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Holly Maree Parsons
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**THE EFFECT OF URBANISATION ON
THE SUPERB FAIRY-WREN
(*Malurus cyaneus*)**

**A thesis submitted in partial fulfilment of the
requirements for the award of the degree**

DOCTOR OF PHILOSOPHY

From

UNIVERSITY OF WOLLONGONG

By

**HOLLY MAREE PARSONS
BACHELOR OF ADVANCED SCIENCE
(BIOLOGY: HONS)**

**SCHOOL OF BIOLOGICAL SCIENCES
2009**

THESIS CERTIFICATION

I, Holly M. Parsons, declare that this thesis, submitted in partial fulfilment of the requirements for the award of Doctor of Philosophy, in the School of Biological Sciences, University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualification at any other academic institution.

Holly M. Parsons

Date

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ABSTRACT

The process of urbanisation is altering much of the world's natural habitats, resulting in landscapes vastly different from those they replace. However, the urban matrix is not devoid of wildlife. In fact, its capacity to support a wide diversity of fauna is becoming increasingly valued. Urbanisation changes the patterns of resources and habitat structure, creating mosaics of optimal and sub-optimal patches. Therefore we would expect to see changes in the behaviour and ecology of species living in urban habitats.

The superb fairy-wren (*Malurus cyaneus*) is a small insectivorous bird species whose response to urbanisation is unclear. It has been shown to prefer the edges of remnant habitat, particularly in weed-infested areas, yet is patchy in its distribution in urban landscapes, and thought to be in decline there. In this thesis I have examined how (a) vegetation characteristics, (b) territory size, (c) behaviour, including foraging and (d) food availability differ by living in urban habitats compared to rural/remnant habitats.

Superb fairy-wrens showed a preference for suburban landscapes with shrubs, usually native, and avoided suburban locations without them. In both rural/remnant edge habitat and suburban habitat they were also associated with the introduced weed lantana (*Lantana camara*). It is likely that this shrub provides important shelter, especially in the absence of native vegetation that provides equivalent structure.

Radio-tracking of female superb fairy-wrens revealed that territories in suburban locations were, on average, half the size of territories in rural/remnant habitats when calculated using the minimum convex polygon method. Calculations made with the fixed kernel method indicated that there was no difference in territory size. This difference in size calculated by different methods suggests that superb fairy-

wrens utilise more of the vegetation within suburban territories and avoid larger areas of unsuitable habitat in rural/remnant edge locations. The sizes of both the suburban and rural/remnant habitats were similar to that in higher quality fragmented habitats, as calculated by previous studies.

Regardless of the location of their territories, superb fairy-wrens foraged largely on the ground but spent the most of their time, on average, in shrubs. Males spent significantly longer foraging in suburban locations than rural/remnant habitat, with females showing the same, but non-significant trend. This increase in foraging time was not taken at the expense of other behaviours however and appeared to be due to the size of food items in suburban territories. The biomass of individual arthropods was smaller in suburban locations than rural/remnant territories but the total biomass per site was the same, largely due to the greater abundance of orthopterans in rural/remnant areas. This suggests that superb fairy-wrens foraged for longer in suburban territories to obtain equivalent intake to that in rural/remnant territories. Suburban areas without superb fairy-wrens did not have a lower biomass of arthropods than suburban fairy-wren territories and therefore it is unlikely that birds in suburban habitats were selecting their territories based on food availability.

Superb fairy-wrens instead appear restricted in their distribution in urban habitats due to a shortage of suitable vegetation, primarily comprised of the shrub layer. While there were changes to food resources, the flexible behaviour of this species with urbanisation allows it to modify its foraging behaviour to compensate for this difference. We do not know the long term consequences faced by individuals occupying the urban landscape, but it appears that that these two habitats, with varying degrees of urban impact, provide suitable habitat for this species to persist.

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