Widespread local extinctions in tropical forest 'remnants'

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The small fragments of tropical forests left behind after deforestation are suffering extensive species extinction, according to new research led by the University of East Anglia (UEA).

Publishing today in the journal PLoS ONE, the researchers carried out a comprehensive assessment to estimate the long-term impact of forest fragmentation and hunting on tropical biodiversity in Brazil.

They studied the Atlantic Forest of eastern Brazil, including the region's largest and least disturbed old-growth forest remnants, and found that remaining habitat fragments had been virtually emptied of their forest wildlife.

White-lipped peccaries were completely wiped out, while jaguars, lowland tapirs, woolly spider-monkeys and giant anteaters were virtually extinct. Defaunation even extended to forest remnants with relatively intact canopy structures.

Widespread agricultural expansion has transformed the world's tropical forests, leaving few remaining blocks of primary forests unaltered by humans. There have been scattered reports of large mammal extinctions throughout Brazil, but the conservation value of a rapidly growing number of small forest remnants in highly-fragmented tropical forest landscapes has been hotly debated.

Senior author Prof Carlos Peres, of UEA's School of Environmental

Sciences, said: "You might expect forest fragments with a relatively intact canopy structure to still support high levels of biodiversity. Our study demonstrates that this is rarely the case, unless these fragments are strictly protected from hunting pressure.

"There is no substitute for strict protection of remaining forest fragments in biodiversity hotspots like the Brazilian Atlantic Forest. Protection of forest cover alone is not enough to sustain tropical forest species, as overhunting compounds the detrimental effects of small habitat area and isolation."

Drawing on information from wildlife surveys and local interviews conducted at 196 forest fragments spanning a vast region covering 252.670 km2, Dr Peres worked in partnership with Dr Gustavo Canale of the State University of Mato Grosso (UNEMAT). They investigated the effects of anthropogenic landscape alteration and other impacts, such as hunting, on the survival of large vertebrate species.

The researchers travelled more than 205,000km by treacherous dirt roads to uncover the largest and least disturbed forest fragments left in this vast region of the Atlantic Forest.

"We uncovered a staggering process of local extinctions of mid-sized and large mammals," said Dr Canale.

Around 90 per cent of the original Atlantic Forest cover (about 1.5 million km2) has been converted to agriculture, pasture and urban areas, and most of the remaining forest patches are smaller than a football pitch. On average, forest patches retained only four of 18 mammal species surveyed.

This study - the first to document the loss of five large tropical forest mammals from one of the world's most endangered tropical biodiversity

hotspots - highlights the critical importance of the few legally protected areas established in the Atlantic Forest.

"We found that the protected areas retained the most species-rich forest fragments in the region," said Dr Canale. "We therefore recommend the implementation of new strictly protected areas, such as National Parks and Biological Reserves, including forest fragments containing populations of endangered, rare and endemic species, particularly those facing imminent extinctions."

However, many of the existing protected areas are far from secure.

Prof Peres said: "A growing number of reserves are being degraded, downsized, if not entirely degazetted, so holding on to the last remaining large tracts of primary forests will be a crucial part of the conservation mission this century."

With the global population projected to surpass nine billion by 2050, tropical forests will face increasing threats posed by anthropogenic land-use change and overexploitation.

"Human populations are exploding and very few areas remain untouched by the expanding cornucopia of human impacts," said Prof Peres. "It is therefore essential to enforce protection in areas that are nominally protected 'on paper'. The future of tropical forest wildlife depends on it."

More information: 'Pervasive defaunation of forest remnants in a tropical biodiversity hotspot' by Gustavo R. Canale, Carlos A. Peres, Carlos E. Guidorizzi, Cassiano A. Gatto and Maria Cecília Kierulff will be published online by *PLoS One* on Tuesday August 14.

Provided by University of East Anglia