BIRDS IN THE 'BURBS'

Improving habitat for native birds in residential areas

Today, more than half of the world's human population live in cities; a trend expected to increase in the coming decades. Continued population growth and urban development transform the environment to make way for more houses, shops and roads. How does this environmental change affect the birds that share our suburbs? Why do some birds cope better than others? And what can we do to better support the more sensitive species?

LA TROBE UNIVERSITY

RESEARCH CENTRE FOR FUTURE LANDSCAPES

Who lives in your neighbourhood?

Urban areas can support a wide range of native plants and animals, including some threatened species. This is especially true for birds which are often widespread and abundant in cities and towns. However, it's clear that some neighbourhoods provide better habitat for birds than others. Some species have adapted well to life in the suburbs, while others struggle to persist.

This brochure summarises the impacts of urbanisation on bird communities in Melbourne, Australia, and outlines actions we can take to improve habitat for native birds. Let's start by identifying the birds that regularly occur in your garden to see how your neighbourhood compares with other suburbs of Melbourne!

'Common' birds of urban Melbourne

Each worth **1** *point*

✔ **Australian Magpie**
Cracticus tibicen

○ **Noisy Miner**
Manorina melanocephala

○ **Red Wattlebird**
Anthochaera carunculata

○ **Rainbow Lorikeet**
Trichoglossus moluccanus

○ **Little Raven**
Corvus mellori

○ **Pied Currawong**
Strepera graculina

'Uncommon' birds of urban Melbourne

Each worth **2** *points*

○ x2 **Spotted Pardalote**
Pardalotus punctatus

○ x2 **Brown Thornbill**
Acanthiza pusilla

○ x2 **Australian King Parrot**
Alisterus scapularis

○ x2 **Laughing Kookaburra**
Dacelo novaeguineae

○ x2 **Eastern Spinebill**
Acanthorynchus tenuirostris

○ x2 **Crimson Rosella**
Platycercus elegans

'Rare' birds of urban Melbourne

Each worth **3** *points*

○ x3 **Mistletoebird**
Dicaeum hirundinaceum

○ x3 **Eastern Yellow Robin**
Eopsaltria australis

○ x3 **Silvereye**
Zosterops lateralis

○ x3 **Superb Fairywren**
Malurus cyaneus

○ x3 **Golden Whistler**
Pachycephala pectoralis

○ x3 **Fan-tailed Cuckoo**
Cacomantis flabelliformis

<8 points
Standard surburbia

8–18 points
Fledgling habitat

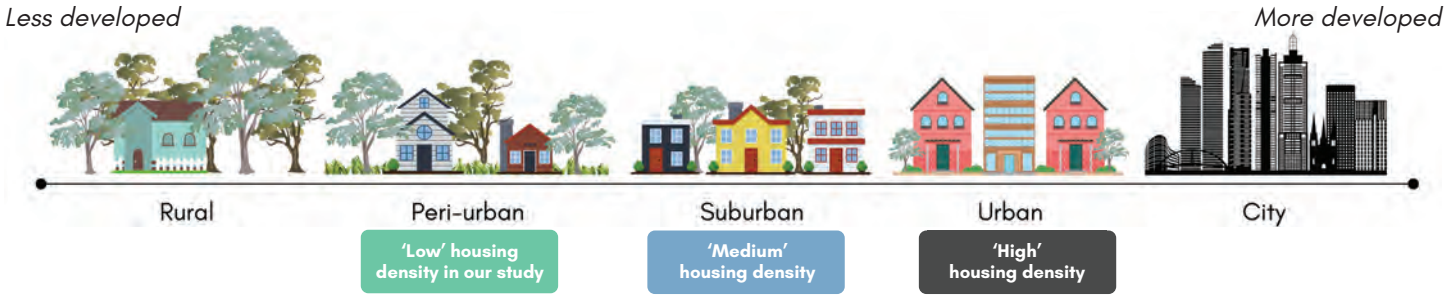
>18 points
Birding bliss!

How does urbanisation impact birds?

Urbanisation transforms environments across large areas, often resulting in the loss of suitable habitat and resources for many species of native wildlife. Such transformation strongly influences the distribution and abundance of individual bird species, and the diversity and composition of bird communities.

