

SHORT NOTE

Multiple young shining cuckoos (*Chrysococcyx lucidus*) being fed by single grey warbler (*Gerygone igata*) pairs

A.J. BEAUCHAMP

17 Bellbird Ave, Onerahi, Whangarei 0110, New Zealand

Shining cuckoos from New Zealand spend winters in the Bismarck Archipelago (New Guinea) and Solomon Islands (Gill 2013), but breed in New Zealand between mid-October and early January (Gill 1982; Anderson 2009). Grey warblers (*Gerygone igata*) are the preferred host of the migratory shining cuckoo (*Chrysococcyx lucidus*) in New Zealand (Gill 1983; Higgins 1999). Grey warblers start breeding in August, in advance of the arrival of shining cuckoos in the upper North Island; if they nest successfully they can evade being parasitised (Anderson 2009). However, replacement nests can be vulnerable to parasitism by cuckoos, and nests holding young grey warbler chicks may have their nestlings evicted by adults shining cuckoos, potentially to induce renesting by warbler pairs and increase opportunities for parasitism (Briskie 2007).

Grey warbler clutches generally comprise 4 eggs (range = 2-5; Heather & Robertson 2015). Most

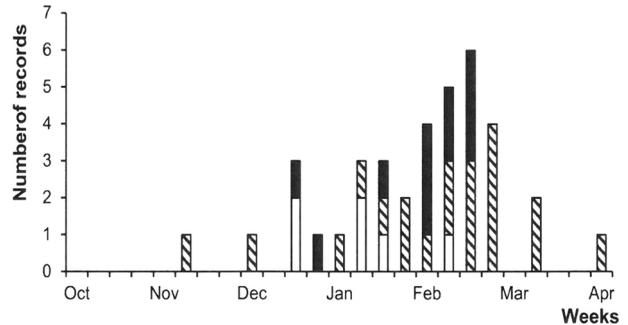
cuckoo eggs are laid during the egg laying period of the host, but some can be laid up to 9 days after a host clutch is completed (Gill 1982a, b; Briskie 2007). One cuckoo egg is generally found in a nest with grey warbler eggs, but 2 cuckoo eggs have been recorded (Briskie 2007). Shining cuckoos usually remove an egg when they parasitise a nest, and this can be either a shining cuckoo or a grey warbler egg (Briskie 2007). The host nestlings are ejected by the cuckoo chick within 4 days of hatching, or when the weight of the cuckoo chick matches that of the grey warbler chick (Gill 1982b; Higgins 1999).

It is assumed that in nests where cuckoos lay more than 1 egg, that an older cuckoo chick would eject the younger chick as well. Cuckoo chicks weigh the equivalent to c. 3 grey warbler young at fledging. Consequently, raising 1 cuckoo chick falls within the expected foraging expenditure of an average clutch of grey warbler young (Anderson *et al.* 2013), and only 1 cuckoo is expected to be raised at a time by a grey warbler pair (Gill 1982c, 2013; Wakelin 1967). Gill (1982a) found that newly fledged

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Correspondence: tbeauchamp@doc.govt.nz

Fig. 1. Records from OSNZ and this study of the detection of dependent shining cuckoo with grey warblers in New Zealand. Solid filled bar = multiple cuckoo; unfilled bar = Kawau single cuckoo records; hatching = OSNZ published records in "Summarised Notes" and "Classified Summarised Notes" publications collated from *Notornis* volumes 1 to 45.



shining cuckoos were generally silent while they remain weak flyers, but then become noisy when their flight capacity increased. They were fed up to 4-5 weeks after they left the nest (Gill 1982c).

There are no observations to confirm that 2 shining cuckoo chicks are ever raised in the same grey warbler nest, or that cuckoo and grey warbler chicks are raised in the same clutch. However, there are published observations of either multiple cuckoo fledglings being fed by a single pair of warblers, or a single cuckoo fledgling being fed by more than a pair of hosts. For example, between 1940 and 2006, Ornithological Society of New Zealand (OSNZ) members recorded, in Classified Summarised Notes (CSN) and individual contributions, 17 observations of single cuckoo fledglings being fed by 1 or a pair of grey warblers, but also 5 records of 2 shining cuckoo fledglings (Anon 1943; Stidolph 1955; Sibson 1957, 1958; Buchanan 1998), and 2 records of 3 shining cuckoo young seemingly being fed by a single pair of warblers (Edgar 1973; Parkin 1954). In addition, there are 5 records of cuckoo fledglings being fed by a succession of 8-10 warblers (Edgar 1972), and 1 cuckoo fledgling being fed by 5 grey warblers (Edgar 1972). One record indicated that 2 cuckoo fledglings were fed by the same warbler pair for at least 7 days (Stidolph 1955) and 3 fledglings were fed in the same location over 3 days (Parkin 1954). Here I report on 3 occasions over a period of 5 years in which I recorded grey warblers feeding several cuckoo fledglings simultaneously (Fig. 1).

