**The use of tree-ring data, coupled with population structure, to improve the management of an endangered tropical timber species**

N. Bourland1, M. De Ridder1, J. Van den Bulcke2, F. Fétéké1,3, B. Toirambe1, J. Van Acker2 and H. Beeckman1

*1 Service of Wood Biology, Royal Museum for Central Africa, Belgium*

*2 Laboratory of Wood Technology, Ghent University, Belgium*

*3 Axe Gestion des Ressources forestières, Département Biosystem Engineering, Université de Liège - Gembloux Agro-Bio Tech, Belgium*

**Corresponding author:** [nils.bourland@africamuseum.be](mailto:nils.bourland@africamuseum.be)

**Keywords:** afrormosia, CITES, Congo Basin, forest inventory, growth, logging, *Pericopsis elata*, semi-deciduous rainforest

*Pericopsis elata* is a flagship timber species. Commonly logged in Central African semi-deciduous rainforests, this tall tree suffers from a lack of regeneration throughout its natural distribution area. For this reason, and because of ongoing logging activities, it is listed on CITES Appendix II. This implies, among others, that the trade of its wood is in no way detrimental to its survival. In other words, logging companies have to guarantee that the species is not overharvested. One way to do so is to simulate recovery rates in the next logging cycle. In this study, we coupled population structure data with growth rates of the target species to judge the carrying capacity of its population in the Kisangani-Yangambi forest area (DRC). So as to determine the natural population structure, we inventoried *P. elata*’s stems alongside a cumulative length of 30 km of transects opened in the Yangambi Biosphere Reserve. We obtained mean growth rates per diameter class from tree-rings analyses of 37 stem discs from *P. elata* individuals collected in the study area (from De Ridder et al. 2014). We showed that the population structure follows a bimodal bell-shaped curve, comforting the general lack of regeneration. The carrying capacity of the target-population appeared to be quite low with respect to legal minimum logging diameter and logging cycle. Additionally, we obtained an age-diameter relationship for the target species, and estimated when large disturbances originated its populations. Our findings were mostly consistent with those of Bourland et al. (2012, 2015) in Cameroon.

**References**

Bourland, N. et al. (2012). Ecology of *Pericopsis elata* (Fabaceae), an Endangered Timber Species in Southeastern Cameroon. *Biotropica* 44:840-847.

Bourland, N. et al. (2015). How Tightly Linked Are *Pericopsis elata* (Fabaceae) Patches to Anthropogenic Disturbances in Southeastern Cameroon? *Forests* 6:293-310.

De Ridder, M. et al. (2014). Dendrochronological Potential in a Semi-Deciduous Rainforest: The Case of *Pericopsis elata* in Central Africa. *Forests* 5:3087-3106.