THE AVIAN COMMUNITY ASSOCIATED WITH EUCALYPTUS MICROCARPA

INTRODUCTION

The present study was undertaken in Pomingalarna Reserve, an area of 165 hectares approximately two kilometres west of Wagga Wagga. Although some areas of the Reserve have been used for grazing, the higher ground is naturally timbered and resembles the tall semi-arid woodland that formerly characterized the district and is now patchily distributed (Specht *et al.* 1974). The dominant species of tree is Western Grey Box *Eucalyptus microcarpa* or, in smaller areas, Black Cypress Pine *Callitris endlicheri.*

The survey was aimed at observing the structure of the avian community associated with the dominant tree, *E. microcarpa.* Weekly observations were carried out from the first week in July to the last week in November 1976. From July to mid-September rainfall readings were fifty-three per cent of average (Fig. 1) and the district had been declared drought-affected. However, from mid-September to the end of the period rainfall was 145 per cent of average. Because the period divided itself into two distinct parts climatically, it was decided to compare the structure of the bird community during the period (1) of reduced rainfall and low temperatures with that during the period (2) of increased rainfall and high temperatures. The terms 'winter' and 'spring' were considered inappropriate because, by definition, winter runs from early May to early August, the mid-point being the winter solstice. In other words, Periods 1 and 2 are shorter than winter and spring and the end of Period 1 does not coincide with the end of winter.

STUDY AREA AND METHODS

Intense observations were made of six selected *Eucalyptus microcarpa* trees. The trees were selected because they were about the same height and had similar density of foliage, and branching and were spaced approximately 100 metres apart along a south-western slope, the elevation ranging between 200 and 150 metres. Observations were made during daylight on each (22) Wednesday from 7 July to 30 November 1976. Each tree was visited at hourly intervals and was observed for five minutes. During that period, individuals and species were counted every minute, i.e. five counts for each period. The periods were separated by breaks of five minutes spent moving from tree to tree. Observations totalled 124 hours. The counts were pooled for Period 1 (7 July to 15 September) and for Period 2 (22 September to 30 November).

Identification of birds was based on Slater (1970, 1974). Meteorological data were recorded at the Soil Conservation Service of New South Wales Research Centre, about one kilometre south of the area.

RESULTS AND DISCUSSION

Though the average monthly rainfall at Wagga Wagga is rather uniform, Period 1 had much less and Period 2 much more than average. However, the mean monthly maximum and minimum air temperatures were normal (Fig. 1). In other words, during Period 1 drought coincided with the coldest months but during Period 2 increased rainfall coincided with increasing air temperature.

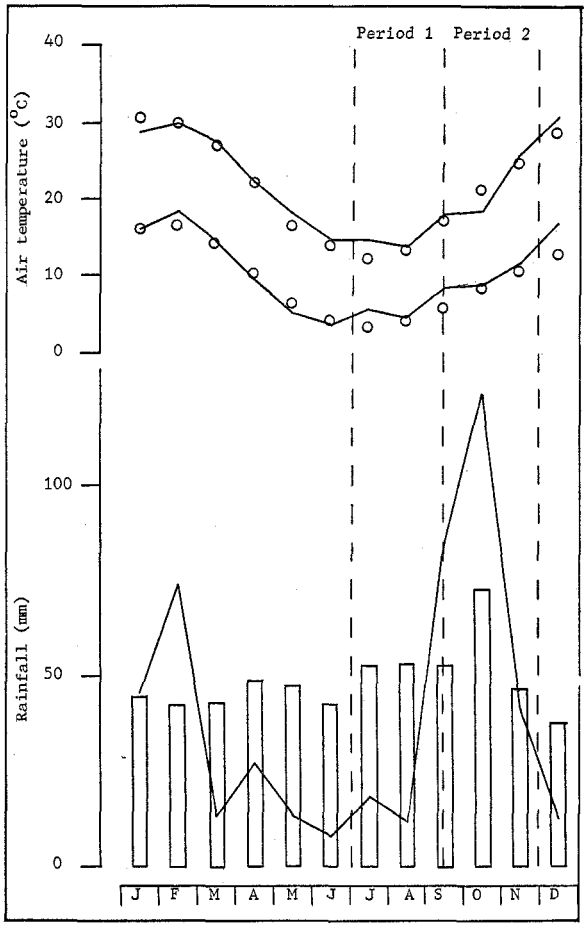

Figure 1. Mean monthly maximum and minimum temperatures and monthly rainfall for 1976 at Pomingalarna Reserve, Wagga Wagga. The open circles represent average temperatures up to 1975; the vertical bars represent average rainfall up to 1975.

