

## Wildlife in tropics hardest hit by forests being broken up

December 5 2019





Sunbear (*Helarctos malayanus*) -- one of the tropical mammal species found to be negatively affected by forest edge in Malaysian Borneo. Credit: Matt Betts



Tropical species are six times more sensitive to forests being broken up for logging or farming than temperate species, says new research.

A team led by Oregon State University and including Imperial College London scientists found that sensitivity to <u>forest</u> fragmentation—the breakup of forests by human activities like logging or farming—increased six-fold at low versus high latitudes, putting <u>tropical</u> <u>species</u> at greater risk of extinction.

The finding, published today in *Science*, could allow researchers to design more effective conservation schemes, such as leaving larger areas of pristine forest intact in tropical areas.

Co-author Professor Rob Ewers, from the Department of Life Sciences at Imperial, led the data collection. He said: "Our research suggests that actions as simple as building roads through forests have far greater <u>ecological impact</u> in the tropics than they do in the temperate world. We need to tread very lightly in these sensitive ecosystems.

"It also provides important nuance in conservation planning. It explains why plans used in one place don't necessarily work in another, and gives us great insight into how we should be tailoring our plans to account for ecological history."

The researchers tested the 'extinction filter hypothesis', which suggests animals that evolved in environments that suffer regular disturbances—such as fires and hurricanes—should be more likely to cope with new disturbances like deforestation.

These disturbed conditions occur more regularly in temperate latitudes, so the species in those forests were expected to fare better under forest fragmentation.







Unfragmented tropical forest in Costa Rica. Species that evolved in landscapes with little large-scale disturbance -- like this one in the tropics -- tend to be more sensitive to deforestation and edge effects than those that have persisted in landscapes with disturbances like fires and windstorms. Credit: Christian Ziegler

The team gathered 73 datasets of forest species abundance around the world collected over the past decade and used modeling software to separate the effects of fragmentation from other factors. The datasets contained 4,489 species from four major taxa—arthropods (2,682); birds (1,260); reptiles and amphibians (282); and mammals (265).

They looked for 'edge avoidance' - animals that do not like living near the edges of forests, where conditions like light and moisture are markedly different from the dense core. Edges are created when forests are broken up by deforestation and other human activities like farming or roads, such that 70 percent of Earth's remaining forest is within one kilometre of the forest edge.

They found that in low-disturbance regions, nearer the equator, 51.3 percent of forest species tend to avoid edges compared to 18.1 percent in high-disturbance zones further from the equator.

First author Professor Matt Betts, from Oregon State University, said: "Biodiversity of vertebrates increases massively toward the equator, but even accounting for that, a greater proportion of species are more sensitive to fragmentation. Sensitivity increases six-fold at low versus <u>high latitudes</u>.

"That means that not only should we care about the tropics because so



many species are found there that are found nowhere else on Earth, but those species are also more sensitive to how we treat the forests."

Although species at temperate latitudes are less sensitive to forest fragmentation, there are still some species that will be negatively impacted, and this is predicted to rise as species gradually move toward the poles in response to climate change.

Co-author Dr. Cristina Banks-Leite, from the Department of Life Science at Imperial, said: "Tropical forests are at increasing danger from human activities. The results we obtained show how the expansion of roads and agriculture in the tropics can drive species extinction even when overall forest cover levels are maintained.

"These results allow us to better focus conservation and restoration activities depending on the history of disturbance of a region. In Brazil, for instance, the Atlantic Forest has a longer history of disturbance than the Amazon. So, in the Atlantic Forest we could expect that an increase in forest cover would lead to high gains of species, even if this new forest is fragmented. In the Amazon, on the other hand, either deforestation or simply the creation of a new road could lead to <u>species</u> losses."

**More information:** M.G. Betts el al., "Extinction filters mediate the global effects of habitat fragmentation on animals," *Science* (2019). <u>science.sciencemag.org/cgi/doi ... 1126/science.aax9387</u>

"Lasting signature of forest fragmentation," *Science* (2019). <u>science.sciencemag.org/cgi/doi ... 1126/science.aba1103</u>

Provided by Imperial College London



Citation: Wildlife in tropics hardest hit by forests being broken up (2019, December 5) retrieved 28 April 2024 from <u>https://phys.org/news/2019-12-wildlife-tropics-hardest-forests-broken.html</u>

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.