

# Probable protective nesting association between Australasian Figbird, Noisy Friarbird and Papuan Frogmouth

Stuart Rae

The Research School of Biology, Building 116, Daley Road, Australian National University, Canberra ACT 0200, Australia  
Email: stuart@stuartrae.com

**Summary.** A pair of Australasian Figbirds *Sphecotheres vieilloti flaviventris* and a pair of Noisy Friarbirds *Philemon corniculatus* nested within 1 metre of a pair of nesting Papuan Frogmouths *Podargus papuensis*. This is likely to be an example of a protective nesting association whereby the passerines benefitted from the protective umbrella of the Frogmouths, which would be likely to exclude potential predators from the mutual nesting area. If so, this is the first record of a caprimulgid acting as a protective species in a nesting association.

## Introduction

Protective nesting associations are where one or more bird species are believed to gain better reproductive success by nesting close to another species, which by excluding potential predators envelopes the others within its protective zone. There are numerous examples of this type of relationship worldwide, where passerines are the most common protected species and raptors the most frequent protectors (Quinn & Ueta 2008). In Australia, the most common relationship is that between the Leaden Flycatcher *Myiagra rubecula* and the Noisy Friarbird *Philemon corniculatus*, where the Friarbird is regarded as the protective species (Marchant 1983). Here, I outline a probable protective nesting association between the Noisy Friarbird, Australasian Figbird *Sphecotheres vieilloti flaviventris* and Papuan Frogmouth *Podargus papuensis*.

## Observations

A Papuan Frogmouth was found sitting on a nest in Kutini-Payamu (Iron Range) National Park, Cape York, Queensland (12°44'S, 143°E), on 23 November 2011. The nest was in a tall (~25 m) Leichhardt Pine *Neolamarckia cadamba* on the edge of rainforest by a stream and adjacent to a dirt road (Figure 1). The nest branch was ~15 m above the ground, with no branches below it, and the nest was placed on a kink in the branch amongst numerous epiphytic ferns about two-thirds (5 m) of the way along the branch. Two other bird species had built their nests close to that of the Frogmouths: a pair of Australasian Figbirds was feeding young in a nest ~0.5 m from the male Frogmouth as it sat on its nest, and a pair of Noisy Friarbirds was building a nest ~1 m from it (Figure 2). No other birds' nests were found either in the tree or in adjacent trees during the subsequent 4 days of observations.



**Figure 1.** Leichhardt Pine in Kutini-Payamu (Iron Range) National Park, Queensland, 2011, where the nests of Papuan Frogmouth, Australasian Figbird and Noisy Friarbird were situated. All three nests were within the circle. Photo: Stuart Rae



**Figure 2.** A male Papuan Frogmouth (1) broods a single chick on its nest in the centre between the two passerine nests. An Australasian Figbird brings food to its young in the nest (2) on the left of the Frogmouth, and a partly built nest of a Noisy Friarbird (3) hangs from a branch in the upper right. Photo: Stuart Rae

## Discussion

The setting of the Papuan Frogmouth nest on the branch and the location of the nest-tree are typical of the species, being in the ecotone between rainforest and woodland edge, close to a watercourse and road, both of which are used as hunting habitats (Higgins 1999). Male frogmouths sit on their nests all day when they have eggs or young in the nest, and one or both of the pair is usually in attendance at all times during the night (Cleere 1998; Higgins 1999; Körtner & Geiser 1999). When a predator approaches, frogmouths can rear up in a threat posture (SR pers. obs. of Tawny Frogmouth *Podargus strigoides* in daylight: in this posture they are ~1 m wide and a third as tall). Papuan Frogmouths are slightly larger than Tawny Frogmouths (Cleere 2010) and would thus present a formidable challenge to a predator.

In the study area, potential avian predators of frogmouths, passerines, and their eggs and young include the Brown Goshawk *Accipiter fasciatus*, Grey Goshawk *A. novaehollandiae*, Red Goshawk *Erythrotriorchis radiatus*, Rufous Owl *Ninox rufa*, Black Butcherbird *Cracticus quoyi* and Pied Currawong *Strepera graculina*. Other likely predators at this site would be the Canopy Goanna *Varanus keithhornei*, Amethystine Python *Morelia amethystina*, Carpet Python *M. spilota*, Green Python *M. viridis*, Brown Tree Snake *Boiga irregularis* and Northern Tree Snake *Dendrelaphis calligastra*. Arboreal predators such as goannas and snakes would approach along the main branch, and as the Papuan Frogmouth nest was on the main branch, any threat defence by the Frogmouth might be enough to deter such potential predators and prevent their reaching the passerine nests.

There is no information on how Papuan Frogmouths react to predators at night. However, as they are nocturnal, it is likely that, like Tawny Frogmouths which swoop at approaching intruders (Bridgewater 1932, Körtner & Geiser 1999), they would be more active in defence against any potential predator at night. In contrast, diurnal birds are less likely to mob any potential predator at night (Yorzinski & Platt 2012). Therefore, by nesting close to the Papuan Frogmouths, the Figbirds and Friarbirds would be likely to gain protection from nocturnal predation.

