



Karst and National Parks

Workshop
Jósvafő
22-26th, January 2019

Programme and Abstract Book



NATIONAL RESEARCH, DEVELOPMENT
AND INNOVATION OFFICE



Organising Committee

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PROGRAMME TIMETABLE

Tuesday, 22nd, January

- 17:00-19:00 Arrival
19:00-20:00 Welcome Drink (Tengerszem Hotel conference room)
20:00- Dinner (restaurant)

Wednesday, 23rd, January

- 08:00-09:00 Breakfast
09:00-09:05 Welcome
09:05-09:20 *Tamás Telbisz* (Eötvös University, Budapest): Why do we study „Karst & national parks”? – Introduction of the project
09:20-09:50 *Balázs Veress* (director, Aggtelek National Park): Presentation of Aggtelek National Park Directorate
09:50-10:20 *Péter Gruber* (ANP): Conservation of abiotic values in Aggtelek National Park
10:20-10:40 *Sándor Rózsa* (ANP): Guarding the protected values – introduction of the Ranger Service of Aggtelek National Park
10:40-11:00 *Zsolt Bacsó* (ANP): Relationship of nature conservation and tourism in Aggtelek National Park
11:00-11:20 Coffee Break
11:20-11:40 *Tamás Telbisz* (Eötvös University, Budapest): Opinion of local people and tourists about Aggtelek NP based on a questionnaire survey
11:40-12:40 **Methodological discussion – how to carry out the tasks in the project (interviews, questionnaires)**
12:40-13:40 Lunch (sandwich)
13:40-14:00 *Christos Stergiou* (Aristotle University of Thessaloniki): An overview of the Vikos-Aoos National Park: from Paleolithic hunter-gatherers to modern touristic development
14:20-14:40 *Alena Gessert, Janetta Nestorová-Dická* (University of Pavol Jozef Šafárik Košice): Slovak karst and its most important tourist sites
14:40-18:00 Walking from Tengerszem Hotel Jósvalfő to Vörös-tó (Red Lake)
Back through Baradla Cave
18:00-19:00 Leisure time
19:00- Dinner

Thursday, 24th, January

- 08:00-09:00 Breakfast
09:00-09:20 *Ranko Milanović, Marijana Josipović* (Tara NP): Tara National Park
09:20-09:40 *Jelena Čalić* (Geographical Institute Jovan Cvijić, Belgrade): Landforms of Tara Mountain
09:40-10:00 *Jelena Kovačević-Majkić* (Geographical Institute Jovan Cvijić, Belgrade): Hydro-issues of Tara Mountain
10:00-10:20 *Jovana Brankov* (Geographical Institute Jovan Cvijić, Belgrade): Tourism development in Tara NP: the community perspective
10:20-10:40: *Petra Radeljak-Kaufmann* (University of Zagreb): Development trends in the surroundings of the Krka National Park

- 10:40-11:00 *Neven Bočić* (University of Zagreb): The karst geomorphological features of the National Park North Velebit (Dinaric karst, Croatia)
- 11:00-11:20 Coffee Break
- 11:20-11:40 *Zoltán Imecs* (Hungarian Geographical Institute of Babeş-Bolyai University, Cluj Napoca): Apuseni Nature Park - geography and tourism
- 11:40-12:00 *Alin Mos* (director, Apuseni Nature Park): Apuseni Nature Park - a park for nature and people
- 12:00-12:20 *Eszter Tanács* (Centre for Ecological Research, Hungarian Academy of Sciences): Ecosystem service mapping for the sustainable development of karst areas
- 12:20-12:40 *Tibor Standovár* (Eötvös University, Budapest): Special biological values of a karst national park (Aggtelek National Park)
- 12:40-13:00 *Margit Kőszegi* (Eötvös University, Budapest): The changing idea of the creation of national parks in Hungary - a brief historical overview
- 13:00-13:20 *László Mari* (Eötvös University, Budapest): Karst and national parks in a European context
- 13:20-14:00 Lunch
- 14:00-18:00 Field program - Derenk: abandoned village, Bódvalenke: gypsy frescoes, Szögliget - thermal springs
Rákóczi Cave
- 18:00-19:00 Leisure time
- 19:00- Dinner

Friday, 25th, January

- 07:30-08:00 Breakfast
- 08:00- Departure for field program
Aggtelek: Zombor-lyuk stream sink, lake; Main entrance of Baradla Cave (~ 9:00)
Gombasecká / Gombaszögi Cave (~ 9:30-10:30)
Silicka Ladnica / Szilice Ice Cave (~ 10:30-12:00)
(Silica/Szilice - a village on karst)
Hačava/ Ájfalucska (~ 13:00) - waterfalls in the valley + village (rusyn; tourism)
Walking in Zadielska Dolina until ~ 16:30, and back to Jósvalfő
- 19:00- Dinner

Saturday, 26th, January

- 08:00 Breakfast
- 09:00 Farewell, departure to home

ABSTRACTS

Abstracts are in the order of presentations.

