

FORAGING IN THE INTERTIDAL ZONE BY THE AUSTRALIAN MAGPIE LARK *Grallina cyanoleuca*, MORETON BAY, QUEENSLAND

D. T. NEIL

Department of Geographical Sciences and Planning, The University of Queensland,
St Lucia, Qld 4072

Received 4 December 1991

Utilization of marine resources on an intertidal mudflat at Moreton Bay, Queensland, by the Australian Magpie Lark is reported. Magpie Larks represented 17 per cent of the individual birds observed in the study area at low tide and, for 90 per cent of observations, they foraged on seagrass beds, rather than bare mud or rocky areas. Magpie Larks observed on the intertidal flat spent about 98 per cent of their time actively foraging.

INTRODUCTION

The Magpie Lark, one of only two members of the Grallinidae family, is found throughout Australia (with the exception of Tasmania) and on many coastal islands (Pizzey 1980) and appears to be expanding its range (Blakers *et al.* 1984).

Reported habitat preferences focus on areas adjacent to freshwater such as alluvial flats, lake banks and swamps (Gould 1865), along creeks and rivers (Gould 1865; Pizzey 1980), in open areas near water (Cayley 1971) and around water margins in general (Slater 1974; Scrventy and Whittell 1976; Pizzey 1980). Open timber (Macdonald 1973; Slater 1974; Woinarski *et al.* 1989; Brooker *et al.* 1990), open paddocks (Slater 1974) and pasture (Schodde and Tideman 1988), plains and clear land (Blakers *et al.* 1986) are all utilized. Smith (1984) recorded Magpie Larks in some eucalypt forest types and coastal scrub near Bega, New South Wales, but not in rainforest. In a study in Gippsland, however, Friend (1982) recorded Magpie Larks in plantation pine forest, but not in eucalypt forest.

Magpie Larks are common in urban areas (Pizzey 1980), particularly in suburban parks (Macdonald 1973). Catterall *et al.* (1989) compared suburban areas and native forest/woodland and

found a marked preference by Magpie Larks for suburban areas. In the literature reviewed there are no reports of the use by Magpie Larks of the intertidal zone as a source of food.

Casual observation of Magpie Larks in an urban area adjacent to Moreton Bay, Queensland, suggested that these birds often foraged on the intertidal flats there. This note reports on the results of a more systematic set of observations during June–July, 1991.

STUDY AREA AND METHODS

The study area lies on the west coast of southern Moreton Bay at Victoria Point, some 30 km south-east of the Brisbane central business district. The intertidal zone of the study area has a maximum width of about 220 m and an area of 15 ha. The long axis of this area is oriented southwest to north-east and is thus exposed to the prevailing south-east winds. About 45 per cent of the intertidal zone has a cover of seagrass (*Zostera capricorni*), 51 per cent is bare sandy mud, about 4 per cent is lateritic gravels (referred to as rocky) and the remainder (< 0.1%) is a small, dissected laterite platform.

The number of Magpie Larks on the intertidal zone of the study area was counted from a vantage point on its western margin at half hourly intervals on five days during June and July, 1991. The number of birds actively foraging at each observation was recorded, as was the number using muddy, rocky or seagrass areas of the intertidal zone. In addition, the

numbers of waders and gulls on the mudflat at each observation was recorded. On 13 additional days counts were made of the numbers of waders, gulls and Magpie Larks within one hour of low tide. These counts were separated by half an hour.

RESULTS AND DISCUSSION

A total of 96 counts was made when the intertidal flats were exposed, and between the hours of 0700 and 1645. Magpie Larks were never observed in the study area outside these hours. Of these observations, at least one Magpie Lark was active on 90 per cent of occasions. The mean number of individuals during these observations was 3.4 (S.D. = 2.4). For observations within one hour of low tide ($n = 41$) the mean number of individuals was 3.8 (S.D. = 2.6). Ninety-eight per cent of Magpie Larks observed were actively foraging at the time of observation.

For about two hours before and after high tide only sand beach was accessible to Magpie Larks as the intertidal flats were inundated. Although Magpie Larks are reported as 'puddling on the edge of freshwater' (Schodde and Tideman 1988), those foraging on the intertidal mudflats at Victoria Point were never observed wading.

