

Country bird, city bird

A comparison of bird communities in
and around four South African cities

TEXT **JESSLEENA SURI**

Rapid urbanisation places immense pressure on the natural world, in terms not only of the amount of space being converted into cities, but also of the much larger footprint of land required to feed the inhabitants of those cities. Research from various parts of the world has shown that as natural land has been transformed into streets and farmers' fields, the loss of habitat has been matched by the loss of wildlife that relied on that habitat for survival.

Most research into urban ecology has been conducted in the northern hemisphere, where cities are much older, highly planned and geographically similar as regards their temperate environments. By contrast, cities south of the equator, such as those in Africa, are still growing rapidly and often informally, and they tend to fall in tropical zones and areas with exceptionally high biodiversity. Although the impacts of urbanisation are likely to be similar in both hemispheres, there is still a need for more research in the south, especially in Africa, that can guide future efforts to create more biodiversity-sensitive cities in these rapidly urbanising regions.

Birds make good indicator species, and the presence or absence of a species can offer insight into the quality of a habitat and the health of an ecosystem.



KERVIN PRAYAG

ABOVE Often seen in moist urban landscapes, the Cape Wagtail is familiar to many South Africans.

OPPOSITE Pin-tailed Whydahs are often seen in urban gardens, where the males aggressively defend their territories.

In northern cities, the richness of bird species tends to decrease as urban cover increases. Sensitive and specialised species are lost because they are unable to tolerate the levels of disturbance and habitat fragmentation within cities. These tend to be smaller-bodied species, insectivores and ground- and forest-dwellers. At the same time, some species are inclined to proliferate in cities, as they are able to capitalise on the abundant resources on offer. These are often larger, omnivorous species, consisting of scavengers, seed-eaters and frugivores (such as crows,

sparrows and bulbuls, respectively). As these shifts in community composition occur, cities are thought to be drivers of a process known as biotic homogenisation, where communities become less distinct and start to look the same in different cities. >



Gathering extensive bird community data from various cities would be impossible for a research team. Fortunately, we can use citizen science databases like the Southern African Bird Atlas Project (SABAP2) to explain large-scale patterns in bird communities across the region. The SABAP2 protocol requires birders to submit lists of birds seen over at least two hours of birding in all habitats within a pentad (grid cell of 5x5 minutes or roughly 9x9 kilometres). Unlocking the full power of the SABAP2 dataset involves intensive statistical techniques, like multi-species occupancy modelling. Accounting for each species' response to urban land cover, we calculate the probability of occupancy for each species in each pentad. These are then used to derive estimates of species diversity and turnover, from which we can compare bird populations in cities to each other and to their surroundings.

We wanted to examine bird communities within and between four of South Africa's major cities: Johannesburg, Pretoria, Cape Town and Durban. Each of these cities sits within a distinct habitat type, which enables us to explore whether bird communities in cities are shaped by the pressures of urbanisation or if their original habitat is more important.

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The extensive sampling areas of the SABAP2 pentads make it difficult to attribute our results to specific habitat use, but these findings are probably a reflection of the relative heterogeneity

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in the structure of the urban area versus its surrounding biome. In Cape Town and Johannesburg, for example, the surrounding habitats of fynbos and grassland, respectively, are structurally quite homogenous. In these cases, the mosaic of diverse habitats in the cities can support a wider array

of species. Durban, on the other hand, sits on a coastal forest belt surrounded by savanna and some grassland. Its surroundings already support diverse habitats, and thus a richer bird community. The disturbance and fragmentation associated with urbanisation, by contrast, reduce diversity within the city.

Comparing the cities to one another, we were unable to find any evidence of the bird communities responding uniformly and becoming more alike. Counter to what is commonly reported elsewhere, in our four cities the bird communities are almost as distinct from one another as their surroundings. What we did find, however, was that the areas surrounding each city share about 40 per cent of their species. This suggests that homogenisation may be happening, or starting to happen, at a much larger scale and that many of South Africa's species have increasingly cosmopolitan distributions. Previous studies using SABAP2 data have shown that there are several 'native invader' species in South Africa, where birds are expanding their ranges because of anthropogenic factors. For example, the Hadedra Ibis, Pied Crow and Black Sparrowhawk have all expanded their ranges in response to the proliferation of lawns, powerlines and alien trees throughout the country. Future studies that track changes in these communities over time will be vital in order to identify which species might be benefiting at the expense of others, and homogenising urban communities as a result.

We found that the types of birds that are consistently successful in urban areas are frugivores, raptors and scavengers. Frugivores such as bulbuls and mousebirds may be benefiting from the abundance and diversity of plants that provide fruit throughout the year in suburban gardens. Meanwhile, there is emerging evidence to suggest that certain raptors may be highly successful in urban areas, due to the availability of nesting habitat and an abundance of prey species such as pigeons and doves. Further analyses into species-specific responses to urbanisation are important in directing conservation and restoration management efforts. For example, in Cape Town we might identify urban pentads where locally indigenous species like the Bokmakierie or Cape Grassbird are able to thrive and

where efforts could be made to ensure they continue to do so. In Durban we might identify species that don't occur in urban pentads but may be found on urban fringes, and similarly management practices could be adapted to secure these species in habitat patches within those pentads.

Our results do not suggest that these cities are not causing ecological losses. However, they do show that cities are capable of supporting a surprising diversity of bird species. These rich communities provide important ecosystem services and a means for urban residents to engage with nature and generate further interest and participation in citizen science.

The expansion of SABAP2 into the African Bird Map, and the uptake of atlas in countries with some of the continent's major megacities, like Kenya and Nigeria, will help shed even more light on the nature of urbanisation in Africa and its impacts on bird communities. We are grateful to the citizen scientists who contribute their time and effort to databases such as SABAP2 and would encourage more to join in doing so.

LEFT Rock Kestrels are one of many common urban raptors in South Africa, often seen in open areas on city outskirts.

OPPOSITE Spotted Eagle-Owls will readily move into an appropriate nesting box, or plant pot in the case of this well-known family in Kirstenbosch Botanical Garden.



ANTON CRONE (2)