

Monitoring tree growth and mortality in central Africa

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Since 2009, the growth and mortality of 26,044 trees of 51 species, including the most logged timber tree species, have been monitored annually in logged and unlogged forests in 9 sites across Central Africa. The monitoring continues as new sites, trees and records are added to the database on a regular basis.

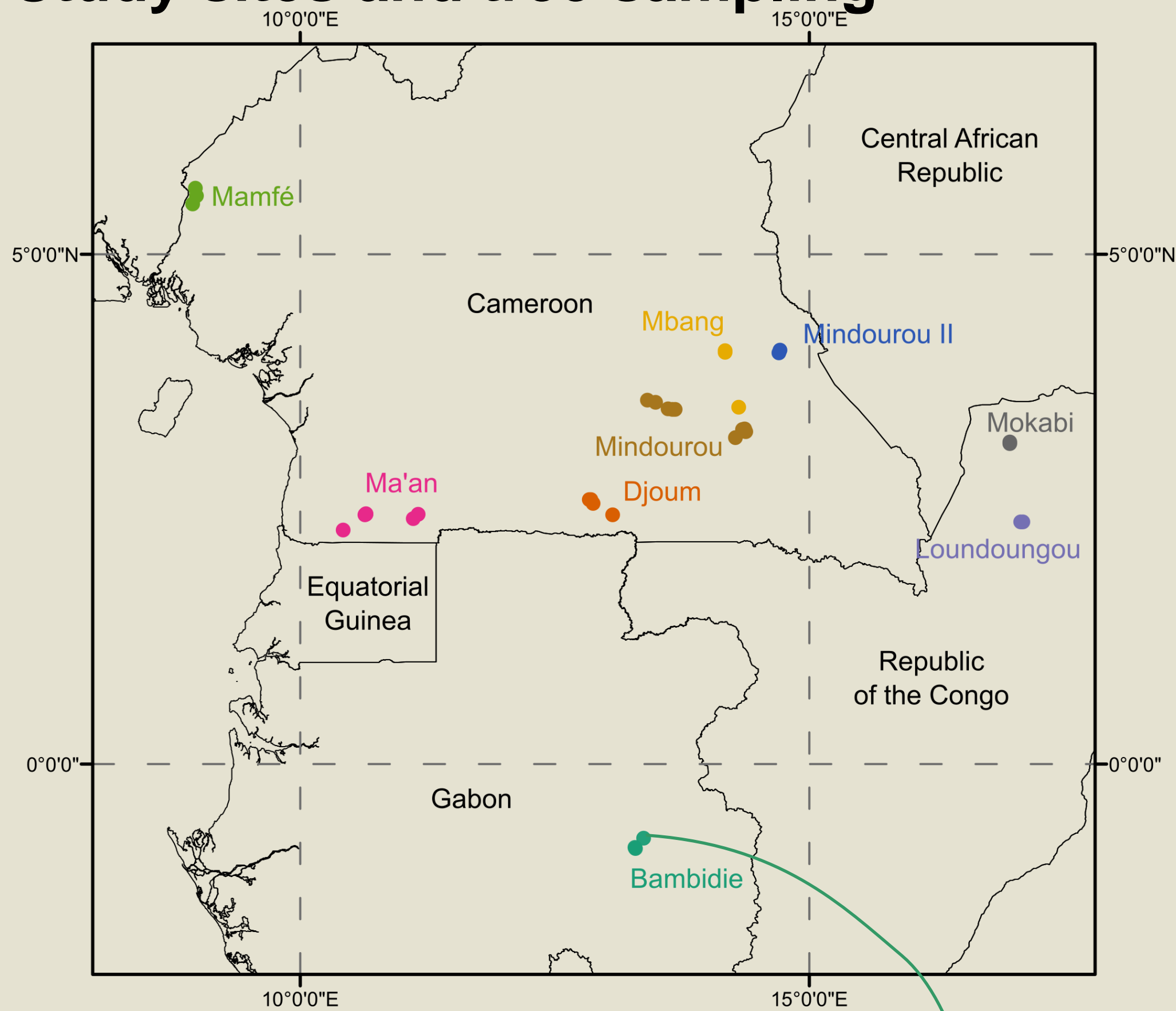
We aim to predict species-specific tree growth and mortality rates, which are needed, for example, to design sustainable management plans, and to study the drivers of tree growth and mortality.



