



Recommendations on the use of prescribed burning practices in grassland conservation – An evidence-based study from Hungary

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Fire as a natural disturbance has been present in most European grasslands. In parallel controlled use of burning was an important part of the traditional landscape management for millennia. It was used to reduce litter and suppress woody vegetation as well as to maintain open landscapes suitable for farming. Recently, human activities have a considerable impact on natural fire regimes through habitat fragmentation, cessation of traditional grassland management and climate change. Nowadays the majority of human-ignited fires are uncontrolled burnings and arson, which have serious negative impacts on human life, property and can be detrimental also from the nature conservation point of view. Despite fire was widely applied in the past and the considerable extension and frequency of current grassland fires, the impact of fire on the grassland biodiversity is still scarcely documented in Europe. The aim of our study was to gather practical knowledge and experiences from Hungary concerning the effects of fire on grasslands. To fulfil this aim we sent questionnaires to experts from Hungarian national park directorates to gather unpublished data and field observations concerning the effects of burning on grasslands. Based on the answers for the questionnaires fire regularly occur in almost every grassland types in Hungary. We found that effects of fire are habitat-specific. One hand uncontrolled burning and arson have serious detrimental impacts on many endangered species (ground-dwelling birds, such as *Asio flammeus*, *Tringa totanus* and *Vanellus vanellus*; or lizards, such as *Ablepharus kitaibelii*). On the other hand in several cases fire has a positive effect on the habitat structure and favours species of high nature conservation interest (plant species, such as *Adonis volgensis*, *Chamaecytisus supinus* and *Pulsatilla grandis*; butterflies, such as *Euphydryas aurinia*; bird species such as *Circus aeruginosus* and *Larus cachinnans*). Our results suggest that even uncontrolled burning can have positive impacts from a nature conservation point of view by supporting several endangered species, reducing accumulated litter and maintaining open landscapes. Given the fact that due to land use changes and global warming the frequency of fire events are expected to increase in the next future, it is crucial to summarize evidence-based knowledge on fire in a European level and to design prescribed burning experiments in which the effects of fire could be studied in a controlled way.