Selectively logged Amazon forests play important role in climate

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Logging road and surrounding forest five years after logging in a concession applying reduced impact logging. Taken in Amapà, Brazil. Credit: Ervan Rutishauser

With careful management, selectively logged tropical Amazonian forests can recover their carbon stocks within a cutting cycle of 20 to 30 years, according to researchers who report their findings in the Cell Press journal *Current Biology* on September 21. The findings show that sustainably logged tropical forests continue to play a key role in global carbon sequestration, with important implications for global climate.

"We found that under current timber-harvesting intensities, Amazon forests logged with reduced-impact logging techniques shall recover their initial carbon stock in 7 to 21 years," says Ervan Rutishauser of CarboForExpert in Switzerland and CIRAD in France. "This is fast, compared to the recovery time of commercial volumes that can take up to a century to go back to pre-logging stocks."

About half of the remaining tropical forests are designated for timber production. And yet little is known about how those forests respond to logging pressure at the regional level. To find out, Rutishauser and colleagues conducted the first comprehensive assessment of post-logging recovery of above-ground carbon stored in trees across the whole Amazon Basin. The work was made possible with the development of Tropical Managed Forests Observatory, a pan-tropical network aimed at understanding the long-term effects of logging on tropical forest ecosystems.

The researchers focused on 79 permanent TmFO sample plots representing 376 hectares of forested area at 10 sites across the Amazon Basin. Their goal was to determine the rate at which the recovering

forest can recapture carbon emitted through logging. They also sought to identify the main drivers determining that time to recovery of post-logging tree carbon.

Their analysis reveals a recovery time of 7 to 21 years under current logging intensities (10-30 m3/ha). That time to recover initial carbon stocks after selective logging depended almost exclusively on logging intensity—that is, on the amount of tree biomass removed or killed during timber harvesting.

"Our results imply that the time to recover carbon stocks does not significantly vary across the entire Amazon Basin, despite a well-known Northeast-Southwest environmental gradient," Rutishauser says.

The finding can now serve as a useful decision-making tool for forest managers and policy makers, the researchers say. They note, however, that poor logging practices continue to degrade many forests, while others continue to be cleared and converted into more profitable pasture and plantations.

The researchers' next step is to explore the time to recovery of forests under heavier commercial logging intensities across TmFO.

"While carbon-oriented forestry might trigger a shift toward sustainable forest management, wood supply shall remain the principal objective of forest management," Rutishauser says. "Our aim is to provide scientific evidence and practical guidance to define sustainable harvest intensities that ensure both long-term timber harvest and maintenance of carbon stocks."

More information: *Current Biology*, Rutishauser et al.: "Rapid tree carbon stock recovery in managed Amazonian forests" dx.doi.org/10.1016/j.cub.2015.07.034

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