

Katona, K, M Kiss, N Bleier, J Székely, M Nyeste, V Kovács, A Terhes, Á Fodor, T Olajos, E Rasztovits, L Szemethy (2013) Ungulate browsing shapes climate change impacts on forest biodiversity in Hungary. Biodiversity and Conservation 22(5):1167-1180

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Abstract

Climate change can result in a slow disappearance of forests dominated by less drought-tolerant native European beech (*Fagus sylvatica*) and oak species (*Quercus* spp.) and further area expansion of more drought-tolerant non-native black locust (*Robinia pseudoacacia*) against those species in Hungary. We assumed that the shift in plant species composition was modified by selective ungulate browsing. Thus, we investigated which woody species are selected by browsing game. We have collected data on the species composition of the understory and the browsing impact on it in five different Hungarian even-aged forests between 2003 and 2005. Based on these investigations the non-native *Robinia pseudoacacia* living under more favourable climatic conditions was generally preferred (Jacobs' selectivity index: $D = 0.04 \pm 0.77$), while the native *Fagus sylvatica* and *Quercus* spp. (*Q. petraea*, *Q. robur*), both more vulnerable to increasing aridity, were avoided ($D = -0.37 \pm 0.11$; -0.79 ± 0.56 ; -0.9 ± 0.16 ; respectively) among target tree species. However, economically less or not relevant species, e.g. elderberry (*Sambucus* spp.), blackberry (*Rubus* spp.) or common dogwood (*Cornus sanguinea*) were the most preferred species ($D = 0.01 \pm 0.71$; -0.12 ± 0.58 ; -0.2 ± 0.78 , respectively). Our results imply that biodiversity conservation, i.e. maintaining or establishing a multi-species understory layer, can be a good solution to reduce the additional negative game impact on native target tree species suffering from drought. Due to preference for

Robinia pseudo-acacia selective browsing can decelerate the penetration of this species into native forest habitats. We have to consider the herbivorous pressure of ungulates and their feeding preferences in planning our future multifunctional forests in the light of climate change impacts.

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