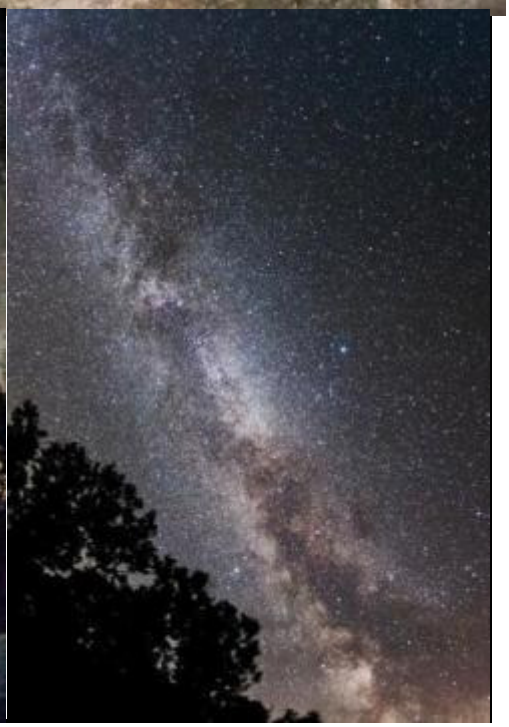
Nomination Package

International Dark Sky Park Designation

Bükk National Park



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1. Letters of nomination and support

IDA Board of Directors / Dark Sky Places Committee
International Dark-Sky Association
3223 N. First Avenue
Tucson, Arizona 85719

Dear IDA Board of Directors,

As an IDA Section Leader, the president of the Hungarian Astronomical Association, it is my privilege to nominate the Bükk National Park for designation as an International Dark Sky Park. This designation will be a great reward to the numerous efforts have been made to protect the natural night skies over North-East Hungary.

The Bükk mountain is a famous touristic destination in Hungary, it is easily accessible from Budapest and serves two county towns, Miskolc and Eger. These two cities, with the populations of more than 200,000 together, are just dozens of kilometers from the heart of the national park. Then the Dark Sky Park in the vicinity of these cities should be significant call for the students, pupils and all the citizens to get acquainted with the beauty of starry sky.

I have been impressed with the extensive history of astronomy related programs in the Bükk Natural Park and also in Eger and Miskolc. I did participate personally in many of those programs. The Hungarian Astronomical Association organized their annual camp at the Bükk mountain for years.

I have been following the process of the development of the application, I have also been involved in some measurement campaign there and in the interpretation of the measurement data. Therefore, I can confirm based on the observations and measurements that the quality of the night sky is definitely better than the minimal expectations for a "Silver" tier.

I understand that, at the time of nomination, a significant part of the lighting inside the nominated region is not in conformance with the Park's lighting plan – then a provisional status is possible. However, the efforts has been made in order to protect the night sky together with the nomination of the Peak would help to replace the luminaries during the following years.

I highly recommend that the IDA Board of Directors grant the Bükk National Park the title of an International Dark Sky Park.

Zoltán Kolláth PhD, DSc
Professor of physics, Eötvös Loránd University, Savaria Campus
section leader, IDA Hungary
president, Hungarian Astronomical Association
member of IDA, International Astronomical Union, Lighting Society of Hungary

EGER TÉRSÉGE
MATYÓFÖLDTŐL A BÜKK-FENNSÍKIG

Eger Térsége Turisztikai Desztináció
Menedzsment Egyesület
3300 Eger, Bajcsy-Zs u. 9.
Tel: +36 36/ 517 715
www.csillagvidek.hu

Dear IDA Board Directors,

As the director of the Touristic Association of Eger and its region (Eger Térsége TDM), I recommend the Bükk National Park for designation as an International Dark Sky Park.

The TDM system is designed to increase the competetiveness of tourism, enhance the performance of tourist destinations, increase visitor satisfaction, improve the supply of tourist destination related information, as well as ensure timely supply of business information to operators engaged in the tourism industry.

The Association is a community of tourism service providers from Eger and its thirty kilometer wide surrounding area. The aims of the Association are the promotion and the development of the tourism.

Eger and its region is rich in tourist attractions, it has several natural, cultural, historical and culinary values. Responsible tourism should be encouraged to take on board the night sky as a resource to protect and value in all destinations.

Most Hungarians live in an area where they cannot see the Milky Way due to lighting from cities. Bükk is one of the few areas of Hungary where artificial lights hardly disturb the sight of the starry sky. The public can become acquainted with the undisturbed night sky and the nocturnal landscape here. We aim to create memorable experiences that are fun, adventure and learning for the travelers.

I highly recommend that the IDA Board of Directors grant the dedicated part of the Bükk National Park the title of an International Dark Sky Park.

Eger, August 10, 2016

EGER TÉRSÉGE TDM EGYESÜLET
3300 Eger, Bajcsy-Zsilinszky u. 9.
Adószám: 18033816-2-10
Bank: 10401141-50526571-62821013

IDA Board of Directors
International Dark-Sky Association
3223 North First Avenue
Tucson, Arizona 85719

August 15, 2016

Dear IDA Board Directors,

As the director of the Birdlife Hungary's Bükk Local Group (MME Bükki Helyi Csoport), I recommend the Bükk National Park for designation as an International Dark Sky Park.

The Hungarian Ornithological and Nature Conservation Society (Magyar Madártani és Természetvédelmi Egyesület, MME), also known as BirdLife Hungary, is the leading non-profit, non-aligned (apolitical), charitable, nature conservation organisation in Hungary. The Bükk Local Group is one of the MME's biggest regional organizations. The Society undertakes practical work to conserve Hungary's biodiversity based on sound scientific research. MME advocates effective conservation of birds and their habitats by government at a national and local level and supports this work through educational programmes and its membership, which is open to all who share its goals. MME works internationally as a member of the BirdLife International Partnership.

According to many research' artificial lights have devastating effects on many bird species. Birds that migrate or hunt at night navigate by moonlight and starlight. Artificial light can cause them to wander off course and toward the dangerous nighttime landscapes of cities. Every year millions of birds die colliding with needlessly illuminated buildings and towers. Migratory birds depend on cues from properly timed seasonal schedules. Artificial lights can cause them to migrate too early or too late and miss ideal climate conditions for nesting, foraging and other behaviors.

To be a Dark Sky Park would be an important tool in the protection of our nocturnal birds. That's the reason I support the nomination of the Bükk National Park to be an International Dark Sky Park.

Sincerely yours,

MAGYAR MADÁRTANI ÉS TERMÉSZETVÉDELMI EGYESÜLET
Bükki Helyi Csoport
3300 Eger, Sánc u. 6.
Adószám: 19001243-2-43

Tamás Szitta

Birdlife Hungary's Bükk Local Group

IDA Board of Directors
International Dark-Sky Association
3223 North First Avenue
Tucson, Arizona 85719

August 18, 2016

Dear IDA Board Directors,

As the TDM manager of the Tourism Association of Szilvásvárad (Szilvásvárad Idegenforgalmi Egyesület), I recommend the Bükk National Park for designation as an International Dark Sky Park.

Our Association main aims are: cooperate with our service sector (accomodations, restaurants, museums, forest railway station etc) in order to increase our number of tourists and the tourist's satisfaction, besides we would like to preserve our nature. We are searching all so possibilities and tender, which help us to develeop our tourism.

Most Hungarians live in an area where they cannot see the Milky Way due to lighting from cities. Bükk is one of the few areas of Hungary where artificial lights hardly disturb the sight of the starry sky. The public can become acquainted with the undisturbed night sky and the nocturnal landscape here. We aim to create memorable experiences that are fun, adventure and learning for the travelers.

I highly recommend that the IDA Board of Directors grant the dedicated part of the Bükk National Park the title of an International Dark Sky Park.

