

Likely depredation of a Superb Fairy-wren *Malurus cyaneus* nest by an uncommon predator, the White-browed Babbler *Pomatostomus superciliosus*

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Abstract. This paper describes a likely incident of opportunistic depredation of a Superb Fairy-wren *Malurus cyaneus* nest by an uncommon predator, the White-browed Babbler *Pomatostomus superciliosus*, and presents the first photographic evidence of nest-depredation by this species. Potential implications of the observation are discussed in the context of detecting unexpected and uncommon nest-predators.

Introduction

Nest-depredation is a significant pressure for breeding birds and causes up to 90% of failed nesting attempts (Guppy *et al.* 2017; Okada *et al.* 2017). Major nest-predators in Australian temperate woodlands include the introduced Red Fox *Vulpes vulpes*, Eastern Brown Snake *Pseudonaja textilis*, rodents, and various predatory bird species (Zanette & Jenkins 2000; Debus 2006; Colombelli-Négrel & Kleindorfer 2009; D. Belder unpubl. data). Avian nest-predators typically include large, predominantly carnivorous species such as butcherbirds *Cracticus* spp., the Australian Magpie *Gymnorhina tibicen*, currawongs *Strepera* spp., and corvids *Corvus* spp. (Zanette & Jenkins 2000; Debus 2006). However, unexpected and/or opportunistic nest-predators such as the Brown-headed Honeyeater *Meliphaga brevirostris* (Zanette 1997), Eastern Spinebill *Acanthorhynchus tenuirostris* (Guppy *et al.* 2016), and Eastern Whipbird *Psophodes olivaceus* (Guppy *et al.* 2017) have also been reported. This paper adds to a growing body of evidence that a wide range of omnivorous bird species may prey on the eggs of other species and documents an unexpected nest-predator in the context of box–gum grassy woodland habitat restoration.

Study area and methods

I located a Superb Fairy-wren *Malurus cyaneus* nest in a box–gum grassy woodland restoration planting on a farm near Wagga Wagga, New South Wales, on 21 October 2016. The nest was situated 0.35 m above the ground in a patch of Black Anther Flax-lily *Dianella revoluta*, and was under construction at the time of discovery. A UOVision UV565HD motion-sensing wildlife camera was installed ~1.5 m from the nest on the day of discovery. This was set to normal sensitivity, with a burst of three images to be captured at a minimum interval of 30 seconds, and was running constantly from the time of installation. The nest was again checked on 25 October, 31 October, and 4 November. Three eggs were laid between 31 October and 4 November. On 9 November, the nest was found to be empty but intact. I reviewed all camera imagery recorded between 4 and 9 November and identified the date, time, and probable cause of the nest failure.

Results

Imagery captured by the wildlife camera on 8 November 2016 shows a group of White-browed Babblers *Pomatostomus superciliosus* foraging amongst the Black Anther Flax-lily in which the Superb Fairy-wren nest was located. The Babblers are first captured in a sequence of images taken at 0706 h Australian Eastern Daylight Time. In the next sequence of images, at 0707 h, a single Babbler is seen with its head in the nest (Figure 1). Two breeding-plumaged male Fairy-wrens on either side of the nest appear to be exhibiting distressed or defensive behaviour; one shows the flattened posture and fluffed feathers typical of a defensive display. The camera subsequently captured at least three Superb Fairy-wrens (at least two males and one female) returning to the nest until 0840 h, after which time no further activity was recorded at the nest. The nest was known to be between 4 and 6 days into the incubation phase at the time of depredation.

Discussion

The recorded imagery depicts a White-browed Babbler probing a Superb Fairy-wren nest. This behaviour could be attributed either to predation on eggs or young, or removal of nesting material. As the nest appeared to be intact when it was subsequently checked, and no egg fragments were observed in the vicinity of the nest, it is doubtful that the Babbler inadvertently dislodged the eggs while stealing nesting material. It is therefore likely that the imagery depicts an incident of opportunistic depredation.

White-browed Babblers are typically classed as insectivores, and primarily forage among leaf-litter on the ground (Antos & Bennett 2006). Their diet consists largely of invertebrates, but they are also known to feed on small amphibians and reptiles, as well as fruits and seeds (Higgins & Peter 2002). This indicates that this species is not strictly insectivorous, and will opportunistically select other high-value prey items. There are two published records of White-browed Babblers depredating bird nests in woodland sites: Carter (1923) documented consumption of Red Wattlebird *Anthochaera carunculata* eggs, and Van Bael & Pruett-Jones (2000) recorded depredation of



Figure 1. White-browed Babbler apparently depredating a Superb Fairy-wren nest, 8 November 2016. The camera viewed the nest from the right-hand side. Note distressed/defensive behaviour exhibited by two adult male Fairy-wrens. Photo: Donna J. Belder

Splendid Fairy-wren *Malurus splendens* nests. However, the species is not well-known as a nest-predator. It is noted that the foraging behaviour and diet of the White-browed Babbler are similar to those of the Eastern Whipbird, identified by Guppy *et al.* (2017) as a primary predator of small bird nests in temperate woodland sites. Furthermore, the congeneric Grey-crowned Babbler *Pomatostomus temporalis* has been identified as a primary woodland nest-predator (Robertson *et al.* 2014), and has also been recorded depredating Splendid Fairy-wren nests (Van Bael & Pruett-Jones 2000).

The unexpected nest-predators identified in this and other studies almost always target eggs rather than hatched young. In general, depredation risk for avian nests is highest in the nestling phase, when increased activity at the nest and begging young are likely to attract the attention of predators (Muchai & du Plessis 2005; Ibáñez-Álamo *et al.* 2012). It is therefore of considerable interest that nests may also be targeted or opportunistically depredated during the laying and incubation phases by species such as the White-browed Babbler and Eastern Whipbird. Although parental investment in the breeding attempt is lower during the laying and incubation phases than in the nestling phase, nest failure and re-nesting are nonetheless costly for the breeding pair (Antczak *et al.* 2009).

The White-browed Babbler is a frequent occupant of grassy woodland restoration plantings (D. Belder unpubl. data). Although there is no strong evidence of this species acting as a primary predator, it is worth considering that the presence of the species in restoration plantings may present a predation risk for small woodland birds breeding in these sites.

This paper presents the first photographic evidence of likely nest-depredation by the White-browed Babbler. Identifying nest-predators is often difficult for several reasons. Firstly, detailed studies of nest success are undertaken infrequently, perhaps because of the labour-intensive methods required to obtain data on nest success and evidence of predation events. In the absence of empirical evidence, predation risk and primary nest-predators can at best be loosely inferred using pattern data and pre-existing knowledge of species' behaviour.

Secondly, studies of nest success have persistently used artificial nest experiments to identify nest-predators, but there is often little or no correspondence between predators of artificial and natural nests (Zanette 2002). Thirdly, unless a chance observation is made, researchers typically rely on remote surveillance via wildlife cameras to capture nest-depredation events. Use of wildlife cameras can be problematic because of high costs (both financial and labour) and low reliability (Newey *et al.* 2015). The example described in the present paper illustrates how difficult it can be to obtain irrefutable evidence of nest-depredation, and subsequently profile unexpected and/or uncommon nest-predators. For example, it is possible that a different camera angle and shorter minimum capture interval might have provided clearer images of this suspected nest-depredation event. Despite these challenges, further research on nest success is essential to enhance our understanding of nest-depredation dynamics and metapopulation processes of birds in temperate woodland habitats and restoration plantings.

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