

House Price Index Predicts a Larger Impact of Habitat Loss than Primary Productivity on the Biodiversity of North American Avian Communities

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Abstract : Habitat loss due to land use change is one of the leading causes of biodiversity loss worldwide. This form of habitat loss is a non-random phenomenon since the same environmental factors that make an area suitable for supporting high local biodiversity overlap with those that make it attractive for urban development. We aimed to compare the effect of two non-random habitat loss predictors on the richness, abundance, and rarity of nature-affiliated and human-affiliated North American breeding birds. For each group of birds, we simulated the non-random habitat loss using two predictors: the House Price Index as a measure of the attractiveness of an area for humans and the Normalized Difference Vegetation Index as a proxy for primary productivity. We compared the results of the two non-random simulation sets and one set of random habitat loss simulations using an analysis of variance and followed up with a Tukey-Kramer test when appropriate. The attractiveness of an area for humans predicted estimates of richness loss and increase of rarity higher than primary productivity and random habitat loss for nature-affiliated and human-affiliated birds. For example, at 50% of habitat loss, the attractiveness of an area for humans produced estimates of richness at least 5% lower and of a rarity at least 40% higher than primary productivity and random habitat loss for both groups of birds. Only for the species abundance of nature-affiliated birds, the attractiveness of an area for humans did not outperform primary productivity as a predictor of biodiversity following habitat loss. We demonstrated the value of the House Price Index, which can be used in conservation assessments as an index of the risks of habitat loss for natural communities. Thus, our results have relevant implications for sustainable urban land-use planning practices and can guide stakeholders and developers in their efforts to conserve local biodiversity.

Keywords : biodiversity loss, bird biodiversity, house price index, non-random habitat loss

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