



Effects of forestry treatments on forest site conditions and the biodiversity of different organism groups

(Oral and Poster)

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There is a paradigm shift in Central Europe from the rotation forestry systems towards continuous cover forestry that provides a diversification of possible management practices. In a mature, temperate sessile oak-hornbeam forest in Northern Hungary, four different forestry treatments were experimentally studied: preparation cutting (30% partial harvest), clear-cutting, retention tree group, and gap-cutting using six replicates in block design. The effects of these treatments were studied on forest site (microclimate and soil) conditions and on community structure (species richness, abundance, species composition) of vascular plants, enchytraeid worms, ground beetles and spiders between 2014 (pre-treatment) and 2016 (post-treatment).

Light availability increased in all treatments; it was the highest in clear-cutting, intermediate in gap-cutting, and the lowest in preparation cutting and retention tree group. Vapour pressure deficit (function of air temperature and humidity) increased only in the clear-cutting. Soil temperature increased mainly in the clear-cutting and retention tree group. Soil water content was the highest in gap-cutting, intermediate in clear-cutting and lowest in preparation cutting and retention tree group.

The treatment effect and the sensitivity of community variables were versatile among organism groups. Plant cover increased in all treatments, especially in the gap-cutting and clear-cutting. The abundance of worms decreased in clear-cutting and retention tree group. The species richness of plants increased in clear-cutting and gap-cutting, for enchytraeids it strongly decreased in retention tree group. The treatment effect on the abundance and species richness of spiders and carabids was weak. The effect of treatments on species composition was significant for all organism groups, but it was relatively strong for spiders and enchytraeids and slight for plants and carabids.

Although plants were very sensitive to the changes of light conditions that resulted considerable increase in the species richness and cover in gap-cutting and clear-cutting, their composition slightly changed due to the survival of perennial forest species. Enchytraeid worms were the most sensitive organism group for treatments, soil temperature and humidity changes resulted deteriorated assemblages in retention tree group and clear-cutting. Good dispersal ability of spiders and carabids could compensate the effect of treatments establishing only compositional differences among the treatments. Based on this short observation period we can conclude that fine-scale forestry treatments like gap-cutting had only moderate effect on forest site, which is favourable for conservational perspectives.

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