

Evidence of species loss in Amazon

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Credit: Dr. Ricardo Solar

Researchers studying plants, ants, birds, dung beetles and orchid bees in the Brazilian Amazon have found clear evidence that deforestation causes drastic loss of tropical forest biodiversity.

Publishing this week in *Ecology Letters*, researchers highlighted how

remaining areas of undisturbed and recovering [forest](#) provided the last refuge for many [species](#) unable to withstand the impact of human activity.

As one of the most comprehensive surveys of the impacts of disturbance on tropical [forest biodiversity](#) ever conducted, the international team, including Lancaster University, conducted a detailed analysis of nearly 2,000 species of plants, birds, beetles, ants and bees that were found across more than 300 diverse sites in the Brazilian Amazon.

They found, where forests had been cleared for cattle ranching and agriculture, plant and animal life was impoverished and remaining species invariably consisted of the same subset of the original flora and fauna.

Researchers say this is "irrefutable" evidence that biodiversity is declining across the tropics.

But some hope still remains. The researchers also found [species loss](#) could be offset by maintaining areas of forest that contain distinctly different populations of plants and animals that, while different, complement and help sustain each other.

Other findings were:

- Deforestation through logging, fire and farming had a major effect on species loss and simplification across large areas.
- Natural differences between pristine forests and variation in forms of disturbance to the forests – such as logging and fire – across large landscapes means that simplification of species is not playing out equally everywhere.
- To preserve maximum [species diversity](#), reserves should not be concentrated in one part of a region, but as a widespread network

of forest reserves. These should include secondary forests where no [primary forests](#) remain.

Dr. Ricardo Solar, lead author of the study and a research fellow at Brazil's Universidade Federal de Viçosa, said: "Pre-existing differences in the undisturbed forests plus the way in which they had been altered by [human activity](#) had an impact on which species survived.

"Some of the disturbed forests were able to maintain up to 80per cent of the species found in pristine forests – this gives us hope. It is vitally important that reserves should not be concentrated in a single part of a region, but as a widespread network of forest reserves."

Co-author Professor Jos Barlow, Lancaster University, said: "The lower species diversity in degraded forests also indicates that many species are restricted to undisturbed forests. This demonstrates the importance of controlling selective logging and preventing wildfires in all forests, including those on private lands that have already been disturbed."

Fellow co-author Dr Toby Gardner, researcher at the Stockholm Environment Institute, said: "There remains a widespread assumption that concentrating conservation efforts on the protection of isolated reserves is the best way we can safeguard biodiversity. But our work shows that in areas of private land that have already been disturbed – which dominate much of the tropics – we need to maintain and protect a wide network of forest areas. Without such a landscape-scale approach we can expect many species to go regionally extinct."

Dr Joice Ferreira, a co-author from the Brazilian Agricultural Research Center, said: "These findings are timely as Brazil recently revised its environmental laws regulating forests, allowing a trading system for private reserves and designing plans for environmental restoration.

"For example, the high variation in biodiversity found in secondary forests indicates the role these ecosystems play in regional conservation. For many areas of the Amazon, conserving existing secondary forests may be much cheaper and even more efficient than planting trees."

More information: "How pervasive is biotic homogenization in human-modified tropical forest landscapes?" *Ecology Letters* August 24
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