In cities across the world, bird communities change as one moves from forested or rural areas to suburban neighbourhoods, to the inner city. Differences are also observed between the types of birds commonly seen in residential streets, urban parklands and patches of native bushland.

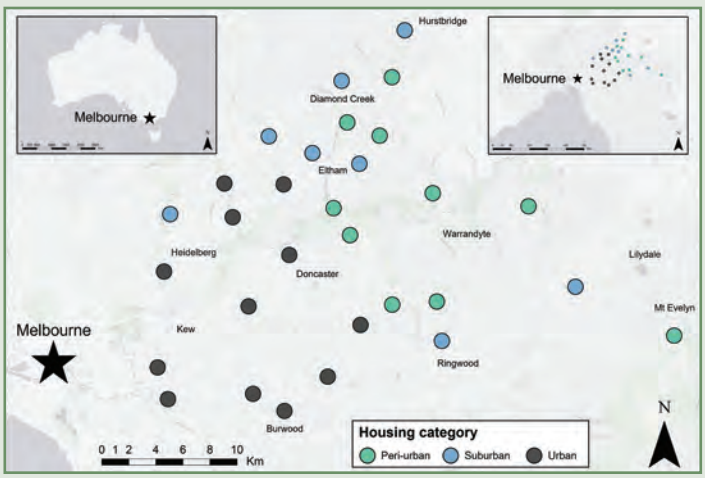
For birds to survive in urban environments, they must not only adapt to altered habitats, but also navigate a range of threats and disturbances originating from humans such as increased housing density, vehicle traffic, domestic cats, noise pollution and artificial light at night.



Investigating bird communities in Melbourne

We carried out a study in urban Melbourne, Australia, on the unceded lands of the Wurundjeri People of the Kulin Nations. We aimed to investigate how birds respond to urbanisation, particularly to changes in housing cover and canopy tree cover across residential neighbourhoods. We selected 30 'suburbs' (urban landscapes each 1 km^2 in size) ranging from 9–39% housing cover and 13–63% tree cover, in north-eastern Melbourne (see map).

In each suburb, birds were surveyed at 10 'sites' located in residential streets, urban parklands, along creeks and streams, and in native bushland (see example suburb). Each site was surveyed five times, spread across the breeding and non-breeding seasons of 2018 and 2019, for a total of 1500 surveys.



Bird communities change through time

The birds that share our suburbs change over time. These changes may occur seasonally: for example, birds like the Eastern Spinebill and Gang-gang Cockatoo visit Melbourne in the cooler months, and then return to the forested ranges over summer. Other changes occur more gradually over decades. Since the 1840s, large areas of native bushland have been cleared across Melbourne, resulting in the decline or loss of many woodland and forest species ('bush birds'). Some birds have persisted in urban areas, aided by the planting of native eucalypts and flowering shrubs in residential streets and gardens. These plants benefit nectar-feeding species, such as the Little Wattlebird, Rainbow Lorikeet and Noisy Miner, which have expanded in range and number. Other species have moved into urban areas from drier, more inland environments such as the Little and Long-billed Corella, Galah and Crested Pigeon. Bird communities will change further in the future as our cities continue to grow.

How do different bird species respond?

Birds require a range of resources to survive in urban areas including food, water, shelter and nesting sites. Some species have specific needs that are not met in urban areas and so they are scarce or absent. These birds are termed Urban Avoiders. Others are flexible in their requirements and can adapt to urban environments: termed Urban Adapters. A select few species thrive in cities and become common and abundant: these are termed Urban Exploiters, and often include introduced species. We investigated how birds classified as Avoiders, Adapters and Exploiters respond to changes in housing cover and canopy tree cover across suburbs of Melbourne.

Attributes of a suburb

Housing cover

Tree cover

Key

- Negative response
- Strong negative response
- Positive response
- Strong positive response

AVOIDERS

ADAPTERS

EXPLOITERS

We found **AVOIDERS** were most likely to occur in suburbs with high tree cover and low housing density. Examples include the Fan-tailed Cuckoo, Yellow-faced Honeyeater and Silvereye.

