

MIXED-FORESTS ENHANCE BIODIVERSITY OF UNDERSTOREY VEGETATION IN EASTERN FENNOSCANDIA – COMPARISON OF FINLAND AND RUSSIAN KARELIA

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INTRODUCTION

- Understorey vegetation consists of a great part of the total biodiversity of boreal (Taiga) forests.
- Plant biodiversity supports ecosystem services (Pohjanmies et al. 2021a,b).
- We compared species numbers of forest plants between Finland and Russian Karelia (Fig. 1).
- Climate and soil fertility were relatively similar in both sides of the border, but there were differences in the forest structure (Fig. 2).

AIM

- Correspondence of the biogeographical zones between the Finnish and Russian classification systems.
- Effect of the site fertility, proportion of broadleaved trees and number of tree species on the species number (S) of vascular plants of understorey vegetation.

METHOD

- Study material: an extensive systematic survey of vegetation, soil and stand variables in Finland (348 plots) in 2006–2007 (EU Forest Focus BioSoil) and in Russian Karelia (130 plots) in 2008–2009 (Fig. 1).
- NMDS ordination of vegetation in analysing correspondence between the biogeographical zones of Finland and Russian Karelia.
- GAM models in describing relationships between herb S vs. site fertility level (forest types 1-6, from rich to poor), tree S and proportion of broadleaved trees (of total stand volume).

RESULTS

Biogeographical zones (NMDS) (Fig. 3)

- **Hbor**: Hemi boreal (FI) – Isthmus Middle Taiga (RU)
 - **Sbor**: South boreal (FI) - Middle Taiga (RU)
 - **Mbor**: Middle boreal (FI) – North Taiga (RU)
- FI= Finland, RU = Russian Karelia

Number of herb species (GAM models) (Fig. 4a-d)

- Herb S increased with **the site fertility level** (forest type), **proportion of broadleaved trees** (mainly *Betula* spp.) and **tree S** in both countries.
- Herb S was higher in Karelia than in Finland in mesic sites of Sbor (Fig. 4a). Probably this was because the **volume of spruce was lower and that of broadleaves was higher** in Karelia (Fig.2).
- Site type classification (Pohjanmies et al. 2021a).

REFERENCES

Pohjanmies, T. et al. 2021a. Site types revisited: Comparison of traditional Russian and Finnish classification systems for European boreal forests. *Applied Vegetation Science* 24 (1), e12525.

Pohjanmies, T. et al. 2021b. Abundance and diversity of edible wild plants in managed boreal forests. *Forest Ecology and Management* 491, e 119151

