

Photo Story

DOI: 10.21570/EDGG.PG.46.64-72

Conservation values of the alkaline grasslands – Hortobágy National Park, East Hungary

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The Hortobágy National Park, established in 1973, is the oldest, largest and probably the most unique national park in Hungary. The most famous and typical habitat complex of the park is the alkaline grassland and marshland complex situated in the core area, in more than 80,000 hectares, forming one of the largest pristine open landscapes in Europe. It is a flat lowland landscape, typically managed by grazing cattle and sheep (Godó et al. 2017; Kovácsné Koncz et al. 2020). The continental climate and the salt-rich groundwater enabled the formation of extensive alkaline grasslands, which form an extremely heterogeneous habitat complex. Vegetation patterns are driven by the fine scale patterns of abiotic environmental factors such as soil salinity and microtopography (Deák et al. 2014a). On the highest elevated plateaus, species-rich loess grasslands (*Salvia nemorosae-Festucetum rupicolae*) can be found; they are followed by several types of alkaline dry grasslands (*Festucion pseudovinae*), open alkaline swards (*Puccinellietum limosae*), alkaline wet meadows (*Beckmannion eruciformis*) and alkaline marshes (*Bolboschoenetum maritimi*) in the deep-lying areas (Deák et al. 2014a,b,c; Valkó et al. 2014). Interestingly, the highest and lowest elevated points of this gradient can be found within one meter of elevation difference (Deák et al. 2014a).

Pannonic salt steppes and marshes of the Hortobágy are considered as priority habitats in the Natura 2000 ecological network of the European Union. They hold several endemic plant species, including *Cirsium brachycephalum*, *Limonium gmelinii* subsp. *hungaricum* and *Aster tripolium* subsp. *pannonicum*, which are adapted to the special environmental conditions. Some parts of the landscape are very similar to coastal saline habitats in terms of habitat structure and species composition. The Hortobágy is also a paradise for bird-watchers. Among the nesting species there are the strictly protected Great Bustard (*Otis tarda*), the Red-Footed Falcon (*Falco vespertinus*) and the Eurasian Stone-Curlew (*Burhinus oedicnemus*). The marshes and fishponds provide

habitat for several waterbirds, both during the nesting and migration period. Many of these habitats are under the protection of the Ramsar Convention. The National Park is a UNESCO World Heritage Site because of its cultural and natural values. Besides the abovementioned natural values, the 'puszta' still holds several traditions related to ancient animal husbandry, folk art and architecture.

If you are interested in the researches of the MTA-ÖK Lendület Seed Ecology Research Group related to the ecology and conservation of grasslands in the Hortobágy, please visit our research blog at <https://deakvalko.blogspot.com/>.

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Birdseye view of the extended open landscape (Photo by S.B.).



Springtime, the patterns of surface water show perfectly the micro-topographic heterogeneity in the landscape (S.B.).



The 'higher-elevated' dry grasslands are separated by surface water in early spring (B.D.).



At the 'highest elevations', such as on ancient burial mounds (kurgans), species-rich loess grasslands occur (B.D.).



Aster tripolium subsp. *pannonicum* is an endemic subspecies, typical of alkaline grasslands and meadows (L.G.).



Phlomis tuberosa is a protected species of the loess grasslands (B.D.).



Gagea szovitsii is a protected geophyte which occurs in the most pristine alkaline grasslands (B.D.).



Cerastium dubium is an early-spring annual species typical of alkaline grasslands (B.D.).



Matricaria chamomilla is a typical species of open alkaline swards and also a well-known medicinal herb (B.D.).



Open alkaline swards in the spring aspect with a traditional sweep-well in the background. Sweep wells are iconic landscape elements in this region protected by the European Landscape Convention (L.G.).



Plantago schwarzenbergiana is a protected endemic species of the alkaline grasslands (B.D.).



Myosurus minimus is an ephemeral *Ranunculaceae* species, typical of muddy surfaces (L.G.).



Salicornia prostrata is a halophyte species preferring chloride-rich soil (L.G.).



Gortyna borelii lunata is a strictly protected moth species, the caterpillar of which is an oligophagous specialist of *Peucedanum officinale* (S.B.).



Lycosa singoriensis is a protected spider species. This steppic fauna element reaches its western limit of distribution in Hungary (B.D.).



The Hungarian grey cattle is an ancient and robust endemic breed, which is widely used for the conservation management of the alkaline grasslands and wetlands (B.D.).



Przewalski horses (*Equus caballus przewalskii*) are wild horses of the Eurasian steppe. In the Hortobágy, they live in a 4000-hectare large area where the free-ranging grazing mimic the ancient grazing regimes of the Holocene (B.D.).



The Eurasian Stone-curlew (*Burchinus oedicnemus*) prefers the open alkaline swards as its nesting site (S.B.).



The Red-footed Falcon (*Falco vespertinus*) is a strictly protected raptor, nesting in colonies in the few forest stands (S.B.).



The Little Owl (*Athene noctua*) (above) and the Barn Owl (*Tyto alba*) (below) often nest in old farmhouses, and other buildings (L.G.).



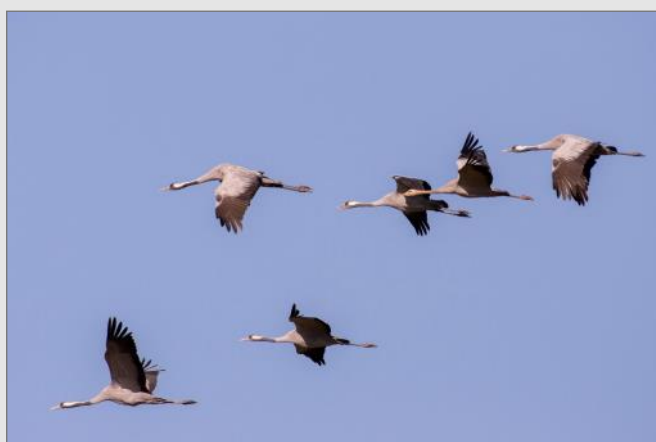
The Great Bustard (*Otis tarda*) is the largest bird species of Europe. Hortobágy represents one of the last areas where it can occupy its original nesting habitat types, i.e. dry grasslands (L.G.).



Hortobágy is an important stopover site for bird migration. Eurasian Dotterels (*Charadrius morinellus*) are present in large numbers on the alkaline grasslands during autumn (S.B.).



Lapland Buntings (*Calcarius lapponicus*) often visit the grasslands in wintertime (S.B.).



Autumn is a great time for observing the Common Cranes (*Grus grus*), which spend several weeks in the Hortobágy during their migration. Due to conservation efforts, their number has been steadily increasing in recent years and may reach up to 160,000 individuals at peak season (L.G.).



Hortobágy is an important stopover site for migrating geese. In the middle of the picture, the strictly protected and globally endangered Lesser White-fronted Goose (*Anser erythropus*), with the yellow eye-ring, can be seen (S.B.).



Hortobágy, as one of the largest unpopulated areas in Hungary, has a dark and unpolluted starry sky. As a recognition, the National Park got a silver tier Dark Sky Park designation from the International Dark Sky Association (L.G.).



Dawn in the Hortobágy puszta (S.B.).



Still life before a thunderstorm (S.B.).



Traditional animal husbandry: Grey cattle, sweep well and traditional architecture (S.B.).



Spider-net veil forming a baldachin above the sward (L.G.).