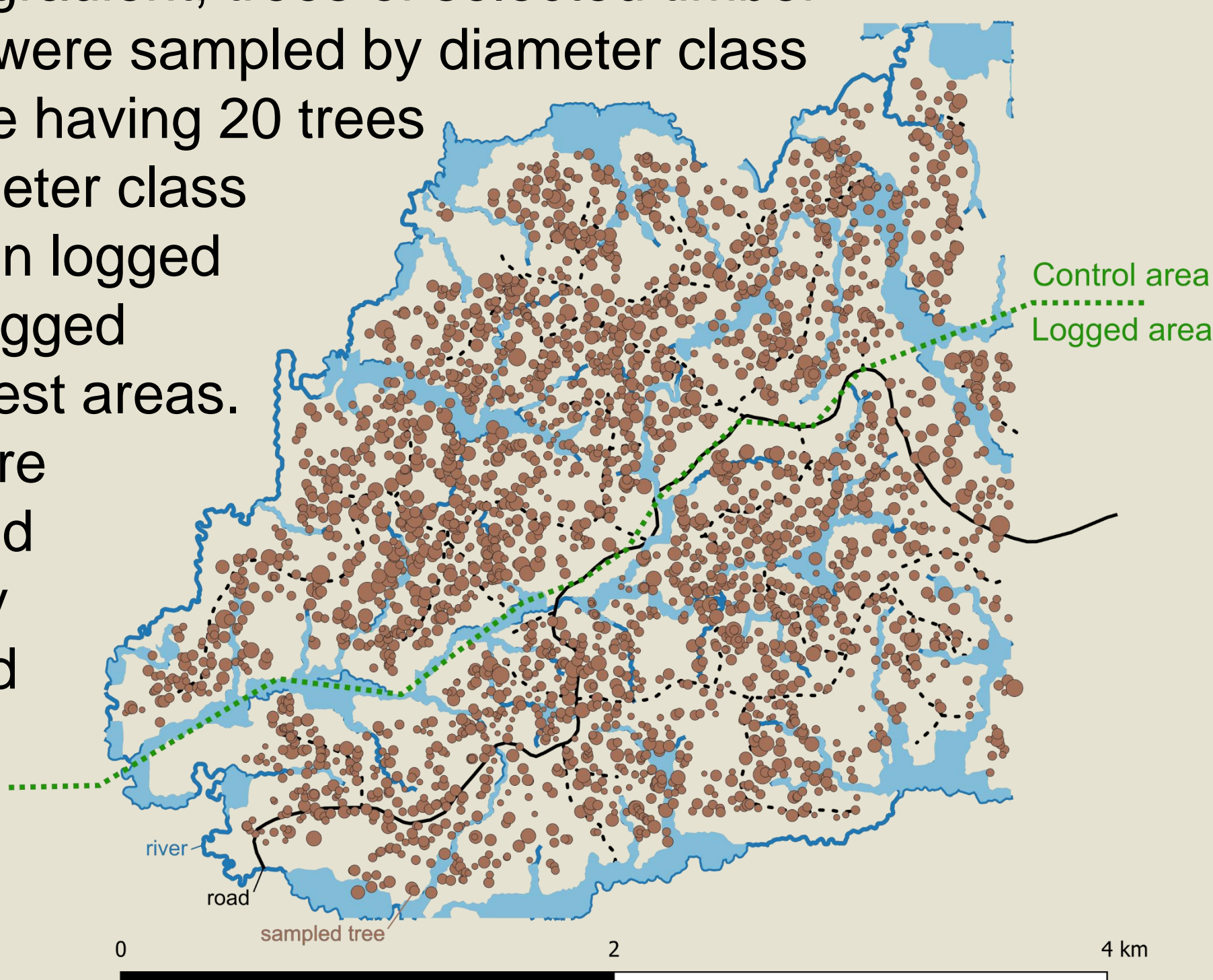
Introduction

Tree growth and mortality are two central processes in mixed and structurally complex tropical moist forests, but accurate estimates of the variables needed to model them remain sparse and scattered. As a result, it is still difficult to predict forest evolution, responses to environmental changes and develop reliable management plans.

