

Global survey of urban birds and plants find more diversity than expected

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The largest analysis to date of urbanization effects on bird and plant species diversity worldwide found four "cosmopolitan" bird species found in more than 80 percent of cities are the rock pigeon, house sparrow, starling and barn swallow. Credit: NCEAS, Paige Warren

The largest analysis to date of the effect of urbanization on bird and plant species diversity worldwide confirms that while human influences such as land cover are more important drivers of species diversity in cities than geography or climate, many cities retain high numbers of native species and are far from barren environments.

Urban ecologist Paige Warren of the University of Massachusetts Amherst, co-leader of a 24-member research working group at the University of California Santa Barbara's National Center for Ecological Analysis and Synthesis (NCEAS), and colleagues reported their findings recently in *Proceedings of the Royal Society B*.

"We were able to build the largest database to date from the largest number of cities, more than 140 on every continent except Antarctica," Warren says. "So it's a more global survey than past studies, which have focused mainly on North America and Europe. For the first time, we were able to include cities in South America, in the tropics and in developing countries. This gives us more confidence in our generalizations about what is going on."

"Looking at what drives the number of [species](#) found, we see that human factors are more influential than region or where the city is located, for example," she adds. The researchers wrote, "Not surprisingly, greater proportions of intact vegetation in cities, as found in older cities, preserve [plant species](#). These results highlight the importance of including remnant vegetation and restoring natural areas in the design of cities."

Thus, the study underlines the value of urban green space as refuges for [native species](#) and migrating birds, Warren says. Conserving green spaces, restoring native plant species and adding habitats that promote biodiversity in cities can support more bird and plant species.

Working group members compiled the global dataset for birds in 54 cities and for plants in 110 cities. The majority of urban bird and plant species they found are native, they write, and cities even support populations of 36 threatened bird and 65 threatened plant species.

But across the study, cities supported about 92 percent fewer bird

species and 75 percent fewer [native plant species](#) than expected for similar undeveloped lands, a "substantial decline" that is best explained by human-built features such as [land cover](#) and city age. The working group found that cities with more natural habitats support more bird and plant species and experience fewer species losses as the city grows.

The most common "cosmopolitan" [bird species](#), occurring in more than 80 percent of cities, were the rock pigeon, house sparrow, starling and barn swallow. Among plants, 11 species including annual meadow grass occur in more than 90 percent of cities.

One of Warren's co-leaders and the paper's lead author, Myla F.J. Aronson of Rutgers, points out that "while urbanization has caused cities to lose large numbers of plants and animals, the good news is that cities still retain endemic native species, which opens the door for new policies on regional and global biodiversity conservation."

Networking since 2010, the researchers recently received a five-year National Science Foundation grant to fund a global network called UrBioNet to support urban biodiversity research and practice. Among other goals, they hope to expand databases to include more cities with rapid urban growth and less available data in such places as Africa, South America and Southeast Asia, and to develop recommendations for monitoring biodiversity in urban areas.

More information: [rspb.royalsocietypublishing.org ...
133330.full.pdf+html](https://rspb.royalsocietypublishing.org/doi/10.1098/rspb.2014.1333)

Provided by University of Massachusetts Amherst

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