Grazing and biodiversity in Transylvanian wood-pastures

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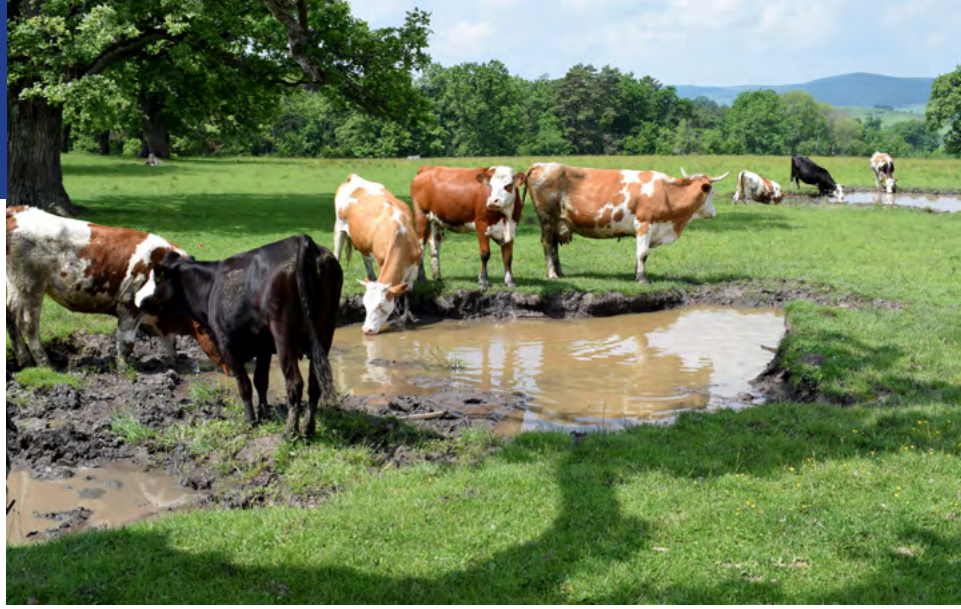


Wood-pastures grazed extensively with cattle and buffalo have high levels of biodiversity, and often include small, temporary ponds. *Ref : Tibor Hartel*

Grazing and biodiversity

Extensively managed wood-pastures are considered archetypes of traditional farming landscapes with high natural and cultural values in Europe. The livestock type used for grazing, as well as the structural features on the pastures, influences the biodiversity value of pastures. Scattered trees and shrubs were valued for their fruits, shade for livestock, beneficial effects on grassland and their beauty.

Within the context of Transylvanian pasture management, the livestock traditionally used for grazing were buffalo, cattle, horses and pigs, while sheep grazing was generally restricted.

Nowadays, wood-pastures are negatively affected by improper grazing management (i.e. overgrazing with sheep) and also by the removal of scattered woody vegetation.

Sparse trees and shrubs support high biodiversity in pastures

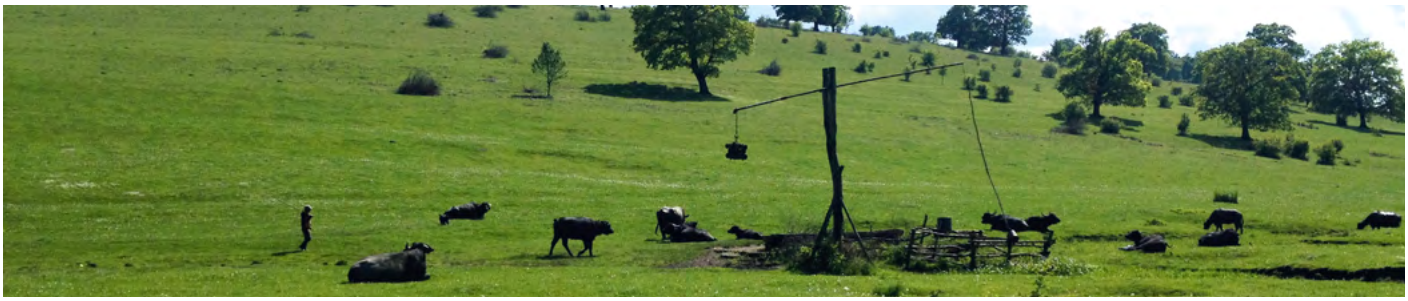
We assessed the importance of trees and shrubs for spider and herbaceous plant communities in a Transylvanian wood-pasture grazed with mixed livestock (sheep, cattle, buffalo), in a ca 1 Livestock Unit/ha. The tree community was dominated by oak (*Quercus robur, Q. petraea*), with an overall mature tree density of ca 1 trees/ha (with maximum 4-7 trees/ha, this being the characteristic density for oak wood-pastures from this region).

