

Rebuttal of Johnstone, Kirkby, and Kissane's claim about a first record of Carnaby's Cockatoo raising two broods in one season

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Johnstone, Kirkby, and Kissane recently (2024) published a paper titled *First record of Carnaby's Cockatoo raising two broods in one season* in *Corella* (48: 24-27). The paper provided a two-sentence abstract, both of which were incorrect; a poor introduction to the subject of double-brooding; an inadequate description of methods; an inadequate presentation of the results; incorrectly interpreted results; and finished with a discursive, virtually citation-free discussion. On the evidence presented, Johnstone *et al.* did not demonstrate that a female Carnaby's Cockatoo raised a second brood in one season; however, they have described a case of the same hollow being used successfully in the same season by different female Carnaby's Cockatoos, an uncommon occurrence.

Keywords: Carnaby's Cockatoo, *Zanda latirostris*, double brooding

PREAMBLE

On 3 July 2024, the executive officer of the Western Australian Carnaby's Cockatoo Recovery Team circulated agenda papers for the next Recovery Team meeting to all team members and observers. Included in the papers was a copy of Johnstone *et al.*'s (2024) research paper in the journal *Corella*, reporting on their record of a female Carnaby's Cockatoo *Zanda latirostris* raising two broods in one season. As an observer of Recovery Team meetings, DAS received a copy of the papers. As someone who has had a research engagement with Carnaby's Cockatoos since January 1968 until the present, DAS read Johnstone *et al.*'s paper with interest and increasing concern. DAS's concerns were such that he contacted PRM, a long-term colleague and collaborator in research on Carnaby's Cockatoo, and asked if he had read the paper. PRM had read the paper; in fact, in great detail as he had been asked by *Corella*'s sub-editor terrestrial birds to review the paper for the journal and submit his report and recommendation. PRM's detailed report on the journal's review template ended with the recommendation that: *With some heavy editing and revision this could make a concise Short Note, but there is little to indicate it can ever have the makings of a full research paper.*

In the light of our assessment of the paper published in *Corella*, we have undertaken a detailed critique of the paper under the headings used by Johnstone *et al.* and demonstrate there is too much uncertainty in the evidence used to justify their claim of "first record of double breeding" in this species.

INTRODUCTION

Johnstone *et al.*'s introduction consists of three paragraphs. The first aims to set out the potential significance of successful double-brooding in this species, but the authors limit the text to accounts of a few local, south-west Western Australian passerine species with well-recognised precocial breeding

strategies (moderate clutch size, short incubation, short nestling period, and little or no parental investment post-fledging). This irrelevant paragraph has only one citation, to Johnstone and Storr (2004).

The second paragraph states *In what is our most studied cockatoo, the Galah Eolophus roseicapilla, Rowley (1990) recorded them re-laying after failure.* This statement about the Galah being the most studied cockatoo is not correct. Rowley studied the Galah from 1970-1976 and produced three research papers and the book that Johnstone *et al.* cite. Johnstone *et al.* discount Carnaby's Cockatoo, the subject of their paper, which, without doubt, is the most studied cockatoo, not only in Australia, but in the world. Carnaby's Cockatoo has been the subject of much research, with more than 50 scientific papers on the cockatoo's behaviour and ecology published since Carnaby (1948) and Perry (1948) and Saunders and many others from 1974 until the present (e.g., Saunders 1974, 1982; Saunders and Ingram 1998; Saunders and Dawson 2018; Riley *et al.* 2023; Le Souëf *et al.* 2024; Ryken *et al.* 2024).

The brevity of the Introduction is inadequate. No examples of double-brooding are provided of non-passerines and in particular altricial species such as cockatoos (small clutch size, lengthy incubation period, prolonged nestling period, and 11 months post-fledging parental investment). Carnaby's Cockatoo's breeding biology is well documented in the published literature, mostly recently by Saunders *et al.* (2014) and Saunders and Dawson (2018), yet Johnstone *et al.* make no reference to those studies. At the suggestion of at least one of the reviewers of their paper after submission, Johnstone *et al.* cite Johnstone *et al.* (2013) in relation to the breeding biology of the Forest Red-Tailed Cockatoo *Calyptorhynchus banksii naso* and Saunders' (1977) account of Red-tailed Black Cockatoos breeding twice a year (autumn and spring) in south-west of Western Australia; however, Saunders' (2023) paper elaborating on his earlier (Saunders 1977) account and Emison

et al.'s (1995) description of presumptive reneesting of Red-tailed Black-Cockatoos in south-eastern Australia are not cited. None of these papers refer to two successful breeding attempts by the same female in the same breeding season.

