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INTERSPECIFIC AGGRESSION WITHIN THE GENUS *MANORINA*

Local populations of miners (genus *Manorina*) typically exclude most other avian species from their territory (Dow, 1977; Smith & Robertson, 1978). Here I report an aggressive interaction between populations of two congeneric species, the Bell Miner *Manorina melanophrys* and the Noisy Miner *Manorina melanophala*. Populations of these two species occupied abutting territories in 2 ha of dry layered woodland lining a small gully running into the Plenty River at the Janefield Training Centre, Bundoora, 16 km north-north-east of Melbourne. The site is described in detail as Region II by Smith & Robertson (1978).

During the study thirty-two Bell Miners were colour banded to facilitate recognition of individuals. Detailed estimates of the size of the Bell Miner population were obtained on average 2.5 times per week during observation periods lasting 60 to 180 min between September 1981 and February 1983, by taking a census of the banded and unbanded birds present in the study site. During these observation periods any other avian species present were noted.

The study site was marked with a 20 m grid pattern by white stakes so that birds' positions and sites of territorial boundary conflicts could be plotted on a map. The Noisy Miners initially occupied open woodland surrounding the gully and were not present in the study site.

RESULTS AND DISCUSSION

Between September 1981 and June 1982 the study site was occupied by Bell Miners and three other avian species (Table I). All other avian species were excluded

from the site by the Bell Miners. The Bell Miner population appeared to be divided into two social groups. The southern group consisted of a mated pair and up to eleven non-breeding individuals while the northern group consisted of four mated pairs and up to twelve non-breeding individuals (Fig. 1a).

There were twenty-five individuals in the Bell Miner population when the first of four birds was seen to be suffering from a sickness which caused the swelling of the middle anterior phalanx of one foot on 18th May 1982. The sick birds were unable to perch properly and were often seen trying to feed while hanging from one foot. This appeared to be a severe handicap and a gradual deterioration in the appearance of their plumage was observed. Between 18th May 1982, and 8th June 1982, approximately eight birds disappeared from the southern group area. One was known to have been shot; the others may have dispersed or died. An inspection of neighbouring Bell Miner populations within 3 km of the study site failed to locate any of the individuals which had disappeared.

On 8th June 1982, fifteen or more Noisy Miners were seen fighting with Bell Miners 20 m inside the southern group area (Fig. 1b). The next day Bell Miners from the northern group were also seen harassing Noisy Miners in the southern group area. From this time on the boundary between the southern and northern group areas became less distinct (Fig. 1 b-h). In such fighting a group of six or more Noisy Miners flew high above a section of Bell Miner territory calling loudly; they would then descend into a particular tree and attempt to feed while being attacked by resident Bell Miners. After the fighting the Noisy Miners usually continued to occupy

