AUSTRALIAN FIELD ORNITHOLOGY 2008, **25**, 149–152

Further Dietary Items of the Eastern Barn Owl *Tyto javanica* in Diamantina National Park, Queensland

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Summary. The diet of the Eastern Barn Owl *Tyto javanica* was determined by analysis of 46 pellets from a roost in Diamantina National Park, Queensland, collected in June 2007. The diet comprised 43% mammals (31% dasyurids, 12% rodents), 8% birds, 1% lizards and 48% insects, by number; and 72% mammals (44% dasyurids, 28% rodents), 22% birds, 1% lizards and 5% insects, by biomass. Mammals occurred in 39 pellets (85%), birds in nine (20%), lizards in two (4%) and insects in 21 (46%).

Among many other dietary studies of the Eastern Barn Owl *Tyto javanica* in Australia, particularly the arid zone, there have been three previous pellet samples analysed from Diamantina National Park in arid western Queensland (Debus *et al*. 1999, 2007; Palmer 2001). The earlier samples contained mainly rodents, leading Palmer (2001) to suggest that the Owl is a rodent specialist, even in the arid zone, and therefore unlikely to take small marsupials in sufficient quantities to enable its pellets to be used to track the potential recovery of small-mammal diversity since the Park's gazettal. Subsequently, Debus *et al*. (2007) found that the Owl did indeed take small dasyurid marsupials. Their sample contained a higher abundance of dasyurids than rodents, as well as two native mammal species not recorded in the previous samples. This paper describes the diet of Eastern Barn Owl(s) in the Park on the basis of pellets collected by AJL in June 2007. We note that the South-East Asian and Australasian populations of the Barn Owl complex have now been raised to species rank (Christidis & Boles 2008).

The sample of 46 pellets (some fragmented) was collected in June 2007 from buildings in the Park headquarters complex (23°45′S, 141°08′E), the same site as the previous sample in 2006 (Debus *et al*. 2007). Pellets ranged in age from fresh to old and weathered, and thus represented weeks or months of accumulation. They were again clearly referable to the Eastern Barn Owl by the characteristic *Tyto* 'glazed' coating on the fresher ones. The pellets were analysed by ABR as described previously (Debus *et al*. 1999, 2004, 2007), i.e. by microscopic comparison with a reference collection, by consulting Thomas (1888) and Watts & Aslin (1981), and by counting skeletal parts and paired jaws.

Thirty-four intact pellets measured 27–56 × 22–31 mm (mean 40 × 26 mm), and 44 intact and broken pellets (whose halves could be matched) weighed 1.5–9.4 g (mean 4.8 g, total pellet mass 213 g). The Owl(s) took a variety of mammals, birds, reptiles and insects (Table 1, which gives scientific names). By number, the Owl's diet was 43% mammals (31% dasyurids, 12% rodents), 8% birds, 1% lizards and 48% locusts [disregarding insect remains, including four ants (Hymenoptera, Formicidae), two cockroaches (Blattodea) and three small beetles (Coleoptera), that were probably in the stomachs of Owl prey]. By biomass, the Owl's diet was 72% mammals (44% dasyurids, 28% rodents),

Table 1

Prey items in 46 pellets from an Eastern Barn Owl roost in Diamantina National Park, western Queensland, June 2007: minimum number of individuals. Prey weights mostly from Palmer (2001) and Debus *et al.* (2004, 2007), otherwise Marchant & Higgins (1993), Strahan (1995) and Higgins *et al.* (2006).

Prey species	*Weight (g)*	*No. (n)*	*% n*	*Biomass (g)*	*% biomass*
Narrow-nosed Planigale *Planigale tenuirostris*	6	11		66	
Kultarr *Antechinomys laniger*	25	3		75	
Fat-tailed Dunnart *Sminthopsis crassicaudata*	15	43		645	
Total dasyurids		**57**	**31**	**786**	**44**
House Mouse *Mus domesticus*	17	22		374	
Long-haired Rat *Rattus villosissimus*	134	1		134	
Total rodents		**23**	**12**	**508**	**28**
Total mammals		**80**	**43**	**1294**	**72**
Black-fronted Dotterel *Elseyornis melanops*	32	1		32	
Budgerigar *Melopsittacus undulatus*	29	10		290	
Babbler *Pomatostomus* sp.[a]	50	1		50	
Little Woodswallow *Artamus minor*	17	1		17	
Zebra Finch *Taeniopygia guttata*	12	1		12	
Total birds		**14**	**8**	**401**	**22**
Reptiles (Gecko: Gekkonidae)	5	**2**	**1**	**10**	**1**
Yellow-winged Locust *Gastrimargus musicus*	1	3		3	
Locust (Orthoptera: Acrididae)	1	86		86	
Total insects		**89**	**48**	**89**	**5**
Total		**185**	**100**	**1794**	**100**

