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Research Note

The long-nosed bandicoot (*Perameles nasuta*) as a nest-predator

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Abstract. We have been documenting nest predation on a woodland site in south-east Australia using camera traps. Here we describe the recording of a long-nosed bandicoot (*Perameles nasuta*) digging out the tunnel nest of a spotted pardalote (*Pardalotus punctatus*), and eating the three young birds. The diet of this species is mainly insects and other invertebrates, so this observation is significant as it is the first documentation of this animal as a nest predator.

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Introduction

It is acknowledged that for most passerines, nest predation is at least a major cause of nest failure (DeGregorio *et al*. 2014) and has a significant impact on the breeding success of woodland passerines. Apart from some exceptional seasons, and perhaps in some unusual species, it accounts for 70–90% of nest losses in this group (Matthews *et al*. 1999; Colombelli-Négrel *et al*. 2009; Guppy *et al*. 2017; see review in Guppy *et al*. 2014).

Guppy *et al*. (2017) used remote cameras to identify 16 species of nest predators in a woodland community on the south-east coast of New South Wales, where the annual failure rate of nests (that progressed to at least one egg) over the three years of the study (2012–14) was 43–55%. Five of these predators were mammals, but the long-nosed bandicoot, which is present on the site, was not recorded as a nest predator. This was as expected as the diet of this species is mainly insects and other invertebrates, plant material and fungus (Ride 1970; Strahan 1983; Scott *et al*. 1999; Thums *et al*. 2005). We continued the study the next season (2015–16) and recorded a long-nosed bandicoot depredating the nest of a spotted pardalote. The nests of the spotted pardalote are mainly ground tunnels on this site, and the nest chamber is lined with the bark of the various stringybark species (*Eucalyptus* spp.) found on the site. No nests have been examined on this site, but other studies show that tunnels vary in length from 10–50 cm (Higgins and Peter 2002). Predation by a bandicoot of a nest of a spotted pardalote, as described below, has not previously been reported in the literature.

Methods

The study site (35°52′S, 150°03′E) was 10 ha of temperate woodland (~200 m × 500 m; 100 m above sea level), 6 km north-west of Moruya, New South Wales, Australia. This type of woodland is widespread immediately inland of the coast between Ulladulla and Bermagui, New South Wales (Austin 1978). The site adjoins state forest and is situated in a mixed landscape with forest as the dominant component extending for at least 20 km in three directions. Aerial photographs of the nearby state forest (Forestry Corporation of NSW, Southern Region, pers. comm.) show that few and only small changes to the area of forested land have occurred since 1949. This site has been described in detail previously (Guppy *et al*. 2014). Rainfall and temperature have been recorded for the site since 2005 and the records for 2015, and particularly for October 2015, do not stand out as unusual compared with both the October and yearly averages.

The cameras (HC500 Hyperfire Semi-Covert IR; Reconyx Inc., Wisconsin) were digital, with a passive infrared motion detector, and a night-time infrared illuminator. They were mounted on a metal stake, or strapped to a tree, and positioned (irrespective of the species) 100–150 cm from nests that were 0–3 m above ground. One camera was placed at each nest and set on high sensitivity to take 10 pictures (one per second) for each trigger. There was a delay of ~7 s between successive triggers. The SD memory cards held ~10 000 pictures and the cameras and nests were checked every 1–3 days.

Results

The pardalote nest was discovered on 5 October 2015, and the adult birds were feeding young birds on 16 October. Fig. 1 shows a male pardalote entering the nest at 1314 hours on 19 October and shows the state of the nest entrance at this time. A long-nosed bandicoot (Fig. 2) is then seen digging out the nest at 0354 hours on 21 October (Fig. 3). Fig. 4 (25 s later) shows the nest contents; two young birds in front of the nest entrance, and the bandicoot eating one young bird. Fig. 5 (taken 5.5 min after Fig. 3) shows the bandicoot eating the last of the three young birds. The three young birds disappeared (we assume the nestlings were consumed, but the photographs only show that they disappeared) over a period of 6 min, but the last fledgling may have been removed and eaten elsewhere.

Fig. 1. Male spotted pardalote (circled) entering the burrow entrance before it was dug out by the bandicoot.

Fig. 2. A long-nosed bandicoot at the site of the nest.

Fig. 3. The long-nosed bandicoot digging out the nest.

The predation episode lasted from 0344 hours (when a bandicoot was first recorded at the nest) to 0407 hours (when a bandicoot was last recorded at the nest). Fig. 6 shows the excavated nest the next morning with the tail of the male pardalote visible (see arrow). A bandicoot subsequently visited the nest on 22 October at 0448 hours and on 24 October at 0310 hours. The predation was discovered on 24 October, at which time there were no visible remains of the young birds. The remains could have been eaten by a scavenger, but this would have been detected by the camera.

Fig. 4. Two young spotted pardalotes (circled) in front of the nest entrance and one young bird (circled) in the mouth of the bandicoot.

Fig. 5. The bandicoot eating the last (circled) of the young birds.

Fig. 6. The nest in daylight, after being dug out by the bandicoot. The stringybark lining of the nest chamber is visible. The tunnel was estimated to be between 30 and 50 cm long.

Discussion

The diet of the long-nosed bandicoot comprises mainly invertebrates, plant material, and fungus (Ride 1970; Strahan 1983; Scott *et al*. 1999; Thums *et al*. 2005). To our knowledge, there is only one publication that mentions vertebrates as part of the diet; such material was found to be a minor, but constant part of the diet, comprising 4% of scat volume, and included bird feathers (Scott *et al*. 1999). Where it is known, the diet of other

species of bandicoot is similar, the vertebrate component is minor or non-existent, and birds are not mentioned *per se* in either of these studies (Keiper and Johnson 2004; Shevill and Johnson 2007). The number of long-nosed bandicoots on the site is unknown, but camera monitoring of areas where the tell-tale conical craters are found, show them to be present. However, in the three-year study of nest predators, we monitored 169 nests, 45% of which were on or close to the ground (Guppy *et al*. 2017), and did not record a bandicoot at a nest. So the long-nosed bandicoot is a rare visitor to a nest and, as such, is an insignificant nest predator. But the recording presented here shows that this animal can detect young birds underground, it will go to some effort to reach them (Fig. 3), and will eat the entire fledgling.

With the exception of some desertions on one uniquely hot day (Guppy *et al*. 2012), nest predation on this site is the only cause of nest failure (Guppy *et al*. 2017). This demonstrates the importance of nest predation relative to food supply, climatic variables and disease, and shows that the study of nest predation is important for our understanding of the factors influencing the nesting phase of independent young production in woodland bird communities. But until recently, the identity of nest predators, worldwide, has been largely unknown. It was only in the mid-2000s, when high-capacity/high-speed memory cards for digital cameras became available, that the inherent difficulties in the continuous observation of nests was overcome (Ribic *et al*. 2012).

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