We found **ADAPTERS** were likely to decline with greater urban development. Examples include the Eastern Rosella, Laughing Kookaburra and Sulphur-crested Cockatoo.

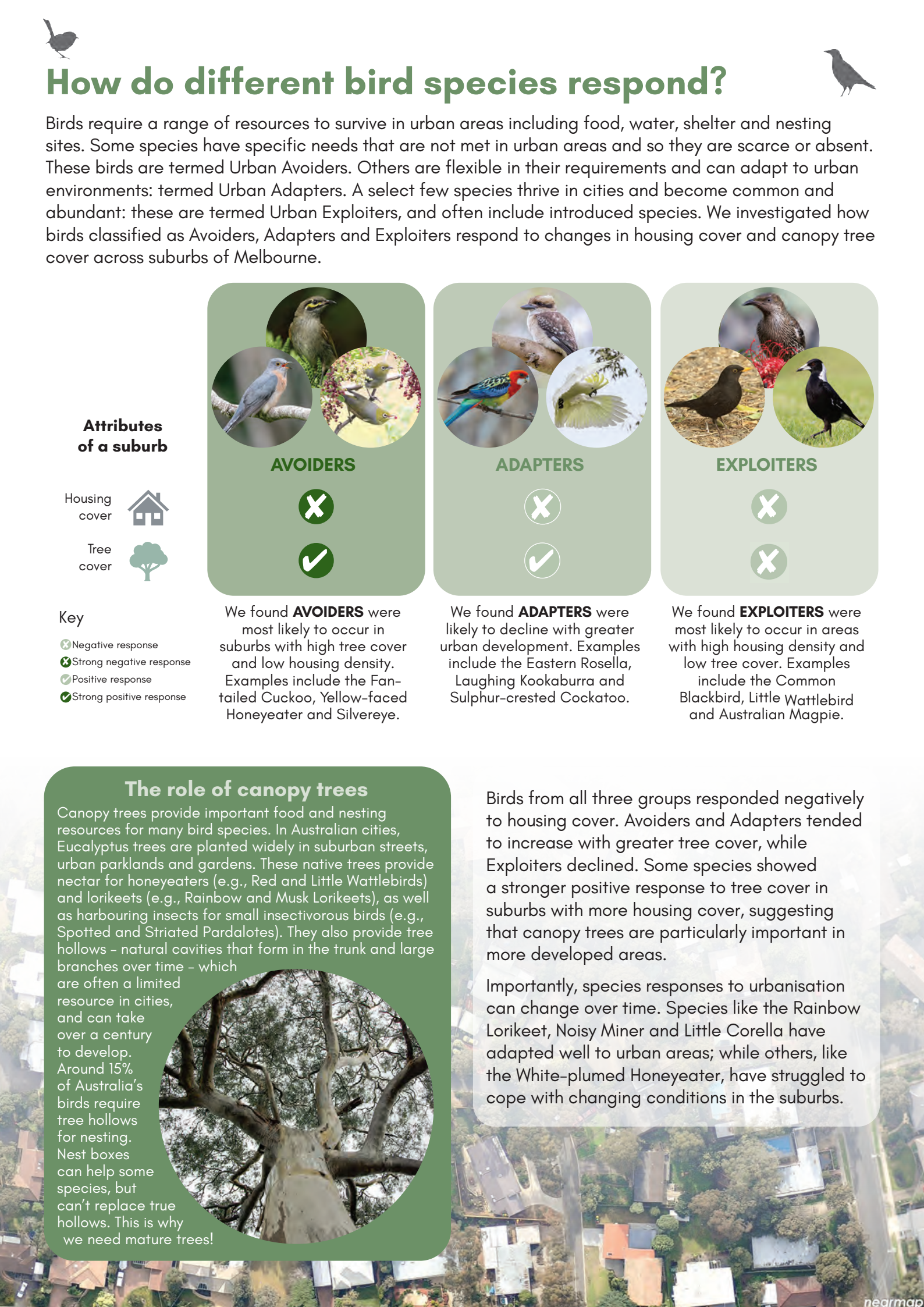
We found **EXPLOITERS** were most likely to occur in areas with high housing density and low tree cover. Examples include the Common Blackbird, Little Wattlebird and Australian Magpie.

