

Hunting Rates and Prey of a Pair of Breeding Nankeen Kestrels *Falco cenchroides* near Sydney, New South Wales

M.J. STARR¹, M. STARR¹ and S.C. WILSON²

¹10 Bowman Avenue, South Camden, New South Wales 2570

²Texas Tech University, 3601 4th Street STOP 6591, Lubbock, Texas 79430-6591, U.S.A. (Corresponding author: stephen.wilson@ttuhsc.edu)

Summary

The behaviour of a pair of Nankeen Kestrels *Falco cenchroides* at a nest-site was observed for 32 hours over four days in spring 1999 at a rural site at Camden, New South Wales, during the nestling stage. The mean prey-delivery rate to the nest was 3.80 ± 0.78 items per observation hour, of which the male transferred 1.5 ± 0.35 items per hour to the female. The prey-delivery rate increased over the observation period, to twice the initial rate by four days after day 1. Lizards approximately 50 mm or less in length made up the majority (87%) of prey items, with fewer mice (10%) and other small items ($n = 123$).

Introduction

The diet and breeding behaviour of the Nankeen Kestrel *Falco cenchroides* are well known, with quantified studies having been summarised by Marchant & Higgins (1993). However, little information on these aspects of the Kestrel's biology has been added over the past decade, and the number of detailed studies remains limited. Feeding rates and prey in breeding Kestrels were studied by observation, at all stages of the nesting cycle, at two sites on the tablelands of New South Wales (Bollen 1991, Paull 1991). These studies quantified prey-delivery rates of male to female and parents to nestlings, and found that Kestrels prey mostly on vertebrates when feeding young.

A pair of Nankeen Kestrels had been observed nesting in a hollow of a large eucalypt at a rural site near Camden, New South Wales, for several years. In the spring of 1999 the behaviour of the breeding birds was observed nearly continuously during daylight hours on four days over a five-day period. This paper presents the results of those observations.

Study area and methods

Observation site

The study site, on a 1600-ha rural property near Camden (34°03'S, 150°42'E) on the inland fringe of Greater Sydney, is described elsewhere (Starr *et al.* 2004). The Kestrels' nest was in a large solitary tree, on an elevated position overlooking farmland that included a commercial dairy and several sheep-holding paddocks.

Observations

The nest was observed during the early nestling period in 1999. A single observer was concealed in a hide placed at ground level 100 m from the nest-tree, and all observations were made by unaided eye or with the use of 8×40 binoculars. Time of day, the sex of the adults, types of prey brought to the nest, and prey transfers from male to female were recorded. Continuous observations were made of the nest-site as follows, for a total of 32 hours over four almost consecutive days:

Table 1

Male prey-delivery rates to the nest, and transfers of prey from male to female, of a pair of Nankeen Kestrels during the nestling period at Camden, N.S.W., October 1999.
Day = observation day, h = hours of observation, S.E. = standard error.

Day (h)	Deliveries/h	Transfers/h
1 (7.3)	2.9	0.8
2 (8.25)	3.1	1.7
3 (8.3)	3.0	1.1
4 (8.3)	6.1	2.4
Mean	3.80	1.50
S.E.	0.78	0.35

18 October: 0750–1230 h and 1330–1610 h (7.3 h)

20 October: 0735–1550 h (8.25 h)

21 and 22 October: 0730–1550 h (8.3 h/day)

Statistical analysis

Percentages of prey types were compared using a one-way analysis of variance (ANOVA). Significant differences were then further examined using the Tukey test (SigmaStat 2.0, SPSS Inc., Chicago, U.S.A.).

Results

Nest-site

The Kestrels' nest-hollow was approximately 6 m from the ground, in a live Forest Red Gum (*Eucalyptus tereticornis*, or possibly a hybrid eucalypt), approximately 28 m tall. The nest-hollow, approximately 8 m from ground level and facing north-east, was created by a primary branch having fallen some years previously.

