



Prescribed burning supports grassland biodiversity – A multi-species study

Orsolya Valkó (1), Balázs Deák (1), Tibor Magura (2), Péter Török (2), András Kelemen (1), Katalin Tóth (1), Roland Horváth (2), Dávid Nagy (1), Zsuzsanna Debnár (1), György Zsigrai (3), István Kapocsi (4), and Béla Tóthmérész (1)

(1) MTA TKI, Budapest, Hungary (valkoorsi@gmail.com), (2) University of Debrecen, Department of Ecology, (3) Research Institute of Oenology and Viticulture, (4) Hortobágy National Park Directorate

During ancient times, fire was an important factor shaping European landscapes. Nowadays, prescribed burning can be one of the most effective conservation tools for the management of open landscapes, controlling dominant species, reducing accumulated litter or decreasing wildfire risk. In a prescribed burning experiment, we studied the effects of fire on dry alkaline grasslands. We tested whether autumn prescribed burning can be an alternative conservation measure in these grasslands. We selected six sites in Hungary: in three sites, prescribed burning was applied in November 2011, while three sites remained unburnt. We studied the effects of fire on soil characteristics, plant biomass and on the vegetation and arthropod assemblages (isopods, spiders, ground beetles and rove beetles). Soluble salt content increased significantly in the burnt sites, but soil pH, organic matter, potassium and phosphorous did not change. We found that prescribed fire had several positive effects from the nature conservation viewpoint. Diversity and the number of flowering shoots were higher, and the cover of the dominant grass was lower in the burnt sites. Graminoid biomass was lower, while total, green and forb biomass were higher in the burnt plots compared to the control ones. Our findings suggest that prescribed burning fire did not harm arthropods; species-level analyses showed that out of the most abundant invertebrate species, the abundance of ten was not affected, one decreased and one increased after burning. Our findings highlight that mosaic prescribed fire is a viable management tool in open landscapes, because it supports plant diversity and does not threaten arthropods.