[a]Only Halls' Babbler *P. halli* has been recorded in the Park

22% birds, 1% lizards and 5% locusts. Mammals occurred in 39 pellets (85%), birds in nine (20%), lizards in two (4%) and insects in 21 (46%).

The pellets contained between one and 14 prey items (mean 4.0, mode 3), and dietary profitability was 39 g of prey per pellet (lower than in all previous samples, cf. Debus *et al*. 1999, 2007; Palmer 2001). The Owl(s) sometimes foraged mostly on locusts, as confirmed by two pellets that contained locusts only (nine and 14 locusts, respectively), and four pellets that contained 6–10 locusts as well as other small prey (1–2 dasyurids). Otherwise, there was typically one prey item per pellet for the larger items (rat, Budgerigar or babbler), or some combination of 2–3 small mammals and/or 1–2 birds, a gecko, and/or several locusts. This study added another small native mammal species (the Kultarr, a dasyurid marsupial) to the prey list for the Eastern Barn Owl at Diamantina National Park. Levins' dietary niche breadth for prey biomass in 2007 was 1.76, which is similar to previous values of 1.79 (1995) and 1.98 (2006), but higher than 1.05 in 1995 (cf. Debus *et al*. 1999, 2007; Palmer 2001). This result suggests that the Owl's dietary niche is broader during years when there are fewer large rodents (i.e. Long-haired Rats) available.

The results of this study provide a greater contrast than that found by Debus *et al*. (2007) with the earlier studies for the site (Debus *et al*. 1999; Palmer 2001). Specifically, the current study showed that dasyurids were the dominant mammalian prey by biomass and abundance. Overall, dasyurids were the dominant prey group by biomass. The current results for Diamantina are thus similar to those of Heywood & Pavey (2002) for the Barkly Tableland (Northern Territory), and contrast strongly with the contention that the Eastern Barn Owl is a rodent specialist, avoiding dasyurids, in the Australian arid zone (cf. Palmer 2001). The reversed importance of dasyurids versus rodents by biomass (cf. Debus *et al*. 2007) confirms the Owl's selection of small mammals, regardless of whether they are marsupials or rodents (see also Debus *et al*. 2004). The prevalence of locusts in the Owl's diet again (as in 2006: Debus *et al*. 2007) provides further evidence of its dietary flexibility in the arid zone and elsewhere (cf. Fitzsimons *et al*. 2008), and raised the question of whether the Owl would take plaguing locusts over mammals, owing to ease of capture.

The growing list of small native mammals in Eastern Barn Owl pellets from Diamantina may partly reflect the recovery of the Park's vegetation, and hence recovery of small-mammal populations, since the cessation of cattle-grazing. Alternatively, it may result from the larger sample size of pellets in 2007 compared with earlier samples, or simply the cumulative sample of pellets that is now including locally uncommon or rare mammals. The first possibility seems likely, given the sample of 40 pellets in 1998 that contained only House Mouse and Long-haired Rat as mammalian prey (Debus *et al*. 1999). However, the Kultarr can persist on gibber with cattle-grazing (C. Pavey pers. comm.). The varying dietary composition over the four pellet-collection periods probably also reflects seasonal conditions, and hence the relative abundance of the mammalian prey species.

We (AJL, ABR and SD respectively) gratefully acknowledge the assistance and support of Queensland Parks & Wildlife Service staff during this and other visits to Diamantina National Park, the facilities of the Australian Museum, and the facilities of Zoology, University of New England. We also thank Angus Newey for help in collating the pellet measurements, and James Fitzsimons and Chris Pavey for comments on a draft.

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Received 9 May 2008 ■