Priority areas of nature conservation in the Great Milic Nature Park

The variety and wealth of fauna and flora in highlands depend largely on the diversity of geological and topographical conditions because the variety of rocks creates varied edaphic conditions, and the varied surface shapes lead to mixed microclimatic conditions. As a result, a variety of habitats, diverse flora and fauna find a home and varied associations are formed in the highlands.

The sides of dissected cups and tent-shaped volcanic wrecks of varied exposure and slope degree provide so many habitats that the species and association wealth of Zemplén Mountains and especially the region of the Milic group and its neighborhood are comparable to the Mecsek or Bükk Mountains, which are far richer regarding the quality of rock. Primarily owing to the richness in shapes, among our volcanic highlands, the region named Zemplén Mountains in Hungary can be described as the region having the most varied flora and fauna.

In Slovakia, the **Milic** is a European special area of interest (SCI) composed of the southern part of the **Szalánc (Slanec) Mountains** bordering Hungary. This is a mountainous, forested, sparsely populated landscape on the southern volcanic highland of the Szalánc (Slanec) Mountains. The massif of the Milic is remarkably partitioned and is composed of a number of individual subunits; the Bradlo strata crag (840 m) and the extended Milic stratovolcano (896 m) are the most important. The mountain range is predominantly covered by clay-stone sediments from the Tertiary age. The primeval mountain beech forests which require acid soils and the lime-maple forests - occasionally have a virgin forest character, especially in the Great Milic ranges. Oak forests find favorable living conditions on the extreme growing sites. The presence of plain-like swamp alder stand is notable because it is an unusual occurrence in this 530 m elevation. Typical species of swamp forest vegetation -including the forest association representatives are in the relief depression of the Malá Izra (Little Izra). The important landscape features are the rock formations and stone rivers in combination with their unique living communities and plant associations. The presence of birds (raptors, owls, and songbirds) has an enormous importance.

The northern foothills of Milic are covered with the preserved natural association of forests and mountain meadows, which are suitable for scything and in some places grazing the livestock as well (scything once a year). The unfertilized meadow vegetation on the clearings of Milic, scythed once a year, is of great value.

The Milic habitat protection area is within the Szalánc (Slanec) Mountains bird protection area which belongs to the international system of Important Bird Areas (IBA). Among the area's most valuable species are the imperial eagle (*Aquila heliaca*), lesser spotted eagle (*Aquila pomarina*), the honey buzzard (*Pernis apivorus*), the Ural owl (*Strix uralensis*), the white-backed woodpecker (*Dendrocopos leucotos*), and the black kite (*Milvus migrans*). Aside from the habitats and species European importance, further habitats and species there are representing national values. Due to its location, the area is the important migration corridors for the gray wolf from Slovakia to Hungary.

Protected areas in Slovakia: the state protects the natural heritage by establishing different types of specially protected areas in Slovakia. The Act on Nature Conservation (No 543/2002 TT), established the following categories: national parks, landscape protection area, protected area, nature reserves, natural monument, protected landscape element and bird protection area. Some of the areas protect European habitats and species are present in the area, and the remainder areas protect national habitats and species. During their forest protection activities, foresters take into account the degrees of protection of each area, which are number 5 in Slovakia. The intensities of the forest management activities and also the regeneration methods take into consideration the different degrees of protection.

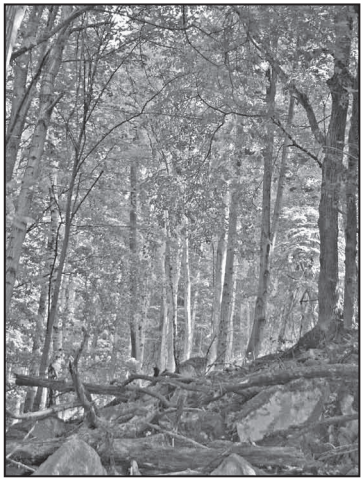
Partial view from the forest of the Castle Hill of Szalánc (Slanec)

