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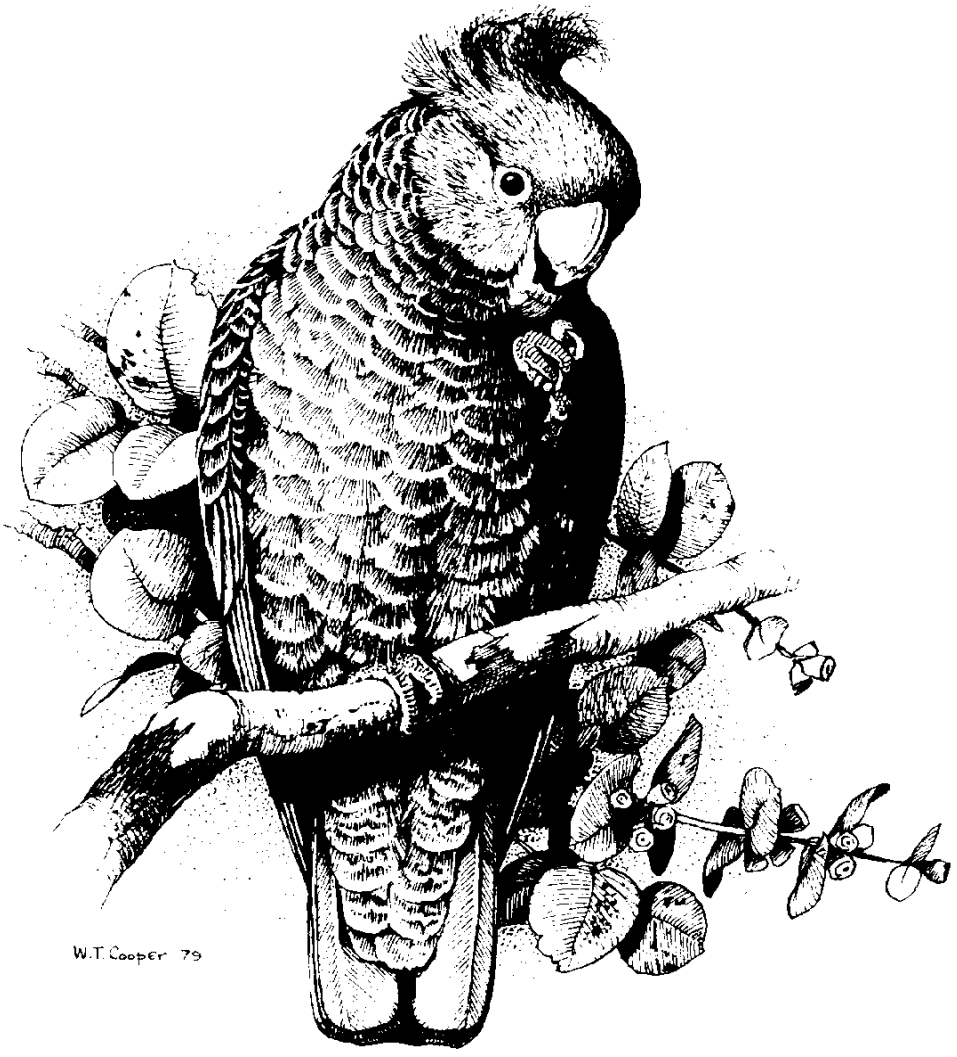

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ARTICLES

Canberra Bird Notes 45(2) (2020): 107-110

BREEDING OF BASSIAN THRUSH AT THE AUSTRALIAN NATIONAL BOTANIC GARDENS IN 2018

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Abstract. *Bassian Thrush (BT), Zoothera lunulata, breeding at the Australian National Botanic Gardens (ANBG) in 2018 was notable. Reports from a number of sources suggest that there were at least three, possibly five, fledglings from at least two, possibly four, nests. Compared to previous records, this is an extraordinary breeding event.*

Active nests of BT were located in August 2018 about 360 metres apart: one in Section 51 and one south of the rainforest gully in or near Section 219 (exact section not recorded). As well, the behaviour of adults in Section 1 at this time and the later location of a fledgling at the same location suggested that a nest was also located there (about 200m from the other two nests). In September, nestlings were found in Section 51 and fledglings were found in a number of sections. A fledgling located in the Sydney Gully in October is most likely from a fourth nest which was not located.

Figure 1. Bassian Thrush fledgling, Section 1, 17 September 2018 (*Steve Wallace*).

Reports of BT breeding behaviour began on 12 Aug when three birds were reported by John Leonard in Section 20 (a minimum of 50 m from Section 1) with one of these birds collecting nesting material. Also on 12 Aug, Marnix Zwankhuizen reported a bird gathering nesting material in Section 2. I saw an adult gathering food in Section 1 on 13 Aug (to feed female?) and filmed a fledgling being fed in the same location on 17 Sep.

On 12 Aug, Marnix Zwankhuizen reported a pair in Section 51 with a female being fed while on a nest. I located the nest and filmed the female being fed while on it on 13 Aug and on 10 Sep two nestlings being fed. The young were still in the nest the next day. On 17 Sep, the nest was empty but a fledgling was located 70m from the nest (Sections 46 and 47). On 22 Sep, Graeme Austin located two smaller BTs (fledglings?) in Sections 42/46/47 (personal communication).

Christine D. located a bird on a nest south of the Rainforest Gully on 22 Aug. A bird carrying food was recorded by A. Smith (2018a) on 24 Aug in the Rainforest Gully and another carrying food in the Sydney Gully. On the same day, Patrick Wyllie reported a bird carrying food on the Eucalypt Lawn (a large grassed area covering most of the area between Section 1, Section 51 and the Sydney Gully) and recorded a bird on a nest but did not detail where. On 5 Oct, A. Smith (2018b) photographed a fledgling in the Sydney Gully. This bird is probably from a third nest. Although the record is just two weeks after the recording of the other fledglings, it is not considered to be one of these because of its level of plumage development. The location is also at least 200 metres from the nest in Section 51 and the possible nest in Section 1.

Figure 2 - Map of ANBG showing sections mentioned in the text.

While the species is regularly seen at ANBG, breeding records, and in particular successful fledging, are uncommon in both ANBG and the ACT. The COG records up to the end of June 2014 contained only six breeding records for the species in the ACT, with only one of these at ANBG (on nest). To June 2018, only four more breeding records had been added with three of these at ANBG: two records of nests with young in July 2015 and one of an adult carrying food in September 2017. Only one of the ten ACT records was of dependent young, recorded at New Chums Road in 1986. The 2018 breeding records represent a

significant increase in the BT breeding records for the ACT, particularly for dependent young.

In a couple of chance encounters at ANBG with Emeritus Professor Andrew Cockburn, he suggested reasons why BT nesting success may be different in 2018. Based on the work done on the birds at ANBG over many years, he said that nestlings were a food Pied Currawong (PC) fed to their young but were not the preferred food of the adults. He suggested that BT rarely fledged due to PC predation of nestlings when nesting of the two species coincides. In 2018, PC breeding had been delayed in the dry conditions, possibly because nesting of Superb Fairy-wren, another source of nestlings for PC young, had also been delayed. Reduced predation by PC may have contributed to the success of BT breeding in 2018.

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THE 2018-2019 ACT EASTERN KOEL SEASON. I. ADULT AND FLEDGLING BEHAVIOUR IN CHAPMAN/RIVETT AND NARRABUNDAH

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Abstract. *Detailed observations on the behaviour of adult and fledgling Eastern Koels* (Eudynamys orientalis) *from the Chapman/Rivett area for the seasons from 2013-2014 to 2017-2018 were provided in five previous papers. The first of two articles documents further observations of adult behaviour and the pattern of sightings of fledglings during the summer 2018-2019. It also contains relevant observations from Narrabundah, adding to those reported earlier for the 2017-2018 season. Part II details the 2018-2019 Koel season elsewhere in Canberra.*

1. Introduction

Previously I have published observations of Eastern Koel (*Eudynamys orientalis*) (hereafter Koel) fledglings and adult behaviour in Chapman/Rivett for the five Koel seasons from 2013-2014 to 2017-2018 (Holland, 2018a and references therein). This paper documents some further aspects of adult behaviour, and the smaller number and different pattern of fledgling records in the summer of 2018-2019. Also included are details of adult Koel activity and fledglings around Diana White's place in Narrabundah, further building on the observations of the high number of fledglings found there in 2017-2018 (Holland 2018b).

2. Methodology

My observations were made in the same way as described in Holland (2018a), and Koel calls are also described in the same way. Diana White's observations were again made either from around her garden or from her walks around her area, though this year she did not venture as far as usual due to the heat, particularly in January. All calls in her account are given as she has described them.

3. Observations in Chapman/Rivett

3.1. Aspects of adult behaviour during the 2018-2019 season

The first Koel report (as posted on eBird Australia) for the season in Canberra was from Celia Hindmarsh on 2 Oct. She heard it in the "nature strip" behind her house in Mentha Pl Rivett at 08:00 h, giving both the *wurra-wurra wurra* and *coo-wee* calls. This is the Themeda/Mentha lane (T/M lane hereafter) which is close to my place and has previously been a favourite location for Koels, including fledglings (Holland 2018a). However, it was not until 08:15 h on 9 Oct that I heard my first male Koel giving both calls from across Darwinia Tce (often just Tce hereafter). That afternoon around 16:42 h, on checking the mainly *ko-el* calling, I found 2 males together in the small Rivett park about 300 m from our house and around 150 m from Celia's site.

At least one male stayed around, it was sometimes seen, but was heard daily up to 28 Oct, mainly in that area. Apart from the occasional *whoaing*, it was nearly all *ko-el* calling,

including for long periods from before 05:00 h on 16 and 17 Oct, an indication that female Koels had yet to arrive in my area.

We were then away until 7 Nov, after which male calling continued from a much wider area and with a greater proportion of *whoas*, but one was seen on only one occasion. This included such calling around 04:10 h and 03:15 h on 13 and 15 Nov, respectively, further support that this call can be given when it is still dark (Holland 2018a, see also further below). Quite a few Red Wattlebird (*Anthochaera carunculata*, hereafter RWB) fledglings were seen or heard being fed from about then, including two being fed separately in my GBS site.

At 06:40 h on 22 Nov a male was seen *kek kek kekking* while it flew, pursued by a RWB, to the rear of 46 Croton St Rivett, a further example of a male giving this call, which is usually associated with the female (see Holland 2017a). It is also a spot where Koels have been seen in the past (Holland, 2017a), and where a male was seen on 16 Oct. The male then commenced *whoaing*, and then both *whoas* and *kek keks* could be heard coming from (a) different bird(s) to the WNW about 150-200 m away, with some *ko-el* calling beyond there. At 06:41 h the male flew towards the calling.

This was the first time a female call had been clearly heard, and the incident heralded a much more active period of adult Koel activity up to Christmas. For several minutes around 16:43 h on 24 Nov there were repeated harsher female calls sounding very much like the Dollarbird (*Eurystomus orientalis*), with some *whoas* interspersed, from Burgan Pl Rivett. At 06:28 h on 25 Nov I heard this same call again on the Duffy side of the W end of Hindmarsh Drive, and then again at 06:47 h, together with *ko-eling* (a male was seen) and *whoaing* from the rear of 50 Tullaroop St. Soon 2 RWBs chased a bird from there into a Hakea bush on the adjacent verge of Hindmarsh Drive. A female Koel soon emerged, and I could see a possible nest in the bush (it was later confirmed to be old). The activity continued until at least 06:54 h.

From 17:30 h that afternoon the female was initially calling harshly and flying around in my GBS site. Shortly after she gave a more normal call and there was much *kek kekking*, *whoaing* and *ko-eling* until 20:28 h. From then a party of at least three birds were calling/disputing in the local area, often for much of the day. This consisted of a male still giving continuous *ko-el* calls, and less frequently another male giving the *whoa* call (the two could often be heard at the same time), accompanied by a female's *kek kek kekking* (the harsh call was heard again only on 30 Nov).

This activity was far too complex to describe in detail, but the following are worth mentioning:

1. While the activity covered an area with a radius of around 1 km from our house[1] , more than three birds were only occasionally heard or seen together (two females were heard together only a few times). It was not clear whether there was more than one group of Koels present. The presence of the harsher calling female both in Duffy and my GBS site around 700 m distant on the same day (25 Nov) provides some evidence for a single mobile group of Koels moving around to different spots.

[1] Covering the S end of Duffy, the W parts of Rivett from Bangalay Cres, Rivett Oval and Salsola St, and the NW half of Chapman W from about the Chapman shops.

2. Birds were often seen, continuing a trend over the past few years where, as their presence and activity has increased, both sexes have become much easier to observe, rather than just to hear their calls.

3. This includes a pair often together (sometimes silent) in my GBS site, with a female seen giving some *ko-el*-like growls while the male was *whoaing* around 18:00 h on 30 Nov. At 12:54 h on 21 Dec, following some close *whoas* and *kek keks*, a female was found crouched in a quite bizarre, forward-leaning, frozen position in a *Melaleuca* bush at our rear fence. There were some more *whoas* at 13:03-13:04 h and a male could then be seen sitting still in an Argyle Apple tree <10 m away, with the female still frozen. Both called at 13:10 h from the same places, and after a few more calls the female was still there frozen at 13:30 h, but had gone by 13:40 h.

4. More *whoaing* was heard at 04:35 and 04:52 h on 1 Dec, at 04:50 h on 3 Dec, at 03:45-03:48 h on 11 Dec, at 04:45 h on 17 Dec and 04:33 h on 18 Dec, further evidence that this male call can be given while it is still dark (Holland 2018a). This call gradually became the dominant one from the end of the first week of December. Interestingly from 8-16 Dec most of the *ko-el* calling came from the edge of Chapman backing onto Cooleman Ridge, including the rear of 44 Monkman St. This suggested that the remaining unpaired male(s) had moved to the edge of the suburbs.

5. At 06:51-06:52 h on 3 Dec a pair of Koels copulated briefly (just a couple of seconds) at the top of the big tree at the rear of 75 Tce. This was followed by *whoas* and some *kek keks* as the birds remained there, with the two nearby RWBs briefly showing some aggression.

6. A male was seen being harassed by a Noisy Friarbird (*Philemon corniculatus*) on 6 and 18 Dec, and a Pied Currawong (*Streptura graculina*) on 7 Dec. Males or females were being chased by Australian Magpies (*Gymnorhina tibicen*) on 21 Dec, as well as on 7 and 9 Jan 2019. These interactions all occurred within my GBS site.

The above activity coincided with the completion of a RWB nest just above eye level in a flowering plum outside our bedroom window. Birds were on it from 27 Nov, and on 11 Dec the first feeding could be seen. From 09:25-09:30 h on 17 Dec there were *kek keks* very close, with the RWBs clearly alarmed. On investigation a female Koel flew out of the nearby Snow Gum with a RWB in pursuit.

However, on 19 Dec the heads of two chicks could first be seen taking the offered food, indicating that these were RWBs and not Koels. There was only one chick in the nest on 22 Dec, and after we were away from 25 Dec to 5 Jan there was just a single RWB fledgling in our GBS site in early January 2019.

On our return the Koel calling activity continued but with only *whoas* and *kek keks* given, with no male *ko-eling* heard until 30 Jan. However, adults were only seen on three occasions up to 14 Jan. After this time adult calling was also reduced, perhaps due to the very hot second half of January, and with only a single female observed on 27 Jan, the last adult actually seen. One interesting observation was of two birds heard giving distinctly different *whoa* calls from the Rafferty/Monkman Sts direction from 06:48-06:59 h on 23 Jan, the longest stretch of calling for quite some time. There was also more *whoa* calling before or close to first light, *i.e.* 10 times between 6 and 20 Jan, starting from 05:13 to 05:30 h, and 4

times from 26-29 Jan, starting from 05:31-05:47 h. Interestingly, *kek keks* were only definitely heard at 05:17 h on 13 Jan.

Although three birds could still be distinctly heard on the morning of 7 Feb, calling was further reduced in February. While calling seemed to pick up a bit for a few days mid-month, it soon decreased again and it was very quiet early in March, with the last *whoas* heard on the mornings of 10 and 11 Mar. During this time the *ko-el* call was heard on three occasions between 2-17 Feb, plus a very raspy one within our GBS site on the afternoon of 3 Mar.

In summary, although female Koels arrived late, in terms of adults the 2018-2019 season was the busiest it has ever been, with activity within my GBS site for a total of 16 of the 18 GBS weeks starting from 6 Nov to 5 Mar, the longest so far (*cf* 11 weeks for 2017-2018). However, breeding was less successful, as described in Section 3.2.

3.2. Fledglings in Chapman/Rivett during the 2018-2019 season

Although I listened carefully for them, no fledglings were found on our return on 5 Jan, despite the pre-Christmas activity. However, RWB fledglings were counted from seven different locations up to 1 Feb, including 2 close together on that date in the core 2018 Koel fledgling area (Holland, 2018a).

Map 1. Locations of fledglings in Rivett and Chapman. The white lines forming a triangle are the approximate boundaries within which JH1 and JH2 were observed.

I found my first Koel fledgling on 24 Jan over 200 m away from the rear of 75 Tce, around 51 days after the above copulation observation there on 3 Dec. I thought I could hear the typical (though soft) Koel fledgling begging call near there around 06:35 h on 22 Jan, but this could not be later confirmed.

In total I positively confirmed only three fledglings in 2019. Details of these are in Table 1, which also includes the 2 fledglings found by Susan Wishart in Chapman. Their locations may be found in Map 1. The discussion of these follows the Table.

Table 1 Details of the fledglings found in Chapman/Rivett in 2019.

Date	Time (h)	Comments
Fledgling JH1		
24 Jan	18:30-18:33	Fledgling with a quite long tail located in a large Oak at the front of 26 Goodenia St Rivett. It was begging loudly but not seen until a RWB fed it.
It was seen again at 6:30-6:33 h on 26 Jan at 29-33 Goodenia (again fed by a RWB), at 19:52-19:54 h on 31 Jan at 30 Goodenia St, and at 06:48 h at the front of 28 Casuarina St (100 m away) on 3 Feb, when 1 of 5 RWBs present fed it. While it begged very loudly and could be heard from >100 m away on all the above occasions, it could not be located each time it was otherwise checked (it was heard at 16:54-16:57 h at 20-22 Casuarina St on 27 Jan, but not on the evening or morning of 28 and 29 Jan, respectively, or on 4 occasions between 1-11 Feb).		
Fledgling JH2		
5 Feb	06:38-06:43	A light brown fledgling was found in a medium-large Photinia at the front of 20 Kanooka St Rivett (heard begging from 50 m away). On approach two RWBs were active, often growling, in same bush, but feeding not confirmed.
A brownish fledgling was seen at 15 Kanooka at similar times on 3 occasions between 9-12 Feb. It sometimes begged very loudly (it could be heard from >200 m away on 9 Feb), but at other times quite softly. On 9 Feb it was noted there was not much black around the head and face/cheek, so it was probably not that advanced. It also flew weakly at first, but more strongly soon after. RWBs were actively feeding quite close by on all occasions, and twice followed the fledgling as it flew away, but feeding it was never confirmed. It was also heard begging in the area on 4 similar times between 7-17 Feb, with a further outlier on 25 Feb. On 16 and 17 Feb it could be heard begging from >100 m away and traced to gums at the rear of 37 Kanooka St. This is diagonally opposite No 20 due to the U-shaped street, and all observations were within 150 m of each other. It could not be heard on the morning of 6 Feb, or, except for softly on 25 Feb, on 5 occasions between 19-27 Feb.		
Fledgling JH3		
27 Feb	06:40-06:42	Soft begging at 84 Monkman St Chapman was traced to an exotic tree at the edge of No 86. A very long-tailed fledgling then flew 30 m across the block.
Soft but clear begging was heard at 06:42 h on 28 Feb, the fledgling was close to the same position before it flew to the back of No 86. Both times no RWBs were around, so possibly fully independent.		
Fledglings SW1 and SW2		
Susan Wishart informed me she had two fledglings that year in Musgrove Street Chapman on the corner of Rolfe Pl. She had photos from 28 Jan of a Koel fledgling being fed by RWBs, and then more photos from 7 Feb of a Koel fledgling, but did not remember seeing the host birds. At the same time, just across the road, she could see a Koel chick still in a RWB nest. So at least 2 new ones.		

These were the only fledglings I fully confirmed. Clear begging was also heard from the rear of 126-128 Perry Drive around 06:50 h on 4 Feb, but not again despite regular checking. This is around 250 m from where JH2 was located the next day, and over 200 m from where JH3 was found 3 weeks later. I concluded that JH1 and JH2 (which were never found sequentially) were different as they were at least 225 m apart at their closest point, and the latter was recorded over 21 days (13 days if the aural record of 25 Feb is discounted). JH2 and the possibly independent JH3 may have been the same though they were observed >300 m apart.

Interestingly, all my three were found at the eastern and southern periphery of the area where fledglings have been observed in previous years. Fledgling JH1's location was close to where fledglings F1b and J5/6 were on a single occasions (Holland 2017a and Holland 2018a, respectively), but otherwise previous sightings have been at least 150 m away. However, at its closest point (rear of 37 Kanooka St), JH2 was <50 m away from fledgling

J4 (115 Tce) in 2018, whereas JH3 was where the mobile J2 was seen on one occasion (Holland 2018a and Holland 2017a, respectively).

Despite the pre-Christmas activity, no fledglings were found elsewhere in the area outlined in footnote 1, including the previously favoured spot around the T/M lane and the Rivett park, where the season's Koel activity was initially centred (see above).

The two fledglings observed by Susan Wishart (see Table 1) should also be noted. They were at the SE of the area noted in Footnote 1, around 350 and >400 m away from JH2 and JH3, respectively. Musgrove St is right on the edge of my usual (about once a week) coverage, but as I was regularly checking my other fledglings, I didn't go there for over 3 weeks after 24 Jan and missed these.

Only for JH1 was the RWB conclusively proven as the host. It was likely also the host for JH2, as RWBs were often present and may have fed it several times. No definite host was seen for JH3. Noisy Friarbirds (sounding very like Koel fledglings) were nearby on 28 Feb, but they were only passing through and none were observed in the area during January, which is when eggs would have needed to be laid.

As in 2016-2017 and 2017-2018, and in contrast to the previous years (see Discussion in Holland 2017a), very few adults were found close to fledglings. Adults calling near fledglings were only noted on three occasions, for JH1 on 3 Feb, and JH2 on 7 and 12 Feb, respectively.

Noisy Miners (*Manorina melanocephala*) have previously been present in the area where JH1 was observed, though they were not noticed while JH1 was present there. They have a territory centred on the eastern side of the Bangalay Cres underpass about 150 m to the NE. This is the only area to date occupied by Noisy Miners in Rivett where Koel fledglings have been found. While a fledgling was found near this underpass on 15 February 2014 (see Holland, 2014), this was about a year before the Noisy Miners moved into this territory. While specific attention has not been given to this area, it is not where I recall RWBs or adult Koels being frequently present (see further discussion of possible Noisy Miner impact in Section 5.2.3 below).

4. Observations in Narrabundah

4.1. Adult behaviour during the 2018-2019 season

During the 2017-2018 season Diana White had an early fledgling on 26 Dec 2017 in her garden at 65 Caley Cres Narrabundah, and subsequently at least seven further fledglings nearby (Holland, 2018b). On 7 Nov 2018 she reported on the COG chat line that her first pair of Koels was active in her garden, and by 10 Nov she noted there were two very active pairs in her area, calling and chasing each other.

At the time this was one of the few reports of the noisy aggregations made by multiple birds of both sexes, and it pointed to another batch of fledglings in her area this new season. From mid-November Koel activity, especially of males, seemed to move away from her place towards Narrabundah College to the ESE, or further downhill to the N towards the Griffith shops. However, on occasions both sexes of Koels, as well as RWBs, were feeding in her Mulberry, and were also in the very large flowering gum diagonally behind in Walker Cres.

She noticed the female Koel was making a different sound when feeding, almost a clucking sound.

On 29 Dec she reported much more excited interactions of several females, and more males calling around her area again. There were some birds close by feeding in her Sour Cherry (which was quite depleted already), with male and female interactions, some very late into the evening, in it and in the dense Pagoda tree over the back fence, She noted it was certainly a different pattern from that of last season. So far she was not aware of any fledglings immediately nearby, but the fruit sources which were available last year had been less and had ripened later.

On 6 Jan Diana reported that the Koels had continued to be very excited and active early morning and late into the evening, as well as during the day. Every few hours or so there was much frantic chasing from one favoured area to another. She had sighted at least three females flying over together, and earlier in the day had seen a younger male like those described by Geoffrey Dabb (Dabb 2018, see also 9 Feb below). There was also mournful *ko-eling* nearby on several occasions, and a beautiful glossy adult male silently scanning diagonally behind in Walker Cres. There were also unseen birds, both male and female, calling from the dense Pagoda tree over the back fence and further behind in the large gum.

There also must have been more males than she had actually sighted, as every time she specifically headed out to try to catch sight of them from the spots where new calls came from (their *Eucalyptus mannifera*, the Pin Oak opposite Mosman Pl in Caley Cres, or the Pin Oaks in Carnegie Cres), the action had moved on. Interestingly, a variety of calls was given. She wondered if this could be because of a mix of younger and older birds, with different abilities to, or reasons for, making the calls. So far, no fledglings had been found although she had not been walking around very far in the recent heat.

On 20 Jan Diana reported that the persistent calls early and late had not been evident for a while, though there had still been intermittent varied female and male calls with high-speed chases and some meetings at the favoured spots high in the canopy. Then long periods of silence or answering/competing calls coming from more distant locations were noted. Once again she heard a female make the clucking sound which she had noticed before in November (see above). It was definitely a different summer this year, with no sign of fledglings around there yet.

On 25 Jan Diana reported the adult males and females were still calling around the periphery, very early around 05:00 h and sometimes around 19:00 h, chasing across her place through the Pin Oak canopies in lower Carnegie Cres, then further downhill through the Pin Oaks in Sprent St towards Narrabundah College. Females together were sounding strident (competing?), a truncated *Whu wu chwoo* (a kind of whistling sound was added). There were also calls at times from males, sometimes from the same spot, but mostly from the Pin Oaks in Carnegie Cres.

After this the first of a number of fledglings was found as described in Section 4.2. In complete contrast to their behaviour in Chapman/Rivett (see above), adults were still very active close to the fledglings during this time, as noted in the entry for 31 Jan in Table 2. On 4 Feb Diana noted that female and male adult Koels were still calling in the morning and evening from the lower Carnegie Pin Oaks or from the Gum/Pin Oak in Walker Cres (see also 8, 9 and 18 Feb below). However, apart from the female being in the same tree as DW2

on 2 Feb, unlike last season there does not seem to have been any direct interaction (Holland 2018b).

In Pullen St on the morning of 8 Feb Diana heard female Koels shrieking together. There were three different sounds: *quick quick. kek kek, shwick shwick*. In Carnegie Cres she could see the birds flying through the canopies of the Pin Oaks, and looking across from outside 8 Pullen St she spotted one of the females perched in the sparse "lookout tree" of a side garden peering into the Pin Oaks at the two others. She wondered if these were the same birds she had sighted there much earlier, flying together and shrieking as if to outdo each other, sometimes flashing past to the Pin Oaks in Carnegie. She also wondered if the more whistling/breathy sound could be a younger bird? Christine D's observations (see Section 3.4 in Holland 2020b, Part II this issue) tend to support this.

On the morning of 9 Feb Diana heard a cacophony of female then male calls from the Pin Oaks in Carnegie Cres. She spotted a female on top of the above "lookout tree". A male flew in and joined her at the top. They sat looking at each other, beaks touching. The male began preening (it was a young male with brown wing feathers mottled, first noted on 6 Jan above, and sighted on and off since). The female sat crouched (see my similar observation on 21 Dec in Section 3.1 above) and peering into the Pin Oaks, then suddenly flew into one near the corner of Caley Cres.

On 18 Feb there was a loud chorus of females and one male from 07:30-08:00 h in the Pin Oaks in lower Carnegie Cres. An all-black male was sitting near the top of the "lookout tree" at the back of 8 Pullen, with the female lower down the tree. They sat still and quiet for some time until a Pied Currawong flew into the very top of the tree. The female gave a shrill *kek*, but both remained still. The Currawong eventually flew off, but there was no response from the Koels.

While no more fledglings were observed after 18 Feb, adult activity continued to be seen and heard in the general area to the end of February. Often more females seemed to be present. In the first half of March, activity decreased noticeably but on 14 Mar Diana heard and saw both a female and male Koel in the Meehan Gardens area at least 400 m N of her place. No *ko-el* calling was noted during or after the period of fledgling observations in Table 2 and the text below it.

4.2. Fledglings in Narrabundah during the 2018-2019 season

Despite all the Koel activity, Diana's first fledgling was not found until 29 Jan, over one month later than in 2017-2018 (Holland 2018b). At least 8 fledglings were positively confirmed in 2019. Details of these, including their designations, are in Table 2 and the text following it. Their locations may be found in Map 2. The discussion of these follows in Section 5.2.2.

After this sudden burst of fledglings (8 over 5 days) no more new ones were found, with the possible exception of one seen on 14 Feb. DW3 and/or DW6 (it was often hard to tell which one) were seen or heard in the spots around Diana's garden mentioned in Table 2 (including 84-86 Walker Cres) each day from 3-6 Feb, and then up to 13 Feb. Sometimes they (probably the more advanced DW3) ventured further across the roads to 85-89 Walker Cres (3 and 8 Feb), and to 13 (6 Feb) or 19 Carnegie Cres (7 and 13 Feb). A fledgling, thought to be DW7, was also seen in neighbour John's backyard on 4, 5, 11 and 13 Feb, or heard there (sometimes for long periods), including on 7-8 Feb.

Table 2 Diana White's observations of new fledglings in Narrabundah.

Date	Comments
29 Jan	First Koel fledgling (DW1) this season found at about 07:00 h in a large oak in the laneway beside 67 Walker Cres, fed by RWBs. It was quite advanced, with a well-developed long tail, pipping loudly as it moved around in the tall canopies (it was not there the next day).
30 Jan	I found another long-tailed fledgling (DW2) in the top of a large tree at 96 Walker Cres, fed by RWBs (it was here again pipping loudly early on 2 Feb, when a female flew into the top of the tree calling *quick quick*; the young flew off still begging). Then unmistakable pipping from our back yard in the large Pagoda tree over the back fence, a fledgling (DW3) fed by RWBs. They were coming to the top of the Mulberry (scarce small berries there) and back to the Pagoda tree. It moved around for an hour, led by RWBs. A fledgling (likely the same) was not seen in the garden again until late on 1 Feb.
31 Jan	This morning round 07:00 h, I found a small fledgling (DW4) in a street tree at 5 Pullen St. It was pipping persistently, but over 10 minutes no RWB came in to feed it. Adult male and female Koels were calling close by when I left, as well as RWBs chuck-chucking intermittently round about.
1 Feb	This morning just before 07:00 h a fledgling was pipping from the back garden of 3 Pullen St, likely same one (DW4) as yesterday as it was in the large Pin Oak it had flown to. It was still in there later but despite moving around to get a view my husband Ian and I could not see it. Then at 3-5 Pullen we both heard 2 birds pipping, DW4 still in the Pin Oak and one with a softer call, probably from the back or side garden hedging plants (DW5). On the morning of 2 Feb soft pipping (likely the same fledgling DW5) was heard at 8 Pullen St. A RWB then led it across the back garden.
2 Feb	Around 11:30 h I heard loud pipping and saw a fledgling (DW3) flying into the Pagoda tree where RWBs fed it. Then I heard another softer fledgling call (later identified as DW6) from the NW corner. It seemed to be coming from the flowering Crepe Myrtle in a neighbour's side garden. I thought I heard a third pipping at one point (later identified as DW7), with RWBs darting about making a huge cacophony of cackles and chuck chucks from the gum diagonally behind here on Walker. This was interspersed with the persistent pipping calls, including the softer pipping round the back nearby. I suspected there were more fledglings further away where more repeated adult calling was coming from downhill. That morning Ian heard and saw a fledgling (DW8) in a garden at the corner of Strzelecki Cres that flew into large trees in Captain Cook. It seemed like a sudden late burst of fledging and our RWBs had already raised 2 clutches of their own.
	I mentioned the possibility above of 3 (or at least 2) Koel fledglings around together behind here and maybe 1 further downhill. About 19:00 h we went out to investigate constant pipping and realised there were 2 over the back fence somewhere. I located one (DW6) in the Crepe Myrtle in 84 Walker's western garden and lower foliage of the gum. In the lower NE garden over on our neighbour John's grass (88 Walker) there was a small one (DW7) on the ground. John makes a practice of feeding birds bread at his back deck and a number of RWBs were coming in to feed there. The fledgling kept up a constant pipping as the RWBs continued to ignore it. It then did a couple of short hops in a different direction before, still pipping and intermittently fluttering/begging, it flew up to the lower rung of the back deck, and a RWB flew in and fed it. Other birds continued to ignore it and eventually, around 20:00 h, it flew a short distance to the rotary clothes line and sat calling for some time. Then it suddenly flew over the E side fence into the back garden of 8 Carnegie into an Ash there, where I had heard pipping before. John told me later that one RWB picked up some bread and fed it, but I had not seen that.

