

## Communal Breeding by the Australian Magpie-lark

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*Emu* 88, 112-114

Received 26 June 1987, accepted 13 November 1987

Chapman (1975) stated that communal breeding had not been recorded for the genus *Grallina* and Dow (1980) did not include the Australian Magpie-lark *Grallina cyano-leuca* in his major review of Australian birds known to be either obligate or opportunistic communal breeders.

During three breeding seasons from September 1981 to April 1984, I observed approximately 20 contiguous territories of the Australian Magpie-lark in suburban Melbourne. All observations, with dates and times, were recorded in the field in plain notebooks.

One of these territories, centred at the corner of Kooyongkoot and Reserve Roads, Hawthorn (c. 37°50'S, 145°02'E), was occupied continuously by one male and two females throughout most of the study period. Although no birds were banded, individuals could usually be distinguished throughout any one observation period because they were either continuously visible or had distinctive physical characteristics. Such characteristics included the shape of the white pattern on the folded wing, the black and white pattern at the edge of the breast bib, and displaced feathers during moult. Between observation periods individuals could only be distinguished with certainty on few occasions but observations suggest that the three birds were always the same individuals.

Whenever more than three adults (always one male and two females) were observed in the territory, the excess birds were obvious intruders and were chased out by one or more of the resident three.

### Results and discussion

#### *Nesting activity*

Throughout the 1981 and 1982 breeding seasons all nests of the communally breeding trio were in a tall pine tree *Pinus radiata* at the territory centre, but in 1983 the nest tree was a large Mahogany Gum *Eucalyptus botryoides* 25 m east of the pine.

On 13 September 1981 I found a male and a female building while a third bird was present in adjacent trees. On 15 October 1981 I observed the nest for 40 min from 1740 to 1820 h. While a male was incubating, two females flew into the nest pine, the first one relieving the male at the nest and the second landing several metres higher in the pine. In a few minutes the second female moved down and

changed with the first, which flew south to the feeding male. In following sequences the male relieved the second female at the nest and 18 min later was relieved himself by the first female. Within two minutes the second female flew in and moved to the nest branch, settling 2 m from the nest where the first female was still incubating. During observations the male was constantly visible and the two females, although out of view at one stage, were distinguishable by the pattern of black spots beneath the lower margin of the black breast bib.

On 22 November 1981, from 1130 to 1202 h, I observed a male and two females feeding two small recently fledged young about 3 m apart at the top of the nest pine. At one stage one female was preening beside a fledgling when the other female flew in and fed the second fledgling.

These initial observations in the 1981 season showed that by at least 15 October a male and two females were all accepting each other in the territory and participating in incubation. By 22 November all three adults were also attending and feeding recently fledged young. Throughout the 1982 and 1983 breeding seasons, until 4 November 1983, all nests and broods of the territory were similarly attended by a male and two females. All three birds were last recorded together on 4 November 1983. After that date the territory was held by only one male and one female and all nesting activity involved only one pair. On 23 November the dried body of an adult female, presumably that of the missing bird, was found on the South-eastern Freeway within the southern perimeter of the territory. This communal association of at least 26 mo was probably terminated only because of the accidental death of one female.

All birds participated in all breeding stages, i.e. in building, incubating, brooding and feeding nestlings and fledglings (Table 1). At all stages the male made fewer nest visits and spent much less time on the nest than would be expected if all three adults had contributed equally (Table 2).

With nestlings, the male contributed only 10% of the total observed brooding time of 225 min (Table 2). This was partly due to the lesser number of visits to the nest by the male but also partly due to female behaviour. Both females displayed a positive need to attend the nest, particularly when young nestlings were present, leaving less time for the male. The male's brooding time was often

TABLE 1 Nest attendance of the Australian Magpie-lark over three breeding seasons in a territory communally occupied by one male and two females.

Date	No. of minutes observing	Breeding stage*	Male		One female		Other female	
			No. of visits	Minutes brooding/incubating	No. of visits	Minutes brooding/incubating	No. of visits	Minutes brooding/incubating
<b>1981</b>								
15 Oct.	40	E	2	c. 24	2	c. 9	1	c. 7
22 Nov.	32	F	2	0	6	0	3	0
<b>1982</b>								
7 Oct.	18	N	2	1.5	3	11.5	2	5
10 Oct.	30	N	2	3	3	11.5	3	9.5
15 Oct.	15	N	0	0	2	c. 8	3	c. 4
6 Nov.	23	E	0	0	1	8	1	11
14 Nov.	47	N	3	9		6 visits; 38 min		
25 Nov.	10	N	2	0	2	8	1	1
4 Dec.	20	N	1	0		5 visits; 0 min		
6 Dec.	33	F	1	0		7 visits; 0 min		
<b>1983</b>								
21 Sept.	45	B	1	0		2 visits; 0 min		
22 Sept.	25	B	0	0	2	0	1	0
25 Sept.	18	B	1	0	1	0	1	0
5 Oct.	22	E	0	0	1	17	1	5
9 Oct.	107	E	2	11	5	60	4	34.5
10 Oct.	10	E	0	0	1	6	1	4
17 Oct.	10	E	0	0	1	9	1	1
20 Oct.	60	N	0	0	5†	33	5	27
23 Oct.	51	N	5	9	4†	20	7	22
4 Nov.	15	N	1	0	2	4	1	0

\* B = building; E = eggs; N = nestlings; F = fledglings, fully-dependent and still in the nest tree.

