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AND NATURAL HABITATS

Standing Committee

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REPORT

**ON THE SPOT EXPERT APPRAISAL OF THE
SZÉNÁS HILLS PROTECTED AREA**

(HUNGARY)

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Table of Contents

1.	Introduction	3
2.	Description	3
3.	European interest.....	4
3.1	Habitats	4
3.2	Species	5
4.	Conservation Measures	5
4.1	Legal Protection	5
4.2	Buffer Zones	5
4.3	Zoning.....	6
5.	Supervision/wardening.....	7
6.	Land use planning	7
7.	Management.....	8
7.1	Management Resources and Administration	8
7.2	Principal Management Approaches	9
8.	State of conservation of the main species and habitats	10
9.	Uses and Socio-economic Activities.....	13
10.	Appraisal of the implementation of the previous recommendations (2010)	14
11.	Conclusions	15
12.	The suggested recommendations for the renewal of the European Diploma for Protected Areas in 2020	16
	Annex 1	18

1. INTRODUCTION

The Szénás Hills Protected Area was awarded European Diploma for Protected Areas (EDPA) status on 11 September 1995, following application made by the Hungarian Government to the Council of Europe in March 1994.

The site was first appraised through site visits for EDPA status in 1994 to support the initial application, and again in 1999, after which the EDPA status of the site was renewed (in 2000) for a further 5 years until September 2005.

In 2005 the status was renewed until September 2010, this time through discussion between the Bern Convention Secretariat and the site managers. The status was again renewed in 2010 for a further 10 years, following discussions held between the Secretariat and the site manager and the advice of the Group of Specialists of the European Diploma of Protected Areas.

The initial award in 1995 was made subject to two conditions being fulfilled:

- that appropriate measures are taken to eliminate the mouflon (*Ovis musimon*);
- to generally prohibit hunting throughout the area, on the understanding that selective culling organised by the managing authorities may be carried out to control the large populations of herbivores.

In addition to these, the award was made with 7 recommendations attached (see Annex 1). Further revised recommendations were attached to the renewals in 2000, 2005, and 2010. The most recent recommendations from 2010, and an assessment of the degree to which the managing authorities have met them, are included in section 7.

This present assessment was undertaken prior to the consideration of the renewal of EDPA status in 2020. It was carried out on 4 and 5 September 2019, accompanied by staff from the Duna-Ipoly National Park Directorate and Pilis State Forest Company, with an additional unaccompanied visit to the site on 6 September.

2. DESCRIPTION

A complete description of the site is given in the original application for EDPA status presented by the Hungarian Government in 1994 (PE-S-ZP (94)48), and in the initial expert appraisal conducted in the same year (PE-S-ZP (95) 52). A summary, together with additional information collected from the present visit, is given here:

- The Szénás Hills Protected Area occupies a series of low hills at between 220-558m above sea level, approximately 17 km north-west of Budapest, within the 'Danube Bend', where this major river changes direction from an easterly to a southerly flow.
- The site is underlain by hard geology of predominantly Triassic dolomite, with a smaller area of Dachstein limestone, which give way to tertiary sediments and quaternary sands and loess in the valleys and surrounding landscape.
- The hills comprise several largely east-west ridges, which themselves are deeply incised, giving a very varied topographical relief of steep slopes and narrow valleys.
- The site sits wholly with the Buda Protected Landscape Area (ca.10,528ha), comprising 1182ha of what is understood to be the most biologically rich part of the Buda Hills. This includes Dolomitic grassland, steppe grassland and native deciduous woodland.
- In addition to this core area, there are two buffer zones which separate the Szénás Hills Protected Area from adjacent urban development. These comprise abandoned orchard to the south, and arable farmland and forest to the north, totalling 163ha. The buffer zones are privately owned, but are subject to the regulations of the Buda Protected Landscape Area.
- To the east, the Szénás Hills are bounded by three smaller municipalities (Pilisszentiván, Nagykovácsi, and Piliscsaba), and to the west by low lying largely cultivated farmland. To the north

and south the site is contiguous with the Buda Protected Landscape Area, as well as undesignated land, predominantly of forest.

- The site is owned by the Hungarian Republic, with ownership vested in the state-owned Pilis Forest Company; management of the site is led by the Duna-Ipoly National Park Directorate, working in close partnership with the Pilis Forest Company and the municipality of Pilisszentiván.
- The hills and valleys of the protected area are in stark contrast to the farmland and urban areas of the surrounding plains, and it is the upland relief which has protected the site from much human intervention.
- Nevertheless, the Szénás Hills have been heavily influenced by human activity, and the past 100 years have seen periods of deforestation of native woodland, grazing by livestock and non-native mouflon, afforestation with black pine (*Pinus nigra*) in the 1930s, increased recreational use, urban incursion, and more recently, nature conservation management.

3. EUROPEAN INTEREST

The Szénás Hills are undoubtedly a unique natural area, and certainly of exceptional European significance. It is particularly noted for its Dolomitic grasslands, a highly restricted habitat, and surviving here as one of the most species-rich examples in the Transdanubian hills.

The principal reasons for this biological richness are given (in the original application for EDPA status) as:

- The underlying geology of dolomitic limestone, the natural and semi-natural habitats of which are typically of very high species value, wherever they occur.
- The area is situated within the Pannonian European biogeographical region, but exists as an ecotone with several biogeographical influences, including steppe, continental, Eastern Europe, Mediterranean, and boreal/alpine elements.
- The varied relief of Dolomitic limestone geomorphology, which gives rise to an equally varied microclimate. This is characterised by hot, dry south-facing slopes with thin soils (sometimes with naturally eroding surfaces), and northern slopes and valleys with more stable, deeper soils. This allows both thermophilous and cold tolerant species to thrive in close proximity, in a variety of vegetation communities.
- The historic absence of woodland, which has allowed species of open habitats to persist, allowing relict species of ancient paleoclimatic ages to survive in ‘barren grasslands’.

