

# Environmental Futures Centre

## Forecasting and managing biodiversity change: birds in an urbanising landscape

*Carla Catterall*

Brisbane lies at the centre of one of Australia's biodiversity "hotspots", supporting a notably high concentration of species. For example, about half Australia's birds occur in Brisbane. However, Brisbane also lies at the centre of Australia's fastest growing regions in terms of human population size. The combination of these two factors poses unprecedented challenges for the city and its surrounding region. Will rampant urbanisation spell doom for this rich natural heritage or can patterns of human settlement and land use be managed in a way that enables the diversity of birdlife and its associated ecosystems to persist alongside the city's human occupants? A research team led by Carla Catterall assesses recent changes in Brisbane's birds (1990's to mid 2000's) and useful indicators for assessing the quality of their habitats.

### ***Development and Change***

Development in urbanising areas involves landscape transformations. Urbanisation often goes hand in hand with deforestation and loss of wildlife habitats, as native vegetation is cleared for housing developments. On the other hand, when developments are placed in areas previously cleared for pasture or cropland, garden plantings may offer an increased diversity of habitats for wildlife. Watering of gardens or providing food may increase the supply of resources for some species.

Urbanising regions are large-scale mosaics in which residential areas are interspersed with business and industrial domains, grassy parkland or pasture areas, and remnant native forest of different types. These differing elements

of the mosaic support different combinations of species. By studying the combinations of bird species that occur in the different habitat elements that make up the urban mosaic, we can get an idea of what could happen to bird diversity if we remove some elements (such as remnant bushland) or create others.

### ***The Suburbs***

Brisbane's suburbs have a much more diverse and interesting mix of bird species than would be expected from studies of urbanisation conducted in the northern hemisphere. From 38 suburban sites that were surveyed in both the early 1990s and the mid 2000s, 62 native and 7 introduced bird species were recorded.



In both time-periods, most suburban species were native and most were of larger body size compared with the common birds of bushland.

The data reveal that there is no trend for decreasing total bird diversity in the suburbs over time. Rather, the net trend was for increases in a range of species. Suburb sites also became more homogeneous, being increasingly dominated by a particular suite of large native birds, including rainbow lorikeets, noisy miners, crested pigeons, and Torresian crows.

Some of the species whose numbers increased over time are known to be aggressive competitors for key resources or predators on the nests of other birds. This is expected to eventually cause a decrease in the numbers or diversity of smaller birds.

### ***The Bush***

Within the larger patches of forest (bushland), the study revealed a high total diversity of native bird species: 77 native and no introduced bird species were recorded from 29 sites in large eucalypt forest tracts.

While a few species were common in both forest and suburbs, there were large and consistent differences in community composition between forest and suburbs in both time-periods. Bushland sites had a distinctive set of bird species, most

of which were uncommon in the suburbs. Bushland sites were also less similar to one another than was the case for suburban sites.

Small patches of bushland down to around 10 hectares in area retain most of the bushland-dependent bird species that occur in large forests. Below a threshold size of around 5 hectares, the bird species in these patches become similar to that in well-vegetated suburbs and are dominated by large-bodied native species including the highly-aggressive noisy miner.

### ***Brisbane's Biodiversity Challenge***

Given the trends revealed by this study, together with current scientific knowledge of ecological principles, it is clear that Brisbane's bird diversity is far from secure. This work has shown that well-planted suburbs can support a diverse (although novel) bird community, especially if there are dense plantings of trees and shrubs rather than lawns. However this is no substitute for forest biodiversity. Urban designs to sustain the city's bushland-dependant bird diversity need to also incorporate sufficient total area of native bushland, in patches above 10 hectares in area.

For more information please contact [c.catterall@griffith.edu.au](mailto:c.catterall@griffith.edu.au)

