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# Australian Wildlife Society

## University of NSW Wildlife Ecology Research Scholarship

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The Australian Wildlife Society Wildlife Ecology Research Scholarship is open to postgraduate research students from any university in Australia undertaking a research project at University of New South Wales that is of direct relevance to the conservation of Australian native wildlife (flora or fauna).

The scholarship totals \$5,000 and is awarded to one candidate, who receives one payment of \$2,500 each semester. The scholarship is provided to support operational costs associated with the successful candidate's research project, such as:

- Travel associated with the research project
- Fieldwork expenses
- Specialist software
- Small items of equipment (i.e. less than \$5,000)

**The recipient of the 2017 scholarship was Corey Callaghan for his project on the impact cities in the Blue Mountains World Heritage area has on bird-life.**

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## What impact do cities in the Blue Mountains World Heritage Area have on bird-life?

**Corey Callaghan**

### Introduction

The Greater Blue Mountains World Heritage Area (GBWHA) is an area of 10,000 km<sup>2</sup> which lies about 180 kilometres from Sydney, New South Wales. It consists mostly of wilderness dominated by temperate forest including over 100 species of eucalypt. The area was listed as a world heritage area due to its rich natural and cultural values. In addition, 265 birds have been recorded within the GBWHA. Nestled within the middle of the GBWHA is an urbanised strip consisting of a small number of cities.

As we are all well aware, our birds are constantly facing a number of threats, such as habitat loss and climate change. Coupled with both of these are the impacts that a continually increasing urban population have on birds. For example, by 2030 60 percent of the human population is predicted to live in cities and one in three people will live in cities with a population greater than one million people.

So far, the impacts of urbanisation on birds have been fairly well-studied, both internationally and in Australia. For instance, we know that in general the species richness – that is, the number of species of birds – decreases with increasing urbanisation. We also know that (1) bird abundance and density increase with increasing urbanisation,



Some non-native species such as house sparrow and rock pigeon appear to be generally restricted to the most urban points, while others such as Eurasian blackbird are found more generally.

(2) cities are often dominated by larger-bodied birds, and (3) non-native birds are more dominant within cities as opposed to more natural areas. Although these patterns have been relatively well-tested, these studies have taken place in large, global cities such as Sydney, San Francisco or Berlin. Ultimately, few studies have tried to investigate these results within small-scale cities.

The aims of my project are to assess the aforementioned patterns within smaller cities (populations ranging from about 2,000 to 8,000), which reside within the

GBWHA. I aim to identify patterns of bird composition, abundance, density, and traits across four small-scale urbanisation gradients.

### Methods of the study

Thanks to a grant awarded by the Australian Wildlife Society, a small team of volunteers have been conducting bird surveys since August 2017. There are four transects, one each in Katoomba, Woodford, Hazelbrook and Lawson. Woodford, Hazelbrook and Lawson each have five dedicated survey points that are surveyed on each visit, while Katoomba

has nine dedicated survey points. The points, separated by about 500 metres, lie along a generally straight transect which is aimed to cut across both the most urbanised area of the city and also transverse a portion of the bush. There have been two visits per month to survey all of the transects and associated points. Five-minute point counts are conducted, where the observer records all birds seen and/or heard.

### Preliminary Results

Thus far, we have conducted surveys on ten days for a total of 240 point-counts. A total of 86 species have been recorded on the surveys, with the most common being eastern spinebill, red wattlebird, pied currawong, yellow-faced honeyeater, and crimson rosella; recorded on 75 percent, 64 percent, 49 percent, 48 percent and 45 percent of surveys, respectively. Sixteen species have only been recorded once while six have been recorded twice. We have also preliminarily observed an increase in the number of bird species with decreasing urbanisation. Some non-native species such as rock pigeon and house pigeon appear to be generally restricted to the most urban points, while others such as Eurasian blackbird are recorded more generally.