In addition, despite a variety of pressures through the 20th Century in particular, the relatively sympathetic land use history brought about by the unforgiving landforms and soils has allowed the Szénás Hills to avoid full scale commercial forestry, intensive farming and urban encroachment.

3.1 Habitats

The Szénás Hills Protected Area includes four principal habitat types:

- **Rock vegetation** – on Dolomitic ridge crests and steeper south-facing slopes. Where these grasslands have a relatively closed sward they are considered ‘pristine’, and are perceived to be possibly a plagioclimax vegetation. Where there is more open vegetation (e.g. >50% bare ground), subject to either natural erosion or erosion influenced by large herbivores, these are considered to be ‘degraded’.
- **Grasslands** – typically on shallower slopes both south and north facing, these Steppe grasslands feature a dense, closed sward, of >10cm.
- **Karst oak forests** – typically on south facing slopes
- **Beech-Hornbeam-Oak forests** – typically on north facing slopes and in valleys

In addition to these main habitats are smaller areas of native scrub species (such as *Juniperus*, *Crataegus* and *Fraxinus*), plantations of non-native black pine (*Pinus nigra*), and occasional stands of non-native black locust tree *Robinia pseudoacacia*.

At the time of initial assessment for EDPA status (1994), of the 1182 hectares of the proposed area, 942ha (79.7%) were covered by natural deciduous forest, 100ha (8.5%) by dolomitic grasslands and 120ha (10.2%) by the pine plantations.

3.2 Species

Since the conferring of EDPA status, there has been considerable amount of research into the biological value of the Szénás Hills Protected Area, much of which has been collated into an excellent volume of research (Dobolyi and Kézdy, 2008) published by the national park directorate. Some highlights are described below.

Vascular Plants

The area is very species rich, and a total of 722 vascular plant species and subspecies have been recorded, more than 100 of which are protected. There is a particularly rich flora of endemic and relict species (some of which are endangered), especially in the more open grassland areas. These include red list species such as Dolomitic flax *Linum dolomiticum* (occurring here at its only known location) and *Seseli leucospermum*.

Invertebrates

The invertebrate interest is gradually becoming better understood and is stated to be especially representative of continental and Mediterranean assemblages.

- Orthoptera – 57 species recorded, including 3 protected species *Sago pedo*, *Gampsocleis glabra* and *Stenobothrus eurasius*. The steppic grassland slopes and karstic forests are the most species rich.
- Coleoptera – 530 species recorded, including 17 protected species. The dry calcareous grasslands and ‘white oak’ (presumably *Quercus pubescens*) woodlands are the most valuable habitats.
- Microlepidoptera – despite under-recording, 437 species have been recorded, reckoned to be only 70% of the area’s true species richness.
- Butterflies – 129 species recorded, representing 82% of all species currently present in Hungary.
- Macroheterocera – a ‘highly important’ fauna of around 750 species

4. CONSERVATION MEASURES

4.1 Legal Protection

In addition to its Protected Area status, the Szénás Hills Protected Area enjoys two further layers of legal protection:

- It is a part of the Buda Protected Landscape Area (10,528ha), designated in 1978 by the National Authority for Environment and Nature Conservation
- It is designated as part of the Budai-hegység Special Area of Conservation (9522ha) under the terms of the European Union Habitats and Species Directive.

4.2 Buffer Zones

The two buffer zones referred to in the description above have existed since before the award of EDPA status, and their importance has been consistently emphasised at each appraisal of the site since.

The northern buffer is largely arable farmland (with some rough grassland and scrub on the periphery) whilst the southern buffer is predominantly an orchard. The management of each of these appears to be largely sympathetic to the management of the Szénás Hills, acting as both an ecological transition from more

