Bird interactions in Sydney gardens: some initial findings of the Birds in Backyards program

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ABSTRACT

A community-based survey by 723 volunteers investigated the relationships between small birds, aggressive birds and garden vegetation. Seven species of small bird were targeted in the survey, and all seven species were less likely to be recorded from gardens in which Noisy Miners were present. The distribution of the Noisy Miner was unrelated to the vegetation composition of gardens. Noisy Miners were equally likely to be present in gardens comprised of Australian native species, exotic species or a mixture of the two. However, several species of small bird, notably the Superb Fairy-wren, Eastern Spinebill and Eastern Yellow Robin, were more likely to be encountered in gardens comprised predominantly of Australian natives. A second aim of the survey was to increase public awareness of issues concerning the status and ecology of birds in Australian cities. The project was reported by several newspapers and radio stations, and there was considerable feedback by telephone, from council newsletters and via the internet, which suggested that the information had reached a diverse audience. This first module of the *Birds in Backyards* program has provided a good indication that community-based surveys have considerable potential both to collect useful data and to increase community understanding of the ecology of urban wildlife.

Key words: urban, Noisy Miner, *Manorina melanocephala*, garden, survey

Introduction

Birds provide a conspicuous example of a group of organisms that is affected by urbanisation. Many bird species are still prevalent throughout cities, sometimes at higher densities than in traditional habitat (Recher 1972). However, in Sydney there has been a noticeable, though largely unstudied, change in the urban bird community (Hoskin *et al.* 1991) with numbers of smaller native birds diminishing. Concurrently, there has been a considerable increase in the number of exotic and larger native species.

A number of suggestions has been proposed to explain this shift in the composition of urban bird communities. As cities expand, those species living within natural habitats on the periphery of the expansion, or within fragments of natural vegetation within the city, are likely to be affected by an increase in the distance between patches and the few remaining areas of remnant bushland. The replacement of natural habitat may result in the local extinction of some species, or promote the survival of other species in new ecological niches, thus altering population structures and interspecific interactions (Erz 1966; Tomialojic and Profus 1977; Tomialojic 1985; Suhonen and Jokimaki 1988).

The replacement of natural habitat involves changes both in garden structure and in garden composition. Changes in garden structure have been implicated in the decline of bird diversity and dominance by a few large and aggressive species (Green 1984; Sewell and Catterall 1998). In particular, the preponderance of maintained lawns in urban areas, with the retention of large trees, might mean that low shrub and ground-nesting birds, such as fantails, wrens and whistlers, are less likely to find suitable habitat free from predation and human interference. In contrast, birds that nest in hollows or in the tree canopy may have abundant nesting sites and be common in urban areas, e.g. lorikeets, friarbirds and Noisy Miners *Manorina melanocephala* (Sewell and Catterall 1998).

Changes in garden composition have been implicated in an increase in two common native birds of eastern Australian gardens. It has been suggested that the popularity of new cultivars of Australian grevilleas with larger flowers and longer flowering seasons has created ideal conditions for the aggressive Noisy Miner (Low 1994). Exclusion of small birds by this species is well documented in traditional woodland (Dow 1977; Grey *et al.* 1997; 1998; Arnold 2000). Similarly, the Pied Currawong *Strepera graculina* is another native species whose dominance of the urban matrix is partially due to the provision of exotic vegetation that produces abundant berries (Buchanan 1989; Bass 1995; Major *et al.* 1996). The Pied Currawong is also a predator of small birds and their eggs (Cooper and Cooper 1981; Priddel and Carlile 1995; Major *et al.* 1996). It has, therefore, been identified as a potential factor responsible for the decline of bird diversity in cities.

This paper presents some preliminary results on the first module of the *Birds in Backyards* program, a community-based initiative with the dual aims of increasing understanding of urban bird communities, and making information available to a broad public audience. The two aims of this study were 1) to investigate the relationships between small birds, garden composition and the presence of the Noisy Miner; and 2) to evaluate the success of the *Birds in Backyards* project in terms of public education.

