Integrating the avoidance of forest degradation into systematic conservation planning in the Eastern Amazon

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Undisturbed forests are becoming increasingly rare in the tropics. The area of forest degraded by some form of disturbance, such as logging or fire, in the Brazilian Amazon now greatly exceeds that which had been deforested. Yet forest policy in the Amazon, as elsewhere in the tropics, remains overwhelmingly focused curbing the rate of forest loss without considering impacts on forest quality. We use a unique data set from the Sustainable Amazon Network (RAS), in the eastern Brazilian Amazon to assess the impacts of forest disturbance on biodiversity and assess the benefits of including avoided degradation measures in conservation planning. Biodiversity data on trees and fauna from two large regions, Santarém and Paragominas, were combined with remote sensing data to model biodiversity patterns as well as estimates of above-ground carbon stocks across a range of land-use types and forest conditions. We found that impact of forest disturbance on biodiversity loss in the state of Pará equates to double that lost from deforestation alone, -the equivalent of losing 92,000-139,000 km2 of primary forest. We found a strong positive relationship between increasing carbon stocks and higher biodiversity in varyingly disturbed forests. Simulations demonstrated that a carbon-focused conservation strategy is least effective at conserving biodiversity in the least disturbed forests, highlighting the importance of on-the-ground biodiversity surveys to prioritise conservation investments in the most species rich forests. We explored trade-offs among management actions to guide priorities for habitat protection, avoided degradation and restoration and found that where restoration imposes significant opportunity and implementation costs, efforts to avoid and reverse the degradation of existing forests can deliver greater returns on investment for biodiversity conservation. Systemic planning of forest management options at regional scales can

substantially improve biodiversity outcomes while greatly reducing costs and risks. These results provide new and valuable information for regulators, conservation practitioners and landowners in this biologically unique region.

Publication:
American Geophysical Union, Fall Meeting 2017, abstract #B12A-08

Pub Date:
December 2017

Bibcode:
2017AGUFM.B12A..08F

Keywords:
0414 Biogeochemical cycles; processes; and modeling;
BIOGEOSCIENCES; 0426 Biosphere/atmosphere interactions;
BIOGEOSCIENCES; 0439 Ecosystems; structure and dynamics;
BIOGEOSCIENCES; 1632 Land cover change; GLOBAL CHANGE