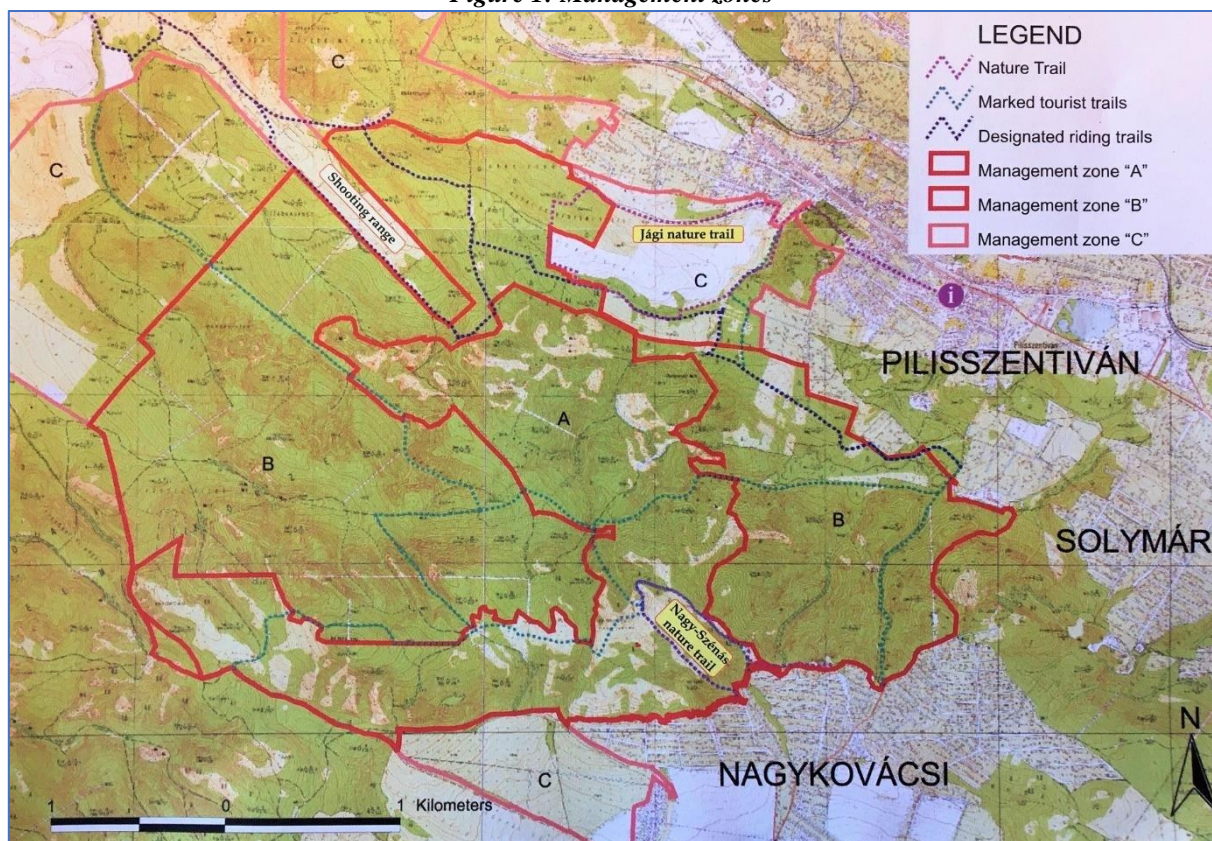
intensively managed land into the less intensively managed areas of the EDPA site, but perhaps most importantly as a physical buffer to urban encroachment on the from adjacent settlements.

Each of the buffer zones is privately owned, and there do appear to be occasional conflicts with proposed land uses within the buffer zones, making purchase by public authorities seem an attractive option. However, the land has not been offered for sale, and it may well be too expensive to purchase in any case. In the meantime, the retention of these areas in the Landscape Protected Area is essential to maintaining their function as buffers to the Szénás Hills, and this measure has thus far provided adequate protection to ensure that these buffer zones continue to function as intended.

4.3 Zoning

The 2008-2018 management plan established 3 management zones in the Szénás Hills Protected Area, each with differing management objectives and provision for public access and recreation. This appears to be a sensible zonation, and has significant benefits in targeting resources, aiding understanding of the relative nature conservation value of different parts of the area, and gives a valuable framework for managing different public access provision.

Figure 1: Management zones



Zone A – Nature Zone

This is an area of minimal intervention, comprising woodlands and grasslands, including most if not all of the Dolomitic grassland, and its associated rare species. Active woodland management is confined to the removal of non-native species, work to target the management of rare species, and emergency work (e.g. health and safety). Otherwise, natural processes operate, with regeneration, disturbance through wind blow, senescence and decay, together with the action of wild boar and deer, the populations of which are strictly managed. The grasslands are essentially unmanaged, but are subject to the severities of the microclimate, disturbance by wild mammals (especially wild boar), and natural erosion. Public access is confined to low intensity activities, principally on foot on marked trails.

Zone B – Managed Zone

Predominantly forest, managed sympathetically, shifting away from more intensive forest management of rotational clearfell towards continuous cover forestry of a native species mix, principally hornbeam *Carpinus betulus*, beech *Fagus sylvatica*, oak *Quercus petraea*, and sycamore *Platanus pseudoplatanus*. Small scale felling is practised, principally producing firewood for local sale. It is also the principal zone where the conversion of Austrian pine *Pinus nigra* stands to native woodland has been undertaken. A broader variety of recreation is permitted, including horse riding trails and orienteering.

Zone C – Interpretation Zone

Includes forest, farmland and orchards and some grasslands, of lower nature conservation value, and includes the two buffer zones described above. The forest areas are subject to conventional forest management. It is the focus for much of the educational and interpretative work, and includes nature trails and easy access to the new visitor centre at Pilisszentiván. It can be freely visited for a wider variety of recreational uses, and includes marked cycle and horse-riding routes, and access by motor vehicles for local residents is allowed by permit.

5. SUPERVISION/WARDENING

The Szénás Hills Protected Area is in the most populated part of Hungary, and is just 17km from the centre of Budapest, from which it is easily accessible by private and public transport. In addition, the population of local towns in the immediate vicinity of the area numbers some 50,000 inhabitants¹

Earlier EDPA appraisals have highlighted the need to control access and police the area to control damaging influences. This appears to have been successfully achieved through a combination of an increase in rangering resources, the provision of marked trails for a variety of recreational uses, the fencing of the protected area which controls access, and an extensive education, interpretative and outreach programme with local communities.

The ranger service covering the Buda Hills Protected Landscape Area, which numbered only 1 individual in 1994, now has 5 rangers, and is supplemented by volunteer ‘civil rangers’. In 2005 the ranger service lost its policing powers, but the combined approach outlined above has compensated for this loss of authority, replacing it with a more positive, collaborative approach, to the great credit of the managing authorities. Whilst it is difficult with any amount of resource to fully prevent any harmful influences, it was notable that on this visit, the assessor saw no litter at all, and no evidence of inappropriate uses, other than two very small (<1m diameter) fires sites in Zone A.

6. LAND USE PLANNING

The combined measures of the available legal protections, buffer zones and zoning appear to adequately protect the site from damaging land use change.

The Duna-Ipoly National Park Directorate has recently (2017) established a trilateral ‘agreement of co-operation’ with the Forest company and the municipality of Pilisszentiván. Whilst this does not specifically mention land use planning, the positive relationship which has been established with this municipality is reflected in the local land use plan (2016), which includes reference to the EDPA site, highlights the importance of it, and specifically includes regulations for the buffer zone against the construction of buildings and utilities.

