EDGE INFLUENCE ON VEGETATION AND FOREST STAND STRUCTURAL ELEMENTS IN CONIFEROUS WOODLAND KEY HABITATS IN SOUTHERN LATVIA

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IEGULDĪJUMS TAVĀ NĀKOTNĒ
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Introduction

Forest fragmentation (Zipkin et al., 2009) and edge effect (Ries et al., 2004) studies have been aroused a lot of interest in forest ecology due last decades. Mostly, these concepts are linked by anthropogenic loads, including intensive logging activities and developed silviculture practices. In Latvia, large forest areas have been intensively utilised during last 100 years. The large influence of intensive forest management has caused habitat depletion (Barrett et al., 2001) and habitat loss. To protect small forest stands with high ecological value in production forests the woodland key habitat (WKH) concept has been created in Fennoscandia and Baltic states (Gjerde et al., 2007; Timonen et al., 2011). Although, WKHs have an important function to preserve biodiversity and provide their persistence in their small patches in fragmented forest landscape.

In Latvia, the gap analysis of all WKHs types shows serious lack of them, including *Pinus sylvestris* L. and *Picea abies* (L.) Karst. semi – natural forest stands. Many WKHs are located on the clear cuts, young forest stands, forest lanes and ditches. This fact caused different abiotic and biotic factors for species, which are located closer to habitat edges. We studied human – induced edges to assess the vegetation changes from habitat edge to interior. In fact, due WKHs small size and isolation, they are strongly affected by 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

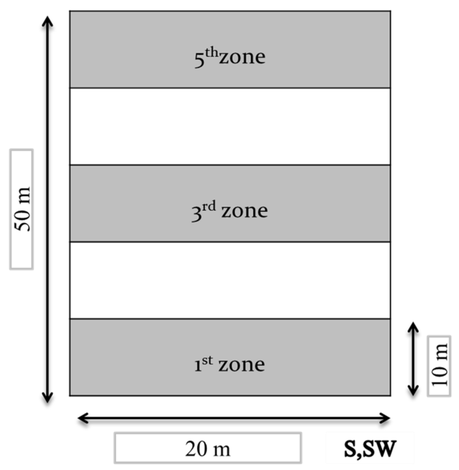
The aim of this study was to estimate the edge effect impact on the vegetation and forest stands structural elements of coniferous woodland key habitats.

First, we estimate the edge effect influence on vegetation regarding to distance from the edge (zones: 1st, 3rd, 5th). Furthermore, we estimated forest stands structural elements regarding to distance from the edge (zones: 1st, 2nd, 3rd, 4th, 5th).

Materials and methods

The study was conducted in southern Latvia, which is located in hemiboreal vegetation zone. The study sites were defined as WKH's and eight of them dominated by Scots Pine (*Pinus sylvestris*) and four by Norway spruce (*Picea abies*). The forests were owned by JSC ''Latvia's state forests''. The research has been performed in four forest types: *Hylocomniosa*, *Myrtillosa mel*., *Vacciniosa turf. mel*. and *Myrtillosa turf.mel*.

On each site, we established one study plot. The size of each sample plot is 20m ×50m, which has been divided into five 10 m wide sample zones. The Braun-Blanquet method was used to describe the plant communities: the total projective coverage of moss (E0), herb (E1), shrub (E2) and tree (E3) layer. Also tree species and diameter at breast height were measured of each living (DBH≥6 cm) and dead (DBH≥10 cm) tree and dead wood pieces (length ≥1 m) on the sample plot.



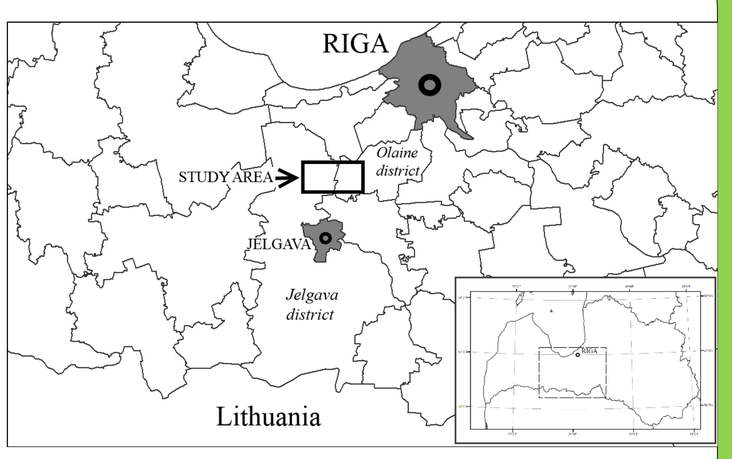


Figure 3 and Figure 4. The scheme of sample plot (Fig.3). The study area (Fig.4).