DW4 or DW5 (again hard to tell) was also heard at 7 Pullen St on 4 Feb, then not until 8 Feb when one was seen in a Pin Oak outside 69 Sprent St (which backs onto 7 Pullen). On 10 Feb Diana found a long-tailed one in a large tree at the side of 69-71 Sprent. It flew strongly up to the gum on the footpath outside 76 Caley, where it called loudly for some time. On 11 Feb she found a fledgling in a street Ash at 8 Pullen. It pipped continually until a Pied Currawong flew in to investigate. It hopped round threatening, the fledgling kept

moving away, then the Currawong lunged at it and it shrieked and flew away towards canopies in Sprent St with the Currawong in pursuit.

Map 2. Locations of Diana White's fledglings in Narrabundah. The white lines forming the trapezoid and triangle are the approximate boundaries within which DW3, DW6 & DW7, and DW4 & DW5, respectively, were observed.

On 13 Feb she followed loud pipping to large canopies behind 80 Sprent (opposite No 69), then saw a fledgling fly to the nearby lower canopied tree nearer Narrabundah College. On 14 Feb she heard softer begging in the side hedge Arbutus at 76 Caley, where the louder begging one had flown to on 10 Feb. It was thus a possible new one (labelled DW9). The last fledgling (likely DW7 even though it hadn't been seen/heard for 4 days) was in the Pagoda tree in John's backyard on 18 Feb. She watched it for some time pipping persistently until a RWB fed it, and the fledgling then chased its host around the garden.

5. Discussion

5.1. Adult activity in Chapman/Rivett during the 2018-2019 season

The male Koels observed close to my GBS site on 9 Oct were among the first to be reported for the season. Only *ko-eling* with the occasional *whoa* was then heard and only males were seen until well into the second half of November. The first female was noted on 25 Nov. As in some other areas of the ACT (see Section 5.8 in Holland 2020b, Part II this issue), this was more typical of the 2015-2016 season and those prior to that (Holland 2017b), with the males coming first and then *ko-eling* for some time before the first females arrived.

The first hearing of all three calls (*ko-el, whoa* and *kek kek*) on 22 Nov heralded a very active period, both in my GBS site and the local area, until Christmas. This consisted of mainly three adult birds which were often easy to find, with the proportion of *whoas* also taking over from the *ko-el* calls. These calls were sometimes heard well before dawn. The behaviour was complex, as summarised in Section 3.2 above. In the new year, calling activity continued but only *whoas* (including on many occasions before light) and *kek keks* were heard. Birds were seen only occasionally, the last a female on 27 Jan. Calling continued through February, with the *ko-el* call heard several times, last on 3 Mar, and the last *whoa* on 11 Mar.

In terms of adults the 2018-2019 season was the busiest yet. However, as described in Section 3.2, there was less successful breeding: only three fledglings were confirmed[2], all at the periphery of where fledglings have previously been observed. The RWB was confirmed as the host for only one. It was almost certainly the host for the second as well, but the late third fledgling was possibly already independent. As in the past few seasons, no adult/fledgling interaction/association was observed.

It is unclear why relatively few fledglings were observed compared with past years, despite the very active adults, particularly in the last six weeks of 2018. However, this is in line with past scenarios discussed in Section 4.1 of Holland (2018a), when I have found Koel fledglings away from the main centres of activity. It provides more support for the theory that if Koels are very noisy, RWBs may be more alert.

5.2. Activity in Narrabundah during the 2018-2019 season

5.2.1. Adult activity

The 2018-2019 Koel fledgling season around Diana's place in Narrabundah was much later and shorter. All young were found in a 3-week period from 29 Jan, compared with the nearly 10 weeks from 26 Dec in 2017-2018 (Holland, 2018b). One possible reason for this is that she did not walk around the area as much in January 2019 due to the heat.

Unlike Chapman/Rivett (see above) and much of the rest of Canberra (see Holland 2020b, Part II this issue), Diana had females present from 7 Nov, although they moved further away for over a month before returning around Christmas time. Diana attributed this to the fact that the fruit sources had been less and ripened later than in the previous season. The 2018 spring was very dry and good rains fell only in November and especially December. The return of the females in the second half of December and the first fledgling found on 29 Jan correspond well with the maximum 37-day period between egg-laying and fledging (Abernathy and Langmore, 2017). However, the early fledglings (DW1 to DW3) seemed quite mobile, *i.e.* older, indicating that females must have returned to Diana's area earlier.

In contrast to my experience, there was still considerable adult Koel activity while the fledglings were being observed in Diana's immediate surroundings, though it seems that a female and fledgling were present in the same tree in only the one case (2 Feb).

As noted above another notable feature was their varied calling. This includes the clucking sound when the female was feeding in November and January. Calls noted on 6 Jan (and the possible different reasons for them), and the truncated *Whu wu chwoo* (a kind of whistling sound) on 25 Jan, were possibly the same as the more whistling/breathy sound Diana thought might have been by a younger bird on 8 Feb.

Based on my observations (see Section 3.1 above), the calls in the 2018-2019 season varied considerably from the standard male *whoa* and female *kek kek*: for example the two distinct *whoa* calls on 23 Jan, the female Dollarbird-like call on 24 Nov, and the female *ko-el*-like growls on 30 Nov. Other observers also noted different calls, including juveniles whistling (Christine D; see Section 3.4 in Holland 2020b, Part II this issue). In fact the more I observe Koels, the more complex their range of calls appears to be.

[2] This does not include the two found by Susan Wishart at the SE of the area described in Footnote 1.

5.2.2. Fledglings

The total number of fledglings was difficult to determine accurately, though we have concluded there was a minimum of 8. Two (DW1 and DW8) were found once only, about 125 m and 5 days apart, on 29 Jan and 2 Feb, respectively. The advanced one at 96 Walker Cres (DW2) was seen there twice (30 Jan and 2 Feb), but could possibly also have been seen on 6 and 10 Feb.

Late a.m. on 2 Feb (and possibly a.m. on 4 Feb) was the only time a third fledgling was heard at 65 Caley Cres. Though only 2 were actually seen that evening, and on 11 and 13 Feb (two were heard together at other times), it has been concluded there were 3 different fledglings based on their calls, appearance and favoured spots. The one first seen on 30 Jan has been designated DW3 on the basis of its loud pipping, relative mobility and initial association with the Pagoda tree. The second, DW6, was again calling softly from the Crepe Myrtle tree that evening (2 Feb), when at the same time a further new one (DW7) was found on neighbour John's grass. By its small size and sedentary behaviour as described in Table 2, it was clearly not DW3, though later it did manage to fly a reasonable distance (25 m or so) to 8 Carnegie Cres.

Likewise there were two heard together in Pullen St only on the morning of 1 Feb, as noted in Table 2. One has been labelled DW4, and the other softer begging one DW5. Subsequently only 1 fledgling was ever heard or seen there, and, as noted in the text below Table 2, from 4 Feb it was often difficult to identify individual fledglings. Only the softer begging fledgling at 76 Caley Cres on 14 Feb may have been new.

Except for DW8, which was not seen being fed, all fledglings appeared to have RWB hosts, though the identities of DW4, DW5 and DW6 while being fed were never 100% certain. Except for 5 Jan, when Diana watched a Magpie-lark (*Grallina cyanoleuca*) chasing a female Koel across Carnegie Cres from the corner of Walker Cres, no other possible hosts were identified in the area.

5.2.3. Interactions with other species

Except for two outliers (fledglings DW 1 and DW8), all activity was within a small area within 150 m of Diana's house to the N and SE, more concentrated than in 2017-2018. A possible reason was that she did not venture quite as far as in 2017-2018, particularly not during the very hot January.

Another possible reason may have been the effect of the Noisy Miner. On 6 Jan Geoffrey Dabb noted that the local Koels continued to avoid his immediate area in Brockman St Narrabundah. However, he heard activity every day from a few streets away. That morning he had devoted a couple of hours to getting the locations more specifically. On the map he attached (see Map 3, note modified as detailed below), the red shaded area was defended by Noisy Miners and relatively Koel-free. The green shaded area included the site of excited calling that day there by at least 4 Koels, 2 males and 2 females. The purple star marked a RWB nest tree with 2 recently fledged RWBs, and the yellow stars were RWB territories. He agreed with Diana that the dense Pin Oaks particularly along Carnegie Cres were favoured by Koels.

In response on 6 Jan Diana noted that some Noisy Miners made forays across Carnegie Cres from the corner of Walker Cres (close to Geoffrey's furthest right yellow star), but were

chased off by the large group of RWBs there. However, on 20 Jan she noted the presence of a large group of Noisy Miners in Walker Cres which were definitely carving out a corridor downhill from the base of Rocky Knob through Mosman Pl, across Caley Cres, and down to a small footpath gum outside No 69 Walker Cres (ironically next to where she found her first fledgling DW1 on 29 Jan – see Map 2), then back again. Interestingly, where Geoffrey found his fledgling on 18 Jan was also well within his red shaded Noisy Miner territories (see Holland 2020b, Part II this issue).

On 7 Feb Diana indicated she had not bothered going further up than 84 Walker Cres recently because of the territorial Noisy Miner birds moving in. She later clarified that, while there was a pair of RWBs trying to hold their own through one middle section closer to Allen St, the congregations of RWBs were at the lower parts of Walker Cres before Carnegie and Pullen, towards Narrabundah College. As there were many dense hedges and flowering shrubs and trees in the gardens, she concentrated her efforts there.

Map 3. Amended Geoffrey Dabb's map of Noisy Miner and RWB territories
The red shaded area was defended by Noisy Miners and relatively Koel-free. The green shaded area included the site of excited calling there on 6 Jan by at least 4 Koels, 2 males and 2 females. The purple star marked a RWB nest tree with 2 recently fledged RWBs, and the yellow stars were RWB territories. The red lines enclose the approximate extension of the Noisy Miner territories based on Diana White's observations. The green lines enclose the approximate extension to cover where Diana found most of her fledglings.

The purpose of Geoffrey's map was to predict possible sites where fledged Koels might appear soon. Comparing his map with where Diana subsequently found her fledglings, it turned out to be a reasonable prediction, except that the green shaded area needed to be moved slightly in a NW direction (as enclosed by the green lines added to Map 3) to include the high activity around Diana's place at 65 Caley Cres, including at 84-88 Walker Cres. The NE edge of the red shaded Noisy Miner territories needed to be extended well to the NE

to account for Diana finding them up to 69 Walker, and up to 82 Walker Cres, on 20 Jan and 7 Feb, respectively. This is approximately enclosed by the red lines added to Map 3.

Further examples/discussion of possible interactions with the Noisy Miner are mine at the end of Section 3.2 above, and those included in Section 3.3 of Part II, as well as John Leonard's observation in Section 5.6. From this it seems the main evidence for the potential impact of Noisy Miners comes from Narrabundah, where they appeared to be driving RWBs out of their territory, and thus affecting the distribution of adult and fledgling Koels.

Other interactions were between the adult Koels with the Pied Currawong on 18 Feb noted in Section 4.1 above, and also with the fledgling DW4/5 on 11 Feb (Section 4.2). Also on 24 Jan about 07:30 h Diana heard the *Wu Wu* call and spotted a male silently perched in a street Ash near the corner of Allen and Caley, ignoring 3 Pied Currawongs hopping from branch to branch around him. He sat still for quite some time, then flew off.

Of particular interest was the fledgling DW7 on the ground in Diana's neighbour John's place at 88 Walker Cres on the evening of 2 Feb. I cannot recall ever seeing a fledgling on the ground, nor ever having it brought to my attention. While Diana did not actually observe it, on 4 Feb John told her a RWB had picked up some bread left on the ground for birds and fed the fledgling, and also that it had even pecked at the bread. Again this has not previously come to my attention.

Acknowledgments

My sincere thanks go to Diana White for collecting the fledgling observations near her house in Narrabundah, for her detailed correspondence with me, and for allowing me to use this information as described in this Part, having again declined a number of offers to be a co-author. Diana again also kindly invited me to inspect her local area, affording me a much more complete picture. Many thanks also to Geoffrey Dabb for allowing me to use his map of Noisy Miner territories, and for allowing me to amend it to take in Diana White's observations.

References

See Holland 2020b, Part II this issue.

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THE 2018-2019 EASTERN KOEL SEASON. II. OBSERVATIONS OF ADULT AND FLEDGLING BEHAVIOUR IN WIDER CANBERRA

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Abstract: This Part details adult Eastern Koel *(Eudynamys orientalis) presence and behaviour throughout Canberra during the spring/summer of 2018-2019. This is again based on comments posted on the COG chat line, correspondence directly with the author, and the more detailed observations from Chapman/Rivett and Narrabundah (see Part I). This was a slightly different Koel season, compared with the previous two. In some areas they arrived later than expected, in others arrival of females was delayed, the latter likely responsible for much more springtime ko-el calling in these areas than in the previous two seasons. Despite a later and shorter fledgling season, the 2017-2018 and 2018-2019 numbers were the same: 86 reported fledglings. Some areas continued supporting multiple fledglings. For the first time fledglings either taking or being fed bread, mince or cheese from feeding tables by their RWB hosts has been reported. An increasing variety of calls has also been reported. There is further evidence that identification of females by call alone needs to be treated with some caution. Koels are increasingly extending their activity from the Canberra suburbs into parklands, creek corridors and bushland.*

1. Introduction

The first breeding records for the Eastern Koel (*Eudynamys orientalis*) (Koel hereafter) in Canberra were published in 2009 (Lenz *et al.* 2009). Since then reports of breeding have steadily increased. For the past five years I have published observations of fledglings and associated adult behaviour in Chapman/Rivett (Holland 2014, 2015, 2016, 2017a, 2018a), as have Darwood (2015) for Flynn, and Abernathy and Langmore (2016, 2017) for Canberra. I have also published observations documenting apparent changes in adult Koel behaviour throughout Canberra, and a significant increase in the number of fledglings reported during the spring/summers of 2016-2017 and 2017-2018 (Holland 2017b, Holland 2018b, c). This Part details observations in Canberra for the 2018-2019 season, as does Part I for Chapman/Rivett and for a further cluster of fledglings in Narrabundah.

2. Methodology

Most of the reports of fledglings and adult Koel behaviour for the 2018-2019 season again came from the COG E-mail Discussion List (COG chat line), though some were from E-mails directly to me. Due to space limitations, many of these observations as well as the comments and subsequent correspondence have had to be edited, retaining only the most relevant information. As illustrated by some of the more difficult cases, where one observer reported a number of Koel fledglings from the same general area, or several observers reported them from a given suburb, great care was taken to avoid double counting after discussion with the observers and taking into account the locations, dates, age and behaviour of the fledglings. Despite my own preferences (see Holland 2018a), descriptions of adult and fledgling Koel calls have been left as indicated by the observers. As far as possible all these communications are acknowledged.

3. Observations of adult Koels' arrival, activity and departure

3.1. Arrival and departure

As noted in Part I (Holland 2020a, this issue) Celia Hindmarsh first reported a male Koel giving both calls in Rivett on 2 Oct. I then found two males nearby there on 9 Oct, and David Rosalky reported a male calling from Deakin on 10 Oct. After that, Koels seemed slow to arrive in other areas, with reports only from Garran and Kaleen up to 20 Oct, and from a total of only 12 suburbs by the end of October, most of them assumed to be of males *ko-eling*. David Rosalky reported the first female call from Deakin on 20 Oct, and another was heard briefly in Yarralumla on 27 October. Interestingly Geoffrey Dabb reported an adult male giving the ('complaining' as he described it) *kek kek kek* call when being pursued by an Australian Magpie (*Gymnorhina tibicen*) and a Pied Currawong (*Streptura graculina*) in Narrabundah on 30 Oct. Together with my observation on 22 Nov described in Part I, and as previously summarised in Holland (2017a), these are further examples of males giving this call. Clearly identification of females based on call alone needs to be treated with some caution.

More Koels then seemed to arrive, with mainly reports of calling (including in 3 instances between 03:00 and 05:00 h) from a further 14 suburbs by 6 Nov, but only Terry Munro specifically mentioned a female calling briefly in Watson on 5 Nov. A very early breeding record was Lach Read's observation at 18:30 h on 6 Nov of a pair of Koels mating in Lyons. He had close views of both birds sitting on an exotic bush, before and after the event. The male had called loudly from a maple, and the female flew in and they copulated. The pair separated, but were later seen eating red berries on the same bush.

On 8 Nov, following Diana White's report on 7 Nov of a pair active in her garden (see Holland 2020a, Part I this issue), David Rosalky reported that the male Koel that had been around for a month, had found a partner. At 19:15 h the previous evening he heard it calling with active responses from a female. His *ko-el* calls also had shifted to *wirra-wirra*. The birds were situated about 200 m from the perching tree where he saw a male two nights previously, and where the action of last year was centred (see Holland 2018b). He wondered if the same birds were reclaiming territory. However, as noted below it turned out to be a relatively quiet season, with no fledglings observed.

The above three were the first definite reports of female Koels in the 2018-2019 season. Koels continued to arrive slowly in some other suburbs, *e.g*. not until mid-November in North Lyneham and Hackett. However, apart from Diana White's (see Holland 2020a, Part I this issue) the only report of a noisy interaction was by Ryu Callaway in Fadden. Around 04:35 h on 15 Nov, he was woken by a large, very insistent Koel ensemble. Over the next 10 or so minutes it appeared that there were at least 6 birds.

On 26 Nov, following the posting of my first female actually seen on 25 Nov (see Holland 2020a, Part I this issue), Isobel Crawford reported that in East Dickson the females had arrived over the past week, and were very apparent aurally and visually. She noted the host species was putting a lot of energy into encouraging the Koels to go away. On 1 Dec Philip Veerman posted that Koels were now certainly established near his place in Kambah. On 28 Nov he had watched a male and female together on the power pole at the front of his home. He had not seen that before, they usually hid among the foliage. While watching those two, there were certainly another two heard nearby. This is in line with my experience (see

Section 3.1 of Holland, 2020a, Part I this issue) that as their presence and activity has increased, both sexes have become much easier to observe, rather than just to hear call.

On 2 Dec Martyn Moffat informed me there were at least three Koels at his place in Curtin, females having arrived about a week ago, and on 7 Dec Chris Hastir posted there were four Koels fighting in her Wanniassa garden. On 12 Dec Barbara Allan informed me that Koels were very noisy around her place, and she may have witnessed one laying an egg. Terry Bell indicated that at his place in Braddon, at one time he saw four males chasing a single female. On 30 Jan he posted that there had been so much courtship behaviour in the October/November period that he considered that Koels were the most common birds to be heard and seen in his area.

However, the general impression seemed to be of a relatively quiet and late season, with few further reports up to Christmas Day. In response to Geoffrey Dabb's views posted on 28 Dec that around his place in Narrabundah the absence of Koels was related to the presence of Noisy Miners (*Manorina melanocephala*) (see further in Section 3.3), Mark Clayton noted that Koels were somewhat late in arriving in Kaleen this year. Alison Milton agreed that Koels were also late arriving in Higgins, and Susanne Gardiner noted they started calling in Ainslie weeks after everyone else reported their arrival. David Rosalky reported that the Koels in Deakin had been active only very occasionally (despite the early above activity).

In contrast John Harris posted that Koels were extremely active and numerous around his part of Gungahlin (Nicholls) this year. There were quite a few Koels along the Ginninderra Creek corridor and nearby street trees (the multiple Koel interaction behind his house the previous night is described in Section 3.3). Philip Veerman also noted that around his place in Kambah this year there were at least two pairs of Koels, seen and heard daily (and nightly) over the past 5 weeks. There had been many sightings of pairs chasing each other.

Reporting was quieter into the New Year, with Sandra Henderson mentioning lots of noise (usually two birds) in Wanniassa. On 5 Jan Charmian Lawson reported Koels had been very active in Holder for a couple of days, and at one point there were two males and she thought two females in their front yard. On 8 Jan John Harris reported continued Koel activity along Ginninderra Creek in Gungahlin. He saw and heard them every afternoon and morning and described the noisy multiple adult Koel interaction included in Section 3.2. Ryu Callaway posted that in Fadden he was under the impression that the Koel presence was largely unchanged, if not up on previous years. However, when present, they seemed to be in higher numbers and groups (note his comments on their calling in Section 3.4).

The first fledgling was reported on 3 Jan (see Table 1). The 2018-2019 season's fledglings are tabulated Section 4, Tables 1-2, with the discussion following.

On 9 Feb John Harris posted that after Nicholls being "Koel City" in Gungahlin, suddenly the absence of *wirra wirra-ing* was obvious. After a number of chatline subscribers responded including that they still had Koels calling, John noted he had just seen two males and that all the suggestions of decreased activity were likely correct – less frenzied mating activity now, and birds busy feeding on soft fruits *etc* to build up strength for the migration.

Koel reports continued to be posted on the COG chat line. On 13 Feb David Rosalky posted that after a busy December, Koels had pretty well disappeared from around his place in

Deakin. Since he returned from Broulee three weeks ago, he had had no observations (including no fledglings – *cf.* 2017-2018, Holland 2018b). However, that morning there was a male making the *ko-el* call repeatedly (for further reports of late *ko-el* calls see Section 3.4).

On 22 Feb Con Boekel posted that about 06:15 h during the dawn chorus that morning two birds (male and female?) in upper Turner appeared to be taking it in turns to call with another two birds (male and female?) further away towards lower Turner. In my experience four vocal Koels close together is a large number so late in the season.

On 27 Feb Christine D informed me that after she had seen the juvenile Koel (see 24 Feb entry in Table 2), she saw an adult pair in her fig tree, presumably two of the birds which had been around for most of the summer. She had quite often looked out since and could see a male sitting quietly (almost sleeping), and sometimes the female.

From the responses to my chat line request on 14 Mar it was clear that there were still Koels present in many suburbs, including some *ko-el* calling (see Section 3.4). These were Hughes, Fraser, Wanniassa (two places, including a female seen), Turner (last reported from there on 18 Mar), Chapman, Kaleen, Kambah (the juvenile seen by Philip Veerman on 14 and 18 March in Table 2 below), Narrabundah (a still pair seen by Diana White), Cook and Watson. The last report on eBird Australia was of two birds in Watson by Ash Allnutt on 21 Mar.

On 16 Apr Mark Clayton informed me that Gil and Marion Pfitzner in Evatt, who are very familiar with the species (see 24 Jan entry Table 2 below), had recorded a "black male" Koel as it flew into a tree in their front yard on 8 Apr. One of his banding trainees in Lyneham (Goodwin Street) had also recorded a Koel calling "*ko-el*" a couple of weeks ago.

However, most unexpected was the female Koel photographed by Rob Parnell, first seen being swooped by 2 Pied Currawongs, in Strzelecki Cres Narrabundah on 17 Jun. Based on the brownish head and lack of black chin and throat, Geoffrey Dabb identified it as an immature about 6-9 months old, so a young from the 2018-2019 season. Rob states on the eBird Australia record that his neighbour saw a similar bird drinking from his birdbath on the same morning. Both observers noted that the bird did not fly strongly or with any confidence, which raises the possibility that it may have been injured and was unable to migrate north.

This is a remarkable observation. The Bird Info data on the COG web site (canberrabirds.org.au/wp-content/bird_data/347_Eastern%20Koel.html) shows no records between April to September inclusive, except for the first winter records in July and August 2016. Access to the COG database reveals a total of 7 records between 3 July and 19 August 2016, all attributed to the Canberra Nature Map (CNM), several of which are included in COG's 2016-2017 Annual Bird Report (ABR, Canberra Ornithologists Group: Ed. P Fennell). However, as confirmed by Ryu Callaway, these records are not contained in the CNM, and have been entered into the COG database in error. This does contain an eBird record from Alastair Smith of a Koel calling in Garran on 29 August 2016. Later ABRs for 2017-2018 and 2018-2019 show no winter records except for the above one.

3.2. Noisy multiple adult Koel aggregations/interactions

During the 2018-2019 season there were again many observations of noisy multiple adult Koel aggregations/interactions, including those from early and late November reported in Holland (2020a, Part I this issue). Others are described in Section 3.1 above, though with the exception for Ryu Callaway's in Fadden on 15 Nov, all other reports were from the end of November/early December, possibly reflecting the late arrival of females.

In addition John Harris reported that late afternoon on 7 Jan there was an amazing demonstration by at least five males and three females along Ginninderra Creek in Gungahlin. Males were chasing the females, constantly wirra wirra-ing while the females were 'playing very hard to get', fleeing from the males from tree to tree with their brassy screeches. The Red Wattlebirds (Anthochaera carunculata, hereafter RWB) were 'kicking up a great fuss' as well and scaring females from the tree in which they landed, but when a female took flight a male would chase her again. There were more males than females, so males would temporarily veer from their path in pursuit of a female to try to frighten off another male. The whole affair went on for about half an hour until they shifted their commotion to the north. On 12 Jan John posted that two, possibly three male and two female Koels were similarly extremely active that morning around Kangaroo Close Nicholls/Ginninderra Creek at Percival Hill.

On 20 Jan Jenny Bounds informed me that since 4 Nov she had been hearing or seeing up to 3 Koels almost every day in and around her Weston garden. The previous morning she had 4 Koels (2 males and 2 females) in a tree all in the same binocular view, calling together and doing what she described as body twitching or flicking, which she had not seen before.

The same day Christine D posted that she had often been hearing three Koels calling - two birds keeking, and one wirra wirra-ing. That afternoon there were very loud keeks from the fig just outside the window, and she saw a male and two females. The latter were behaving very oddly, making jerky movements of their head and tail, and almost as if one was copying the other, making it look a bit like a dance. She had the feeling it was about dominance, and eventually the one actually in the fig tree (the other one was in the adjacent plum tree) moved slowly out of the tree, and flew to a nearby tree, and the other one followed, as if chasing. A few minutes later there was wirra wirra from the fig tree, and the male was there alone, before he flew off. She had not seen such behaviour before. Under 'Social Behaviour' Higgins (1999) describes some similar behaviour to the two above.

3.3. Interactions of adults with other species

The most notable observations of adult Koel interactions with other species for the 2018-2019 season involve the Noisy Miner, for which the only previous interaction I can recall was the post by David Rees on 29 Dec 2017 (see Holland, 2018c). He had watched a male Koel being chased around his street in Harrison by, inter alia, Noisy Miners.

The discussion in the 2018-2019 season was started by Geoffrey Dabb, who on 28 Dec posted that it had been an unusual season in that he had had very few Koels around his immediate area in Narrabundah. There had also been few RWBs, which he attributed to the aggression of Noisy Miners, at least two groups of those having moved in about 5 years ago. He still heard quite a few Koels from 100 m or so away, meaning a couple of streets distant, possibly from places that were still miner-free. This likely included Diana White's place which is about 350 m directly east of Geoffrey's.

Geoffrey noted that the day before he had seen a male Koel nearby, which was unusual. This was a first-year bird with a mixture of fresh black and worn brown plumage, which tended to confirm his suspicion that Canberra is visited by a high proportion of young birds (Dabb, 2018, see also Diana White's observations from close by, in Holland 2020a, Part I this issue). Typically, he noted the bird was evicted from its perch by a Noisy Miner. Further discussion of the possible impact of Noisy Miners in Narrabundah is in Part I (Holland 2020a, this issue).

Philip Veerman responded that in Kambah Noisy Miners were in small groups nearby, but rarely in his property. He had not particularly noticed them bothering Koels and could not remember any interaction. On 30 Dec Graeme Hansen posted that Koels on the bush line of Ainslie were completely untroubled by the many Noisy Miners that lived around his place.

Other interactions reported were with the Pied Currawong, including my observations (together with the Noisy Friarbird (Philemon corniculatus) and Australian Magpie), as well as Diana White's with both adult and fledgling Koels (see Sections 3.1 and 5.2.3, respectively, in Holland 2020a, Part I this issue). As noted in Section 3.1 above Geoffrey Dabb reported an adult male being pursued by an Australian Magpie and a Pied Currawong in Narrabundah on 30 Oct.

On 28 Dec David Rosalky reported that, besides being chased regularly by RWBs, a pair of Koels was chased by a Sulphur-crested Cockatoo (Cacatua galerita) in Deakin. He noted it was hard to work out what that was about other than sport and fun. On 11 Jan Christine D informed me she had watched a male Koel feeding a female in her fig tree in Flynn, and now the male was chasing an Olive-backed Oriole (Oriolus sagittatus) from the tree.

Interactions with the RWB hosts include Isobel Crawford's in Dickson on 26 Nov (see Section 3.1 above), and the following posted by John Harris on 28 Dec (see also 7 Jan above) on the complex interaction that unfolded in the tree behind his house just before dusk the night before. John was alerted by the proximity of the 'wirra wirra' call which seemed to become frenetic and complex until he realised that there were two male Koels, which, if not physically fighting, were screaming loudly at each other about a metre apart. Then three RWBs turned up, diving and screeching. It was because of the way they were diving that he then realised that there was a female Koel camouflaged in the foliage. She soon started her 'brassy squawking' but was very reluctant to be dislodged and too protected by the foliage for the RWBs to actually strike her when dive-bombing. The two dramas proceeded as if they were unrelated. The two male Koels continued to challenge each other, no doubt over the female, but the RWBs ignored them. They kept harassing the female until finally she flew off with the RWBs in pursuit. The males wirra-wirra-ed at each other for a little longer (or was it quora-quora?) and then flew off in the same direction as the female.

3.4. Variation in Koel calling, including ko-eling late in the season

In Part I (Holland 2020a, this issue) I note that the more I observe Koels, the more complex their range of calls seems to be. Examples from both my own and Diana White's experience are listed in Section 5.2 of Part I. While in my area mainly koel-ing was heard until females arrived in late November, others had different experiences.

On 28 Dec Mark Clayton posted that this year in Kaleen the male Koels were not giving their typical coo-ee (or ko-el) call. He had only heard it twice very early when they first arrived. Both sexes were giving their other regular calls, and a lot of funny calls (assorted

shrieks and whistles) that he had not heard before. They were also NOT calling in the middle of the night. From the responses Con Boekel in Turner could not recall hearing the 'koh ell' call at all this season, but at the time they were calling well past dusk and well before dawn.

Susanne Gardiner also noted both sexes were calling in Ainslie from around 03.30 h onwards. Philip Veerman in Kambah agreed there was also a lot less of the "ko-el" "coo-ee" call, with calling during the night and mostly at dawn. There was a lot of shrieking, especially when males and females were flying together. Several times he had heard an unfamiliar new call, a cackling sound very much like a Dollarbird (Eurystomus orientalis), he believed by the female Koel. This is similar to what I described in Part I (see Holland 2020a, Part I this issue).

John Harris responded that Koels were recognisable a few months ago by the iconic 'coo-ee' call every dusk and early evening, quite constant for some weeks. Of late he had not heard it, only the invariable and far-carrying 'wirra wirra' and its variants all night every night. The above are further examples of this call at night (see Holland 2020a, Part I this issue).

On 8 Jan Ryu Callaway posted that in Fadden he had also had the whole range of calls including the 'ko-el' call frequently. The Dollarbird-like calls described by others (see above) had also been frequently heard. He did not recall it from past years. On 14 Jan Harvey Perkins noted that in the Gleneagles part of Kambah he had heard more calling (both ko-el and wirra-wirra) earlier this season than in any previous year (cf. Philip Veerman's comments above).

On 27 Feb Mark Clayton posted that a Koel was giving the "ko-el" or "coo-ee" call that morning for only the second time in the current breeding season. Local calling had been rapidly dropping over the previous couple of weeks, with only males calling intermittently. Alison Milton also heard one giving the ko-el call in Higgins that afternoon.

Philip Veerman heard the "ko-el" call from the male Koel that morning, also for the first time for a month or two. Around dawn on the mornings of 10 and 11 Feb Harvey Perkins had heard "ko-el" calls. He had recorded "wirra wirra" calls through January and up to 2 February, then nothing until these calls. At 07:45 h on 27 Feb Joan Lipscombe heard 2 Koels calling 500 m apart in Campbell, both giving "coo-ee" calls. On 2 Mar Tony Nairn posted that he had heard a Koel in Watson giving the ko-el call on several mornings during the previous week.