The role of canopy trees

Canopy trees provide important food and nesting resources for many bird species. In Australian cities, Eucalyptus trees are planted widely in suburban streets, urban parklands and gardens. These native trees provide nectar for honeyeaters (e.g., Red and Little Wattlebirds) and lorikeets (e.g., Rainbow and Musk Lorikeets), as well as harbouring insects for small insectivorous birds (e.g., Spotted and Striated Pardalotes). They also provide tree hollows – natural cavities that form in the trunk and large branches over time – which are often a limited resource in cities, and can take over a century to develop. Around 15% of Australia's birds require tree hollows for nesting. Nest boxes can help some species, but can't replace true hollows. This is why we need mature trees!

Birds from all three groups responded negatively to housing cover. Avoiders and Adapters tended to increase with greater tree cover, while Exploiters declined. Some species showed a stronger positive response to tree cover in suburbs with more housing cover, suggesting that canopy trees are particularly important in more developed areas.

Importantly, species responses to urbanisation can change over time. Species like the Rainbow Lorikeet, Noisy Miner and Little Corella have adapted well to urban areas; while others, like the White-plumed Honeyeater, have struggled to cope with changing conditions in the suburbs.



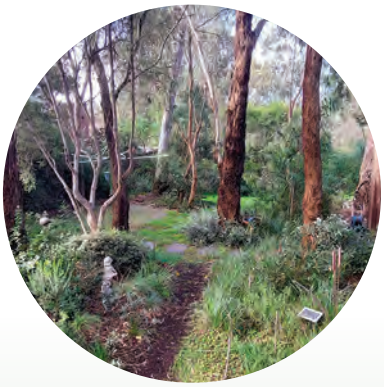
What makes a site suitable for bush birds?

Birds that depend on native vegetation ('bush birds') are particularly vulnerable to urbanisation because the patches of habitat that remain in cities are often small, isolated and degraded. As a result, bush birds are rare in most urban environments. We investigated which habitat features of residential streets, urban parklands, streamsides and native bushland were most important for species of bush birds. This included the abundance of the aggressive Noisy Miner (*Manorina melanocephala*).

Habitat features	Bush birds		Noisy Miners
Tree cover	✓		✓
Large mature gum trees			✓
Mid-storey cover	✓		
Shrub cover	✓	vs.	✗
Prop. of exotic trees	✗		✗
Prop. of exotic shrubs			✓
Noisy miner abundance	✗		

Noisy Miners are a big problem! They were recorded in all 30 suburbs, at 279 of the 300 sites. Where Noisy Miners were common, such as in residential streets and open parklands, bush birds were scarce.

The best way to improve habitat for bush birds (without benefitting the Noisy Miner) is to increase native mid-storey and shrubs, and reduce Noisy Miner numbers.



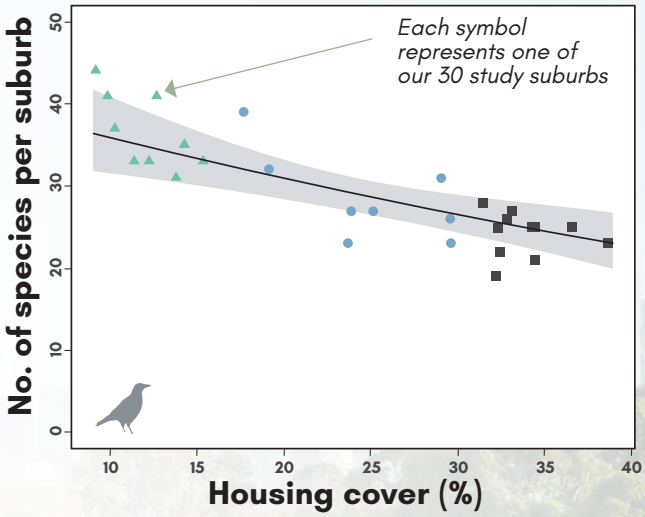
Sites located in different land-use types provide different resources for bush birds. **Native vegetation sites** were the most suitable: on average, they supported 53% of bush bird species recorded in that suburb. This was followed by **streamside areas** (40%), **residential streets** (35%), and **urban parklands** (25%).

