Remote sensing data reveals hundreds more species at risk of extinction

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The velvet-purple coronet is classified by IUCN as a species of least concern, but a Duke-led study finds it should be classified as vulnerable. Credit: Natalia Ocampo-Peñuela

A new Duke University-led study finds that more than 200 bird species in six rapidly developing regions are at risk of extinction despite not being included on the International Union for Conservation of Nature (IUCN) Red List.

The study, published Nov. 9 in the peer-reviewed journal *Science Advances*, used remote sensing data to map recent land-use changes that are reducing suitable habitat for more than 600 bird species in the Atlantic forest of Brazil, Central America, the western Andes of Colombia, Sumatra, Madagascar and Southeast Asia.

Of the 600 species, only 108 are currently classified by the IUCN Red List as being at risk of extinction.

The new analysis, however, reveals that 210 of the species face accelerated risks of extinction and 189 of them should now be classified as threatened, based on the extent and pace of habitat loss documented by recent remote sensing.

"Good as it is, the Red List assessment process dates back 25 years and does not make use of advances in geospatial technologies," said Stuart L. Pimm, Doris Duke Professor of Conservation Ecology at Duke's Nicholas School of the Environment. "We have powerful new tools at our fingertips, including vastly improved digital maps, regular global assessments of land use changes from satellite images, and maps showing which areas of the planet are protected by national parks."

The munchique wood-wren is critically endangered and affected by ongoing deforestation in its small range. Credit: Natalia Ocampo-Peñuela

By not incorporating this type of modern geospatial data directly into its assessments, Pimm said, the Red List is underestimating the number of species at risk and causing scientists and policymakers to overlook priority areas for conservation.

"The Red List employs rigorously objective criteria, is transparent, and democratic in soliciting comments on species decisions," he stressed. "That said, its methods are seriously outdated."

For instance, while the Red List currently includes estimates of the size of a species' geographical range in its assessment process, it fails to

account for how much preferred habitat remains within that range, said Natalia Ocampo-Peñuela, the new study's lead author, who received her Ph.D. from Duke earlier this year.

"Some bird species prefer forests at mid-elevations, while others inhabit moist lowland forests," she said. "Knowing how much of this preferred habitat remains—and how much of it has been destroyed or degraded—is vital for accurately assessing extinction risks, especially for species that have small geographical ranges to begin with. But it's ignored in the current Red List assessment process."
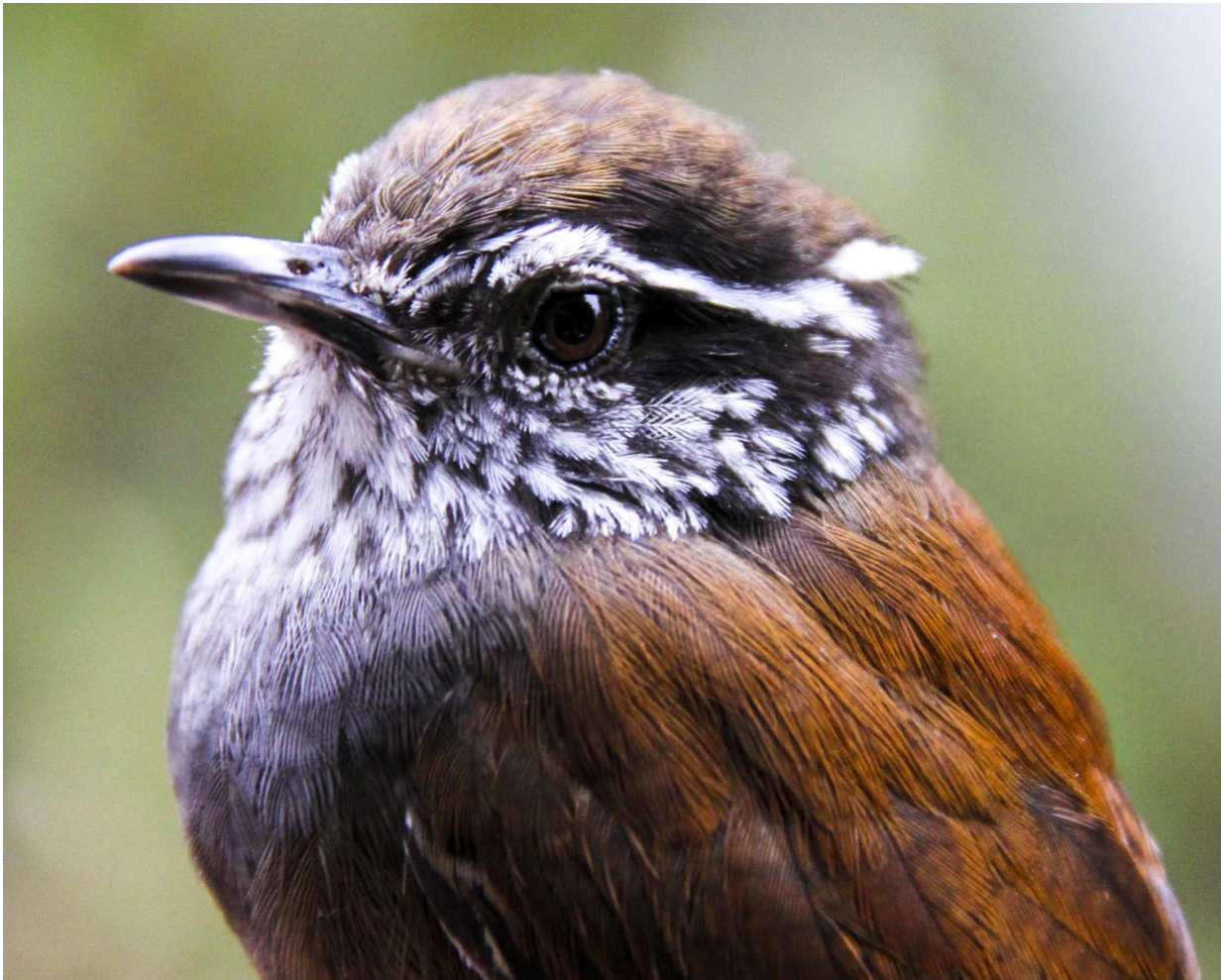
The purplish-mantled tanager is classified as near-threatened by IUCN, but a new study suggests it should be in the vulnerable category due to forest loss in its range. Credit: Natalia Ocampo-Peñuela

"When these factors are accounted for, some species that are not currently considered at risk of extinction likely have ranges that are smaller than those that the Red List otherwise quite sensibly decides are at risk," said study co-author Clinton Jenkins, who directs the biodiversity mapping site http://www.biodiversitymapping.org.

Added Ocampo-Peñuela, "Natural habitats in the most biodiverse places on Earth are disappearing, pushing species toward extinction a thousand times faster than their natural rates. Preventing these extinctions requires knowing what species are at risk and where they live," she said. "With better data we can make better decisions, and have a greater chance of saving species and protecting the places that matter."

More information: "Incorporating explicit geospatial data shows more species at risk of extinction than the current Red List," *Science Advances*, DOI: 10.1126/sciadv.1601367

Provided by Duke University

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