Pp 211 - 215 in *Urban Wildlife: more than meets the eye,* edited by Daniel Lunney and Shelley Burgin 2004. Royal Zoological Society of New South Wales, Mosman, NSW.

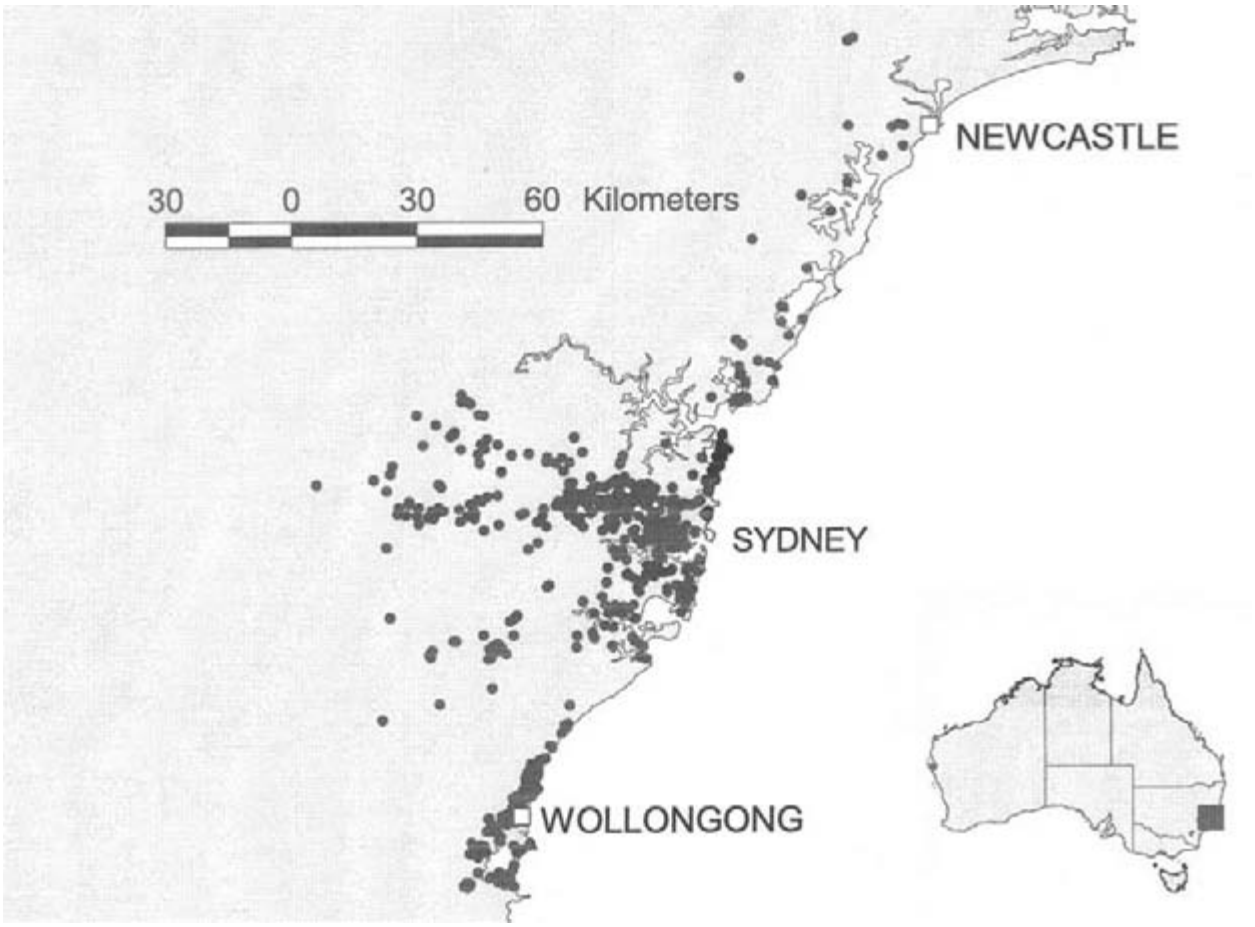

Figure 1. The locations in the greater Sydney region at which volunteers conducted surveys of backyard birds.