On 3 Mar Christine D reported that late afternoon on 2 Mar she heard a whistling call, that she identified a few years ago as the one which seems to replace the begging call in juvenile Koels (see Darwood 2015). She saw the juvenile whistling, but then a male flew at it and it flew off. That morning she heard the yip yip yip yip call, which she now identifies as a juvenile Koel call, probably fear/warning/panic rather than a contact call (see Darwood 2015; see also similar call for her fledgling - 14 Jan entry in Table 1, and the "wik wik wik wik" call of the juvenile male bird - 28 Feb entry in Table 2). A little later she heard the wirra wirra/keek keek of a male-female interaction. So three birds were all still hanging around, coming in for the figs. Though she had been searching for some indication of adults looking out for their young (see discussion in Section 5.8 of Holland, 2018c), she still had not seen it.

On 14 Mar John Leonard noted he had heard one ko-eling in Hughes that morning, and Mark Clayton indicated his wife heard the "koel" or "cooee" call that morning in Kaleen.

4. Numbers of Eastern Koel fledglings reported for Canberra in the 2018-2019 season

Holland (2017b) published totals of Koel fledglings that had come to attention over the three breeding seasons from 2014-2015 to 2016-2017, noting how numbers for the last of these were around double the previous two. With the earlier reporting of fledglings and consequently longer breeding period in the 2017-2018 season, numbers increased further from around 60 to 84. Given the seemingly different season described above and suggestions of a poorer breeding season for 2018-2019, I again closely monitored reports of fledglings. Several specific requests were also made on the COG chat line for further observations; again there was an excellent response. This information, including observations by Diana White and me reported in Holland (2020a, Part I this issue), is summarised in the Tables below.

The reports of fledglings for January 2019 are summarised in Table 1, with the later observations in Table 2 (total number 86). A discussion of these results follows in Section 5.

Table 1 Eastern Koel fledglings reported in January 2019.

Date*	Observer	Location**	Comments
3 Jan	Alison Milton	Jerrabomberra Wetlands	RWB feeding a young Koel (hereafter YK) near the Fulica Hide, perhaps not long out of the nest in the next tree.
7-12 Jan	Jerry Olsen	Cook	Chick found in a RWB nest in Dugdale St on 7 Jan. A storm tipped the nest over on 8 Jan, a photo showed a well-feathered nestling with a very short tail hanging on. At 17:00 h on 11 Jan it was still there, but had moved one branch away parallel from the nest branch, so now a fledgling. On the evening of 12 Jan it had moved to the top of the tree. Jerry watched for 5 minutes as the RWBs defended it against a Pied Currawong. It was being fed every 2 minutes or so on flying insects.
11 Jan	Barbara Allan	Page	Confirmed a YK heard in the fog on 9 Jan, attended by RWBs in park at the W end of Hannaford St. Probably a few days out of the nest. On 16 Jan this YK was noted to be growing, not venturing far from a favoured mulberry.
11 Jan	Rosemary Birch	Evatt	A YK finally seen being fed by a RWB in a large *Photinia*, after hearing begging calls in the tree for a few days. So likely fledged only recently.
12 Jan	Barbara Allan	Page	Last evening another much older YK, begging loudly in her nature strip. By 16 Jan it had moved into her garden and could feed itself on plums, though it still begged and was fed by 2 RWBs. On 20 Jan it was still feasting on plums.
14 Jan	Christine D	Flynn	A YK was begging in the fig in the front garden. Later the begging became a screech, almost a *keek*. The tail was not really short, but the bird seemed a bit clumsy, and very shy, and soon flew off. I think a male Koel took off after it.
14 Jan	ShortyWestlin	Fadden	At Bugden Ave 2 RWBs were feeding a YK. From its size and length of tail it appeared to have fledged a little while ago.
14 Jan	Harvey Perkins	Kambah	Yesterday, a very noisy YK following its RWB parent all day.
16 Jan	Barbara Allan	Hawker	A YK near the shops in Beetaloo St yesterday, RWB hosts.
16 Jan	Con Boekel	Turner	A YK (separately a RWB fledgling) in Ridley St, RWB hosts.
17 Jan	Steve Wallace	Fraser (2)	Two YKs this morning. I saw one and heard the other, about 150 m apart – one near the intersection of Bingley Cres and Moir Pl, the other near the western intersection of Rochford St and Bingley. The host of the one I saw was a RWB. Calling adults had covered all of Fraser, so more young expected (see below), but little activity around the Spence shops this year.

Table 1 continued on next page

Table 1 continued from previous page

Date*	Observer	Location**	Comments
18 Jan	Geoffrey Dabb	Narrabundah	YK in the front gardens of 36-40 Brockman St. RWB territory must have been between Brockman north to Hamelin Cres.
18 Jan	Pete Cranston	Giralang	Reliable colleague identified a YK at Octans Close.
19 Jan	Ryu Callaway	Fadden	A YK briefly in my GBS site. Already a very competent flyer. Host not seen, though when it flew away I did hear a RWB call from that direction.
20 Jan	Sue Beatty	Holder	A YK in my garden being fed by a RWB.
20 Jan	Robin Hide	Ainslie	A RWB feeding a begging YK in a crab apple. It was also seen on 22 Jan with a RWB pursuing and feeding it an insect.
20 Jan	Barbara Allan	Page/Scullin	YK yesterday, corner of Chewings St and Ross Smith Cres.
20 Jan	Steve Wallace	Fraser (2)	Two more YK (tails about half grown, both fed by RWBs) sightings near the intersection of Bingley and Strathnairn Pl, and also on Bingley, between Woodger and Wickens Places.
21 Jan	Alberta Hayes	Ngunnawal	Our RWBs at the Casey end of the suburb have a YK for at least the second season in a row. Their nest tree was cut down in winter, so they moved two along and started up again.
21 Jan	Pete Cranston	O'Connor	A YK at our place between Quandong and Miller Streets. Our local RWB fledged a first generation, but do not appear associated with this one (different RWB host later confirmed).
24 Jan	Steve Wallace	Fraser	An advanced YK, with a fuller tail, was being fed by RWBs on the track between Woodger Pl and Bazley St. The 20 Jan YK between Wickens and Woodger was calling same time.
24 Jan	Mariko Buszynski	Garran	A YK in Fitchett Street was being fed by a much smaller RWB.
24 Jan	Alison Milton	Higgins (2)	This morning I located, in a neighbour's tree, the YK I'd been hearing for 3-4 days. It moved around, constantly calling, following the RWBs. It often perched in plain view, including feeding itself on a neighbour's plums, before a RWB finally fed it. Later I could hear YKs calling in both my back and front yard, and soon two YKs, with four attendant RWBs, flew into the same yard across the street.
24 Jan	Jack Holland	Rivett	YK JH1 - details in Holland (2020a, Part I this issue).
24 Jan	Mark Clayton	Evatt	Marion and Gil Pfitzner in MacDowell St have a YK being fed by RWBs, it was first seen on 20 Jan and they have been hearing it since. They've now had a YK for 3 years in a row.
25 Jan	Philip Veerman	Kambah	Well grown YK with close to a full-length tail, RWB host.
25 Jan	Pete Cranston	O'Connor	While the 21 Jan YK was seen feeding, another came to the same fence line, had a minor interaction, and flew off again. This explains the 2 YK calling around for the past few days.
26 Jan	Pete Cranston	O'Connor	At dawn I thought there could be 3 YK whining. Confirmed an hour later, with all three in the same backyard Ash tree (*Fraxinus*), in the same sector of the tree for 20 minutes, no more than 2 metres apart, all calling continuously. The sole RWB seemed "bemused", and no feeding was seen.
26 Jan	Jack Holland	Yarralumla	On the lake side of the Government Nursery, a YK in an open position high up in a half dead pine. Its tail was well formed, and it flew 25 m. I did not see it fed, or any RWBs.
27 Jan	Con Boekel	Turner/ O'Connor (2)	Last evening a YK, holding its wings out, possibly to deal with heat stress in 42^{o}C, was following a RWB at the corner of Watson St and Masson St. This morning on Dryandra St, a YK was begging to a RWB. The Ridley St bird (16 Jan), did not hang around. The Masson/Watson St bird was 840 m, and the Dryandra St bird 760 m from the Ridley St bird.

Table 1 continued on next page

Table 1 continued from previous page

Date*	Observer	Location**	Comments
29 Jan	Julie Clark	Yerrabi Pond - Amaroo side (2)	Two begging YKs, each in the vicinity of RWBs, but about 400 m apart as the crow flies. One appeared younger than the other, and was being fed by a RWB.
29 Jan	Diana White	Narrabundah	YK DW1 - details in Holland (2020a, Part I this issue).
30 Jan	Diana White	Narrabundah (2)	YKs DW2 and DW3 - see Holland (2020a, Part I this issue).
30 Jan	Terry Bell	Braddon	For the past few days a constantly chipping large YK has been in my retirement village at Girrawheen St/Haig Park. Confirmed that it was being fed by RWBs on 1 Feb.
31 Jan	Diana White	Narrabundah	YK DW4 - details in Holland (2020a, Part I this issue)
31 Jan	Steve Wallace	Fraser	YK at the eastern intersection of Bingley Cres and Brophy St. Did not see it fed but RWBs were in the area. Present there until at least 14 Feb.
31 Jan	Steve Wallace	Dunlop	Well-developed YK at West Belconnen Pond, a RWB fed it. On 5 Feb Michael Lenz reported it was still there.

*Wherever possible this is the date of the record. In some cases it is the date of posting on the COG chat line or E-mail to me.
** Single new YK unless indicated otherwise

There were 43 fledglings reported for January. Table 2 summarises reports of fledglings for the remainder of the breeding season.

Table 2 Eastern Koel fledglings reported from 1 February 2019

Date*	Name	Location**	Comments
1 Feb	Diana White	Narrabundah	YK DW5 - details in Holland (2020a, Part I this issue)
1 Feb	Dennis Bryant	Giralang	An E-mail to the COG office with observation details of a bird that called incessantly and was being fed by a honeyeater half its size. Bill Graham responded it was a YK.
2 Feb	Diana White	Narrabundah (3)	YKs DW6, DW7 and DW8 - details in Holland (2020a, Part I this issue).
2 Feb	Stan Jarzynski	Kambah	A begging YK near Mannheim Street fed by a RWB.
3 Feb	Steve Wallace	Fraser	Another YK in neighbour's yard in Tillyard Drive. Not the same one near the intersection of Rochford and Bingley Sts which I have not heard since I first reported it on 17 Jan. Over the last two days, I have seen three of the five other Fraser chicks I have already reported, all fed by RWBs.
3 Feb	Michael Lenz	Lyneham	YK begging in plane tree at the corner of Brigalow and Boyd Sts, RWB nearby.
4 Feb	Gail Neumann	Yarralumla	Yesterday I noticed a RWB flying to a very weak call in my neighbour's maple. Today 2 RWBs fed the YK several times. It is still quite a small bird, hence the rather weak calls.
4 Feb	Jack Holland	Rivett	YK JH2 - details in Holland (2020a, Part I this issue).
4 Feb	Valerie Handley	Ngunnawal	An E-mail to the COG office with observation details and photos of a bird making "tut tut" calls in her silver birch. It flies down to eat mince she puts out for an old Pied Currawong she has fed for a couple of years. From the photos Geoffrey Dabb confirmed it was a YK, a few weeks out of the nest, with the developing black plumage on the "shoulders" showing it to be a young male.
5 Feb	Ken Black	Fraser	Recently fledged YK fed by a RWB in Brophy St, first seen 1 Feb. Different from Steve Wallace's 31 Jan one 100 m away.
6 Feb	Richard Lane	Barton	A noisy YK in Blackall Street on 2 Feb, fed by a RWB, despite being twice the size of it. Capable of feeding itself, but sat there chirping away, virtually mugging the RWB each time it arrived.

Table 2 continued on next pager

Table 2 continued from previous page

Date*	Name	Location**	Comments
6 Feb	Helen Walker	O'Connor	The last two weeks I have seen a quite large YK still begging for food and fed by RWBs, a street back from Macarthur Ave.
6 Feb	Marion Jones	Deakin	Last week I thought I heard a YK. I heard it begging again and on inspection I found a Pied Currawong appearing to feed what I am sure was a YK. I managed to get a couple of very poor quality photos (the general shape of the brownish bird was good, in particular the long tail, indicative of a reasonably mature YK).
7 Feb	Philip Veerman	Kambah	A smaller, younger YK with a stubby tail only about one third full length in the Chinese elm in my front yard. A RWB perched near it for 10 seconds as the YK fluttered its wings towards it, before both flew out (the YK weakly) over a neighbour's house. Still present on 20 Feb when it was about the size of the RWB.
8 Feb	Helen Walker	Amaroo (0)	My daughter in Tarrabool St near Yerrabi Pond has had a YK fed by RWBs from the middle of this week. Probably same as Julie Clark's younger one of 29 Jan (see Table 1), which she had seen three times since in slightly different locations close to here.
8 Feb	Helen Walker	O'Connor	A YK on the power line being fed by both RWBs. It flew into a fig tree where it snacked on figs in between insect deliveries. Photo showed it was around the same size as the RWB, whereas the 6 Feb already around for over 2 weeks would be much larger.
9 Feb	Mavis Jones	Torrens	A YK in our wild cherry tree. I haven't seen any birds approach it for about 2 hours, just now it was chasing starlings out of the tree, so probably already independent.
10 Feb	Terry Bell	Braddon	A second begging YK at my retirement village.
12 Feb	Nick Payne	Griffith	A YK (photo) in a neighbour's front garden. I have not actually seen it being fed, but a RWB was flying in and out of the tree it was in, so the host is very probably a RWB.
12 Feb	Anna Lasi	Fisher	Forwarded a photo to the COG office of a lighter version Koel fledgling that was begging in her garden.
14 Feb	Ian McMahon	Cook	Since 26 Jan my local RWBs have been feeding a YK around 182-184 Dexter St, where they also raised a YK last year. Not same as Dugdale St 300 m away as there for nearly 3 weeks.
17 Feb	Ryu Callaway	Yarralumla	A YK along LBG beside the Royal Canberra Golf Course, about halfway between Yarralumla Nursery and footbridge to the W (Westbourne Woods). RWBs were in attendance.
18 Feb	Denise Kay	Giralang	A YK in my neighbour's yard, RWBs to-ing and fro-ing.
21 Feb	Ryu Callaway	Red Hill (3), Griffith, Spence	Alerted me to 7 YK reports on CNM, 5 were accepted as new: 1. 15 Jan, Friendship St Red Hill, looked pretty young, not much black around head, light under. 2. 7 Feb, Red Hill NR near Francis St, only 200 m away, but 23 days later, also not much black around the head. 3. 7 Feb, Hartog St Griffith, further away (>500 m), quite a dark one, more black around the head. 4. 18 Feb, 30 Somerville St Spence, >200 m from Ken Black's on 5 Feb, black above, not much below the eye. 5. 21 Feb, another one in Hartog St, but 14 days later, and quite a light one with very little black around the head.

Table 2 continued on next page

Table 2 continued from previous page

Date*	Name	Location**	Comments
23 Feb	John Leonard	Hughes	A YK in our backyard in Hughes working its RWB hosts hard, egging them on with urgent begging calls that sounded to my ears (and presumably the 'parents') exactly like a RWB chick. However, what was really interesting was that at one point a Noisy Miner showed up (see further discussion in Section 5.6).
24 Feb	Christine D	Flynn	Saw a new probably independent YK near my fig tree.
27 Feb	Marg Peachey	Flynn, Cook (2), Kambah, Farrer, and one unknown (1+)	ACT Wildlife has had six YKs in care this year. 4 were released, one was euthanised and one was still in care. No further details were available, and unfortunately due to previous reports of 4 fledglings from Kambah, 3 from Cook, and 2 from Flynn, except for the Farrer one, it was not clear how many actually were new.
27 Feb	John Harris	Percival Hill	No breeding observed along Ginninderra Creek but a begging YK this morning on Percival Hill.
27 Feb	Jack Holland	Chapman	YK JH3 - details in Holland (2020a, Part I this issue).
28 Feb	Nicki Taws	Cook	A quite mobile YK with a well-developed tail in Wybalena Grove on 16-17 Feb, attended by a RWB (see also 8 Mar).
28 Feb	Christine D	Flynn	A different YK showed up, calling loudly at times with the "*wik wik wik wik"* call, and spending some time in the fig tree. From the photo Geoffrey Dabb identified it from its black shoulders as consistent with a young male from this season.
3 Mar	Ryu Callaway	Fadden	Saw 2 female/young Koels in flight, one was identified as a YK, quite a capable flyer, possibly independent as not attended to by a host. My last sighting of a YK (also a capable flyer) was on 19 Jan (6 weeks ago) in nearly the same spot.
4 Mar	Michael Robbins	Kambah	Photo of a YK giving the '*cheep, cheep'* call, quite advanced judging from the amount of black around the head (tail not seen).
8 Mar	Muriel Story	Cook	A noisy YK, fed by a RWB, at my place at Tipper Pl in the first week of February. Tipper Pl is off Dugdale St but that fledged on 8 Jan. The Dexter St one, 450 m away (see 14 Feb above), had a well-defined territory, and Wybalena Grove (see 28 Feb) is 300 m away at its closest point, so all 4 are different.
14 Mar	Chris Hastir	Wanniassa	Had one YK with RWB parent a couple of weeks back (a new and relatively late fledgling)
14 Mar	Susan Wishart	Chapman (2)	YKs SW1and SW2 - details in Holland (2020a, Part I this issue).
14 Mar	Philip Veerman	Kambah	Saw a YK sitting in my big eucalypt. It was looking very scruffy but I expect it to be the second one, but it now looks normal size, rather than too small (20 Feb, too long ago - so different). Also present also on 18 Mar, it made a tiny squeak call before flying.

*****Wherever possible this is the date of the record. In some cases it is the date of posting on the COG chat line or E-mail to me.

** Single new YK unless indicated otherwise

With another 43 added, the minimum total for the 2018-2019 season was 86 fledglings, possibly up to 91 depending on the ACT Wildlife ones, the same as the 2017-2018 season with the 2 new Ngunnawal and Cook ones (see 21 Jan and 14 Feb entries) added.

5. Discussion

5.1. Timing of Eastern Koel breeding for the last three seasons

As for the 2017-2018 season (Holland 2018c), there were few reports of female Koels during October. However, reports of fledglings started much later (early January compared with early December), despite the early copulation reported by Lach Read in Lyons on 6 Nov (see Section 3.1). By comparison with the 2017-2018 season, with eighteen reports of fledglings by 15 Jan, there were only eight up to this time (see Table 1). The first 4 reported from 3-11 Jan were all very recent fledglings, underlining the later fledging during the 2018-2019 season, whereas the next 3 appear to have been more advanced. Note that in 2016-2017 there were only 3 fledglings reported by 15 Jan, even though more females had been observed early in the season.

Table 3. Location and number of Koel fledglings for the past three seasons.

District	Season		
	2018-2019	**2017-2018**	**2016-2017**
Belconnen	**28 (31[3]):** Cook 4 (6[4]), Dunlop 1, Evatt 2, Fraser 8, Flynn 3 (4[5]), Giralang 3, Hawker 1, Higgins 2, Page 3 and Spence 1.	**30[6]:** Cook 1, Evatt 2, Florey 1, Flynn 1, Fraser 6, Giralang 4, Lake Ginninderra 1, Kaleen 4, MacGregor 1, Macquarie 1, Melba 3, Page 1 and Spence 4.	**19-22:** Cook/Macquarie 1, Evatt 1, Florey 1, Flynn 1, Fraser 3-5, Giralang 5, Lake Ginninderra 2-3, Macquarie 1, Kaleen 2, Melba 1 and Page 1.
South Canberra	**20**: Barton 1, Deakin 1, Griffith 3, Jerrabomberra Wetlands 1, Narrabundah 9, Red Hill 2 and Yarralumla 3.	**20**: Deakin 1, Jerrabomberra Wetlands 3, Kingston 1, Manuka 1, Narrabundah 9, Parkes 1, Symonston 1, The Causeway 2 and Yarralumla 1.	**7-8:** Deakin 2, Jerrabomberra Wetlands 1-2, Manuka 1, Telopea Park 1 and Yarralumla 2.
Weston Creek	**7:** Chapman 3, Fisher 1, Holder 1 and Rivett 2.	**12:** Chapman 1, Duffy 2, Holder 2 and Rivett 7.	**7-10:** Chapman 1 and Rivett 6-9.
Woden	**4:** Hughes 1, Farrer 1, Garran 1 and Torrens 1.	**3**: Hughes 1 and Curtin 2.	**4:** Curtin 2, Hughes 1 and Mawson 1.
North Canberra	**12:** Ainslie 1, Braddon 2, Lyneham 1, O'Connor 6 and Turner 2.	**11:** Ainslie 2, Lyneham 3, O'Connor 3 and Turner 3.	**12-14:** Ainslie 1, Dickson 2, Lyneham 4-5. O'Connor 1, Turner 1, Watson 3-4.
Tuggeranong	**10 (12[7]):** Wanniassa 1, Kambah 6 (8[8]), Fadden 3.	**6:** Kambah 2, Richardson 1 and Wanniassa 3.	**2:** Fadden 1 and Macarthur 1.
Gungahlin	**5:** Amaroo/Yerrabi Pond 2, Ngunnawal 2 and Percival Hill 1.	3[9]: Ngunnawal 1 and Yerrabi Pond 2.	**5-6:** Palmerston 4 and Yerrabi Pond 1-2.

The numbers of fledglings reported for 2018-2019 by 15 Jan was thus about halfway between the two previous seasons. However, in 2018-2019 the bulk of fledglings (62 of 86 or 72%) were between 16 Jan and 15 Feb, with perhaps only one still dependent fledgling reported in March, pointing to a quite short season.

[3] If all those taken to ACT Wildlife from Cook and Flynn were new/different.
[4] See footnote 1.
[5] See footnote 1.
[6] One additional has been added from Cook – see 14 Feb entry in Table 4.
[7] If the two taken to ACT Wildlife from Kambah were new/different.
[8] See footnote 5.
[9] One additional has been added from Ngunnawal – see 21 Jan entry in Table 1.

5.2. Fledgling locations and numbers

Table 3 provides a summary of the number of fledglings per district and the suburbs/locations within these for the 2018-2019 season, as well as the two previous seasons for comparison.

The total from each of the districts gives a minimum of 86 (possibly up to 91 depending on the ACT Wildlife ones) fledglings in the ACT for the 2018-2019 season. This is identical to the minimum number for the 2017-2018 season with the 2 newly identified ones from Cook and Ngunnawal added. Given the similar methodology for obtaining these numbers as outlined above, it can be assumed that, despite the apparently later and shorter breeding season in 2018-2019, the extent of Koel breeding for the two seasons was similar. However, as previously raised, I suspect the numbers are likely to be significant underestimates, as many more fledglings may be overlooked or simply not reported.

As can be seen from Table 3, the main increase in numbers for the 2018-2019 season is from Tuggeranong, which is offset by the much lower number from Rivett (Holland 2020a, Part I this issue). The bulk of the former came from Kambah. On 14 Jan Harvey Perkins, who has previously noted (see Holland, 2017b) that his area in Gleneagles did not seem to be favoured by Koels, posted that, unlike many areas this season, they had had their "best ever" Koel season, topped off by his first ever fledgling the day before. For Belconnen, fledglings again were mainly from the northern half, with only Cook (but at least 4) and Hawker south of Belconnen Way.

There are reports from 10 new locations in Table 3, including 2 fledglings from Higgins. Unlike the adjacent Holt, where last season Chris Davey noted very few Koels, Alison Milton indicated that Koels have been present for a number of years in her area, with numbers increasing over time. However, until now she had not seen any signs of successful breeding. Again no fledglings were reported from Queanbeyan, or, as far as I can find from the level of detail in the eBird Australia reports, elsewhere in NSW covered by the COG Area of Interest (AoI), including Goulburn and Yass.

The highest number was again in Diana White's part of Narrabundah, with at least 8 fledglings, 6 of them in a very close cluster within 150 m from her place. Steve Wallace also found 7 fledglings in a relatively confined area of NE Fraser, with 2 close together several times. Pete Cranston found 3 very close together in O'Connor on 26 Jan. On 12 Feb he noted that one was a one-off but the other two were still around (one for 23 days). Both were being fed still by RWBs, with no signs yet of self-feeding (see comments re mince/cheese transfer in Section 5.3).

Some other fledglings were reported for longish periods: Ian McMahon in Cook for 20 days, one of Steve Wallace's in Fraser for over 15 days, and Philp Veerman's second one for at least 14 days.

The only observations of copulation were mine on 3 Dec (see Holland 2020a, Part I this issue) and Lach Read's early report on 6 Nov (see Section 3.1 above). However, no early fledgling record was reported from the latter. Given the maximum of 37 days from egg-laying to fledging (Abernathy and Langmore, 2017), a fledgling may have been expected around 13 Dec. Susan Wishart also noted that the active Koels around her place in Chapman were using their she-oak as a resting and occasional mating point.

5.3. Fledglings feeding themselves independently and/or taking bread or meat

In 2017-2018 there were several examples of fledglings feeding themselves, most notably on sour cherries and mulberries in Diana White's Narrabundah garden (see Holland 2018b). Diana did not observe this feeding in the 2018-2019 season, probably because by the time of observing her first fledgling in late January the fruit in her trees was depleted. However, there was the very interesting example of fledgling DW6 being both fed bread by its RWB host, and also said to be pecking at the bread itself (see Holland 2020a, Part I this issue).

Other examples of fledglings feeding themselves were Barbara Allan's relatively advanced fledgling eating her plums (see 12 Jan entry in Table 1), like the first of Alison Milton's fledglings (see 24 Jan entry in Table 1). Both did this while still being fed by RWBs, like Helen Walker's fledgling on 8 Feb, which was eating her figs (see Table 2). It is not clear whether the RWB hosts were also feeding the fledglings fruit, but on 19 Jan 2020 Alison Milton posted that last season (2018-2019) she had watched a RWB feeding on nectarines in a neighbour's tree and feeding a Koel chick with the fruit.

However, the most surprising is Val Handley's observation of her fledgling taking left-out mince (see 4 Feb entry in Table 2). While Koels are mainly fruit eaters, fledglings do eat insects, caterpillars, spiders etc. when being fed by RWBs. In a similar observation, on 12 Feb Pete Cranston informed me that he and his partner fed yard birds, and there was a food transfer (mince/cheese) from the RWBs almost directly to his two juvenile Koels. An interesting contrast is Mavis Jones' report that at the end of January a male Koel visited a table on their deck, interested in a share of the mince fed to Australian Magpies. The Koel had two tastes and rejected both, while the magpies stood back.

5.4. Koel activity/fledglings away from the suburbs

Further examples of fledglings being raised in the peri-urban environment are the records at the Jerrabomberra Wetlands and Yerrabi Pond, and particularly the ones from the new sites in Yarralumla adjacent to Lake Burley Griffin and at Percival Hill close to the Ginninderra Creek corridor (see 27 Feb entry in Table 2).

Reports on the COG chat line of adult Koels in the peri-urban environment around Canberra were limited to Jean Casburn, reporting a Koel about 200 m into Narrabundah Hill reserve on 30 Nov, but it flew back to Duffy chased by RWBs. On 4 Feb Jean reported on eBird Australia a Koel seen feeding in blackberries on the N fence line, 100 m into the Narrabundah Hill reserve. However, other peri-urban sightings on the eBird Australia map for the 2018-2019 season include the Tharwa Bridge Reserve, Tuggeranong Hill (multiple sightings), the Murrumbidgee Golf Course, McQuoid's Hill NR, Stromlo Forest Park, Campbell Park, Mt Ainslie NR (a number of sightings), Mt Majura NR, Gungaderra Grassland NR, West Belconnen Pond (multiple sightings, including a fledgling), Parkwood and The Pinnacle NR (a number of sightings).

The lack of fledglings in Queanbeyan may reflect the very limited reporting for this city. Martin Butterfield posted on the COG chat line that on 15 Nov he could hear three different Koels doing wirra-wirra calls from a suspension bridge over the Queanbeyan River. Together with a report from the Queanbeyan Riverside Corridor of a single bird on 4 Dec, these are the only ones for Queanbeyan on the eBird Australia map. It also contains a peri-urban report from Martin at the future Greenleigh bypass site about 2 km E of the city on 20 Dec, as well as reports from 4 sites in the neighbouring Jerrabomberra NSW.

There have also been some more rural observations. On 15 Nov Martin Butterfield posted that he had been sent a photo of a female Koel in Radcliffe Circuit, Carwoola that morning. On 31 Dec Martin reported that a neighbour in Carwoola had advised that a male and female Koel were quietly dining on his boysenberries. The eBird Australia map shows a further record of repeated "ko-el" calls from Martin in Carwoola on 6 Jan, as well as single birds from Millpost Lane about 3 km out of Bungendore on 19 and 25 Jan, near Bywong on 26 Dec and 4 Jan, Sutton Common on 15 Dec, Uriarra Station on 26 Dec, the Kambah Pool NR on 20 Jan and the Tharwa Sandwash on 1 Dec. Together with the sightings from peri-urban locations listed above, this shows how well the Koel has now penetrated into the non-urban environment around Canberra, and can no longer be considered just an urban bird.

5.5. Koel hosts

In well over half the cases, RWBs were again the confirmed host, and this would have also been the case for many more, since in other reports RWBs were often around but not seen to feed young Koels. No possible alternative host was confirmed, but Marion Jones' observation on 6 Feb (see Table 3) of a Pied Currawong appearing to feed a fledgling is of great interest. This species is generally thought to be too large to host Koels and HANZAB (Higgins, 1999) does not list it as a Koel host.

I wondered whether it was possibly harassing or attacking it, but Marion responded that the first thing she saw was the Pied Currawong with what appeared to be something in its beak hopping along the branch towards the fledgling. It definitely did not appear to be harassing it, but unfortunately while she was getting her phone out to try to take a photo of the two of them together the Currawong left. It is possible that rather than being the actual host, maternal instinct caused the Pied Currawong to offer food to the fledgling in response to its loud and continuous begging. HANZAB (Higgins, 1999) lists species that have been observed feeding Koel fledglings where they were not the original host (or where the host species was unknown), but the Pied Currawong is not among the species named.

Two nestlings were reported for 2018-2019: Jerry Olsen's (see 7-12 Jan entry in Table 1) and Susan Wishart's (see Table 1 in Holland 2020a, Part I this issue), This now makes nine ACT observed nestlings that I am aware of.

From 4 Feb to 14 Mar advanced, probably independent fledglings were observed (see entries 4, 9, 24, 28 Feb, 4 and 14 Mar in Table 2, as well as 27 Feb in Holland 2020a, Part I this issue).

5.6. Interactions of adults/fledglings, and fledglings with other species

Reports of adult/fledgling interactions seem to have been much fewer in the 2018-2019 season, limited to that reported by Diana White in Part I (Holland 2020a), but importantly also the aggressive action by a male towards a juvenile reported by Christine D on 3 Mar (see Section 3.3 above), and perhaps towards a fledgling as noted in her 14 Jan entry in Table 1. Also, Julie Clark noted that while watching the second fledgling (see 29 Jan entry in Table 1), an adult female flew into the adjacent tree, where it remained for a couple of minutes.

Mavis Jones saw her probably independent young Koel chase Common Starlings (Sturnus vulgaris) out of a tree (see 9 Feb entry Table 2), but the most interesting observation was made by John Leonard while watching his fledgling in Hughes (see 23 Feb entry in Table

2), when a Noisy Miner showed up. He noted that normally if they found a RWB in the backyard they would be aggressive and try to drive it away. However, on this occasion the Noisy Miner looked concerned, remained silent, and was hopping around seemingly looking for food. John's interpretation was that the Koel begging calls were also sufficiently like a Noisy Miner's for the bird to be fooled. It did not try to drive away the RWB hosts, and may even have thought about feeding the young Koel itself. It did not do so, and after a few minutes flew off.

This may have been similar to Marion Jones' experience with the possible Pied Currawong host (see 6 Feb entry in Table 2 and further discussion in Section 5.5 above). As summarised in Section 5.4.1 of Holland (2018b), there are quite a few previous examples of the Pied Currawong interacting with Koel fledglings, but only a couple have been identified this season, Diana White's on 11 Feb (see Table 2 in Holland 2020a, Part I this issue), and Jerry Olsen's very interesting observation of his fledgling being defended against a Pied Currawong by its RWB hosts (see 7-12 Jan entry in Table 1).