Study sites and tree sampling



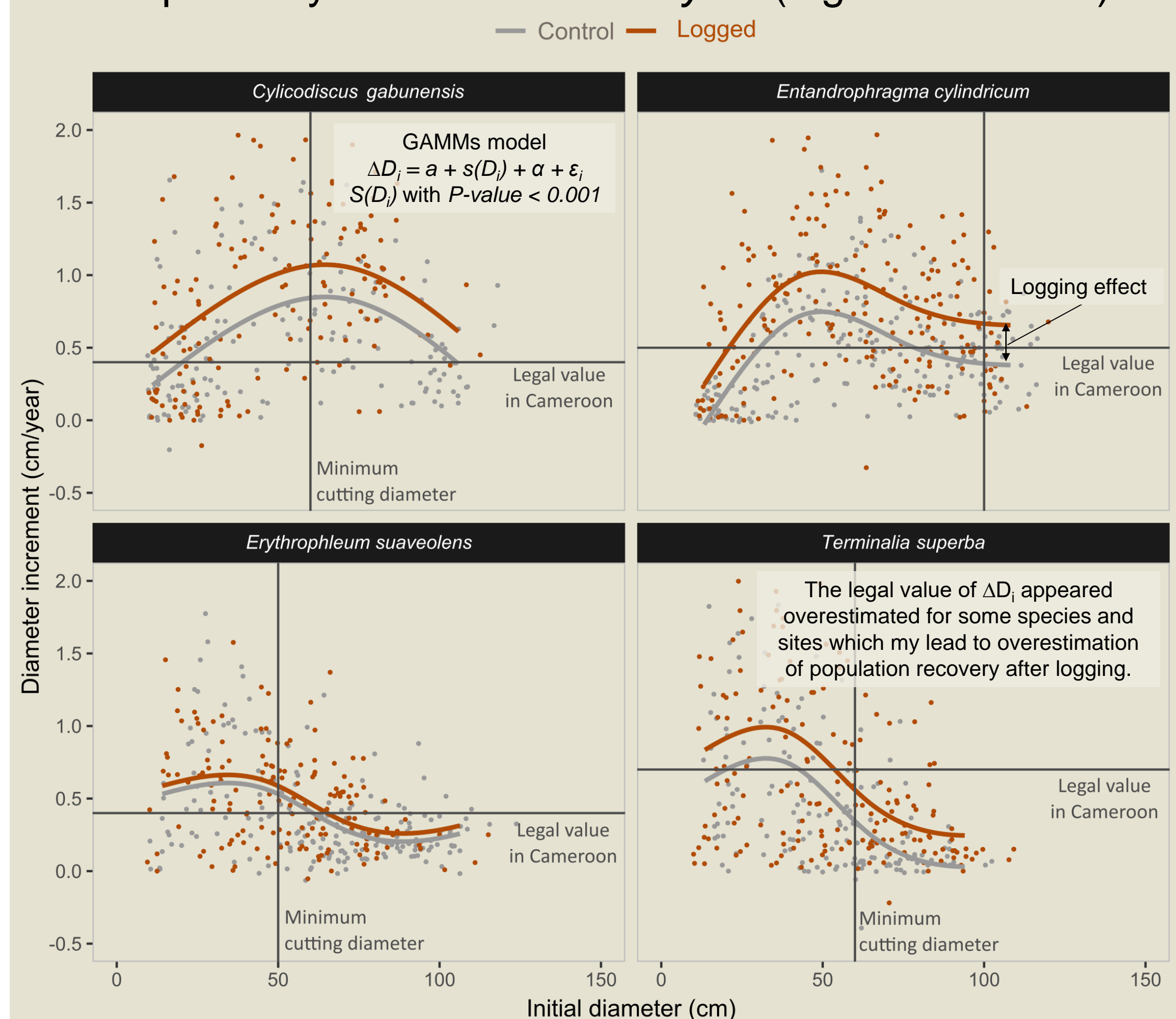
In 9 forest concessions, across a wide climatic gradient, trees of selected timber species were sampled by diameter class to ensure having 20 trees per diameter class (10 cm) in logged and unlogged large forest areas. They were monitored yearly by local field teams



Example of two forest areas of about 500 ha where approx. 9000 trees of 18 species have been sampled across species and diameter classes.

Results

- Diameter increment varied widely between sites, conditions and species highlighting the need for additional and local estimates and providing key estimates to revise management plans.
- Diameter increment often varied non-linearly with tree diameter and ignoring such relationships may lead to biased forest projections.
- Logging stimulated tree growth, the effect may be detectable only after 2 years and may persist few years and up to 15 years for *T. Scleroxylon* (Ligot et al. 2019).



Relationship between diameter increment and initial diameter. Here, for illustrative purposes, these are the estimates computed for only 4 species in one site (Mindourou).

Read more in the related publications :
Ligot et al. Tree growth and mortality of 42 timber species in central Africa. For Ecol Manage 505. 2022.
Ligot et al. Growth determinants of timber species [...] in central Africa. For Ecol Manage 437. 2019

My forthcoming research will delve deeper into monitoring and modeling forest dynamics across both temperate and tropical realms, with a special focus on regeneration processes and testing alternative silvicultural methods.