In a study of the birds of the Hunter and Richmond Rivers, New South Wales, Gosper (1981) divided the areas surveyed into 11 habitats. Of the four habitats associated with the margins of the marine environment, Magpie Larks were frequently observed (i.e. present for between 31 and 60% of surveys) in mangrove swamps and salt marshes, and scarce (present for < 10% of surveys) on salt meadows. In shallow estuarine waters, the habitat most similar to that in the present study, Magpie Larks were scarce (i.e. < 10% of surveys) compared with 90 per cent of observations (very common, by Gosper's classification) on the Victoria Point mudflat during June–July, 1991.

Gosper (1981) lists 26 passerine species observed in wetlands of the Hunter and Richmond Rivers, only 11 of which were observed in the shallow estuarine waters habitat. Only the Azure Kingfisher, Sacred Kingfisher, Welcome Swallow and Australian Raven were common. Willie Wagtails, Australian Ravens and Azure Kingfishers were all observed on the Victoria Point mudflat, but all were scarce.

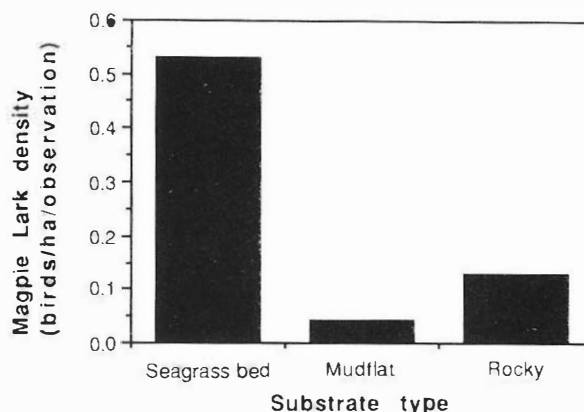


Figure 1. Foraging preferences of Magpie Larks by substrate type for those observations occurring within one hour of low tide.

Magpie Larks foraged on the seagrass beds for 81 per cent of observations, on the bare mud for 13 per cent and the rocky southern margin for 6 per cent. This indicates a marked preference for seagrass beds by comparison with the mudflats, even though the seagrass areas are furthest from shore. Although the seagrass beds cover 45 per cent of the area of the intertidal zone, they are accessible for a smaller proportion of the time. The pattern is made more clear by examining the density of foraging Magpie Larks for those observations made within one hour of low tide. At these times, 90 per cent of Magpie Lark foraging is on the seagrass beds (Fig. 1) which cover 45 per cent of the study area, 8 per cent on mud (51% of the area) and 2 per cent on rocks (4% of the area). No Magpie Larks were observed foraging on the laterite platform. These results suggest that, although these birds prefer foraging on the seagrass beds, they will utilize the bare mudflats and rocky areas, mainly when the seagrass beds are inundated.

Magpie Larks are reported to be common in urban areas. Lenz (1990) records dominance (i.e. per cent of birds seen) for Magpie Larks in three breeding bird communities in suburban Canberra of 2.3, 1.0 and 0.3 per cent. Jones' (1983) study of suburban birds in Townsville reveals that about 7.0 per cent of birds observed at 13 sites were Magpie Larks. By comparison, this species represents 17 per cent of the avifauna foraging on

