## S9 Text. Biodiversity risk index assessment

We use the species-area relationship (SAR) to account for potential biodiversity trade-offs associated with each scenario of agricultural production in LAC. SAR models have been widely applied to account for biodiversity impacts linked to land use changes and habitat loss, e.g [1–4]. Specifically, we apply a countryside model [5] to predict endemic bird's risk of extinction and endangerment ($S_{risk}$) attributable to agricultural expansion. We limit the study to birds since taxon's sensitivity to different forms of land-use change is well studied, and data on their conservation status and spatial range are most reliable, updated, and readily available from IUCN (2008) [6] and CIESIN-Nature Server (2008) [7]. To avoid the scale dependency factor [1] when assessing the extinction rate we limit our study to endemic birds i.e., species with breeding range limited to Latin America and the Caribbean (LAC).

Original SAR models, also called conventional power models, assume that variations in species number is mainly a function of changes in habitat size. These models have been questioned as they tend to overestimate extinction rates [8, 9]. Overestimation is due to a large extend to the oversimplification of species-habitat relationships which ignore critical factors like differential responses of species to matrix composition, permeability and the existence of different degrees of habitat suitability, e.g. [10–12]. Countryside models partially fill some of the main gaps of the more conventional power models as they take into account taxon's affinity and adaptability to changing conditions, and can be formulated as:

$$S_{risk,t} = \frac{S_{new,t}}{S_{org}} = c\left(\frac{\sum_{j=1}^{4} h_j * A_{new,t}}{A_{org}}\right)^{z} \qquad \text{(Eq. S9.1)}$$

where $S_{new}$ is the number of bird species recorded in year $t$ and $S_{org}$ is the original number of bird species. $A_{new}$ is the remaining habitat size in year $t$ and $A_{org}$is the original habitat area. $c$ is a constant and depends on the type of taxon and region, $h_j$ represents the suitability of birds to habitat $j$, and $z$ is also a constant indicating the rate of species change per unit of area [13]. Positive values of $S_{risk}$ imply an increase in the birds' risk of extinction and endangerment, while negative values will entail a risk reduction over time. Negative values might occur as a result of a reduction in the agricultural area (cropland/pasture land) in some FPUs. To account for the impacts that agricultural abandonment and forest re-growth might have on biodiversity, we assume that $h_j$ for these new (regrown) habitats equal those of natural vegetation. Information on the different habitat types $j$ and $Anew$ by FPU in 2010 is obtained from the 300 meter resolution 2009 Global Land Cover Map [14]. Original land uses are grouped into four main classes (habitat types $j$): natural vegetation, cultivated area, cultivated pastures and urban/artificial. To determine the suitability of bird species to the different habitat types ($h_j$) we use the data provided by Koh and Ghazoul (2010) [2]. To improve model performance, $h_j$ values are calibrated, and finally set to: $h = 1$ for natural vegetation; $h = 0.45$ for pastures; $h = 0.32$ for croplands and $h = 0$ for urban/artificial.

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