† Same individual; distinguished by damaged left wing.

Within any one observation period females were distinguished either because they were continuously visible or because of some distinctive plumage characteristic. Between observation periods females could not be distinguished. The data in any female column therefore may not apply to the same bird of the two involved.

limited by the early return of a female to the nest. For example, on 7 October 1982 the male was on the nest rim feeding the nestlings when a female returned and commenced brooding before the male could do so. On another visit to the nest the male had only brooded for 1.5 min before a female returned and nudged him with her bill to speed his departure.

On at least six occasions I witnessed a female demonstrating unwillingness to relinquish incubating or brooding. On 7 October 1982 a female, which had been brooding very small nestlings for 8 min, would not leave when the other female arrived with food but instead took the food from the other female and fed it down into the nest. Three days later, a female bringing food had to nudge the brooding female's neck with her bill to cause it to depart.

In the following season, on 10 October 1983, an incubating female would not leave the nest until the other female hopped onto the nest rim after having first moved

in a semi-circle around the nest. By 20 October the nest held very small nestlings and the brooding female only momentarily rose and stood in the nest while the other female stood on the nest rim and fed the young. On 23 October one female retained the brooding on at least five consecutive occasions as the male and other female brought food for the young. At one visit the male would not respond to the female's soliciting of the food from him but circled the nest a few centimetres from it until the female stood and allowed him to feed the young beneath her. On each of three occasions when the second female arrived with food the brooding female moved off the nest but hopped back on to the nest rim as the second female briefly stood on it feeding the young. The original female recommenced brooding as soon as the second female departed.

#### *Non-breeding activity*

From 10 February to 7 August 1983 inclusive i.e. through-

TABLE 2 Summary of nest attendance of the Australian Magpie-lark in a territory communally occupied by one male and two females. Based on Table 1: data from both females combined.

Breeding stage*	No. of observation periods	No. of minutes observing	Male		Both females combined		Male contribution to nest attendance as % of total	
			No. of visits	Minutes brooding/incubating	No. of visits	Minutes brooding/incubating	No. of visits%	Minutes brooding/incubating%
B	3	88	2	0	7	0	22	—
E	6	212	4	c. 35	20	171.5	17	20
N	9	266	16	22.5	54	202.5	23	10
F	2	65	3	0	16	0	16	—
TOTALS:	20	631	25	57.5	97	374	20	13

\* See explanation given with table 1.

out the non-breeding season, one male and two females were present on each of the 26 occasions I visited the territory. They moved around together or else maintained contact by moving to and from each other. All three birds roosted together on the 20 occasions when roosting was observed during this period. The first roost, used from at least 5 to 23 March, was in a small eucalypt 10 m north-west of the pine and the second roost, used from at least 16 April to 7 August, in another small eucalypt only 12 m north-east of the pine. These, and similar observations in 1982, show that a male and two females, presumably the same three birds as those involved in communal breeding, remained in the territory throughout non-breeding seasons.

#### *Antiphonal calling*

Antiphonal calling in the territory between a male and one female, with or without the minor involvement of the second female, was observed frequently. For example, on 24 October 1982 one of the females flew to the horizontal arm of a freeway light and, as the male landed beside her, commenced calling. Both performed typical, full, antiphonal calling with voice and wing-raising; as they called, the other female landed beside them but remained silent. On 25 September 1983 all three birds were feeding together when the male and one female suddenly flew off rapidly to drive away an encroaching Magpie-lark. Landing after the chase, they engaged in antiphonal calling. The other female, which did not participate in the chase or calling, flew to rejoin the other two birds only when they recommenced feeding.

I witnessed antiphonal calling by all three birds only on 22 August 1983. Three times during 78 min of observation on that day the male and both females simultaneously landed together on a vantage point and all engaged in antiphonal calling accompanied by wing-raising.

#### *Dominance*

Clutch sizes were not determined. Although the maximum number of fledglings from any one nest was never more than four, the same maximum fledged from nests in other territories held only by pairs, thus it is not known if only one female laid.

#### *Origin*

How this instance of communal breeding originated is not known. It is possible that a female of the last brood of one nesting season overstayed in the parent territory and became accepted by its parents as a helper in the following season. However, my observations at territories throughout the study area indicate that this would be unusual for the young generally left their natal territory from two to nine months before the following nesting season commenced.

#### **Conclusion**

This record of communal breeding is apparently the first for both the Australian Magpie-lark and its family Grallinidae. As the behaviour was found in only one (five percent) of the territories studied much more effort is needed to establish whether it represents communal breeding in an evolutionarily significant sense or is simply an isolated case of an extra bird joining a normal territorial pair. The third bird's presence in the territory throughout the non-breeding season precludes it from being purely a casual participant appearing only when the adults are active at the nest.

#### **References**

- Chapman, G. (1975). Recent observations on the family Grallinidae and comments on its taxonomy. *Emu* 74, 307.
- Dow, D.D. (1980). Communally breeding Australian birds with an analysis of distributional and environmental factors. *Emu* 80, 121-140.