Edge effects on vegetation, forest structural elements and epiphytic lichens in black alder woodland key habitats in southern Latvia. Preliminary results.

Liepa Līga and Straupe Inga

Department of Silviculture, Forest faculty, Latvia University of Agriculture

IEGULDĪJUMS TAVĀ NĀKOTNĒ

ERAF
EIROPAS REĢIONĀLĀS ATTĪSTĪBAS FONDS

EIROPAS SAVIENĪBA

Introduction | The large influence of intensive forest management has caused habitat degradation (Barrett et al., 2001) and habitat loss. To increase and conserve the natural and semi natural forest stands in Baltic countries and Fennoscandia, the woodland key habitat (WKH's) concept has been created. WKH's concept has been explicated to the regions where woodlands have been managed and therefore highly fragmented (Timonen et al., 2010). Fennoscandian deciduous swamp woods (including black alder WKH's) are protected under the Habitats Directive (Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora) in European Union.

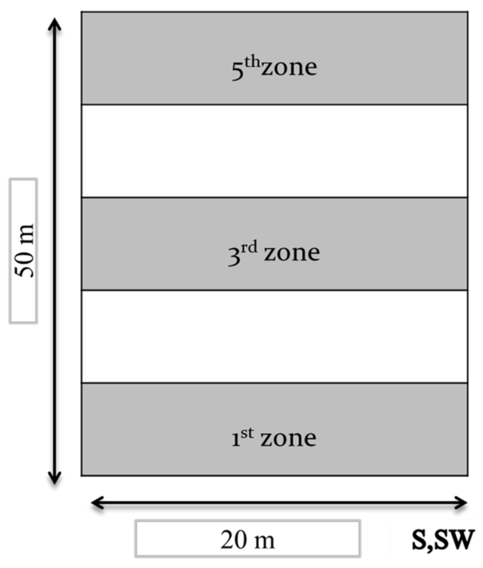
The forest drainage and melioration development during last century dramatically influenced this habitat type in country (Prieditis, 1997). In Latvia, the gap analysis of woodland key habitats shows serious lack of this habitat type in all regions. Many of these WKHs are located on the clear cuts, clearances, young forest stands, forest roads and ditches. This fact caused different abiotic and biotic factors for species (Roberge et al., 2011), which are located closer to habitat edges. We studied human – induced edges to estimate the vegetation changes from habitat edge to interior. However, as WKHs are small parcels in production forests, they are affected to edge effects (Aune et al., 2005).

Figure 1 and Figure 2. The presence of dead wood in different decay stages is an important key element for woodland key habitats (photo: Līga Liepa)

The aim and objectives | The aim of this study was to assess the edge effect influence on the vegetation of black alder woodland key habitats. First, we analyze and estimate the edge effect impact on vegetation and stands structural elements regarding to distance from the habitat edge to interior (zones: 1st ,3rd ,5th, see below).

Furthermore, we evaluate the edge effect influence on vegetation and stand structural elements regarding to different age classes of forest stands (group A, B, C, see below).

Materials and methods | The area concerned is located in the hemiboreal vegetation zone in southern Latvia. The research was performed in three forest types: *Dryopterioso – caricosa, Filipendulosa* and *Oxalidosa turf.mel.* In total 13 study sites were performed and estimated. The area of sample plot was 20×50 m and each plot was divided into five 10 m wide sample zones. In the south or south–west side of the study sites there were stands that corresponded to three different age groups: four young forest stands (A), four middle–aged forest stands (B) and five mature forests stands (C). The Braun–Blanquet method was used to characterize plant communities: the total projective coverage of moss, herbaceous, shrub and tree layers as well as the coverage of each separate species was recorded in the sample zones as a percentage. Also tree species and diameter at breast height (DBH) were measured of each living tree (DBH≥ 6 cm) and dead (DBH≥10 cm) tree or dead wood pieces on the each study site and sample zone. In addition, we determined indicators – epiphytic lichens.