The influence of Duna-Ipoly National Park Directorate has been instrumental in preventing some potentially damaging developments.

¹ Estimate from Wikipedia 2018 population data of the towns of towns of Pilisszentiván, Nagykovácsi, Piliscsaba, Solymar and Pilisvörösvár.

7. MANAGEMENT

7.1 Management Resources and Administration

All of the land within the EDPA area of the Szénás Hills Protected Area is owned by the Hungarian Republic, vested in the state forest company (Pilis Forest Company, PFC). The management of the area however is principally guided by Duna-Ipoly National Park Directorate, and the two public bodies work in close co-operation on all matters concerning the management of the Szénás Hills Protected Area.

Duna-Ipoly National Park Directorate

The Directorate is one of 10 such directorates in Hungary, which together cover the whole of the country, managing national parks, landscape protected areas and smaller nature reserves. The Duna-Ipoly directorate manages 1 National Park, 8 Landscape Protected Areas, and 36 nature reserves. The Directorate area has a population of some 3 million people, including Budapest, the largest centre of human population in the country.

Core funding of the directorate comes from the Hungarian government (c.25% of the directorate's budget) covering staff salaries, core office costs, etc, and there is some income generation from sales and ecotourism (c. 25%), but a significant proportion of the budget (c. 50%) now comes from EU funding sources, including LIFE and INTERREG, to fund particular projects.

The Szénás Hills does not have a specific budget allocated for its management, but the area is a priority and a 'shop window' for the directorate, and resources are targeted there in preference to other areas. The Directorate has a small but highly dedicated and experienced staff on the Szénás Hills.

Resources appear to be at least adequate to meet the management needs of the Szénás Hills Protected Area, with one possible exception. EU funding has been a vital in meeting significant management needs, and it is doubtful that progress with key EDPA recommendations could have been met without it. However, it appears that this funding is rarely used to employ additional project staff, which limits the reach of these projects, and can put existing core staff under significant pressure. That the directorate has made such effective use of EU funding is a credit to their dedication, but greater progress in meeting EDPA recommendations could well follow from employing additional project staff through these funding mechanisms (see recommendation 2).

Pilis Forest Company (Pilisi Parkerdő Zrt)

Pilisi Parkerdő Zrt. is a private limited company wholly owned by the Hungarian state. Under a treasury contract, it manages forests owned by the Hungarian state, and does not receive any direct funding from the state budget. 62% of the areas managed by Pilisi Parkerdő Zrt. are protected e.g. the Buda, Pilis and Gödöllő Landscape Protection Areas, the Pilis Biosphere Reserve, and the Szénás Hills Protected Area. There are ten organizational units, and the Szénás Hills Protected Area falls within the area managed by the Budakeszi Forestry Unit; this unit also manages 5640 hectares of Buda Landscape Protection Area.

The Pilisi Parkerdő Zrt has distinct responsibilities in the Szénás Hills Protected Area, principally forestry management and game control. Its ethos has shifted from one of purely silvicultural management to one of ecosystem management, and for instance is increasingly adopting more sympathetic management practices, including natural regeneration in preference to planting, and continuous cover forestry, in preference to rotational clear fell.

As a large forest enterprise, it brings considerable resources and expertise to the management of the Szénás Hills, and has been particularly instrumental in the conversion of Austrian pine *Pinus nigra* to native woodland, and in reducing the populations of native and non-native large mammals. Informal discussions during the on the spot appraisal with Dr Péter Csépanyi, Head of Department for Forestry at the Ministry of Agriculture, suggest that there may be an appetite for vesting more management control of the Szénás Hills Protected Area (see recommendation 1).

The DINPD achieved a LIFE Nature project for the nature conservation management of the Szénás Hills between 2003-2008, in cooperation with Pilis Forest Company. After completion of the LIFE project the two organisations signed an 'agreement of co-operation'.

Local Municipalities

Of the three principal municipalities adjacent to the Szénás Hills Protected Area, one (Pilisszentiván) joined to the above mentioned 'agreement of co-operation'. This agreement, established in 2016 and renewed annually, appears to be a highly effective mechanism for closer working between the public authorities and the local communities. The agreement sets out the responsibilities of the 3 parties in habitat restoration, big game control, guarding of the site, education and communication, research, and funding, amongst other issues. The overall purpose of the agreement is to "...*guarantee that conservation management issues concerning the European Diploma Site Szénás Hills, shall be attended to in co-operation by the parties, at a level required by its international importance*".

At a meeting with the Mayor and Deputy Mayor of Pilisszentiván as part of the on the spot appraisal, it was clear to the assessor that the Szénás Hills were highly valued in the local community, for their intrinsic value as part of the local landscape, for the recreational opportunities they give, and for the enhanced quality of life enjoyed by local people. The European Diploma status is also highly valued, for the recognition it brings to the local area, and for instance features prominently on the local town tourist map.

This trilateral agreement appears to be an exemplary model on which to base local co-operation, and it would be highly beneficial to extend this type of agreement to the other municipalities, especially Nagykovácsi and Piliscsaba (see recommendation 1).

7.2 Principal Management Approaches

Pine removal

A principal objective of management has been to steadily remove black pine *Pinus nigra* stands, and replace them with native vegetation. Owing to the very steep slopes and difficult accessibility for forestry machinery, this is technically very challenging, and has required the deployment of sensitive and innovative techniques to achieve restoration without damage to forest soils. Hence it is necessarily slow progress. Some 200m³ of pine are removed each year, and the conversion to native woodland in treated areas appears to be progressing well. There is some concern that from a starting point of 120ha in 1994, progress could be accelerated to achieve complete eradication within the next decade (see recommendation 4). On one site visit within Zone A, regenerating pine <20 years old was noted adjacent to open grassland, suggesting that the net change in pine cover may not be as high as is desired.

