

NOTE

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**Synanthropy of the Australian magpie:
a comparison of populations in rural
and suburban areas of southeast
Queensland, Australia**

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Abstract

The urbanised environment provides ecologists with unique situations in which to undertake ecological study. It has been said that urbanisation is like a natural experiment; we often have populations of animals that have gone from living in natural or semi-natural environments to living in a highly modified anthropogenic environment. These situations provide ideal settings to study the ecological and behavioural differences that may develop in populations located in different habitats.

Urbanisation typically results in a minority of species dominating the fauna, and this thesis aimed to examine one such species, the Australian magpie. Despite the magpie being a common and well-liked suburban bird, the majority of previous research on this species has been undertaken within rural or exurban locations. This thesis aimed to examine what actually happens to the species when it lives in the suburban environment. In particular I focused on specific behavioural and ecological features, to see if there were any particular adaptations the suburban magpies showed and also if the suburban habitats provide certain resources favourable to the magpies and what ecological effects these may have.

Comparisons of the territory structure and resources of rural and suburban magpies showed that although many features of the territory are similar between rural and suburban locations, notably the choice of native nest trees, magpie territories within suburban areas were smaller and contained more anthropogenic features. The reduced territory size may possibly be related to a greater abundance of key food resources also evident within suburban areas.

Cover image: John Gould (1804-81) *The birds of Australia 1840-48*. Artists: J. Gould and E. Gould; Lithographer: E. Gould

Furthermore, suburban magpies are more successful in their foraging attempts, again possibly reflecting a more abundant food supply in suburbia and also the simplified nature of suburban foraging areas might facilitate more successful foraging. The increased foraging success is likely to explain the greater provisioning rate to nestling suburban magpies.

Suburban magpies also utilised human provided foods. I quantified the extent of wildlife feeding within many of the suburban study sites of this thesis (through the use of questionnaire surveys). In each of the locations it was evident that at least one person (usually more) was providing a regular supply of food to wildlife and magpies appeared to be the main recipients of this food. Previous ecological studies suggest the provision of extra food to avian populations is likely to affect the breeding ecology, and this was so for magpies. The suburban populations initiated breeding significantly earlier than rural magpies. To test the influence of food, supplementary food was provided to rural magpies, not currently receiving any additional human provided foods. The fed rural magpies initiated breeding before control rural magpies (i.e. not receiving any additional food) but suburban magpies still initiated breeding before all other groups. This suggests additional factors present within suburbia, such as warmer temperatures, may also control the timing of breeding in magpies.

Magpies in rural and suburban locations lived within different vertebrate communities. Within suburban magpie territories a greater number of intrusions were made by domestic animals, notably dogs (*Canis lupus*) and cats (*Felis domesticus*). The frequency of raptors entering the territorial areas occupied by magpies appears to suggest such events are more common in rural areas. The number of humans entering magpie territories was obviously greater in the more populated suburban areas and the majority of magpies responded neutrally to humans. However a group of magpies that previously exhibited extreme aggression towards humans were found to have a greater frequency of aggressive interactions with potential predatory intruders, which were primarily humans. Subsequent examination of the level of corticosterone from this aggressive group of magpies found that a high level of aggressive interactions with potential predators and humans is reflected in higher

level of corticosterone, which may have implications for further behavioural and even physiological changes.

An ability to habituate to human in urbanised areas is a key attribute of successful synanthropic species. Comparisons of magpies disturbance distances at different points along the urban gradient (the gradient that runs from the urbanised city to natural wildlands) found suburban magpies only responded to humans when they had approached to a close distance (often less than one metre) and many simply walked away to avoid the approaching human. Rural and exurban magpies responded to humans at greater distances than suburban magpies. The distance at which they responded to the human was usually 100 meters plus, and these magpies always flew away. A continuation of this investigation over a temporal scale again found the large difference in response to humans, with suburban magpies exhibiting a decreased response towards humans. However, a certain proportion of responses from suburban magpies were also aggressive. The examination of disturbance distance over the breeding season found that in suburban magpies the responses of most disturbance distance variables remained similar between breeding stages. Rural magpies, however, exhibited variation in their responses towards humans depending on the stage of breeding. It is suggested that the response of rural magpies may be a typical fear response towards an unusual potential threat

The studies presented in this thesis show that magpies have the behavioural capacity to take advantage of resources in suburban landscapes that are not available or are in lesser supply in rural landscapes, it is these abilities that facilitate the magpies synanthropy.

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DECLARATION

This work has not been previously submitted for a degree or diploma at this or any other university. To the best of my knowledge and understanding, this thesis contains no material published or written by another person except as acknowledged in the text within.

Daniel Rollinson