**Tropical forests recover carbon faster than plant biodiversity**

A new study of tropical forests has concluded that plant biodiversity takes longer to recover than carbon storage in regrowing forests following major disturbances such as farmland clearance.

The findings, published in the scientific journal Proceedings of the Royal Society B, have important implications for conservation since regrowing forests are now widespread in South and Central America. In addition, over half of all tropical forests have already been converted for agriculture, logged or burnt in the recent past. Regrowing forests studied like those examined in this study could help to soak up emissions produced by human activities and potentially help to reduce extinctions.

The scientists concluded that although carbon recovered quickest, even after 80 years regrowing forests tended to have less carbon than undisturbed forests. This is probably because these forests are often dominated by small, fast growing trees. It may take centuries for larger trees which hold more carbon to become established.

In contrast, the number of tree species recovered quickly, but many species associated with undisturbed forests were rare in regrowing forest. This is worrying because these species are probably those most vulnerable to extinction.

This new research is the first large scale analysis of both plant biodiversity and carbon pool recovery in tropical secondary forests - areas which have re-grown after a major disturbance such as farmland clearance.

The research team which included scientists from the Centre for Ecology & Hydrology and Bournemouth University conducted a synthesis of data collected from more than 600 secondary forest sites from 74 previous studies, describing carbon pools and plant biodiversity. Each site had comparable data for a nearby site that was relatively free of human disturbance.

Lead author Phil Martin, a PhD student at the Centre for Ecology & Hydrology, said, “We think plant species normally found in undisturbed forests are failing to colonise regrowing forests because their seeds never get there. These recovering forests are often far from undisturbed forests and surrounded by farmland. This means forest animals cannot move seeds between the two forests. We suggest that when conservationists aim to restore tropical forests they should help dispersal of seeds from undisturbed to regrowing areas by planting trees throughout the wider landscape.”

In the study the researchers point out that these results show that forests that are regrowing following agricultural use may be more valuable for the carbon they store than for their biodiversity for the first 100 years. Policies such as Reducing Emission from Deforestation and Degradation (REDD) often assume that carbon and biodiversity are interchangeable. This work shows this is not the case.

Co-author Professor James Bullock from the Centre for Ecology & Hydrology said, “Our results clearly indicate that preservation of old-growth forests is vital for the conservation of some specialist species. However if a forest is recovering after clearance policymakers should not assume that biodiversity and carbon recovery are closely related.”

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