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Introducing the "Pilis Gap Experiment": a new multi-taxa study focusing on the effects of continuous cover forestry

Bence Kovács[1], Flóra Tinya[1], András Bidló[2], Gergely Boros[3], Péter Csépányi[4], Zoltán Elek[5], Csenge Veronika Horváth[6], Gábor Illés[7], Julia Locatelli[6], Csaba Németh[1], Zoltán Soltész[1], Ferenc Samu[8], Vivien Sass[2], Péter Ódor[1]

[1] Centre for Ecological Research, Institute of Ecology and Botany, Hungary
[2] University of Sopron, Institute of Environmental and Earth Sciences, Hungary
[3] Szent István University, Department of Zoology and Animal Ecology, Hungary
[4] Pilisi Parkerdő Ltd., Hungary
[5] MTA-ELTE-MTM Ecology Research Group, Hungary
[6] Eötvös Loránd University, Faculty of Science, Hungary
[7] National Agricultural Research and Innovation Centre, Forest Research Institute, Hungary
[8] Centre for Agricultural Research, Plant Protection Institute, Hungary

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There is a paradigm shift in silviculture towards the not just economically but also ecologically sustainable continuous cover forestry (CCF) methods. Their aims are to provide timber, to maintain buffered microclimate and biodiversity, and to meet social requirements simultaneously. However, the concept and the details of these techniques has to deal with numerous uncertainties.
In broadleaved forests containing light-demanding tree species such as oaks, a widely applied tool of CCF is the creation of artificial gaps. Since these methods were originally developed in stands dominated by shade-tolerant species, there are no ultimate guidelines available that could help stakeholders to plan the harmonized managements in oak-dominated stands. Therefore, it is important to study from both a forest management and nature conservation point of view what are the effects of different gaps on environment, biodiversity and tree regeneration.
The "Pilis Gap Experiment" is conducted in a ~10 ha, 90-year-old sessile oak–hornbeam forest stand in Hungary. The area is fenced to exclude the effects of large-bodied game species. Five treatments with uncut control plots were applied in six blocks as replicates, within a complete block design in the winter of 2018/2019. The study follows a before-after control-impact design, thus, pre-treatment conditions were measured at closed canopy conditions with the same methodology.
Within the framework of the "Pilis Gap Experiment", we focus on the effects of gap size (small: 150 m^2 versus large: 300 m^2), shape (circular vs. elongated) and type (promptly created vs. delayed extended). The applied and studied factors are already present in the Hungarian forest management practice, but these three effects have never been analyzed independently. The main questions of the experiment are: how will the implemented treatments change (1) the forest site conditions (microclimate, soil and litter properties); (2)

the understory vegetation; (3) the natural regeneration; and (4) the community structure of animal groups (enchytraeid worms, dipterans, ground beetles and spiders). (5) We detect the gap-closure and the structural changes in each treatment types as well.
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