

in Őrség National Park

Szépligeti Mátyás³, Attila Mesterházy¹, Gyula Pinke²,
 Ágnes Csiszár¹, Dávid Schmidt¹ & Dénes Bartha¹



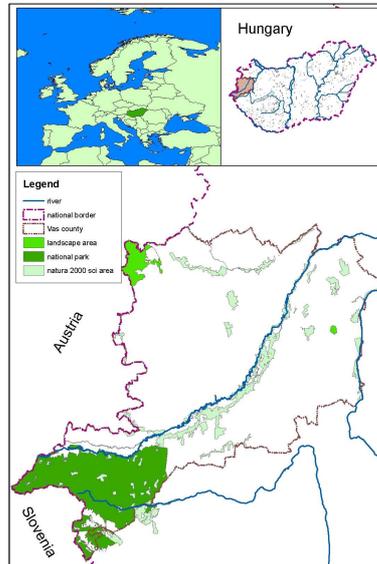
¹University of West Hungary, Faculty of Forestry, Sopron, amesterhazy@gmail.com,

²University of West Hungary, Faculty of Agricultural and Food Sciences, Mosonmagyaróvár

³Őrség National Park, [Őrszentpéter mszepligeti@gmail.com](mailto:orszentpeter.mszepligeti@gmail.com)

Introduction

Őrség region is situated in the western border of Hungary, in the forefront of the Alps. It is characterised by a relatively high amount of precipitation (800-900 mm), high clay content of the soils and scattered human settlements. Food needed to be produced on a relatively large area, because of the unfavourable soil conditions. Due to the high clay content of soils the water absorption capacity is low. Because of this fact a special tillage method was invented to ensure the efficiency of the cropping systems, which resulted in ridge-planted plough-lands. The distinctive environmental conditions between the top and the bottom of the ridges allowed for a diverse arable weed vegetation to evolve. The farmers of the region cropped mainly rye, flax, buckwheat and wheat. After the revision of the state borderlines following the First World War, a significant part of the human population living on the borderland moved away. The abandoned land was quickly colonized by forest vegetation. The rate of the forestation was further increased in consequences of negative processes in Hungarian agriculture during the post-communist period in the 1990's. In parallel with this phenomenon the area of the meadows and arable fields in the region reduced by up to 65% in the last 100 years. Nowadays, traditional tillage forms remained only in tiny traces in the region and some earlier common weed species withdrew significantly or even disappeared. The Őrség National Park, which was founded in 2002 on 44 000 hectares, aimed besides of the preservation of natural assets, the maintenance of the previous farming systems too.



Materials and Methods

A field reservation (Feldflorareservát) was established on 2ha of a fallow land in 2004. The area was used previously as arable land, and after its abandonment it was used as a pasture. A flat land was chosen, because the ridge-planted plough-lands occurred also in similar waterlogged planes. The ploughing was done with a tractor, but any further work was implemented with tools pulled by horses. The sowing of ancient cultivars of winter wheat, rye and flax was done by hand. Seeds of native arable weed species and rare pioneers were also sowed. These were collected from local habitats and received from the Botanical Garden of Gatersleben. The sowed weed species were as follows: *Lolium temulentum*, *L. remotum*, *Agrostemma githago*, *Centaurea cyanus*, *Juncus capitatus*, *Veronica agrestis*, *V. acinifolia*, *Cuscuta epilinum*, *Camelina alyssum*, *Bromus secalinus*.



Results

The field reservation was operated between 2004 and 2007. Except of *Centaurea cyanus*, *Veronica agrestis*, *V. acinifolia* and *Juncus capitatus* all sowed species emerged and increased their population. On the top of the ridges in addition to the sowed crops, semi-natural pioneers (*Scleranthus annuus*, *Gypsophyla muralis*, *Ranunculus sardosus*) appeared also, while between the ridges mainly Nanocyperion species (*Lythrum hyssopifolia*, *Centunculus minimus*, *Juncus bufonius*) thrived. Besides the sowed weed species only some common weeds (*Matricaria recutita*, *Chenopodium polyspermum*, *Erigeron annuus*) appeared spontaneously, and certain species from the neighbouring fields (eg. *Veronica spp.*, *Anthemis arvensis*) emerged later on the territory of the field reservation. The high number of big games grazed in the reservation continuously, which promoted to tiller the winter cereals, but in spring it reduced the cover of the crops. In parallel with trampling and grazing *Cirsium arvense* became more frequent in the first year, which was controlled by hand tools. From the second year this species did not cause any further problem.

