets or excreta at the roost. However, call-playback after dusk on the last occasion attracted a silent Barking Owl that appeared adult-like. It peered about, seemingly for the source of the

playback calls (which had ceased), then departed after a few minutes. Evening playback in early May attracted an immature Barking Owl of adult-like size, plumage and proportions, and which gave juvenile food-begging calls. It was naïve and approachable, slightly clumsy, and had juvenile rectrices as described by Higgins (1999). Taking incubation and nestling periods of about five weeks each (Higgins 1999) from the time one adult disappeared in late September, apparently to nest, gives hatching around the end of October and fledging in early December. It then flew to the ground, apparently for an insect, but seemed to be waiting for the parents to feed it; it was thus still partly dependent about five months post-fledging.

The adult pair was again located roosting in the stringybark near the dam on 4 September 2004, and six collections of a total of 31 pellets (including fragments of about three) and prey remains were made beneath the roost between that date and 5 December. The Mountain Gum was confirmed as the nest tree on 25 September, when the male was roosting high in the adjacent, rather sparse Apple Box *E. bridgesiana*, apparently guarding the nest, and the female gave a rumbling call from within the hollow at 1630 hours. By this stage prey remains had accumulated under plucking or feeding perches within 30 metres of the hollow. On 10 and 17 October both owls were again roosting in the stringybark, and the nesting attempt had failed. On 1 November neither owl was at the roost, and one had been moulting its secondaries. On 5 December the owls were absent, although there were fresh pellets beneath the roost. The cause of breeding failure was unknown, but it probably occurred at the egg or even prelaying stage (i.e. the attempt was possibly aborted). Potential predators of owl eggs or chicks are absent locally (goannas, pythons), or would likely be repelled by the owls (cats, possums).

Pellets were analysed by ABR, and their contents quantified, as previously described (Debus 1997; Debus and Rose 2003).

In 2003–04, 15 intact pellets measured 29–56 × 20–30 millimetres (mean 42.4 × 24.4 mm). The diet consisted of 23 per cent mammals, 8 per cent birds and 69 per cent insects by number (Table 1), and 65 per cent mammals, 31 per cent birds and 4 per cent insects by biomass. Mammals occurred in 34 pellets (94%), birds in five (14%) and insects in 18 (50%). The spring sample was dominated by mammals (nine, versus one bird and seven insects), whereas the summer sample was dominated by insects (28, including Christmas beetles, versus three mammals and

TABLE 1

Diet of a family of Barking Owls at Dumaresq Dam, Armidale, September 2003 to February 2004 (= '2003') and September-December 2004: minimum number of prey individuals in approximately 36 and 31 pellets respectively, from skull and/or jaw count. \*Introduced species. Mean prey weight from Strahan (1995), Higgins (1999) and related volumes, Debus (2001) or estimated.

Species	Weight (g)	2003	2004
<b>Mammals:</b>			
Sugar Glider <i>Petaurus breviceps</i>	128	11	7
*Rabbit <i>Oryctolagus cuniculus</i> (juv.)	300	1	1
Total mammals		12	8
<b>Birds:</b>			
Australasian Grebe <i>Tachybaptus novaehollandiae</i>	219		4
Crimson Rosella <i>Playcerus elegans</i>	135		1
Eastern Rosella <i>P. eximius</i>	110	1	
Noisy Miner <i>Manorina melanocephala</i>	60		1
*House Sparrow <i>Passer domesticus</i>	25	1	
*Common Starling <i>Sturnus vulgaris</i>	78	2	6
Total birds		4	12
<b>Insects:</b>			
Christmas beetle <i>Anoplognathus</i> sp.	1	25a	
Scarab beetle (Scarabaeidae: Rutelinae)	1	7	12
Click beetle (Elateridae)	1		1
Longicorn beetle <i>Phoracantha</i> sp.	1	1	1
Weevil (Curculionidae)	1	1	
Grasshopper (Orthoptera)	1	1	
Total insects		35	14
TOTAL		51	34

a Including five *A. porosus*.

