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Silvicultural Treatments of Exotic and Native Tree Monocultures and Influence on Biodiversity Facilitation in Southern Ecuador. Preliminary Results

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Abstract

Forest plantations with exotic species in southern Ecuador have been characterised mostly by having negative externalities in both ecological and economic aspects. After 10 years of research in mountain forests in southern Ecuador on aspects of restoration and reforestation few native tree species with good growth response in comparison to exotic species have been identified. The knowledge transfer project New Forests for Ecuador aims at testing the potential shelter effect of exotic *Pinus patula* plantations and natural stands of *Alnus acuminata* for natural regeneration and enrichment planting of native tree species in order to provide a tool for conversion of monocultures into mixed forests. 51 sample plots of 24 × 24 m of core area were established in eight different sites of *Pinus* and *Alnus* stands within the Province of Loja. The initial parameters (soil, mesofauna, mycorrhizae, light intensity and microclimate) were measured before applying silvicultural treatments. Silvicultural thinning treatments with three different intensities (reference, strong and slight intervention) were applied for *Pinus* stands, and two for *Alnus* stands (reference, strong intervention). Inside of each sample plot, nine native tree species were randomly planted and its growth was measured during one year. Preliminary results show a positive response to the canopy opening in *Pinus* and *Alnus* stands of four native tree species in terms of survival and growth. It is expected that the final results provide scientific basis for developing suitable tool for conversion of forest monocultures into mixed forests with higher ecological and economic values in mountain ecosystems of southern Ecuador.

Keywords: *Alnus acuminata*, mixed forest, natural regeneration, *Pinus patula*, reforestation, shelter effect