5.7. Possible reasons for the delay in the Koel season, including the first fledglings

A number of reasons have been advanced for the slow onset of the 2018-2019 Koel season in many areas, in particular the very dry spring, which would have had a significant impact on RWB breeding. The rains in November and particularly in December 2018 would have helped the RWB to breed, and that in turn would have helped the Koels. While this does correlate with the arrival of females in many areas towards the end of November, and the consequent onset of the fledgling season from early January, there was not necessarily a poor RWB breeding before the New Year. While on 29 Dec Michael Lenz noted that the RWB was still common on Lyneham Ridge, he had only the odd record of fledglings for this season, whereas the previous year many fledglings were produced. However, in other areas significant RWB breeding was still observed.

In my Chapman/Rivett GBS site I found my first RWB nest being built on 27 Sep 2018 with dependent young (dy) from 8 Nov, a bit later than usual (normally from towards the end of September). As noted in Part I (Holland, 2020a), quite a few RWB fledglings were also seen/heard being fed in the wider Chapman/Rivett area from about mid-November. Further, when I was actively looking for Koel fledglings in the New Year, I counted RWB fledglings from 7 different locations during January (see Holland 2020a, Part I this issue). Similarly, on 20 Jan Jenny Bounds noted that since October she had had RWBs nesting and with fledglings, probably from 2 pairs of adults in the area, over all GBS weeks except for 3 weeks in December.

From Lyneham, and perhaps from Rivett (despite the high pre-Christmas activity), there is some support that geographically-favoured areas last year were not necessarily favoured again this season, but otherwise this is very hard to discern from Table 3. No Koel fledglings have been reported from Watson for the past 2 seasons.

The talk on breeding success at Moruya by Michael Guppy at the 13 Feb 2019 COG meeting raised the possible effect of the Southern Oscillation Index (SOI) on Koel breeding and migration cues. While this would require a much deeper analysis than is possible in this paper, in November 2019 it was noted that since mid-2016 the SOI had been relatively stable, with only a short La Niña (www.bom.gov.au/climate/influences/timeline/). Thus, it would not seem to explain the differences between the seasons.

Therefore, the reasons for the slightly different 2018-2019 season remain unclear.

5.8. Main features of the 2018-2019 Koel season

In summary the key feature of the 2018-2019 season were:

- At least in some areas such as Chapman/Rivett, Deakin and Nicholls, the males arrived first and *ko-elled* for some time before the first females arrived, more typical of the 2015-2016 seasons and before that.
- In other areas such as Kaleen, Higgins and Ainslie, Koels seemed to arrive later and there was very little *ko-el* calling reported from the first two of these suburbs,
- High male and female activity from early November was only reported in Narrabundah, Fadden, Weston and Braddon. In other suburbs, such as Rivett/Chapman and Dickson, such activity started towards the end of November.
- Once Koels arrived they were often very conspicuous due to their noisy multiple bird aggregations/interactions.
- A much wider range of adult calls has also been reported, including in several areas females giving Dollarbird-like calls. There have also been a couple more cases of a male giving the *kek kek* call usually attributed to females.
- Probably due to the late arrival of females in many districts, the first fledgling was not reported until 3 Jan, about a month later than in the 2017-2018 season. However, fledgling numbers were the same for the two seasons at 86, though the 2018-2019 season was shorter, with the bulk (72%) reported between mid-January and mid-February.
- For the first time observers reported fledglings either taking or being fed bread, mince or cheese from feeding tables by their RWB hosts, as well as further examples of advanced fledglings feeding on fruit themselves. A case of a Pied Currawong probably feeding a fledgling has also been reported.
- There have been further cases of other species interacting with Koel fledglings, as well as discussion of the possible effect of the Noisy Miner on the RWB host, and consequently on both adult and fledgling Koel distribution.
- Adult Koels and fledglings were reported from peri-urban areas as well as more rural areas. Koels are now increasingly penetrating into the non-urban environment around Canberra and can no longer be considered a solely urban bird.
- Some areas which in the past have had many fledglings, such as Lyneham and Rivett, experienced reduced breeding activity, but in other areas such as Narrabundah, Fraser, Kambah and O'Connor, multiple fledglings were reported, suggesting that their main RWB hosts remain relatively naïve.
- Finally, there was an observation of an immature female Koel in June, the first authenticated report of a Koel in mid-winter.

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THE HYBRID HONEYEATER AT JERRABOMBERRA WETLANDS NATURE RESERVE (WHITE-CHEEKED *PHYLIDONYRIS NIGER* X NEW HOLLAND *P. NOVAEHOLLANDIAE*): A CONTINUING STORY

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Abstract. *Following the appearance at Jerrabomberra Wetlands of a hybrid honeyeater in 2016, a similar hybrid, probably the same bird, was observed at the same site in 2017, 2018, and 2019. As in 2016, the hybrid engaged in nesting activity paired with a New Holland Honeyeater. There is evidence that as in 2016 the mixed pair raised young in 2019.*

The purpose of this note is to add to earlier observations of the occurrence of a hybrid honeyeater (White-cheeked x New Holland: Phylidonyris niger x P. novaehollandiae*) reported in Canberra Bird Notes 41(3) December 2016. This note is intended to be read with the 2016 article and the photos shown there: reference to the online version is recommended http://canberrabirds.org.au/wp-content/canberra-bird-notes/CBN-41-3-23-Jan.pdf.*

Provision has been made for entry of such a hybrid in the eBird recording system. Apart from reports in the Canberra area, records have now been entered from near Brisbane, QLD (August 2017, 2 birds, and 4 records in March and June, 2018) and near Perth, WA (one record June 2019). The latter observation is described by Groom in Australian Field Ornithology 36 (2019).

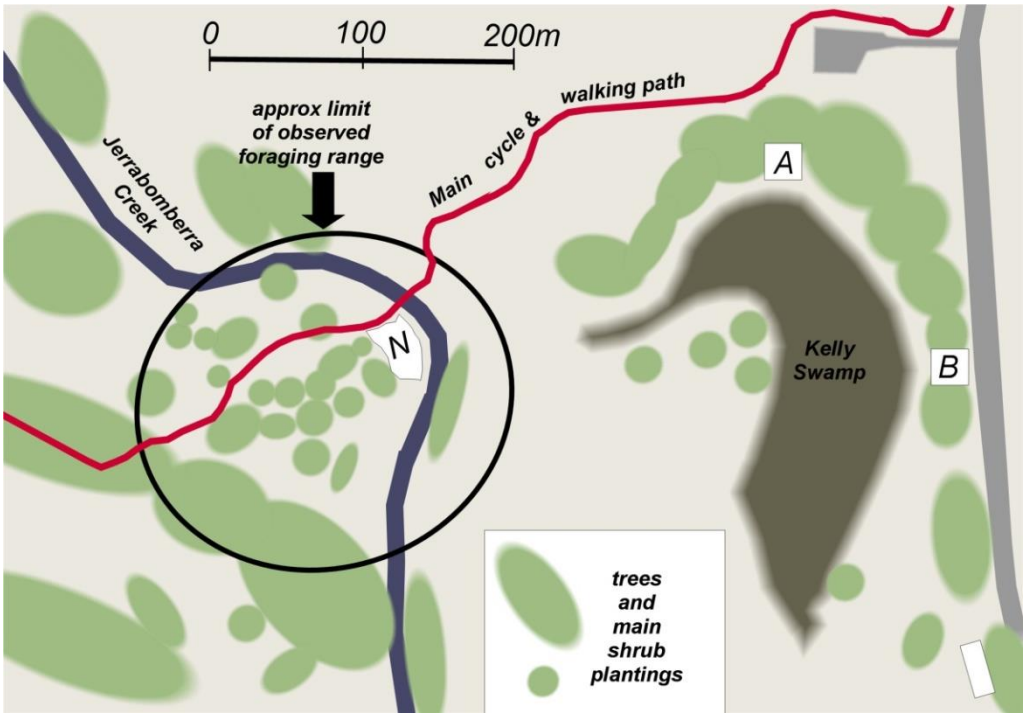
In the below account the abbreviation 'HTH' is used to refer to a hybrid-type Phylidonyris honeyeater. The following further abbreviations are used: 'NHH' – New Holland Honeyeater; 'WCH – White-cheeked Honeyeater: '2016 hybrid' – the bird described and illustrated in the 2016 CBN article; 'JWNR' – Jerrabomberra Wetlands Nature Reserve, ACT; 'JWNR site' – the area near Jerrabomberra Creek shown as the foraging area in the accompanying sketch map.

Summary of observations 2017 - 2019

In each of 2017, 2018 and 2019, on frequent but irregular visits to the JWNR site, I searched for any possible progeny of a mating between the 2016 hybrid and an NHH. No such progeny were found that could be definitely identified as such. However in each of those years an HTH was present. The HTH made seasonal nesting attempts.

In 2017, in May and November, an HTH was seen carrying nesting material. It regularly entered the undergrowth of tangles of dry reeds around the 2016 nest location. A nest was probably concealed there, but that behaviour ceased after heavy rain, indicating apparent failure of any nesting attempt. Earlier, in August 2017, Christine Darwood posted a photo of an HTH carrying nest material at another nearby location in the JWNR site, and reported a nest and a failed nesting attempt. (eBird – recorded under 'White-cheeked Honeyeater', as at April 2020). (https://ebird.org/checklist/S39077039 ; https://ebird.org/checklist/S39077199)

In 2018 an HTH was present at the JWNR site and engaged in similar reed-entering behaviour suggesting nesting.



The sketch map shows part of Jerrabomberra Wetlands Nature Reserve. This part of the reserve is much visited by persons observing, recording and photographing birds. The area with trees and shrubs to the west of Jerrabomberra Creek is known as the 'woodland section' or the 'woodland loop' where a walking path provides a circuit through that section. Outside the indicated trees and shrubs the vegetation is mainly grassland (mown, grazed or rank) or reeds or typha. The main path shown is often busy with walkers, cyclists or joggers. Several other paths traverse the area. The indicated foraging range was the usual haunt of an HTH when present in the 4-year period described here. In that area, several species of honeyeaters compete for access to flowering trees and shrubs, many the result of out-of-area plantings. The small area 'N' is the reedy area near the bridge containing the 2016 nest site and believed to be an occasional HTH nesting site over the period 2017-2019.

View from bridge over Jerrabomberra Creek looking towards the 'woodland loop' at JWNR. The reed-bed nesting area is beside the bridge. The dead tree is frequently a resting and vantage point for honeyeaters and other small birds. The eucalyptus shown often attracts foraging honeyeaters, which also feed at a variety of smaller shrubs planted in the area.

On 23 July 2018, Ryu Callaway, an observer familiar with the 2016 hybrid, reported an HTH feeding in Grevillea at Narrabundah College. The distance from Narrabundah College to the JWNR site is 2.5km in a straight line. It is not known whether the Narrabundah bird was the HTH present at the JWNR site in mid-2018 although Christine Darwood photographed an HTH at the JWNR site on 28 July 2018. Apart from the Narrabundah observation there have been no HTH observations in the Canberra area other than at JWNR.

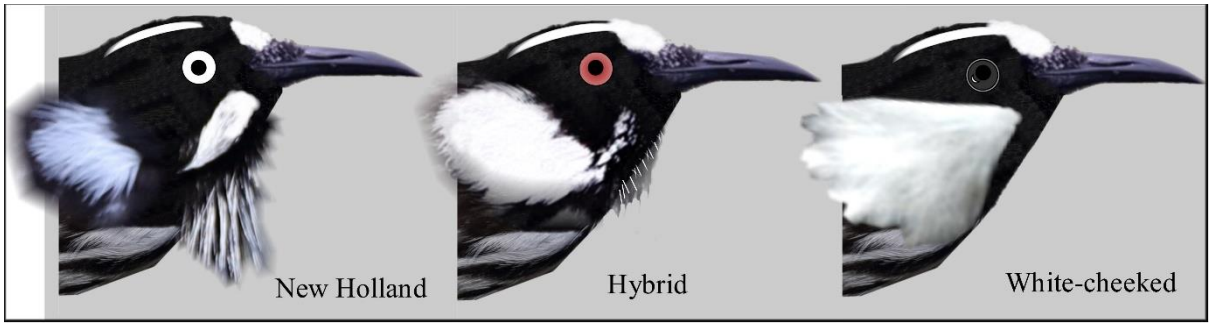
In 2019 between August and December I visited the JWNR site about once each week, for searches of about 30 to 60 minutes duration. An HTH was found on most but not all occasions. A small number of New Holland Honeyeaters was present on each occasion. On 9 September an HTH was seen holding in the bill many small flying insects, consistent with feeding small young. On 6 November an HTH was seen carrying nesting material (fragments of grasses) into the reedy undergrowth.

The surprising occurrence of an HTH at the one location over a period of four years justifies a close examination of the available photographic evidence from over that period. As no birds were banded, it cannot be established with certainty that more than one bird was involved. (The occurrence has now extended into a 5th year. An HTH was observed in the JWNR site in April 2020.)

Each HTH seen at the JWNR site over the last four years showed the following characters distinguishing it from an adult New Holland Honeyeater: a continuous white lateral crown stripe, absence of a white malar plume, absence of a significant white beard (a few short white bristles only), conspicuously large cheek plume (or 'fan'), dark or reddish iris (depending on angle of light).

Features distinguishing each HTH observation from a WCH were (a) less extensive (although large) fan, not beginning as a cohesive plume below or in front of eye (b) an indistinct arc of small white feathers in front of the fan, forming a narrow crescent under the eye ('the under-eye crescent') and (c) the colour of the iris in good light. On different occasions there might be slight differences in (b) depending on the angle of view or the posture of the bird or texture of the plumage due to moisture or fluffing. In an out-of-focus photo a white area against black can be exaggerated.

The features mentioned are indicated in the accompanying sketch.



The WA observation

Photos from the JWNR site might be compared with the images presented with the description of the possible hybrid in Western Australia. The WA subspecies of the WCH, *gouldii*, has a smaller fan. The respects in which the WA bird departs from each of the parent species correspond broadly to those for the 2016 hybrid, in particular the under-eye

crescent (interpreted in the WA bird as a 'black malar patch within the white cheek-plume'). Differences in the WA bird are the very dark iris and a break in the lateral crown stripe.

The Queensland observations

According to the photos on eBird, these could be of a single bird, remarkably similar to the 2016 hybrid. There are no details of a second hybrid referred to in the report of 4 August 2017. As with the Canberra record, but unlike the WA record, the Queensland sighting occurred outside the normal range of the White-cheeked Honeyeater: https://ebird.org/australia/checklist/S43549961

Observations of White-cheeked Honeyeater

The first record of a White-cheeked Honeyeater in the Canberra area was in December 2015. That bird was the presumed parent of the 2016 hybrid (see 2016 article). Before April 2020 the latest record on eBird of a WCH in the Canberra area was on 28 October 2018. Before the existence of a hybrid was accepted, several observations of an HTH were recorded in eBird as of a WCH, some but not all being annotated to indicate hybrid status. In the eBird photographic records of a local 'WCH' in 2017 and 2018 there are several that show an HTH

Since 2016 there is no convincing photo of a WCH in the Canberra area.

Reporting over the years of a hybrid bird as a 'White-cheeked Honeyeater' may have caused confusion among local observers. The Annual Bird Report (Canberra Ornithologists Group 2020) for 2018-2019, under 'White-cheeked Honeyeater', gives 7 records for 'one vagrant bird resident for 2 years', and 13 records for the previous year. If the hybrid bird described here is to be listed as a matter of record as a WCH, all local records of a WCH are to be interpreted accordingly, unless there is photographic evidence that a particular record refers to a typical WCH.

A comment on variable plumage colour of back and primaries

This is not a central issue here, but needs to be mentioned because of the degree of variation that appears in photographs. In the field, the apparent colour of upperparts is affected by whether a bird is in full sun or in shade or back-lit or has wet or dry plumage. Published photos are sometimes affected by digital lightening used in an attempt to show the 'true' colour of the bird. However there is wide variation in actual colour. Specimens of both honeyeater species in the Australian National Wildlife Collection have been examined under uniform light conditions. These show a range of colours, in upperparts of different birds, from light greyish brown to brownish black. Different colouration in this respect is not useful in distinguishing the two honeyeater species, in my view.

However relative 'brownness', particularly in the primary coverts, may be useful in distinguishing individuals or determining age. While brown tones might be due to worn plumage, juveniles, also, of both species are said to be browner (Menkhorst *et al*. 2019 (ABG)), and illustrations therein. See also HANZAB on paler brown upperparts of juvenile NHH).

The 2016 hybrid, a bird at the end of its first year, appeared to be browner than a typical NHH. The HTH observed in later years sometimes showed brownish upperparts, particularly in photos in 2018 (see photo B2). That photo is of a bird that, if the 2016 hybrid,

would have been at the end of its third year. Coincidentally, photos taken at the same time and place of an NHH show a bird with brown upperparts (B3). That bird does not appear to be a juvenile. It shows a well-developed fan, malar plume and white beard, a marked contrast to the under-developed yellow-gaped juvenile shown in ABG as an example of a 'browner' NHH juvenile.

It seems curious that in these two species browner plumage does not appear to be gender-related, by contrast with the third *Phylidonyris* species, the Crescent Honeyeater. (Compare HANZAB descriptions.)

Iris colour

Accompanying photos, and those taken in 2016, show iris colour as a relevant distinguishing feature in most HTH photographs. The apparent HTH iris colour varies from pale chestnut or pale apricot to an indeterminate dark colour according to the light. In a well-lit photo the distinctly reddish iris colour is darkest next to the pupil, fading to white at the outer margin.

That iris colour contrasts with the conspicuous white 'lifesaver' iris of a typical NHH. However, the NHH in photo B3 has a pale-brown iris. Again, that possible indication of juvenile status seems inconsistent with the plumage features of that bird. On the same day (10 June 2018) an NHH, possibly the one in B3 but not with the same apparent brown plumage, showed a reddish colour in its iris. (C series of photos.) It is possible the exceptional iris colour occurred in only the one individual seen on that day. No explanation of it is attempted here.

The problem of young birds, and the young recorded in 2019

This problem was mentioned in 2016. It is difficult to distinguish the very early fledglings of each species. We now have the ABG illustrations of 'juveniles', as well as those in HANZAB. In the field guide, 'juvenile' plumage is defined as 'the first plumage of contour (non-downy) feathers worn by a bird'. The illustrations in ABG of the juveniles of each species show a yellow gape, but the proportions of the birds illustrated (relative length of bill and tail) indicate in each case an advanced juvenile, each at the stage where the species can be clearly identified. (This is no criticism of the illustrator; the role of the field guide artist is to emphasise such aids to identification rather than the difficulties.)

Here photos from 2019 are shown of fledglings on 29 September and 11 October, the latter being observed foraging within 1m of the foraging adult HTH. The parentage of each fledgling is uncertain. The broken crown stripe might suggest NHH/NHH, but the features to be expected in an early non-downy fledgling of NHH/NHHxWCH parentage can only be inferred. (The second-generation hybrid fledglings photographed in 2016 were too downy to provide any useful guidance. Second-generation hybrids could vary considerably between themselves on the points differentiating the two species.)

The matter is of some interest, as a definite record of juveniles of mixed parentage would provide further evidence of the possibility of WCH gene-flow into the local NHH population, in addition, that is, to the evidence from the 2016 mixed-parentage breeding event.

The Kelly Swamp photos, November-December 2019

Rodney and Deborah Ralph have published on the Canberra Nature Map website photographs taken on 15 November and 17 December 2019 of juvenile birds that are designated as WCH x NHH hybrids:
https://canberra.naturemapr.org/Community/Sightings/Details/4241646

I have been told by Rodney and Deborah that on each occasion the subject was a single bird feeding on blossom in shrub plantings near the margins of Kelly Swamp, JWNR (near hides, first at B, then A on sketch map). They have sent me a number of photos, two of which, from the later date, are presented here. These have also been posted on eBird. The appearance of the bird is consistent with all photos being of the one individual (called here KS1) with plumage and other features developing over a period of 32 days. KS1 is unlike the adult hybrid then at the JWNR site and is clearly a juvenile (it shows a trace of pale gape and has a small fan). It lacks any sign of a white malar plume but has an under-eye crescent in a rudimentary form. It has a broken lateral crown stripe. It has a dark iris, a feature to be expected in both WCH and NHH young, although the light does not allow close examination of this.

Despite the difficulties mentioned above with respect to young fledglings, it is suggested here that absence of the malar plume in a more advanced juvenile may be a significant consideration. Photos of much younger fledglings from the JWNR site in 2016, some with downy plumage, show the early emergence of the malar plume. Those younger fledglings were probably of NHH/NHH parentage, although at that time and place the 2016 hybrid could have been one parent. Therefore there is credible evidence that KS1 is a second-generation hybrid, being the progeny of the adult HTH active at the JWNR site in 2019. Moreover the absence of a malar plume in the fledgling(s) photographed at the JWNR site on 29 Sep and 11 Oct leaves open the possibility that one or all of those earlier photos are of KS1 or a sibling of KS1.

A final comment

Having examined several hundred photos taken in 2016 and subsequent years, my own view is that all adult HTHs that I have seen at the JWNR site have been the same individual bird. Records of a WCH in the Canberra area before April 2020, if of a typical WCH, quite likely relate to only one individual bird. (There are no confirmed records, in my view, since 2016.) That individual was the presumed parent of the 2016 hybrid. (See 1916 note.) If present here, an HTH other than the 2016 hybrid could only be (a) a descendant of the 2016 hybrid; (b) a sibling or part-sibling of the 2016 hybrid or a descendant thereof; (c) the product of an unrelated hybrid mating, possibly outside the Canberra area. Only one adult HTH has been seen at one time.

Accompanying photographs

Series A: Examples of HTH in two previous years. A1-A3 - all from 30 May 2017. (A2 is probably carrying nest material.) A4 – from 11 November 2017. This bird is carrying soft nest material (down or spider-web). A5 and A6 – from 11 June 2018.

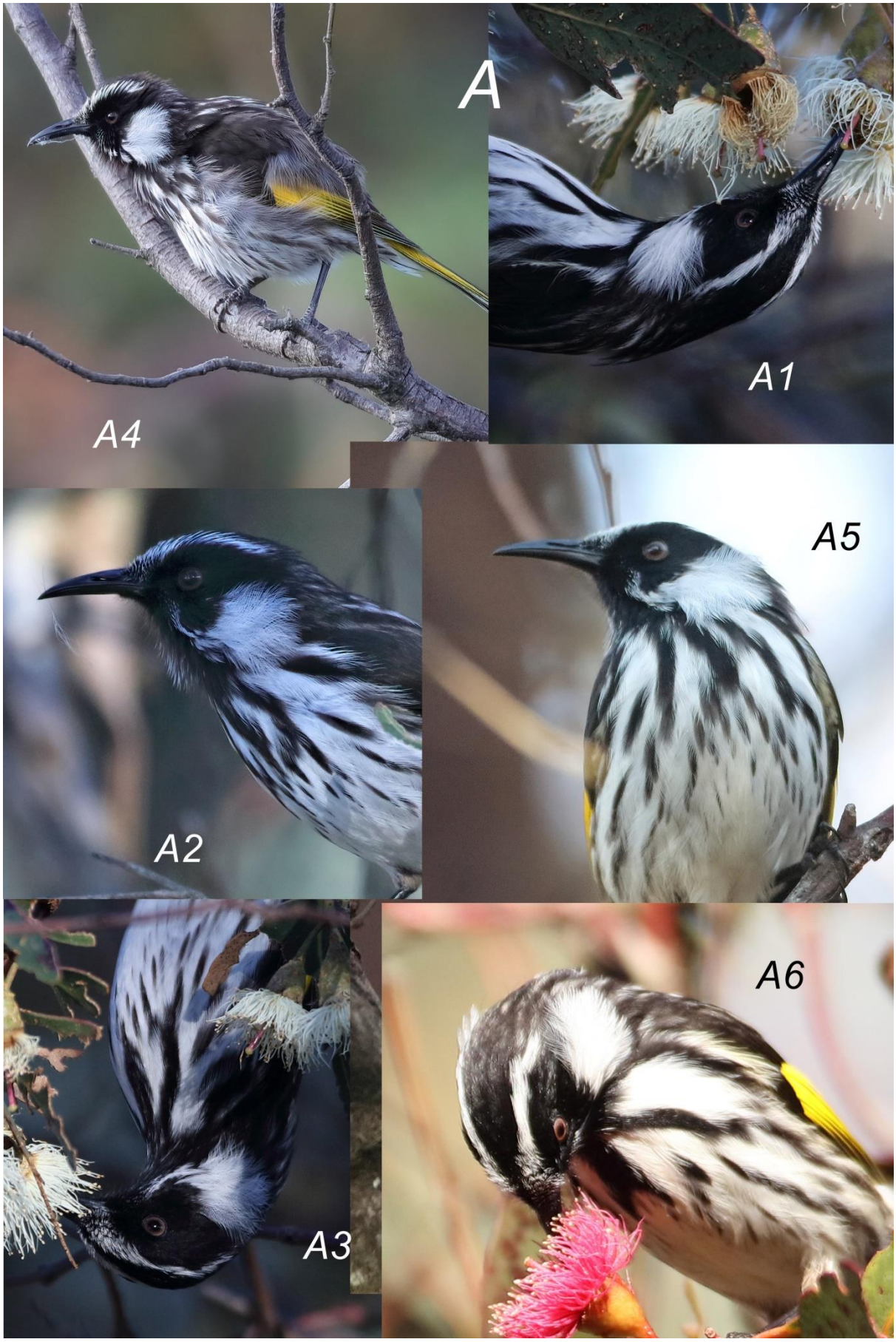
Series B: Photos relating to the discussion of brown upperparts. B1 is the 2016 hybrid on 21 October 2016. The short brownish-black feathers of the face contrast with the mid-brown colour of the upperparts. In B2 (a photo on 10 June 2018) strong sunlight has lightened otherwise dark areas so that upperparts, face and iris all appear exceptionally pale. The same comments apply to the NHH in B3, photographed on the same day. However the iris of that bird has enough colour to contrast with the stark white 'lifesaver' iris of a typical adult NHH. The same bird is possibly the bird, or one of the birds, shown in the C series under different light conditions. The 'beard' of the bird in B3 contrasts with the short white throat bristles of the HTH in B1 and B2.

Series C: An atypical NHH with coloured iris. All photos in the C series were taken on 10 June 2018 within a few minutes of photos B2 and B3. A bird with a coloured iris, either pale brown or pale chestnut, was seen foraging and engaging in interactive behaviour, both on ground and perched, with up to 8 other NHHs. Some interaction resembled 'corroboree' behaviour as described in HANZAB, and occurred near or in the nesting area of the HTH. Where in company, the bird with a coloured iris, possibly but not definitely the same bird in all images, is indicated by an arrow.

Series D: Heads of the HTH in 2019 (one in 2020). These can be compared with the images in the 2016 article. In D1 the bird is foraging for small arthropods in a much-visited callistemon shrub; in the other five it is in grevillea. D1 and D2 - 27, 29 September; D3 and D4 - 24 September; D5 - 10 October. D6 is the bird referred to as appearing on Easter Sunday, 12 April 2020. Here this bird shows a dark iris, but the iris is chestnut in stronger light in other photos at the time.

Series E: More from 2019. E1 - HTH carrying small flying insects on 9 September. (Compare photos labelled '9' from 2016.) In E2 and E3 (20 September) the birds are in a small leafless shrub used as a staging point close to a presumed nest. The HTH has collected a small egg case or pupa from a twig and is flying with it down into the reed base. The mate, presumed to be the male, has arrived to watch proceedings. (Only one typical NHH has been seen in close company with the HTH. Of the two, in both 2016 and 2019 the HTH was much the busier in carrying nest material or food items into the reed base.) E4 - HTH foraging on a bare twig (22 October). E5 - HTH gathering fine grass stems in the margins of Jerrabomberra Creek (by bridge) to be carried into reeds (6 November).

