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Title:

Gain of habitat-generalist birds does not compensate for loss of forest-dependent birds across a gradient of forest cover

Abstract:

The amount of native habitat cover in anthropized landscapes plays a major role in driving species richness and composition. The decrease in tropical forest cover causes different effects on species with different habitat requirements. While forest-specialist species are highly sensitive to deforestation due to their dependency on closed habitats, habitat-generalists are less affected by changes in habitat structure. Nevertheless, the diversity components of species compositional shifts and the species distribution thresholds according to the amount of habitat cover remain poorly understood. Here, we evaluated how the amount of forest cover determines the richness and composition patterns of forest-dependent and habitat-generalist bird species in the Atlantic Forest from Brazil. We additionally established a threshold for the change in species distribution along a forest cover gradient. We sampled the bird communities from 40 landscapes with independent gradients of forest cover ranging from ~1.3% to ~90% (within a 1000 m radius). Decreasing forest cover reduced the richness of forest-dependent species and increased the richness of habitat-generalist birds. However, the gain of habitat generalists did not compensate for the loss of forest-dependents birds. For example, a 10% decrease in forest cover led to the loss of ~4 forest-dependents and the gain of only ~2 habitat generalists. As a result, we demonstrated that the loss of forest-dependent bird species and the gain of habitat-generalist were the primary causes of increased differences in bird community composition. Furthermore, the main threshold for the change in species composition was determined to be 32% of forest cover. In landscapes with less than 32% of forest cover, the exclusion of forest-dependent species may reach up to 23%. Thus, the amount of forest cover in tropical landscapes is a deterministic factor for the structure and dynamics of communities. Evaluating the thresholds at the species level proved to be a more effective tool for conservation of species, mainly for forest-dependent species, and are essential for devising more effective environmental policies in tropical forests to maintain ecosystem integrity.

Keywords:

Forest Amount, Thresholds, Atlantic Rainforest