

Could more intensive farming practices benefit tropical birds?

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Cattle pasture next to contiguous forest. When further from large forests, low-intensity farming loses more total evolutionary history of birds. Credit: David Edwards

The world is facing an extinction crisis as more and more forests are converted into farmland. But does it help when farms share the land with birds and other animals?

The short answer is "no," according to new evidence based on the diversity of bird species reported in the Cell Press journal *Current Biology* on September 3. If the goal is to preserve more bird species, representing a greater span of evolutionary history, then it's better to farm more intensively in some areas while leaving more blocks of land entirely alone. In other words, land-sparing wins out over land-sharing.

"I think the most surprising result is that [species richness](#) within communities does not explain the loss of phylogenetic diversity under land-sharing," says David Edwards of The University of Sheffield. "So even if farming at low intensity over a larger area retains the number of species present, those species are less evolutionarily distinct and thus preserve less [phylogenetic diversity](#)."

Edwards and his colleagues examined this question of farming practices in the Chocó-Andes of Colombia, a global hotspot for birds, including many species that can't be found anywhere else. It's also a place where tropical cloudforest landscapes are threatened by widespread pastures for cattle.

"The Chocó-Andes are a hotspot of endemism and have been widely impacted by low-intensity farming, making this one of the most threatened faunas on Earth," Edwards says. "It is vital to consider how best to farm here, but also to use this region as a model for how best to farm in other locations."



Low-intensity farmland with isolated trees and forest patches retains less total bird evolutionary history than farming more intensively and protecting contiguous forest (background). Credit: David Edwards.

The researchers sampled birds in three study areas, each containing contiguous forest and cattle farms. While they found many [bird species](#) living within low-intensity farmland communities, those areas showed a loss of more than 650 million years of [evolutionary history](#) in comparison to the forest.

Edwards and his colleagues then used landscape simulations to examine the outcomes of land-sharing versus land-sparing practices. Their

analyses show that land-sharing becomes increasingly inferior to land-sparing as the distance from intact forest grows. Isolation from forest also leads to the loss of more evolutionarily distinct species from communities within land-sharing landscapes, which can be avoided with effective land-sparing.

Edwards's team concludes that "land-sharing policies that promote the integration of small-scale wildlife-friendly habitats might be of limited benefit without the simultaneous protection of larger blocks of natural habitat, which is most likely to be achieved via land-sparing measures."

There's plenty of work to do in order to simultaneously protect natural habitats and boost farm yields. Sustainability initiatives for oil palm, soy, and other crops now take a land-sharing approach by requiring the protection of biodiversity within tropical farmland.

"My feeling is that land-sparing-type approaches—such as biodiversity offsets, which can protect larger tracts of natural habitat—are gaining traction, but there is a long way to go for expansion of such policies writ large," Edwards says.

More information: *Current Biology*, Edwards and Gilroy et al.: "Land-Sparing Agriculture Best Protects Avian Phylogenetic Diversity"
[dx.doi.org/10.1016/j.cub.2015.07.063](https://doi.org/10.1016/j.cub.2015.07.063)

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