Why do we study „Karst & national parks”? – Introduction of the project

Tamás Telbisz

Department of Physical Geography, Eötvös University, Budapest

Likewise many other physical geographers, I studied the geomorphology of karst terrains for long, because it is an amazing discipline. However, after several years of field experience, I recognized that not only the geomorphology but the life conditions of people living on karsts are also quite specific. Thus, we started to study karsts in a broader context including both physical and social viewpoints. Due to the hydrological, pedological and topographic settings, karstlands, in fact, often have lower population densities than surrounding non-karstic terrains and the depopulation of karst mountains in Europe is also a characteristic phenomenon, though this process is not restricted to karsts. We found that practically the only potential, which could stop - or at least decelerate - this process, is tourism and nature protection. From this viewpoint, low population density is an advantage. Moreover, karsts are special from biological aspects, too. In addition, the spectacular karst landforms, especially caves, gorges, collapse dolines can attract tourists as well. Therefore, national parks on karsts can protect natural values and promote tourism at the same time. More recently, geoparks can play a similar role. However, the aims behind the foundation of national parks can be highly variegated, and there are changes in the goals both in time and space. Recently, it is a more pronounced opinion that national parks should become economic drivers, too.

Based on the above background, our research questions are the followings: are karstic national parks “specific”? Is the conservation of abiotic values preferred in them - scientifically or financially? People who live on karst - can they perceive the advantages of national parks or they feel rather restrictions? Tourists who visit karsts - what do they get (in terms of knowledge, adventure, recreation, etc.), and how do they impact the area? How does the state consider its national parks? These are the issues briefly articulated in this introductory presentation.

Presentation of Aggtelek National Park Directorate

Balázs Veress

director, Aggtelek National Park

Aggtelek National Park (founded in 1985) is the first Hungarian national park, which was pronouncedly declared to protect geological values, namely superficial and underground karst forms. Aggtelek National Park is situated in Northern Hungary, as part of the former Gömör-Torna Karst, between Sajó and Hernád rivers having an area of cca. 20,000 ha. Caves of Aggtelek Karst and the neighbouring Slovak Karst were inscribed to the list of UNESCO World Heritage as Natural World Heritage on 6th, December 2005. Aggtelek National Park Directorate manages not only Aggtelek Karst but Zemplén and Tokaj-Bodrogzug Protected Landscape Areas as well as 17 National Nature Reserves. The total area managed by Aggtelek National Park Directorate is 440,000 ha. The tasks are the followings, the protection and conservation of biotic and abiotic values on the areas belonging to the ANP Directorate, land management according to nature protection principles, education and presentation of nature protection goals, increase of public awareness and dissemination of knowledge.

Conservation of abiotic values in Aggtelek National Park

Péter Gruber

Aggtelek National Park Directorate

The protection of abiotic natural values played a dominant role when Aggtelek National Park was declared in 1985, thus the national park directorate pays special attention to the conservation and presentation of these abiotic values and increased efforts are made to obtain financial support for the development of these sites. In the recent period and even now, there are several development projects supported by different organizations, which aims at the conservation and development of these geologic values, which are, to some extent, part of the World Heritage. The actual presentation reviews the steps made since the foundation of ANP towards the conservation of abiotic natural values, and the ongoing projects and expected results are presented in more details.

Guarding the protected values – introduction of the Ranger Service of Aggtelek National Park

Sándor Rózsa

Aggtelek National Park Directorate

Structure of the Ranger Service at Aggtelek National Park and in Hungary in general. Main legal framework of the operation of rangers in Hungary, rights and duties of rangers. Means and equipment. Main tasks and problems.

Relationship of nature conservation and tourism in Aggtelek National Park

Zsolt Bacsó

Aggtelek National Park Directorate

Aggtelek National Park Directorate belongs to the state administration working at a World Heritage and Hungaricum site. It protects, investigates and presents the natural values of the national park, and provide an example for visitors about the practical issues of nature protection. From environmental education to ecotourism at all levels, the attitude is formed by the national park in the hope that visitors will become ecotourists in nature, and responsible and environmentally conscious citizens in their everyday life, who take part in nature protection.