The first observations were made on the margins of Mansion House Lawn (-36.4314 S, 174.8188 E), on Kawau Island. Between 1700-1905 h on 28 January 2012, 3 shining cuckoo fledglings were seen moving together within 5 m of each other calling, begging and being fed by a grey warbler pair member as the cuckoo fledglings and warblers ranged over an area of 0.8 ha. An adult cuckoo was seen near the fledglings at 1700 h on 28 January but no interactions were seen. Between 1143-1215 h on

the 29 January 2012 another cuckoo fledgling joined the group. The 4 cuckoo fledglings were observed for a cumulative total of 47 minutes between 1245-1850 h on 29 January 2012 from distances between 3-7 m away. At least 3 of these birds followed the warbler in turn to beg for food and each being fed during a 6-minute period. During this time, the young cuckoos that were not being fed were visible within 1-10 m of each other, confirming that 4 cuckoos were present simultaneously. The 4 young cuckoos were still together between 0738-0750 h on 30 January 2012 when I left the island.

A second observation of grey warblers feeding multiple cuckoo fledglings was in a tree at the front of a property on Douglas Street, Whangarei (-35.7063 S, 174.3099 E). Between 1946-2000 h on 15 January 2013, I recorded 2 cuckoo fledglings being fed by a single grey warbler. During that time, the fledglings were calling continuously while perched less than 2 m apart in the tree.

The final observation of several shining cuckoo fledglings being fed by simultaneously by a single warbler pair involved 2 well-feathered cuckoo young at Kawakawa Bay, Auckland (-36.9372 S, 175.1839 E). The cuckoos were observed in the same pohutukawa on 27 and 28 January 2016, along with 2 grey warblers, one of which was observed feeding the cuckoos. The grey warblers chased 2 silvereyes (*Zosterops lateralis*) and attempted to chase a tui (*Prosthemadera novaeseelandiae*) from the tree. An adult cuckoo was sometimes within 20 m of the fledglings but was not seen interacting with them; it gave the call note and chatter notes, and then 14 whistling calls (Beauchamp 2016). Adult cuckoos are known to occasionally feed cuckoo young (Anonymous 1946) but were not seen doing so here.

All 3 observations of multiple cuckoo fledglings associating with pairs and/or single grey warblers coincided with the period that single dependent cuckoo fledglings were seen (Fig. 1). Thus, there was no evidence that multiple associations were

restricted to just one part of the breeding season, although most occurred within the peak breeding period of the shining cuckoo.

The mechanisms that lead to multiple cuckoos being fed by a single grey warbler or single pair are unclear. Fulton (1909) reported that 2 cuckoo fledglings were fed by 1 grey warbler, after 2 neighbouring grey warblers met (each with a solo cuckoo young). One of the grey warblers then deserted its cuckoo young, and the second warbler “adopted” the abandoned cuckoo fledgling. This may explain how pairs of grey warblers end up with 2 cuckoo young, but it seems unlikely to explain all situations where there are more than 2 young.

On Kawau Island it is possible that the 3 (likely 4) shining cuckoo fledglings I observed being fed by one pair could have been raised within the abutting neighbouring grey warbler territories; but that would be unusual, as previously only 1 dependent young cuckoo had been detected in the 22 ha I surveyed in each visit in the previous 22 years (Beauchamp 2016). The appearance of a fourth young cuckoo during the time that I was following the group of 3 cuckoo fledglings and the grey warbler, and where no other grey warbler pairs were present, suggests that groups of cuckoos could be made up of newly “independent” young from non-abutting home ranges attaching themselves to a grey warbler that is still feeding a cuckoo.

Soler *et al.* (2014) studied the magpie (*Pica pica*) parasitised by the great spotted cuckoo (*Clamator glandarius*) and found that broods at fledgling comprised either magpie or cuckoo young; and that in some situations, cuckoos left natal groups to be adopted and fed by other magpies. Soler *et al.* (2014) used three experimental manipulations to assess the adaptive reasons for post fledgling adoption. Experimental translocations of dependent fledgling cuckoos over distances averaging 7 km resulted in adoptions and feeding, but only by magpies that were feeding fledgling cuckoos at that time. Magpie pairs that had no dependent young, or just magpie fledglings, did not feed cuckoo fledglings during that season. Host magpies recognized their nest-raised cuckoo fledglings and fed them preferentially (Soler *et al.* 2014). Magpie nests are frequently multi-parasitised, and post-fledgling competition may result in some great spotted cuckoo young attaching to magpies that are better disposed to raising them (Soler *et al.* 2014).

My observations and review of the literature suggest post-fledgling parental care of multiple shining cuckoos by a single grey warbler pair may be more common than previously appreciated. Why such adoptions by grey warbler occur, and their importance in maintaining shining cuckoo populations is not known but deserves further investigation. Observations, including that adult

shinning cuckoo adults can feed cuckoo fledglings (Anonymous 1944; Stidolph 1955), and that there may be post-fledgling care by multiple grey warblers of cuckoo fledglings (Anonymous 1940; Edgar 1972), indicate that there could be differences between the grey warbler – shining cuckoo breeding system and other host-cuckoo systems.

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