Yours Sincerely,

Andrea Tóth

TDM manager

Tourism Association of Szilvásvárad

Szilvásvárad Idegenforgalmi Egyesület
3348 Szilvásvárad, Miskolci út 7.
Tel.: [illegible] Fax: 564-000
Adószám: 18502059-1-10
Bankszámlaszám: Agria Takarékszövetkezet
Szilvásvárad 61600025-10003073

EGERERDŐ ERDÉSZETI ZRT.
3300 Eger, Kossuth u. 18. ✉ 3301 Eger, Pf. 55.
☎06 36 801-540, 801-500 .= 06 36 801-502

IDA Board of Directors
International Dark-Sky Association
3223 North First Avenue
Tucson, Arizona 85719

August 18, 2016

Dear IDA Board Directors,

As the CEO of the Egererdő Forestry Co. (Egererdő Erdészeti Zrt.), I recommend the Bükk National Park for designation as an International Dark Sky Park.
Egererdő is a forestry company of Hungary's largest forest-covered mountain. The area of forests operated and managed by them covers a total of 72,000 ha and it is 4% of the country. The main principles of it is the multipurpose and near-nature forest management. But nowadays the public-welfare forestry is getting more and more important in the management.
For economical point of view the stands are average, although the importance of ecological and turistical attracion are high. 52 % of the territory are under nature conversation, completing with the Natura 2000 areas grows up to 68 %.
Some 97.7 percent of the Bükk National Park is state owned, with the following managing organizations in charge: the Egererdő Forestry Company (on the western side of the Bükk), the Északerdő Forestry Company (on the eastern side of the Bükk), while only 2.5 percent of the area is managed by the Bükk National Park Directorate.
After the hills of Buda the most popular turistical destinations are in the Mátra and the Bükk mountains. The company is also deal with wood processing (Mátra Parquet), game management and other public welfare services (open-air schools, forest railroads etc.).
Light pollution is one of today's most important global and local environmental problem. A growing body of scientific research suggests that light pollution can have lasting adverse effects on both human and wildlife health.
Egererdő Forestry Company as one of the managing organizations of the Bükk is strongly support the nomination of the Bükk National Park to be an International Dark Sky Park.

EGERERDŐ Zrt.
3300 Eger, Kossuth L. út 18.
1.

Sincerely yours, Dr. László Jung general manager

ÉSZAKERDŐ Erdőgazdasági
Zártkörűen Működő Részvénytársaság

ÉSZAKERDŐ Zrt.

16-153/2016.

IDA Board of Directors
International Dark-Sky Association
3223 North First Avenue
Tucson, Arizona 85719

August 24, 2016

Dear IDA Board Directors,

As the general manager of the ÉSZAKERDŐ Forestry PLC, I recommend the Bükk National Park for designation as an International Dark Sky Park.

ÉSZAKERDŐ PLC engaged in the business of forestry is located in the north of Hungary. The area of forests operated and managed by them covers a total of 103.000 hectares, accounting for 6 per cent of the total areas of forests in Hungary.

In order to protect nature and human surrounding,our Forestry endeavours to make its nature protection aims popular and known to population. For education purposes, we have created special "training paths" for children and adults where under professional guidance, they can enlarge and improve their knowledge of the animate and inanimate nature. Our Forestry has also joined the nation-wide "school in the forest" programme, the building and continuous improvement of which is undertaken by the Forestry to increase the quality of life of future generations.

The inappropriate or excessive use of artificial light – known as light pollution – can have serious environmental consequences for humans, wildlife, and our climate. Light pollution can confuse animal navigation, alter competitive interactions, change predator-prey relations, and cause physiological harm. But it is also an incredible waste of energy and producer of CO_2.

To be a Dark Sky Park would be an important tool in the protection of our nocturnal wildlife habitats and also the landscape values of Bükk.

ÉSZAKERDŐ PLC as one of the managing organizations of the Bükk is strongly support the nomination of the Bükk National Park to be an International Dark Sky Park.

Sincerely yours,

ÉSZAKERDŐ Zrt.
3525 Miskolc, Deák tér 1.

Zay Adorján
managing director

H-3525 Miskolc, Deák tér 1. Levelezési cím: H- 3501 Miskolc, Pf.: 2., Tel.: +36-46-501-501, Fax: +36-46-501-505
E-mail: info@eszakerdo.hu, Web: www.eszakerdo.hu, K & H Bank Zrt. 10200139-27012190-00000000, Adószám: 11071596-2-05

IDA Board of Directors
International Dark-Sky Association
3223 North First Avenue
Tucson, Arizona 85719

31 August, 2016

Dear IDA Board Directors,

As the director of the Hungarian Geographical Society's Eger-Bükk regional Department (Magyar Földrajzi Társaság Eger-Bükk-vidéki Osztály), I recommend the Bükk National Park for designation as an International Dark Sky Park.

The Hungarian Geographical Society (MFT – http://www.foldrajzitarsasag.hu) was founded in 1872 with the aim to promote geography science and geography's domestic results. The members are the most outstanding scientists of Hungarian geography (academicians, professors, research professors).

The purpose and mission of the Society is:

- supporting domestic geographical research and promoting their results,
- disseminating geographical knowledge (formal and informal),
- representing the interests of the Hungarian geographers,
- promoting the professional activity of Hungarian geographers and geography teachers.

The Society promotes, organizes and supports geographical research and scientific expeditions, all levels of geography education, geography teacher trainings. The Society do community activities related to geographical, environmental protection and sustainable development in partnership with other institutions and organizations.

To be a Dark Sky Park would be a relevant tool in the protection of the area's dark sky values, getting more people informed about the harmful effects of light pollution and introducing people the sight of the sky free from artificial lights.

I highly recommend that the IDA Board of Directors grant for the Bükk National Park the title of an International Dark Sky Park.

Sincerely yours,

Antal Tóth

Letter of Recommendation

For the *International Starry Sky Park* project

By the **Kaptárkő Nature Conservation and Cultural Association**

Artificial light pollution is the most recent kind of environmental problem, still increasing in its importance. The extravagant evening light is unequivocally harmful not only through unnecessary waste of illuminated energy and materials, used for the light devices, but the artificial lights disrupt natural orientation and life-organising mechanisms of the animals.

The planned units, including presentation of general scientific and environmental survey of the problems, preparation and creation of reporting artificial lights, introduction of possible ways of measurable light reduction are equally important to reduce this newly occurring impact on the environment. Targeted persons by the project activities are regional stakeholders, including the majors, community leaders and interested individuals of the region, together with activists of the civil sector and students, as potential multipliers.

The **Kaptárkő Nature Conservation and Cultural Association** is a regional civil organisation with long tradition and wide activity. As a professor of the Eszterházy Károly University, I have personal experience about the Association in several ways. First of all, their frequent open-air activities in and around Eger; the presentations they deliver in the Lyceum Building of the University; the supporting scientific activity that recently lead e.g. to nation-wide acceptance of the "Kaptárkő" (Beehive Stone) forms as a *Hungaricum*. (There are 41 independent beehive stone formations in NE-Hungary.)

Not surprisingly, several members and activists are, or used to be, our students of Geography, and Environmental Studies in the Eszterházy Károly University of Applied Sciences. Having been personally contacted with them as their teacher or even diploma-theses supervisor, I have good experience about them considering their attitude to environmental problems, and their knowledge witnessed during their exam and seminar performances being our students.

Based on the above circumstances, I warmly recommend the respective agency to support the planned activity for dissemination of knowledge on and against the artificial light pollution.

Eger, August 8, 2016

Prof. Dr. János Mika
DSc, head of Department for
Environment and Landscape Ecology,
Eszterházy Károly University, Eger

Répáshuta Község Polgármestere

3559 Répáshuta, Kossuth út 2.

IDA Board of Directors
International Dark-Sky Association
3223 North First Avenue
Tucson, Arizona 85719

1th September, 2016

Dear IDA Board Directors,

As the major of Répáshuta , I strongly support the nomination of the Bükk National Park to be an International Dark Sky Park. Our settlement is situated in the heart of the Bükk National Park. Not only the periphery, but the inner (clear) areas are also protected, regarding to the legislation of the Bükk National Park int he park's managing plan. In fact these conditions are limiting our sweep, and makes us a special place among hungarian villages. Répáshuta's residents recognised the importance and the surrounding protected area's natural and cultural values, including starry night skies. We also know that night lighting fixtures are negatively impacting the natural environment, the quality of life, and limiting sky visibility and enjoyment for citizens and visitors. We go wise to the facts like:

-We must preserve the scening beauty around or settlement in order to maintain our unique natural and historic heritage.

-We are a significant destination for rural tourism, and we can enhance our allurement with acquiring the title: Dark Sky Park

- At this present moment, our night lighting fixtures are not shielded 100 percent, but we do announce now that in 1.5 year, all lighting fixtures will be replaced to appropriate, light pollution free ones.

- We are committed to supporting practicles that limit or minimize light trespass from night lighting fixture in order to protect the beauty of the night skies.

We do recommend the Bükk National Park for designation as an International Dark Sky Park.

Sincerely yours,

Répáshuta Község Polgármestere

Mr. Tamás Erdös

mayor

Zöld Akció Egyesület
Green Action

Dear IDA Board Directors,

As the chairman of the Green Action Association (Zöld Akció Egyesület), I recommend the Bükk National Park for designation as an International Dark Sky Park.