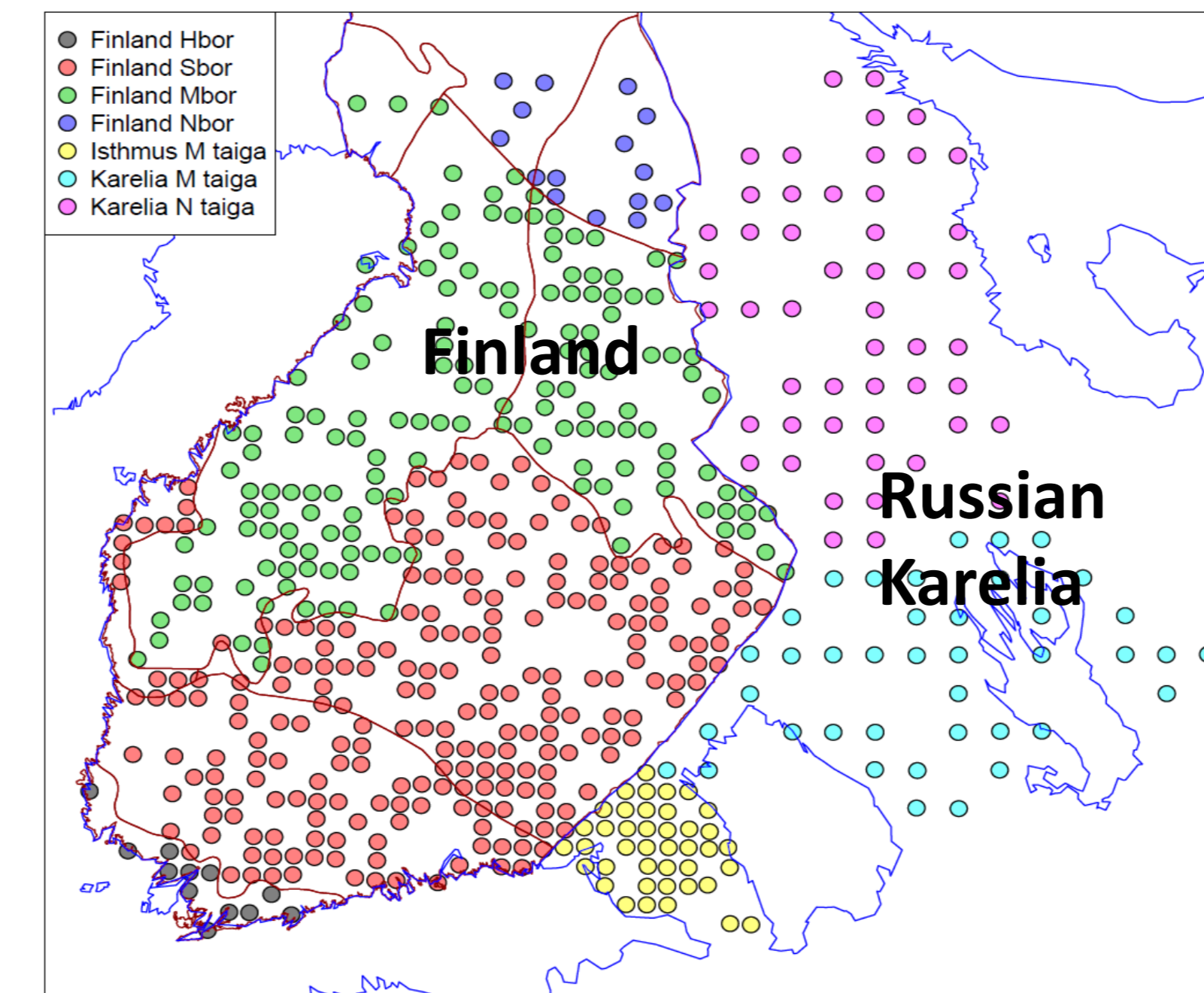


Fig. 1. Sample plot network and zones

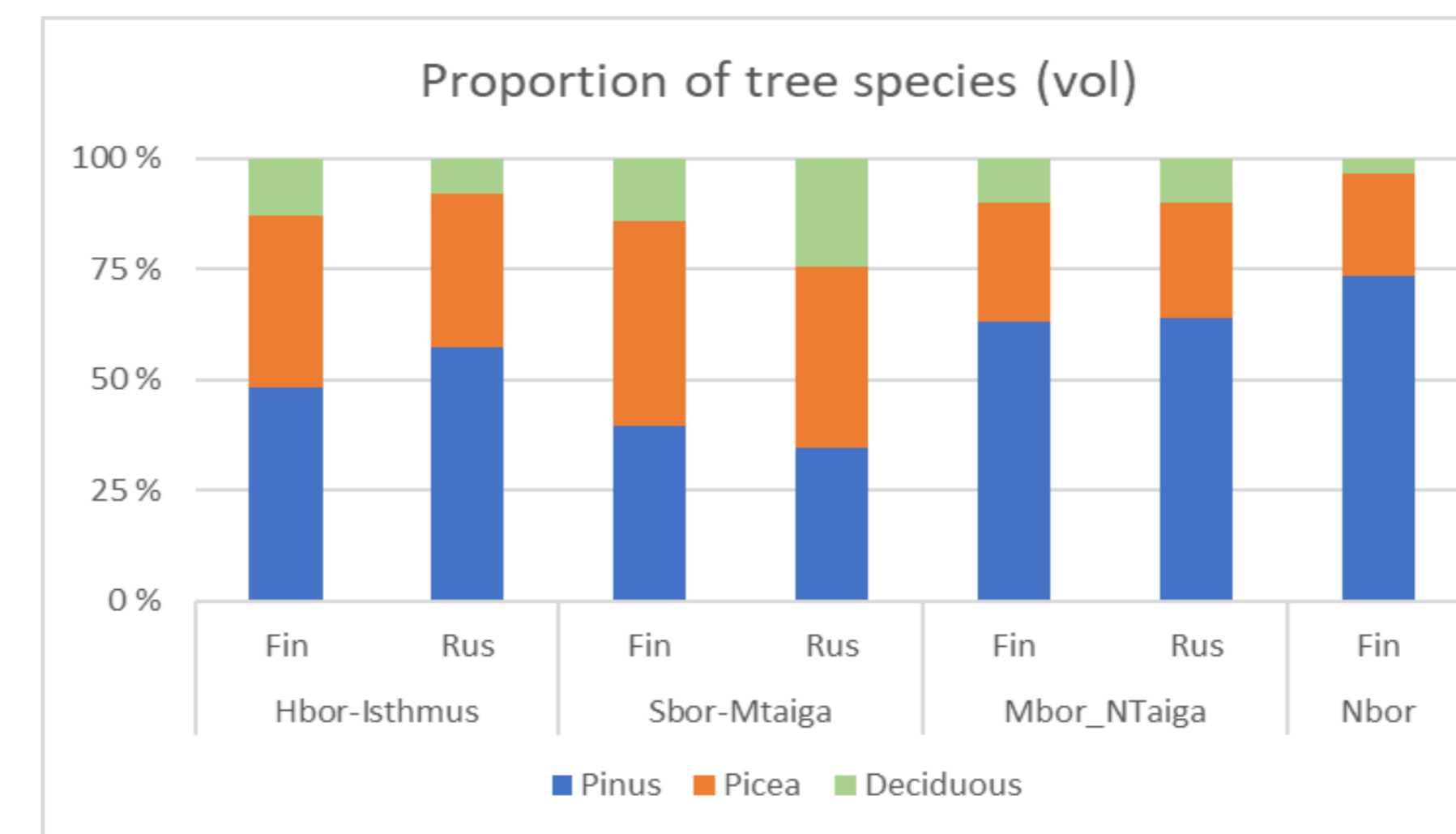


Fig. 2. Forest structure

COMPARISON OF ZONES

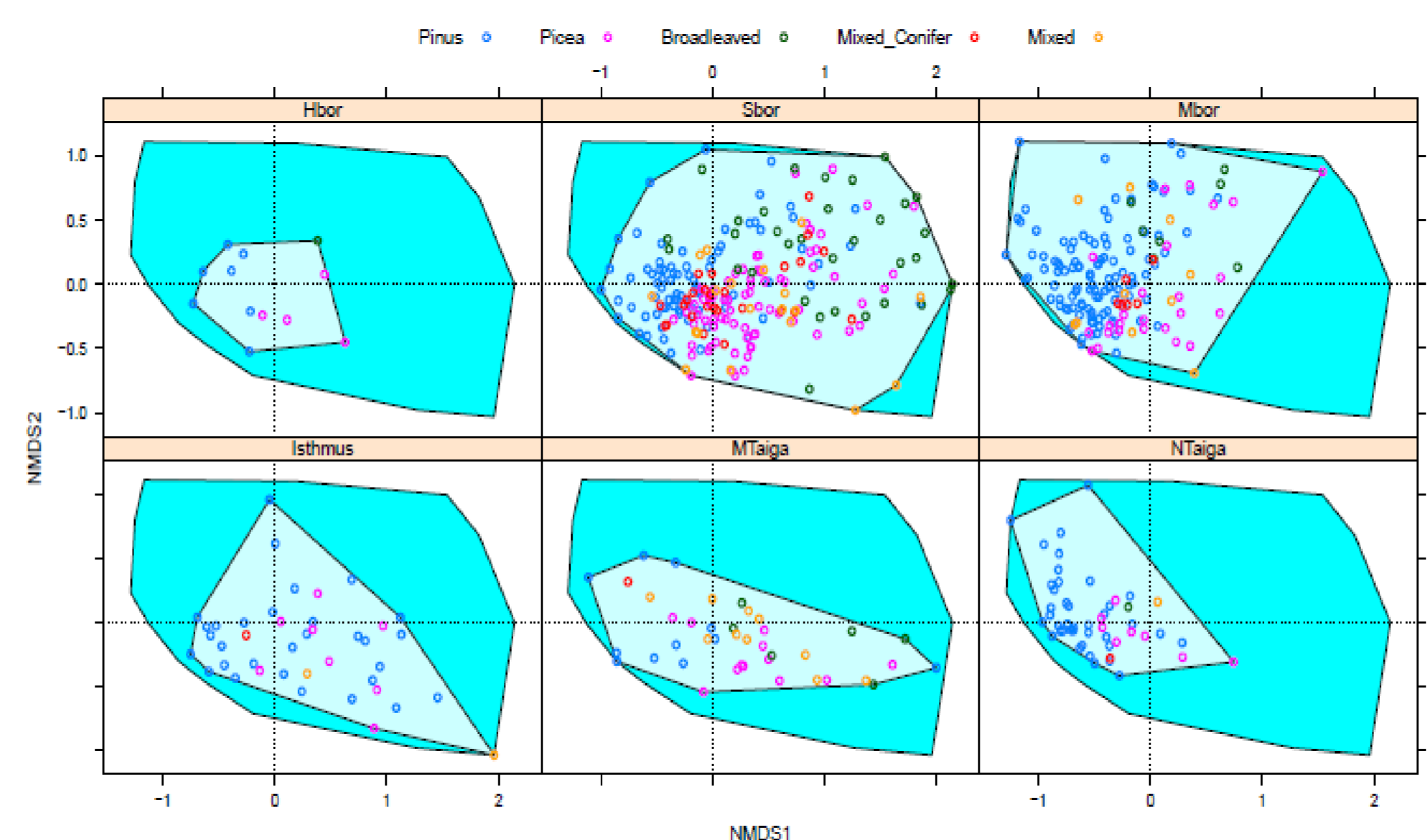


Fig. 3. NMDS ordination of the sample plots divided to three latitudinal zones (columns). Upper row Finland, lower row corresponding zones in Russian Karelia. Tree species marked.

