

Title: Modeling The Effectiveness of Protected Areas in Preventing Forest Loss in Southwest of Amazonia Arc of Deforestation, Lábrea, Brazil

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Thema: 1. Forests and biodiversity

Subtheme: 1.2 Deforestation and forest fragmentation

Abstract of the paper: The Brazil's Arc of Deforestation continues to expand across the Amazon region and has already reached southeast of the Amazonas State. This new deforestation frontier has affected part of Lábrea, a county in Amazonas State that has the 17th highest deforestation rate in the Brazilian Amazon. This high rate has been attributed to the pressure induced by the neighboring states of Acre and Rondônia, which have intense deforestation processes undergoing by expansion and consolidation of the agricultural and ranching frontier. The natural ecosystem impacts caused by land-use changes in Lábrea, specifically agricultural and ranching activities, have induced serious social conflicts contributing to expulsion of extractive workers, such as rubber tappers and Brazil nuts gatherers. Consequently, traditional families are demanding the creation of extractive reserves to protect themselves. Besides, as part of the Program for the Acceleration of Growth (PAC), the Ministry of Transportation plans to reconstruct the BR-319 highway (Porto Velho- Manaus), abandoned since 1988, and to recuperate part of the Transamazon highway (BR-230) connecting BR-319 to Lábrea. To avoid environmental consequences of these projects, the Brazilian government proposed in 2006 several protected areas in the region of BR-319 influences, including four in Lábrea. The aim of this study is to model the spatial dynamics of deforestation in Lábrea through future deforestation scenarios, and to evaluate the usefulness of proposed protected areas in containing deforestation. To assess deforestation inside protected areas, the model uses weights of evidence that represent probabilities of cells being deforested. First, weights of evidence of protected areas already created in Acre, Rondônia and the southern part of Amazonas State have been calculated and used to predict deforestation inside protected areas in Lábrea. Several scenarios of the deforestation were simulated with (Governance-GOV) or without the proposed protected areas (Business As Usual-BAU). In each of these scenarios, two study cases were considered, one where the weights of evidence were homogeneously distributed over the protected areas (1), and the other where the weights of evidence were gradually distributed in accord with an internal Euclidian distance function (2). The most realistic scenarios for our dataset is therefore considered to be those that use gradually distributed weights of evidence. In the scenario (GOV-2), deforestation was reduced in the study area by 5,1 % (2.596 km<sup>2</sup>) as a result of the reserves, when compared to the corresponding baseline scenario (BAU-2). The results underline the importance of creating protected areas to reduce deforestation.

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