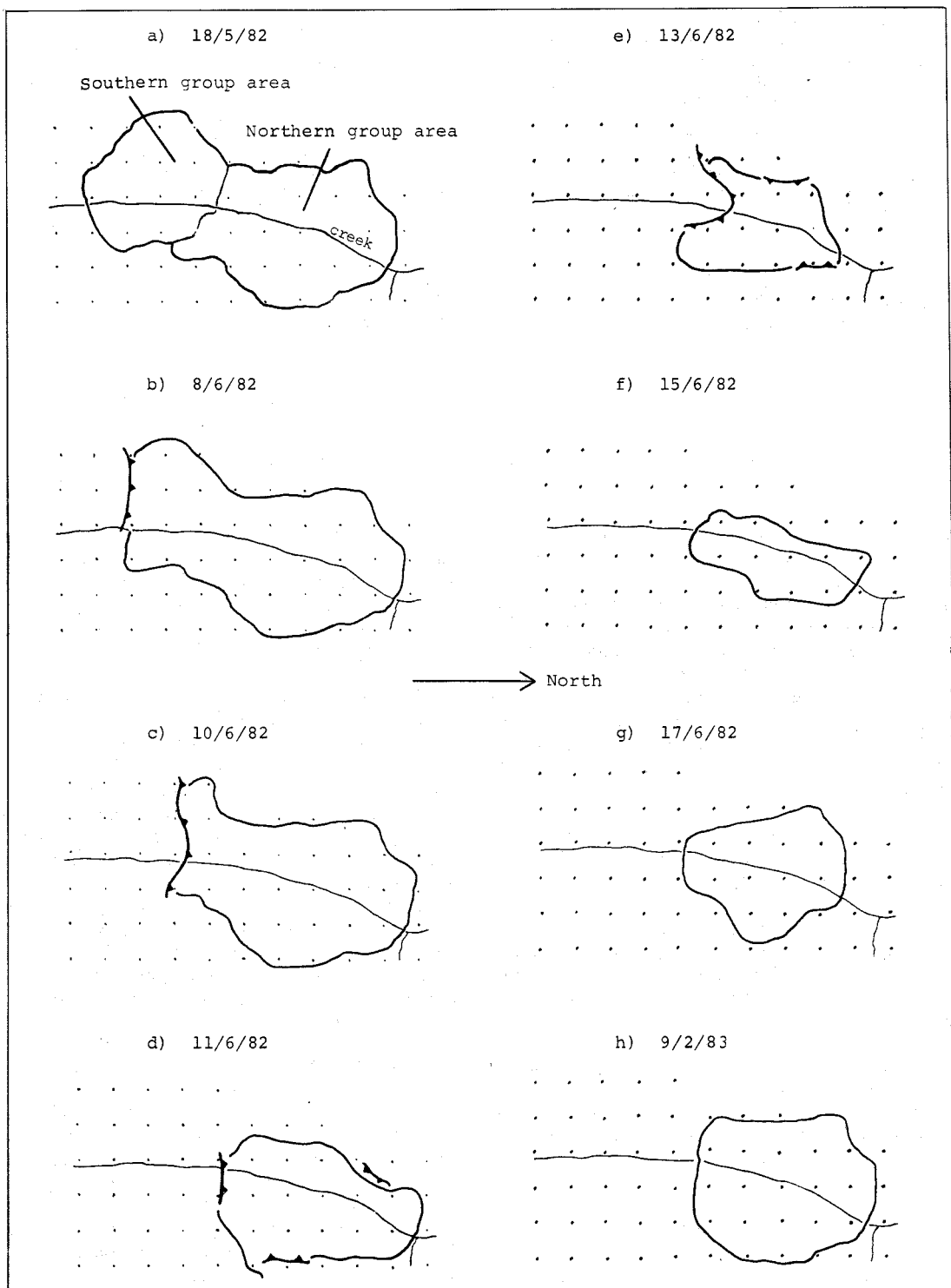


Figure 1. A chronological series of maps of the study site depicting the invasion of the Bell Miner territory (area enclosed by solid black line) by Noisy Miners. Lines with triangles on them represent zones of invasion by Noisy Miners. Small dots represent the grid pattern of stakes on the site.

TABLE I

Species present and feeding unharassed by Manorina species in the southern group area during various periods of time.

Name	12/9/81 - 8/6/82	8/6/82 - 25/6/82	1/7/82 - 9/2/83
Eastern Rosella <i>Platycercus eximius</i>		X	X
White's Thrush <i>Zoothera dauma</i>	X	X	
Rose Robin <i>Petroica rosea</i>			X
Eastern Yellow Robin <i>Eopsaltria australis</i>			X
Crested Shrike-tit <i>Falcunculus frontatus</i>		X	
Golden Whistler <i>Pachycephala pectoralis</i>			X
Rufous Whistler <i>Pachycephala rufiventris</i>			X
Grey Shrike-thrush <i>Colluricincla harmonica</i>		X	X
Restless Flycatcher <i>Myiagra inquieta</i>			X
Grey Fantail <i>Rhipidura fuliginosa</i>		X	X
Willie Wagtail <i>Rhipidura leucophrys</i>			X
Superb Fairy-wren <i>Malurus cyaneus</i>	X	X	X
White-browed Scrubwren <i>Sericornis frontalis</i>	X	X	X
Brown Thornbill <i>Acanthiza pusilla</i>		X	X
Varied Sittella <i>Daphoenositta chrysoptera</i>		X	X
Red Wattlebird <i>Anthochaera carunculata</i>			X
Bell Miner <i>Manorina melanophrys</i>	X	X	
Noisy Miner <i>Manorina melanocephala</i>		X	
Yellow-faced Honeyeater <i>Lichenostomus chrysops</i>			X
White-plumed Honeyeater <i>Lichenostomus penicillatus</i>		X	X
White-naped Honeyeater <i>Melithreptus lunatus</i>		X	X
New Holland Honeyeater <i>Phylidonyris novaehollandiae</i>		X	
Spotted Pardalote <i>Pardalotus punctatus</i>		X	X
Red-browed Firetail <i>Emblema temporalis</i>		X	

the tree and the size of the Bell Miners' territory was reduced. Figure 1 b-e depicts the continued invasion of the Bell Miner territory over the following five days which resulted in the departure of Bell Miners from much of their territory and Noisy Miners occupying the whole southern group area by 13th June 1982.

On the 15th June 1982, no Bell Miners or Noisy Miners were present in the southern group area, however, Crested Shrike-tit, White-plumed Honeyeater, and New Holland Honeyeater were present and fed unharassed. In the following two weeks fifteen avian species foraged in the southern group area undisturbed (Table I). By early July 1982, there were eleven individuals left in the Bell Miner population. All but one of the southern group had disappeared, as had a female whose home range had been immediately adjacent to the southern group area. The one southern group individual which remained on the study site was a juvenile (one month old) which joined the northern group. Between July 1982, and February 1983, a total of eighteen species were seen feeding in the southern group area (Table I). Neither the Noisy Miners nor the Bell Miners attempted to regain possession of the area during this period. The northern group area, however, did gradually return to its size prior to 18th May 1982 (Fig. 1 f-h).

Reduction in the defensive strength of the southern

group appears to have enabled the Noisy Miners to exclude Bell Miners from their territory. Considering the energy expended by the invading Noisy Miners, their departure two days later is extremely puzzling. Perhaps the benefits they obtained from the invasion were in the form of a short-term enhancement of food supply.

The degree to which the Bell Miners had been excluding other avian species from their territory is evident in the rapid colonisation of the 'unoccupied' southern group area by other species. The most abundant initial colonisers were Spotted Pardalote, White-naped Honeyeater, and Eastern Rosella, all of which compete with Bell Miners for food (Smith & Robertson 1978); all glean psyllid lerps from the canopy foliage. Later colonisers utilised a wider variety of food types and foraging methods. It would appear that environmental factors which led to a decrease in the Bell Miner population resulted in a series of abrupt changes in the bird community of the site.

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