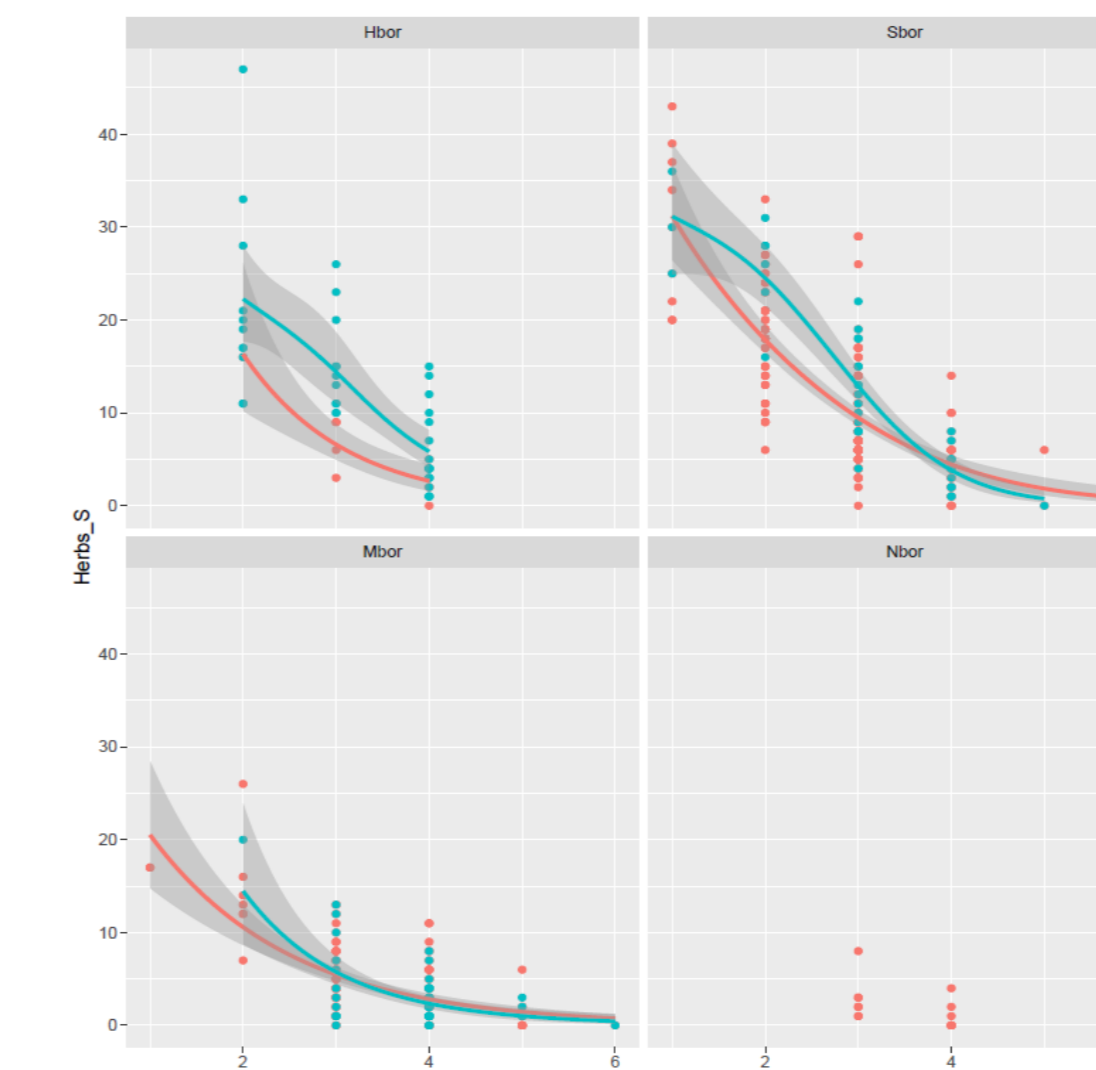


Fig. 4a. Herb S vs. fertility level (1 -6, from rich to poor) in different zones

