



Land Reclamation in Brazilian Amazônia: A chronosequence study of floristic development in the national forest of Jamiri-RO mined areas

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Although reclamation techniques for forest ecosystems recovery have been developed over the past decades, there is still a great difficulty in the establishment on environment assessment, especially when compared to the non-disturbed ecosystems. This work evaluated the results and limitations on cassiterite-mined areas in reclamation, at Brazilian Amazônia. Floristic variables from 29 plots located on 15-year-old native species reforestation sites and two plots from preserved open/closed canopy forests were analyzed in a chronosequence way (2010-2015). Regeneration density, species richness, average girth, and average height were evaluated every year, by means of cluster analysis (Euclidian distance, Ward method) and submitted to multiscale bootstrap resampling ($\alpha=5\%$). It was conducted the regression analysis for each identified group in 2015 in order to verify differences between the chronosequence development. The results showed the existence of two main groups in 2010, one with all mined plots were allocated and other with open/closed canopy plots. After 2011 some mined areas became allocated in the open/closed canopy plots group. From 2013 and on open/closed canopy plots appeared shuffled in the formed groups, indicating the reclamation sites conditions became similar to natural areas. Finally, in 2015 three main groups were formed. The regression analysis showed that group three had a higher trend of development for regeneration density, with higher angular coefficient and higher values. For species richness all the groups had a similar trend, with values lower than open/closed canopy forest. In average girth higher trends were observed in group one and all values were near to open canopy forest in 2015. Average height showed better trends and higher values in group two. It was concluded that all mined sites had a forest recovery process. However, different responses to reclamation process were observed due to the differences in the degraded soils characteristics.

Keywords: Recovery, Restoration, Forest, Chronosequence, Cassiterite.