

# Cities can be part of the solution in sustaining species

March 14 2022

---



Credit: Pixabay/CC0 Public Domain

A newly published study led by Yale School of the Environment researchers found that a projected urban expansion of up to 1.53 million square kilometers over the next three decades threatens the survival of more than 800 species—but also that a focus on urban planning that protects habitats can mitigate the impact.

Within the next 30 years, the global urban population is projected to increase by 2.5 billion people, which will greatly increase urban spread. Much of this urban expansion is predicted to occur in [biodiversity hotspots](#)—areas rich with species that are at a high risk for destruction due to human activity—imperiling a wide variety of species, many of which are already threatened by extinction.

Expansion is projected to result in up to 1.53 million square kilometers of new urbanized land, directly threatening 855 species, according to the findings of a new Yale-led study published in in the *Proceedings of the National Academy of Sciences*. The study is co-authored by Karen Seto, Frederick C. Hixon Professor of Geography and Urbanization Science at Yale School of the Environment (YSE); Rohan Simkin, a Ph.D. student at YSE; Walter Jetz, director of the Yale Center for Biodiversity and Global Change and professor of ecology and evolutionary biology at Yale; and Robert McDonald, lead scientist for nature-based solutions at The Nature Conservancy.

The study identified hotspot cities whose growth are predicted to have particularly large impacts on species habitats. Many of these cities are in equatorial regions where urban growth coincides with biodiverse habitats. The cities that pose the greatest threat to species due to expansion are predominately located in the developing tropical regions of sub-Saharan Africa, South America, Mesoamerica, and Southeast Asia.

Species listed as "threatened" on the International Union for Conservation of Nature's Red List are disproportionately represented among the heavily impacted species.

But focusing global efforts on minimizing impacts on habitats in these growth regions can help conserve and protect species, the authors say.

The study relied on data from Yale's Map of Life—a collection of species distribution data used to monitor, research, and create policies that protect species worldwide. It also used a recently developed suite of land-use projections to assess future habitat loss from urban land expansion for more than 30,000 terrestrial species globally. The study found that urban land expansion is a significant driver of habitat loss for about one-third of these.

The study comes as the 15th Conference of Parties to the UN Convention on Biological Diversity prepares to convene in April to decide the new post-2020 [biodiversity](#) conservation framework. The study demonstrates the need for global conservation efforts to include policies to preserve species in urban lands.

"Cities are actually part of the solution," said Seto. "We can build cities differently than we have in the past. They can be good for the planet; they can save species; they can be biodiversity hubs and save land for nature."

The study found that the largest impacts on species are not from the world's largest cities, but from [urban areas](#) that have a myriad of endemic species and where expansion can destroy habitats. And these areas are rapidly becoming more urbanized.

"One of the aims of the study was to identify those species, not that just are threatened, but that are specifically threatened by urban land development," says Simkin, the lead author of the study. "I think that the average person on the street is very aware of the climate crisis now, but I'm not sure they are aware of the biodiversity crisis."

But obstacles to containing sprawl include economic pressures, governance structures, and awareness of the importance of habitats and preserving biodiversity. It's easier to build out, not up, Seto noted.

Species under the most pressure from expansion are concentrated in areas from central Mexico through Central America, the Caribbean, Haiti, Nigeria, Cameroon, Sri Lanka, Indonesia, Malaysia, Thailand, Brazil, and Ecuador.

"We are at a critical moment when the world's governments are renegotiating their commitments to the Convention on Biological Diversity. This study is important since it lets us quantify, for the first time, which specific species are most threatened by urban growth and where urban protected areas are needed to safeguard them," McDonald said.

Global agreements on biodiversity and conservation that focus on protecting the [habitat](#) of species that are predicted to be the most vulnerable, investments from the Global Environment Facility, and targeted action at local scales can help mitigate impact on species.

"The study offers vital decision-support in regions across the world to plan for urban growth that minimizes the loss of biodiversity," said Jetz. "It leverages the Species Habitat Index, a central biodiversity change indicator of the draft post-2020 Global Biodiversity Framework of the Convention on Biological Diversity, to assess future scenarios."

Despite the potential for loss of [species](#) from land expansion, the study highlights how cities can proactively protect biodiversity, Seto said.

"The majority of these places have yet to be built," she noted. "Science-driven policies that guide how the cities of tomorrow get built will have a tremendous effect."

The results of the study and projected patterns of [urban expansion](#) and biodiversity impact can be found [here](#).

**More information:** Biodiversity impacts and conservation implications of urban land expansion projected to 2050, *Proceedings of the National Academy of Sciences* (2022).

[doi.org/10.1073/pnas.2117297119](https://doi.org/10.1073/pnas.2117297119)

Provided by Yale University

Citation: Cities can be part of the solution in sustaining species (2022, March 14) retrieved 26 April 2024 from <https://phys.org/news/2022-03-cities-solution-sustaining-species.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.