

Want to fight climate change? Don't poach gorillas (or elephants, hornbills, toucans, etc.)

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Wildlife that disperse large seeds like this toucan are key to preserving carbon rich tropical forests. Credit: John Robinson/WCS

Here's a climate solution we can all get behind: don't kill elephants. Or poach gorillas—or wipe out tapirs, hornbills, or other large-bodied wildlife that eat fruit and disperse large seeds. That's because a new paper by the Wildlife Conservation Society (WCS) has found that overhunting these species makes forests less able to store or sequester carbon. The authors describe their results in the journal *PLOS Biology*.

The authors found that many of the mammals and birds targeted by illegal and commercial hunting are fruit eaters that disperse large seeds from [tree species](#) with high carbon stock capacity. The paper says the loss of these large frugivores such as primates, hornbills, toucans and others changes the composition of forests over time so that wind-dispersed or small-seeded tree species with lower wood density, and therefore lower amounts of carbon, become more prevalent.

Said the study's lead author, Dr. Elizabeth Bennett, WCS Vice President of Species Conservation, "Many tropical forests have been described as 'empty' owing to loss of animals, often as a result of unsustainable subsistence or market hunting. Such hunting is known to have detrimental effects on [target species](#), broader biodiversity, and the livelihoods and well-being of local communities. Less appreciated is the adverse impact of defaunation on the capacity of tropical forests to sequester and store carbon, which has implications for climate change."

In the Neotropics, for example, defaunation of large primates and tapirs, which disperse seeds from large-seeded trees with higher wood density, is predicted to lead to long-term losses in above-ground tree biomass of an average of 3%–6%, but to as much as nearly 40%. In central Thailand, tree species dependent on seed dispersal by large-bodied frugivores account for nearly one-third of the total carbon biomass.

The authors point out that emerging efforts to reduce net emissions by restoring tropical forests through planting seeds and seedlings typically

involves small-seeded, largely second-growth species. Large-seeded, animal-dispersed tree species are typically underrepresented in seedlings acquired for restoration plantations. Once lost, restoration of animal populations is difficult, especially in the absence of their food sources, and this would constrain the capacity of restored forests to store and sequester carbon.

The findings underscore how ecologically intact forests—large, unbroken swaths of forests that are free of significant human-caused damage and containing full assemblages of wildlife—are of particular importance. High-integrity tropical forests are estimated to remove and store around 3.6 billion tons of CO₂ per year (net) from the atmosphere.

Said co-author, Dr. John Robinson, Joan L. Tweedy Chair in Conservation Strategy at WCS, "Animals have a vital role in maintaining the integrity of such forests; those forests with their full complement of faunal species, at healthy population densities, sequester and store more carbon than those that have lost components of their fauna. Maintaining intact faunas is therefore a critical component of any strategy to conserve forests to address [climate change](#)."

Another negative climate impact is the loss of wildlife from hunting that affects total forest carbon storage by removing carbon that is stored in animal bodies. For example, an adult forest elephant holds about 720kg (1,587 pounds) of carbon (2.64 tons of CO₂e). The 11,000 elephants killed in a single national park in Gabon from 2004–2012 would therefore have meant the loss of 7,920 tons of carbon storage, equivalent to 29,040 tons of CO₂e.

The authors note that there are already markets that value the [carbon sequestration](#) and storage capacity of forests, with REDD+ (Reduced Emissions from Deforestation and forest Degradation) being the most developed. These mostly voluntary markets have so far largely focused

on the carbon in the forest trees and on reducing emissions by avoiding deforestation and forest degradation. As the loss of large animals degrades the carbon content of the forest, over both the short and long term, there is a market opportunity to incorporate the carbon bonus of an intact fauna to strengthen the existing biodiversity evaluations to include a demonstration of full ecological integrity of protected fauna.

Said Bennett, "Explicitly valuing wildlife for its role in the sequestration and storage of carbon in [tropical forests](#), and creating a market for intact faunal assemblages, can potentially generate significant revenues for [forest](#) and hunting management. Such a market is one way to pay for the multi-faceted programs needed to conserve forests with their full complement of large faunal species, while also ensuring the nutritional health and well-being of local communities in [carbon](#)-friendly ways."

More information: To avoid carbon degradation in tropical forests, conserve wildlife, *PLOS Biology* (2023). [DOI: 10.1371/journal.pbio.3002262](#)

Provided by Wildlife Conservation Society

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