



## Basal area reduction proliferates lianas in managed forests: liana quantification after logging, thinning and fire in Eastern Amazon<sup>(1)</sup>

Johan Slätis<sup>(2,5)</sup>, Lucas Mazzei<sup>(3,5)</sup> e Hanna Tuomisto<sup>(4,5)</sup>

<sup>(1)</sup>Work carried out with financial support from Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Capes).

<sup>(2)</sup> Universidade de Brasília, Brazil, <sup>(3)</sup> Embrapa Amazônia Oriental, Brazil, <sup>(4)</sup> University of Turku, Finland, <sup>(5)</sup> johan.slatis@aluno.unb.br; lucas.mazzei@embrapa.br; hanna.tuomisto@utu.fi

**Abstract**—Liana proliferation is suggested as one of the reasons for reduced tree growth and CO<sub>2</sub> sequestration in tropical forests. Lianas proliferate in disturbed forests such as managed forests. To quantify the increase of lianas, we analyzed the data of liana prevalence i.e., proportion of trees with lianas, recorded at Tapajós, Brazil from 1981 to 2012. The Tapajós experiment tests the impact of two different logging intensities and three thinning intensities. An uncontrolled fire burned part of the experimental area in 1997. Lianas increased 6 times in plots where the basal area reduction was > 25% (p<0.05), especially in plots with heavy thinning. Lianas increased 3 times in areas with a BA reduction of 15 – 25 % (logging and light thinning). In the primary forest (control) lianas reduced by 20% over the 31-year period. An unexpected tendency was found in the heavily thinned areas that burned (6 plots): Here increase of lianas was slower than in the areas not affected by fire. Liana proliferation might explain slow growth in managed forests. The slowest tree volume growth in Tapajós was in the heavy thinning areas with the highest liana prevalence. Even though liana suppression boosts tree growth, liana cutting is not practiced in managed forests in Eastern Amazon. Liana cutting is a win-win-win situation. Reducing lianas improve tree growth and CO<sub>2</sub> sequestration, it restores the proportion of trees and lianas, and it improves logging work safety. Liana suppression should be included in management plans and forest concession bidding processes.