
EFFECTS OF A SMALL SCALE NON-MECHANISED FOREST MANAGEMENT AND A HIGH IMPACT AND MECHANISED FOREST MANAGEMENT ON THE FOREST DYNAMICS AND GROWTH OF THE RESIDUAL TREES

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This study was performed in PSPs located at the CPAF-ACRE EMBRAPA experimental area and at the PC Peixoto management areas. At CPAF-ACRE the managed area was mechanically exploited in 1992 and at PC Peixoto animal traction was used to extract the planks. The periodic annual diameter increments recorded were 0.27 cm yr^{-1} . Differences in crown exposure and species groups had a highly significant effect on the annual mean growth of trees and no significant effect was found for diameter class. Stand basal area increment was higher in the mechanised logging ($0.26 \text{ m}^2 \text{ ha}^{-1} \text{ yr}^{-1}$) than in the low impact management in PC Peixoto ($0.09 \text{ m}^2 \text{ yr}^{-1} \text{ ha}^{-1}$) and in the undisturbed forest ($0.05 \text{ m}^2 \text{ ha}^{-1} \text{ yr}^{-1}$). The mean annual stand basal area increment of commercial species was $0.15 \text{ m}^2 \text{ ha}^{-1} \text{ yr}^{-1}$ ($1.4 \text{ m}^3 \text{ ha}^{-1} \text{ yr}^{-1}$) in the mechanised logged PSPs, $0.04 \text{ m}^2 \text{ ha}^{-1} \text{ yr}^{-1}$ ($0.3 \text{ m}^3 \text{ ha}^{-1} \text{ yr}^{-1}$) in the natural forest and $0.13 \text{ m}^2 \text{ ha}^{-1} \text{ yr}^{-1}$ ($1.1 \text{ m}^3 \text{ ha}^{-1} \text{ yr}^{-1}$) in PC Peixoto. Mortality varied from $2.1 \% \text{ yr}^{-1}$ in the undisturbed areas to 3.0% in the non-mechanised forest management and 4.1% in the mechanised forest management. Recruitment rates averaged 32 (natural forest), 36 (non-mechanised logging) and 50 (mechanised logging) plants $\text{ha}^{-1} \text{ yr}^{-1}$. Damage produced by exploitation in the PSPs PC Pedro Peixoto was $1.2 \text{ m}^2 \text{ ha}^{-1}$. Two years after logging species richness was similar in the PSPs at PC Peixoto than before logging. The density of stems of commercial species ($\text{dbh} > 5\text{cm}$) was also similar to the forest before logging.