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RESILIENCE OF TREE SPECIES RICHNESS IN LOWLAND RAIN FORESTS: IMPLICATIONS FOR FOREST CONSERVATION

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Most tropical forests are subject to several impacts, such as fragmentation, deforestation and selective logging, which result in loss of biodiversity. These impacts trigger the process of natural regeneration that involves changes in plant community composition, hence affecting ecosystem functions. Resilience is the capacity of an ecosystem to return to its original state after a disturbance including species composition, structures and ecosystem functions. To investigate the potential resilience of species richness (total, endemic and threatened species) in fragments of Atlantic Lowland Rain Forest, we performed a chronosequence study using 12 secondary forests with different ages (8-29yrs) and two mature forests. We established ten 10x10m plots equidistant 20 m; all live trees (CBH > 15 cm) were identified and classified as endemic or threatened. The resilience was given as the time forests take to achieve the species richness (total, endemic and threatened) of mature forests. We used Generalized Linear Models (GLMs) with quasibinomial family to test for effects of successional age on tree species richness resilience. We estimated resilience based on regression line coefficients. Our results show an increase in total species richness and endemic species richness with forest age ($p<0.001$ and $p<0.01$); therefore, late successional forests harbor more endemic species than initial forests. However, we found no relationships between threatened species richness and forest age ($p=0.069$). We predict that these secondary forests would take ~59 yrs to reach the total species richness and ~56 yrs to reach endemic species richness. Our findings suggest that these forests can be resilient due to a gradually recover of species richness and species with important conservation status. Hence, these results show we urgently need to plan strategies for selecting areas with high potential for natural regeneration, since it takes a long time for a clear cut forest to reach the original state of biodiversity.