Methods

Publicising urban bird issues

In order to obtain a large sample from a broad geographical area, we enlisted volunteers to conduct the bird surveys. We sent a media release to the major newspaper publishers across the greater Sydney region, giving coverage to an area stretching from Newcastle to Wollongong and as far west as the eastern edge of the Great Dividing Range (Figure 1). Information on urban birds and details of the survey were also available from a website, and the results of the survey were disseminated both on the website and in a newsletter sent to the participants. More than one thousand survey kits were mailed to people who phoned in response to the promotional material. The survey kits included information on the status and ecology of birds in urban environments and photographs of 20 common bird species.

Module 1 survey

Seven hundred and twenty-three volunteer surveyors provided useable data on the birds they saw in their gardens, during seven 20-minute surveys conducted in November 2000. Here we concentrate on 10 species, of which seven were readily-identifiable small birds: Willie Wagtail *Rhipidura leucophrys*, Silvereye *Zosterops lateralis*, New Holland Honeyeater *Phylidonyris novaehollandiae*, Superb Fairy-wren *Malurus cyaneus*, Eastern Spinebill *Acanthorhynchus tenuirostris*, Red-browed Finch *Neochmia temporalis* and Eastern Yellow Robin *Eopsaltria australis*. The remaining three species were selected because they are often blamed for a reduction in the diversity of small birds – Noisy Miner, Pied Currawong, and Common Myna *Acidotheres tristis*.

In addition to recording the birds they encountered, volunteers were also asked to provide information on the nature of their gardens. In particular, they reported whether their gardens were 1) composed predominantly of species that are native to Australia, 2) composed predominantly of exotic species, or 3) composed of a roughly even mixture of the two.

Results

Publicising urban bird issues

The project was enthusiastically reported by those newspapers which covered it, but the amount of media interest was less than expected, with only eight newspaper articles in total (Table 1). The two major Sydney newspapers did not respond to our promotion of the survey, but both later reported the results. Six suburban newspapers and three radio stations provided the majority of the pre-survey publicity. As well as putting the volunteers in touch with us directly, this media coverage referred many recruits to the website, from which survey kits could be printed. The web-site received a total of 17,032 hits during November 2002, with over 10% of hits having a duration greater than five minutes.

Table 1. Publicity associated with the community-based survey.

Medium	Number
Newspaper articles	8
Radio interviews	9
Newsletters (Council etc)	9
Web hits (one month's data)	17,032

Module I survey

Although 871 people took part in the survey, the data from only 723 volunteers could be included in the analysis because the other participants were not confident of their ability to identify all the target species.

The Common Myna was the most frequently reported bird across urban Sydney (Table 2), occurring in 80% of gardens during the survey. The most common native species were the Pied Currawong (64%) and Noisy Miner (59%). The Willie Wagtail was the most common small bird, occurring in 37% of gardens, and the Eastern Yellow Robin was the rarest (7%).

Several of the more common species, most notably the Common Myna, were found in similar numbers right across Sydney, but some of the smaller birds varied in abundance depending on the district (Table 2). For example, Willie Wagtails were five times more common in Illawarra gardens (47%) and Western Sydney gardens (55%) than in gardens of Northern Sydney (9%).

Small birds were distinctly less common in Northern Sydney, a region that was characterised by the highest reporting rate of Pied Currawongs and Noisy Miners. At the other extreme was the Illawarra region, which had by far the lowest reporting rate of Noisy Miners, and the highest reporting rate of small birds (Table 2).

There was a clear negative association between Noisy Miners and all seven species of small birds (Table 3), particularly the three nectarivorous species (New Holland Honeyeater, Eastern Spinebill and Silvereye). For example, New Holland Honeyeaters were found in 42 % of gardens from which Noisy Miners were absent, but only in 12 % of gardens in which Noisy Miners were present. However, the same negative associations were not apparent for the Common Myna and Pied Currawong.