It is evident also that whilst at least some of the pine plantations were originally established on open grassland habitats, most of the habitat restoration is towards native woodland, rather than species-rich grassland. Since the grassland types are considerably rarer than the woodland, this appears to be something of a missed opportunity. However, the assessor understands that forestry regulations in Hungary require that where woodland is cleared, an equivalent area must be re-established elsewhere in the same municipality. Whilst a sensible regulation in normal circumstances, this is a significant constraint on the management and restoration of the rare grassland types and their component species, and there appears to be no exemption where nature conservation priorities of open habitats might be paramount (see recommendation 4).

Game management

The removal of non-native large mammals, and the reduction of native mammals to acceptable population levels has been a condition and subsequent recommendation in the Szénás Hills Protected Area since the award of European Diploma status in 1995. To date the combination of control methods (e.g. big game drives, shooting, trapping) appears to be achieving the desired objectives, and will no doubt need to continue for the foreseeable future (see recommendation 3). The non-native mouflon is now rarely seen, and fallow deer *Dama dama* are infrequent, and it is evident that woodland structure is benefiting. Woodland in zone A especially shows good evidence of natural regeneration and increasingly varied structure, and contrasts with woodlands on the periphery of the protected area which are more uniform. The effect on the grassland has been apparently to reduce erosion on steeper slopes (but see comments on grassland management below).

Fencing

During a major LIFE funded habitat restoration project almost the entirety of the Szénás Hills Protected Area was enclosed with a fence which prevents the ingress of large wild mammals. Combined with the

ongoing control of large mammals both within the fence and outside, this provides an effective way to manage the levels of browsing and grazing within the protected area. It also has the effect of limiting public access to the less intensive activities. Continued maintenance is necessary though if the fence is to continue to be effective, and in particularly severe winters prone to large scale tree fall (as in December 2014) cost may be particularly high.

Grassland management

The grasslands do not appear to have any active management (no livestock grazing or manual or mechanised cutting), and it is likely that the character as well as the extent of the grasslands has changed considerably over the last 100 years. Most recently, the reduction in the mouflon population, which is understood to have contributed to unacceptable erosion of Dolomitic grassland and the suppression of woodland regeneration, is likely to have had some effect on the structure (if not necessarily the species composition) of these grasslands.

There is still occasional physical disturbance of the grassland by wild boar *Sus scrofa*, and presumably low levels of periodic grazing by any remaining mouflon. The open patches created by the boar provides some dynamism in the vegetation, with bare regeneration niches for annual and biennial plant species, as well as for any perennial species which require bare ground for regeneration. It is likely that the bare areas are also valuable to invertebrate species. The relatively short growing season, severe drought on the steeper slopes, the thin unstable soils, and probably the continuing effects of lower populations of larger wild mammals, probably all continue to contribute to maintaining some open grassland areas.

Rare species

The species which receives the most attention is inevitably the Dolomitic flax *Linum dolomiticum*, narrowly endemic solely to the Szénás Hills. It exists in just a few locations on Dolomitic grassland, on some of the most exposed areas in the Szénás Hills Protected Area, with 1km square. Detailed monitoring has shown that the species is declining in extent, and in overall population size, but despite some detailed research it is not yet clear what is driving this change. A project of *in situ* and *ex situ* experiments to understand the population dynamics of the species is underway.

8. STATE OF CONSERVATION OF THE MAIN SPECIES AND HABITATS

On a 3 day visit it is not possible to fully understand the state of the conservation of the principal habitats and species. Presented here are some general conclusions based on various available reports, conversations with staff of the Duna-Ipoly National Park Directorate, Pilis Forest Company and local experts, combined with the personal observations of the assessor during the site visits.

Woodlands

Broadly, the management of the woodlands is well planned, and well executed. The woodland in the protected area is subject to 10-year forest design plans, and since 2004 has been managed under a continuous cover forestry system, which is more ecologically beneficial than previous approaches. In Zone B, where woodland is actively and sympathetically managed, there is evidently increased structural variation, and a steady shift towards a more natural species mix, as a result of forest management, large mammal control and the removal of exotic species. There are still extensive woodland areas which are very uniform in age, but these will gradually diversify through successive forest management cycles. The removal of both *Pinus nigra* and *Robinia pseudoacacia*, though admittedly relatively slow, appear to be successful.

The minimal intervention woodlands of Zone A there are obvious signs of healthy natural regeneration throughout, frequently of beech *Fagus sylvatica*, sycamore *Platanus pseudoplatanus*, ash *Fraxinus excelsior*, and field maple *Acer campestre*, and good structural variation. Standing and fallen dead and decaying wood is present, and will no doubt increase over time.

The regeneration appears to be filling gaps in the canopy of the woodland, which is to be expected, but the effect is that whilst vertical structural variation is increasing, horizontal (or spatial) variation appears to be reducing. Monitoring will need to assess whether gaps in the canopy are adequately created in this system through e.g. tree senescence, storm action and large herbivore activity.

Whilst most of the rare plant species appear to be associated with more open habitats, the increasing knowledge of invertebrate populations appears to demonstrate the value of the karst oak woodlands in particular.