Green Action is an environment and nature conservation association founded in 1990, Miskolc. Our mission is:

- helping resolve environmental problems;
- disseminating of ecolgogical approach;
- initiating social actions to protect our natural values and conserve our resources;
- processing harmful pollutions of nature and eliminating environmental damage;
- working for conserve and restorate the natural state of the Bükk.

Light pollution is an obvious problem for astronomers and poses a serious threat to wildlife, having negative impacts on plant and animal physiology. Light pollution can confuse animal navigation, alter competitive interactions, change predator-prey relations, and cause physiological harm. But it is also an incredible waste of energy and producer of CO_2. Every photon reaching into space is wasted energy.

To be a Dark Sky Park would be an important tool in the protection of our nocturnal wildlife habitats and also the landscape values of Bükk.

I warmly recommend that the IDA Board of Directors grant the dedicated part of the Bükk National Park the title of an International Dark Sky Park.

Miskolc, August 10, 2016

Zoltán Demeter

chairman

ZÖLD AKCIÓ Miskolc Green Action

H-3525 Miskolc, Kossuth u. 13. Tel.: (36-46) 508-700, 508-701 E-mail: greenaction@greenaction.hu

Ez a dokumentum újrahasznosított papírra készült!

Bükki Nemzeti Park Igazgatóság
3304 Eger, Sánc u. 6. - Levélcím: 3301 Eger, Pf.: 116.
Ig. közv.: (36) 422-700
Tel.: (36) 411-581
Fax: (36) 412-791
E-mail: titkarsag@bnpi.hu
Honlap: www.bnpi.hu

To: IDA Board of Directors
International Dark-Sky Association
3223 North First Avenue
Tucson, Arizona 85719

Dear IDA Board Directors,

As the director of the Bükk National Park Directorate, I strongly support the nomination of the Bükk National Park to be an International Dark Sky Park.

Bükk National Park - including the Bükk Mountains, a part of the Northern Mountain Range - was established on 1 January 1977 on an initial 38,774.6 hectares.; as of today it covers 43,168.8 hectares. It is the third national park in Hungary, but the first one in a mountain area.

The decree of designation defines the following tasks:

- To protect the typical and varied landscape features and the natural assets;
- To preserve the cultural features of the landscape;
- To safeguard the conditions for the research of the area;
- To promote recreation and education in nature, while conserving natural assets;
- To promote ecotourism, so both natural and cultural assets are interpreted to the public;
- To function as a best-practice site for environmental protection.

Our sky luminance measurements confirmed the good quality of the sky, so I can state that the quality of the night sky is better than the minimal expectations.

We have cooperation agreement with the promoter NGO (Hive Stone Nature Conservation Association) to protect the area's dark sky values. The park staff and the major part of stakeholders are interested in founding the Dark Sky Park. We also organized nighttime hikes and stargazings in the area and astronomy became part of the park's field study center's curriculum. The boundaries of the International Dark Sky Park have already been implemented into the National Park's management plan, and awaiting for its final approval to be recognised by IDA Board.

That's the reason I recommend the Bükk National Park for designation as an International Dark Sky Park.

Sincerely yours,

12th September , 2016.

BÜKKI NEMZETI PARK Igazgatóság Eger

Mrs. Rónai Kálmánné

director

2.The Bükk National Park

1.1 Foundation of the Bükk National Park

Bükk National Park - including the Bükk Mountains, a part of the Northern Mountain Range - was established on 1 January 1977 on an initial 38,774.6 hectares.; as of today it covers 43,168.8 hectares. It is the third national park in Hungary, but the first one in a mountain area. The head office was in Miskolc until 1979, but then it was moved to Eger. Ever since the head office is housed at 6 Sánc St. in Eger-Felnémet.

The decree of designation defines the following tasks:

- To protect the typical and varied landscape features and the natural assets:
- Rock formations, caves, dolines, springs and other water bodies;
- Mountain meadows and pastures rich in Carpathian floristic elements, typical and rare forest types, as well as indigenous plant communities and animal species.
- To preserve the cultural features of the landscape;
- To safeguard the conditions for the research of the area;
- To promote recreation and education in nature, while conserving natural assets;
- To promote ecotourism, so both natural and cultural assets are interpreted to the public;
- To function as a best-practice site for environmental protection.

Property data

There have been instances of extension of the national park since its designation, comprising 43,168.8 hectares as of today. This area is managed and utilized in different ways, i.e. 94.27 percent of it is forest, 3.35 percent is grassland (meadow and pasture), 1.95 percent is withdrawn from cultivation, 0.42 percent is arable land, and the remaining 0.01 percent is vineyards and orchards.

The protected area is situated in two counties, the bigger part (65 percent) in Borsod-Abaúj-Zemplén County, while the smaller part (35 percent) in Heves County.

The municipalities fully or partially overlapping the Bükk Nationa Park:

- Borsod-Abaúj-Zemplén County: Dédestapolcsány, Mályinka, Tardona, Varbó, Parasznya, Miskolc, Bükkszentkereszt, Kisgyőr, Sály, Kács, Cserépváralja, Cserépfalu, Bükkzsérc and Répáshuta

- Heves County: Eger, Felsőtárkány, Szarvaskő, Mónosbél, Bélapátfalva, Szilvásvárad and Nagyvisnyó

In fact, there are only one settlements that is situated within the boundaries of the national park. This is Répáshuta, with a population of 424 inhabitants.

Some 97.7 percent of the national park is state owned, with the following managing organizations in charge: the Egererdő Forestry Company (on the western side if the Bükk), the Eszakerdő Forestry Company (on the eastern side of the Bükk), while only 2.5 percent of the area is managed by the Bükk National Park Directorate. The remaining 2.3 percent is owned by local municipalities.

1.2 Tasks and responsibilities

- Conservation of water courses
- Nature conservation management – reconstructions, maintenance and operation
- Survey, research and monitoring of natural areas
- Ranger service
- Interpretation, education
- Assistance and consultancy in the planning process and approval of the district forest and game management plans
- Providing expert opinion on local planning schemes
- Providing expert opinions on issuing permits on both protected and not protected areas
- Designation of new protected areas
- Legal offences
- Landscape and habitat management
- Purchase of land in protected areas and acquisition of land

Conservation of water courses

There have been incidents in the operation area of the Bükk National Directorate the last few years when streams have dried out completely, or in other instances they have grown into rivers after major down-pours. The latter cases induced major government actions and investments to tackle water management issues and they enjoyed a great support by the public. These programmes focused on prevention to protect human life and property, but they definitely considered nature conservation aspects, as well. We strongly believe that water management measures can be in line with nature conservation objectives.

Nature conservation management – reconstruction, maintenance and operation
The Bükk National Park Directorate, in addition to the Bükk National Park, also attends to management tasks of areas and assets under national protection of any level in the counties of Nógrád [1], Heves [2] and Borsod-Abaúj-Zemplén [3] as defined by legislation. At present, the following areas are under national protection:

National Park	Year of establishment	Area (ha)
Bükk National Park	1977	43 168.8

The protected natural areas of national importance, as that of the Bükk National Park are sustained by nature conservation management. The Nature Conservation Act No. 53 of 1996 lists the following measures: surveys and cadasters, and all other activities aiming at the protection, conservation, maintenance, reconstruction and interpretation of protected areas. The management plans of protected areas developed according to the law include all-round guidance to be taken into consideration in all cases by all.

Certain management requirements and directives were already included in the annex of the founding decree in 1976, regarding mostly the limitations to land uses different from the traditional forestry applied in the low-mountainous forested areas at those times. Although the tasks assigned to landscape protection were also included, the emphasis was definitely on the conservation of protected species.

The protection of wild plants and animals is a primary task. The regulation of various activities, especially that of forestry and grass land management is important in order to maintain protected plant species and their communities, protected animals along with the preservation of their habitats.

The conservation of other vertebrates of primary significance (e.g. Alpine newt, Saker falcon) can be implemented by special programmes (rescue, re-introduction, active protection). The big game species of the mountain (i.e. Deer, Roe-deer, Mouflon, Wild boar) are not under protection thus hunting them is permitted and prevents their over population and the consequent degradation of their habitats. Especially, the exotic Mouflon is unwanted, as it causes severe damage to the fragile rocky grassland.

The slow and spontaneous re-introduction of top predators (i.e. wolf and lynx) must also be encouraged by prohibiting their hunting and ensuring that their territories are.

