The forest fragmentation impact on unmanaged broad-leaved deciduous forests (*Quercus* and *Fraxinus*) in southern Latvia

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Introduction

Landscape fragmentation (Hanski, 2005), habitat loss and degradation are the main reasons for the biodiversity loss. For centuries, Fennoscandian hemiboreal natural old broad – leaved deciduous forests dominated by *Quercus* and *Fraxinus* (Habitat Directive habitat type 9020*) covered large territories in Northern Europe and Latvia. To protect the small semi – natural forest patches in managed forest areas the woodland key habitat (WKH) concept has been introduced in Fennoscandia and Baltic states (Kati et al., 2004). As WKH's are small forest patches they are affected by edge effects (Aune et al., 2005). Furthermore, to extend their small size the WKH's concentration places have been created in larger forest patches where forest stands nearby was associated with a similar age, presence of indicators and red – listed species can be expected to occur.

We studied whether the edge effect influence of old broad- leaved WKH's differ between the concentration places and scattered habitats in fragmented landscape.

Figure 1 and Figure 2. Deciduous broad – leaved forests are dominated by nemoral type species. The shade provides that many of vascular plant species have short period of flowering before canopy opens (photo: Līga Liepa)

The aim and objectives

The aim of this study was to determine forest fragmentation impact particularly edge effect on the deciduous WKH's in southern Latvia.

First, we assess the edge effect influence on vegetation regarding to distance from the edge (zones: 1st, 3rd, 5th) and between concentration places and scattered WKH's. Furthermore, we estimated forest stands structural elements regarding to distance from the edge (zones: 1st, 2nd, 3rd, 4th, 5th).

Materials and methods

We selected unmanaged mesotrophic and meso-eutrophic sites dominated by oak (*Quercus robur* L.) and common ash (*Fraxinus excelsior* L.). The research have been performed in three forest types: *Mercurialiosa mel.*, *Dryopteriosa* and *Aegopodiosa*. The area concerned is situated in the hemiboreal vegetation zone in southern Latvia. In total, 12 study sites were performed and investigated (the area of each sample plot is 20×50 m), which has been divided into five 10 m wide sample zones. According to Braun – Blanquet method the projective coverage of species in 1st, 3rd and 5th sample zones (1-10 m, 20-30 m and 40-50 m from forest edge to interior) representing moss (E0), herb (E1), shrub (E2) and tree (E3) layers. 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.

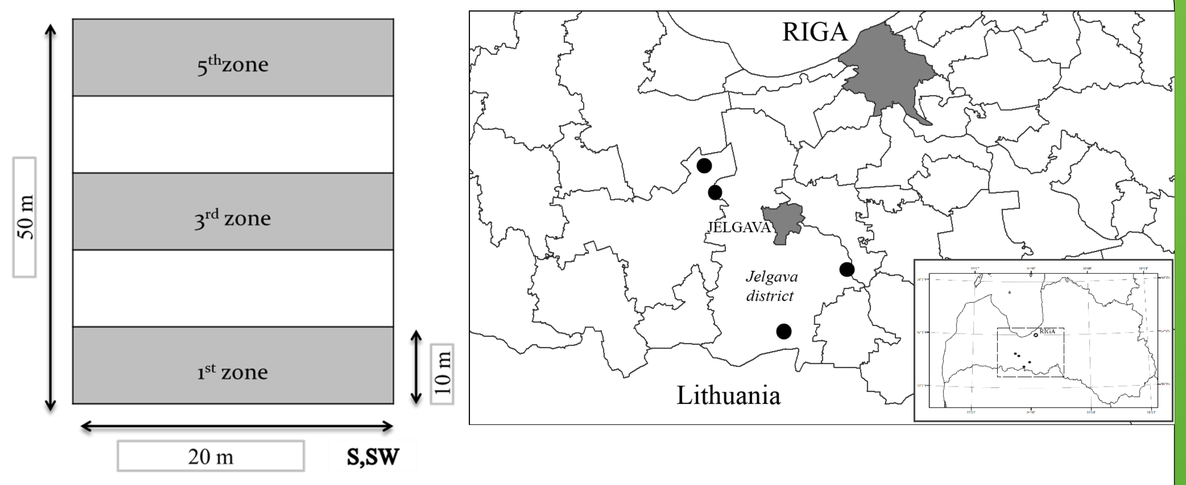

Figure 3 and Figure 4. The scheme of sample plot (Fig.3). The study areas (Fig.4).

Results

The total number of species in 12 sample plots were 114. In the moss layer – 13, herb layer - 104, shrub layer - 16 and tree layer - 9 species were found.

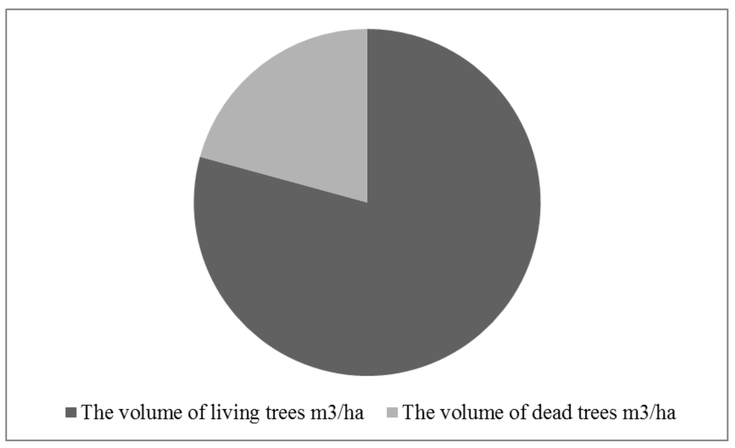

Figure 5. The proportion in volume (m^3/ha) of living trees and dead wood in deciduous WKH's.

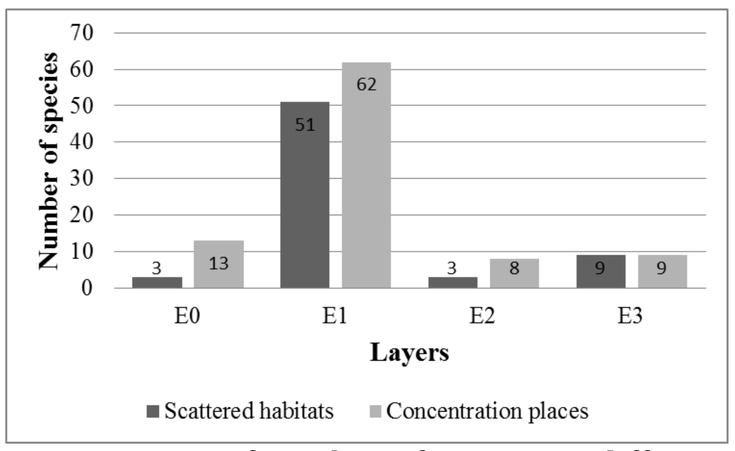

Figure 6. The comparison of number of species in different layers in the different habitat types.

Conclusions

The results of this study suggest that vegetation in deciduous woodland key habitats are not affected by the influence of edge effects. We suggest that the trend of influence of edge effect increases in the study sites where habitats are scattered, therefore the buffer stripe creation around these woodland key habitat type is essential required to provide the specific microclimate into it.

Acknowledgments

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