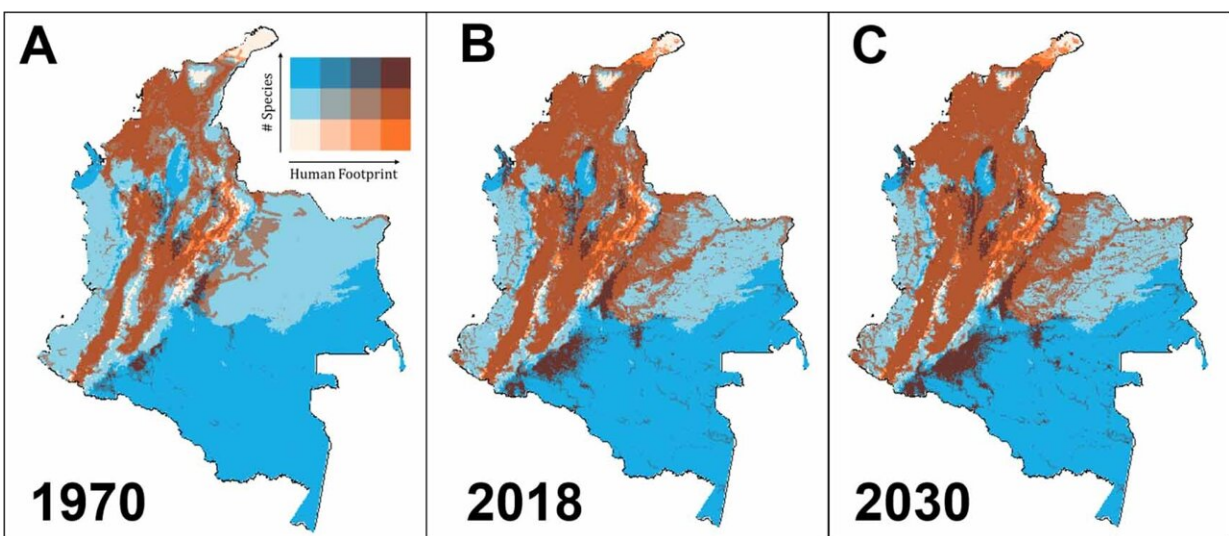


Colombia, a global biodiversity hotspot, faces rising threats to bird species from expanding human footprint

December 8 2022, by Allison Soergel



Temporal changes of the spatial overlap of resident terrestrial bird species' distributions ($n = 1459$) and the Legacy-adjusted Human Footprint Index (human footprint) for 1970 (A), 2018 (B), and 2030 (C). Credit: *Environmental Research Letters* (2022). DOI: 10.1088/1748-9326/ac98da

A new study published in the journal *Environmental Research Letters* used satellite mapping data to analyze how changes in human footprint on the landscape between 1970 and 2018 overlapped with distributions of 1,469 Colombian bird species. The study is the first of its kind to expand focus from forested regions, like the Amazon and Chocó, to all

of Colombia's terrestrial habitats. Researchers also projected future trends in human impact on bird habitats through 2030.

The all-Colombian research team was led by joint first-authors Natalia Ocampo-Peñuela, an Assistant Professor of Environmental Studies at UC Santa Cruz, and Andrés Felipe Suárez- Castro, a researcher who is affiliated with the Australian Rivers Institute at Griffith University. The other co-authors are affiliated with the Humboldt Institute and the Pontificia Universidad Javeriana, both based in Bogota, Colombia.

The team's findings reveal that forest-dwelling birds in previously pristine habitats are increasingly at risk, as deforestation accelerates. Meanwhile, some species in less-studied habitats, like savannas and dry shrublands, face similarly serious impacts. Across all [habitat](#) types, birds that live exclusively or almost exclusively within Colombia or are already nationally listed as threatened will continue to bear the brunt of future impacts from human activities.

Colombia is a global hotspot for [biological diversity](#) and has almost 2,000 species of birds—more than any other country in the world. But 140 of Colombia's bird species are nationally listed as threatened, mostly due to habitat impacts. The research team sought to identify additional species and habitats that might need protection in the future.

"I hope that this study can serve as an [early warning](#)," Ocampo-Peñuela said. "This is a way to use remote-sensing data to propose which species we may need to focus our efforts on, in terms of reevaluating their conservation status."

To arrive at their findings, researchers built upon prior work that both tracked changes in human footprint across space and time and projected future trends. These existing national datasets provided map layers for seven variables, including land-use type, rural population density,

proximity to infrastructure, and measures of habitat fragmentation and degradation. The team compared this with the habitat distributions of 1,469 resident Colombian bird species that have tight connections to terrestrial habitats within the country.

From this analysis, the team identified 69 birds for which human footprint had increased in more than 50% of the species' distribution between 1970 and 2018, and 19 of those were not yet listed nationally in any threat category for conservation. The sooty ant-tanager and Venezuelan troupial are two examples. Both birds live either exclusively or almost exclusively within Colombia. Nine additional birds that were similarly impacted but not yet listed were forest specialists, while eight others had habitat distributions outside of forests.

Ocampo-Peñuela says these and other findings from the paper around non-forest birds indicate a need for increased research and conservation across a wider variety of habitats in Colombia.

Forests have traditionally been more heavily studied within the country, both because they are more readily identifiable on satellite imagery and because of the iconic nature of ecosystems like the Amazon rainforest. The current study's focus across [habitat types](#) therefore helps to alleviate a bias toward forest species that has emerged in much of the conservation literature.

However, the paper's findings also clearly show that forest-dwelling birds won't be spared from habitat impacts either. In fact, they're likely to be disproportionately affected in the future.

"Many forest birds have remained kind of untouched for many decades, but because of the most recent wave of deforestation in the Andes-Amazon transition that began in 2015, our projections show that these birds will be significantly impacted in the next decade," Ocampo-

Peñuela said.

"This huge spike in deforestation has moved so fast that some field studies are not able to keep track of it, but through these spatial projections, we can predict what's going to happen and try to get ahead of it by protecting those forests that are at the frontier of deforestation in Colombia."

The paper also identified that areas of high species richness and high [human footprint](#) have increasingly overlapped over time, and this trend is likely to continue into the future. While some key areas may be able to be protected within reserves, Suárez-Castro says the study shows that others are already so heavily altered that other types of conservation efforts will also be needed to enable humans to live alongside wildlife more sustainably.

"The impacts we're seeing and predicting for the future are so widespread that we can't protect everything in protected areas," he said. "But also including a big focus on restoration and mixed management strategies, like agroforestry or payment for ecosystem services, would help to protect as many [species](#) as possible for the future."

More information: Natalia Ocampo-Peñuela et al, Increased exposure of Colombian birds to rapidly expanding human footprint, *Environmental Research Letters* (2022). [DOI: 10.1088/1748-9326/ac98da](https://doi.org/10.1088/1748-9326/ac98da)

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