Series J: Very young birds. J1 and J2 - 11 October 2019. While probably partially dependent, this bird was able to feed by itself on nectar in a small grevillea. J3 - 29 September 2019. J4 and J5 - This bird, designated here KS1, is the juvenile photographed by Deborah and Rodney Ralph on 17 December 2019. (These and related photos may be found posted on Canberra Nature Map and eBird.) J6 - J11 – These are all fledglings photographed at the JWNR site in 2016. Although very young, each shows an emerging white malar plume. J6 - 6 December; J7 - 2 December; others - 4 December.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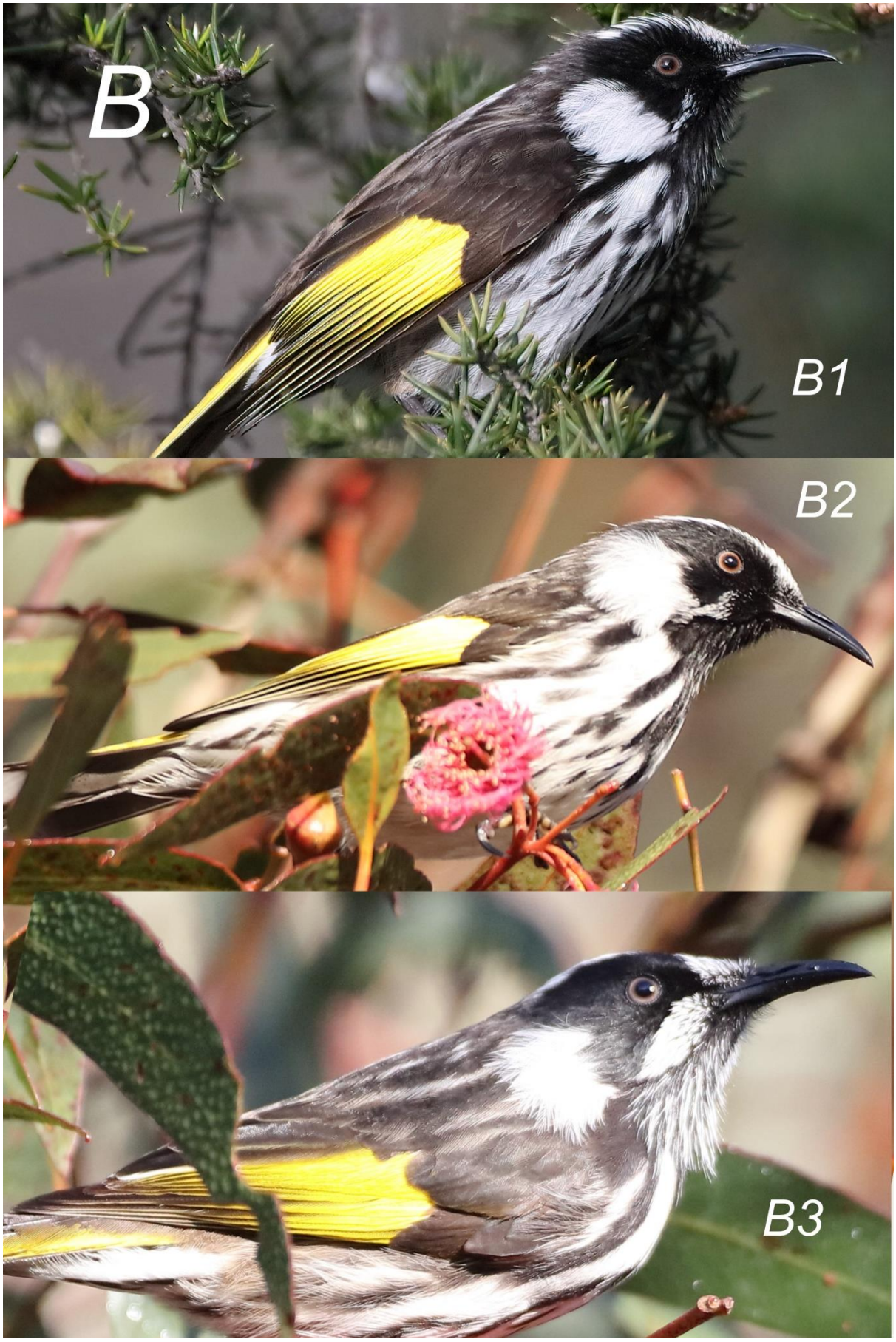
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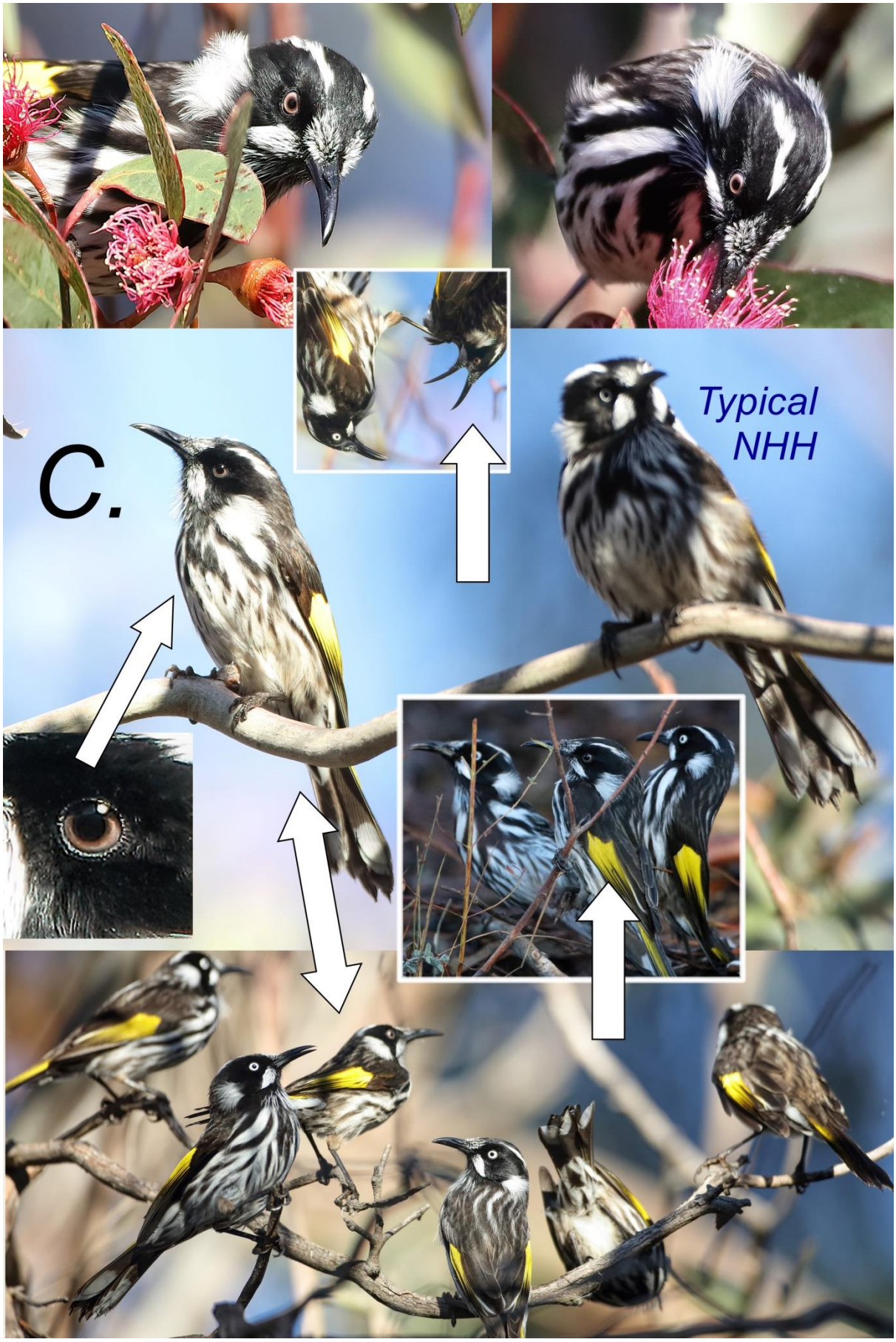
C.
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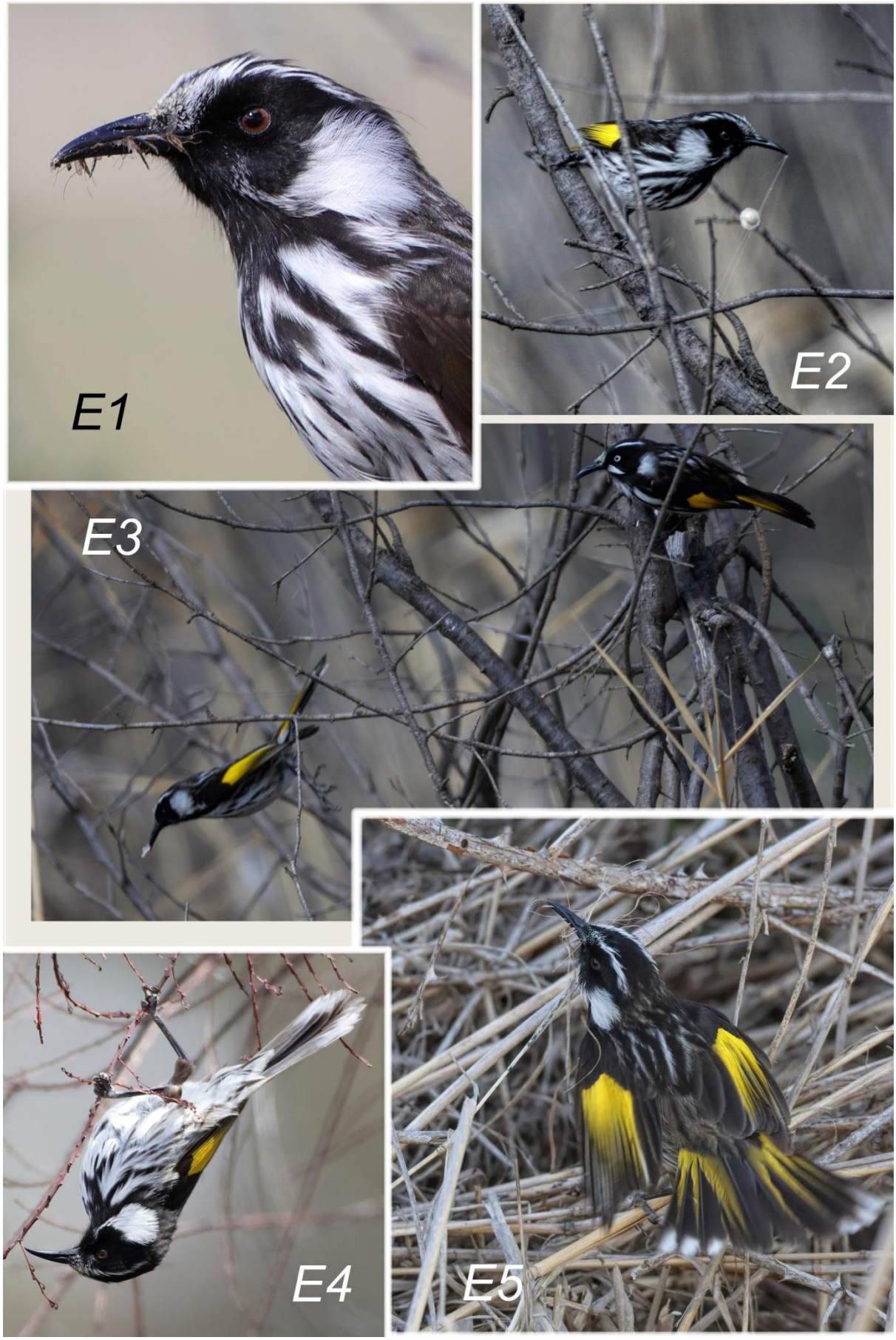
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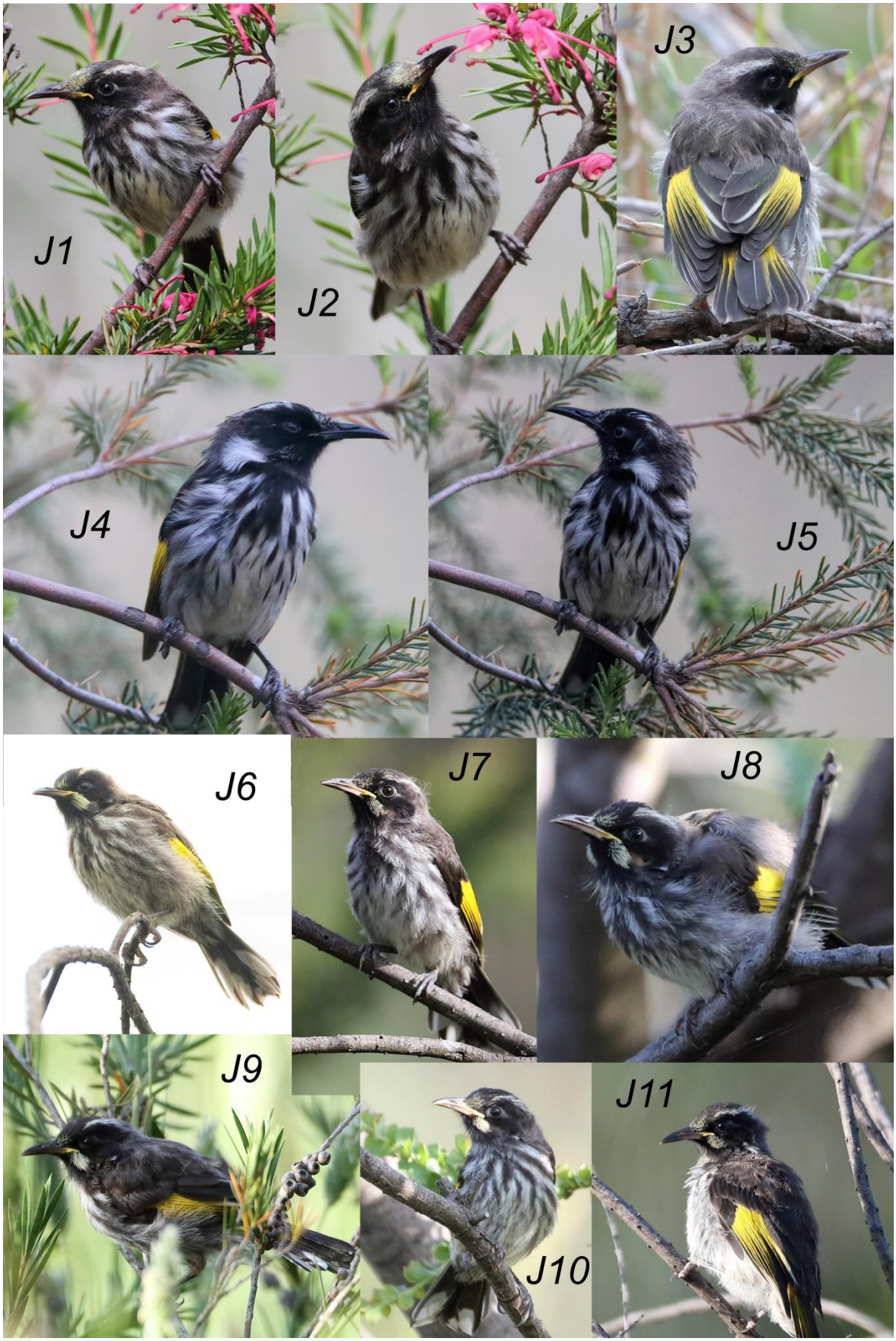
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This article has benefited from conversations with local birdwatchers over the 4-year period covered. I should mention in particular Shorty Westlin, Steve Wallace, Christine Darwood, Michael Lenz and Alastair Smith. Thanks to Rodney and Deborah Ralph for their significant contribution. I should also acknowledge again the people who helped with the earlier article. Use of information from eBird and Canberra Nature Map is acknowledged.

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THE BREEDING SUCCESS AND DIET OF LITTLE EAGLES IN THE ACT AND NEARBY NSW IN A DRY YEAR, 2019

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Abstract. *Fourteen Little Eagle* (Hieraaetus morphnoides*) territories have been identified in the ACT in three years of study, although not all have been occupied in all years. In the ACT in 2019, spring rainfall was well below average and maximum temperatures above average. A minimum of ten pairs of Little Eagles were located in the ACT during the 2019–2020 breeding season. Nine pairs had nests and at least six laid eggs. A minimum of three pairs successfully fledged a chick each. Of four pairs that were monitored in nearby NSW, single chicks were successfully reared by three pairs and one nesting attempt was disrupted during incubation by a pair of Wedge-tailed Eagles* (Aquila audax). *Overall breeding success was lower than for 2018 but similar to 2017. The main prey types were: mammals (50%) of which rabbit was the main species; small/medium-sized birds (43%); and reptiles (7%). Similar proportions of mammals, birds and reptiles were eaten in 2019 and 2018, and a higher proportion of mammals than in 2017.*

Introduction

This is the third consecutive annual report by the Little Eagle Research Group, whose aim is to describe the population ecology of the Little Eagle (*Hieraaetus morphnoides*), a species listed as vulnerable in the Australian Capital Territory (ACT) and New South Wales (NSW).

In spring and summer 2019–2020 (hereafter referred to as 2019), the Little Eagle breeding season, environmental conditions in the ACT and surrounding area were extreme, with the highest average daytime temperatures on record, low rainfall, and long dry periods (Bureau of Meteorology (BOM) 2020). Also, air pollution was high with raised dust carried by winds on numerous occasions, and extensive smoke haze from bushfires in surrounding areas of NSW severely degrading air quality in late November and December (BOM 2020a), continuing into January (BOM 2020b). The very warm and dry conditions affected general bird activity (Holland 2019a), numbers were low and fewer birds were breeding (Holland 2019b).

This preliminary report summarises the breeding status and diet of a sample of Little Eagles in the ACT and surrounding area of NSW under the extreme conditions of 2019 and

compares them with those of the previous two years of study (Rae *et al*. 2018, 2019). Details of movements during this period of birds fitted with satellite trackers will be reported separately.

Methods

All Little Eagle nests and territories known from previous surveys in 2017 and 2018, and localities around them, were checked for occupancy in the 2019 breeding season. The survey was done by the same methods as in previous years (Rae *et al*. 2018, 2019) following the methods of Hardey *et al*. (2013). Observations of the birds' behaviour were mostly done by watching for eagles from vantage points from late July 2019 to February 2020 and following up any sightings of eagles for possible nests.

Field observations were supported by following the movements of a sample of birds that were fitted with GPS-satellite transmitters (Rae *et al*. 2019). Four males and three females in seven territories carried transmitters, confirming their movements and breeding status. Further information on the behaviour of eagles was obtained with the deployment of cameras at two nests prior to the breeding season. Still images of activity at the nests were recorded with time-lapse settings and motion sensor.

Prey remains were collected from below nests and perches used by eagles between August 2019 and March 2020, in batches each site visit. The minimum number of each prey species per batch was calculated from distinguishable parts (Watson *et al.* 1987, Rae *et al*. 2018 & 2019). The composition of the prey remains in 2019 was summarised and compared with those of 2017 and 2018 as reported in Rae *et al*. (2018, 2019). Cast pellets of undigested food were collected and stored for later analysis as per Watson *et al.* (1993) and Rae *et al*. (2018, 2019).

Results

Number of Little Eagle pairs and breeding success

A minimum of nine pairs of Little Eagles were confirmed with nests in the ACT in 2019, and a tenth pair occupied another territory, but no association with a nest was confirmed. There were single birds in two further territories. Four pairs with nests were confirmed in nearby NSW (within 30 km of the ACT border). One other successful breeding event in the NSW area was reported to the study (Michael Lenz, *pers. comm*.). Not all the ACT or the nearby NSW area was surveyed.

Most territories occupied by Little Eagles in the ACT in 2019 were occupied in previous years. Seven of these were occupied in both 2017 and 2018, one pair were in a territory first known in 2018, and two pairs were in new-found territories. One of the single birds was in a territory occupied by a pair in 2018, and the other was in an area where nesting birds have been reported prior to this study. Two territories occupied in 2017 were not occupied in 2019. The new-found occupied territories were in areas where birds had been previously observed and were not adjacent to any of the unoccupied territories; therefore it is considered that a minimum of 14 distinct breeding territories have likely been identified over the three years of study.

The four territories monitored in nearby NSW in 2019 were the same as in 2018. Two of these were also monitored in 2017.

Six of the known pairs of Little Eagles in the ACT laid eggs. No eggs hatched at two of these nests after prolonged incubation (minima of 66 and 78 days; average successful incubation period about 37 days). Chicks hatched in the other four nests, and one died when only a few days old during a period of hot windy weather. Three chicks were reared, one from each successful nest. In nearby NSW, three chicks were reared from three nests, and another nesting attempt failed after disturbance by a pair of Wedge-tailed Eagles (*Aquila audax*) during incubation (details below). Therefore, breeding success was 0.30 chicks fledged per pair with a nest in the ACT, 0.75 in NSW and 0.46 overall. Or alternatively, 0.50 chicks were reared per pair that laid eggs in the ACT, 0.75 in NSW and 0.60 overall. Fewer chicks fledged per pair with a nest in the ACT than in 2017 and 2018 (0.44 & 0.55, respectively) and fewer overall than in 2018 (0.61), but similar to that in 2017 (0.45).

A pair of Little Eagles successfully reared a chick at one of the nests monitored with a camera. At the second nest with a camera, a pair of Wedge-tailed Eagles were recorded at the Little Eagle nest during the incubation period. The Little Eagles laid their first egg on 9 Sep and began incubating from then (Fig. 1). Photographs from 15 Sep showed a second egg (Fig. 2). One of the birds was incubating the eggs on 19 Sep when a pair of Wedge-tailed Eagles approached the nest, displaced the incubating Little Eagle, and one of the eggs was broken when a Wedge-tailed Eagle stepped on it (but did not eat it; Fig.3). The Little Eagles had returned to continue incubating the surviving egg by 20 Sep (Fig. 4). On 22 Sep the incubating female Little Eagle left the nest at 16:16 hrs (Fig. 5) presumably to avoid the approaching pair of Wedge-tailed Eagles which were again at the nest by 16:18, their second visit to the nest (Fig. 6). One of the Wedge-tailed Eagles then stayed on the nest till after 18:00 (Fig. 7). A single Wedge-tailed Eagle made a third visit to the nest on 24 Sep (Fig. 8) and there was a fourth and last visit on 25 Sep. No egg was visible on 24 Sep, and the Little Eagles abandoned their breeding attempt. The pair were subsequently seen within 1 km of the nest on 15 Nov, flying over an area where they had been observed previously.

Figure 1 (left) and Figure 2 (right): See text above for explanations.

Figure 3 (top), Figure 4 (middle) and Figure 5 (bottom): See text on p. 160 for explanations.

Figure 6 (top), Figure 7 (middle) and Figure 8 (bottom): See text on p. 160 for explanations.

Diet

The remains of 96 individual prey items were collected and all were identified to species except for two small passerines. In addition, 264 pellets were collected for future analysis. Analysis of the prey remains revealed the proportions contributed by number were mammals (50%), birds (42.7%) and reptiles (7.3%). The mammals were mostly young

European Rabbits (*Oryctolagus cuniculus*) (45.8%) and single items of Ring-tailed Possum (*Pseudocheirus peregrinus*), Brown Hare (*Lepus europaeus*) leveret, Red Fox (*Vulpes vulpes*) cub and an adult Eastern Grey Kangaroo (*Macropus giganteus*) paw (the last would have been collected as carrion, as a Little Eagle could not kill a full-grown kangaroo). The main bird species eaten were Crimson Rosella (*Platycercus elegans*) (n = 12), Starling (*Sturnus vulgaris)* (n = 5) and Eastern Rosella (*P. eximius*) (n = 4). The unidentified passerines were possibly a thornbill species and an Australasian Pipit (*Anthus novaeseelandiae*) or Eurasian Skylark (*Alauda arvensis*). Two reptile species were eaten: Eastern Blue-tongue Skink (*Tiliqua scincoides*) (n = 4) and Cunningham's Skink (*Egernia cunninghami*) (n = 3).

Over all three years of study, 2017, 2018 and 2019, mammals (42.6%) and birds (47.3%) were the most common prey items (n = 336) (Figure 9). Most of the mammals eaten were rabbits (88.8%, n = 143). There were significantly fewer mammals and reptiles, and more birds eaten in 2019 than in 2017 (Fisher exact test, n.s. $\chi^2 = 12.14$, df = 2, P = 0.002), but no difference between 2019 and 2018 (Fisher exact test, n.s. $\chi^2 = 0.02$, df = 2, P = 0.99).

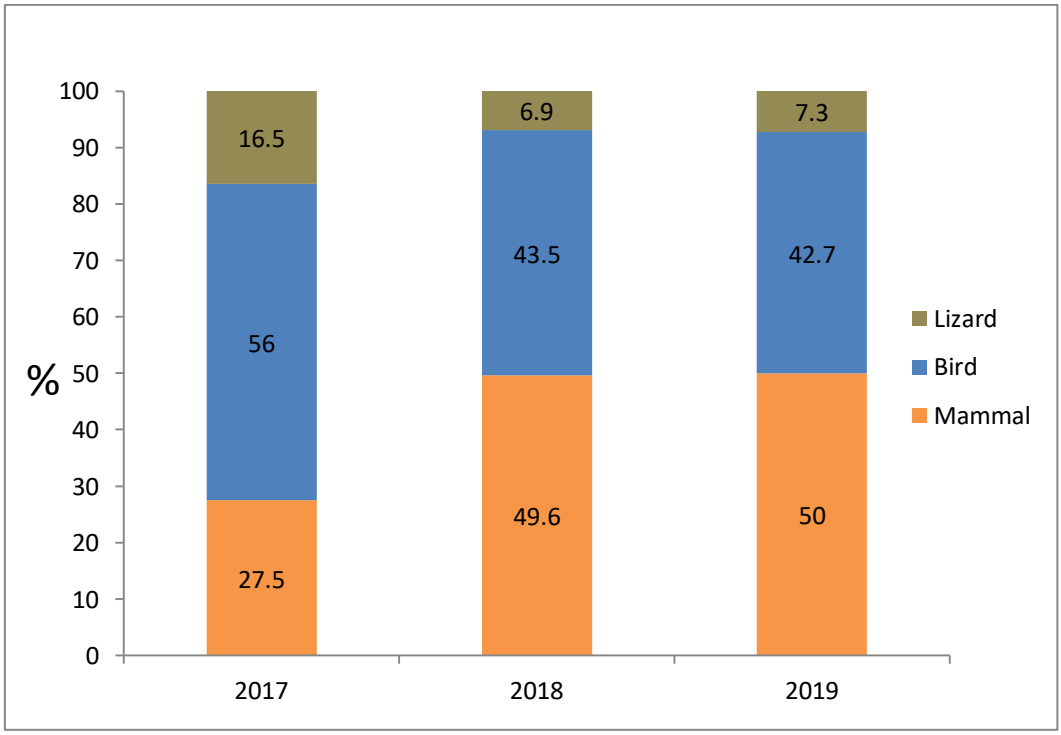

Figure 9. Proportions of food types in the remains of Little Eagle prey collected during the breeding season in the ACT and nearby NSW in 2017 (n = 109), 2018 (n = 131) and 2019 (n = 96).

Discussion

The number of Little Eagles found with nests in the ACT and nearby NSW in 2019 (9 and 4, respectively for each state) was similar to those in 2017 (9 and 2) and 2018 (9 and 4) (Rae *et al.* 2018, 2019). One territory that was occupied in the ACT in 2017 was vacant in 2018 and 2019 and another territory that was occupied in the ACT in 2017 and 2018 was vacant in 2019. However, the total numbers were balanced by new-found nesting birds in areas not previously surveyed and those territories could have been occupied in 2017 and 2018.

The failure of one breeding attempt due to disruption by a pair of Wedge-tailed Eagles confirms that Wedge-tailed Eagles can displace Little Eagles from their nests, as suggested by Olsen *et al.* (2006). Over the three years of the study, there have been nine other cases where breeding has failed post egg-laying: unhatched eggs (n = 3), eggs eaten by predator (n = 2), nest blown out (n = 1) and unknown causes (n = 3). As the larger eagles did not kill either of the Little Eagles and visited the nest four times, twice when no Little Eagles were present, it would seem that the purpose of their visits was more inclined towards occupying the nest site or ousting the adults rather that depredating the Little Eagles or their eggs. Interspecific competition for territories, sometimes called interference competition, is not unusual among raptors (for example, Kostrzewa 1990, Kruger 2004).

Little Eagle breeding success (young fledged per nest where eggs were laid) was lower in 2019 (0.6) than in the previous two years and lower in all three years of this study (Rae *et al.* 2018, 2019) than around Armidale, NSW, in 2017 (0.83) and 2018 (1.00) (Larkin *et a*l. 2020). Raptor breeding success varies in association with food supply (Newton 1979) and Larkin *et al*. discussed the possibility of the high breeding success in 2017 being related to a high abundance of rabbits in their study area. Ridpath and Brooker (1986) related lower breeding success of Wedge-tailed Eagles during drought to lower prey abundance under poor habitat conditions.

There was a considerable difference in annual rainfall between the two Little Eagle study areas. In Canberra it was 486 and 472 mm for the years 2017 and 2018, respectively, and higher at Armidale (817 and 638 mm; BOM Climate data online, for the respective airports). In Canberra, annual rainfall has been lower than usual every year of the study (BOM 2018, 2019). In 2019, Canberra received just 358.6 mm, 60% of the long-term mean, and temperatures were higher than usual (BOM 2020 a, b). During drought, numbers of woodland birds in the ACT area have been found to decline due to habitat degradation (Taws *et al.* 2011). Low rainfall is also poor for breeding rabbits, the main other food eaten by Little Eagles, as less green feed is available (King *et a*l. 1983). As well as resource availability, drought probably also affects bird populations by increasing physiological pressures (Selwood et al. 2015) and the Little Eagle and their prey species could have been distressed.

It appears that the Little Eagle population and breeding success in the ACT area has been in a trough during the past three years, which will potentially change if conditions improve. Long-term study is necessary to fully assess differences in breeding population and productivity under annual variabilities in weather and food availability, as has been done for other long-lived raptors such as the Wedge-tailed Eagle (Robertson 1987), Black Eagle (Gargett *et al.* 1995) and Golden Eagle (Watson and Rae 2019). Therefore, study and analysis of the breeding ecology of Little Eagles by the research group is ongoing.

Acknowledgements

The aim of the Little Eagle Research Group is to describe the population ecology of the Little Eagle. This is a collaborative study group, combining the members' knowledge, expertise and resources and we thank all other members for their teamwork on the study; namely Melissa Snape, Melissa Piper and Zohara Lucas. Rob Magrath and Simon Cherriman gave comments and helpful discussion on the draft. We are grateful for information supplied by the public as to the whereabouts of Little Eagles and to landowners and managers for allowing access to nest sites. All nest sites are georeferenced and archived but this information is not made available to the public at the request of some of the

landowners and managers and for the protection of the eagles and the integrity of the research.

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THE CANBERRA BIRD BLITZ 2019

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Abstract. *This paper describes the conduct and outcomes of the Canberra Ornithologists Group's fifteenth "bird blitz", held on 26-27 October 2019, and provides comparisons with the fourteen previous blitzes. In 2019, 417 surveys were submitted, from 102 grid cells; 181 bird species were recorded, 70 of them breeding. Highlights included the first blitz records of the Yellow-billed Spoonbill and the Common Sandpiper.*

Introduction

On the last weekend in October 2019 (Saturday 26 and Sunday 27), the Canberra Ornithologists Group (COG) held its fifteenth annual "bird blitz". In this exercise, we aim to record all species of wild bird present in the ACT over that weekend, to obtain a broad indication of their abundance, and to record breeding status. To achieve this, we set out to conduct a minimum of one 20-minute 2-hectare survey within each of the 165 grid cells covering the ACT (a 2.5-minute grid on lines of latitude and longitude, so each cell measures approximately 3.5 km by 4.5 km). A subsidiary aim of this exercise is to encourage more of our members to get out, survey and submit records.

The data collected are entered into eBird and the COG Atlas databases, and subsequently contributed to the BirdLife Australia Atlas database. They are available for scientific purposes and as an input to Canberra land-use planning.

Conduct of the blitz

Participants register for their preferred locations or grid cells, on a first-in, best-dressed basis. In the allocation process, some site preference is given to members who survey given sites on a regular basis. More tardy volunteers are cajoled by the organiser into surveying the remaining sites. Less experienced birders may accompany more experienced birders who indicate a willingness to take them along. And as a modest inducement to participants, a variety of prizes are on offer, courtesy of our members. One difference in the conduct of the 2019 blitz was the number of eBird participants who may or may not have realised their records were contributing to the blitz outcome.

Participants are allowed to choose their preferred methodology from the three BirdLife Australia Atlas options: a 20-minute/2-ha survey; within 500 m of a central point, for >20 mins; or within 5 km of a central point, for >20 mins. Incidental records are also welcomed, as are the various options from eBird.

Results and discussion

Operational issues

The weather on both days was good early, but then became windy, with one participant describing conditions as "a howling gale". However, the drier than usual autumn and winter

clearly had an effect. Most trails in Namadgi National Park were accessible. Unlike 2013, we did not conduct training classes to assist newcomers.

Level of participation and coverage

At least 100 named COG members, eBirders and friends took part in the 2019 blitz (a list of known participants is at Table). It is highly likely that some at least of the eBirders were unaware their records would be incorporated in the blitz analysis, but they are publicly available and moderated records and so it would be foolish to ignore them. As noted before, the number of participants probably equates to well over 100 if the unnamed companions are taken into consideration. Congratulations must go to the individuals who have supported the blitz each year since its inception: Matthew Frawley, Stuart Harris, Shirley Kral, Bruce Lindenmayer, Gail Neumann and Philip Veerman, as well as the author.

Table 1. Known blitz participants 2019

Barbara Allan	Sarah Fieg	Duncan McCaskill
Richard Allen	Matt Frawley	David McDonald
Ash Allnutt	Matt Fox	David McDonald
Roger Amos	Peter Fullagar	Julie McGuiness
Ian Anderson	Rob Geraghty	Ian McMahon
David Baldwin	Bill Graham	Megan Mears
Lia Battisson	Jeannie Gray	Gail Neumann
Cedric Bear	Tonia Haff	Harvey Perkins
Sue Beatty	Horst & Kay Hahne	Magen Pettit
Con Boekel	Lindsay Hansch	Deb & Rod R
Jenny Bounds	Stuart Harris	Lucy Randall
John Brannan	Sandra Henderson	Lach Read
Tina & John Bromhead	Jack Holland	Steve Read
Gordon Buchanan	Steve Holliday	David Rees
Prue Buckley	Julie Hotchin	Michael Robbins
Mikayla Burke	John Hurrell	Margaret Robertson
Ryu Callaway	Ned Johnson	Sue Robertson
Mark Carey	Bron King	Viv Rolland
Brian Chauncy	Daryl King	Alison Russell-French
Julie Clark	Sybilla Kovacs	Alastair Smith
David & Mel Clark	Shirley Kral	Nicki Taws
Mark & Kay Clayton	David Landon	Alan Thomas
Roger Curnow	Kim Larmour	Philip Veerman
Geoffrey Dabb	Michael Lenz	Ros & Ben Walcott
Christine Darwood	Bruce Lindenmayer	Shorty Westlin
Chris Davey	Joan & Trevor Lipscombe	Nancye Whybrow
Dianne Deans	Noel Luff	Tony Willis
Barbara & Chris de Bruine	Jim Lumbers	Kevin Windle
David Dedenczuk	Rod Mackay	Patrick Wyllie
Alistair & Carmen Drake	Alison Mackerras	
Jean French	Liam Manderson	

Surveys were received from 102 grid cells, or 62% of those possible. Our best coverage was in 2007, when we managed 122 grid cells. Observers clearly prefer surveying areas where they can be assured of seeing good numbers of bird species – an understandable but, for blitz purposes, somewhat regrettable choice. Jerrabomberra Wetlands and most other nature reserves were particularly favoured, though the most surveyed site this blitz was the woodland surrounding the Namadgi Visitors Information Centre, thanks I suspect to a chatline posting of the presence of Painted Honeyeaters (*Grantiella picta*) there. Nevertheless the grid cells surveyed covered most habitat types, so I believe we have a representative sample of ACT avifauna for the weekend. Map 1 (see page 178) shows the grid cells covered, while Table 2 (pages 179 to 183) indicates the comparisons between blitz years.