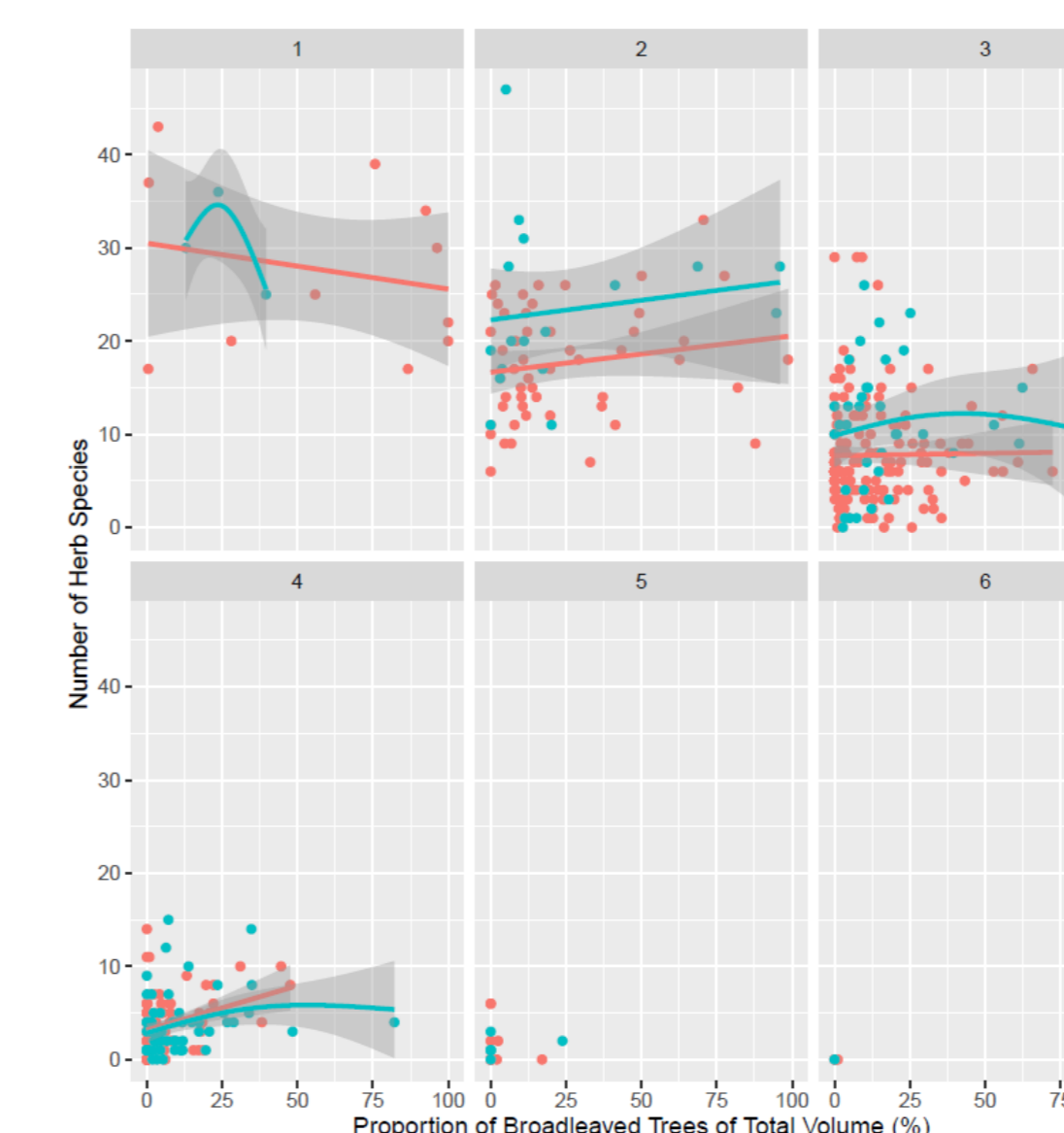


Fig. 4b. Herb S vs. proportion of broadleaved trees in fertility levels