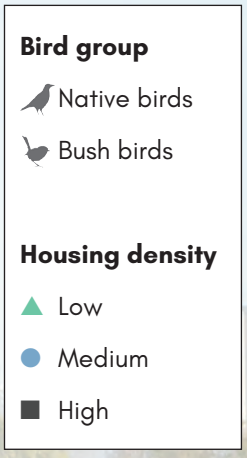
The ultimate neighbourhood bully

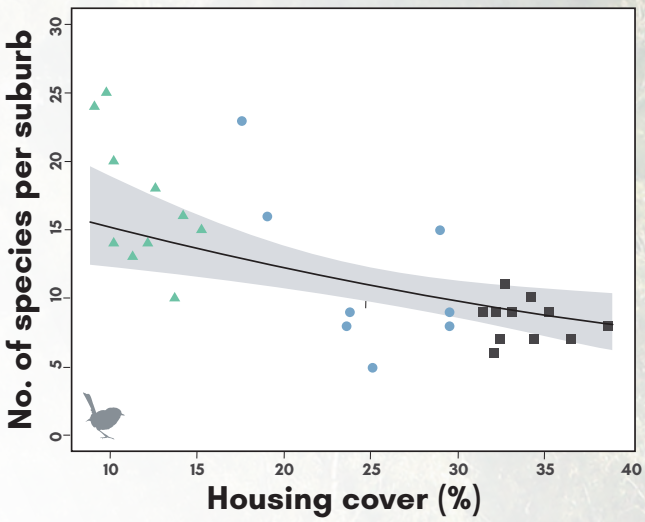
The Noisy Miner is a native honeyeater that occurs in open woodland habitats in eastern Australia. It has adapted well to urban areas and increased in number in Australian cities in recent decades. Unfortunately, Noisy Miners are territorial and highly aggressive towards other bird species. At high densities, Noisy Miners aggressively exclude small bush birds by physically attacking them (called 'mobbing') and driving them out of the area. They then monopolise resources and take over entire gardens, streets and urban parklands.

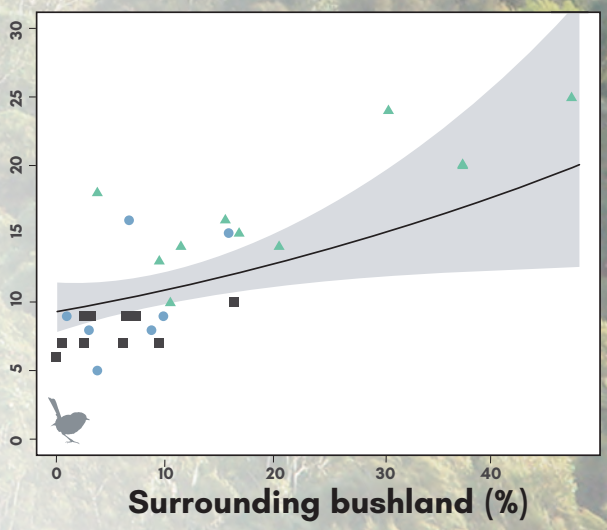
How does urbanisation affect bird diversity?

Cities are mosaics of different land-uses: industrial land, residential streets, gardens, parklands, creeks and patches of bushland. Areas close to the city centre tend to have greater cover of houses, shops and roads, more people, and a greater proportion of exotic trees. In contrast, areas near the urban fringe tend to have less housing, more tree cover, and a greater amount of native bushland. These changing environmental conditions all have the potential to influence the *diversity* (or number) of different bird species within a suburb. We investigated which physical properties of suburbs had the strongest influence on the diversity of all native birds, and diversity of bush birds, that we recorded in our surveys.









We found that housing cover was the strongest driver of the diversity of both native birds and bush birds. Suburbs with more housing had fewer bird species. Housing cover reduces the amount of land available for other, more suitable, habitats such as gardens and bushland. Suburbs with more houses also have more human disturbance, such as vehicle traffic and domestic cats.