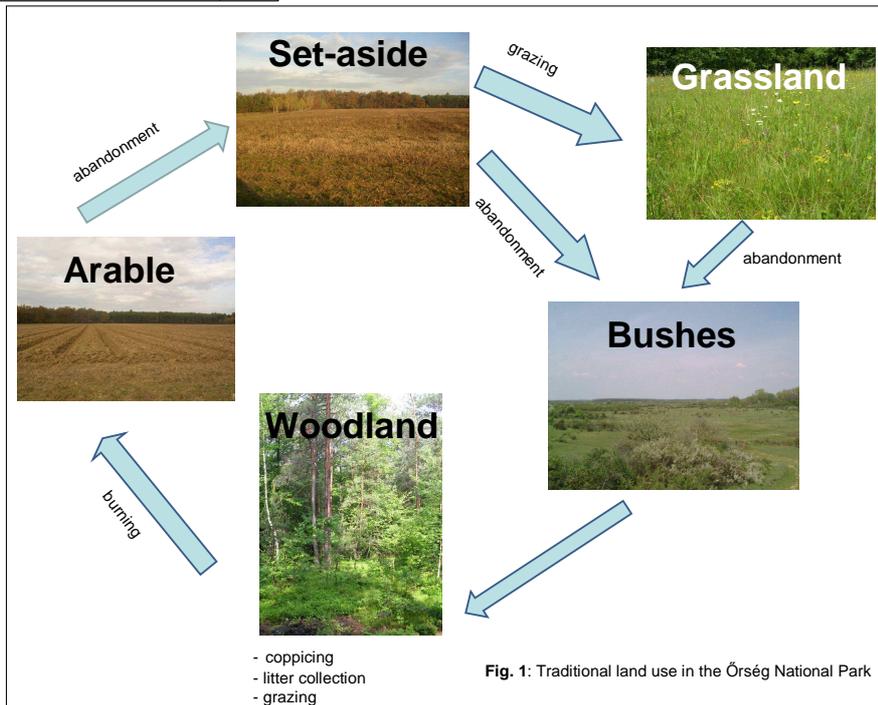


Fig. 1: Traditional land use in the Őrség National Park

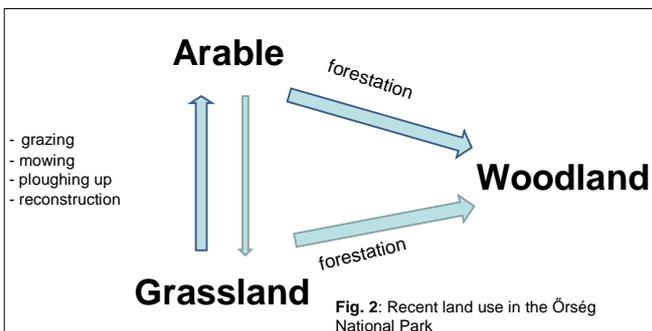


Fig. 2: Recent land use in the Őrség National Park



Conclusions

The grazing by game is useful in autumn, but it is important to protect against them from the end of the winter. Sites opened due to game trampling were favourable for the growth of *Ambrosia artemisiifolia* at the end of the summer and we were not able to control this noxious weed, and we have to face with the punishment of the competent authority. The most suitable habitat to establish a field reservation is the existing extensively managed arable fields. In the case of older fallows the number of weed species will be lower. The maintenance of such kind of reservation require significant human capacity almost in the whole year, and it can be maintained only if you have enough financial and human resources. The national park directorates should be take more attention to these rare and unique weed species whose maintenance is strongly depending on the traditional plough-land management.

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