

Variation in Bird Diversity with Habitat Quality in Hobart, Tasmania



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Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any tertiary institution, and to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

Signed



Megan Heileman BA.

Photograph on cover page: Green Rosella foraging on Banksia, University of Tasmania campus, Sandy Bay.

–Megan Heileman

Abstract

As urban areas expand throughout the world, they have a number of negative impacts on native wildlife. Birds are a useful indicator group for measuring such impacts. This study aims to assess urban impacts on birds, assessing bird diversity, abundance and species composition across a range of urban environments, from the city centre to native vegetation remnants. Particular emphasis is placed on the potential conservation value of urban parks and native vegetation remnants, and on habitat quality factors determining variation in native bird diversity, including measures of vegetation, invertebrates and human disturbance levels. It is hypothesized that native bird diversity and abundance will decrease with decreasing habitat quality.

Birds were surveyed six times over nine weeks in summer and autumn, 2007, in Hobart, Tasmania, using the rolling point count method. Surveys took place at five urban sites including Hobart city centre, a residential area (Sandy Bay), three native vegetation remnants (Queen's Domain, Bicentennial Park and Knocklofty Reserve). Data was also collected on plant species, vegetation structure, invertebrate species on plants and human disturbance including percent cover of built environment, vehicle traffic, pedestrian traffic and noise levels at the point counts. Statistical methods used included bar charts of species richness and abundance, ordinations of species, species classifications, one tailed t-tests and correlation analysis between habitat variables and bird species richness. PC Ord 4 was used for ordinations, Minitab for the correlation analysis and Excel for all other analyses.

Results of this study show that native bird species richness and abundance is significantly higher in the native vegetation remnant sites than in the urban sites, urban parks have more native species than surrounding streets and the city centre has fewer native bird species than the residential site. Abundance was highest at Knocklofty, followed by the two urban sites but the majority of the urban abundance composed of introduced species. Bird species composition was similar in the native sites and in the urban sites but native and urban sites were very different from each other. The same was found to be true in the case of plants. Also, native birds correlated positively with native plants, vegetation cover and complexity. Likewise, introduced birds correlated positively with introduced plants. Bird behavioural interactions were found to reinforce these trends. Invertebrate species richness and abundance was not significantly different at urban sites than at native sites. Invertebrate species composition did vary, however,

loosely on the basis of site and plant species they were found on. This and seasonal variation in abundance of invertebrates could have important implications for birds. Human disturbance variables were significantly negatively correlated with most native bird species, and positively correlated with introduced species. Season also played a role in variations in native bird species richness and abundance, as many species favoured summer, particularly summer migrants, and a few favoured autumn or were season neutral.

The results of this and other studies suggest that the maintenance of native vegetation remnants is essential to maintaining a high native bird species richness and abundance, but that urban parks and gardens improve landscape connectivity and can act as supplementary resources for native birds, especially during winter. Also, both habitat quantity and quality are important for the long term sustenance of diverse native bird communities in an urban setting.

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