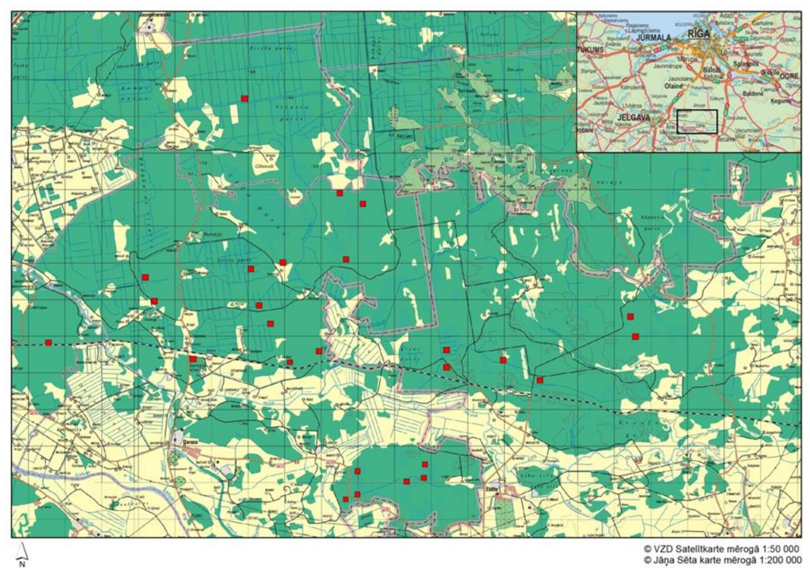


Figure 3 and Figure 4. The scheme of sample plot (Fig.3) and the study sites (Fig.4).

Results | We recorded a total of 105 species. Among these layers, the herbaceous layer had most species – 77, followed by moss layer – 24, shrub layer – 10 and tree layer – 4. The number of species were varied among the different study sites and distances from the habitat edge to interior. The projective coverage of species in moss, herbaceous and shrub layers were affected by different age groups (A and C), but did not differ significantly with increasing the distance from habitat edge to interior.

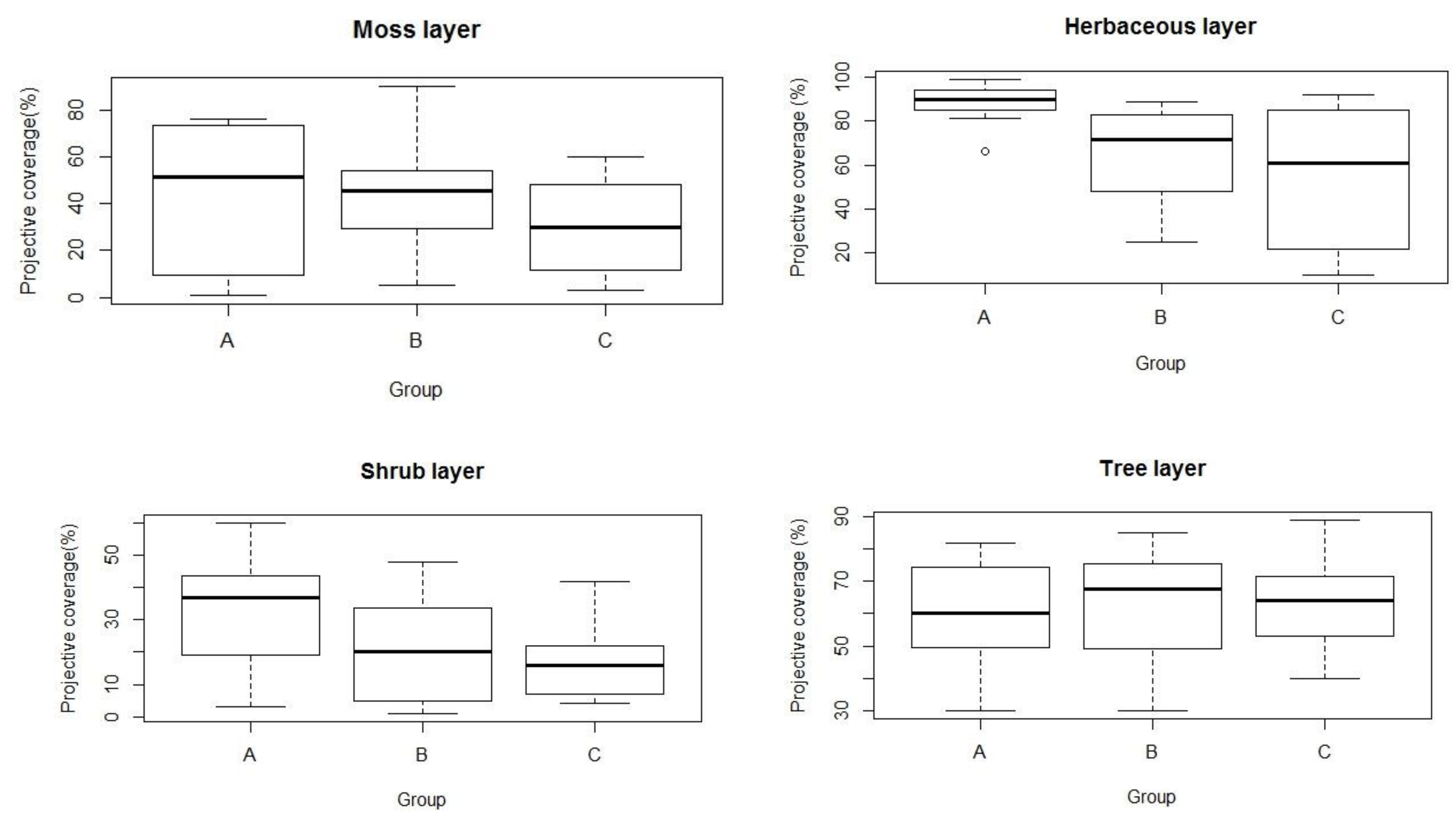


Figure 6. The comparison of projective coverage (%) in different layers in the study sites with different groups.