By sustaining our grasslands and wetlands we can ensure the long-term survival of many, vulnerable animal species (e.g. invertebrates, etc.).

The protection of caves not only serves the preservation of these geological formations, but also sustains their fauna (primarily bats).

1.3 The flora of the Bükk

The flora of the Bükk National Park is very rich and diverse, it is rightly deserves protection and attention. There are approximately 2500 vascular plants in Hungary, 1500 of them can be found also in the Bükk National Park. 500 plants are protected in Hungary and more than 200 live in the Bükk National Park.

The presence of various plants and associations is due to several factors, thus the geological characteristics, the bedrock, the special types of soil, the climate and the usage of the land. Due to the differences in height, there are special floral zones in the Bükk National Park. While several eastern plants (like yellow pheasant's eye, paque flower, amygdala) live at the foothills, in the plateau and the northern edge of the Bükk we can find relict montane plant species (like yellow wood violet, Alpine clamatis, hemerocallis) which live only here in Hungary. The relict plant species which lived in very small areas, got used to the changed circumstances and became independent native species. There are two special, native plant species in Bükk National Park, the strictly protected Vrabélyi hesperis and Hungarian hare's-tail grass.

The most common plant associations are the zonal, closed forests, with Austrian oak-oak woods in the lower zones followed by hornbeam and then beech-groves. There are other tree associations different from the before mentioned zonal forests, regarding both their species and their appearance. The difference is due to the extreme habitats, like steep slopes or rocks. These natural values of these habitats exceed those of the zonal forests. Such forest associations can be found on the dry southern slopes of the mountains, (karst bush-forests, oak woods) usually with open steppe-fields and rock-lawns, rocky grasslands while the northern, cool ravine- and rock forests abound in rock-lawns with hare's-tail grass and shrubberies rich in relict plant species. As a result of earlier human interference several valuable plant associations could develop, their presence also depends on the natural agricultural activity of man. The extensive, chemicals-free gardens and orchards of the hill-foot, as well as the montane hayfield meadows of the Bükk-Plateau belong to these associations.

1.4 Zoological values

The vertebrate fauna of the Bükk National Park and the Bükk region surrounding the mountain provides habitat for a considerable population of species richer than the Hungarian average, many being endangered in terms of their nature conservation status. The cold-wet habitat types are dominated by the Boreal, Boreo-Alpine, Alpine and Carpathian elements, while at the southern escarpments of the plateau and on the dry-warm habitats in the Southern Bükk the Sub-Mediterranean, Balkan and Continental elements are dominant. The endemic species living only in the Bükk are valuable colourful elements (e.g. Duvalius gebhardti), or the subendemic subspecies, like for instance the Erebia ssp.. The different fauna impacts, the variable surface forms and the vegetation developing on them made it possible for fauna rich in species to find its living conditions in the Bükk.

As far as fish are concerned, the Barbus meridionalis, endemic in the Carpathian Basin, is a rare denizen of the creeks. In the alpine region of the mountain the alpine newt (Triturus alpestris), which is the most characteristic endangered amphibian, appears sporadically. Of the reptiles, only the Ablepharus kitaibelii fitzingeri, which appears only in some places of the mountain, can be pointed out. Birds are represented by approximately 100 nesting species in the area of the national park. The greatest values of the mountain are the diurnal birds of prey, which constitute a considerable part of the endangered species. The programme for the protection of the globally endangered imperial eagle (Aquila heliaca) constituting 10% of the Hungarian stock is outstanding. The stock of other species being endangered all over Europe, Aquila pomarina, Circaetus gallicus, and the Falco peregrinus, is also exceptional. Tetrastes bonasia rupestris, which has an extremely reduced population, is one of the most endangered species in the National Park.

The bats, representing almost all Hungarian species, need to be mentioned from among the mammals. The protection of those caves where ,bat species endangered all over Europe (e.g. Miniopterus schreibersi, Rhinolophus euryale) pass the winter and breed in large numbers has special importance. The number of over-bred ungulate big game is a considerable nature conservation problem on the area of the mountain; returning big predatory animals - wolf (Canis lupus) and lynx (Lynx lynx) - could have an important role in their regulation.

1.5 Rock, caves, waters

Thinking of the Bükk mountains we may recall first the white rocks shining out of the wood or the sheer rocky walls surrounding deep valleys. Springs spouting from rocks or caves hiding in the depth of the mountains may also come into our minds.

The geological history of the Bükk started about 240 million years ago when the central part of today's Carpathian Basin was occupied by a stately chain of mountains. After the north-east verge of these mountains had sunk a sea was surging in place of the Bükk for almost 70 million years between the late Carboniferous age and the end of the Triassic period. As a result of this transgression primarily limestone of various colour and stratification formed deposits but to a smaller extent dolomite and sea clay covers are also perceivable.

The major part of the Northern-Bükk is made up of slate originating from the middle Carboniferous period, these are the oldest rocks of the mountain. The most spectacular exposure of this rock can be seen in the slate-quarry of the Bán Valley. On the northern verge of the mountain (around Nagyvisnyó) an amazing exposure of dark coloured bituminous limestone that was formed at the end of the Palaeozoic in the late Permian period can be observed. In these rocks nearly the entire fauna and flora of the warm, shallow seas of the late Palaeozoic is represented: calcareous algae, foraminifera, corals, sea lilies, rotifera, sea urchins, mussels, snails, trilobites.

The central part of the mountain, the High-Bükk, is made up of white, sometimes grey or pink limestone that was formed in the Triassic period of the Mesozoic. Clay-slate layers can also be detected and also a small amount of dolomite and sand-stone. The most

impressive occurrence of the thin layers of our early Triassic limestone deposits are the standing devil's ribs in the Ablakoskő Valley or the Leány Valley.

The grey dolomite of the Vár Hill at Felsőtárkány-village was formed in the middle Triassic and serves as habitat for a unique vegetation. The limestone of the plateau was formed in the shallow sea of the middle and late Triassic period. The abundance of thalloid corals confirms that the formation of these rocks took place in a shallow sea.

The sinking of the sea in the late Triassic is demonstrated by the formation of colourful (grey, pink, red) limestone at Répáshuta-village. In the deepening sea bed flint limestone was accumulated (lower part of Lusta Valley, upper part of Szinva Valley, middle part of Hór Valley). The original structure of thin banks and thick lamella has almost disappeared as a result of strong plication and metamorphic foliation. The lamellated structure that can be easily observed today is the result of the loosening and cleavage of the slate layers.

In the Jurassic period of the Mesozoic colourful deep-sea radiolarite and stratified black radiolarian slates (e.g. roofing slate of Lök Valley) formed deposits with a thick hiatus directly over the late Triassic layer. At the end of the period carbonate sediments established themselves between the various slate layers.

A substantial amount of intrusive magmatic and effusive rock can be found among the Mesozoic sedimentary rocks of the Bükk; in the Triassic period mainly porphyrite and diabase, in the Jurassic period mainly gabbro and basalt layers were formed.

In the pass of the Eger Stream between Szarvaskő and Tardos the road cut exhibiting a pillow structure which is characteristic of underwater basalt effusions is extremely spectacular.

In the late Eocene period, after a long period of erosion, overlying sediments were formed. These are missing in the inside of the mountain, we know about only a few shreds in places safe from erosion but on the periphery of the mountain these deposits can be easily observed.

The sediment rocks and fossils of the middle Miocene sea which covered the entire Bükk for a short period of time can be discovered on the peripheries of the mountain (Határ Peak at Nagyvisnyó, gravel pits of the Éger-vaulk at Dédestapolcsány).

The current stage of the development of the Bükk started about 15 million years ago, at the end of the Miocene period. The present appearance was formed by a number of elevations and erosions. By the end of the Pliocene period the gravel sediments and rhyolite tuff covers had eroded in the inside of the Bükk as a result of the wind, precipitation, decay and disintegration; the dominant part of the mountain became an open karst. In the glacial period the slow elevation continued, the destructive activity of external forces became stronger in the mountain that was growing ever higher. The destruction can be recognised most easily at the frontier of the contiguous mass of limestone and the clay slate layers.

Geologic forces and surface erosion produced a great variety of karst forms in the limestone mountains during the millions of years: sumps, caves, deep gorge valleys, lofty rocks.