Feeding rates

The rate of prey delivery to the nest by the male was 2.9–6.1 (mean 3.8 ± 0.78) items/h, of which he transferred 0.8–2.4 (mean 1.5 ± 0.35) items/h to the female (Table 1). The food transfers took place both in an adjacent tree and at the nest. The female then took the food into the nest and fed the young. The mean daily rate of prey delivery increased over the four days, to over twice the initial rate by four days after the first day of observations.

Prey

Of 123 observed prey items, 107 (87%) were lizards, 12 (10%) were mice and four (3%) were small unidentified items, probably arthropods (Table 2, Figure 1). Small skinks, probably *Lampropholis*, approximately 50 mm or less in length, made up the majority of prey items ($F_2 = 300.9$, $n = 4$, $P < 0.001$). The mice were most likely House Mouse *Mus domesticus*.

Table 2

Prey items delivered to the nest of a pair of Nankeen Kestrels during the nestling period at Camden, N.S.W., October 1999. Hours = hours of observation time, other = small unidentified items.

Date	Hours	Lizard	Mouse	Other	Total
18.10.99	7.3	18	2	1	21
20.10.99	8.25	20	5	1	26
21.10.99	8.3	22	3	0	25
22.10.99	8.3	47	2	2	51
Total	32.2	107	12	4	123

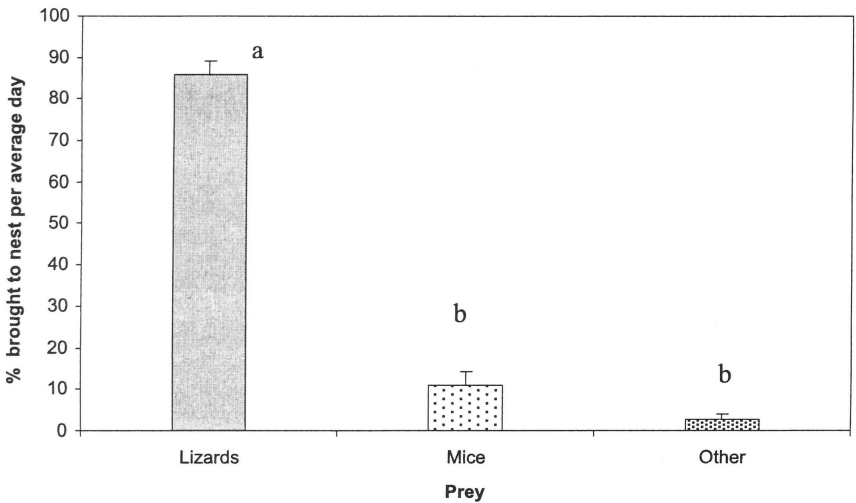


Figure 1. Mean percentages, with standard errors, of prey items brought to the nest of a pair of breeding Nankeen Kestrels at Camden, N.S.W., over four days during the nestling period, 1999. Different superscripts indicate a significant difference at the $P < 0.05$ level.

Discussion

Aspects of the Kestrels' biology at Camden were generally similar to those reported elsewhere (reviewed in Marchant & Higgins 1993), although the proportion of lizards in the breeding diet was higher. Prey-delivery rates at Camden were higher than recorded during the Kestrel's nestling period elsewhere. Bollen (1991) and Paull (1991) recorded rates of 0.9–1.1 and 0.6 item/h respectively, although prey at those nests included larger vertebrates such as birds and a rat. Over a brief observation period (3.25 h) on one morning, the delivery rate was 22.8 items/h for a Kestrel pair feeding their nestlings on arthropods (Cupper & Cupper 1981). Habitat and season can affect diet; the high rate of lizard capture at Camden may reflect the abundance of this prey type in the area. The increasing prey-delivery rate over the observation period at Camden may have reflected the growth of nestlings, or addition to the brood as further chicks hatched, and thus the increasing food demands of the brood.

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