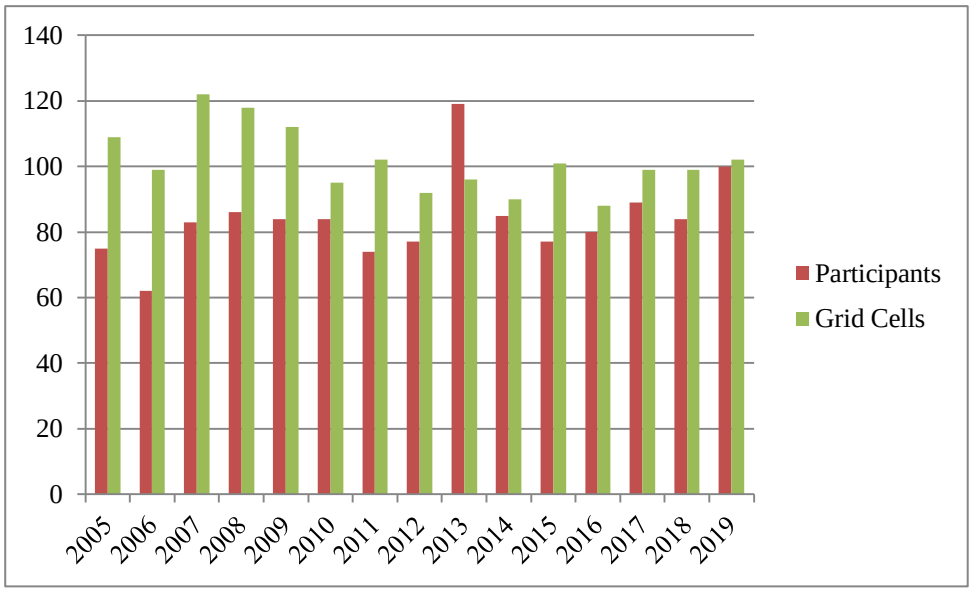


Figure 1. Number of participants and covered grid cells.

Surveys submitted

In the 2019 blitz, a total of 417 eligible surveys ("datasheets") were received, 152 in hard copy, and the remainder via eBird. Numbers have fluctuated over the 15 years of the blitz from a previous high of 370 in 2018 to a low of 242 in 2006. The actual number each year appears to have more to do with the types of surveys undertaken, and the relative proportion of lengthy surveys. It is at times a difficult trade-off for our blitzers between covering many grid cells and hence generally adopting the "20-minute, two-hectare" survey, and covering fewer areas but doing so more intensively over a longer period with a "within 500m" survey. The situation is further muddied now with eBird contributions able to avoid this classification.

Type of survey

As usual, participants were given the option of choosing their survey type to best fit the grid cell or location they were surveying and to allow for personal preference and time or other constraints. Without closer analysis, it is impossible to be definitive about the effects of survey type on outcomes. In the case of the blitz, which is essentially a citizen science exercise involving observers of differing levels of expertise, it is likely that the time spent at each site has a greater bearing on the numbers of species recorded, or the breeding status.

Species recorded

As Fig. 2 and Table 2 show, 181 bird species were recorded over the two blitz days in 2019. When all blitz years are considered together, 222 species have been recorded, while 124 species have been recorded every year. By way of comparison, the species total for all of the financial year 2018-19 and the whole of COG's area of concern, as recorded in the Annual Bird Report, was 249 from 345 grid cells (Canberra Ornithologists Group 2020). There have been blitz breeding records every year for only 23 species; while 141 species have been recorded as breeding at least once in the blitz.

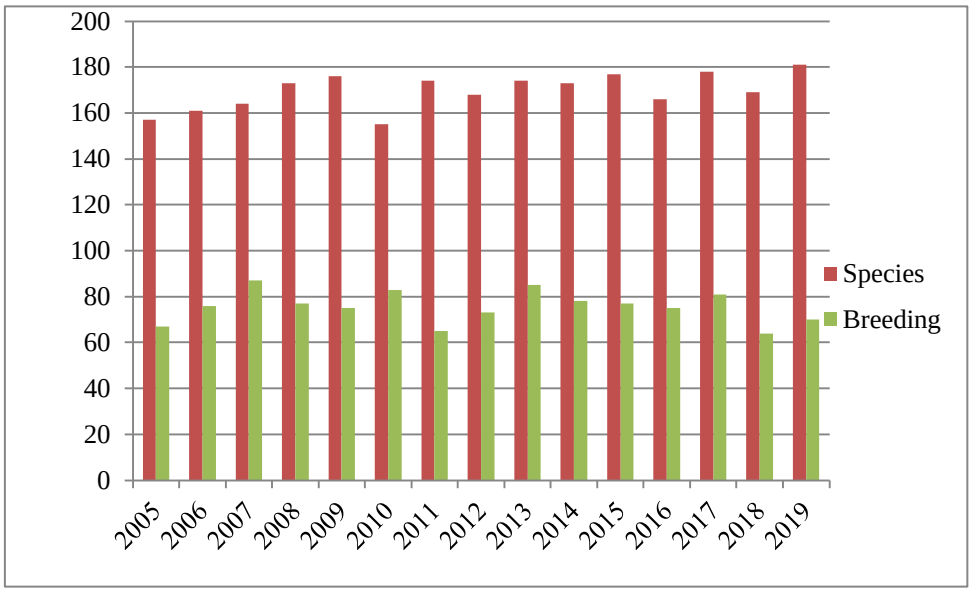


Figure 2. Number of species observed, and recorded breeding.

Highlights of the 2019 blitz

Two species were recorded during the blitz for the first time. Neither, it must be said, was a complete surprise. The Yellow-billed Spoonbill (*Platalea flavipes*) had been recorded previously at West Belconnen Pond, while the Common Sandpiper (*Actitis hypoleucos*) at Isabella Pond had been widely recorded by many COG members in the weeks leading up to the blitz.

(Left) Common Sandpiper (*Sandra Henderson*) and (right) Chestnut-rumped Heathwren (*Magen Pettit*).

Perhaps the most striking result of blitz 2019 was the influx of White-winged Trillers (*Lalage tricolor*). It was another irruptive woodswallow year, with both Masked and White-browed Woodswallows (*Artamus personatus, A. superciliosus*) being quite widely recorded and in flocks of up to 100. The Pied Butcherbird (*Cracticus nigrogularis*) appears to have established itself in Canberra and is now being regularly recorded. The first Brush Bronzewing (*Phaps elegans*) since blitz 2009 was a welcome record, as was that of the ever-elusive Chestnut-rumped Heathwren (*Calamanthus pyrrhopygius*) at Bluetts Block and the Powerful Owl (*Ninox strenua*) in Namadgi National Park.

Photos and collage of the ten most recorded species, blitz 2019 (*Geoffrey Dabb*).

Species most commonly recorded

The Australian Magpie (*Gymnorhina tibicen*) [with 252 records, involving 1129 individuals] remained in its usual preeminent position as "most common" species. It was followed by the Crimson Rosella (*Platycercus elegans*) [247 records], Australian Raven (*Corvus coronoides*) [209], Red Wattlebird (*Anthochaera carunculata*) [208], Pied Currawong (*Strepera graculina*) [205], Grey Fantail (*Rhipidura fuliginosa*) [198], Magpie-lark (*Grallina cyanoleuca*) [188], Sulphur-crested Cockatoo (*Cacatua* galerita) [186], Galah (*Eolophus roseicapilla*) [180], and Yellow-faced Honeyeater (*Caligavis chrysops*) [158]. (See Collage above).

No surprises here. All of these species featured in last year's top fifteen, albeit in a slightly different order. Former favourites, the Superb Fairy-wren came in at 12th. Apart from being widespread, these species are all readily identifiable.

Species not recorded in blitz 2019

Forty species which had been recorded in previous blitzes were not recorded in 2019. Inevitably, species known to be present in the ACT over the blitz weekend sometimes fail to

be recorded. "Resident" crakes, rails and button-quails can be elusive, as was the case in 2019 with Spotless Crake (*Porzana tabuensis*) and Painted Button-quail (*Turnix varius*). Other species with quite restricted distribution in the ACT, such as the Stubble Quail (*Coturnix pectoralis*), were not recorded in 2019. Several of our occasional visitors did not visit over the blitz weekend, including Great Crested Grebe (*Podiceps cristatus*) and Channel-billed Cuckoo (*Scythrops novaehollandiae*). Disappointingly, the Restless Flycatcher (*Myiagra inquieta*) was not recorded and nor was the Australian Owlet-nightjar (*Aegotheles cristatus*).

The results for our high-country specialists were varied, as usual. We failed to record Cicadabird (*Coracina tenuirostris*) and Olive Whistler (*Pachycephala olivacea*). There are possible non-worrying explanations for our missing this group of birds. The Cicadabird is a migrant and may simply not have returned by the last weekend in October. Our survey did not coincide with the efforts of a banding team, responsible for previous good returns. We did not have as many observers in the high country and they did not spend as long there as in some years. But it does appear that the 2003 fires are possibly a continuing influence here. One dreads to think of the impact of January's fires, which wiped out 80% of Namadgi National Park.

Most worrying, however, was the lack of records of the Glossy Black-Cockatoo (*Calyptorhynchus lathami*), which has not been recorded in the blitz since 2008.

Breeding

As Table 2 and Fig. 2 show, in the 2019 blitz only 70 species of bird were recorded as "breeding" – that is a generous interpretation, including the widest parameters recorded such as "display" and "inspecting hollow". The highest breeding we have recorded in the blitz was 87 species in 2007 and the lowest, 65 species in 2011. Only 23 species have been recorded breeding every year in the blitz, while 141 have been recorded as breeding at least once over the fifteen blitzes. This relatively poor breeding result in 2019 was probably partly at least the result of the dry conditions.

Scarlet Robin feeding young on the Centennial Trail (*Duncan McCaskill*).

As usual, the species most commonly recorded as breeding were either relatively large and/or conspicuous ones, namely Australian Magpie, Common Starling (*Sturnus vulgaris*), Magpie-lark, Pied Currawong, Crimson Rosella, Australian Wood Duck (*Chenonetta*

jubata), White-winged Chough (*Corcorax melanorhamphos*), Red Wattlebird and Willie Wagtail (*Rhipidura leucophrys*).

Arguably the most pleasing breeding record was that of the Southern Whiteface (*Aphelocephala leucopsis*) – only the third blitz breeding record for this species. Other species whose breeding is only occasionally recorded include the Hoary-headed Grebe (*Poliocephalus poliocephalus*, Yellow-tufted Honeyeater (*Lichenostomus melanops*, Bassian Thrush (*Zoothera lunulata*) and White-fronted Chat (*Epthinaura albifrons*). Red-capped, Flame and Scarlet Robins (*Petroica goodenovii, P. phoenicea, P. boodang*) were also successful. Disappointingly, there were again no breeding records for the Buff-rumped Thornbill (*Acanthiza reguloides*). The annual report for 2018-19, however, shows 18 breeding records for the species (Canberra Ornithologists Group 2020).

If we consider the 76 species whose status is "common" or "very common" breeding resident, 75 were recorded as being present in the ACT over the blitz weekend but there were breeding records for only 49 of them (55%). Amongst the "uncommon breeding resident" group, 33 of the 36 were present but only 7 (19%) were breeding; of the 17 "rare breeding resident" group, we recorded 15 [missing the Blue-billed Duck (*Oxyura australis*) and Emu (*Dromaius novaehollandiae*)] but only found three breeding [White-fronted Chat, Yellow-tufted Honeyeater and Indian Peafowl (*Pavo cristatus*)]. We recorded all 20 "common breeding summer migrant" or "common breeding visitor" but only found three of them breeding. Hopefully this was merely an indication of a late start to the breeding season.

Photos and collage of some of the vulnerable and endangered species in the ACT (*Geoffrey Dabb*).

ACT-listed vulnerable and endangered species

If we exclude the Swift Parrot (*Lathamus discolor*) which is unlikely to be here in late October, and the Australian Painted Snipe (*Rostratula australis*) and Regent Honeyeater (*Anthochaera phrygia*) which are seriously rare in the ACT, of the bird species listed as

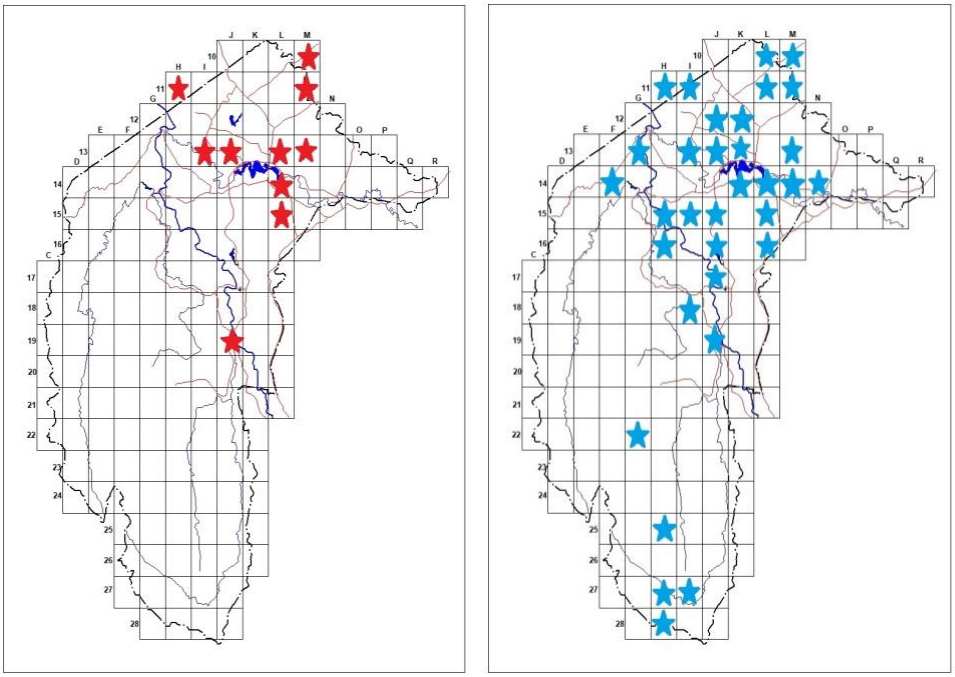
vulnerable or endangered in the ACT, only one was not recorded, the Glossy Black-Cockatoo.

As usual, the most widely recorded of the "vulnerables" was the White-winged Triller, which is considered in more detail as a case study, below. There were 14 records of 1-4 individuals of the Scarlet Robin, from 13 widespread grid cells, mainly in Namadgi National Park. Its reporting rate of 3.6% was well below the long-term blitz average of 6.4%. There was one breeding record, of dependent young, from the Centennial Trail at Taylor (see photo above). The Superb Parrot (*Polytelis swainsonii*) appears to be holding its own. There were 14 records of 1-8 birds from eight grid cells, all in north and north-west Canberra. Its reporting rate of 3.6% was a slight rise on the long-term blitz average of 3.1%. There were 9 Varied Sittella (*Daphoenositta chrysoptera*) records of 1-8 birds mainly from nature reserves in 6 grid cells, at a reporting rate of 1.8%, well below the long-term average of 2.7%.

The picture for the other vulnerables is less positive. After no blitz records in 2018, the Brown Treecreeper (*Climacteris picumnus*) was recorded once at a private property in grid I18. The Little Eagle (*Hieraaetus morphnoides*) was recorded three times from the same grid cell. Its reporting rate of 0.8% is well down on the long-term blitz average of 1.4%. There was one breeding record, however, with a bird recorded on a nest in Campbell Park. The two records of the Hooded Robin (*Melanodryas cucullata*) came from Mulligans Flat Nature Reserve, and Naas Road.

The Painted Honeyeater has now been listed as vulnerable in the ACT so it was encouraging to have records of three of these birds, two at the Namadgi Visitors Information Centre woodland, thanks to the initial discovery by Ryu Callaway, and one at Stony Creek Nature Reserve from Richard Allen. The only previous blitz recording of the species was in 2014.

A case study: White-winged Triller (*Lalage tricolor*)



Distribution of the White-winged Triller in 2018 (left) and in 2019 (right).

The 2019 blitz was a remarkable one for the trillers. This is a species whose status is "uncommon breeding summer migrant". It is listed as vulnerable in the ACT and yet there were 68 records, of between 1 and 30 birds, across 33 grid cells. The reporting rate for the species soared to 15.3%, compared with a blitz average of 6.6%. The distribution maps above show how starkly the difference from last year's blitz played out.

And there was one breeding record, in the woodland surrounding the Namadgi Visitors Information Centre.

Male White-winged Triller on nest (*Sandra Henderson*).

It is unclear what caused the spike in 2019 triller numbers though it is well known that influxes are often recorded (Higgins *et al*. 2006).

Trends

While the number of records and reporting rate of the majority of species fluctuate, in some cases markedly from year to year, after fifteen blitzes, trends are emerging for certain species, trends which are for the most part also reflected in COG's Annual Bird Reports. I have chosen the reporting rate (RR) as the most helpful indicator of trends and have highlighted only those species with sufficient records to make sense of possible movements.

Many of the ducks and other waterbirds are doing very well, perhaps thanks to the increasing number of urban wetlands being created throughout Canberra. The reporting rate of most ducks was generally steady, with the Grey Teal (*Anas gracilis*) at 9.4% fairly steadily rising from a long-term average of 7.7%. The Black-fronted Dotterel (*Elseyornis melanops*) RR of 3.1% has steadily risen, as has that of the Little Pied Cormorant (*Microcarbo melanoleucos*), RR 8.4% against its long-term average of 7.8%.

Most of the raptors fared less well. The two most commonly recorded, the Nankeen Kestrel (*Falco cenchroides*) and the Wedge-tailed Eagle (*Aquila audax*) were holding their own; but the Collared Sparrowhawk (*Accipiter cirrocephalus*), the Australian Hobby (*Falco longipennis*) and the Brown Falcon (*F. berigora*) have been steadily dropping. Surprisingly the Swamp Harrier (*Circus approximans*) had a good year (RR 1.3%). Amongst the parrots, the greatest increase has been seen for the Rainbow Lorikeet (*Trichoglossus haematodus*) (up 135% on its long-term average); the Little Corella (*Cacatua sanguinea*) (RR 8.4%) has also increased rapidly. The cuckoos generally declined, with even the Fan-tailed Cuckoo (*Cacomantis flabelliformis*) down to RR 6.4% against its long-term average of 14.5%.

Amongst the honeyeaters, the Red Wattlebird and the Noisy Miner (*Manorina melanocephala*) were relatively stable.

Amongst the "pest" species, the Australian White Ibis (*Threskiornis molucca*) was up 40% and the Spotted Dove (*Streptopelia chinensis*) almost doubled, though the Common Starling (*Sturnus vulgaris*) was relatively stable and the Common Myna (*Sturnus tristis*) fell slightly.

The small woodland birds have generally speaking not fared well. The Eastern Yellow Robin (*Eopsaltria australis* showed a modest decline. Even the relatively common thornbills have declined: the Buff-rumped Thornbill (*Acanthiza reguloides*) at RR 9.7% is down 38%, while the Yellow-rumped Thornbill (*A. chrysorrhoa*) at RR 18.1% is down 26%. There were a few bright spots, however, with the Weebill (*Sericornis brevirostris*) rising steadily - perhaps thanks to a loud and distinctive call preventing it from being overlooked.

Conclusions and lessons for the future

Blitz 2019, like its predecessors, has increased significantly the amount of data about Canberra's birds. Several of the grid cells surveyed would in all probability not have been covered but for the targeted effort of the blitz. The blitz data are made available to the managers of Canberra's national park and nature reserves. A lesson to be drawn from the blitz is that, when prompted, more of our members will get out, survey and submit surveys and perhaps revisit favoured spots.

There is, inevitably, an element of "luck of the day" in terms of the results but the long-term trends are already being highlighted. The blitz breeding observations are particularly useful in fleshing out a more detailed overall picture of bird breeding in Canberra. And given the tendency of our vulnerable species to be patchily distributed, the additional blitz information about where they are and in what numbers is highly valuable.

Acknowledgements

First and foremost, thanks must go to all COG members who participated in the 2019 blitz, and particularly to those who put in two full days of birding in remote sites. The assistance of staff at Namadgi National Park in providing advice, and access to areas behind locked gates, is greatly appreciated. Thanks also go to Jaron Bailey for extracting and manipulating blitz data from the COG databases and from eBird, to Nicki Taws for provision of the map, and to Geoffrey Dabb, Sandra Henderson, Duncan McCaskill and Magen Pettit for photographs. And sincere thanks too to all those COG members who donated prizes.

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Map 1 (Blitz coverage 2019) and Table 2 (species list), see following pages.

Map 1. Blitz coverage 2019.

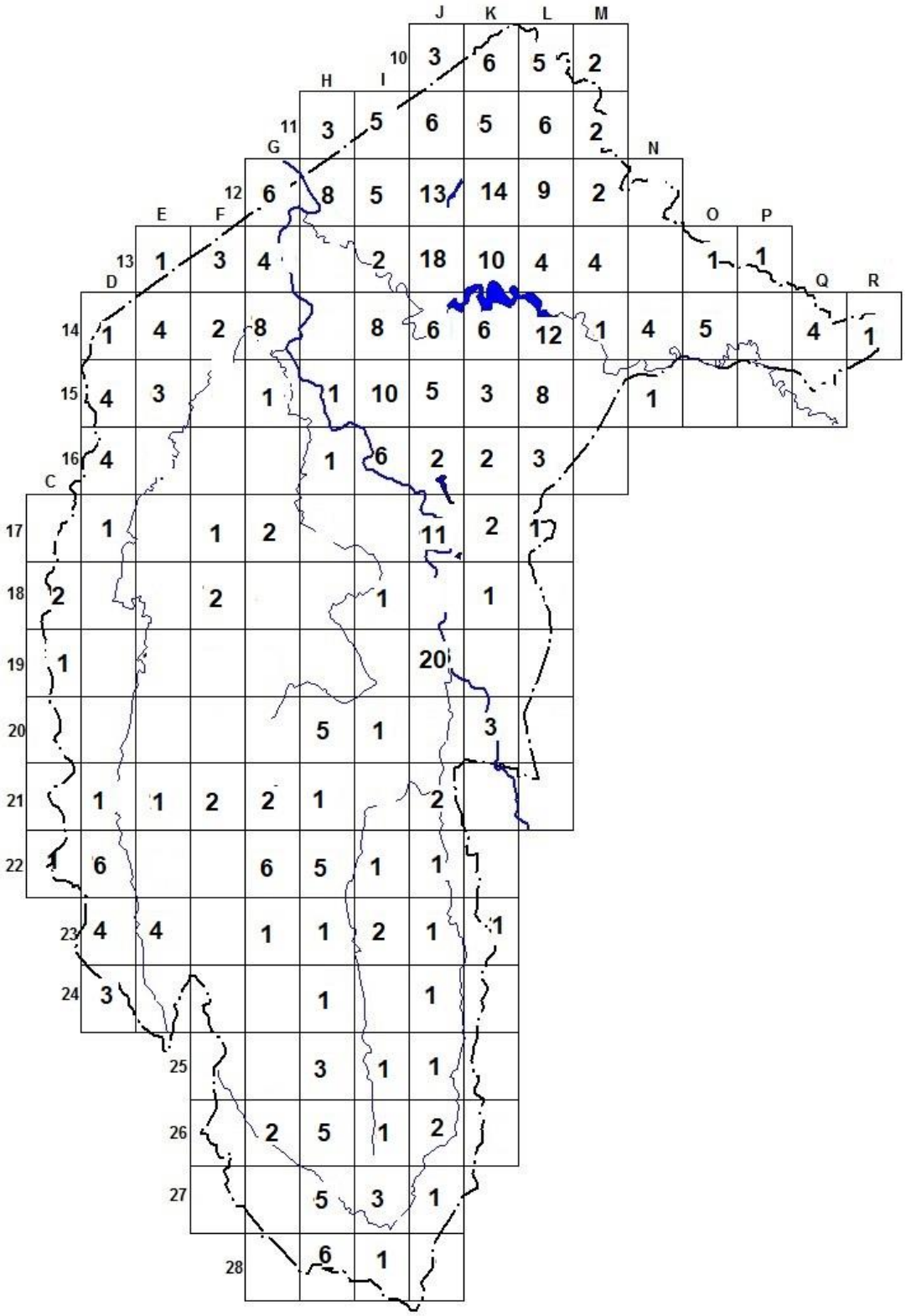

Table 2. Species recorded during the 2005-2019 blitzes.
[x=present; *=breeding]

Common Name	**05**	**06**	**07**	**08**	**09**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
Emu	x		x	x			x	x				x	x		
Indian Peafowl	x			x		x			x	x	x	x	x	x	x
Stubble Quail		x			x		x		x	x	x	x	x		
Brown Quail		x	x	x	x		x	x	x	x	x	x	x	x	x
Blue-billed Duck	x	x		x	x		x			x	x		x		
Musk Duck	x	x*		x*	x*		x	x		x	x		x		x
Pink-eared Duck		x	x		x			x	x	x	x	x	x	x	x
Freckled Duck								x	x	x	x		x	x	x
Black Swan	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Magpie Goose				x	x						x				
Australian Shelduck											x*	x*			
Aust Wood Duck	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x
Hardhead	x	x	x*	x	x	x	x	x	x	x	x	x	x*	x	x
Aust. Shoveler	x	x*	x	x*	x	x*	x*	x	x*	x	x*	x	x	x	x
Pacific Black Duck	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Mallard & hybrids	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Grey Teal	x*	x	x*	x*	x	x*	x	x*	x	x	x*	x*	x*	x	x
Chestnut Teal	x	x	x*	x	x	x	x	x	x	x	x	x	x	x	x
Australasian Grebe	x*	x	x*	x*	x	x*	x*	x*	x*	x*	x	x*	x*	x	x*
Hoary-headed Grebe	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x*
Great-crested Grebe	x										x		x		
Rock Dove	x	x	x	x	x	x	x	x	x*	x*	x	x*	x	x	x
Spotted Dove				x	x	x	x	x*	x*	x*	x	x	x	x	x
Wonga Pigeon	x			x				x			x		x	x	x
Common Bronzewing	x	x	x	x*	x	x*	x	x	x	x	x	x	x	x	x*
Brush Bronzewing					x										x
Crested Pigeon	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Peaceful Dove	x	x		x	x		x		x	x		x			
Tawny Frogmouth	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Aust. Owlet-nightjar				x			x	x	x	x	x	x			
Eastern Koel			x	x		x*		x	x	x	x	x	x	x	x
Channel-b. Cuckoo						x									
Horsfield's Br. Cuck.	x	x*	x	x	x*	x	x	x	x	x	x	x	x*	x	x
Black-eared Cuckoo											x				
Shining Br. Cuckoo	x*	x*	x	x	x	x	x	x	x*	x	x*	x	x	x	x
Fan-tailed Cuckoo	x	x	x*	x	x	x	x	x	x	x*	x*	x	x*	x*	x
Brush Cuckoo	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Pallid Cuckoo	x	x	x	x	x	x	x	x*	x	x	x*	x	x	x	x
Lewin's Rail								x							
Buff-banded Rail		x		x	x				x					x	x
Aust.Spotted Crake			x		x	x	x		x	x	x		x	x	x
Baillon's Crake				x	x		x		x	x			x	x	x
Spotless Crake									x		x		x		
Purple Swamphen	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Dusky Moorhen	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Black-tail. Native-hen					x		x	x							
Eurasian Coot	x*	x	x*	x*	x*	x*	x*	x	x	x*	x*	x*	x*	x*	x*

Table 2 continued

Common Name	**05**	**06**	**07**	**08**	**09**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
Yellow-bill. Spoonbill															x
Royal Spoonbill		x	x	x	x	x			x	x	x	x	x	x	x
Straw-necked Ibis		x	x	x	x		x		x	x	x		x	x	x
Aust. White Ibis	x	x	x*	x*	x*	x*	x	x	x	x*	x	x	x	x	x
Glossy Ibis		x	x				x				x				
Nankeen Night Heron	x	x	x	x	x	x	x	x	x	x	x		x	x	x
Cattle Egret		x					x	x	x	x	x	x	x	x	x
White-necked Heron		x	x		x		x	x	x	x	x	x	x	x	x
Great Egret		x	x	x	x	x	x	x	x	x	x		x		x
Intermediate Egret				x		x	x	x		x	x		x		
White-faced Heron	x*	x*	x*	x	x	x*	x*	x	x	x	x*	x	x	x	x
Little Egret				x			x								
Australian Pelican	x	x		x	x	x	x	x	x	x	x	x	x	x	x
Little Pied Cormorant	x	x	x*	x*	x*	x*	x*	x	x	x	x	x	x	x	x*
Great Cormorant	x	x	x	x	x	x	x	x	x	x	x	x*	x	x	x
Little Blk. Cormorant	x	x	x	x	x	x*	x	x	x	x	x	x	x	x	x
Grt. Pied Cormorant			x	x	x		x		x	x	x	x	x	x	x
Australian Darter	x	x*	x*	x*	x*	x*	x*	x	x	x*	x*	x*	x*	x	x*
Bush Stone-curlew										x	x	x	x	x	x
Red-necked Avocet														x	
Pied Stilt			x		x				x		x		x		x
Blk.-fronted Dotterel	x	x	x	x	x	x*	x	x*	x*	x	x*	x	x	x	x
Banded Lapwing					x										
Masked Lapwing	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Red-kneed Dotterel		x	x	x	x				x*	x	x*		x	x	x
Aust. Painted-snipe							x	x							
Bar-tailed Godwit			x												
Common Sandpiper															x
Sharp-tail. Sandpiper	x		x		x		x		x	x			x	x	x
Pectoral Sandpiper															
Latham's Snipe	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Painted Button-quail	x			x	x	x	x	x							
Silver Gull	x*	x*	x*	x	x	x	x	x	x	x	x*	x*	x*	x	x
Caspian Tern											x				
Whiskered Tern				x	x										x
Barn Owl							x								
Powerful Owl					x						x				x
Southern Boobook	x			x		x		x	x	x	x	x	x		x
Blk.-shouldered Kite	x	x	x	x	x		x	x	x	x	x	x	x	x	x
Wedge-tailed Eagle	x	x	x	x	x*	x*	x	x*	x	x*	x	x*	x	x*	x*
Little Eagle	x	x	x	x*	x*	x*	x	x	x*	x*	x*	x*	x	x*	x*
Swamp Harrier	x	x	x	x		x	x	x	x*	x	x	x	x	x	x
Spotted Harrier								x	x	x			x		
Brown Goshawk	x*	x*	x*	x*	x*	x*	x	x	x	x	x*	x*	x*	x	x*
Collared Sparrowhwk.	x	x	x*	x	x	x	x	x	x	x	x	x	x*	x*	x*
White-bell. Sea-Eagle			x	x			x		x	x	x			x	
Whistling Kite	x	x	x*	x	x		x*	x	x	x	x	x	x	x	x
Rainbow Bee-eater	x	x	x*	x*	x	x*	x*	x	x*	x*	x	x	x*	x*	x
Oriental Dollarbird	x	x	x*	x	x*	x*	x	x*	x	x*	x	x	x*	x*	x

Table 2 continued

Common Name	**05**	**06**	**07**	**08**	**09**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
Azure Kingfisher														x	
Sacred Kingfisher	x*	x*	x*	x	x*	x*	x	x*	x*	x*	x*	x*	x*	x*	x
Red-back Kingfisher			x	x											
Laughing Kookaburra	x*	x*	x	x	x*	x	x	x	x*	x	x*	x*	x*	x*	x
Nankeen Kestrel	x*	x*	x*	x*	x	x	x*	x*	x*	x*	x	x*	x*	x	x
Australian Hobby	x	x	x*	x*	x*	x*	x	x	x*	x	x	x	x	x	x
Brown Falcon	x	x	x*	x	x	x	x	x*	x	x	x	x	x	x	x
Peregrine Falcon	x	x	x	x	x	x*	x*	x	x	x*	x*	x	x*	x*	x*
Cockatiel					x										
Glossy Blk.-Cockatoo	x	x		x											
Yell-t. Blk.-Cockatoo	x	x	x	x*	x	x	x	x	x*	x*	x*	x	x	x	x
Gang-gang Cockatoo	x	x	x	x	x*	x	x*	x	x	x*	x	x*	x*	x*	x*
Galah	x*	x*	x*	x*	x*	x*	x	x*	x*	x*	x*	x*	x*	x*	x*
Maj. Mitch. Cockatoo			x												
Long-billed Corella				x		x	x		x	x*	x	x*	x	x	x
Little Corella	x*	x*	x*	x*	x	x	x	x*	x*	x*	x	x*	x*	x*	x
Sulphur-cr. Cockatoo	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Red-rumped Parrot	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Crimson Rosella	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Eastern Rosella	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Blue-winged Parrot											x				
Turquoise Parrot					x										
Musk Lorikeet													x		
Rainbow Lorikeet	x	x	x	x*	x	x	x	x	x	x	x	x	x*	x*	x
Superb Parrot	x	x*	x*	x	x*	x*	x	x	x	x	x	x	x	x	x
Aust. King-Parrot	x	x	x	x*	x	x*	x*	x*	x*	x*	x	x	x*	x*	x*
Superb Lyrebird	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Satin Bowerbird	x	x	x	x*	x*	x	x	x	x*	x*	x*	x*	x*	x	x*
Wh.-thr. Treecreeper	x	x*	x*	x*	x*	x*	x*	x*	x*	x	x	x	x	x	x
Red-br. Treecreeper	x	x	x		x	x			x			x		x	x
Brown Treecreeper	x	x	x*	x*	x*	x	x	x*	x	x	x	x	x		x
Superb Fairy-wren	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x	x*
Crescent Honeyeater					x	x	x	x		x*		x	x	x	x
White-cheeked HE													x	x	
New Holland HE	x	x*	x*	x	x	x	x	x	x	x	x*	x	x	x	x
Brown-headed HE	x	x	x	x*	x	x	x*	x*	x	x	x	x*	x*	x	x
White-naped HE	x	x	x	x*	x*	x	x	x*	x*	x*	x*	x	x*	x*	x*
White-eared HE	x*	x	x*	x*	x*	x	x	x	x*	x	x*	x	x*	x	x
Painted HE										x					x
Noisy Friarbird	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x	x*	x*	x
Scarlet HE													x	x	
Eastern Spinebill	x*	x*	x	x	x	x	x	x	x*	x*	x	x	x	x	x
White-fronted Chat					x	x	x	x			x	x*	x	x	x*
Lewin's HE												x			x
Red Wattlebird	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
White-plumed HE	x*	x*	x*	x*	x*	x*	x	x*	x*	x*	x	x	x	x*	x*
Fuscous HE	x*	x	x*	x*	x	x*	x	x*	x	x*	x*	x	x*	x*	x
Yellow-faced HE	x	x*	x	x*	x*	x	x	x	x*	x	x	x	x	x	x