We identified:

- 144 species of spiders, out of which 12 were red-listed and four were new for the Romanian fauna.
- 195 vascular plant species, out of which 24 were autochthonous weeds and 32 were forest-specific herbaceous plants.

Open pastures, sparse trees, sparse trees with shrubs and forest edge had statistically distinct spider and herbaceous plant communities. Scattered trees and shrubs were the richest, while open pastures were the poorest for both taxonomic groups.

Research carried out on other taxonomic groups (birds, amphibians) in Transylvania shows that wood-pastures have rich and distinct passerine bird communities, due to shrubs, large old trees and open spaces. Furthermore, rare amphibians species (e.g. yellow-bellied toad, and the great crested newt) benefit from the ponds, created by cattle and buffalo grazing.



Sparse mature trees and shrubs are natural features which confer high natural and cultural values to the whole pasture ecosystem. *Ref : Tibor Hartel*

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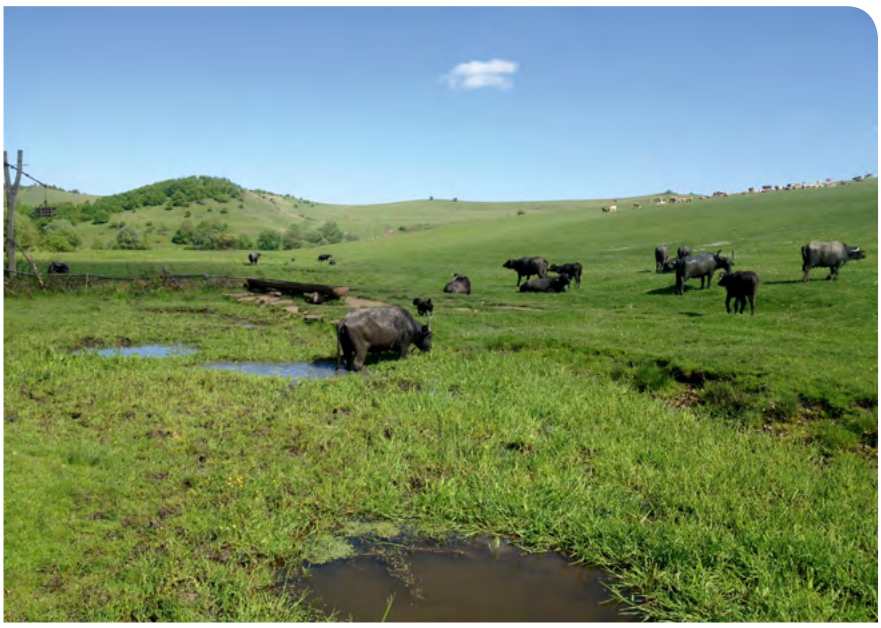
Advantages

- Scattered mature trees and shrubs substantially increase the value of pasture biodiversity.
- Scattered mature trees and shrubs do not compromise production and economic profitability of the pastures.
- Scattered trees and shrubs play a crucial role in maintaining the biodiversity value of pastures, as well as providing options for alternative nutrients (e.g. fruits for people and leaves for livestock).
- The temporal continuity of scattered mature trees and shrubs can be sustained through tree regeneration (either natural or assisted).
- Certain livestock types (e.g. buffalo, cattle) can help maintain wetlands by creating small ponds across the pasture, for the benefit of rare amphibians.



Water buffalo in a temporary pond. Six amphibian species (including three protected under the Habitats Directive) reproduce in these pond systems. *Ref : Tibor Hartel*

Recommendations

On oak wood-pastures, the scattered mature tree density should be maintained at the level of 4-7 trees/ha. This will create wood-pasture systems with high natural, cultural and economic values.

The cultural and ecological values of oak wood-pastures will be maximized if grazing includes a mix of species, such as buffalo with cattle, and is carried out with appropriate management choices (i.e. adequate stocking rates, rotational grazing).

Sparsely scattered native thorny shrubs will further improve the natural value of the wood-pasture, while allowing for tree regeneration.

Further information

Gallé R et al. (2017). Sparse trees and shrubs confers high biodiversity to pastures: case study on spiders from Transylvania. PLOS ONE (under revision).

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