Refugees and Residents: Densities and Habitat Preferences of Lorikeets in Urban Melbourne

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Summary

Lorikeet densities were measured across four habitat types in urban Melbourne. Musk Glossopsitta concinna and Rainbow Lorikeets Trichoglossus haematodus were shown to preferentially use established streetscapes with predominantly native vegetation. The high densities of Musk Lorikeets recorded possibly reflect a paucity of flowering in Victorian Box–Ironbark forests during the autumn/winter of 2002 and the availability of supplementary nectar resources in the urban environment. Future planting decisions in recently developed streetscapes will dictate the long-term resource potential for lorikeets and other nectarivores in urban Melbourne.

Introduction

Five species of lorikeet occur in Melbourne, Victoria, with the Musk Lorikeet Glossopsitta concinna and Rainbow Lorikeet Trichoglossus haematodus being most common (Emison et al. 1987). Other less common lorikeets occurring in Melbourne are the Little Glossopsitta pusilla, Purple-crowned G. porphyrocephala and Scaly-breasted Lorikeets Trichoglossus chlorolepidotus. The Rainbow Lorikeet is considered to be relatively sedentary (Norris 1995), establishing resident populations in Melbourne since the late 1970s (Veerman 1991, Higgins 1999). The Musk Lorikeet is a highly mobile species (Emison et al. 1987) that tracks eucalypt nectar resources typically across the Box–Ironbark forests and is considered to be an irregular seasonal visitor to Melbourne and surrounds.

The Box–Ironbark forests and woodlands of south-eastern Australia are typified by profuse winter flowering in certain years, attracting high densities of nectarivores, some of which are able to track flowering over large spatial scales. The lorikeets (family Psittacidae) are representative of such species. Flowering of eucalypts within this region can vary significantly both temporally and spatially (Mac Nally & McGoldrick 1997, Wilson & Bennett 1999) and this can have profound effects on regional bird-community dynamics. Nectarivores (such as lorikeets) which rely on winter flowering are likely to be most affected by occasional poor flowering seasons in these forests. This may result in high concentrations of mobile species outside their usual Box–Ironbark habitats. The autumn/winter of 2002 was a relatively poor flowering period in the Box–Ironbark region of Victoria (pers. obs.), resulting in a diminished nectar resource.

Melbourne offers a wide variety of habitats for lorikeets, ranging from patches of remnant indigenous vegetation to highly modified urban streetscapes. This study examines the influence of differing urban habitats on the occurrence and
densities of lorikeets during a period of poor flowering in Victorian Box–Ironbark forests and woodlands (autumn/winter 2002). The study was undertaken as part of a broader study of birds in urban Melbourne.

**Methods**

The location of study sites was concentrated within the eastern and south-eastern suburbs, within a 30 km radius of the Melbourne Central Business District.

Bird censuses were conducted in four broad habitat types:

*Parkland:* Predominantly remnants of indigenous vegetation, including some revegetated areas and planting of non-indigenous natives. These parks ranged in size from 6 to 300 ha and varied in vegetation types, purpose and land-use histories.

*Native Streetscape:* Established residential streetscapes that contained predominantly native Australian (but not necessarily locally indigenous) trees (e.g. Red-flowering Gum *Eucalyptus ficifolia*, Mugga Ironbark *E. sideroxylon* and Spotted Gum *Corymbia maculata*).  

*Exotic Streetscape:* Established residential streetscapes that contained predominantly exotic (non-Australian) trees, including both deciduous and evergreen trees.

*Recently Developed Streetscape:* Recently landscaped residential streetscapes lacking mature trees. These are new housing estates characterised by limited planting, contributing to a simpler habitat structure. Planting in this habitat consisted of both native and exotic vegetation.

Nine replicate sites were established within each habitat type resulting in a total of 36 sites. Transects were 200 m in length and 50 m in width, constituting an area of one hectare. For streetscapes, transect midlines were based on roads or footpaths as appropriate. Each transect was surveyed on foot over a ten-minute period and all lorikeets seen and heard were recorded, including those flying above the canopy. Sites were separated by a distance of at least one kilometre.

Surveys were conducted between 13 March and 4 June 2002. Each transect was surveyed three times, on different days, between dawn and mid afternoon during favourable conditions (days of high wind or rain were avoided). Surveys were conducted by three observers (MJA, JAF, GCP).

The relationship between habitat type and the presence or absence of lorikeet species was analysed using Chi-square analysis. To examine differences in the density of lorikeets between habitat type ANOVA tests were conducted. Significant differences between habitat types were elucidated using the Student Newman-Keuls multiple range test. Rainbow Lorikeet densities were logarithmically transformed to correct for normality.

**Results**

Densities (mean ± 1 standard error) of Musk and Rainbow Lorikeets combined across all habitat types were 1.77 ± 0.54 and 1.67 ± 0.34 birds/ha, respectively.

There was only one Little Lorikeet recorded during the study and therefore it was excluded from the analysis.