The least indented, most homogenous part of the mountain is the 800 m high Bükk plateau which is divided into two territories (Great and Little plateau) by the Garadna-stream. The karst formation had special effect on the present appearance of the plateau. The main features of the gently wavy surface are low horsts, dolina in between (and a subgroup: uvala), swallets, potholes, caves. Horsts of tectonic origin (Kiskőhát) and the long, wide, valley-like hollows under the level of the plateau, the valleys (István-lápa Valley, Fehér-kő Valley) are characteristic of the area. Polje receding on the surface of the Great Plateau were formed as a result of structural motions (Nagymező, Fekete-sár). On the verges of the plateau ravine valleys of karstic origin are stretching (Sebesvíz Valley, Teknős Valley).

The horsts towering at the verges of the central Bükk are the most distinctive rocks of the mountain. Beneath the enormous peaks the remains of those caves can be found which confirm that the central Bükk and the Great and Little Plateau were once integral. At the feet of the Tar-rock, the Magos Rock, and the Köpűs Rock, next to the whirlpool caldrons of former cave-streams the lateral galleries of old caves and the eroding recrystalised dripstones still can be observed.

The sump-caves take us to the rich and variegated undersurface world of karst phenomena. 45 of the 853 explored caves are strictly protected. The deepest cave of the country can be found here, the 250 m deep István-lápai Cave which together with the Szepesi Cave and the István Cave at Lillafüred (the latter is open for visitors) belong to the most beautiful karst galleries abounding in dripstones.

The karstwater treasure in the depth of the mountain is the greatest value of the Bükk. It provides more than 1 million people with clear fresh water. As pollution may get into the karst galleries together with the precipitation, karstwater is very sensitive. We must take care of it!

Once the mountain was rich in springs and streams, however today (as a result of the increased exhaustion of drinking water) one can rarely see open-air springs or living streams.

The last stream valley with natural living stream is the Garadna Valley where you can find water any time of the year from the spring to the outlet.

The water output of the springs and the abundance of water of the streams is highly dependent on the precipitation. There are seasonal springs and intermittent drifts which exist only after snowbreak or in a period of high precipitation. The best-known of these springs are the Imó Rock and Vörös Rock springs where the water-spout can be as high as a human for a few days during the spring-snowbreak.

Travertine separates out from the water of streams spouting from the karst springs and forms dames in the stream bed. The water runs across these dams and continues its way through little waterfalls. The algae and mosses living on the steps of the stream bed intensely stimulate the formation of spring-limestone. The Fátyol(veil) Waterfall running across the spring-limestone steps of the Szalajka-stream, the spring-limestone hump built by the waterfall of the Szinva Stream or the Anna Cave at which came to exist in a recess closed by the precipitation of travertine are all well known, but there are nice spring-limestone formations in the Szentléleki- and Sebesvíz Valleys and at the Harica Spring.

3. Articles from the Management Plan of the Bükk National Park

1. Nature Conservation Objectives:

   Preserving the natural view of the natural Dark Starry Sky.

2. Nature Conservation Strategies:

   Preserving the natural dark sky conditions in the national park. Establishment of light pollution-free zone (Dark Sky Park) as for an instrest of light-sensitive ecosystems and for public outreach.

3. Nature Management methods, restrictions and interdictions

   -In outskirt areas (protected area) illumination of objects are forbidden. To establish a new outdoor lighting it is necessary to have permission of the nature conservation authority involving the Bükk National Park Directorate.

   - Lighting, for non-residential buildings in the outlying targets are to be revised For establishing new outdoor lighting it is the necessary the permission of the nature conservation authority involving the Bükk National park. In the case of having an outside unavoidable lighting, their environment must be designed in a way to not do reduce the value of the of night landscapes.

   - If all the lumen volume of a suburban real estate in excess of 10,000 lumens, detailed lighting plan shall be prepared by the owner and must be consulted prior with Bükk National Park Directorate for authorization.

   - The periphery exposure should not exceed the values of current uses lowest values.

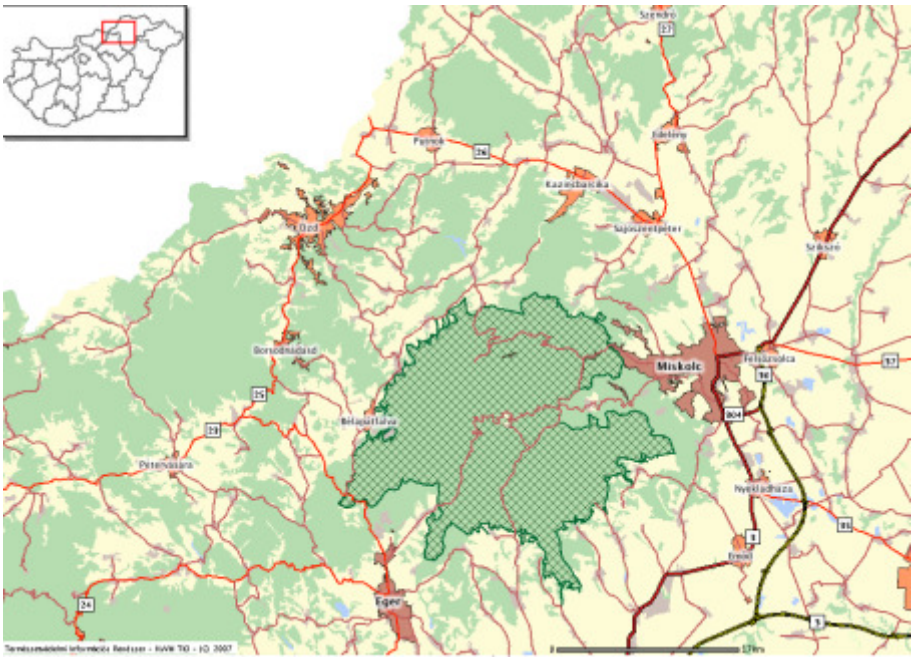
   - The use of upward lighting devices are prohibited.

