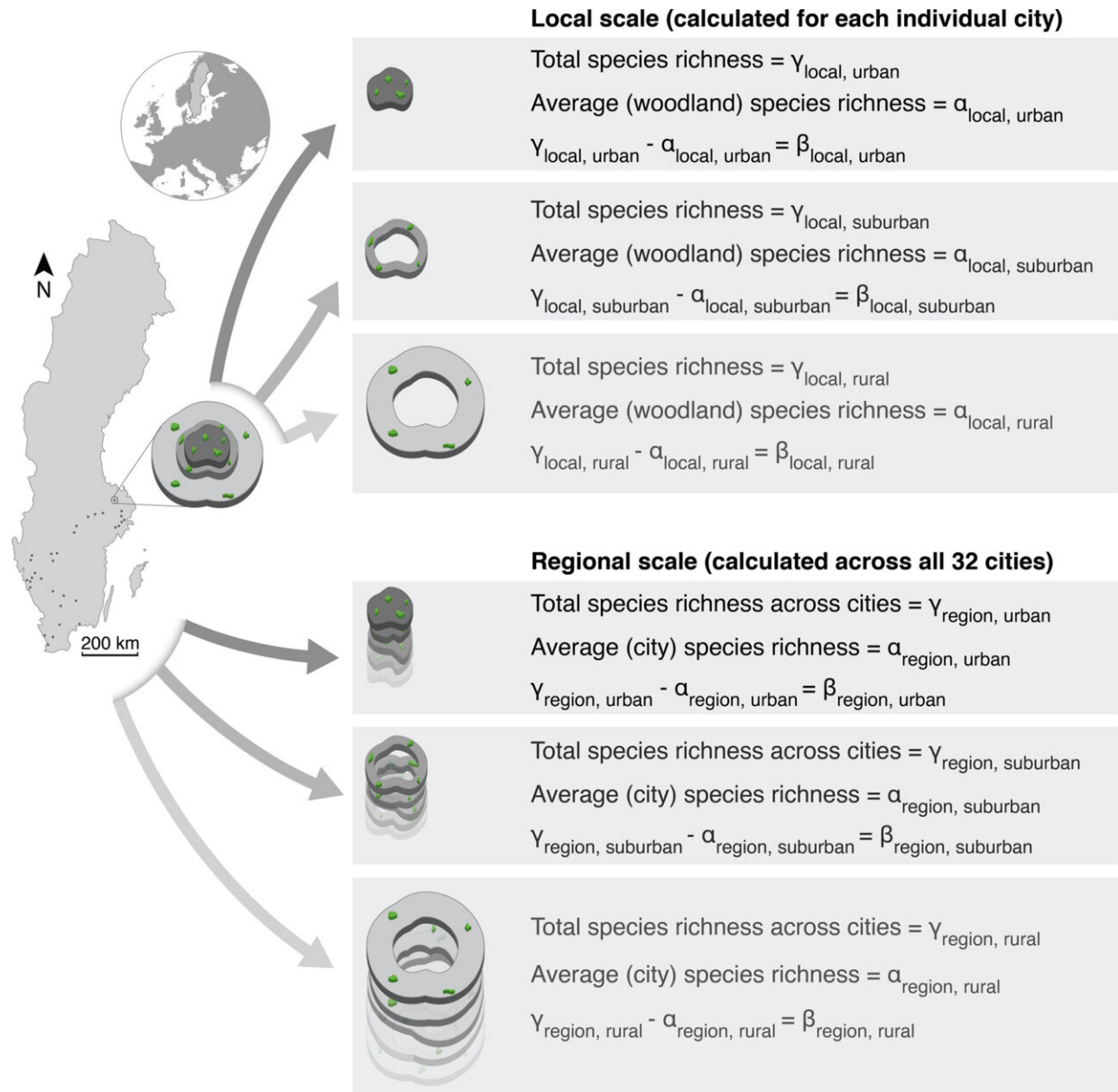


Study finds less bird diversity in city forests

September 29 2022



Map showing Sweden and the location of the 32 cities (dark dots) where surveys were conducted, and a conceptual illustration of how we estimated γ -, α -, and β -

diversity for each of the urbanization levels at the local and regional scale. The conceptual illustration shows woodlands (green) located in the urban (darkgrey shape), suburban (middle-grey ring), and rural areas (light-grey ring). Credit: *Global Change Biology* (2022). DOI: 10.1111/gcb.16350

A new study led by Lund University in Sweden shows that cities negatively affect the diversity of birds. There are significantly fewer bird species in urban forests compared with forests in the countryside—even if the forest areas are of the same quality.

The researchers examined 459 natural woodlands located in or near 32 cities in southern Sweden. They counted the occurrence of different bird species, and the result is clear: in natural forests located in a city center, there are on average a quarter fewer species of forest birds compared to forests outside the city. In terms of endangered species, about half as many species were found in urban forests compared to rural forests.

The results deepen our knowledge of the impact of cities on biodiversity, says William Sidemo Holm, one of the researchers behind the study. It is already well known that urbanization is one of the main driving forces behind the loss of biodiversity, as cities spread out across the globe. What is not as well known, however, is how cities affect protected [natural areas](#) in a city.

"Our study demonstrates that you cannot surround nature with [urban development](#) and believe that it will remain as it is, there is going to be a [negative effect](#)," says William Sidemo Holm, who worked on the study during his time as a doctoral student at Lund University.

The researchers wanted to specifically examine similar forests, or habitats. It is therefore not city parks that have been compared to

countryside forests, emphasizes William Sidemo Holm. The study is one of the first to compare the diversity of similar habitats along a so-called urban gradient.

"This way we know that the results are not driven by differences in the actual habitats, which in this scenario was natural forest. Instead, it was the surrounding environment that was different," he says.

The fact that an [urban environment](#) has such a clear negative impact on forest bird diversity may have to do with access to food, the researchers believe. Many birds depend on [food resources](#) not only in their immediate vicinity but also in their surroundings, and in cities there are fewer insects, for example. In addition, some species are sensitive to artificial disturbances such as noise and light, which occur more in cities.

"Our results highlight the importance of taking surrounding nature into account in urban planning. Above all, it is important to avoid the expansion of cities adjacent to protected environmental areas where there may be [endangered species](#)—we found that these are particularly sensitive to urban surroundings," says William Sidemo Holm.

The study also showed that [urban forests](#) can be important for bird diversity. Although a majority of the bird species were more common outside the cities, there were species that were more often found in cities, such as the hawfinch. The reason may be that cities have more fruit trees that can provide them with food.

"Our conclusion is that it is important to preserve natural forests both in the cities and outside them in order to maintain local diversity," says William Sidemo Holm.

In order to better preserve the biodiversity of cities, more knowledge is needed on how to reduce the negative impact on natural areas from the

surrounding urban environment, say the researchers.

"In the future, it would be particularly interesting to investigate whether coherent green infrastructure in cities, or between city and countryside, can increase the opportunities for bird species in the city to find the necessary resources," William Sidemo Holm concludes.

The research was published in *Global Change Biology*.

More information: William Sidemo-Holm et al, Urbanization causes biotic homogenization of woodland bird communities at multiple spatial scales, *Global Change Biology* (2022). [DOI: 10.1111/gcb.16350](https://doi.org/10.1111/gcb.16350)

Provided by Lund University

Citation: Study finds less bird diversity in city forests (2022, September 29) retrieved 2 May 2024 from <https://phys.org/news/2022-09-bird-diversity-city-forests.html>

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