Ecotones

Grading into more open grasslands are well structured ecotones through scattered trees as scrub. In general such ecotones are highly valuable for invertebrate and birds species, and are present in the protected area around the margins of virtually every grassland area. This includes some species which are of obvious intrinsic value such as the Buda whitebeam *Sorbus semiincisa*, known only from the Buda Hills and nearby Pilis Hills. In places though these ecotones are quite extensive, and particularly with reduced numbers of large grazing and browsing mammals, there is a risk that these coalesce to the exclusion of more open habitats. In places there are signs of scrub species becoming recently established on open grassland, whilst the converse, open space being created for instance by large mammals, was not observed.

Grasslands

Both the dolomitic 'rock' grasslands and steppe grasslands are dealt with here, since the general observations apply equally. The present grasslands continue to be particularly species rich, both in plant species and invertebrates, and appear to be in a favourable state.

As noted above, the grasslands receive little active management (e.g. cutting or grazing), and the reduction in mouflon and other large mammals, whilst successfully achieving objectives for woodlands, may have a more complex impact on the grasslands. Whilst there are some natural processes which contribute to the species richness of the grasslands as suggested above, it is not clear that these are sufficient to maintain the overall extent and quality of the remaining grasslands in the longer term. Indeed, the extent of grasslands appears to have changed little in the last 20 years and remains <10% of the protected area.

In most other circumstances grasslands under such conditions would be likely to progress towards coarse grass species, a lowering of plant diversity, and eventual succession to scrub and then woodland. Despite the relatively low levels of the usual agents which would prevent this succession, some at least of the grasslands appear to be surprisingly stable but monitoring both of quality and extent of the grasslands needs to inform this judgement.

As far as can be ascertained from the available information, the species richness (both plant and invertebrate) of the grasslands is intact, and so too are the populations of rare and endemic species, with the apparent exception of *Linum dolomiticum*. However, edge of range and relict species of paleoclimatic conditions are particularly vulnerable to climate change, and it would be beneficial if long term management planning considered these vulnerabilities and the potential value of adaptive management.

Connectivity

The Szénás Hills Protected Area as a whole is well connected in the landscape, situated as part of the larger Buda Landscape Protection Area, and beyond that is contiguous with other forest areas to the north and south. The grasslands, though distributed over a wide area within the Szénás Hills, often persist as fragments which are isolated from each other by sometimes extensive blocks of woodland (see figures 2 and 3). These might be significant barriers to species mobility (or what has been described as the permeability of the landscape), especially for specialist species of open habitats.

Figure 2: Fragmented Dolomitic grassland**Figure 3: Fragmented steppe grassland**

Future Management and Ecological Trends

Whilst the European significance of the Szénás Hills Protected Area is clear and not in doubt, what is less clear is the relative importance of the major principal habitats and their value for their component species. The emphasis in the EDPA application and initial expert assessment points towards the open habitats as being the most important. Certainly, the early recognition of the Szénás Hills' value for nature conservation in the late 19th Century and early conservation efforts in the 20th Century similarly have emphasised the Dolomitic grasslands and their rare vascular plant species.

This would suggest that the extent and quality of those open habitats should be of primary concern, and would be favoured in preference to the development of an increased extent of deciduous woodland. Our contemporary understanding of the ecological interest of the area gives increased weight to the karst oak woodlands, especially for invertebrates, but the grasslands are nevertheless the more restricted of the habitats, and may well have considerably more rare and endangered species associated with them.

The overall ecological trend over the last century has been one of significant loss of open habitats (albeit degraded in places), which covered most of the Szénás Hills, towards an increased cover of woodland with open habitats now covering less than 10% of the area. Future ecological trends in the core area (zone A) will be governed by the natural process now operating there, and to an uncertain extent by climate change, to which this site might be highly vulnerable.

The managing authorities have made significant progress in addressing past inappropriate management, and establishing a more favourable regime for the nature conservation interest of the site. Having reached this important milestone, it would be timely to collate and examine available evidence and expert opinion, to

establish long term nature conservation objectives and appropriate management for the future (see recommendation 7).

9. USES AND SOCIO-ECONOMIC ACTIVITIES

The principal land uses within the Szénás Hills Protected Area are nature conservation, forestry, education and recreation. Nature conservation and forestry are dealt with elsewhere in this report.

Education and Interpretation

The management authorities have established an excellent and impressive education and outreach programme within the protected area, on its margins, and with the local communities beyond. Highlights of this are given below:

- Employ two environmental educators, providing a range of events and opportunities for families, and students from age 5+ to university age. These are supplemented by rangers who have particular skills e.g. bird ringing for children
- The construction of a new education centre in Pilisszentiván, with EU funding (opening 2020)
- Participants to guided tours, nature conservation courses and volunteer activities regularly exceed 3000 people (adults and children) each year
- An annual programme of educational events, including themed events such as ‘firebugs and bats’, star gazing, bird ringing, and hikes to see *Linum dolomiticum*. Events also tie in to wider themes such as World Water Day, International Bird Watching Day and Street Science (with the Hungarian Academy of Science)
- Two education trails connected to the visitor centre, with interactive boards and marked trails (most of which include the EDPA logo)
- Guided walks into the management zone A – c. 10-15/year
- The ability to tailor events for local institutions who have specific requests
- Close co-operation with local municipalities for mutual benefit, e.g. interpretation and trails
- Regular articles in local media
- Regular publications to highlight the value of the protected area and describe the history and management of the area.
- Ambitions to extend educational activities to more cultural themes, including local archaeological sites.

The location of the new education centre within the town itself in Pilisszentiván is significant, in bringing the educational facilities to the local community, rather than the community having the expense of travelling to them. The municipality contributes directly to the educational provision, which demonstrates the positive value of the trilateral agreement of co-operation. The location also relieves what might otherwise be an additional pressure on the nature of the Szénás Hills.