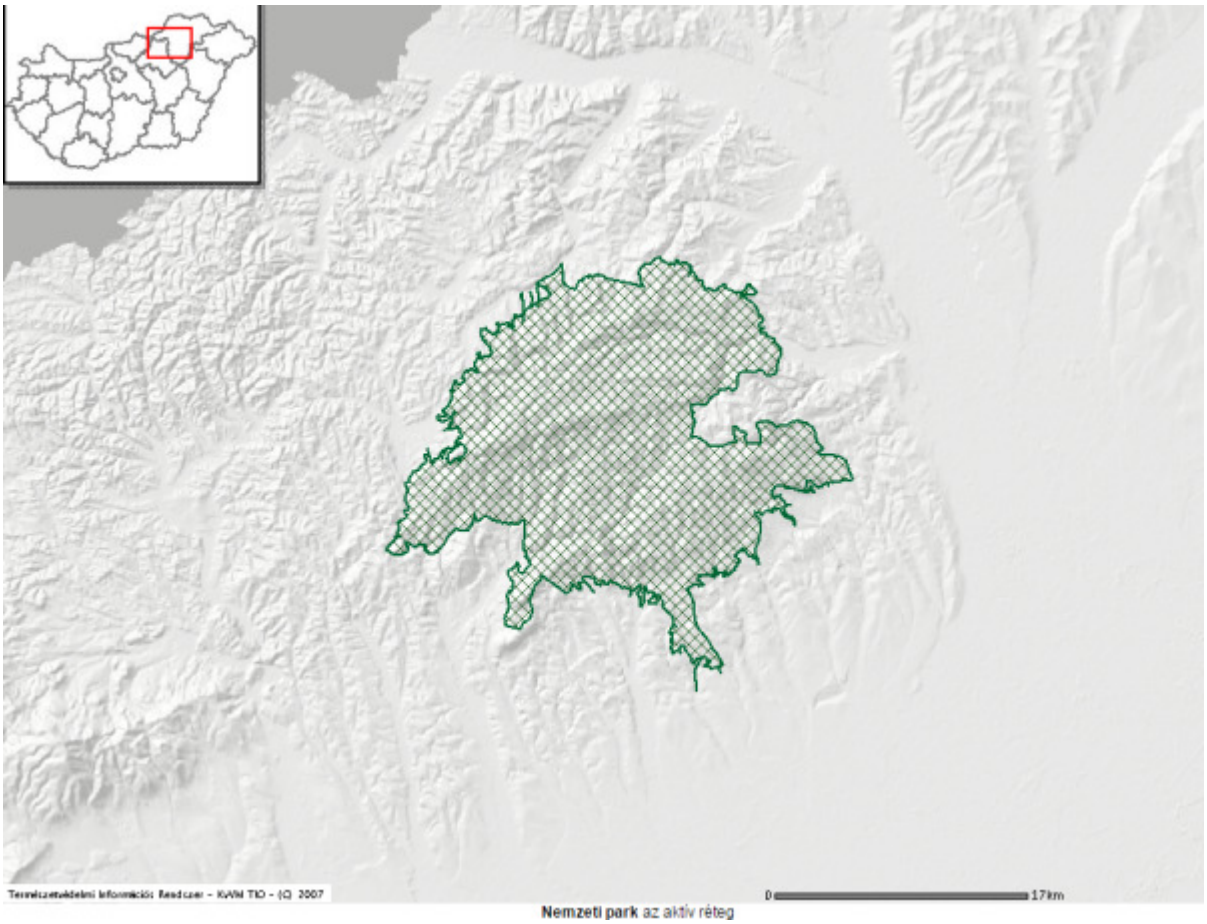
4.Facts about Bukk Starry Sky Park

3.1 Basic summary of Bukk Starry Sky Park

Official Hungarian name: Bükki Csillagoségbolt-park
Official English name: Bukk Starry Sky Park
Location: Selected area of the Bükk National Park
Peoposed quality tier: Silver
Supervisory governmental nature-conservation organization: Bükk National Park Directorate
Astronomical supervisory organizations: IDA Hungary, Hungarian Astronomical Association
Area of the Starry Sky park: 43169 hectares
Whoe area of the National Park: 43169 hectares
Web page: http://bukkicsillagpark.hu
Accessibility: The area of the park is freely accessible on foot at the nature trails and some roads, all year around, 24 hours a day.

3.2 Situation and boundary of the Starry Sky Park





Source: TIR & Google Maps

5.Sky Quality

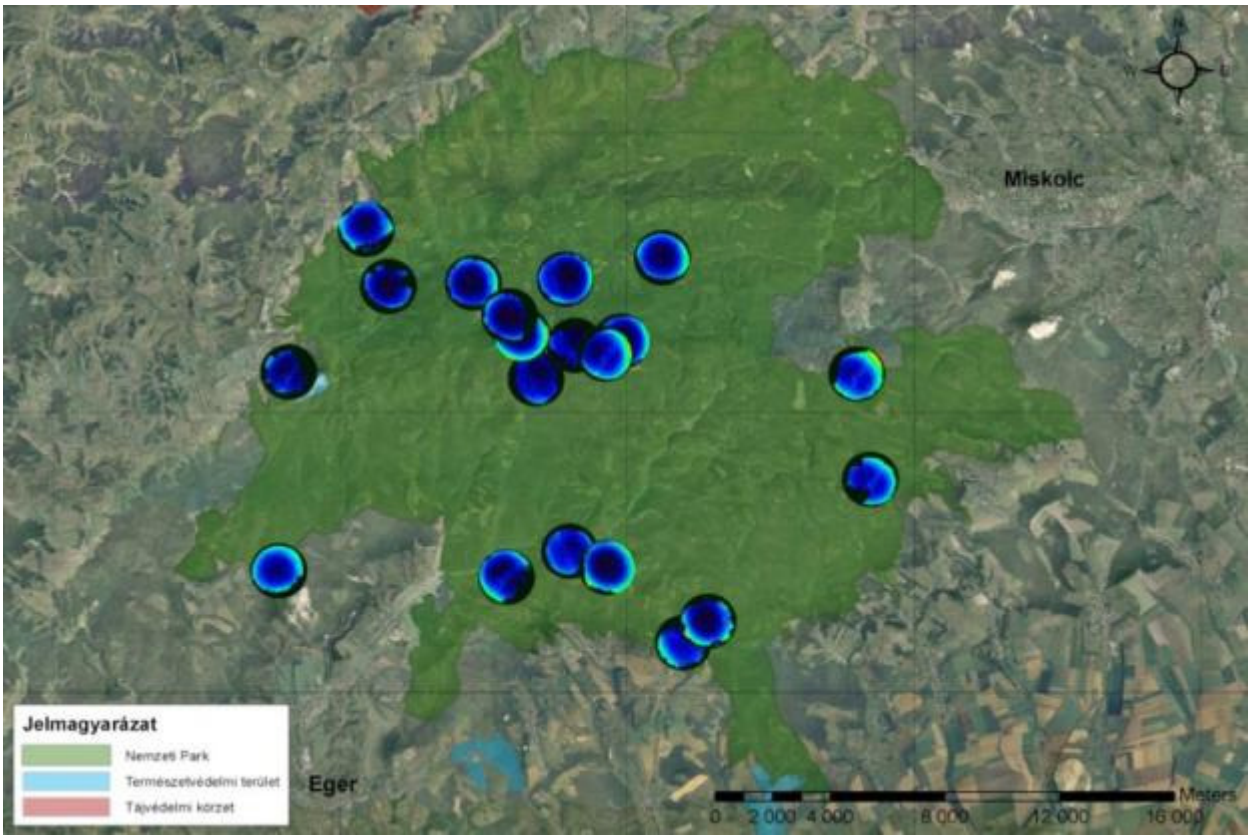
In one year, our association has completed the measurement of light-pollution Bükk National Park , with Sky Quality Meter (SQM-L)and fish-eye photos. As the outcome shows from our research, the 99% of the whole area of the National Park is eligible for the Starry Sky Park Silver tear, since the light pollution level is as low as the IDA's regulation permits. SQM-L measurements show that the quality of the night sky everywhere in the National Park is better than 21.0 maq/sqas. The typical value is around 21.2-21.3 magnitudes/arcsec^2, in ideal weather conditions it can reach 21.5 mag/ arcsec^2. We have conducted and documented several measurements with SQM-L equipment during 2014 and 2015. Ongoing measurements will be maintained by our Association with the help of the National Park Directorate. Each year, with the same SQM-L equipment, we are going to do our measurements at the same positions. We are planning to buy an SQM-LE or SQM-LU in order to provide and collect contiguous data and to assert that the night sky quality does not degrade.

SQM-L datas: Above 21.4 magnitudes/arcsec^2 at 80 degrees above the horizon of the National Park's territory

During a measurement with fisheye lens – even the milky way is clearly visible

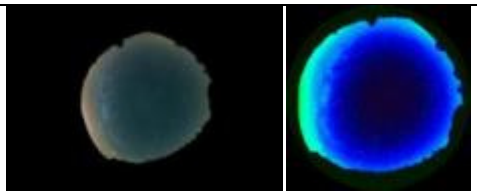
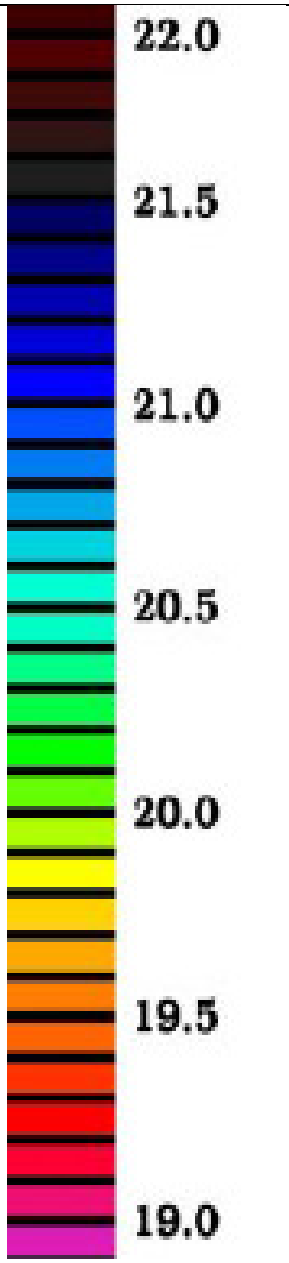
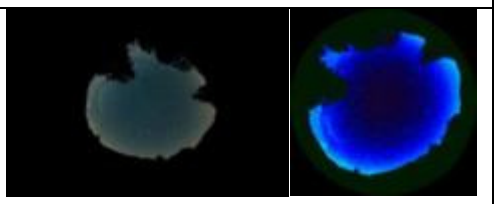
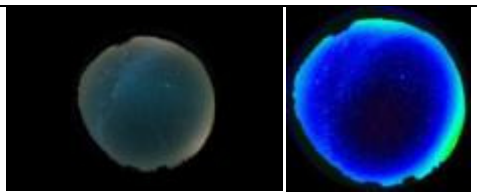
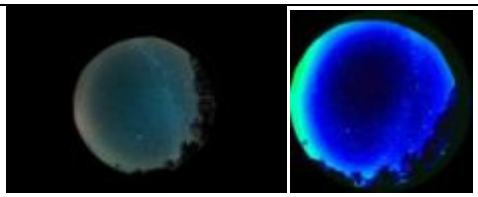
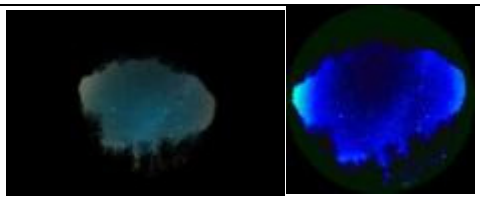
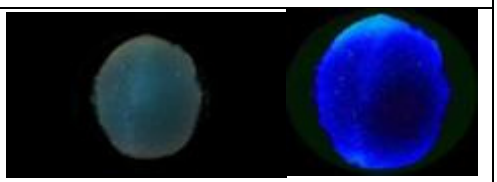
Clear sky at the boundary of the Bükk NP (Hive stones, near Szomolya)

Light pollution can only be observed around 5- 10 degrees above the horizon only in certain places



False coloured fish-eye images from the Bükk National Park.