The Castle Hill of Szalánc is a tongue of the Szalánc (Slanec) Mountains above the village of Szalánc (Slanec). The **Slanský hradný vrch** (Castle Hill of Szalánc) **Nature Reserve** covers 15.81 ha. It was classified in 1932 into the areas of the thermophile, drought-resistant flora and fauna that require special protection. The area is important in scientific research and carrying out cultural and educational activities. The castle ruins are on top of the andesite rock Castle Hill. Beside the drought-tolerant vegetation of Castle Hill, an ancient oak-beech avenue is tucked up on the hillside. The object of protection is signified by the mixed deciduous understory vegetation and mountainous vegetation: rock fescue (*Festuca pseudodalmatica*), evergreen clematis (*Clematis vitalba*), wild lettuce (*Lactuca quercina*), unkempt yellowhead (*Inula hirta*). Besides the trees and herbs, shrubs are also significant: mahaleb cherry (*Prunus mahaleb*) bushes, spiraea spirea (*Spiraea media*), burnet rose (*Rosa spinosissima*) and many other species. The area is protected by grade 4.

The **Trstinové jazero Nature Monument** (Reed Lake) is at the foot of the Castle Hill. This is a natural formation with the 4th grade protection. The total area of the nature monument covers 0.8291 hectares, of which water covers 0.3642 hectares.

The protected area was established for the preservation of valuable protected plants and critically endangered species such as reptiles which are represented in a uniquely high density: smooth newt (*Triturus vulgaris*), great crested newt (*Tritusus cristatus*), alpine newt (*Mesotriton alpestris*), fire salamander (*Salamandra salamandra*), common toad (*Bufo bufo*), yellow-bellied toad (*Bombina variegata*), common spadefoot (*Pelobates fuscus*). The most significant reptiles are the grass snake (*Natrix natrix*), and a slow-worm (*Anguis fragilis*). The important birds are the robin (*Erithacus rubecola*), greenfinch (*Carduelis chloris*), members of the Paridae and Emberizidae families, the Eurasian wren (*Troglodytes troglodytes*), the Mallard (*Anas platyrhynchos*), the common moorhen (*Gallinula chloropus*). The presence of non-native muskrats (*Ondatra zibethicus*) was recorded among the mammals. The species of aquatic and coastal communities are the most typical among the plants: the cattail (*Typha latifolia*), narrowleaf cattail (*Typha angustifolia*), yellow iris (*Iris pseudacorus*), crack willow (*Salix fragilis*), common dogwood (*Cornus sanguinea*), common hawthorn (*Crataegus monogyna*), wild pear (*Pyrus pyraster*), common privet (*Ligustrum vulgare*), dog rose (*Rosa canina*), blackthorn (*Prunus spinosa*), field maple (*Acer campestre*), wild apple (*Malus sylvestris*), common hornbeam (*Carpinus betulus*), pedunculate oak (*Quercus robur*), common beech (*Fagus sylvatica*). One of the endangered plants is the marsh fern (*Thelypteris palustris*).

The mountain ranges of the Milic massif are situated parallel to the Hungarian border, and occasional primeval forests and their fauna communities are located on the volcanic substrate. The Milic was established along a breaking line, where there are easily observable remains of pseudo-volcanoes and their lava flows, which formed the tops of the mountains long ago. The importance of the area is shown by the fact that there are 4 nature reserves on the northern and north-eastern slopes of the Milic in Slovakia, to protect the remains of primeval forests: Veľký Milič (Great Milic SK),



Beech association in the Marocká hoľa Nature Reserve

Malý Milič (Little Milic SK), Marocká hoľa and Malá Izra (Little Izra), and the Miličská skala (Milic Rock) Natural Monument. Each of the four reserves can be visited. The tourist path marked in red leads through the Marocká hoľa and Veľký Milič Nature Reserves. The yellow-marked paths are in the immediate vicinity of the Malý Milič which leads from Szalánchuta (Slanská Huta) to Izra Lake. The Miličská skala (Milic Rock) Natural Monument is most difficult to reach on the Great Milic Peak (HU), next to the border of Hungary.

The **Marocká hoľa Nature Reserve** is located on the southern tongue of the Szalánc (Slanec) Mountains between 610 to 805 meters above sea level, on the western slopes of Sucha Hora or Szár-hegy. "Shining Mountain" is the meaning in the archaic Hungarian "Szár-hegy." The ancient beech forest associations mixed with common ash remained predominantly in the reserve. Sessile oak is the most characteristic species in the northern rocky ridge, and there are beech-oak forest associations in very good condition around here. The object of protection is composed by valuable ancient beech forests older than 130 years – determined by the andesite and andesitic tuff bedrock between 590-635 m above sea level. The mixture ratio is 90 % beech, 10 % mountain elm; the virgin forest like area – occasionally with sycamore maple and common ash mixture – is easy of attainment. The forest vegetation of the area involves all the characteristics of the virgin forest like associations. The diameter and height structure of the undisturbed forests indicate a continuous distribution. The volume of the standing and fallen dead wood and live wood is also correct for a nature reserve.

