

HOW ARE HABITAT AND LANDSCAPE FACTORS INFLUENCING THE DIVERSITY AND ABUNDANCE OF BUMBLEBEES?

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The primary aims of our study were to determine species diversity and abundance of bumblebees in semi-natural grasslands across north-east Estonia, and to evaluate the influence of habitat and landscape factors in the diversity and abundance of bumblebees. The field work was done during the summers of 2008 and 2009 in 22 meadows located in a region called Ida-Virumaa.

At patch scale, we considered variables that described the vegetation in the study areas (i.e. number of species of flowering plants, percent cover of flowering plants and average grass height), and six different indices that were calculated using Fragstats Version 3.3: Area, Perimeter, Shape Index, Perimeter Area Ratio, Fractal Dimension Index and Edge Density. In addition, we considered different variables to describe the composition and configuration of the landscape. In order to analyse the landscape composition, the proportion of different land cover types in the surrounding area of each study site was calculated using ArcGIS 9.3. On the other hand, the configuration of the landscape was analysed throughout eight different indices that were calculated in Fragstats Version 3.3. All landscape variables were estimated at four different scales: 250, 500, 1000 and 2000 meters radius.

In total, we found 24 species of bumblebees, including 5 species of cuckoo bumblebees. The total species found represent approximately 92% of the total species of bumblebees known in Estonia.

In general, we found that there is a strong correlation between the species richness of bumblebees and the number of species of flowering plants. On the other hand, patch area and perimeter do not seem to have an influence on the number of species and individuals of bumblebees in our study sites. At landscape scale, Mean Patch Area of forests appears to have a negative correlation with the number of species of bumblebees at different spatial extents.

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