

LONG-TERM EFFECTS OF THINNING IN NATURAL PINE FORESTS UNDERGROWTH



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INTRODUCTION

Stand attributes such as age, density, and sub-canopy retention influence understory vegetation by altering light, moisture, temperature, and soil nutrients. Overstory species richness generally promotes ground cover diversity and biomass, but this effect can be moderated by forest density through its impact on sub-canopy climate.

AIM: TO INVESTIGATE THE IMPACT OF FOREST MANAGEMENT ON SPECIES COMPOSITION AND RELATIVE ABUNDANCE IN NATURAL PINE FORESTS

METHODS

At three natural pine forest sites (183–258 years; *Myrtillosa* and *Vacciniosa* types), paired 10×10 m plots (managed vs. unmanaged) were established. Vegetation was surveyed in 2004–2005 and re-evaluated in 2024 using 1×1 m subplots. Species cover, richness were recorded. Analyses used linear and generalized linear mixed-effects models (Poisson, Tweedie) to compare diversity and cover.

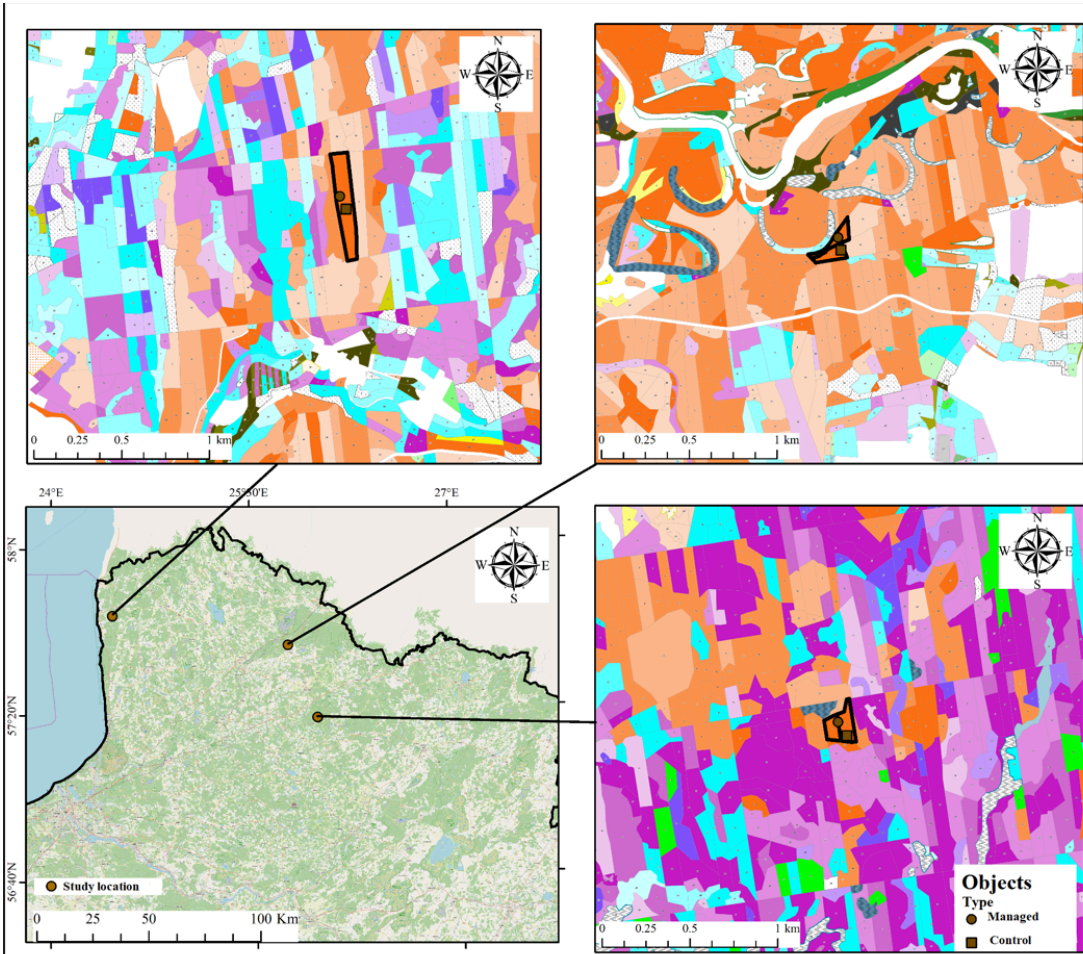


Fig. 1. Location of the studied forest areas and the sample plots.

RESULTS

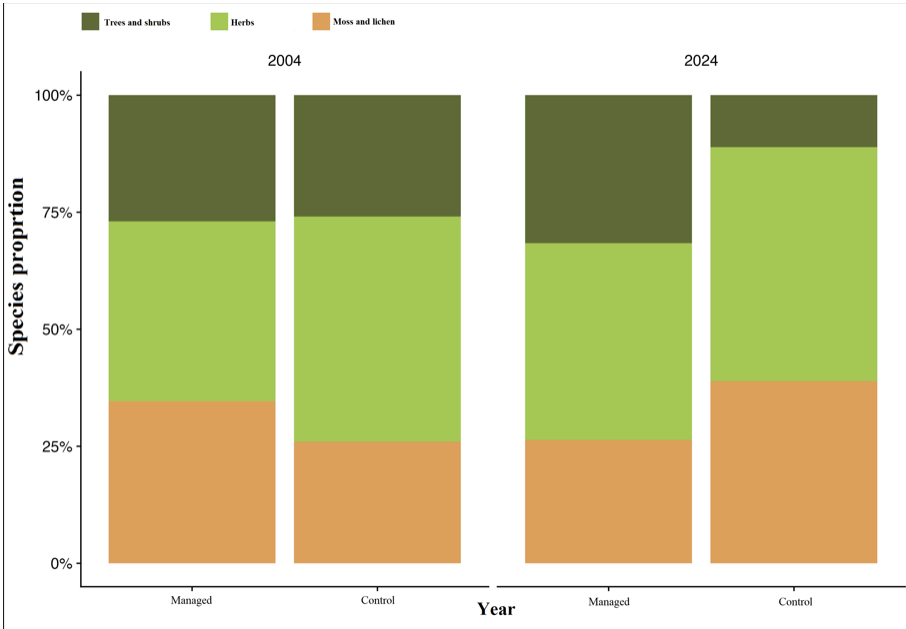


Fig. 2. Proportion of species in different vegetation layers by management type in the 2004 and 2024 surveys.

Type	Total	Herbs	Moss and lichen	Trees and shrubs
2004				
Managed	14.67±2.50	5.67±1.53	5.33±1.15	3.67±2.08
Control	14.00±3.61	6.0±3.61	4.33±1.15	3.67±1.53
2024				
Managed	5.75±1.40	4.33±1.15	3.67±1.15	3.00±2.65
Control	4.03±1.44	4.33±3.21	3.67±1.15	0.67±0.58

Table 1. Mean species number in sampling plots under different management types across two assessment years.

CONCLUSIONS

In managed plots species number in trees, shrubs, and herbs increased, while mosses and lichens declined; the opposite occurred in control plots. Species numbers varied significantly between assessment years but not between management types, with higher numbers in the first year. In 2024, species count differed significantly both within the year and across management types, with managed plots having more species. The litter layer was significantly lower in managed forests.

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