There was a significant relationship between habitat type and the presence of Musk Lorikeets ($c^2 = 12.89$, df = 3, $p = 0.005$), with the species being recorded in most parks and native streetscapes. The Musk Lorikeet was absent from the majority of exotic and recently developed streetscapes (Figure 1a). There was also a significant relationship between habitat type and the presence of Rainbow Lorikeets ($c^2 = 10.52$, df = 3, $p = 0.015$), with the species being recorded in most parks and native streetscapes. Unlike Musk Lorikeets, Rainbow Lorikeets were also recorded in most exotic streetscapes (Figure 1b).
Figure 1. The presence or absence of lorikeets from the different urban habitats: (a) Musk Lorikeet, (b) Rainbow Lorikeet. Shaded bars represent sites with the species present, black bars represent sites with the species absent.
There was a significant difference in the density of Musk Lorikeets between different habitats (F = 7.60, df = 3,32, p = 0.001). Musk Lorikeets were found at significantly higher densities in native streetscapes (average 4.85 birds/ha to a maximum of 13 birds/ha) than other urban habitats (SNK <0.05) (Figure 2).

There was a significant difference in the density of Rainbow Lorikeets between the different urban habitats (F = 3.97, df = 3,32, p = 0.016), with the largest difference being between the high-density populations in native streetscapes (average of 2.78 birds/ha to a maximum of 8 birds/ha) and almost a complete absence in recently developed streetscapes (SNK <0.05) (Figure 2).

Discussion

Results indicated a strong and consistent preference for established native streetscapes in the urban environment by Musk Lorikeets and a slightly weaker preference by Rainbow Lorikeets.

Permanent populations of Rainbow Lorikeets in a number of urban Australian environments suggest that the urban environment is meeting their year-round resource requirements. Of the six recorded densities presented in Higgins (1999), densities ranged from 0.06 to 4.88 birds/ha, whereas, more recently, Jones &
Wieneke (2000) recorded densities as high as 8.11 birds/ha in urban Townsville, Qld. The densities of Rainbow Lorikeets in native streetscapes in this study (2.8 birds/ha) are comparable with those obtained in previous studies.

Musk Lorikeets are highly mobile and adapted to tracking regionally patchy floral resources. Despite being a relatively common and easily observed species, there is a paucity of published information relating to Musk Lorikeet densities (Higgins 1999). Kavanagh et al. (1985) recorded densities of up to 0.2 birds/ha/h in unlogged forest near Eden, N.S.W. Densities of Musk Lorikeets in this study (4.9 birds/ha in native streetscapes) are similar to those reported by McGoldrick & Mac Nally (1998) during flocking associated with heavy flowering in Box–Ironbark forests (280+ birds/50 ha [5.6+ birds/ha]). Oliver et al. (1999) reported 2.78 birds/ha for 93 sites west of Armidale, N.S.W.

The densities of Musk lorikeets recorded in this study appear to be considerably higher than those previously observed in Melbourne (pers. obs.). This apparent influx of Musk Lorikeets into Melbourne coincides with an extremely poor flowering season in Victoria’s Box–Ironbark region. This may suggest that the native streetscapes of Melbourne are providing an alternative high-quality resource during a period of poor flowering in their core Box–Ironbark range.

We propose that the selection of streets with native planting over other habitats in this study, particularly by Musk Lorikeets, may, in part, be attributed to the following factors:

1. The majority of Melbourne’s indigenous eucalypts are not generally recognised as profuse winter producers of nectar.

2. Nectar-yielding street trees are subject to more favourable and consistent environmental conditions. These include increased nutrient inputs, supplementary watering, potentially less competition from other trees, and general tending and maintenance of tree condition.

3. Many native street trees are often not indigenous and are selected for flowering aesthetics, duration and consistency. In many instances these have been planted with the specific objective of attracting native birds.

4. Streetscapes potentially have a higher diversity of nectar-producing trees than remnants of indigenous vegetation in urban Melbourne, resulting in a greater diversity and duration of flowering events.

Most of these attributes were not present in the exotic streetscapes, which generally consisted of exotic trees that did not offer the same nectar resource. Recently developed streetscapes lacked mature vegetation and therefore lacked the structure present in the other habitats.

It is interesting to note that only one Little Lorikeet was recorded during this study. Given that it has a similar nomadic life history and distribution within Victoria as the Musk Lorikeet, one would have expected that greater numbers would have been recorded.

The nationally endangered Swift Parrot Lathamus discolor (Garnett & Crowley 2000) has also been observed exploiting nectar resources provided by non-indigenous eucalypts in urban Melbourne in the autumn/winter of 2002, although not observed in this study. At times high numbers were observed feeding in native street trees (C. Tzaros pers. comm.).
Future planting decisions in recently developed streetscapes will dictate the long-term resource potential for lorikeets and other nectarivores in urban environments. Observations of recently developed streetscapes in this study indicate a bleak future for many nectarivores in these areas, as the majority of plantings are of an exotic nature.

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References


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