Table 2 continued

Common Name	**05**	**06**	**07**	**08**	**09**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
Yellow-tufted HE	x						x		x	x	x	x*			x*
Noisy Miner	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Spotted Pardalote	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x	x*	x*
Striated Pardalote	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
White-thr. Gerygone	x*	x	x*	x	x	x*	x	x*	x*	x*	x*	x	x*	x	x*
Western Gerygone	x	x	x	x	x	x	x	x	x	x*	x	x*	x	x*	x
Weebill	x*	x	x*	x*	x	x*	x*	x	x*	x	x*	x*	x*	x*	x
Pilotbird	x				x	x	x		x*				x		x
Speckled Warbler	x*	x	x*	x*	x*	x*	x*	x	x	x	x*	x	x*	x*	x
Chestn.-r. Heathwren						x		x					x		x
White-br. Scrubwren	x*	x*	x*	x*	x*	x	x*	x	x*	x*	x*	x*	x*	x*	x*
Southern Whiteface	x	x*	x	x	x	x	x	x		x		x*	x	x	x*
Yellow-r. Thornbill	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Yellow Thornbill	x	x	x	x	x*	x*	x	x	x	x	x	x*	x	x	x
Striated Thornbill	x*	x*	x*	x	x*	x*	x*	x*	x*	x*	x*	x*	x*	x	x*
Brown Thornbill	x	x*	x*	x	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Buff-rump. Thornbill	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x	x
Varied Sittella	x*	x*	x*	x	x*	x*	x	x*	x*	x*	x*	x*	x	x*	x
Olive-backed Oriole	x	x	x*	x*	x	x*	x	x	x*	x*	x*	x	x*	x	x
Spotted Quail-thrush	x	x	x	x	x	x	x	x	x	x	x		x	x	x
Eastern Shrike-tit	x	x*	x	x	x	x	x	x	x	x	x*	x	x*	x	x
Olive Whistler							x								
Rufous Whistler	x*	x*	x*	x*	x	x*	x	x	x*	x*	x*	x	x*	x	x*
Golden Whistler	x	x	x	x	x	x	x	x	x*	x	x	x	x	x	x
Grey Shrike-thrush	x	x*	x*	x*	x	x*	x	x	x	x	x	x*	x	x	x
Eastern Whipbird		x	x	x	x	x	x	x	x	x	x	x	x	x	x
Blk.-f. Cuckoo-shrike	x	x*	x*	x*	x*	x*	x*	x*	x*	x	x*	x*	x*	x*	x*
Common Cicadabird				x	x	x		x	x		x	x			
White-winged Triller	x*	x*	x*	x	x	x	x	x*	x*	x*	x*	x	x	x	x*
Pied Currawong	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Grey Currawong	x	x	x*	x*	x*	x*	x	x*	x*	x*	x*	x*	x*	x*	x
Australian Magpie	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Pied Butcherbird										x		x	x	x	x
Grey Butcherbird	x*	x*	x	x	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Maskd. Woodswallow		x	x	x	x		x	x	x					x	x
Wh-br. Woodswallow		x*	x*	x	x		x	x	x	x			x*	x	x
Dusky Woodswallow	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Willie Wagtail	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Rufous Fantail	x		x	x	x	x	x		x			x	x	x	x
Grey Fantail	x*	x*	x	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x	x*
Leaden Flycatcher	x*	x*	x*	x*	x	x*	x*	x*	x*	x*	x*	x*	x*	x*	x
Satin Flycatcher	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Restless Flycatcher	x	x	x		x		x	x	x	x		x	x	x	
Magpie-lark	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Little Raven	x*	x	x*	x*	x*	x*	x*	x*	x	x	x*	x*	x*	x*	x
Australian Raven	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
White-wing. Chough	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Apostlebird												x	x		
Rose Robin	x	x	x	x	x	x	x		x	x	x	x		x	x

Table 2 continued

Common Name	**05**	**06**	**07**	**08**	**09**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
Flame Robin	x	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Scarlet Robin	x*	x*	x	x*	x*	x	x*	x	x*	x*	x	x*	x	x	x*
Red-capped Robin	x	x*	x*	x	x	x*	x	x	x	x	x	x	x		x*
Jacky Winter	x	x*	x	x	x	x	x	x	x	x	x	x	x	x*	x
Eastern Yellow Robin	x*	x*		x	x	x	x	x*	x*	x*	x	x*	x*	x*	x
Hooded Robin	x*	x*	x*	x	x*	x	x*	x	x*	x	x		x		x
Eurasian Skylark	x	x	x	x*	x	x	x	x*	x	x	x	x	x	x	x
Gold.-head. Cisticola	x	x	x	x	x	x*	x	x*	x	x*	x	x	x	x	x
Aust. Reed-Warbler	x*	x	x	x	x*	x*	x*	x*	x*	x*	x	x	x*	x	x*
Brown Songlark	x*	x	x*	x	x		x	x					x		x*
Rufous Songlark	x	x	x	x	x	x	x*	x*	x	x	x	x	x	x	x
Little Grassbird	x	x	x	x	x*	x	x	x	x	x	x	x	x	x	x
Fairy Martin	x	x	x*	x*	x*	x*	x*	x*	x*	x	x*	x*	x*	x*	x*
Tree Martin	x*	x*	x*	x*	x*	x*	x	x*	x*	x*	x*	x*	x*	x	x*
Welcome Swallow	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Silvereye	x	x	x*	x	x	x*	x	x*	x*	x	x*	x	x	x	x*
Common Starling	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Common Myna	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Bassian Thrush	x	x		x	x			x	x*		x			x	x*
Common Blackbird	x*	x	x*	x	x	x	x*	x*	x*	x	x*	x	x*	x	x*
Mistletoebird	x*	x	x	x	x*	x*	x	x*	x	x	x	x	x*	x	x
Diamond Firetail	x	x	x	x	x	x	x	x	x	x	x	x	x*	x	x
Red-browed Finch	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x	x*	x*	x*	x*
Double-barred Finch	x	x*	x*	x*	x	x	x*	x	x	x	x	x*	x	x	x
House Sparrow	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x
Australasian Pipit	x	x	x*	x*	x*	x*	x*	x	x*	x*	x	x*	x*	x	x*
Common Greenfinch	x				x	x	x	x	x*	x	x	x	x	x	x
European Goldfinch	x	x*	x	x	x	x	x	x	x	x	x	x	x	x	x

Notes

Domestic ducks and geese, which frequent the lakes, have been excluded, as have domestic chickens even when recorded far from civilisation. The peafowl have been included as they appear to be a naturally reproducing "wild" population. The "mallards" have been lumped as their exact identity cannot be assured – it probably includes crosses with domestic as well as wild birds. The Emu, Brolga and Magpie Geese are – or were – probably part of the semi-captive population at Tidbinbilla Nature Reserve. The Bush Stone-curlews are included as, though initially introduced to the Sanctuary at Mulligans Flat Nature Reserve, they are free to roam.

Canberra Bird Notes 45(2) (2020): 183-192

A SHORT DISCUSSION ABOUT CASUARINAS AND BIRDS, IN PARTICULAR THE GLOSSY BLACK-COCKATOO *CALYPTORHYNCHUS LATHAMI*

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Abstract. *The first part of this note is about associations between different species of casuarina and different species of birds. Most of the associations mentioned come from observations in Australia, but there are some from elsewhere. The second part is about casuarinas used as food trees by the Glossy Black-Cockatoo (GBC). The status of the GBC in the ACT area is considered, along with present and possible future conservation measures in light of the food trees available to the species in this area.*

For various reasons, prompted in part by the re-appearance in April 2020 of the Glossy Black-Cockatoo (GBC) near Canberra, I had intended to write a general note about birds making use of casuarinas. However, after consulting the available literature about the GBC, in particular about its local movements and its food trees, I found that I had to deal separately with that species. Therefore, this contribution is in two parts.

Casuarinas and some birds that use them

Anyone who takes an interest in birds and the vegetation they use will know that there are several different kinds of trees out there that go under the name of 'casuarina'. The classification within the family has been subject to some revision. A major change in the 1980s was the introduction of the genus *Allocasuarina*, which means that what some people might reasonably call 'a casuarina' (being a member of the casuarina family, *Casuarinacae*) might be, strictly, an *Allocasuarina*. In this note 'casuarina' unless in italics is used in the wider sense, referring to members of the family.

'Casuarina', first given as the scientific name, is said to come from the similarity of the slender branchlets to the plumage of a cassowary ('kasuari' in Malay – so one kind of bird connection right there. The cassowary of the Moluccas was known to, and classified by, Europeans before they found a related species in Australia.)

Casuarinas are sometimes referred to as 'oaks', 'she-oaks' or 'pines'. A single casuarina species can bear several different English names. Many species occur in Australia. One species, *C. equisetifolia* L. ('horse-tail oak', 'beach she-oak', 'coast casuarina' or 'beefwood', among other names), has a wide range extending from Australia to south-east Asia and out into the Pacific islands. When the author Somerset Maugham wrote 'The Casuarina Tree', a 1926 collection of short stories about the British in Malaya, he chose a title that was an extravagant metaphor about the use of the tree in land improvement. *C. equisetifolia* is now one of the casuarinas that have become invasive pest species in coastal areas of the United States.

Figure 1. Top: Red-browed Finch eating casuarina seeds, on ground and in tree, JWNR. Centre: Regent Honeyeater in flowering She-oak Mistletoe, Capertee Valley, NSW, and female Painted Honeyeater in casuarina, near Uriarra Crossing. Bottom: 'Kokomos' roosting in Yar Trees, New Britain, PNG (photos Rocky Roe).

Figure 2. A: Alexandrine Parakeet feeding on introduced *C. equisetifolia*, near Mumbai (photo Pushan Ayyub); B: Yellow-tailed Black-Cockatoo seeking larvae under bark of *C. cunninghamiana*; C: Glossy Black-Cockatoos feeding on large cones of *A. verticillata*, Ainslie/Majura slopes, 2004; D: Glossy Black-Cockatoos in *A. littoralis*, Great Dividing Range near King's Highway, NSW, 2004.

There are several species of casuarina in New Guinea. *C. equisetifolia* is common in some coastal areas. Another species *C. oligodon* is prominent in the highlands landscape. It is

used for fencing (keeping pigs from gardens), firewood and house construction. It is an important fallow plant in the increasingly intensive agriculture over the last 170 years (Bourke 1997). Where Melanesian Pidgin is spoken, a casuarina tree of any species is called a 'Yar'.

For the Canberra area, the helpful little volume *Field Guide to the Native Trees of the ACT* (NPA) lists the following four species: River She-oak (*C. cunninghamiana*); Black She-oak (*A. littoralis*); Bull-oak (*A. luehmanni*); Drooping She-oak (*A. verticillata*).

Turning now to the birds, I remember in my childhood, in Geelong, seeing 'yellow-tailed thornbills' building nests in the drooping needles of roadside 'she-oaks'. (No-one then said 'casuarina', and 'allocasuarina' was still in the future.)

Apart from the GBC, several other species of cockatoos and parrots have been reported as feeding on casuarina seeds. They are included in the wide range of foods of the Crimson Rosella (*Platycercus elegans*), for example. That species has been reported feeding on debris left by the GBC (Lenz 2004b). Alison Rowell has reported Crimson Rosellas feeding on smaller, younger cones of *A. littoralis*, near Tarago.

Pushan Ayyub is a resident of Mumbai, India, where there are plantings of *C. equisetifolia*. He has recorded the closed cones being attacked by the Alexandrine Parakeet (*Psiittacula eupatria*) and to a lesser extent by the more common Ring-necked Parakeet (*P. krameri*).

One subspecies of Red-tailed Black-Cockatoo, the threatened *C. banksii graptogyne,* feeds on the seeds of only three tree species, one being Bull-oak (Buloke) *A. luehmanni*. According to the 'Enjoy Darwin' website, the northern subspecies of the Red-tail is reported to feed on casuarina 'pine nuts'. (Darwin rivals Malaysia in number of places and businesses bearing the name 'Casuarina', probably in recognition of the ubiquitous *C. equisetifolia*.)

The Yellow-tailed Black-Cockatoo (YTBC) (*Calyptorhynchus funereus*) is recorded as another eater of casuarina seeds, in addition to the wide range of other plant species that might be attacked by that species. In recent years small flocks of YTBCs have been seen visiting the casuarinas beside Jerrabomberra Creek in the much-visited nature reserve (JWNR), but when observed closely they have been found to be seeking larvae under the bark rather than seeds. That behaviour has been reported at other locations.

The Red-browed Finch (*Neochmia temporalis*) can often be seen, depending on season, taking seed from opening casuarina cones in the plantings at JWNR. Recently (5 June) at the same site Michael Lenz recorded a European Goldfinch (*Carduelis carduelis*) hanging from opening cones and probing for seeds.

The River She-oak, relatively plentiful in places along our local waterways, often harbours small insect larvae that are hunted by larvae-eating birds, particularly cuckoos (my observations). It also offers food of a different kind. The flowers of the She-oak Mistletoe (*Amyema cambagei*) attract nectar-seeking birds, while the fruit is sought not only by Mistletoebirds (*Dicaeum hirundinaceum*) but by an uncommon honeyeater. Steve Wilson's (1999) historical account of ACT bird life notes that in earlier years the Painted Honeyeater (*Grantiella picta*) was recorded in some numbers at Uriarra Crossing. 'Its main food appears to be the fruit of a mistletoe which grows on the river oaks.' In spring of 2013 the

honeyeater returned to those 'oaks' along the Murrumbidgee, building a nest in one and feeding on nearby mistletoe.

The River Oaks at Capertee Valley, NSW, are a well-known breeding haunt of yet another threatened species, the Regent Honeyeater (*Anthochaera phrygia*), the trees being evidently a good source of insects and nectar, the latter from the abundant mistletoe.

Back to New Guinea: two American ornithologists, Ernst Mayr and Thomas Gilliard, were impressed by what they found among those Yar trees in the highlands. The trees grew in wide valleys where the natural forest had been removed by an increasing human population:

> *Paradisea apoda*, which was found to be common up to 5600 feet, thrived in the casuarina clumps planted for firewood and in islands of trees (usually an acre or two in size) growing over 'mat-mat' (graveyard) plots. Virtually every such island was visited daily by Greater Birds of Paradise, and, in many, males danced. The marked liking which these birds had for such artificial casuarina plantings (the casuarina itself having been conveyed to abnormally high altitudes by primitive man) doubtless is a factor contributing to the abnormally high distribution of this lowland species (Mayr *et* al. 1954).

One more New Guinea bird species might be mentioned here. I recently found on a website dealing with matters New Guinean a report of numbers of large birds, as many as 200, roosting each evening in the bare upper branches of Yar trees (probably *C. equisetifolia*). The birds were known in pidgin as 'Kokomos', otherwise Blyth's (or Papuan) Hornbill (*Rhytoceros plicatus*). This is the only hornbill species to reach New Guinea, and the closest member of the family to Australia. The birds were reported from Bialla, an oil-palm plantation centre on the island of New Britain (King). The person reporting them was kind enough to send me a few photos.

The hornbill is widespread across the lowlands of Papua New Guinea, and is of cultural importance in some places. The coastal area of the island of New Guinea opposite Boigu and Saibai Islands is within the hornbill's nominal range. Those tiny Queensland islands are responsible for several New Guinea species appearing on the Australian list. Some careful plantings on Saibai Island could expand the Australian bird list considerably; Yar trees and figs could help to add Blyth's Hornbill, among others.

A comment about the occurrence and the food trees of the Glossy Black-Cockatoo (*Calyptorhynchus lathami*) in the Canberra area

The Glossy Black-Cockatoo is dependent on *Allocasuarina* seeds, while also making some use of one *Casuarina* species (Chapman). *Allocasuarinas* have harder cones, the seeds being accessible to the Glossy Black-Cockatoo with a bill uniquely adapted to that purpose (Dominique Homberger, pers. comm.; see also Schodde *et al.* (1993) with respect to regional bill variations.)

A 'fact sheet' published for NSW gives the following preferred food trees for the NSW subspecies *lathami* (see also Chapman 2007):
'north-eastern NSW': *A. torulosa* ('forest oak casuarina'), *A. littoralis*;
'south-eastern NSW': *A. littoralis*;
'inland NSW': *A. verticillata, C. cristata/C. pauper* ('belah').

Figure 3. Glossy Black-Cockatoos feeding on cones of *A. distyla*, lower slopes of Mount Jerrabomberra, Queanbeyan, NSW, May 2020. Also shown is a small section of the large amount of discarded cones and debris.

In April 2020 a family group of three Glossy Black-Cockatoos was reported at a locality on the lower slopes of Mt Jerrabomberra, a woodland reserve adjoining the Queanbeyan suburb

of Karabar, NSW. (GBCs are usually seen in threes, being a pair with one young (Forshaw and Cooper 1981).) They were present at least 6 Apr to 17 May, and before moving on had removed nearly all suitable cones from about ten small, shrubby *Allocasuarina* trees. The cones were evidently of high quality.

The relevant tree species has been identified as *A. distyla* ('scrub she-oak' or 'shrubby she-oak', reported to be a food of GBCs in the Blue Mountains (Chapman)). The source of introduction of *A. distyla* to the Mt Jerrabomberra site is still being investigated. Given the location of apparent plantings, it was probably used to stabilize bare and sloping ground in the course of landscaping operations.

After the absence of reports in 2019, it is notable that a pair of GBCs were seen in the ACT feeding on *A. verticillata* on 29 May 2020, western part of Mount Majura. On 2 June 2020 3 GBCs were reported feeding in (possibly only one specimen of) *A. verticillata* on Mount Ainslie (see Canberra Nature Map). Subsequent searches failed to locate the birds. It was noticed that there was a poor growth of cones in the area, those seen being generally opened, old or withered.

The recent story of the GBC in the Canberra area begins with the absence of any record of the species in the ACT in the RAOU atlas surveys 1977-1981 or in the organized COG surveys Sept 1986-Aug 1989. Subsequently, when ranges of the separate populations were described, the ACT was regarded as lying within a wide zone of range discontinuity bisected by the Great Dividing Range. That zone separated the southern coastal population from the inland (Dubbo-Pilliga-Riverina) populations (Schodde *et al.* 1993).

In the COG data, local records of the species began in 1993. There is a useful summary of relevant records by Steve Holliday in *Canberra Bird Notes* of December 2004. This drew attention to GBC observations within *and* to the east of the ACT, the latter being reflected also in more recent COG data. There was a confirmed breeding record in August 2004 from the Mount Ainslie area (Lenz *et al.* 2004). However, records in the COG 'area of interest', mainly from the Ainslie/Majura area, have declined since 2007, despite an increase in active observers. There were no records in 2017 or 2019 (bird-years to 30 June).

In August 2010, the GBC was declared to be a vulnerable species in the ACT. That declaration led to preparation of Action Plan No. 33. The plan noted: 'In the ACT and region the distribution of the Glossy Black-Cockatoo typically reflects the distribution of *A. verticillata* (Holliday 2004)'. It went on: 'The rarity of *A. littoralis* in the ACT … suggests this she-oak species is unlikely to be a significant food source for the birds in the ACT'. In accordance with the plan, organized plantings of *verticillata* occurred in locations in the northern part of the ACT (ACT EPSDD Fact Sheet).

In May 2019, the Scientific Committee under the *Nature Conservation Act* 2014 published a 'Conservation Advice', a statutory document. The 'primary objective' was stated to be 'to maintain a viable, wild population of Glossy Black-Cockatoos in the ACT and region'. With respect to food trees, the advice referred to 'loss by clearing or regular burning' and the need for action to 'maintain and enhance connectivity through plantings of Drooping Sheoak'.

There is a question whether maintaining 'a viable wild population of Glossy Black-Cockatoos in the ACT and region' is a realistic objective.

The guide to ACT trees referred to above notes in relation to each of *A. littoralis* and *A. verticillata*: 'The seeds are a source of food for the threatened Glossy Black-Cockatoo'. However, while *verticillata* is 'locally common in the ACT', *littoralis* has a very limited occurrence in the territory 'but is common in the ranges just to the east of the ACT, such as Gourock Range. … ACT is the western limit at this latitude'. There are numerous patches of it east of the road from Bungendore to Tarago.

Our knowledge of the status of the GBC within the COG 'area of interest' is far from complete. Records of the species over the last 30 years are sparse and intermittent, and consistent with the birds seen here being individuals travelling further afield when pushed to look for food sources. Despite the single breeding record, it has not been established that a small population is resident in 'the ACT and region'. It is possible we only record wandering individuals from further east, from the main area of the coastal population.

However, the possibility that a small resident local population survives within and near the eastern part of the COG area of interest is supported by information from landholders who report GBCs present throughout most of the year. Those reports need to be further investigated, but they relate to small areas of suitable habitat that are not visited by birdwatchers. Generally, such birds are feeding on *A. littoralis*. It would be reasonable to regard such birds as a remnant group, relying on the remnant patches of *littoralis*, still shrinking as a result of land clearing and fire. Replacement plantings of *Pinus radiata* are used by the YTBC, but are of no use to GBCs. When visiting the ACT, GBCs feed on *A verticillata* as the only food source available in the ACT.

GBCs need trees with abundant, mature cones. Availability of a mix of *Allocasuarina* species would help provide a year-round food supply. *A. littoralis* and, given recent evidence, *A. distyla*, are examples of species that could be considered for planting in the ACT. However, that suggestion raises the issue whether it is justifiable to plant, in environmentally protected open spaces, exotic or out-of-area species for the benefit of a threatened bird species.

The possibility has been suggested that the recent visit of a family of 3 GBCs to Queanbeyan might have been caused by burning of their usual food trees by wildfires to the east of the ACT, when severe fires affected Tallaganda National Park. (Much suitable habitat, where feeding GBCs had been recorded, was also burnt in 2017.) The unusually low rainfall period to the end of 2019 might also be a factor. In the first half of 2020 there were reports of GBCs appearing in unusual places, for example Melbourne. (They appeared at Griffith University near Brisbane, although that, curiously, has been attributed to the coronavirus lockdown at about the same time (Ackerman 2020).)

Acknowledgments

The expertise of Nicki Taws enabled identification of the *Allocasuarina* species at Mount Jerrabomberra. There was a useful discussion with Nicki and the following NSW residents about the occurrence of *Allocasuarina* species and GBCs in the local area: Helen and Paul Hadobas, Bill Hall, and Tom Baker. Fred Kuhn gave helpful information about *Allocasuarina* and GBCs in the Mt Fairy area. Dominique Homberger gave advice on an initial draft, and the information about parakeet behaviour. Isobel Crawford, Alison Rowell, Michael Lenz and Steve Holliday gave further help and comments. Thanks to Pushan Ayyub of Mumbai for the Alexandrine Parrot photo and related information. Thanks to Graham King and Rocky Roe for use of the Kokomo photos. Ravi Rau drew attention to the

New York Times article. Thanks to Robin Hide for conversations and pointers with respect to New Guinea matters. (With his help I remembered reading the Mayr/Gilliard report in 1963, soon after my first visit to the strange world of the New Guinea highlands. I then found my own copy.)

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NOTES

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SULPHUR-CRESTED COCKATOOS FEASTING ON CHRISTMAS BEETLES

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At 6:40 h on 4 Dec 2019, I was wandering up my street in Gleneagles, Kambah, and noticed a group of Sulphur-crested Cockatoos (*Cacatua galerita*) on the road under a large eucalyptus tree. They were clearly feeding on something on the ground. Closer inspection revealed their interest was in Christmas beetles. There were ten cockatoos on the ground, a further three in the outer foliage of the tree and a couple more on prominent perches nearby (possibly sentinels?).

Figure 1 (left): Sulphur-crested Cockatoo manipulating a Christmas Beetle; (right) Exoskeletal husk of a Christmas Beetle.

The birds on the ground were feasting on fallen beetles – some alive and still crawling, many barely alive, and many more quite dead. The birds in the tree were clambering about the outer foliage deliberately seeking out and 'plucking' the beetles that were feeding on the fresh young foliage. In both situations, the cockatoos manipulated the beetles, using both beak and feet (Fig. 1, left), in the same way they might an equivalent-sized fruit or nut; the softer inner parts of the beetle apparently being scooped out and eaten before the exoskeletal husk was unceremoniously dropped (Fig. 1, right), adding to the carnage below. From the remnants, it appears the thoracic muscle tissue was possibly the main attraction.

The following morning, at 6:26 h, a slightly smaller group of cockies again arrived on the scene and helped themselves to the dwindling supply of beetles. They seemed a little less engaged and were soon dispersed when a small dog showed up. Some of the cockatoos moved off down the street to feed on the under-ripe fruit of a flowing plum tree (*Prunus* sp.).

[1] All photos by the author.

My interest and surprise in these events was twofold. Firstly, the sheer number of Christmas beetles was impressive, particularly in times when the incidence of these beetles seems to be dwindling year by year. I estimated at least several hundred beetles on the ground, and many were visible in the foliage. As far as I could discern, all were *Anoplognathus chloropyrus*, the Green-tailed Christmas Beetle (Fig. 2), even though several different species of Christmas beetles occur in the ACT, of which five were reported through Canberra Nature Map in the weeks either side of this observation.

Figure 2: The Green-tailed Christmas Beetle (*Anoplognathus chloropyrus*).

Secondly, animal material is a minor component of the diet of Sulphur-crested Cockatoos and the active seeking of animal protein is an uncommon and rarely reported activity of this species. Higgins *et al.* (1999) and Forshaw (2002) mention a few instances of insect material being consumed, including the larvae of longhorn beetles from dead trees, and the larvae and/or eggs of Diptera (fly larvae), Hymenoptera (ant eggs) and Orthoptera (grasshopper larvae and eggs). Christmas beetles are not mentioned. Indeed, there is no mention of adult forms of any kind of insect being eaten.

When available, Christmas beetles are readily eaten by a range of other birds in the area, including the Australian Ravens (*Corvus coronoides*) that breed each year in the tree in question, Pied Currawongs (*Strepera graculina*), Australian Magpies (*Gymnorhina tibicen*), Noisy Friarbirds (*Philemon corniculatus*), Dollarbirds (*Eurystomus orientalis*) and others. But this appears to be the first instance, at least that I am aware of, of Sulphur-crested Cockatoos exploiting this food resource in a deliberate and concerted way. Given the gregarious natures and obviousness of both cockatoos and Christmas beetles, the lack of prior observations suggests this is a highly unusual behaviour, quite possibly related to the severity of the ongoing drought.

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A slight variation of this report is available, together with additional photographs, at http://hdpphd.blogspot.com/2019/12/christmas-beetle-cocky-feast.html

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Canberra Bird Notes 45(2) (2020): 196-198

FIRST BREEDING RECORD FOR PINK-EARED DUCK AT KELLYS SWAMP

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Background

In March 2016 I was privileged to observe the first ever record (Wilson 1999) of Pink-eared Duck (*Malacorhynchus membranaceous*) breeding in the ACT. I subsequently wrote an article for Canberra Bird Notes (CBN) about the event[2] (Smith 2016) and can now follow that up with an observation of the first breeding record of the species at Kellys Swamp.

Observation

On 25 Sep 2019 I observed two adult Pink-eared Duck in the vicinity of a nest recently vacated by a pair of Black Swan (*Cygnus atratus*). I made the comment in my eBird record that the birds were 'rearranging nesting material on a nest that had been built by Black Swan'.

Despite two visits to Kellys Swamp each week, it was not until 6 Nov that I observed juveniles; two adults with a count of 7 juvenile birds. I made the comment in eBird, 'First ever record of breeding Pink-eared Duck at Kellys Swamp'. On 16 Nov I was able to carefully count the full extent of the family, which was two adults and 8 ducklings.

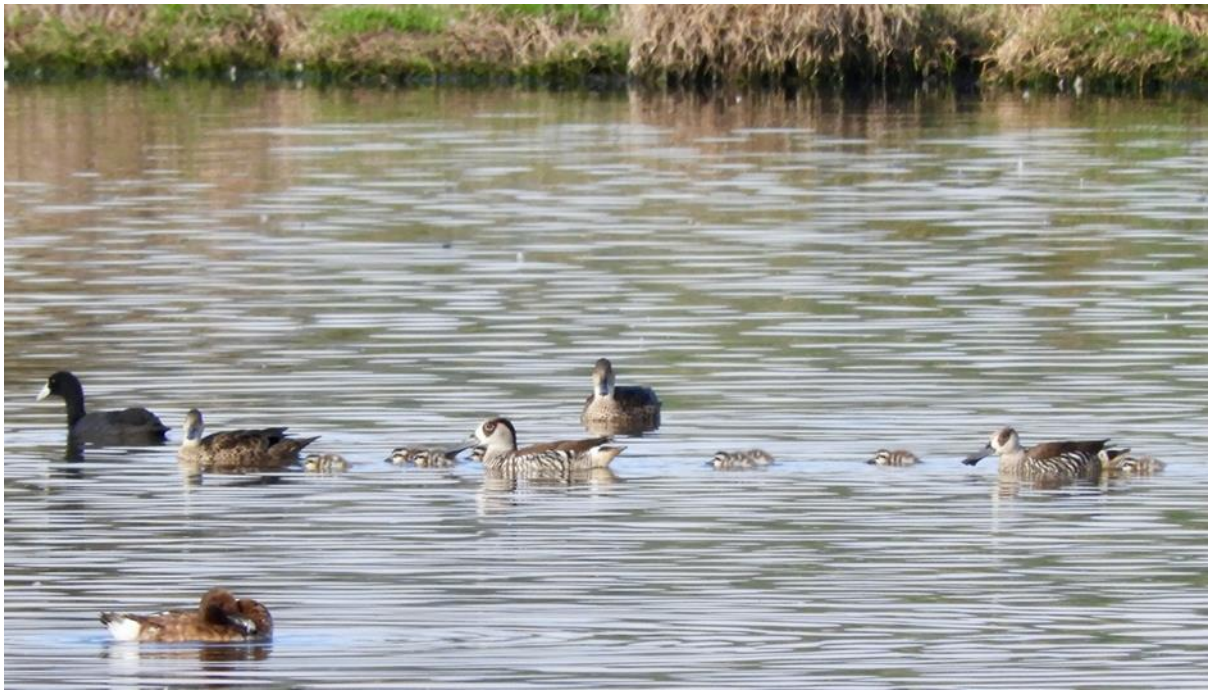

Figure 1: First sighting of the recently hatched Pink-eared Duck juveniles (*Alastair Smith*).

[2] Pink-eared Duck was still reported in the COG Annual Bird Report 2018/2019 as 'non-breeding'.

I continued to monitor this breeding event both by personal observation and also records from other observers in eBird. I was the last observer to report the family on 4 Dec, when I again noted 8 juveniles and photographed the family with the juveniles now two thirds fully grown.

Figure 2: Last sighting of the ducklings, now 2/3 adult size (*Alastair Smith*).

Reports of Kellys Swamp young in eBird

3 Nov 7 ducklings
6 Nov 8 ducklings
10 Nov 7 ducklings
12 Nov 6 ducklings
13 Nov at least 3 ducklings
17 Nov no count
22 Nov 7 ducklings
24 Nov no count
1 Dec no count
4 Dec 8 ducklings

HANZAB (Marchant and Higgins 1990, p. 1253) suggests that the incubation period is 26 days, and only the female incubates the eggs. The fledging period is not determined, and the period of hatching of eggs within a clutch is generally 24-48 hours. Young are precocial and swim straight away.