Obelisk on the Great Milic Peak (HU), at the border of the Milic Rock Natural Monument.

The 64 ha **Marocká hoľa Nature Reserve** was protected in 1950. The object of protection is composed by valuable virgin like beech forests older than 130 years – determined by the andesite bedrock. Despite this, a couple of decades ago the fallen wood material was harvested after a serious wind calamity. Therefore, the former structure, which had been like a virgin forest, disappeared. There was limited removal of wood. Only those specimens were removed which were negative factors for the further natural development of that forest. These should not have a determining influence on the developmental dynamics of the forest associations. However, the existence of the nature reserve was significantly endangered. The degree of protection was moderated to the 4th category in 2004. This allows the harvest of the fallen wood caused by wind or other calamities.

The south-western edge of the Malý Milič (Little Milic) National Nature Reserve and the 6th rest area.

Miličská skala (Milic Rock) was declared a **natural monument** in 1990. The monument covers 11.6 ha and protects the morphologically distinct rock formations which are remnants of dacite flows and were shaped into their current forms through the fragmentation of the originally lava block.

The **Malý Milič (Little Milic) National Nature Reserve** is located in the area of Eszkáros (Skároš) and Szalánchuta (Slanská Huta) and covers 14.05 ha. The protected area is a rocky heel of the Malý Milič with its typical rock walls and rock screes. The area was protected to preserve the typical ancient woodland vegetation and the different species of prey birds which found suitable breeding conditions in the Milic area. The beech forest associations are more common in the area, with mixed oak forests. Sycamore maple associations were formed in the lava flow areas, mixed with ashes and large-leaved lime trees.

The 67.81 ha. **Veľký Milič (Great Milic) National Nature Reserve** was established in 1976. The most remarkable blocks of forest habitat types are present here. The base of the massif is made up of andesites and dacite, which forms the southern part of the Szalánc (Slanec) Mountains. The lime-acorn associations are typical in this oak-beech forest zone. The characteristic plant communities have been created on rocky cliffs, including maple forests on lava flows which are the southernmost occurrences of such habitat type within Slovakia. Virgin forests like ancient forests occur on medium and poor growing sites and between 725-780 m above sea level; the mixture ratio is 65 % beech, 20 % sessile oak, ash 10 %, 5 % hornbeam with scattered

sycamore maples. It has been preserved in a close to original state, but the signs of human intervention are visible. The Veľký Milič (Great Milic) National Nature Reserve has forest communities on southern lava flows in the Szalánc (Slanec) Mountains and a nesting habitat for protected prey birds. The area is used for zoological and forestry research. There is no designated buffer zone and the protection grade is 5.

The **Malá Izra (Little Izra) Nature Reserve** is in the area of the Slanec (Szalánc) Forestry Directorate on the Milic massif, which is situated near Veľká Izra (Great Izra) Lake. The Malá Izra is a natural lake formed by a depression in the terrain, surrounded by a woodland complex in the mountain range of the Milic. The site accommodates rare lowland swamp alder stands at the rather unusual elevation of 530 meters above sea level.

The Hungarian **Zemplén Landscape Protection Area** (Zempléni Tájvédelmi Körzet, ZTK), become protected by the decision of the National Nature Conservation Authority (Országos Természetvédemi Hivatal, OTvH) numbered 1/1984 (XII. 13.), is a nationally protected natural site. Area: 26,496 hectares

According to the regulation, the region has been declared protected for the purpose of "preserving and maintaining the geological values, the terrestrial forms dominating the landscape character, the protected species of flora and fauna, the natural plant associations, the grasslands and the natural forests and the typical landscape environment of communities".