Measurements with SQM-L and fish-eye lens

Coordinates and collected SQM-L data	Image (orginal/false colour)	mag/as^2
48° 4'35.69N; 20°27'5.98E SQM-L: 21.3		
48°04.558'N ; 20°24.726' E SQM-L: 21.4		
48° 4'38.11"N; 20°29'40.48"E SQM-L: 21.2		
48° 3'25.17N ; 20°31'12.22E SQM-L: 21.3		
48° 3'21.22"N ; 20°29'55.19"E SQM-L: 21.1		
48° 2'43.40"N; 20°28'48.47"E SQM-L: 21.2		

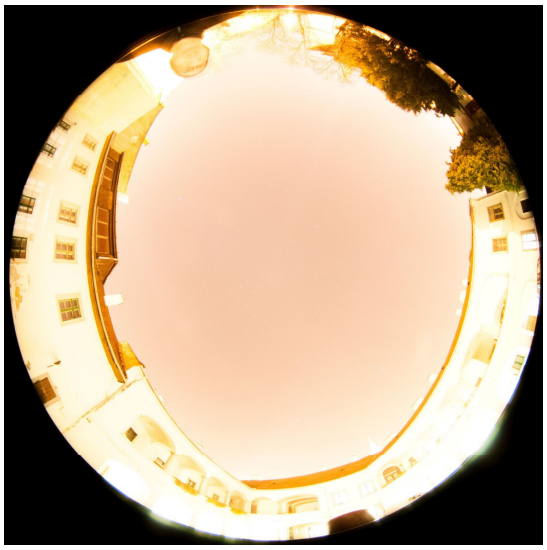
6. Public access and outreach

Through the whole year we are conducting several stargazings, night shows and presentations together with the Bükk National Park Directorate. It was reamarkeably observable that people were very much interested in night shows and observations. The area of the National Park is easy to access by anyone by car or by walk. Actually there are no regulations for limiting public access, except some forestry activities and some scattered strictly protected areas, when there are birds nesting for instance.

Informing people of the starry sky sights are sometimes carried out by using astronomical presentations in near urban areas . The Bükk National Park Directorate's forest school/ field education center in Felsőtárkány accepted 2012 students in 2016. The national park is highly committed in field education, and fighting against light pollution. During the last 2 years we replaced 8 outdoor lighting fixtures in our forest school in order to consume less energy and show a good example to our students/visitors. We led 20 star parties and nocturnal hiking events for these groups in 2016, and also intended to reach or overcome this amount in 2017. Firefly observing, bat catching, and nighttime hikings on study trails are also regularly done almost 2 times a month in high season.

When national park or the association's workers are showing a presentation to educate student or adult groups, light pollution monitoring and light pollution map is always showed and interpreted in order to raise attention to the National Park's current light pollution state. During nocturnal activities (observing of wildlife, night time study trail walks) SQM-L device is used to show the values between populated areas and light pollution free protected areas. At nighttime walks we often lead our visitors as long as 10kms far from settlements in order to make them understood of the difference between settlemens and unsettled area's sky conditions.

The following two images are always shown in presentations about Bükk National Park for a comparison:



Eger – downtown

Bükk National Park

Day and nightime activities with wide interest

Nighttime stargazings and observations were in the very center of the attention to our visitors

Outreach events related to nocturnal ecosystems and astronomy, completed in 2016:

1. 16th April : Startlight study path– Star party http://bnpi.hu/hir/csillagseta-felsotarkanyban-aprilis-16-an-1425.html
2. 9th May: Transit of Mercury. - http://bnpi.hu/hir/merkur-atvonulas-megfigyelese-majus-9-en-egerbol-1451.html
3. 19th May : Biodiversity day: Bat catching, nocturnal leading on study trail and star party http://bnpi.hu/hir/biologiai-sokfeleseg-napja-a-lazberci-viztarozonal-1468.html
4. 11th June : Star party – http://bnpi.hu/hir/ejszakai-tanosvenytura-es-csillagaszati-bemutato-junius-11-en-1486.html
5. 24th June: Firefly observing in the Bükk National Park: http://bnpi.hu/hir/szentjanosbogar-seta-1459.html

6. 25th June: Night of museums, toke place in the Castle of Eger: Star party - 22.30 – 23.30, Egri Vár: The stars of Eger – starry sky presentation with telescope useage. http://bnpi.hu/hir/a-bukki-nemzeti-park-igazgatosag-programjai-a-kalaka-fesztivalon-1494.html
7. 9th Julyl : Startlight study path– Star party - http://bnpi.hu/hir/ejszakai-tanosvenybejaras-es-csillagaszati-bemutato-julius-9-en-1498.html
8. 13th August: Night of the Perseids: http://bnpi.hu/hir/hullocsillagles-es-csillagaszati-bemutato-augusztus-13-an-1506.html
9. 27th August: Night of the bats: Bat catching and observing some planets: http://bnpi.hu/hir/sikeres-volt-a-deneverek-ejszakaja-1522.html

Outreach events related to nocturnal ecosystems and astronomy in 2017: link: http://bnpi.hu/doc/2017/programajanlo_2017.pdf

1. 3th April: International day of Astronomy: Nocturnal hiking, observing of wild animals and star party: http://bnpi.hu/hir/csillagaszati-vilagnap-felsotarkanyban-1597.html
2. 14th April: Nocturnal hiking and observing of wild animals near Szilvásvárad – All national parks of Hungary are involved in this event: http://bnpi.hu/hir/csillagsetak-nemzeti-parkjainkban-szilvasvarad-1600.html
3. 20th May: Biodiversity day in Salgótarján – Bat catching and stargazing
4. 23th June: Firefly observing and nocturnal hiking near Felsőtárkány
5. 7th July: Hiden life of the nocturnal butterflies in the Hór-valley, Cserépfalu
6. 12th August: Night of the Perseids meteor shower
7. 26th Auguszt: Bat night – Bat catching and nightime hiking
8. 4th October: Day of Animals. Observing and knowing of day- and nightime animal activities (nocturnal hiking is included)

Our future plans: To establish an observatory and astro-education center in the heart of the Bükk National Park, close to Répáshuta village. All lighting fixtures of the village are to be replaced to shielded ones below 3000K from this project. Plans are already available, and awaiting to be established:

7. Lighting fixture replacements

On completion of the surveys, we wanted to replace some light fixtures that made light pollution. This activity was done with the purpose of not only to decrease light pollution, but for educational porpuses as well.

As shown on the following photos, we have reduced the light pollution in certain areas. The replaced lighting fixtures can be found in the Szalajka-valley (*Replaced lighting fixtures in the Szalajka-valley*), Kisgyőr (village), St. Stephen Cave *(Old and new lighting fixtures, replaced at the entrance of the St. Stephen's Cave - Bükk National Park*) and Felsőtárkány (The National Park Directorate's field education center) During nocturnal activities in our forest school, we call our student's attention to the replaced lighting fixtures: why we did it, why it is important, and who benefits from this (connection between us and nature) During guided tours to St. Stephen's Cave, outdoor lighting and the colour temperature of the new lighting system is also demonstrated by the collegues of the Bükk National Park Directorate. Light pollution was also an issue at our partner association's visitor center (Rónaörző Nature Conservation Assocation), there were replaced old road lights in order to prevent light pollution and gain the effectivity of their nocturnal presentations and star parties.

