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Effects of agricultural expansion on abundance of species in Amazon rainforest

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The dynamic equilibrium and high biodiversity of tropical rainforests is due to their long climate stability, strongly related to the latitudinal gradient effect among other biotic and abiotic factors. Understanding interactions and feedbacks between sectors at different spatial levels as well as across ecological and social structures could deeply influence global mitigation capacity. This study investigated the loss of forest specimen biodiversity as the agricultural frontier expands into the Amazon. A database was derived from a comprehensive set of thematic maps from the RADAMBRAZIL Project, a major survey from 1973 to 1982 by the Brazilian Ministry of Mines and Energy. We recovered RADAMBRAZIL Project database on forest inventory and used land use and land cover data from National Institute for Space Research (INPE) and Brazilian Agricultural Research Corporation (EMBRAPA) provided by TerraClass for 2008, when the New Brazilian Forest Code went into effect. The results showed that at least 15.57% of the individuals inventoried by the RADAMBRAZIL Project had been impacted until 2008 according to the anthropic area delimited by TerraClass, with individuals suppressed by the expansion of the agricultural frontier and other anthropogenic processes in the Amazon. We found that 84.43% of specimens inventoried by the RADAMBRAZIL Project are located in areas not disturbed until 2008. The three most important economic forest tree species within the Brazilian Amazon, i.e., copaíba (*Copaifera* sp.), andiroba (*Carapa guianensis* Aubl), and Brazil nut (*Bertholletia excelsa*), had losses of 17.14%, 25.13%, and 10.23%, respectively species inventoried by RADAMBRAZIL Project. We highlight the importance of these individuals in providing ecosystem goods and services to the region.

Keywords: Biodiversity, RADAMBRAZIL Project, specimens inventoried, TerraClass