METHODS

Johnstone *et al.*'s first paragraph describes previous research conducted by Johnstone and Kirkby on other black cockatoos and at Johnstone *et al.*'s study site at Cataby, with no details given of its location. None of the previous research is relevant to the subject of their paper. The second paragraph is a poor description of the research related to identifying individuals. Mention is made of measurements taken from all nestlings handled; however, no detail is provided of what measurements were made, nor how those data were used to inform the results. For Carnaby's Cockatoo one would expect to see reference to Saunders *et al.* (2015), who provided well-researched methods for aging nestlings based on measurements of a nestling's folded left wing or on comparisons with a series of photographs of nestlings at weekly intervals. The omission of this information is important when their results are presented later.

RESULTS

Since no mention is made of how the nestlings in the two reported cases were aged, it is difficult to see how the claimed hatching dates could be as accurate as stated by Johnstone *et al.* They state that on 19 September 2022, during the first breeding attempt in artificial hollow #1375, there was a nestling that was two days old and an egg. With their estimate of a two-day-old nestling, the nestling would have emerged from the egg on 17 September. The adult female was trapped on the hollow on 8 November 2022 and banded with an Australian Bird and Bat Banding Scheme individually numbered metal band (320-02106) and colour-banded (purple/yellow) on the other leg. The nestling was also banded (320-02107) and colour-banded (red/purple) the following day (9 November 2022). Mr Rick Dawson trapped the female and banded both the adult and nestling. He measured the length of the nestling's folded left wing (278 mm) and, using the table for aging set out in Saunders *et al.* (2015), estimated its age at 59 days. Working back from this age, the nestling hatched around 11 September 2022; six days earlier than the hatching date given by Johnstone *et al.* By 25 November 2022, the nestling had fledged successfully, by which time it would have been around 75 days old, within the published range of fledging ages (Saunders 1982; Saunders *et al.* 2015).

On 10 February 2023, an adult female was flushed from the hollow (#1375) used earlier. The hollow contained a nestling estimated by Johnstone *et al.* to be three days old and an added egg. It is particularly important to note that the female flushed from the hollow was not identified at this time. Johnstone *et al.* state: *We presumed that the current pair were different birds and late breeders (eggs would have been laid around 4-6 January and this nestling would fledge in April); however, banding details from later photographs showed that this was the same female that had bred previously.* The authors published two photographs of adult female 320-02106 (purple/yellow), but none are dated, so the reader is provided no evidence to show that the unidentified female flushed from the hollow is the same one they recorded near the hollow on 22 March 2023.

On 3 March and 22 March 2023, Johnstone *et al.* observed three birds in the tree to which hollow #1375 was attached. According to Johnstone *et al.*, only the fledgling (320-02107 red/purple) was identified on 3 March. No birds were recorded entering the hollow, which contained a healthy, pin-feathered nestling (banded 320-02120). On 22 March, three birds were observed near #1375: an adult female (purple/yellow), a fledgling (red/purple), and an unbanded, and therefore unidentifiable, adult male. The male was recorded entering the hollow and feeding the nestling. Note that at no time was the adult female 320-02106 (purple/yellow) recorded entering the hollow.

Using analysis based on DNA, Saunders *et al.* (2018) demonstrated that, while Carnaby's Cockatoos display strong pair bonds, 27% of second eggs are fertilised by a male other than the male paired with the female. We have observed that it is not uncommon for an unrelated male to accompany a paired female around active nest hollows. Despite the fact that the male was not banded and the banded female was not observed entering hollow #1375 on 22 March, Johnstone *et al.* assumed that after fledging one young for the season, the presence of the leg banded/colour banded female (purple/yellow) around the hollow on 22 March constituted a second breeding record and interpreted that observation as *This is the first confirmed record of double breeding by female Carnaby's Cockatoo.*

DISCUSSION

As Johnstone *et al.*'s claim that their first confirmed record of double-breeding in Carnaby's Cockatoo cannot be substantiated with the published data, the Discussion is immaterial.

CONCLUSION

At best, Johnstone *et al.* have documented a case of the same hollow being used successfully by different female Carnaby's Cockatoos in the same season. This is an uncommon phenomenon recorded several times at Coomallo Creek by Dawson, Mawson, and Saunders (unpublished data). For example, at Coomallo Creek, 67 km north of Cataby, between 1970 and 1976, of 482 breeding attempts, two (0.4%), and between 2009 and 2023 of 1,545 breeding attempts, four (0.3%) were successfully made in the same hollow in the same season. In the latter period, they were made in both natural and artificial hollows. In the light of the infrequency of this happening in the wild, Johnstone *et al.*'s observations warrant a short note documenting the phenomenon.

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