We also would like to replace the entire light system of Répáshuta so as to comply with the IDA's regulations in 2 years. The Mayor of Répáshuta is highly committed to comply with the rules of the IDA regulations, the starry sky park and national park management plan. They also would like to make it as a pilot project in order to show the right direction and setting as an example for similar actions in the future. His expressed pledge is that within 1.5 years all lighting fixtures will be replaced in the village. This commitment can also be found in his letter of support above.

At the NATO locator station, there are 25 unshielded lighting fixtures. Their replacement was negotiated with the military. According to them, they are committed to the creation of the starry sky park. However, the changes must be implemented in regard to their security considerations. High illumination is needed according to military regulations. This fact will be taken into account in the future.

Replaced lighting fixtures in the Szalajka-valley

Old and new illuminators of the forest school walls made also for educational purposes (Field eduation center – Felsőtárkány)

Illuminator replacements in one of the forest schools in the Bukk National Park (Field education center, Felsőtárkány)

Light pollution reducing in a forest school

We helped our cooperative associaton to see stars even brighther then before. Flourescent city lights were replaced to LED lights with less energy consumption as a advantage (Kisgyőr, at the boarder of the Bükk National Park)

New, less consumptive LED lights

(Its advantage is also interpreted locally to students by our project partner: Rónaőrző Nature Conseration Association)

Old and new lighting fixtures,

replaced at the entrance of the St. Stephen’s Cave

(Bükk National Park)

8.Lighting plan

Guidence for outdoor lighting is given in the management plan of the Bükk National Park. Natural dark sky is one of the most important values, therefore it is forbidden to install new lightning fixtures in the national park. The total area of the Bükk National Park does not reach 44.000 hectares, therefore, the whole area is considered as a Dark Sky Park.

1.General aims and rules
Outdoor lights may only be used for emergency situations and for vehicles used for traffic
A general prescriptive rule is that the permanent artificial lights, used in the NP, cannot result in any observable deterioration of the night sky and nocturnal landscape outside a circle with a radius of 500 meters around the light sources themselves. (For this regulation, observable deterioration means the direct view of light sources, or the increase of sky luminance by 1%.) Outdoor lights may be used in the NP only for the purpose of the safety of the traffic, the walkways and parking lots. In special conditions light can also be used for construction works. No ornamental or advertising lights can be used, and no artificial light sources can be used for forestry works, hunting and fishing.

2.Lighting Zones
The major part of the Bükk National Park is a natural dark zone with no artificial lights. The whole area of the national park is considered as a Dark Sky park.The only locations in the park where permanent outdoor lights are allowed are the urban areas of Répáshuta. (the only settlement which is protected)

3.Lighting regulations
Only fully shielded fixtures can be used, and they should be installed and serviced so that no light should be emitted above the horizontal plane. All lighting fixtures above 500 lumens are must be shielded. The maximum allowable light output (luminous flux) per fixture is 1800 lumens. If the total luminous flux of a premise or realty exceeds 10000 lumens, a detailed lighting permit plan should be prepared. Any construction should be started only after approval by Bükk Nartional Park Directorate as the competent nature conservation management organisation, and by IDA Hungary. The illumination levels cannot exceed the minimum norms available for the given purposes. Outdoor lights can only be used when pedestrian or considerable vehicular traffic is expected. Motion sensors or time switches are preferred in locations with infrequent traffic. Use the most energy efficient lamp available - LED lights below 3000K are obligatory and also stated in the national park's management plan:
1.1. Establishment of an International Dark Sky Park in order to prevent the light sensitive ecosystems, and to safeguard the darkness of the night sky starry sky in the Bükk National Park.
1.1.1.1. Only shielded lighting devices can be used which must be constructed and maintained in such a way that light can not illuminate directly above the horizontal plane. 1800 lumens/fixtures are allowed.
1.1.1.2. Traffic can be limited in the dark sky park.
1.1.1.3. Outdoor lighting can only be used as light sources under color temperature of 3000 K in the dark sky park.

Legal regulation

In Hungary, the relevant national park directorate (this case: Bükk National Park Directorate) is responsible for the national protected area's (national parks, protected landscape areas, conservation areas) conservation management activities, defined by the Law of the Protection of Nature – LIII, 1996. If the area would not be protected, the scope of the Nature Conservation Act does not apply to the Bükk National Park and is only to be governed by the provisions of the NTPBR (National Town Planning and Building Requirements.)

Law of Protection of Nature(LIII, 1996., article 35. § (1), d,):

Outdoor artificial lighting at a fixed location in outlying areas or areas not intended for installation - apart from the necessary illumination of public transport facilities safe operation - must be designed in a way so that the protected or community interest (Nature 2000) animal species are not to be bothered ,endangered or damaged by artificial light.

Government Decree. - NTPBR (National Town Planning and Building Requirements.)(253/1997. (XII. 20.)

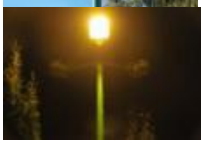
Article § 53 (1) of the construction works and parts of units which, premises will be carried out for the construction material, building structure, built-in equipment and wireless network should be selected and installed to the environment, hygiene of the environment and users's health is not affected by:

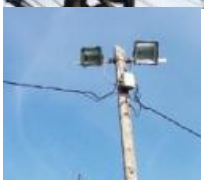
j) light pollution.

Article § 54 (2) Illumination of buildings, public and decorative lighting, neon signs and advertising devices must be located and designed in a way so that the light effect

d) does not cause light pollution.

9. Lighting inventory

Location	Purpose, type	Type + photo	pcs	Compliant?
Répáshuta (village, part of the Bükk National Park)	Road light, Not shielded, 36W compact, 4000K		63	NO
Bánkút (tourist guesthouse)	Road light,parking lot Not shielded, 24W compact, 3100 K	 	18	NO
Szilvásvárad , Szalajka-valley	Parking lot, Shielded, 34W bulb, 3800K		1	YES
Field education center, Felsőtárkány	Entrance lights , 3000K warm white	 	6	YES
St. Stephen's cave	Entrance lights,3000K warm white	 	2	YES
Lillafüred-Alsóhámor-Felsőhárom, (exempt from regualtion)	national road lights ,Sodium, 36W, not shielded, 2800K		188	NO

Ómassa-Újmassa villages (exempt from regulation)	national road lights, not shielded,4000K		67	NO
Jávorkút guesthouse (exempt from regulation)	road lights, not shielded, 3100?		10	NO(disconnected)
Bánkút ski-track (exempt from regulation)	ski-trak lights , bulbs, not shieleded, 3100K		12	NO(disconnected)
Bánkút ski-track (exempt from regualtion	halogen lamps, not shielded	 	15	NO(disconnected)

Summary:

Compliant: 9 fixtures (10%)

Not compliant: 81 fixtures (90%)

Year	**2017**	**2018**	**2019**	**2020**	**2021**
Lighting fixture to be replaced (pcs)	**0**	**13**	**30**	**24**	**15**
Compliance	**9 pcs (10 %)**	**21 pcs (24%)**	**51 pcs (58%)**	**66 pcs (82%)**	**90 pcs (100%)**

At this moment, light fixtures are not 100% complied with IDA's regulation. In 5 years we do want to gather sources , go on tenders to replace all light fixtures in order to achieve 100% compliance. In 2017 there are two tenders already been submitted to replace the entire road light system of Répáshuta. The major of Répáshuta is highly comitted to replace their road light as stated in their recommendation letter, and this idea is also supported by Eszterházy Károly University and Bükk National Park Directorate.

10.Summary

The Hive Stone Nature Protection and Cultural Association contacted the Bükk National Park Directorate with the plans of founding the Bükk Starry Sky Park, following the guidelines of the International DarkSky Association. This two organizations has signed an agreement to achieve this goal and the two biggest landuser (Egererdő and Északerdő Forestry Companies) joined to this effort too.

We started to investigate the quality of the night sky and the nocturnal landscape in the Bükk National Park. Our sky luminance measurements confirmed the good quality of the sky, so I can state that the quality of the night sky is better than the minimal expectations for a Silver tier.

The park staff and the major part of stakeholders is interested in founding the Dark Sky Park. We also organized nighttime hikes, stargazings in the area – as our website shows it and the astronomy became part of the park's field study center's curriculum. I will be responsible for making sky brightness measurements to submit with annual reports to IDA.

We would like to ask the International Dark Sky Association to consider the declaration of the Bükk National Park as a Starry Sky Park, based on our measurements , facts and information written above for a provisional status.

This document was prepared by Richárd Novák

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