The mayor of Pilisszentiván was also keen to emphasise economic value of the Szénás Hills on the edge of the town, which it brings through visitors and tourism

Recreation

As has been highlighted elsewhere, the Szénás Hills Protected Area is popular for various recreation uses, which provides for both the local communities and those from further afield. Principal uses include nature study, informal walking/hiking/running, organised sports (e.g. orienteering), off-road cycling and horse-riding.

The managing authorities appear to have a high measure of control of these varied uses, and whilst it would be impossible to mitigate against all negative impacts, these appear to be relatively few. The combination of zoning, rangers, education programme, signage and trails, and physical infrastructure such as

fencing and gates, all combine to minimise any negative impacts. Further provision for some user groups is desirable (see recommendation 6).

There were not any figures available to indicate the levels of visitor use, but it is evidently a popular area. That this range of activities can be enjoyed by local people and visitors from elsewhere, without notable apparent damage to the special interest of the protected area is testament to the wise management by the managing authorities and their dedicated staff.

10. APPRAISAL OF THE IMPLEMENTATION OF THE PREVIOUS RECOMMENDATIONS (2010)

1. The management of the area should be carried out in close co-operation by the Danube-Ipoly National Park Directorate and the Pilis Forest Company; the activities of the finished LIFE Programme, such as the conversion of black pine forests, reduction of game populations, visitor management, guarding and monitoring, should be continued jointly; the area should be provided with human and financial resources commensurate with the site's national and European importance;

➤ *The close co-operation has continued, and at least adequate provision of resources, has continued, and the agreement between the two managing authorities was renewed in 2013.*

2. Inside and near the area, permission should be given only for such game population management operations as are strictly consonant with the nature conservation objectives assigned to the area, particularly as regards eradication of the mouflon and reduction of the populations of large herbivores to a level compatible with the preservation of the dolomitic grasslands and natural woodlands; these population control operations should be planned on the basis of accurate population monitoring;

➤ *Game management continues to be strictly regulated, and limited to the exclusion of non-native species (mouflon and fallow deer), and the reduction in native species (red deer, roe deer, wild boar). The Pilis Forest Company continues to monitor large mammal populations.*

3. The fence enclosing the protected area must be maintained in good condition to prevent technical sport activities from encroaching upon it and also to raise the effectiveness of game population regulation;

➤ *The fence is regularly maintained and was seen to be in good condition throughout, whilst maintaining good access on foot for the public. Annual maintenance costs are typically fairly modest, but extensive damage following adverse winter weather in December 2014 necessitated extensive repairs which cost approximately €30,000.*

4. Visitor reception capacity should be increased by organising guided tours outside the most sensitive zones, to make the public more aware of the importance of preserving the habitats in the area; measures should be taken to prevent motor vehicles from crossing the area; the visitor centre at Pilisszentiván should be restored and modernised;

➤ *Two environmental educators are employed to enhance visitor reception capacity, and they have proven their worth in meeting this recommendation, alongside ranger staff. Since 2013 professionally guided walks, courses and volunteer events have risen from around 2000 to over 3400. The recently installed fence and gates prevent the illegal use of motor vehicles. The visitor centre at Pilisszentiván is currently undergoing renovation and will be re-opened in 2020. The Municipality of Pilisszentiván has provided an office available for the staff during the reconstruction works.*

5. Regulations must be worked out for horse riding paths in the area; also a mountain bike trail should be designated so as to avoid the fenced and strictly protected area;

➤ *Negotiations were entered into with local horse stables and riding schools to reach agreement on appropriate use of the protected area, which ultimately did not succeed. The construction of the 14km fence effectively ended horse riding access to the protected area, and that from mountain bikes. The*

National Park Directorate nevertheless wants to establish good facilities (dedicated trails) for both these user groups in Zone C and beyond, which will continue to relieve pressure on the margins of the protected area, and maintain the positive perception of the protected area.

6. The protected landscape status of the two areas adjoining the special protection area, which were also the subject of the diploma application, should be maintained to keep them functioning properly as buffer zones; construction in these areas should not be allowed;

➤ *The protected landscape status of these two areas is assured. The local land use plan in one municipality specifically prevents inappropriate development, and it would be valuable for the same level of regulation to be extended to the southern buffer zone. There are some activities which are not controlled though, including the introduction of non-native species and fly tipping, which may have some negative impacts, and it would be valuable to investigate regulating these (see new recommendation 5).*

7. Urbanisation pressure must be handled properly; any new development plans of Nagykovácsi, Pilisszentiván and Piliscsaba should be examined carefully;

➤ *As for 6 above. The National Park Directorate is a statutory consultee for developments on the edge of the protected area, and influences land use planning. The trilateral agreement of co-operation with one of the municipalities is an effective contributor to this process and should be extended to other municipalities.*

8. Co-operation with volunteers (schools, non-governmental organisations, local governments, scouts) must be continued, as well as with local residents, police and civil guards.

➤ *Volunteers are employed extensively in the protected area, from a variety of external groups and organisations, and in a variety of roles (including habitat management, monitoring, rangers). The National Park Directorate works with NGOs in each of the three municipalities adjacent to the protected site, such as the Nagykovácsi Society for Nature and Environment. Volunteering capacity and the outputs from them could be considerably enhanced with better facilities, such as volunteer accommodation, and the employment of a volunteer co-ordinator.*

11. CONCLUSIONS

The last 20 years have seen substantial change in the management of the Szénás Hills Protected Area, and in particular the major successes have been:

- Considerable progress in reducing non-native tree species and the re-establishment of natural vegetation communities;
- Significant reduction in non-native large mammal species, and effective population management of native large mammal species more in keeping with the ecological needs of the protected area;
- Improved ecological conditions in both managed and minimal intervention woodlands;
- The continuing extent of species-rich grassland and their component rare species, and the damaging effects of excess populations of large mammals managed;
- The development of an effective management partnership between the managing authorities, and increasingly with the local municipalities;
- Sound visitor management, with activities successfully zoned to steer reduce impacts on the most sensitive areas, whilst offering enhanced opportunities elsewhere;
- A superb educational and outreach programme, which continues to expand and engage local communities;
- Effective use of external funding sources (principally EU) to meet major project costs.

