Deutscher Tropentag, October 11-13, 2005, Hohenheim

"The Global Food & Product Chain—
Dynamics, Innovations, Conflicts, Strategies"

An Analysis of the Forest Utilisation Effects on the Structural Diversity in "El Cielo" Cloud Forest, Tamaulipas, Mexico

José Javier Corral Rivas[1], Oscar Alberto Aguirre Calderon[2]

[1] *Georg-August-University Göttingen, Institute for Forest Management, Germany*
[2] *University of Nuevo Leon, Departament of Silviculture, Mexico*

Abstract

Structural diversity is believed to be a good indicator of biodiversity. It has become apparent in recent years that forest management actions for timber production have undesirable consequences on the main components of forest stand structure: mixture, positioning, and differentiation. This study was intentionally carried out to analyse the forest utilisation effects on the structural diversity in "El Cielo" cloud forest, Tamaulipas, Mexico. The purpose was to gain deeper insight how the forest utilisation modified the species composition, the spatial structure and the dimensional structure in this type of forest ecosystem. Data from two experimental plots with different histories of management were used to assess the stand structure by using several indices. These indices are derived from the neighbourhood relations between the trees that constitute an ecosystem. The basis for the calculation of these indices was the sampling method so-called here "structural group of five trees". By using this sampling approach, the spatial characteristics can be established merely on the basis of evaluating the immediate neighbourhood of a given number of reference trees. The results indicated that the plant community covering an area of half hectare was a mixture of tropical and template trees of approximately 30 different species with a density larger than 1000 trees per hectare. The neighbourhood parameters showed good tendency for detecting subtle structure changes; moreover, they are easy to calculate and interpret. The comparative structural analysis indicated significant evidences that the forest utilisation decreased the species diversity, modified the spatial distribution and changed the dimensional differentiation.

Keywords: Dimensional differentiation, diversity of species, spatial structure

Contact Address: José Javier Corral Rivas, Georg-August-University Göttingen, Institute for Forest Management, Büsgenweg 5, 37077 Göttingen, Germany, e-mail: jcorral@gwdg.de