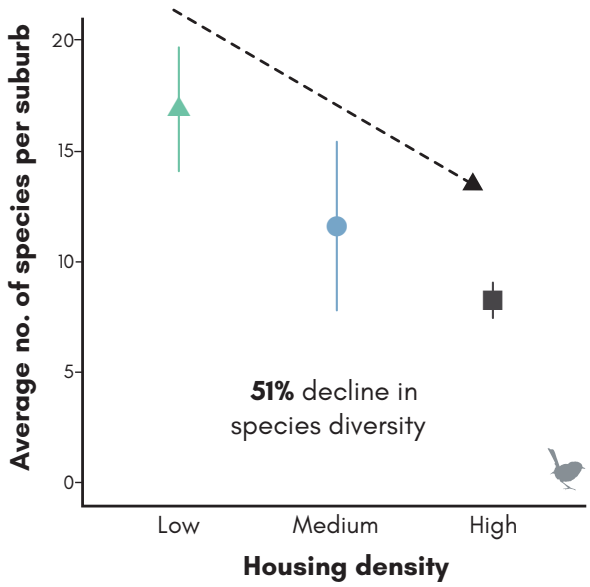
The amount of surrounding bushland was also an important factor for the diversity of bush birds. Suburbs surrounded by more native vegetation had a greater diversity of bush birds.

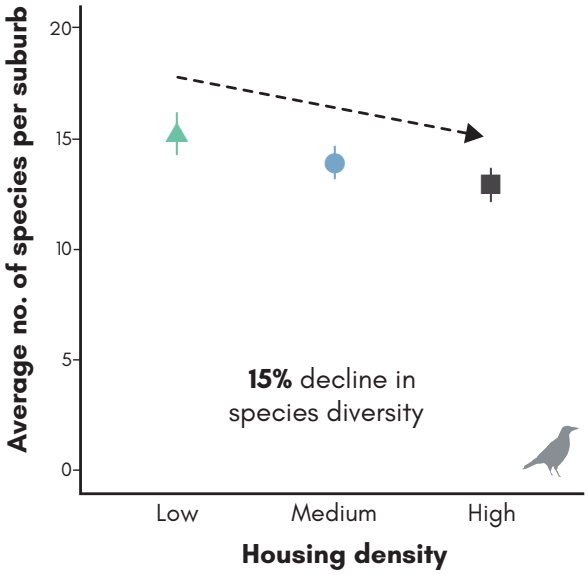
The importance of native bushland

Intact patches of native bushland within, or adjacent, to residential suburbs are critically important for bush birds. These patches provide specialised habitat and resources that birds cannot find elsewhere in cities. They can also function as source areas for populations of bush birds from which some individuals can move into, or visit, residential suburbs. It is essential to protect, manage and restore remaining patches of native bushland near urban areas, and minimise human disturbances and threats to these special places.

How does the bird community change?

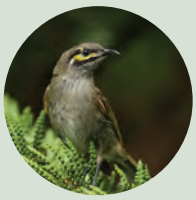
Urbanisation alters the *composition* (or make up) of bird communities through the loss, gain and replacement of species. Over time, this can result in communities becoming more similar to each other (termed 'biotic homogenisation'). In cities, the composition of bird communities typically is influenced by land-use, human disturbance, vegetation patterns, and interactions with other species such as competitors and predators. We investigated which physical properties of suburbs in Melbourne influence bird community composition, and examined whether bird communities become more similar as housing density increases.



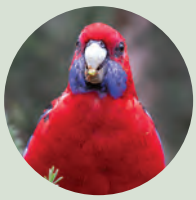


We found that bird communities in suburbs of Melbourne are becoming more similar to each other ('homogenised'). This trend was driven by housing density: bird communities were more similar to each other in suburbs with high density housing, than in suburbs with low or medium density housing. This change was largely due to the loss of bush birds: the average number of bush bird species per suburb declined by 51% from low density to high housing density suburbs, compared with a 15% decline for other native birds. It's clear that residential neighbourhoods do not currently provide sufficient habitat for bush birds.

Bush bird species that frequently were lost from more developed suburbs included:



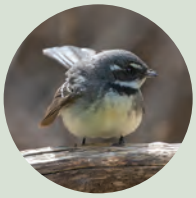
Yellow-faced Honeyeater *Caligavis chrysops*



Crimson Rosella *Platycercus elegans*

Fan-tailed Cuckoo *Cacomantis flabelliformis*

Superb Fairywren *Malurus cyaneus*



Grey Fantail *Rhipidura albiscapa*

White-plumed Honeyeater *Ptilotula penicillata*

What is 'biotic homogenisation'?