As reproductive success declines with distance from protective species (Bogliani *et al.* 1999), it is likely that both passerine species here deliberately selected to nest near the Papuan Frogmouths for protection from predators. The Papuan Frogmouths are most likely to have built their nest first, as their chick was estimated to be 2 weeks old (by comparison with Tawny Frogmouth: SR pers. obs.) and, as they have an incubation period of ~6 weeks (Cleere 1998), the attendant Papuan Frogmouths would have been on the nest (incubating or brooding) for ~8 weeks. It is estimated that the Figbirds would have been there for ~7 weeks, for their young were ~1 week old (Crouther & Crouther 1984; Figure 2), and their building, laying and incubation would have taken ~6 weeks (North 1901; Crouther & Crouther 1984). The Friarbirds were likely to be in only the first week of nesting as their nest was only partly built (Figure 2). As the Frogmouths were brooding a 2-week-old chick and would be doing so for ~2 weeks longer (Cleere 1998), it is likely that they would be there long enough to cover the whole of the Figbirds' nesting period, but not that of the Friarbirds. However, as nest protection increases as the breeding season progresses (Redondo 1989), the Friarbirds would probably have a greater chance of protection while the Papuan Frogmouths were present with dependent young. As there are no records of any frogmouth species preying upon passerines or their nestlings (Higgins 1999), frogmouths are unlikely to be a threat to nesting friarbirds and figbirds.

Noisy Friarbirds usually act as a protective species in nesting associations (Marchant 1983), and Australasian Figbirds will also defend their nests vigorously by mobbing potential predators (Béland 1977; Crouther & Crouther 1984; Noske 1997). Both these passerine species could thus have acted as protectors by mobbing any predators and providing mutual defence to the Papuan Frogmouths in the daytime. Australasian Figbirds mostly nest in colonies (North 1901; Turner 1995; Noske 1997) or can be close to other species (most frequently the Helmeted Friarbird *Philemon buceroides* and Spangled Drongo *Dicrurus bracteatus*), which possibly provide protection (North 1901; Higgins *et al.* 2006). However, there are no published records of the Noisy Friarbird being the protected species in a protective nesting association (Higgins *et al.* 2001). In this instance, both passerines were most likely, and primarily, being protected, as their nest-building commenced after the Papuan Frogmouths' nesting was well established.

The probability of these three nests being so close together by chance could not be tested with such a small sample, but it is a possibility. However, it is likely that both passerine species selected to nest in close proximity to the nesting Papuan Frogmouths in order to gain protection from their presence, be that real or perceived. Fifteen types of nesting associations between avian orders have been identified worldwide (Quinn & Ueta 2008), with only one example involving

Caprimulgiformes—the Sand-coloured Nighthawk *Chordeiles rupestris* as the protected species amongst a colony of Black Skimmers *Rynchops niger* (Groom 1992). Of the eight records of Papuan Frogmouth nests in the Australian Nest Record Scheme, none noted any association with other species (Higgins 1999). This record of a Papuan Frogmouth is the first of a caprimulgid acting as the likely protective species, and further nest records might elucidate whether this behaviour is typical, or an important behavioural strategy for breeding success in the participating species.

I thank Duncan Rae, John Rawsthorne and Peter Ewin for comments on an earlier draft of this text and two anonymous reviewers for further suggestions.

## References

- Béland, P. (1977). Mimicry in orioles of south-eastern Queensland. *Emu* **77**, 215–218.
- Bogliani, G., Sergio, F. & Tavecchia, G. (1999). Wood pigeons nesting in association with Eurasian hobby falcons: Advantages and choice rules. *Animal Behaviour* **57**, 125–131.
- Bridgewater, A.E. (1932). Tawny Frogmouth's calls to young. *Emu* **32**, 71.
- Cleere, N. (1998). *Nightjars: A Guide to Nightjars and Related Nightbirds of the World*. Pica Press, Robertsbridge, Sussex, UK.
- Cleere, N. (2010). *Nightjars, Potoos, Frogmouths, Oilbird and Owlet-nightjars of the World*. WILDguides Ltd, Old Basing, Hampshire, UK.
- Crouther, M.M. & Crouther, M.J. (1984). Observations on the breeding of Figbirds and Common Koels. *Corella* **8**, 89–92.
- Groom, M.J. (1992). Sand-colored nighthawks parasitize the antipredator behavior of three nesting bird species. *Ecology* **73**, 785–793.
- Higgins, P.J. (Ed.) (1999). *Handbook of Australian, New Zealand & Antarctic Birds, Volume 4: Parrots to Dollarbird*. Oxford University Press, Melbourne.
- Higgins, P.J., Peter, J.M. & Cowling, S.J. (Eds) (2006). *Handbook of Australian, New Zealand & Antarctic Birds, Volume 7: Boatbill to Starlings*. Oxford University Press, Melbourne.
- Higgins, P.J., Peter, J.M. & Steele, W.K. (Eds) (2001). *Handbook of Australian, New Zealand & Antarctic Birds, Volume 5: Tyrant-flycatchers to Chats*. Oxford University Press, Melbourne.
- Körtner, G. & Geiser, F. (1999). Nesting behaviour and juvenile development of the Tawny Frogmouth *Podargus strigoides*. *Emu* **99**, 212–217.
- Marchant, S. (1983). Suggested nesting association between Leaden Flycatchers and Noisy Friarbirds. *Emu* **83**, 119–122.
- North, A.J. (1901). *Nests and Eggs of Birds Found Breeding in Australia and Tasmania*. Special Catalogue 1. Australian Museum, Sydney.
- Noske, R.A. (1997). Short breeding season of Figbirds *Sphecotheres virides* in Darwin, Northern Territory. *Corella* **21**, 44–47.
- Quinn, J.L. & Ueta, M. (2008). Protective nesting associations in birds. *Ibis* **150** (Suppl. 1), 146–167.
- Redondo, T. (1989). Avian nest defense – theoretical-models and evidence. *Behaviour* **111**, 161–195.
- Turner, D. (1995). Colonial nesting of Figbirds. *Australian Birds* **28**, 71–75.
- Yorzinski, J.L. & Platt, M.L. (2012). The difference between night and day: Antipredator behavior in birds. *Journal of Ethology* **30**, 211–218.