



## Top tips to improve urban bird diversity

**Planting trees** and maintaining a well-balanced mix of vegetation in urban 'green spaces' can enhance the species diversity of birds and compensate for the negative effect of building, according to new research. Scientists recommend that increasing tree cover rather than limiting new development is the most effective long-term strategy to improve bird diversity in cities.

**There is an increasing awareness** that biodiversity is important for human quality of life in general, and particularly for urban inhabitants. Natural areas and conservation practices in cities give the opportunity for citizens to directly experience nature, which is vital in a world with a high urban population. Despite considerable pressure on the natural environment from land development, cities often support a surprisingly high wild bird population. Birds respond quickly to changes in their environment and scientists can use fluctuations in the population to monitor the ecological effect of management decisions.

Local efforts within cities to promote birdlife have included providing food and nest boxes, preserving local woodland and planting native instead of exotic, non-native trees and bushes. However, until now there has been little quantitative research into the impact of specific elements of urbanisation on bird populations.

Scientists explored bird populations in three cities in Switzerland (Zurich, Lucerne and Lugano). Within each city, they then identified 32 individual sites, characterised by increasing levels of urbanisation. Urbanisation was measured as the fraction of the area within a 50 m radius of the sampling point covered by buildings or other 'sealed' areas, such as courtyards, graveyards and industrial areas. At each site (96 in total), the scientists measured ten 'habitat variables'. These included five structural elements; the percentage area covered by buildings, sealed areas, grass, bushes and trees. They also measured the percentage area covered by coniferous, deciduous, native and exotic woody plants (trees and bushes) and the mean number of woody plant species.

At each site, the scientists recorded bird species richness (number of species) and diversity (a measure of the relative abundance of each species). Each site was visited six times over a period of two months and at different times of the day, to increase the reliability of the results. The scientists then used statistical computer models to look for relationships between species richness and/or diversity and each habitat variable.

The results showed that tree cover had the strongest positive influence on the bird population. On average, the number of species increased by three for every additional 20% of tree cover. The amount of bush and grass cover also had a positive influence, but the effect was far smaller than for trees.

Most bird species increased in abundance with increasing woody vegetation. The maximum number of species (20) occurred where deciduous and coniferous vegetation existed in equal proportions (1:1 ratio). When all vegetation was deciduous, the number decreased to 14. The proportion of native compared to exotic plant species had no influence on species richness or diversity. Sealed area cover had a negative effect on species richness, but no effect on diversity. Conversely, an increase in building cover decreased diversity, but had no impact on species richness. Importantly, neither sealed areas or building cover had as strong an influence as tree cover.

The scientists recommend that urban planning decisions should include increasing the 'vertical' habitat through additional tree cover, to compensate for the 'ground' habitat lost through land development. Since birds showed an equal preference for deciduous and coniferous foliage, they recommend a balanced mixture of both habitat types to maximise the number of species.

**Source:** Fontana, S., Sattler, T., Bontadina, F. & Moretti, M. (2011). How to manage the urban green to improve bird diversity and community structure. *Landscape and Urban Planning*. 101: 278-285.

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