Biotic homogenisation occurs when animal or plant communities in different locations become more similar to each other over time. When this happens, it's often the same suite of fewer species that are favoured, and appear in multiple locations. Homogenisation of bird communities occurs because urban development simplifies the habitats and resources available for birds in cities. Biotic homogenisation has been identified in Australian cities (including Melbourne and Brisbane) as well as in other counties (Sweden, India and Brazil). Homogenisation is a concern for bird conservation, as it leads to the loss of more specialised species and results in the dominance of a small set of exotic species (e.g., Rock Dove or Feral Pigeon, Common Starling) and more-tolerant native species (e.g., Rainbow Lorikeet).

What can we do for the birds in our 'burbs?

1 Protect native bushland patches

2 Protect and supplement native vegetation along streams

3 Increase native tree cover across suburbs

4 Protect and retain all mature native trees

5 Strategically replant open areas in parks and nature strips

6 Increase shrub and mid-storey cover in gardens

7 Contain cats indoors or in outdoor enclosures

8 Install nest boxes and bird baths

9 Contribute to citizen science and educate others!

Further information

Organisations and websites:

BirdLife Australia Birds in Backyards Program:
https://birdlife.org.au/projects/birds-in-backyards/

Gardens for Wildlife Victoria:
https://gardensforwildlifevictoria.com/

The Playbook for Urban Biodiversity:
https://www.unimelb.edu.au/cities/projects/current-projects/playbook-for-urban-biodiversity

Share your feedback here

Publications from this study:

Humphrey JE, Haslem A, Bennett AF (2023). Avoid, adapt or exploit: Re-visiting bird responses to urbanisation using a novel landscape approach. *Global Ecology and Conservation*. https://doi.org/10.1016/j.gecco.2023.e02735

Humphrey JE, Haslem A, Bennett AF (2023). The noisy neighbour conundrum: What influences the value of urban sites for forest birds? *Urban Ecosystems*. https://doi.org/10.1007/s11252-023-01478-x

Humphrey JE, Haslem A, Bennett AF (2023). Housing or habitat: What drives patterns of avian species richness in urbanised landscapes? *Landscape Ecology*. https://doi.org/10.1007/s10980-023-01666-2

Citation:
Humphrey JE, Haslem A, Bennett AF (2024). Birds in the 'burbs: Improving habitat for native birds in residential areas. Research Centre for Future Landscapes, La Trobe University, Melbourne, Australia. https://doi.org/10.26181/25485955

Acknowledgments: This work took place on the unceded lands of the Wurundjeri People of the Kulin Nations, and other lands where Traditional Custodians are yet to be formally recognised. We acknowledge their Elders, past and present, and their ongoing connection to Country and indigenous flora and fauna. For funding, we thank the Holsworth Wildlife Research Endowment and the Ecological Society of Australia, BirdLife Australia, Australian Wildlife Society, and the Field Naturalists Club of Victoria. Thanks also to many private landholders and council officers.

Produced by: Jacinta Humphrey, Angie Haslem & Andrew Bennett.

Design and layout: Judy Bennett (March 2024).

Photo credits (*listed alphabetically*): Alanna Vivian, Alex Maisey, Alex Sibbison, Brian O'Leary, Charlotte Hall, Euan Ritchie, George Pergaminelis, Glenn Pure, Helen Greenwood, Ian Wilson, Jacinta Humphrey, John Barkla, Kathy Zonnevylle, Lilith Armstrong, Lina Nona, Michael Seyfort, Nearmap, Rhys Makdissi, Rob Parker, Stephen Garth, Sui Lay, Tom Headley, Visualspace, Will Salter.

J.Humphrey@latrobe.edu.au **Jacinta Humphrey** **HumphreyJE** **jacintahumphrey**

ESA birdlife AUSTRALIA LA TROBE UNIVERSITY RESEARCH CENTRE FOR FUTURE LANDSCAPES Australian Wildlife Society FNCV