

# Researchers say tropical protected areas are struggling to sustain their biodiversity

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Juvenile iguana

(Phys.org) -- Stirling researcher Katharine Abernethy is one of over 200 scientists involved in a study which concludes that many of the world's tropical protected areas are struggling to sustain their biodiversity.

The study, "Averting [biodiversity](#) collapse in tropical forest protected areas" is published in the journal *Nature*. It was prompted by the rapid disruption of tropical forests which probably threatens global biodiversity more than any other contemporary phenomenon.

With advancing deforestation, protected areas are increasingly becoming final refuges for threatened species and natural ecosystem processes. However, many protected areas in the tropics are themselves vulnerable to human encroachment and other environmental stresses. As pressures

mount, it is vital to know whether existing reserves can sustain their biodiversity.

Led by Professor William Laurance from James Cook University in Cairns, Australia, and the Smithsonian Tropical Research Institute in Panama, the international team studied more than 30 different categories of species - from trees and butterflies to primates and large predators - within protected areas across the tropical Americas, Africa and Asia-Pacific.

Dr Abernethy said: “Safeguarding areas where natural ecosystem processes can still function normally is vital to our understanding of the role of each and every organism within the system.

“We know that each part of the biodiversity has a key role somewhere, like the functions of a body. Without a vision of the whole or, worse, if species are lost, it becomes difficult to understand the reasons for biological change and we become unable to conserve or manage our natural environment well.”



Deforestation in Malaysia

The team estimated how species had changed in numbers over the past two to three decades, while identifying environmental changes that might threaten the reserves.

While most reserves are helping to protect their forests, about half are struggling to sustain their original biodiversity. Species under the greatest threat include big predators and other large-bodied animals, many primates, old-growth trees, and stream-dwelling fish and amphibians, among others.

University of Stirling staff based in Gabon - one of the protected countries surveyed - contributed vital data on the biodiversity, management and ecological processes of the Lopé National Park.

Dr Abernethy commented: “Our original data on many of the highly-threatened species groups, and their roles in forest ecology, together with those from other sites in the study, provided a baseline from which the rates of ecological change and species loss in the protected sites could be measured in the light of the threats and management actions undertaken.

“The pan African analysis has allowed us to understand what works and what doesn’t in enabling Parks to achieve their goal of protecting biodiversity and ecological function, and to focus on what we need to change to ensure better success.”

The researchers found that reserves that were suffering most were those that were poorly protected and suffered encroachment from illegal colonists, hunters and loggers. Deforestation is advancing rapidly in tropical nations and most reserves are losing some or all of their surrounding forest.

The team found many nature reserves acted like mirrors - partially reflecting the threats and changes in their surrounding landscapes. If a

park has a lot of fires and illegal mining around it, those same threats could penetrate the protected area.

The researchers conclude that protected areas are managing to safeguard our natural environment, but that they are under severe threat and cannot ensure conservation without critical support.

“A better job needs to be done in protecting the protected areas,” says Dr Abernethy. “That means fighting both their internal and external threats and building support for protected areas among local communities. Such efforts will help ensure [protected areas](#) are more resilient to future threats such as climate change.”

Provided by University of Stirling

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