Noting the newly hatched state of the young I observed on 3 November, coupled with the nest building adults in late September, this could indicate that the eggs for this particular clutch were laid in very early October 2019.

In researching and writing the initial article on the first breeding event for CBN, I noted the fledging period was unknown (Smith 2016). Based on my own observations and those of others, I suggested 53-55 days. This time frame would indicate that the Kellys Swamp clutch would be indistinguishable from adults by mid-December 2019.

Of note, Kellys Swamp was drying out in late autumn and early summer and was completely dry by 24 December 2019. In these drying conditions, I did not observe any Pink-eared Duck on Kellys Swamp after 4 December. As other observers do not differentiate Kellys Swamp from other parts of JWNR, it is not possible to tell if the birds remained at the Swamp after this time or moved on to Jerrabomberra Creek or Fyshwick Sewage Ponds where the species was still present.

Interestingly my research has also found that there have been two other breeding records of Pink-eared Duck in the ACT. Eight ducklings were reported at the site of the first breeding event, Mulligans Flat big dam, on 6 January 2017. A second breeding record for the current year was recorded at Stockdill Dam between 27 December 2019 and 3 January 2020, where three ducklings were reported.

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RESCUING THE RED-BROWED FINCHES

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An important local habitat for Red-browed Finches (*Neochmia temporalis*) is the little floodplain on the eastern bank of Ginninderra Creek where it skirts Percival Hill between the Barton Highway and Gungahlin Pond. This area was once part of Crace Farm but now contains some important patches of native grasses in the parts where it is not mown for fire protection. Red-browed Finches inhabit this little floodplain, feeding on the seeds of the native grasses and some introduced grasses and nesting in the reeds on the banks of the creek. Other finches are present in smaller numbers, including Double-barred finches (*Taeniopygia bichenovii*) and, more rarely, Diamond Firetails (*Stagonopleura guttata*).

I have lived in Kangaroo Close, Nicholls, for 20 years and my house backs onto the floodplain. I have been counting the finches for all those years. When I first moved here, the flock contained around 20 birds but the numbers gradually increased. By 2010, I regularly counted 30 or 40 birds in the flock. I have always fed them. I use a plain finch mixture without additives, bought in bulk from a produce store. There are those who say we should not feed native birds, but it is my view that we have destroyed so much of their habitat that we should try to assist them as best we can. The finches became very accustomed to me and came to be fed when I whistled. Thirty came regularly to the feed tray on my back patio, bringing their fledglings with them in the breeding season. Over the past few years I have become certain that feeding them has contributed significantly to their survival.

The flock of over 30 birds gradually diminished during the drought years until, by early spring 2019, I counted only an average flock of 15 birds, and the same number regularly visited the feed tray - a 50% reduction. I saw no young birds and presume that breeding had stopped in the drought period - but I believe that I had rescued the flock.

Spring failed on the little floodplain in 2019. The new growth of native grasses withered before producing seed and the finches resorted to seeking fallen seeds in the bare earth. I no longer needed to whistle as they began calling me, and if I was outside in the garden, they began perching on nearby shrubs to gain my attention. By November they took up semi-permanent residence in the shrubbery around the outside of the patio, waiting to be fed and making their presence known if they saw me.

There was significant rainfall in the second week of February 2020. The rapid germination and growth, particularly of introduced low-growing weed species, provided a new and sudden food source for the finches, which were observed close to the ground, feeding on them. They no longer perched permanently near the patio, but still came from time to time during the day, hoping to be fed.

Gradually over the past few months, things have returned to whatever normal was, or perhaps, whatever normal will be. There are still about 15 birds in the flock but I wonder if there is any late breeding happening. They still come to me, of course, if they are nearby, and if I whistle, but they are now ranging further to exploit the native grasses and I see the

little flock of about 15 birds at more distant parts of the floodplain, especially along the creek to the south, just before the Barton Highway where the best areas of native grasses are. Some dredging took place in Ginninderra Creek in May with some removal of reeds towards the outlet of Gungahlin pond. I hope that the finches will nest next spring in the undisturbed reeds south of where the reeds were removed.

I remain hopeful for them. I think I have rescued them.

Accepted 1 June 2020

Pair of Red-browed Finches (*Geoffrey Dabb*)

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OBSERVATIONS OF BLACK KITE PRACTICING SKILLS, ORRORAL VALLEY 2019

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In February 2019 while visiting the Orroral Tracking Station site, in Namadgi National Park, I observed a single Black Kite (*Milvus migrans*) exhibiting interesting behaviours.

Upon arrival at the Orroral Tracking Station I saw a single Black Kite flying low circuits over the carpark and picnic area (Fig 1). It eventually landed on the edge of the concrete pad nearby and began picking at something on the ground. I assumed it was some type of prey item but soon saw through my camera lens that it was picking up small stones and then placing them down again (Fig 2). After several minutes of this activity the Kite ran along the ground onto the grassy slopes of the tracking station, then stopped and looked around for a while. It then took off and flew in a wide arc until it was over the concrete pad once again, whereupon it swooped down and picked up a piece of bitumen rubble from the ground (Fig 3). The Kite then flew wide circuits in a figure eight pattern while it adjusted and studied its load (Figs 4 and 5). After several circuits the Kite dropped the piece of bitumen and flew down the valley.

Figure 1. (See text).

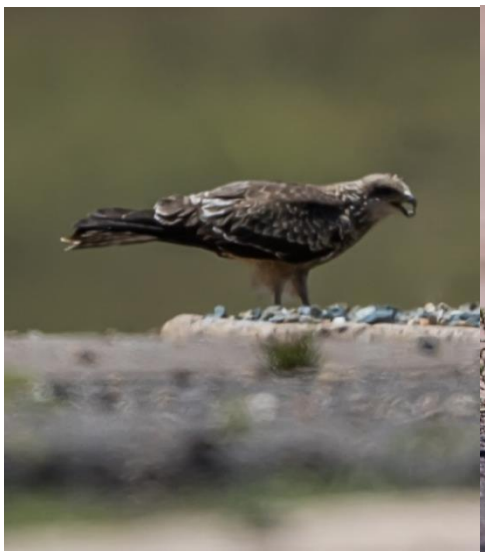

Figure 2 (left) and Figure 3 (right)

Figure 4. (See text)

Figure 5. (See text).

Figure 6. (See text)

Raptors have a reputation for having a keen interest in their surroundings and their habit of practicing their hunting skills. I had previously seen Black Kites in the Northern Territory playing games which appeared to be 'chasey with sticks' (Fig 6) and young Black-shouldered Kites (*Elanus axillaris*) in South Australia picking up debris from a dump site, apparently to practice carrying items (Fig 7). It was a pleasure to observe this occasional visitor to the ACT honing its skills and making the most of the day.

Figure 7. (See text).

Accepted 16 June 2020

COLUMNIST'S CORNER

Canberra Bird Notes 45(2) (2020): 205-209

In pursuit of the Mock Ibis

William Golding was the celebrated English author who wrote Lord of the Flies, and won a Nobel Prize for literature. In 1974 he came to Australia on a visit that took him to Canberra among other places. According to one of his biographers he was fascinated by Australia's birds. 'He met many Australians, some of them distinguished – the poet AD Hope, the novelist Patrick White – but it was hard for them to compete with Australian trees and birds.' Two years later Golding visited Egypt where he made a leisurely boat trip up the Nile. His account of that trip, An Egyptian Journal, contains some scattered observations about the bird life along the river.
Here is one observation, made at a flooded field -

> There were a few large, white birds picking about in the water and on the banks. They were the *Amis des Paysans*, or mock ibis, the Farmer's Friends. I asked about them … and found that they are decreasing in numbers because of the build-up of insecticides.

Later he noticed some birds in 'big trees' along the river:

> … and for a mile or two thenceforward the trees were so full of *Amis des Paysans* roosting among the branches that they looked like sulphur cockatoos in Australia. Come to think of it the trees may well have been eucalyptuses, which are notably established in Upper Egypt, unless my eyes have deceived me. But more poetically than cockatoos I decided the mock ibises, the Farmers' Friends – I cannot be official about them, getting either the language or the apostrophes muddled – I decided they looked like white magnolia blossoms.

William Golding did indeed write 'sulphur cockatoos'. Perhaps he did not quite remember the name he had been told in Australia, or perhaps the phrase appealed to his writer's imagination, or perhaps he preferred a less cumbersome name than 'Sulphur-crested Cockatoo' (seven syllables, after all).

What were those large white birds? They must have been Cattle Egrets, which occur in some numbers at places along the Nile valley. But why 'mock ibis'? There is a curious story about the confusion of two species.

The 'ibis' that was sacred in ancient Egypt, and known as 'ibis' to the Greeks and Romans, disappeared from Egypt, probably well before the 18th century with its emerging curiosity about the natural world. Linnaeus, the Swedish naturalist who devised the naming system used today, believed that the ancient authors who spoke of 'ibis' were referring to the Cattle Egret, then common in Egypt. In 1757 Linnaeus gave the specific name *ibis* to the egret. In English the egret was sometimes referred to as 'Egyptian Ibis'.

In Victorian and Edwardian times Egypt was a favourite destination for wealthy sightseers and sojourners from Europe. Such was the interest in Egypt's antiquities and other curiosities that the artist Charles Whymper (1853-1941) produced a book for such visitors: *Egyptian Birds – for the most part seen in the Nile Valley* (1909).

The Sacred Ibis in ancient Egypt as it appears in Kingsley's book (1888), and deep in papyrus as imagined by Charles Whymper (1909)

Although he had reservations about including the absent 'Sacred Ibis' in the book, he gave two reasons for doing so.

> The first is, that from one cause or another the Sacred Ibis is a bird so wrapped up with all our ideas of Egypt, and almost representative of the birds of Egypt, that most, although they do not know the bird, are interested in its existence. The second is one that follows this known interest, namely exposing of the dragoman's oft-repeated lie, that he can, and does, show the newcomer Sacred Ibises, whereas he cannot and does not.
> (At the time, in some eastern Mediterranean countries, 'dragoman' was a common name for an interpreter or guide.)

With respect to the 'Buff-backed Egret', now known as the Cattle Egret, Whymper said:

> The Egret is one of the many birds that the dragoman makes the tourist happy by calling 'the Ibis', and the number that return to their friends gleefully telling how they saw a flock of Ibises grows every season. In the article on the Ibis I have shown how ludicrously untrustworthy is the dragoman's Natural History information.

The passage referred to read, in part:

> Time after time I have been solemnly informed that four or five, or a round dozen, Ibises had been seen at such and such a place. On inquiry I have been told there could be no mistake, as dear So-and-so, the dragoman, had pointed them out and assured all and sundry that they were 'genuine Sacred Ibis'. And though strange, it is true, people prefer to believe a lie if it confirms what they wish, than the truth if it does not. The sad truth is there are no Sacred Ibises in Egypt at all … .

If it seems strange that persons interested in birds could be misled by such wrong ID advice, remember that the field guide did not exist 100 years ago.

Today's moderators of the eBird recording system have been careful to expunge any report of a Sacred Ibis from the online map of Egypt. However, the tourists mentioned by Whymper *were* being shown an *ibis* in one sense (the Linnean one), although perhaps their tick should have been placed alongside 'Mock Ibis'.

Despite Whymper's indignation, there is some evidence that in 19th century Egypt the egret was 'the sacred ibis' in common, if careless, usage. One author writes of the contemporary traveller meeting with 'the sacred ibis, the typical bird of Egypt', then describes its behaviour (being clearly that of the egret), then goes on 'what is called the sacred ibis seems to be really identical with the buff-backed heron'. The reason is that '*Ibis religiosa* … if once an inhabitant of Egypt, is no longer found there, except in a mummified state in the pits of Memphis and Thebes' (Adams).

Another 19th century writer accepts that 'Ibis aethiopica' is the sacred ibis of the ancient Egyptians but quotes another as pointing out that the buff-backed heron 'does duty on the Nile as the ibis, being generally pointed out to travelers by dragomans, etc., as the real *Ibis religiosa*.' (Kingsley)

The eager pursuit in Egypt of the rare (in fact non-existent) ibis might seem strange to Australians. The common Australian White Ibis is a closely related and visually similar bird. Until 1994 it was regarded as the same species in official lists, under the name 'Sacred Ibis', a name sometimes still used for the Australian species. It is now, to many, the derided 'Bin Chicken' or 'Dump Chook'.

Given that the Australian species is at home in an urban setting, there is a question about the preferred habitat of the Egyptian counterpart. Whymper believed that it disappeared because it needed 'the great jungle-like brakes of papyrus that grow rampantly along the river course' to the south of Khartoum. (Whymper could only find some papyrus for his imaginative painting in the garden of a friend's house in Upper Egypt.) On the other hand, Strabo, a Greek writer at about the time of Cleopatra, is quoted as reporting:

> Every street in Alexandria is full of them. In certain respects they are useful, in others troublesome. They are useful because they pick up all sorts of small animals, and the offal thrown out of butchers' and cooks' shops. They are troublesome because they devour everything, are dirty, and with difficulty prevented from polluting in every way what is clean, and what is not given to them.

That sounds like our Bin Chicken.

As to the Cattle Egret, this has become a widespread species in Australia following its first arrival in any numbers in the 1950s. It appears around Canberra intermittently, sometimes in quite large flocks. There is now a difference of opinion as to whether the species found along the Molonglo is the same as the one you might see along the Nile. As with the Sacred Ibis, the filleting knife of the taxonomist has been at work to separate the eastern population. For that population, according to some authorities, the specific name *ibis* should be replaced by *coromandus*. However in the list used by Birdlife Australia and by COG it is still *ibis*, the species known to Cleopatra.

Flocks of ‘Mock Ibis’ at Jerrabomberra Wetlands in April 2014

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Stentoreus

Canberra Bird Notes 45(2) (2020): 210-212

Birding in Cyberspace, Canberra Style

While I will resist tagging this Birding in Cyberspace contribution the 'Covid-19 column', and avoid punning about Covid and corvids, the virus that has changed all our lives (at least for the present) has impacted upon birding in diverse ways. One of them is that, in observing physical distancing, birding field trips in groups, and bird clubs' face-to-face meetings, have been largely cancelled or postponed. This has freed up time for birders to do things that would perhaps otherwise not have been on their agendas, such as signing up for online birding courses.

Some decades ago, the Cornell Lab of Ornithology commenced providing birding courses to people around the world, by correspondence. Indeed, your columnist did one of their introduction to avian biology courses, by correspondence, when he arrived in Canberra in the mid-1980s. In more recent times, the Lab has introduced online courses, and these are being boosted in response to the current Covid-19 lockdown period.

Cornell's courses are found at their Bird Academy/AllAboutBirds website https://academy.allaboutbirds.org/. They write: 'Whether you're newly curious about what you're hearing in your backyard, an avid birder with a life list to tend, or a budding ornithologist, Bird Academy's team of biologists, educators, and designers are here to help you learn.' They list the currently most popular courses as being 'Bird photography with Melissa Groo', 'Joy of birdwatching', 'Nature journaling and field sketching', 'Think like a bird: understanding bird behavior' and 'eBird essentials'. The last of these is free; there is a charge for the others.

You may care to browse the full Course Catalog (their spelling!). The courses are listed under the headings Bird identification, Bird biology, Art & technical skills, and Nature appreciation. The lengths of the courses vary a lot, with some as brief as one hour (*e.g.* Be a better birder) and the longest being their Comprehensive bird biology course, which is at university-level and will take over 100 hours to complete. I know of at least one COG member who has undertaken the latter course and found it particularly valuable.

Also at the Bird Academy are a host of Open Lectures https://academy.allaboutbirds.org/live-events/. These are, in the main, videos of seminar presentations that have been conducted at the Lab. They cover a wide variety of topics including bird conservation, biology, songs & calls, nesting, bird behaviour, evolution, bird identification, migration, food & foraging, nesting, and a host of others. Highly recommended.

Lost BSOs at Jerra. In June 2020 a post appeared on COG's CanberraBirds email announcement and discussion list, advising that a birder had found a pair of binoculars at Jerrabomberra Wetlands. They had taken the binoculars home and were trying to locate the owners. To avoid exposing myself to the risk of accusations of libel, I will not mention the brand of the binoculars but point out that, according to some, the brand name means 'cherry blossom' in Japanese. One of the well-known subscribers to CanberraBirds posted, in response: 'From reading a few reviews of these bins I suspect the owner left them in disgust!' Intrigued, I checked out a few reviews myself, and quickly understood the basis of that comment.

The lost (or is it found?) binoculars, however, is not the main thrust of the story. While googling reviews of the binoculars, I encountered some posts from 2017 on the Stargazers Lounge astronomy bulletin board https://stargazerslounge.com/topic/218110-how-bad-can-an-astronomical-binocular-get/. As the URL indicates, the thread was titled 'How bad can an astronomical binocular get?' A member named White Dwarf wrote, referring to the brand of binoculars found at the Wetlands: 'Those are not binoculars, but BSOs. As such, they might be useful as a "talking point" paperweight, but not much else.' You are asking what, pray, are BSOs? White Dwarf explained: 'Binocular-Shaped Objects'. I am now wondering if I am going to experience fellow birders glancing at my binoculars and whispering behind their hands something about the columnist's BSOs!

Alice McGlashan is becoming well-known as an authority on the conservation of birds and mammals that breed in tree hollows. She lives in Wamboin, NSW, a rural-residential locality within COG's geographical Area of Interest. Over the years, through a combination of research and trial-and-error, Alice has developed advanced expertise in the design, installation, and maintenance of nest boxes. At her amazing website https://nestboxtales.com/ she points out that:

This website is a donation of my time, to make more accessible information about a way that people like you and me can improve habitat for wildlife across Australia, by installing nest boxes.
Over 300 of our native species in Australia use tree hollows. Of these, 114 or 15% of our native bird species use tree hollows, the majority for nesting purposes. Some bird species, including Masked Owls, Sooty Owls, Australian Owlet-Nightjars and White-Throated Treecreepers also roost in tree hollows year-round…

Native mammals are also heavily dependent on tree hollows, for sleeping during the day or to raise offspring. Of Australian native mammals, 83 species or 31% use tree hollows. These include bats, possums, gliders, and ground-dwelling mammals that climb such as quolls, native rats, dunnarts, phascogales, cuscus, numbats and antechinus.

Key sections of the website cover nest box design booklets, nest box materials, nest box designs, installation tips, monitoring, predators & competitors, ongoing research, and published research. She also explains that 'I have created a companion Facebook group, NestBoxTales for anyone to share stories and learn from other's experiences, about nest boxes and tree hollow using native wildlife across Australia.' She is expert at using trail cameras and other advanced photographical techniques to monitor nest box usage, and some of her videos of Australian Wood Ducklings leaving their nest boxes and hitting the ground below with an audible 'thud!' have gone viral on the internet. See them at the NestBoxTales Facebook page.

Alice generously makes all her information freely available to the public in the interests of conservation. These include detailed plans of nest boxes for a large number of species. Much of the information that she has collated and created has been brought together in a booklet that is also freely available at her NestBoxTales website: *Australian native hollow using species lists & nest box designs*. Among its strengths are numerous regional lists of hollow breeding species, showing for each the optimal box entrance diameter and the height at which they are best placed. One of the lists covers 'Canberra and surrounding NSW region'. It lists the nest box requirements for 34 hollow-nesting bird species and 11 mammal species.

Alice presented an online webinar on 10 June 2020 for COG members and friends: COG's first venture into meeting in cyberspace. Over 60 people participated, and the response was extremely positive. Clearly, a significant demand exists for evidence-informed information about nest boxes for our region, so we are fortunate that Alice McGlashan has developed such high-level expertise in this domain, and is so willing to share it with the birding and broader conservation communities.

The Covid-19 pandemic lockdowns have created many hardships for birders in Australia and abroad, highlighting, however, the ever-expanding opportunities for Birding in Cyberspace, from the relative safety of your computer!

T. alba

This column is available online at http://canberrabirds.org.au/publications/canberra-bird-notes/. There you can access the web sites mentioned here by clicking on the hyperlinks.
To join (subscribe to) the *CanberraBirds* email discussion list, send an empty email message to canberrabirds-subscribe@canberrabirds.org.au. To unsubscribe, either permanently or temporarily, send an email message to canberrabirds-unsubscribe@canberrabirds.org.au. If you wish to re-subscribe after being unsubscribed temporarily, simply follow the 'subscribe' instructions above.
The *CanberraBirds* list's searchable archive is at http://bioacoustics.cse.unsw.edu.au/archives/html/canberrabirds.

T. Javanica

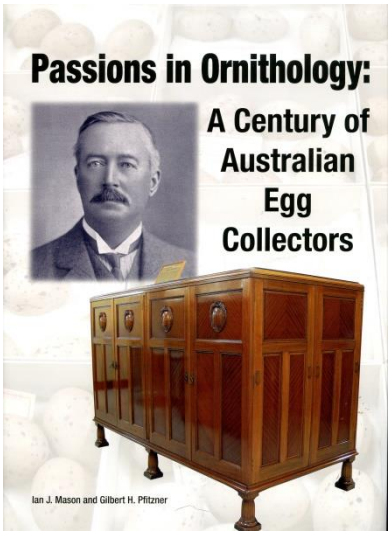
BOOK REVIEW

Canberra Bird Notes 45(2) (2020): 213-216

Passions in Ornithology: A Century of Australian Egg Collectors. **By Ian J. Mason and Gilbert H. Pfitzner**. Self-published. 572 pp. with CD. $95, plus postage if applicable. Available from Ian Mason 0487 196443 Email: ianmason@grapevine.com.au
Also from Andrew Isles.

Reviewed by *GEOFFREY DABB, Narrabundah, ACT 2604 (gdabb@iinet.net.au)*

A new book about the history of bird-egg collecting in Australia



Ian Mason and Gilbert Pfitzner have produced a large book about collectors of bird eggs. Its title is *Passions in Ornithology: A Century of Australian Egg Collectors* (herein referred to as '*Passions*').

The book has entries for some 300 of 'the most prominent oological Australian collectors' – nearly 500 pages of them. A few 'prominent collectors' are not included because they did not respond to enquiries or asked to be omitted. There is a much longer list of 'incidental collectors'. With the book comes a CD containing appendices, with correspondence, record cards, and other original material.

The authors of *Passions* 'acknowledge the invaluable contributions made to ornithology by legions of Australian collectors over more than a century'. They make it clear they do not condone illegal collecting, although the lawfulness of much of the collecting described must have been at least doubtful.

Passions is a book about people rather than natural history. A useful summary of the history of Australian egg-collecting is in the 10-page introduction (documented with 80 citations). That history included the period of 'conservation and regulation' beginning in the 1930s. At that time 'some collectors gave up in despair', some continued collecting under permits, and some continued the hobby, or took it up, without a permit.

Where does this unusual and comprehensive volume sit within the expanding universe of bird books? As noted in the preface, detailed biographies had already been produced for the 'most well-known and prominent oologists and natural history collectors of the late 1800s and early 1900s'. Sydney Jackson, Gregory Mathews and Henry White are given as examples. The great majority of entries relate to people whose claim to inclusion is simply that they collected bird eggs in a serious way. Some did so in a very large way. Many kept detailed records. As the authors note: 'In a number of cases, data collected by these oologists (*e.g.*, Mervyn T. Goddard and Ernest L. Hyem) is more detailed than that recorded by amateur birdwatchers and even professional ornithologists.'

The field covered by *Passions* might be compared to the scope of two other substantial books about people and birds in Australia.

One is Libby Robin's *The Flight of the Emu: A Hundred Years of Australian Ornithology 1901-2001*. Nominally about the RAOU/BA, this is a parallel historical account about people engaged, in one way or other, in 'Australian ornithology'. It is not mainly about egg-collecting. However in a section entitled 'Oology: hobby or science?' Robin describes the period when 'collecting' was a divisive issue within the organization. Several prominent members made no secret of their large collections of eggs. In the 1920s and 1930s, the RAOU's official position became one of requiring (or at least expecting) any collecting to be done under permit. At the time 'egg collecting was becoming less and less scientific, and more and more "philatelic".'

The Flight of the Emu contains a list of 'People of the Century in Australian Ornithology'. 'There are 190 alphabetical entries, with brief mentions of the parts played by spouses and children, bringing the total to about 200 people.' Only 34 of the 'principal Australian oologists' listed in *Passions* are included in the 200 'People of the Century in Australian Ornithology'. Significantly only three of the 34 were born after 1900. In general, the earlier collectors were people prominent in ornithological circles: most of the later collectors pursued their hobby privately, perhaps even secretly, with little or no interest in publicity. One might contrast today's bird photographers.

The main part of Hubert Whittell's *The Literature of Australian Birds* is a 786-page bibliography of Australian ornithology 1618 to1950, with 'biographies of authors, collectors and others'. However very few collectors are included who did not contribute also to 'the literature'. Rare examples are Gould's collector, John Gilbert, and Thomas Lempriere. The latter is in Whittell's book only because he sent 'to England from Tasmania the type-specimen of *Eidopsarus bicinctus* William Swainson 1837'. Neither of those two has an entry in *Passions* although Gilbert is mentioned in the introduction. However, Whittell himself has a 2-page entry. At one point he had an egg collection representing 707 Australian and overseas species.

Few of the 300 'principal Australian oologists' listed in *Passions* are to be found among the 'authors, collectors and others' in Whittell's bibliography.

Among the 300 collectors are examples of very different kinds of collecting. It seems likely that each of them personally gathered birds' eggs *in the field*, at least in a small way. That detail is not mentioned in the summary of the career of Gregory Mathews, but it appears in a recollection about his own childhood made available in an appendix. However he is included as a 'collector' in the sense of being a collection-builder, as is H.L. White. On the other hand, the Denne family, in that sense, were not 'collectors' at all. 'The Dennes never collected for anyone else but Swindells, … nor did they retain any collection of their own' (Robert G.H. Green, from another appendix).

The qualification for a 'principal' oologist is not entirely clear. Charles Barrett certainly made a large contribution to Australian ornithology. However, his known collecting was limited to 'at least 12 egg clutches between 1903 and 1915'. Several in the 'incidental' list gathered many more clutches than that.

A question of the relationship between egg-collecting and the advancement of scientific knowledge still hangs in the air. There might be different views on this question because, as *Passions* shows, there were so many different kinds of collectors, and different kinds of

collecting. Some collections with good accompanying data might help to answer the questions asked by scientists, others might be of little use, if any at all.

A useful history of egg-collecting in the United Kingdom, and changing attitudes to it, is in a doctoral thesis of Edward Cole, University of Glasgow. This has a chapter 'The estrangement of oology from ornithology'. Before World War I the collecting and study of eggs was an integral part of ornithology. In 1911 Lord Rothschild chaired a meeting which formed a section of the British Ornithologists' Union to uphold 'the special interests of Oology within the Union'. Concern about collecting eggs of rare species led to the BOU denying any oversight of the Rothschild group, which in 1922, as a separate entity, became the British Oological Association, nominally established for 'the advancement of the science of Oology'. A further incident involving taking eggs of a rare species, in 1932, led to resignation of Rothschild as president, replaced by Reverend Francis Jourdain whose name became attached to that of the association.

In the UK, claims of a scientific purpose for egg-collecting persisted, but it declined as a hobby until it was largely prohibited by legislation in 1954, with prohibitions on possession strengthened in 1954 and 1981.

The Cole paper provides the information that the egg collections in the UK most used for scientific purposes are those at the Natural History Museum at Tring, which receive 20-30 research visitors per year (information as at 2016). Egg specimens with little or no data are candidates for destruction in research projects.

Another view of the status of egg-collecting as a quasi-scientific activity appears from three propositions by Lloyd Kiff, in a paper in *The Auk* in 2005, quoted here:

- Although most 'oologists' were amateurs, they generally recorded useful and reliable data with their sets.
- Egg specimens and their associated data have probably been used in a greater variety of biological studies than any other type of avian specimens.
- Thus, it is all the more curious that there never seems to have been a time when egg collecting was primarily a scientifically oriented activity, despite the pretenses of its main practitioners.

Eggs as specimens used in biological studies might by now have been overtaken by 'other types of avian specimens' in this era of molecular analysis. However, eggs, I am told, are also useful for that purpose.

It would be fair to say that the published contributions to science of the typical egg-collector are less significant than the raw material, being the data and specimens, they have left behind.

On its website the Australian National Wildlife Collection states: 'we hold more than 17,000 bird eggs from more than 1000 species.' It holds 'leading bird collections' including those of G. Ragless, R. Green, J. Kershaw, D. Seton and A. Ey. (If you want to know more about those collectors, each has an entry in *Passions*.) The website adds: 'The historical egg collections tell us much about where birds once nested and can be used to understand how their distributions and breeding behaviours are changing.'

No doubt much of the history of the eggs at the ANWC is documented there. There will probably be more to be found in *Passions*, about the secretive but prolific collector Mervyn

Goddard for example. Although he destroyed much of his collection, after his death in 2005 a substantial remnant was donated by his family to the ANWC, including a clutch of the extinct Paradise Parrot. A more circuitous route concerns eggs from Bruny Island. These were collected by the Denne family for Arthur Swindells, who sold his collection to Robert Green, whose collections were donated to ANWC in 1999.

Many readers of *Passions* will be interested in the wealth of personal details that the authors have unearthed about the lives of individual collectors. They are likely to appreciate the photographs, one or more being obtained for most entries. Here are three examples from the many I liked: the photo of James Veitch with a world record specimen of a Great White Shark; the one of John Young scaling an improbably slender eucalypt (surely only for the camera); and the photo, in the introduction, of the 1908 interstate conference on bird protection. In this, a semi-circle of seated participants, specified respectively to be egg-collectors or non-egg-collectors, are overlooked by birds in glass cases watching reproachfully in the background.

The authors have created a website for use by those who buy the book. A password will be supplied for accessing corrections and updates.

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RARITIES PANEL NEWS

A very modest list again. For identification purposes, the figbird was, conveniently, a male, with a distinctive red eyepatch and a distinctive call, described by the observer as being "flute-like" though it is more generally regarded as a whistle. This is a coastal species, with only one previously endorsed ACT record of a female in Curtin in 2009. Given the similarity of the female figbird to the Olive-backed Oriole, it is conceivable that others have been overlooked.

The Panel is yet to consider three records. It was unable to endorse two other quite probable records, as the observers did not get sufficiently good views of important identification features. It reiterates how important it is for rarities reports to be as comprehensive as possible.

The Panel is currently updating its 2013 list of "unusuals" for which an endorsed report is required before the record is published in a COG publication.

ENDORSED LIST 96, JUNE 2020

Australasian Figbird *Specotheres viellotti*

1; 11 Apr 2020; Liam Manderson; Hardie Close, Macarthur

Barbara Allan *(allanbm@bigpond.net.au)*

Canberra Bird Notes

Canberra Bird Notes is published three times a year by the Canberra Ornithologists Group Inc. and is edited by Michael Lenz and Kevin Windle. Paul Fennell edits the first issue/year, the Annual Bird Report. Major articles of up to 5000 words are welcome on matters relating to the biology, status, distribution, behaviour or identification of birds in the Australian Capital Territory and surrounding region. Please discuss any proposed major contribution in advance. Shorter notes, book reviews and other contributions are also encouraged. All contributions should be sent to one of those email addresses:

CBN@canberrabirds.org.au or michael.lenz.birds@gmail.com

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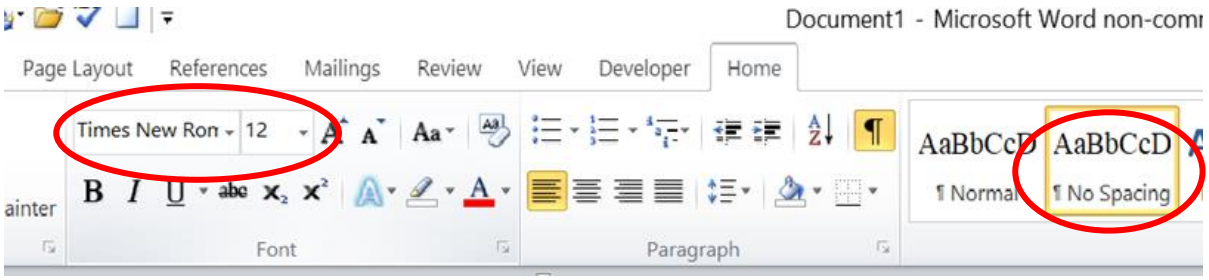

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Contents continued from outside back cover

CANBERRA BIRD NOTES 45(2) JULY 2020

Articles

Notes

Columnist's Corner

Contents continued on inside back cover

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