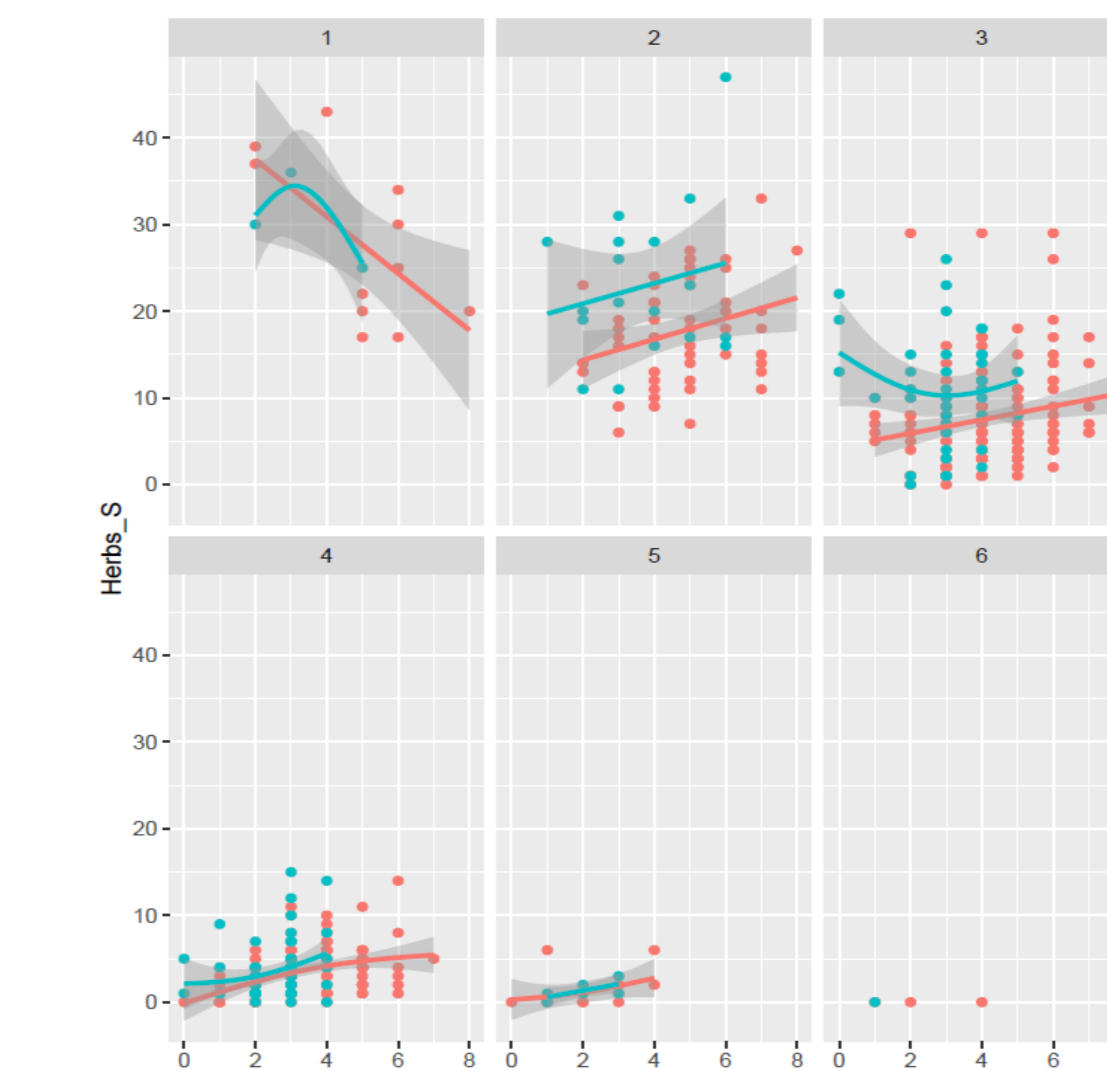


Fig 4c. Herb S vs. tree S in different fertility levels (1 – 6, from rich to poor)