### Next Steps

The next steps for the project include investigating species-specific trends to urbanisation to see which species are more commonly found in the urban area versus the bush area. Currently, some species appear to be restricted



A map of the four transects, located within the Greater Blue Mountains World Heritage Area, which have points aligned across them 500 metres apart. Transects are located in Katoomba, Lawson, Hazelbrook and Woodford.



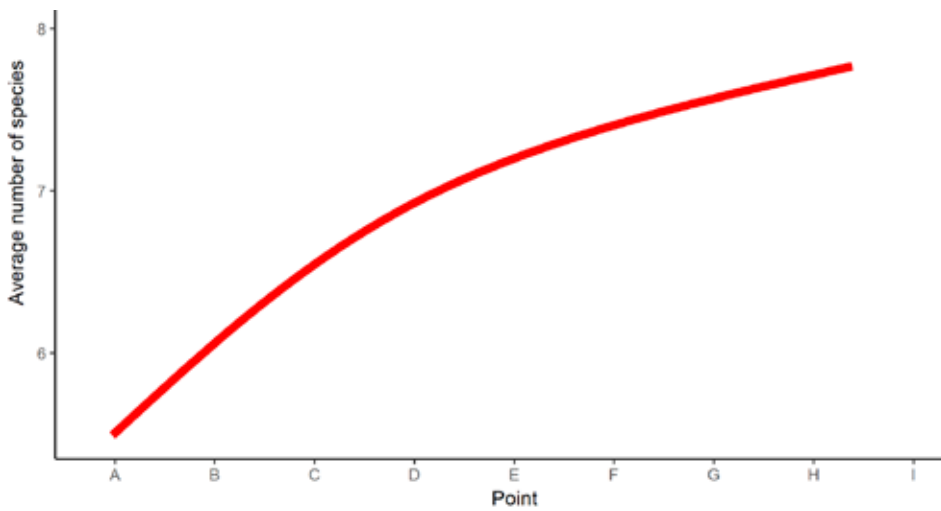
Some species, such as varied sittella, have only been recorded once!



Rock pigeon



Rainbow lorikeet



A theoretical plot of the average species richness observed at each point, based on actual preliminary data. So far, we have observed a general increase in species richness as we move from Point A (nearest the most urban part of each city) to Point I (furthest from the most urban part of each city).



Grey fantail is frequently recorded in the bush but infrequently recorded in the urban areas, contrasting with rainbow lorikeet, which is generally only recorded in the more urban areas.



Red wattlebird has been the second most commonly recorded species so far, recorded on 64 percent of point-counts.

to the bush, such as grey fantail and white-throated tree creeper, while other native species are generally only recorded in urban areas, such as rainbow lorikeet and sulphur-crested cockatoo, and yet others are found commonly in both, such as crimson rosella and eastern spinebill. We will also continue to conduct the surveys until at least August 2018, completing a full year of surveys, at which point a full analysis will be conducted and our aforementioned hypotheses will be tested. At the conclusion of our study, our results will be shared with various land managers and conservation groups to inform them of the impacts that urbanisation is having on bird-life in the Blue Mountains region.



### About me

*I grew up in rural Western New York State (near Niagara Falls!). Since I was a small kid, I've had a strong passion for the outdoors, but when I was a freshman in college, I became mildly obsessed with birds. This obsession quickly translated into a passion for research relating to birds. I received my B.Sc. in Environmental Science from Canisius College in Buffalo, NY and then completed a Masters in Environmental Science at Florida Atlantic University in Boca Raton, FL. I started my PhD at UNSW Sydney in August 2016. This project is one facet of my overall PhD project which is focused on identifying urban ecological patterns in birds, relying largely on citizen science data. My supervisors include Professor Richard Kingsford at UNSW Sydney, Dr John Martin from the Royal Botanic Gardens, and Dr Richard Major from the Australian Museum. In my free time, one can usually find me camping/ birding with my wife Diane and our dog Vader.*