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Grazing for diverse grasslands in protected areas

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- **DESCRIPTION:** Well-designed grazing management can maintain or even increase diversity of habitats and enhance biodiversity of various grassland species, from soil microbes to plants, invertebrates and vertebrates

Grasslands in Europe can host up to 98 plant species per 10 m^2 and thereby provide refuges for threatened and declining invertebrates, bird and mammals. Protected areas are a tool to prevent overexploitation of resources to enable biodiversity to thrive. In contrast to production-oriented grazing, grazing in protected areas (also known as conservation grazing) aims to use herbivores as ecosystem managers to promote multifunctionality in grasslands. In a temperate climate, grassland that is set aside from production for environmental protection is at risk of losing its open character through tree and shrub encroachment. Loss of open grassland can lead to the extinction of rare species. Grazing of grasslands with high nature value also avoids the costs associated with biomass removal.

- **RATIONALE:** European permanent grasslands (PGs) provide forage for ruminants and horses, and are expected to provide the society with many other ecosystem services, including carbon sequestration, soil protection against erosion, clean water, cultural heritage and support for biodiversity. Grazing is an essential activity on grasslands, not only for feeding animals, but also to prevent shrub encroachment and it can also be used to regenerate degraded habitats (unfertile soils). Grazing can maintain nature conservation areas in good condition, and is particularly vital where uneven ground, steep slopes, water bodies or bird nests, make mowing impossible, difficult or undesirable
  - ✓ Rearing of rare livestock breeds that are well adapted to extensive grazing helps preserve the gene pool of these native, ancient ungulates. Hungarian grey cattle are particularly well-adapted to grazing semi-arid habitats, while buffalos keep wetlands in good condition. Both breeds are vital for maintaining landscape diversity and pasture structure and quality

Fig.1: (Extensive grazing with donkeys and Charolais cattle in the Kiskunság, Hungary. Photo: Eszter Lellei-Kovács

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- **RATIONALE (cont.):**
  - ✓ In other areas, Exmoor ponies, aurochs and European bisons are used as an effective tool for transforming degraded areas into valuable grasslands
  - ✓ Grazing for nature conservation can preserve ethnographic traditions in livestock rearing, and revive ancient skills (e.g. shepherding), folk crafts and customs. Traditional buildings such as corrals, stalls and barns can help the establishment of many bird species such as little owl, barn owl, stork, kestrel, hoopoe, and various hirundine (swallows and martins) and swift species
  - ✓ Traditional husbandry is connected with high quality products made from milk (e.g. a wide range of cheeses) and meat (e.g. salamis and sausages from grey cattle and buffalo)

Fig.2: Buffalos for clearing pasture encroached with black locust and staghorn sumac in the Kiskunság, Hungary. Photo: Eszter Lellei-Kovács

- **MECHANISM OF ACTION:** Gentle grazing at a stocking rate of usually less than 0.5 livestock units (LU)/ha, assures the traditional use of pasture grasslands, as well as the maintenance and protection of the species and habitats that they support
  - ✓ Ground disturbance by livestock hooves helps to decompose the thatch at the soil surface, allowing plant seedlings to emerge more easily
  - ✓ Grazing livestock also facilitate the transfer of seeds across grasslands (on hooves, attached to their hair or via their digestive tract) and enable the movement of plant species and genotypes over greater distances. This is important not just for their spreading, but also for the exchange of genes between isolated plant populations and for increasing the productivity of grazed areas
  - ✓ A number of insect species develop on animal faeces, and the overall diversity of grazed areas thus increases.
  - ✓ On species-rich meadows in the White Carpathians, aftermaths were traditionally grazed, as their low production was unprofitable for late hay harvesting. This was also one of the reasons why more species of plants and animals were found there compared to meadows that were only cut
  - ✓ Electric fences allow rotational grazing, while the fence posts serve as perches for a variety of bird species.

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- **POTENTIAL FOR APPLYING THE MANAGEMENT OPTION:** Preserving the biodiversity of open landscapes requires a heterogeneous mosaic of biotopes, where areas without vegetation alternate with sparse, short and tall grasslands with woody plants. This can only be achieved through the regular removal of herbaceous biomass and limiting the spread of woody plants. It is important that this is done through varying the intensity of grazing through the year
  - ✓ The presence of large ungulates has been a source of vegetation disturbance for thousands of years, maintaining a fine landscape mosaic with high biodiversity
  - ✓ Extensive grazing with native ungulates is highly recommended to maintain or regenerate abandoned, degraded or encroached grasslands. Grazing creates a mosaic of open space in the landscape and counterbalances forest expansion. It also enables grass exploitation in areas that are not accessible to cutting machinery (steep slopes, uneven surface, high proportion of woody plants…)
  - ✓ Livestock and other herbivores are often faced with excess forage due to low stocking rates. They therefore select preferred plants from a variety of plant species, botanical families or phenological stages
  - ✓ There is more variation within a species-rich sward, because of the different stages of maturity of the individual species and because of variations in digestibility among plant species
  - ✓ Protected areas may also host toxic plants or those that are avoided because of protective mechanisms such as thorns
  - ✓ On the other hand, the value of biodiverse pastures can be improved by presence of medicinal plants or those species which contain certain metabolites that help to reduce parasitic burdens
  - ✓ Therefore, the environment of a complex multi-species grassland is sometimes considered the "Chemoscape" in which animals chose preferred feed items.

Fig.3: Aurochs and Exmoor ponies used as a tool for the restoration of flower-rich grasslands in an abandoned military area near the town of Milovice, Czech Republic (photos: courtesy ceska-krajina.cz)

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Example of good practice:

- ✓ There are many areas in Europe, where grazing animals are used for species-rich grassland restoration or maintainance. One example is the former military area of Milovice, in the Czech Republic, which is now a nature reserve (ceska-krajina.cz).
- ✓ After the area was abandoned, homogeneous, species-poor stands of tall grasses were formed, a litter layer gradually accumulated and rare plant species were absent. Large ungulates were introduced to manage large areas with minimal human intervention and minimal fossil fuel use.
- ✓ The nature reserve grazing area covers 231 ha. Grazing is extensive, year-round and provided by large ungulates (approx. 20 aurochs, 60 Exmoor ponies and 20 European bison). The animals live off the pasture without feeding or housing, but are provided with a salt lick. The most obvious result of the grazing is the removal of dead biomass and homogeneous stands of tall grasses.
- ✓ The need for species-mixed grazing has become apparent, as horses prefer grasses and are not willing to graze ruderal dicotyledons (which are willingly grazed by large bovids).
- ✓ The restoration of dicotyledons is fundamentally important for pollinators, as nectar sources were not available prior to the introduction of grazing due to tall grasses.
- ✓ After three years of grazing, nectar-bearing herbs spread, including *Anthylis vulneraria*, *Centaurea jacea, Securigera varia, Inula salicina, Colchicum autemnale, Salvia pratensis, Achillea mileafolium, Galium verum* and *Agrimonia eupatoria*.
- ✓ Eight years after the introduction of wild horses, aurochs and European bisons, 280 species of endangered flora and fauna had established.

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