TABLE I

Occurrence of birds in *Eucalyptus microcarpa*. Period 1 (7 July–15 September) and Period 2 (22 September–30 November) 1976.

Species	Period 1	Period 2
Insectivores		
Yellow Thornbill *Acanthiza nana*	68	46
Brown Thornbill *Acanthiza pusilla*	7	27
Red-capped Robin *Petroica goodenovii*	3	1
Flame Robin *Petroica phoenicea*	8	7
Hooded Robin *Melanodryas cucullata*	5	5
Grey Fantail *Rhipidura fuliginosa*	1	158
Willie Wagtail *Rhipidura leucophrys*	1	9
Gilbert's Whistler *Pachycephala inornata*	14	11
Golden Whistler *Pachycephala pectoralis*	9	7
Rufous Whistler *Pachycephala rufiventris*	0	4
Crested Shrike-tit *Falcunculus frontatus*	18	1
White-throated Treecreeper *Climacteris leucophaea*	12	23
Dusky Woodswallow *Artamus cyanopterus*	18	0
Rainbow Bee-eater *Merops ornatus*	0	19
White-winged Triller *Lalage sueurii*	0	29
	164	347
Omnivores		
White-plumed Honeyeater *Lichenostomus penicillatus*	205	190
Little Friarbird *Philemon citreogularis*	0	5
Striated Pardalote *Pardalotus ornatus*	0	16
Spotted Pardalote *Pardalotus punctatus*	0	4
	205	215
Carnivores		
Australian Magpie *Gymnorhina tibicen*	6	10
Laughing Kookaburra *Dacelo novaeguineae*	0	23
Sacred Kingfisher *Halcyon sancta*	0	4
	6	37
Granivores		
Peaceful Dove *Geopelia striata*	12	4
Eastern Rosella *Platycercus eximius*	12	0
Crimson Rosella *Platycercus elegans flaveolus*	3	0
	27	4
	402	603

In these circumstance the bird community would be expected to be more diverse in Period 2 than in Period 1. The measurement of species composition suggested by Hurlbert (1971), i.e. probability of interspecific encounter (PIE), was used to compare the diversity of communities in the two periods. This comparison shows that PIE is 0.703 for the community in Period 1 and 0.817 in Period 2 and that, thus, the community was more diverse in Period 2 than in Period 1.

The most noticeable change in the avian community between Period 1 and 2 is the fifty per cent increase in total sightings (Table I). Of the twenty-five species recorded, twelve were more common in Period 2 than in Period 1, some appearing for the first time. Three species were observed only in Period 1, eight only in Period 2 and fourteen in both; of these last, five became more common in Period 2 and eight less common.

The total number of insectivorous birds doubled between Period 1 and 2, almost entirely because the Grey Fantail *Rhipidura fuliginosa* was seen so much more often. Although total numbers of omnivores remained relatively constant, the number of omnivorous species increased in Period 2. Similarly the number of carnivorous species increased in Period 2, while granivorous species decreased. Though these observations may reflect real changes in composition of species, no definite conclusions can be drawn because sightings of most species were few.

The most frequently sighted birds throughout the study were the White-plumed Honeyeater *Lichenostomus penicillatus*, the Grey Fantail and the Yellow Thornbill *Acanthiza nana*, accounting for over two-thirds of the total.

The community associated with the dominant tree was observed as a means of sampling the entire bird community of the tall semi-arid woodland. Very little can be said, however, about the possible reasons for changes in community structure between Periods 1 and 2 because, apart from the Rainbow Bee-eater *Merops ornatus*, the White-winged Triller *Lalage sueurii* and the Sacred Kingfisher *Halcyon sancta*, which migrate out of southern Australia in winter, the movements of the other species may be ascribed to local changes in distribution within the tall semi-arid woodland, the causes of which may be rather complex. In other words, our observations were a preliminary survey of an avian community from the point of view of diversity of species and their abundance. The results provide the groundwork for subsequent detailed study of individual species.

