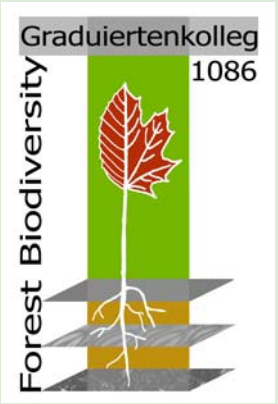




Structure and diversity of understorey vegetation in deciduous forests with contrasting tree species diversity

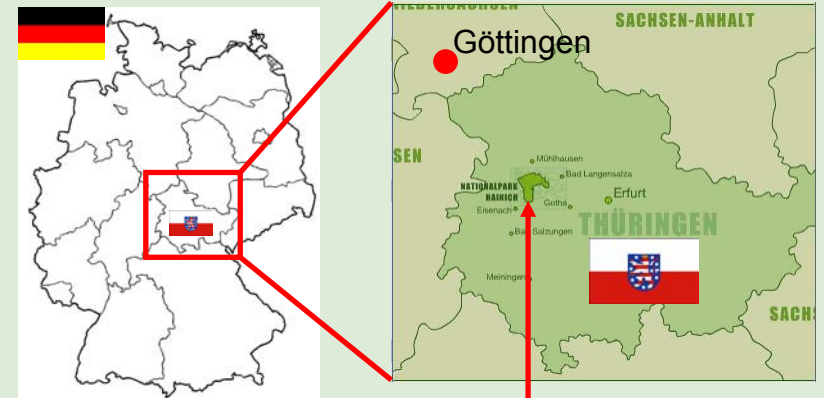
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Introduction

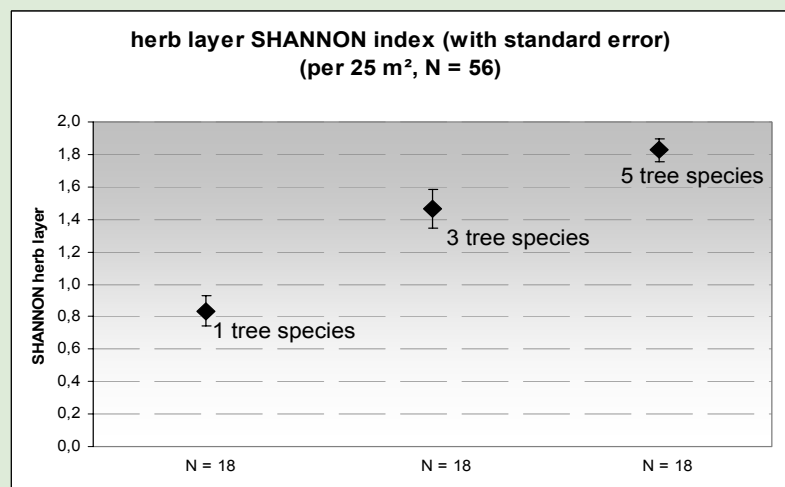
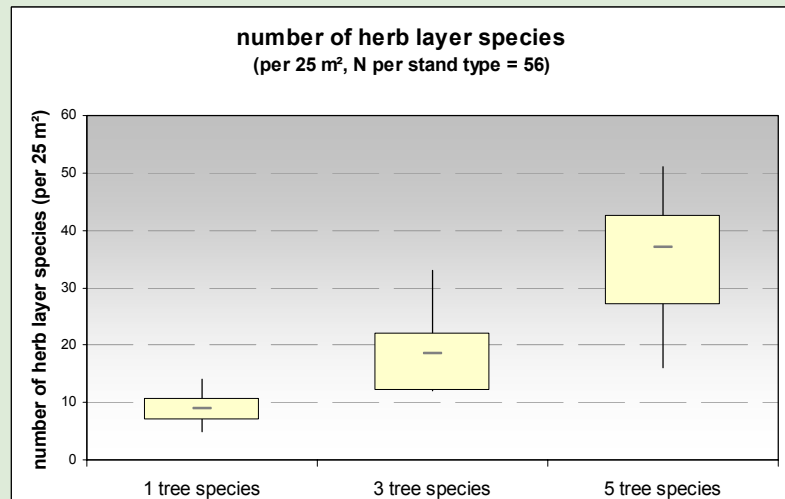
Herb layer species of forests are sensitive indicator organisms regarding site conditions as a result of both natural processes and human impact. In the **Hainich National Park** (Thuringia, Germany) we investigated the structure and diversity of understorey vegetation in deciduous forests with contrasting tree species diversity. The Hainich is the one of the largest deciduous forest areas in Germany. An ample military training area had been established in 1964 and large areas of deciduous forests could develop without forest management. After the military training area was closed down, the Hainich National Park has been founded in 1997.