Results

The total number of species in 12 sample plots were 82. In the moss layer - 17, herb layer - 63, shrub layer - 10 and tree layer 7 species were found. The study shows that the richness and composition of species does not differ significantly among the zones or distance from forest stand edge to interior. The boreal forest type species has been dominated in all sample plots and zones. The average volume of snags was 11,6 m^3/ha in and 14,3 m^3/ha of downed dead wood logs.

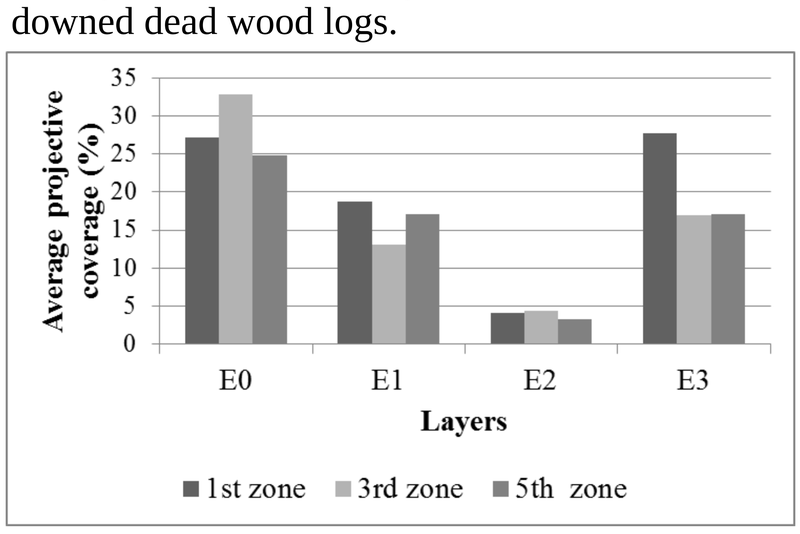


Figure 5. The comparison of average projective coverage (%) in the different layers in the different distances from habitat edge to interior.

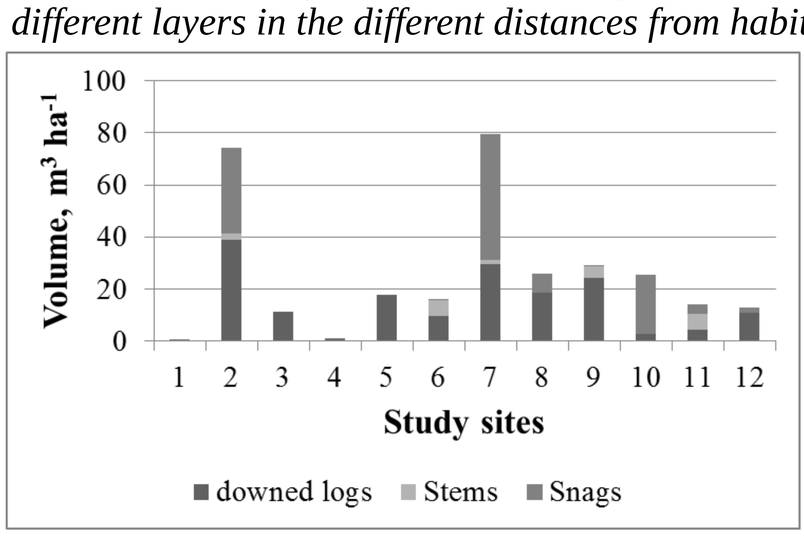


Figure 6. The comparison of dead wood (downed logs, stems and snags) volume in study sites.

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).

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