

Assessment of ecosystem services provided by semi-natural grasslands as a basis for promoting conservation measures.

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Abstract:

Throughout the second half of the 20th Century the area of semi-natural grasslands in Estonia decreased substantially, partly due to the collectivization process during the soviet era leading to agricultural abandonment in some areas and intensification in more productive soil types (Henle et al. 2008). Both of these processes led to declines in species diversity as well as homogenisation and loss of character. Within calcareous grasslands loss of grazing leads to colonization by scrub including juniper (*Juniperus communis*) with very few species and a very different structure, and similar processes occur in other semi-natural grassland types. The unique biodiversity value of semi-natural grasslands in Estonia is well recognised (Dengler et al. 2014), however, an estimation of their value is required to demonstrate to policy makers the urgent requirement for conservation measures. The ecosystem services framework provides a new approach to assess the value and multi-functionality of these habitats. A methodology for assessing ecosystem services in semi-natural grasslands is provided in this paper.

Management type and intensity have a major influence on semi-natural grassland species composition (Burnside et al. 2007). Therefore the first stage of this project was to assess the relationships between the management regime and the presence of key species in different semi-natural grassland types. The Annex 1 habitat classification was used as the starting point for the study because they are thoroughly mapped in Estonia and form the basis for agri-environmental payments. The five dominant semi-natural grassland habitats in Estonia were selected for this study and include: Northern boreal alluvial meadows (6450), Boreal Baltic coastal meadows (1630), Alvars (6280) and Fennoscandian wooded pastures and meadows (6530 and 9070 respectively). These account for 25%, 21%, 15% and 10% of the 109592 ha of semi-natural grasslands in Estonia.

Four ecosystem services were selected for this study: plant biodiversity, soil carbon storage, biomass production and use for grazing animals. As part of the study, bundles and trade-offs between ecosystem services are identified, as well as hot and cold spots for the provision of ecosystem services. Fig. 1 provides a summary of the share of semi-natural grasslands in Estonia and uses the Environmental Stratification of Estonia (ESE) (Villoslada et al. 2016) to show regional distribution.

The results of the project will be translated into policy and decision-making through an online ecosystem services valuation tool in the frame of the LIFE Viva Grass project. The project aims at preventing the loss of High Nature Value grasslands by providing an Integrating Planning Tool and considering socio-economic factors impacting nature conservation policy.

References:

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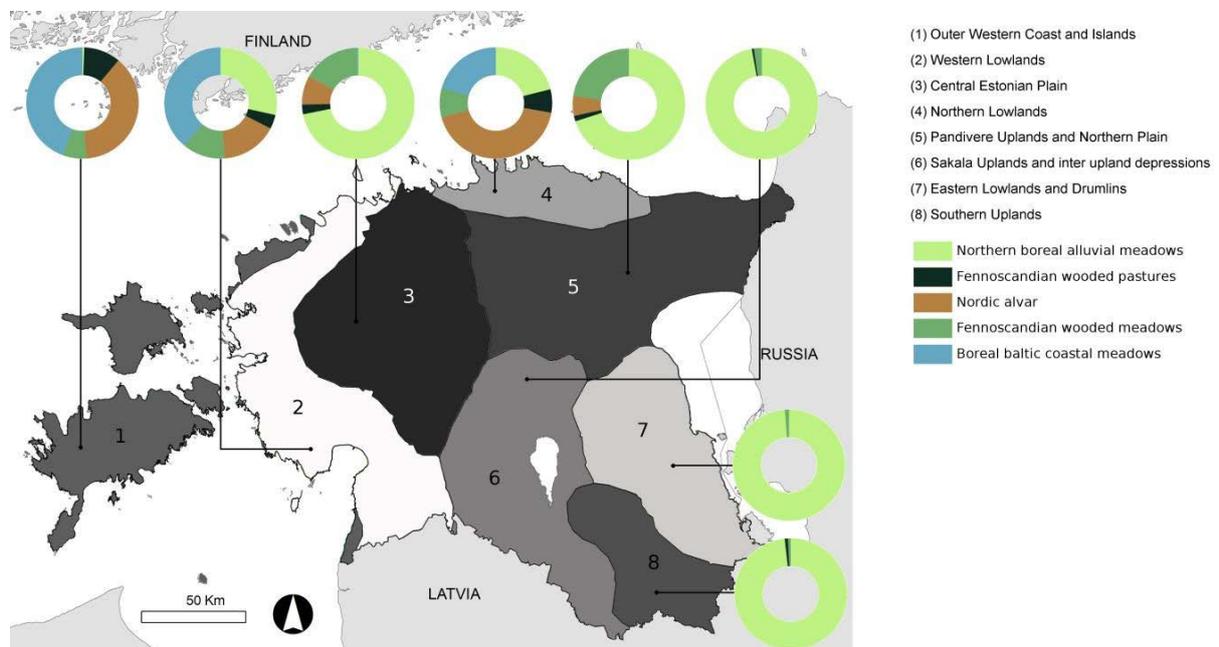


Fig 1. Share and distribution of semi-natural grassland habitats in Estonia. The calculations are based on the Environmental Stratification of Estonia (ESE) (Villoslada et al. 2016).