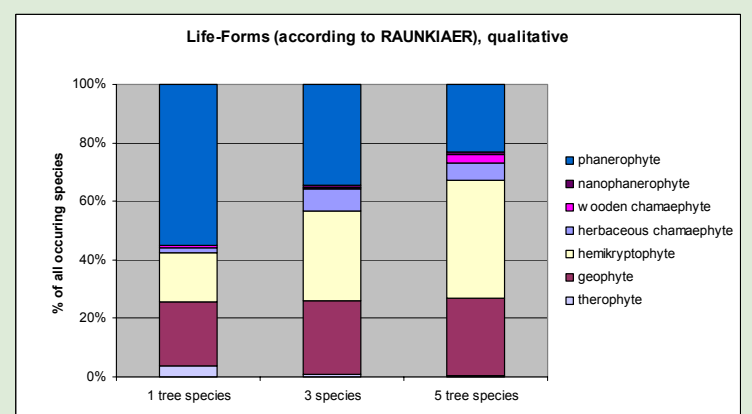
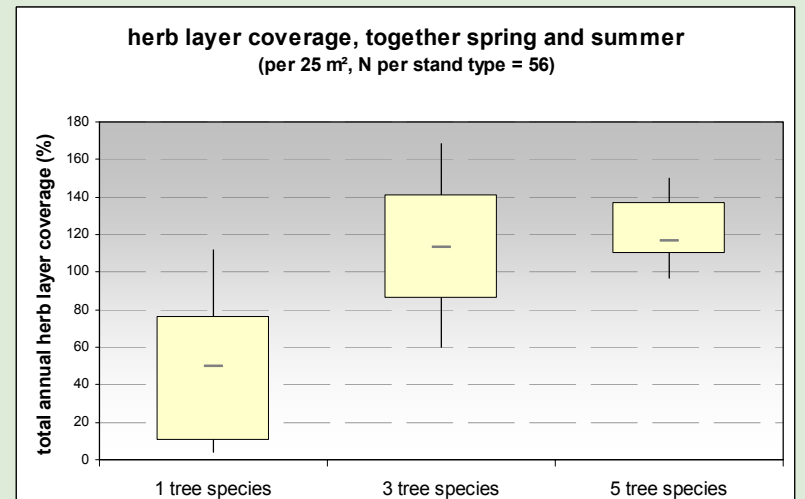
Hainich National Park

Study sites and methodology

Three replicate plots with six randomly distributed subplots were established in three different forest stand types formed by one (*Fagus sylvatica*), three (*Fagus sylvatica*, *Fraxinus excelsior*, *Tilia sp.*) and five tree species (*Fagus sylvatica*, *Fraxinus excelsior*, *Tilia sp.*, *Carpinus betulus*, *Acer sp.*) in the canopy. The plots had to fulfil the following criteria: almost flat relief; eutrophic loess-covered soils with a consistent soil depth; near-natural stands without obvious anthropogenic impact on their structure during the past decades; closed canopy; homogeneous stand structure among all plots.



Results



Conclusion and outlook

Differences between different stand types can be determined concerning species richness, vegetation cover, diversity indices and the distribution of plant functional groups. **Both diversity parameters and biomass of the herb layer increase obviously from the beech-dominated stands up to the mixed stands. As the stands are located on sites with similar soil morphology and equal mesoclimate differences, species richness and species composition must be caused mainly by tree species effects.** The investigation of the functional consequences of these biotic interactions in temperate deciduous forests will be a focus of further research.