three birds). Nevertheless, mammals occurred in 19 of 21 pellets in summer even though represented by only three skulls, suggesting that mammalian prey items were shared among the owl family. Perhaps, before the female resumed hunting, the male's pellets (containing skulls of decapitated prey) were deposited elsewhere. Similarly, in summer there were two cases of the remains of an individual bird being distributed between two pellets (e.g. one rosella foot in one pellet, the opposite foot in another; starling skull in one pellet, post-cranial bones in another). Although Barking Owls seldom hold prey at the day roost (Higgins 1999), another possibility is that some mammals were partly eaten on capture then retained for later consumption, and hence appeared in more than one pellet (assuming one pellet equals one meal; Marks *et al.* 1999).

In spring 2004, 28 intact pellets measured 27–65 × 18–40 millimetre (mean 38.9 × 24.0 mm) were collected. The diet consisted of 24 per cent mammals, 35 per cent birds and 41 per cent insects by number (Table 1), and 44 per cent mammals, 56 per cent birds and less than 1 per cent insects by biomass. Mammals occurred in 15 pellets (54%), birds in 13 (46%) and insects in four (14%). In contrast to 2003, birds dominated the spring 2004 sample, suggesting a possible shortage of mammalian prey.

The owls' diet was similar to that recorded elsewhere in southeastern Australia (Higgins 1999; Taylor *et al.* 2002), and particularly in the wider Armidale district where Barking Owls take many arboreal mammals but few rabbits, and many insects in summer (Debus 1997, 2001). The importance of the Sugar Glider *Petaurus breviceps*, particularly in biomass contribution, is reinforced and suggests heavy reliance by the owl on extensive, healthy woodland and a numerous glider population. The land-birds taken around Dumaresq Dam were abundant farmland

species, but waterbirds contributed 57 per cent of avian prey biomass in 2004.

We speculate that, like other large *Ninox* (Higgins 1999; Harrington and Debus 2000), the Barking Owl prefers mammalian prey, and that the high proportion of avian prey in some rural areas may reflect the consequences of woodland fragmentation and degradation on the abundance of the smaller arboreal marsupials. We also speculate that proximity of Barking Owls to wetlands and waterbird prey (Higgins 1999; Taylor *et al.* 2002) may provide a hedge against shortage of mammalian prey, although the owl may require an abundance of the latter for successful breeding.

#### ACKNOWLEDGMENTS

ABR gratefully acknowledges the facilities of the Australian Museum. We thank Hugh Ford and Todd Soderquist for comments on a draft.

#### REFERENCES

- Debus, S. J. S. (1997). The Barking Owl in New South Wales. *Aust. Birds* **30**: 53–80.
- Debus, S. J. S. (2001). Surveys of the Barking Owl and Masked Owl on the North-west Slopes of New South Wales. *Corella* **25**: 5–11.
- Debus, S. J. S. and Rose, A. B. (2003). Diet of a Barking Owl *Ninox connivens* in the Channel Country of south-western Queensland. *Corella* **27**: 18–19.
- Harrington, G. N. and Debus, S. J. S. (2000). Dietary items of the Rufous Owl *Ninox rufa* on the Atherton Tableland, north Queensland. *Aust. Bird Watcher* **18**: 251–252.
- Higgins, P. J. (Ed.) (1999). 'Handbook of Australian, New Zealand and Antarctic Birds' Vol. 4. (Oxford University Press: Melbourne.)
- Marks, J. S., Cannings, R. J. and Mikkola, H. (1999). Family Strigidae. In 'Handbook of the Birds of the World' Vol. 5. (Eds J. del Hoyo, A. Elliott and J. Sargatal.) Pp. 76–151. (Lynx Edicions: Barcelona.)
- Strahan, R. (Ed.) (1995). 'The Mammals of Australia'. (Reed: Sydney.)
- Taylor, I. R., Kirsten, I. and Peake, P. (2002). Habitat, breeding and conservation of the Barking Owl *Ninox connivens* in northeastern Victoria. In 'Ecology and Conservation of Owls'. (Eds I. Newton, R. Kavanagh, J. Olsen and I. Taylor.) Pp. 116–124. (CSIRO: Melbourne.)