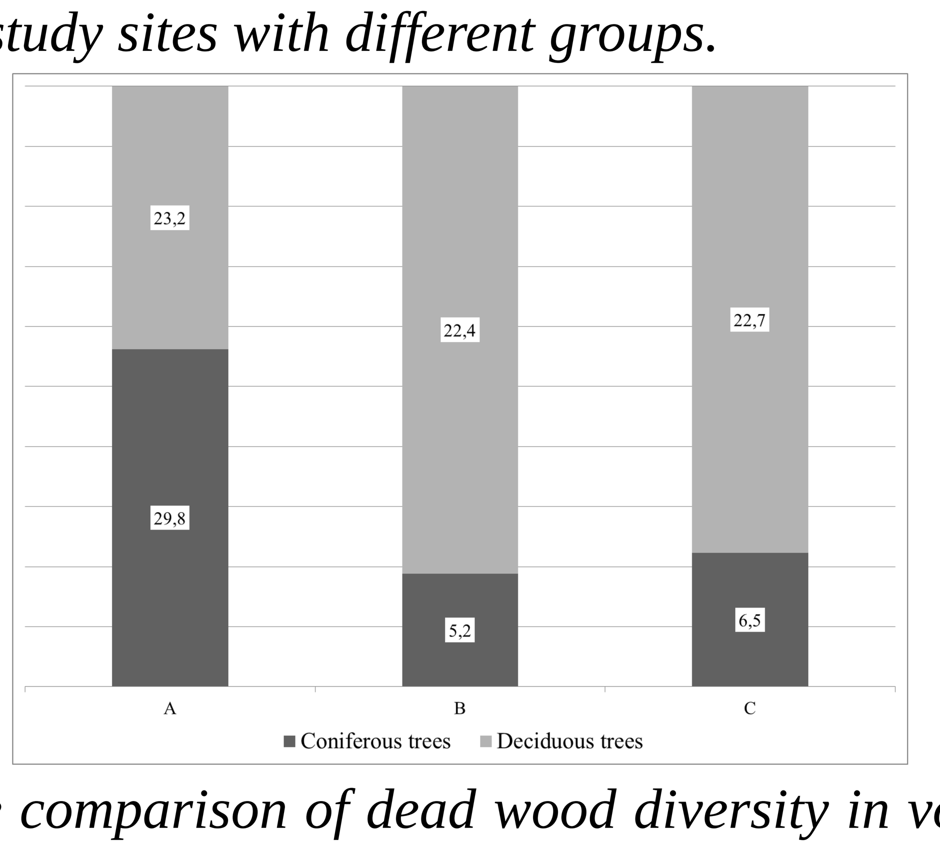


Figure 5. The comparison of dead wood diversity in volume m^3/ha in the different habitat types (among groups: A,B,C).

The volume of living trees and dead wood were not affected by edge length and different age classes.

The presence of indicators – epiphytic lichens were influenced by the distance from the habitat edge to interior. The highest number of indicator species were found in 5th zone (40-50 m) from the habitat edge.

Acknowledgments | The research was carried out in the framework of the project 'Support system of decision making in sustainable forest resource management planning' (agreement No. 2010/0208/2DP/2.1.1.0/10/APIA /VIAA/146, ERAF/ Latvia University of Agriculture).

Bibliography

1. Aune, K., Jonsson, B.G., Moen, J., 2005. Isolation and edge effects among woodland key habitats in Sweden: Is forest policy promoting fragmentation? Biological Conservation 124, 89–95.
2. Prieditis, Normunds, 1997. Alnus glutinosa – dominated wetland forests of the Baltic Region: community structure, syntaxonomy and conservation. Plant Ecology 129, 49–94 .
3. Roberge, J.-M., Bengtsson, S.B.K., Wulff, S., Snäll, Tord, 2011. Edge creation and tree dieback influence the patch-tracking metapopulation dynamics of a red-listed epiphytic bryophyte. Journal of Applied Ecology 48, 650–658.