As part of the protected area, in the northern part of the Zemplén Landscape Protection Area, the following sites are strictly protected, with the total area of 226 ha:

- Oláh Meadow
- Drahos Meadow
- The Castle Hill of Füzér and its Surrounding
- Tolvaj Hill

In the Hungarian side of Great Milic Nature Park, the clearings, such as **Drahos and Oláh Meadow**, and the habitat and association complexes, such as the **hill of Füzér Castle** and **Tolvaj Hill** above Pusztafalu are associations representing priority natural value. The dominating volcanic form of the basin of Pusztafalu, i.e. the lava dome with its steeper slope is the most typical in the case of Tolvaj Hill. Through the gap volcanism, its dense liquefied material, when pushing upwards from the magma chamber, barely reached the surface, and thus did not create lava flows, but penetrated into the surrounding sediments, tuff-stones, lifted them and then congealed.

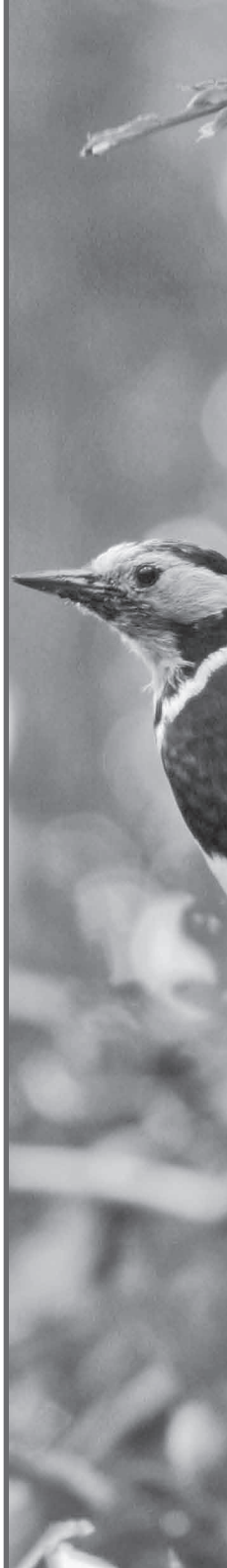
The managed, still natural plant population of mountain meadows (e.g. Drahos Meadow) are characterized by the presence of meadow species from the mountains (e.g. meadow gladiolus, gentian, Siberian iris). The symbiosis of life forms is demonstrated by the fact that the *Maculinea alcon* butterfly species lay eggs onto the flower buds of the Marsh Gentian, or on the upper

part of the stem or on the upper leaves. The young caterpillars develop in the pericarp, and after they have left it, the ant hosts continue their nurture. At a later development phrase, imitating the scent and ultrasound signal of ant larvae, they make the ant workers feed them.

Vipera berus is a snake typical of the higher, more rainy and tussocky meadows of the Zemplén Mountains. It is a short, thick-bodied snake; its length rarely exceeds 80 cm. It has an X or Y-shaped marking on the back. This mark is followed by a brown or black zigzag-patterned streak until the tail tip, so the middle of the back is always dark. It is rare everywhere in its habitats, it preferably avoids people – it perceives ground vibrations and leaves in time. In these areas environment protection management aims to maintain and to increase biological diversity of the grasslands, by means of traditional grassland management such as scything and grazing, and also by stopping or curbing the scrubs.

In the case of the habitat complex of the lava dome of **Tolvaj Hill**, it is typical that on the increasingly steep slopes, the downward ridges of hill sides, the closed forest stands like hornbeam-oak forests, beech forests and rocky forests become thinner, and give way to the acidophilus oak woods formed in these regions on highly acidic bedrock. This way on the southern sides, increasingly exposed to warm weather, acidity- and drought-tolerant species are dominant, while on the northern sides, species preferring acidity and showing humid conditions appear. In the forest stands of the frame soils, characterized by unfavorable nutrient and water management, formed on acidic bedrock, rowan (*Sorbus aucuparia*) can be found, while *Luzula luzuloides*, the common heather (*Calluna vulgaris*) and the bilberry (*Vaccinium myrtillus*) are typical of the grass layer. The association formed in the salient rock ridges, unique in Hungary, is the silicate rocky forest, with the main tree species of sessile oak (*Quercus petraea*) and characteristic species of common whitebeam (*Sorbus aria*), but the silver birch (*Betula pendula*) can also be found here. Further stands of the forest association can be found on the rocks of southern exposure of the volcanic mountains of the northern and north-eastern Carpathian Mountains. On the silicate rocky grasslands of Tolvaj Hill, rock outcrops appear in smaller spots than in the case of the hill of Füzér Castle, and the vegetation of open and closed rocky grassland alternate. From a forestry perspective, the forest stands of the area primarily serve defense purposes.

