

Time is running out in the tropics—researchers warn of global biodiversity collapse

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The African Bush Elephant or Savanna Elephant (*Loxodonta africana*) used to be widespread across the whole continent and despite its high-profile status and conservation investment the pressure from ivory hunters still threatens it with global extinction; the loss of elephants triggers all sorts of other ecosystem changes Credit: Alexander Lees/Manchester Metropolitan University

A global biodiversity collapse is imminent unless we take urgent, concerted action to reverse species loss in the tropics, according to a major scientific study in the prestigious journal *Nature*.

In their paper 'The future of hyperdiverse tropical ecosystems' an international team has warned that a failure to act quickly and decisively will greatly increase the risk of unprecedented and irrevocable [species](#) loss in the most diverse parts of the planet.

The study is the first high-level report on the state of all four of the world's most diverse tropical ecosystems—tropical forests, savannas, lakes and rivers, and coral reefs.

The authors found that although the tropics cover just 40% of the planet, they are home to more than three-quarters of all species including almost all shallow-water corals and more than 90% of the world's bird species. Most of these species are found nowhere else, and millions more are as yet unknown to science.

"At the current rate of species description—about 20,000 new species per year—it can be estimated that at least 300 years will be necessary to catalogue biodiversity," said Dr. Benoit Guénard, Assistant Professor of the University of Hong Kong and an author of the study.

And across tropical ecosystems, many species face the 'double jeopardy' of being harmed by both local human pressures—such as overfishing or selective logging—and droughts or heatwaves linked to climate change.

Dr. Alexander Lees, from Manchester Metropolitan University explained that while over-harvesting of wildlife was responsible for the annual loss of millions of highly trafficked animals such as pangolins, it also affected many other less-well known species.

He said: "Even many small songbirds are at risk of imminent global extinction due to their capture for the pet trade in South East Asia. The rainforests where they live are increasingly falling silent."

The declining health of tropical ecosystems also threatens the well-being of millions of people across the planet.

Lead author Professor Jos Barlow from Lancaster University said: "Although they cover just 0.1% of the ocean surface, [coral reefs](#) provide fish resources and coastal protection for up to 200 million people. And between them, [humid tropical forests](#) and savannas store 40% of the carbon in the terrestrial biosphere and support rainfall in some of the world's most important agricultural regions.

Whilst the conclusions are bleak, the study also outlined the actions that are needed to turn the health of these vital ecosystems around.

The researchers have called for a step-change in efforts to support sustainable development and effective conservation interventions to preserve and restore the tropical habitats that have been the home and last refuge to the overwhelming majority of Earth's biodiversity for millions of years.

Professor Barlow said: "The fate of the tropics will be largely determined by what happens elsewhere in the planet. While most of us are familiar with the impact of climate change on the polar regions, it is also having devastating consequences across the tropics—and without urgent action could undermine local conservation interventions."

Dr. Christina Hicks from Lancaster University said, as a powerful economic driver of change, the role of developed countries was also felt deeply in the tropics.

She said: "Conservation strategies must address the underlying drivers of environmental change whilst avoiding exacerbating deeply rooted inequalities. Environmental aid has remained static in recent years, and remains a drop in the ocean compared to the income generated by resource extraction."

Dr. Toby Gardner, Senior Research Fellow at the Stockholm Environment Institute highlighted the importance of innovation.

He said: "The past decades have seen a boom in proposals, innovations and insights about the science, governance and management of [tropical ecosystems](#) from remote sensing and big data to new legal frameworks for business. The clock is ticking for these proposals and insights to be properly tested."

Dr. Joice Ferreira, a researcher in the team from the Brazilian government's agricultural research institution Embrapa, emphasized that a big part of the solution needs to be in strengthening the capacity of research institutions in the tropics.

She said: "Despite some notable exceptions the vast majority of biodiversity-related data and research is concentrated in wealthy, non-tropical countries."

"An international approach to science is vital to help avoid the loss of tropical biodiversity."

Professor Barlow said: "Fifty years ago biologists expected to be the first to find a species, now they hope not to be the last."

The Review is part of a special package of articles in an Insight on the tropics in this week's *Nature*.

More information: Jos Barlow et al, The future of hyperdiverse tropical ecosystems, *Nature* (2018). [DOI: 10.1038/s41586-018-0301-1](https://doi.org/10.1038/s41586-018-0301-1)

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