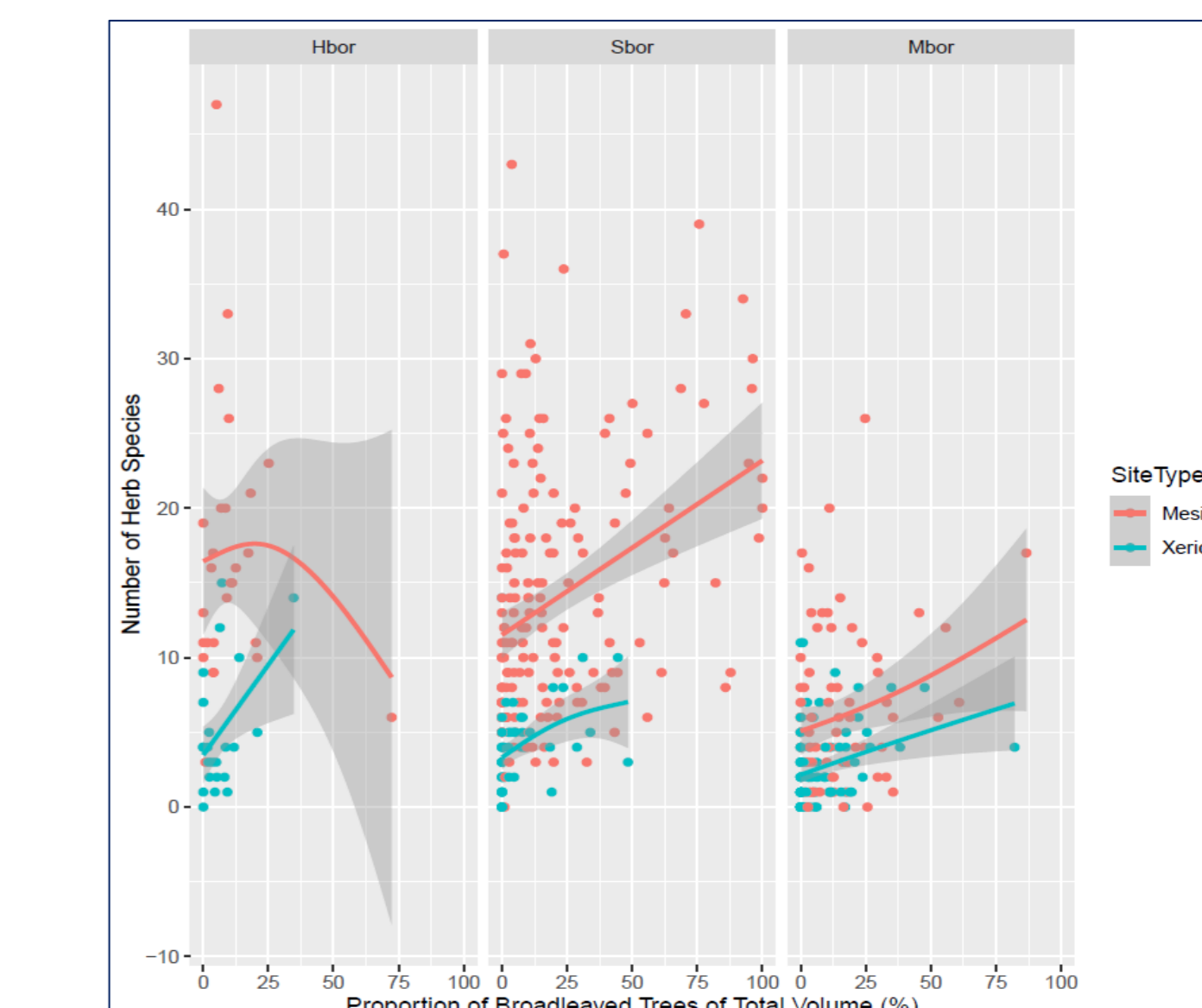


Fig. 4d. Herb S vs. fertility level (mesic: types 1-3 and xeric: 4-5) in zones

CONCLUSION

Our results support the view that the mixed-species forests enhance biodiversity and ecosystem services better than forest monocultures.

CONTACT INFORMATION

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