The **hill of Füzér Castle** is a volcanic formation that is remarkable from a distance, emerging alone from its environment. The upper third of steep hill sides is the dacite block that – forming an almost vertical cliff on the southern, south-western and north-western sides – forms a natural defense line around the hilltop that provides place for castle building. The only bet-



ter access is offered by the gentler topographic conditions of the saddle joining from North-East by means of the access road to the "Párkány" (Shelf) and then the stairs cut into the rock.

The Füzér Castle and the Castle Hill have recently been awarded the prize of "natural wonder of Hungary". An improvement shaping as a result is the rocky grassland visitor track planned on the hillside, which makes it possible to study and present rare sights without damaging them. The protected rarities can be visited in groups with a guide. In the Middle Ages the hillsides were cut bald and later stayed bare due to the intensive grazing of livestock. The barren rock and rockslide surface meant the basis for special pioneer vegetation: the rocky grassland.

The Castle Hill and the castle have been inhabited since the Bronze Age. The anthropogenic effect has been continuous in the Middle Age and the Modern history as well. Among the establishments under the castle, the 1620 inventory lists a wildlife park, and the 1667 urbarium mentions a fishpond. The wildlife park was probably located on the northern side of the Castle Hill, but there is no trace of the fishpond today.

The grazing of livestock played a role in the formation of the silicate rocky grassland association. The vegetation in the neighborhood of the hill of Füzér Castle was clearly a barren area based on the presentations and paintings from the 18-19th centuries. The works of Thomas Ender (1793-1875) Austrian landscape painter should be highlighted here, who – according to his contemporaries – drew, painted and shaded more accurately than the landscape photographing machines of the time, and his aquarelles from the 1860s show a barren area. The Sunday Paper (Vasárnapi Újság) published the original drawing of János Greguss on the treeless Castle Hill and the ruins hidden on the top in 1868.

After the grazing of livestock stopped, the rocky grasslands, pushed back by the expanding scrubs and undergrowth, can find habitat only on the hilltop. In the last hundred years, as a result of the forestation of barren areas, deciduous forest mixed with pine appeared on the hillsides.

Here let me talk about a special forestry activity, a quasi-rural development method: the afforestation of barren areas. It means the binding and afforestation of the barren slopes, the soil of which has not developed or has eroded, by planting saplings or sowing seeds. The purpose is soil protection, which was intended to promote the improvement of the habitat of eroded clearings formed in the earlier centuries and the initiation of soil development.

Nándor Schudlich forest engineer from Füzér reported on the forestation of barren areas in the Hegyköz region at the end of his career, these plantations can be found now in the area of the hill of Füzér Castle in the

advanced succession process of developing into hardwood stand. The forestation of the barren areas of the hill of Füzér Castle with Scots pine (*Pinus sylvestris*), European black pine (*Pinus nigra*) and flowering ash (*Fraxinus ornus*) saplings took place in the 1910s. The photos from the beginning of the 20th century show a young pine tree stand on the southern side of the Castle Hill where the fire breaks between the parts are clearly visible. In connection with the developments in the conducted forestation of barren areas, the report of 1935 says: "... the afforestation of rocky parts under the castle ruins of Füzér should be avoided for conservation purposes."