ACKNOWLEDGEMENTS

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FURTHER NOTES ON THE BIRDS OF MAATSUYKER ISLAND, TASMANIA

I visited Maatsuyker Island, off Tasmania's southern coast, from 16 to 30 January 1975 and from 31 December 1977 to 19 January 1978. Observations during these two visits are given in the systematic list. A second list of species recorded only by the lighthouse keepers is included. Detailed information on the breeding of seabirds has been published elsewhere (Milledge and Brothers 1976). Milledge (1972) has provided a description of the Island's vegetation, climate and topography. He described *Eucalyptus simmondsii* as practically extinct, with only six mature trees being found. There are, in fact, many trees scattered over almost two hectares about the Island's summit.

SYSTEMATIC LIST

Species not recorded by Milledge (1972) are marked with an asterisk.

Eudyptula minor Little Penguin
Seen fishing offshore but only along the eastern coast. Only one breeding colony located, at the boat landing, but isolated nests were found along the eastern shore among boulders and in burrows on the steep slopes.

Diomedea cauta Shy Albatross
Present offshore almost daily; most were seen about The Needles and south of the Island, particularly during windy weather.

***Phoebetria fusca** Sooty Albatross
Two birds near Flat Witch Island during 1975 visit.

Pachyptila turtur Fairy Prion
Observations made at lighthouse on most nights between 19:00 and 23:00 during 1975 visit but few individuals seen. Breeding colonies, not confirmed by Milledge (1972), found: on eastern side of North Point; at boat landing; on western shore opposite the lightkeepers' residences; and at south-western end of Island.

Puffinus tenuirostris Short-tailed Shearwater
Milledge and Brothers (1976) subjectively estimated the number of birds in the breeding population to be one million. In 1978 densities of burrows were plotted over the Island. From the average number of burrows in a series of 4m x 4m quadrats in each area of different density, 480,000 burrows were calculated. If all are used by breeding birds, the previous estimate seems quite satisfactory. In 1975 not seen in flocks on the water until 23 January; began arriving each night between 21:05 and 21:25 but numbers in flocks varied considerably between nights. Most came from a south-westerly direction and flew over The Needles toward lighthouse on first approach; usually flew south of lighthouse and from there turned off to all parts of Island. Apparently not attracted to the light but may have been guided by it. Only two birds known to have struck the light during 1975 visit.

Puffinus gavia Fluttering Shearwater
Two birds, thought to be this species, accompanied the first *P. tenuirostris* to arrive on 20 January 1975; one chased towards The Needles by a *P. tenuirostris* and twittered like a Goldfinch *C. carduelis* as it flew away.

***Pelagodroma marina** White-faced Storm-Petrel
Three or four birds observed at lighthouse each night although about twenty were seen once. May breed on Island, though no burrows were found despite intense search. Several birds considered to be this species heard calling from dense cover at 22:00 in the south-western colony of *P. urinatrix* but their burrows not located.

Pelecanoides urinatrix Common Diving-Petrel
Breeds at all Fairy Prion colonies. Three stunned birds found at lighthouse during 1975 visit. *P. urinatrix* arrived over Island from 21:45 to 22:00.

Morus serrator Australasian Gannet
Groups of up to ten birds feeding between Maatsuyker and De Witt Islands.

Leucocarbo fuscescens Black-faced Shag
Common; breeds on Old Man of Sea and Indian Face at The Needles. Colony described by Milledge (1972) on one of the inner Needles appeared to be abandoned.

***Ardea novaehollandiae** White-faced Heron
Two or three birds observed daily feeding on pig-face slopes at boat landing during 1975 visit when as many as five individuals present. None seen during the second visit.

Haliaeetus leucogaster White-bellied Sea-Eagle
Often seen by lightkeepers; suspected of breeding on south-eastern side of Island. One adult seen on 5 and 6 January 1978.

Circus aeruginosus Marsh Harrier
In 1975 usually one but twice two adults flying round