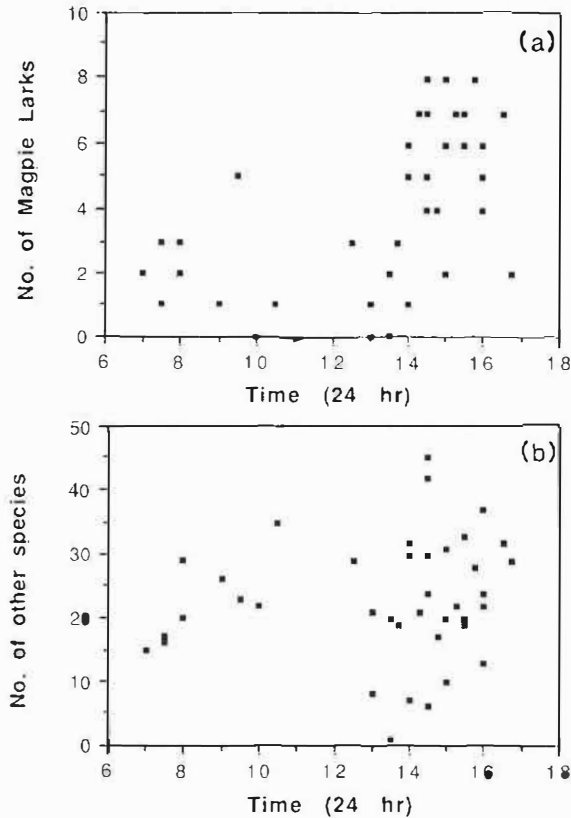


Figure 2. Temporal pattern of diurnal intertidal foraging activity, within one hour of low tide, by (a) Magpie Larks and (b) other species (excluding Silver Gulls).

the Victoria Point mudflat within one hour of low tide (41 observations).

On average, for all observations made, Magpie Larks comprise about 13.5 per cent of the total number of birds utilizing the mudflat at a given time. It is difficult to judge the significance of these observations. Magpie Larks are among the smallest birds foraging, but they are constantly active foragers, unlike gulls, for example, which were inactive during most observations.

There appears to be an increase in intertidal foraging by Magpie Larks through the day (Fig. 2a). The temporal pattern for Magpie Larks is quite similar to that for the aggregated 'other species', although birds in this category tend to maintain more constant numbers throughout the day (Fig. 2b).

Even though these birds spend a great deal of their time in intertidal areas, probably obtaining much of their food there, when alarmed they still take refuge in the trees of adjacent terrestrial areas, where roosting also takes place. Terrestrial feeding on suburban lawns adjacent to the mudflat was frequently observed.

ACKNOWLEDGMENTS

My thanks to Anita Smyth and two anonymous referees for their many helpful comments.

REFERENCES

- Blakers, M., Davies, S. J. J. F. and Reilly, P. N. (1984). 'The Atlas of Australian Birds'. (RAO and Melbourne University Press: Melbourne.)
- Brooker, M. G., Braithwaite, R. W. and Estbergs, J. A. (1990). Foraging ecology of some insectivorous and nectivorous species of birds in forests and woodlands of the wet/dry tropics of Australia. *Emu* 90: 215-230.
- Catterall, C. P., Green, R. J. and Jones, D. N. (1989). Occurrence of birds in relation to plants in a subtropical city. *Aust. Wildl. Res.* 16: 289-305.
- Cayley, N. W. (1971). 'What bird is that?'. (Angus and Robertson: Sydney.)
- Friend, G. F. (1982). Bird populations in exotic pine plantations and indigenous eucalypt forests in Gippsland, Victoria. *Emu* 82: 80-91.
- Gosper, D. G. (1981). Survey of birds on floodplain-estuarine wetlands on the Hunter and Richmond Rivers in Northern New South Wales. *Corella* 5: 1-18.
- Gould, J. (1865). 'Handbook to the Birds of Australia, v.1'. (Author: London.)
- Jones, D. N. (1983). The suburban bird community of Townsville, a tropical city. *Emu* 83: 12-18.
- Lenz, M. (1990). The breeding bird communities of three Canberra suburbs. *Emu* 90: 145-153.
- Macdonald, J. D. (1973). 'Birds of Australia'. (Reed: Sydney.)
- Pizzey, G. (1980). 'A Field Guide to the Birds of Australia'. (Collins: Sydney.)
- Schodde, R. and Tideman, S. C. (Eds.) (1988). 'Readers Digest Complete Book of Australian Birds'. (Readers Digest: Sydney.)
- Serventy, D. L. and Whittell, H. M. (1976). 'Birds of Western Australia'. (University of Western Australia Press: Perth.)
- Slater, P. (1974). 'A Field Guide to Australian Birds: Passerines'. (Rigby: Sydney.)
- Smith, P. (1984). The forest avifauna near Bega, NSW, I. Differences between forest types. *Emu* 84: 200-210.
- Woinarski, J. C. Z., Press, A. J. and Russell-Smith, A. J. (1989). The bird community of a sandstone plateau monsoon forest at Kakadu National Park, Northern Territory. *Emu* 89: 223-231.