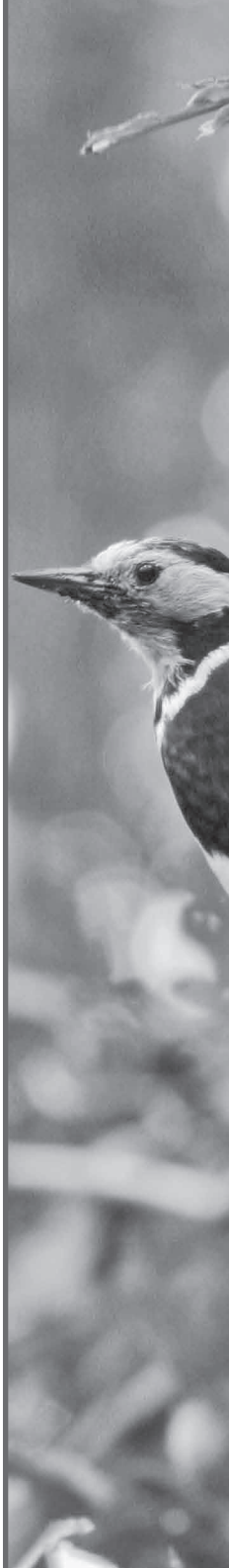
To continue these activities, in 1941 the Administration Committee of Abaúj-Torna County announced the related decision of the Minister of Agriculture to the Hungarian royal Forestry Directorate of Kassa (Kaschau, Kosiče) and the Károlyi estate. The decision declared the Füzér 137a, b and 138 forest compartments, lying on an area of 34,3 cadastral acres (almost 20 ha) to be natural reserves, in agreement with the Hungarian royal religion and public education minister, in order to protect the rare plants growing in the rocky soil of the hill side and the castle ruins.

The rocky grassland cloister, serving presentation purposes, is not only a trail that can be visited by a guide or a tool for sharing knowledge on the nature, but this gridded steel surface, hidden in the landscape allows safe walking on it and creates the infrastructural background of the conservation management of the Castle Hill as well. The eradication works can be carried out on this basis to eradicate the scrubs that have caused the significant loss of character of the rocky grassland mosaic parts. Similarly, the research on the carved stones of the enormous amount of castle wall ruins found at the foot of the dacite organs can be based on this rocky grassland promenade.

The rare plant associations to be presented are the following:

- Pioneer vegetation of rock walls and stone walls;
- acidophilus open and closed rocky grassland types.
- scrubs on rocks, which unique associations appear 450-750 m above sea level in the oak, hornbeam-oak and beech forest zones, and typically form a special mosaic complex with forests on rocks on the northern side.
- woody, lush, natural habitat on the mountainous and hilly areas, the scree forest.

The special and unique silicate rocky grassland association shows an extremely dry and sunny habitat. The grassland, due to the strong abiotic stress, does not close. This is called an edaphic association, which means that the vascular plant species settle on the soil accumulated in rock fissures. Most characteristic species:



- *Aurinia saxatilis*, the plant of rock walls and open rocky grasslands.
- The dwarf iris (*Iris pumila*), characteristic of rocky grasslands, the diversity of flower color, i.e. lusus is characterised by purple and yellow.
- *Sempervivum marmoreum* is a native species of the Carpathian basin or Pannonia, and it is the protected species of prehistoric rocky grass-fields and rocky slopes
- in the more shady and humid corners and sides members of, the *Polypodiaceae* family like *Asplenium trichomanes* and *Polypodium vulgare* – often covering larger rocky surfaces – are typical.
- The low branching semi-shrub, *Minuartia frutescens* is the characteristic of acidophilous rocky grasslands, while beneath the shrub the yellow-flowered *Sedum acre* settled.
- The rockfoil (*Saxifraga paniculata*) is characterized by the capsule-shaped flowers in racemes and its rosette.
- The habitat of *Dianthus carthusianorum* (Carthusian pink) blooming in the summer finds its habitat at the closed rocky grasslands and steppe slopes.
- *Centaurea triumfettii* is typically present in associations of dry rocky grasslands, steppe meadows on slopes, dry oak forests and shrubs.
- *Potentilla arenaria* blooms in great numbers on the Castle Hill, on the northern part the *Lathyrus vernus* and the *Anemone ranunculoides* are common.
- The plant called *Thlaspi kovatsii ssp. schudichii*, stretching through the Meleszke Side, received its scientific name from Nándor Schudich Jr. forest caretaker who discovered the subspecies.

The lack of grazing livestock and the shrubs formed as a result – especially dog rose (*Rosa canina*), blackthorn (*Prunus spinosa*) and hawthorn (*Crataegus*) – hinders the performance of conservation tasks.

Other anomalies, such as the collapse of castle walls and the settlement of rockslide vegetation there endanger the stability and integrity of original associations and reduce their expansion. The Castle Hill of Füzér is a good example of the fact that the cooperation of local population is an example to follow in the field of historic and natural value preservation too. Keeping this example in mind, in the Great Milic Nature Park our goal and task is to ensure the long-term and sustainable preservation of local communities, the natural cultural landscape and the priority historical monuments and natural areas.

Dr. László Nyári