In addition, the managing authorities have either completely met, or made significant progress in meeting, all of the recommendations made in 2010. The European significance of the Szénás Hills Protected Area is clear, the management of the site is exemplary, and I have no hesitation in recommending a renewal of European Diploma status for a further 10 years.

The new recommendations included in Section 9 are aimed at building on the progress over the last 20 years, as well as establishing a clear direction for management over the next 10 years and beyond.

12. THE SUGGESTED RECOMMENDATIONS FOR THE RENEWAL OF THE EUROPEAN DIPLOMA FOR PROTECTED AREAS IN 2020

1. Continue the close co-operation by the Danube-Ipoly National Park Directorate, the Pilis Forest Company and the municipality of Pilisszentiván in the management of the protected area; ensure that nature conservation is the primary consideration on decisions affecting the protected area"; enhance the co-operation between the managing authorities and the local municipalities by a) establishing equivalent trilateral agreements of co-operation with Nagykovácsi and Piliscsaba, and b) establishing more regular local forum meetings of officers and also the public.
2. Continue to pursue EU funding to meet management objectives; ensure the effectiveness and efficiency of project delivery by including the employment costs of appropriate project staff in the project bids and subsequent budgets.
3. Where short term EU funding is supporting longer term needs, secure an appropriate, predictable and sustainable budget to ensure stability of funding.
4. Continue effective game management in line with previous commitments, to reduce populations of non-native mouflon and fallow deer to zero; establish a timeline, funding and appropriate methods to achieve this eradication within 10 years; continue to manage native large mammal populations, based on effective monitoring by the Pilis Forest Company. The game management can be effective only with the continuous maintenance of the state of the fence around the area and with combination of control methods (e.g. big game drives, shooting, trapping).
5. Continue the eradication of non-native tree species, especially black pine and black locust; especially for black pine establish a timeline to complete the programme of clearance, with funding and appropriate methods to achieve the objective within 10 years; investigate with forest authorities where and how in appropriate locations black pine stands as well as other woodland areas might be restored to open grassland, considering appropriate techniques, costs and opportunities, and addressing the regulations which govern such open habitat restoration.
6. Enhance the effectiveness of the buffer areas by the inclusion of appropriate regulations in land use plans to limit inappropriate development; investigate the practicality of regulating other activities (e.g. fly tipping, introduction of non-native species) in these areas.
7. Continue the effective management of visitor access for a range of user groups, including enhancing provision away from sensitive areas e.g. horse-riding trails, and mountain bike routes, where this can relieve pressure on the protected area.
8. By 2022 replace the current 5-year management plan (expired 2018) with a new approved 5 year plan.
9. Develop a long-term 25-year management strategy by 2023, including:
 - Objectives for the relative cover of grasslands and woodlands, the ecotones and connectivity between them, and the natural ecological processes and other management measures required to meet them; this should be based on sound evidence of the ecological value of these broad habitats and the ecological requirements of their characteristic species;
 - Enhanced understanding of the ecological requirements for particularly rare and endangered species; with strategies for appropriate species recovery programmes where necessary;
 - An assessment of the potential impacts of climate change on the priority habitats, species and related ecological processes, together with an adaptation plan where necessary;

- An assessment of future land use pressures, especially from recreation, tourism and urban development, and potential strategies for mitigating the negative impacts of these.
- Determine and implement the range of management options and nature-based solutions necessary to meet the long-term challenges of maintaining the ecological interest of the Szénás Hills Protected Area, especially with regard to long term ecological trends including climate change.

References

Dobolyi, K and Kézdy, P (2008) *Nature Conservation and Researches on the Szénás Hills*. Duna-Ípoly Nemzeti Park Igazgatóság, Budapest.

Extensive use was also made of previous expert appraisals, annual reports provided to the Bern Convention Secretariat (2013-2018) by the Duna-Ípoly National Park Directorate, and also of two booklets published by the Duna-Ípoly National Park Directorate, *Nature Conservation in the Szénás Hills* (2008) and *European Diploma Protected Areas in Hungary* (2015).

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ANNEX 1

Conditions and recommendations 1995

The initial award in 1995 was made subject to two conditions being fulfilled:

- that appropriate measures are taken to eliminate the moufflon (*Ovis musimon*);
- to generally prohibit hunting throughout the area, on the understanding that selective culling organised by the managing authorities may be carried out to control the large populations of herbivores.

The following recommendations were also attached to the award:

1. the necessary means should be provided so that a management plan may be drawn up and implemented as soon as possible;
2. an official name should be given to the special protection area established on the Szénás Hills;
3. the restoration of the dolomitic grasslands should be continued, and the elimination of the pines speeded up. For the non-climax grasslands, care should be taken to conserve a mosaic of habitats and the greatest possible biological diversity by maintaining open spaces, if necessary, through selective elimination of the natural ligneous vegetation;
4. efforts should be made to eliminate *Robinia pseudacacia* throughout the special protection area;
5. an integral natural reserve of at least fifty hectares should be established in the deciduous forest, where all the natural processes are free to develop without human intervention;
6. the policing of the reserve should be improved by allocating the necessary personnel with powers to report offenders;
7. the protected landscape status of the two areas located on the periphery of the special protection area, for which application for the diploma was also made, should be maintained so that they can continue fully to play their role as buffer areas.