Carbon pools recover more rapidly than plant biodiversity in secondary tropical forests

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The problem

Tropical forests:
• 1/2–2/3 of global terrestrial biodiversity
• 40% of terrestrial carbon pools

• But they are being rapidly converted for agriculture.
• Thus, forest restoration is a priority & a key CBD 2020 goal.

However, we lack evidence of how restoration affects carbon pools and plant biodiversity, particularly in the long term.

Research questions

To address this knowledge gap we asked:
1. What factors influence the recovery of carbon pools in secondary forests relative to primary forest?
2. What factors influence the recovery of plant biodiversity in secondary forests?

What we did

Carried out systematic review
Identified studies which used primary forest as a reference
Extracted data from studies
Used mixed models and model averaging to assess recovery

What we found out about…

1. …carbon pool recovery

• Tropical dry forest closer in reaching biomass equivalent to that in primary forests than moist and wet forests.

• Soil C takes longer to recover after arable agriculture than conversion to pasture and shifting agriculture.

2. …plant biodiversity recovery

• Plant species richness increases with age but is a poor measure of recovery as it does not account for species identity.

• The proportion of tree species shared between secondary and primary forests is only very weakly related to time since disturbance.

Implications for restoration

• In tropical forest restoration schemes biodiversity recovery may lag behind that of carbon pools.
• As such CBD goals to enhance carbon stocks may be more easily met than improving the status of biodiversity through restoration.

More info

For more information on my project use the QR code to the right or visit my blog at ecologyforacrowdedplanet.wordpress.com or email me at pmart@ceh.ac.uk