The negative relationship between small birds and Noisy Miners was unlikely to be because they preferred gardens with different vegetation composition (Table 4). Noisy Miners were found in gardens irrespective of the country of origin of the garden plants, whereas several native species, particularly the Superb Fairy-wren, Eastern Spinebill and Eastern Yellow Robins appeared to have a preference for Australian native gardens.

Table 2. The percentage of gardens, in five sub-regions of Sydney, in which particular bird species were recorded during surveys undertaken in November 2001.

Species	Northern n=200	Southern n=96	Western n=136	Central Coast n=47	Illawarra n=217
Common Myna	64	86	90	64	87
Pied Currawong	84	73	45	66	55
Noisy Miner	90	52	75	81	24
Willie Wagtail	9	36	55	38	47
Silvereye	6	44	31	17	44
New Holland Honeyeater	6	31	12	6	48
Superb Fairy-wren	9	23	43	26	25
Eastern Spinebill	8	3	27	11	41
Red-browed Finch	5	3	26	10	11
Eastern Yellow Robin	0.5	0	16	2	9

Table 3. The percentage of backyards in which small bird species co-occurred with Noisy Miners, compared with their occurrence in backyards from which Noisy Miners were absent.

Species	Noisy Miners Present n=426	Noisy Miners Absent n=297
Willie Wagtail	30	47
Silvereye	18	43
New Holland Honeyeater	12	42
Superb Fairy-wren	20	31
Eastern Spinebill	13	37
Red-browed Finch	9	15
Eastern Yellow Robin	5	9

Table 4. The percentage of backyards in which particular bird species were reported, in relation to the predominant origin of garden plants.

Species	Australian n=240	Mixed n=328	Exotic n=142
Noisy Miner	58	59	62
Willie Wagtail	38	37	33
Silvereye	30	28	25
New Holland Honeyeater	28	25	16
Superb Fairy-wren	29	22	18
Eastern Spinebill	30	21	13
Red-browed Finch	15	11	8
Eastern Yellow Robin	10	5	4

Discussion

This first module of the Birds in Backyards Program demonstrated that volunteers can effectively collect information which will improve our understanding of the ecology of urban wildlife. In the process, their own awareness of ecological issues will be increased and they provide a nucleus around which an even greater audience can learn via the popular media.

This study provided support to earlier research in rural Australian woodland (Dow 1977; Grey *et al.* 1997; 1998; Arnold 2000), and in other Australian cities (Sewell and Catterall 1998; Catterall 2004), indicating that the occurrence of the Noisy Miner is associated with the absence of small birds from habitats that might otherwise be suitable. All the species of small bird considered in this study were less common in gardens with Noisy Miners. The composition of gardens also appeared to be an important predictor of the occurrence of small birds. However, this study did not provide any promise that manipulation of garden composition might be used to manipulate the distribution of the Noisy Miner. Further research on the habitat requirements of Noisy Miners should rank a high research priority.

There was good evidence that this project raised public awareness of the way in which the activities of people influence the distribution of fauna. A large audience must have heard about the project for nearly 900 people to take part, and the large number of hits to the web site confirms this. Furthermore, several local councils asked for a summary of the results, which they included in newsletters to their ratepayers, further increasing awareness. The early response of the major newspapers was disappointing and was likely, in part, to have been related to the fact that survey promotion coincided with the opening of the 2000 Olympic Games. Greater publicity for similar projects could be improved in the future by tailoring the information for local newspapers, which were more likely to cover the story if there was an associated local identity.

As with any project in which volunteer participants are self-selected, the location of surveys could not be considered random. Participation was clustered (Figure 1) in those areas where local papers gave good coverage to the project (e.g., reported telephone and internet addresses correctly). It is also likely that the people who participated were more likely to have an existing interest in wildlife and to have more wildlife-friendly gardens. The absolute reporting rate of small birds is therefore likely to be higher in our sample than would be expected for a random selection of gardens across Sydney. However, these biases do not compromise the questions that we sought to answer, and we believe there are considerable opportunities for community-based research in other modules of the Birds in Backyards program.

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