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Contact:
moreno.dimarco@gmail.com

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Recognising synergies and trade-offs could slow world's biodiversity loss

Amid efforts to reduce the loss of global biodiversity, a new study discusses how synergies and trade-offs between different conservation objectives should be researched and recognised in policy making. For example, by increasing protected areas, habitat loss and species decline could also be prevented.

In 2010, world governments failed to meet the goal of significantly reducing the rate at which biodiversity is declining that they had set in the Convention on Biological Diversity in 2002. At the tenth meeting of the convention in 2010, the parties adopted 20 new biodiversity targets, to be achieved by 2020. These ambitious targets include everything from increasing awareness of conservation issues and reforming harmful policies, to expanding protected areas and reducing the loss of natural habitat.

However, synergies and trade-offs exist between different targets and between different strategies to achieve them, most of which are not well understood. The researchers looked at how Target 11, which says protected area coverage must be expanded to 17% of terrestrial land, can synergise or trade-off with other targets. In particular, they investigated whether protected area expansion could be used to also reduce habitat loss (Target 5) and human-induced species decline (Target 12), and which of these targets would contribute most to the maintenance of global carbon stocks (Target 15). They focused on forests and forest-dependent vertebrates as an example.

First, they calculated the rates of forest loss and gain from 2000–2012, using a global grid with a resolution of 1 km. They then looked at how many different forest-dependent vertebrate species, such as amphibians, birds, and mammals — 10 747 in total — reside in the world's forests, and whether their habitat was subject to deforestation. The higher the forest cover in a given area, the higher the value placed on it when trying to reduce forest loss. The more species a forest could potentially support, the higher the value placed on it when trying to reduce species habitat decline.

This resulted in two recommendations: where it would be best to reduce forest loss, and where it would be best to reduce decline of forest species. Both could be achieved by increasing protected area coverage. They discovered that the grid cells facing the highest amount of forest loss and those facing the highest species habitat loss overlapped by 73%, uncovering a synergy between Targets 5, 11, and 12. Essentially, putting protected areas in these overlapping areas could help meet all three targets. The other 27% represented a trade-off between targets 12 and 5, because these areas either had the highest loss of forest or the highest loss of forest species habitat. For example, some areas suffering from severe deforestation actually do not house many forest species. Or, areas such as the Congo basin had high rates of species' habitat loss but not the highest global rates of deforestation *per se*.

Another trade-off emerges in their work when Target 15, protecting the world's carbon stocks, enters the equation. If protected areas were increased to maximise benefit to forest species, 30% more carbon would be protected, compared to expanding protected areas in places with highest forest loss.

While the researchers note that there are numerous solutions and complexities on the table, the expansion of protected areas remains among the most effective tools for conserving biodiversity and halting the conversion of natural areas.

The researchers urge for strategic thinking when pursuing global biodiversity targets. They suggest that securing areas where multiple targets can be achieved under the same investment is an urgent priority, before options for co-benefit are compromised by human pressure.