Opinion of local people and tourists about Aggtelek NP based on a questionnaire survey

Tamás Telbisz

Department of Physical Geography, Eötvös University, Budapest

Nature-based tourism, including geotourism, is a quickly growing sector in recent decades. However, tourism to Aggtelek National Park (ANP) significantly decreased after 1985 unlike the worldwide trend. In 2018, we created semi-structured interviews with the managers of ANP and of the neighbouring settlements and performed a questionnaire survey with local people (187 persons) and tourists (380 persons).

The most serious problems of Aggtelek Karst settlements are unemployment, depopulation and public security. The ANP has a deep presence in the life of local people, ¼ of locals have some professional/job relation to the NP, and further 40% have some personal links to the NP. In general, local people evaluate the ANP as „slightly positive”, but they perceive several NP-related regulations and limitations, too. All stakeholders agree to boost tourism, but it is not easy. A feasible way to enhance tourism would be the thinking in larger units, and the creation of more direct tourist links with other territories, especially with the neighbouring karst region in Slovakia. Baradla Cave („Aggtelek Dripstone Cave”) still plays a strongly dominant role in local tourism, with 2/3 of tourists arriving here only to visit the cave. 59% of tourists are one-day visitors, but 72% of tourists are recurring guests. The tourist motivations were examined by several questions, e.g. we asked people whether the “*National Park*” or the “*World Heritage*” title is more important for them. It is found that the „*World Heritage*” title is more important for all groups, but foreign tourists selected the „very important” option in a much higher proportion (42%) than Hungarians (only 25%). Beside motivations it is essential to know the information sources of tourists. A remarkable result of our survey is that 49% of Hungarian tourists chose „school education” as their information source! This means that public education still has a very significant role in (geo)tourism, and that it is a key question for Aggtelek to remain in the curriculum of elementary schools for the future as well.

Finally, we conclude that the existence of ANP is of particular importance for local people. In spite of all difficulties, the look of villages, the employment possibilities, and the general socio-economic situation is relatively better in ANP than in the neighbouring hilly areas, which are similar in relief, in „remoteness”, but are not built up of karstifiable rocks, therefore there are no special geosites in their areas, and are not protected by a national park. Thus, the national park has a positive impact on local development, but it is not enough to solve deeply rooted social problems.

An overview of the Vikos-Aoos National Park: from Paleolithic hunter-gatherers to modern touristic development

Christos Stergiou

*Department of Mineralogy, Petrology, Economic Geology, Faculty of Geology,
Aristotle University of Thessaloniki, Greece*

At the northern part of the Pindos mountain range in Greece the Tymphi mountain massif is located where also the Vikos and Aoos Gorges are found. Around these gorges the historic region of Zagori is located consisting of 46 villages. Furthermore, at the Lower Vikos Gorge Basin, the Paleolithic-Mesolithic rock shelters of the Boila, Kleithi, and Mega Lakkos are found. The Vikos-Aoos National Park is built by massive dolomites and limestones of the Ionian geotectonic zone which mark a long and continuous marine sedimentary and diagenetic history, from Triassic to Lower Miocene. The tectonic structuring of the Tymphi mountains is the result of the Alpine Orogeny in Greece. Subjected to this ongoing structural control was also the development of the Vikos and Aoos Gorges since Neogene. Major factors controlling the recent geomorphological development of the gorges were the Pleistocene-Holocene glaciations events. Thus, the area is characterized by an active karst and a remnant glaciokarst geomorphology which comprise several characteristic features such as dolines, alpine lakes, and shaft caves. Since Upper Paleolithic period the broader area of the Vikos-Aoos National Park has hosted the diachronic presence of small human societies. Despite the harsh living conditions of the post-glacial environment, the Paleolithic hunter-gatherer populations were attracted to the region of Vikos Gorge as it offered plenty of food, safe shelters and suitable raw materials for stone tools and weaponry manufacturing. During historical times the population of the Zagori region was mainly engaged in nomadic pastoralism, woodworking, trade, caravan transportation. The World War II and the Greek Civil War (1945-1949) had negative impact on the economic flourish of the region, the restricted productive abilities and the ongoing urbanization favoured the internal migration and the immigration of the population. As a result, the Zagori region in the beginning of the 21st century appeared to be significantly affected by depopulation. However, the development of tourism along with alternative tourism types such as geo-tourism inversely affects this population trend. Nowadays a significant touristic industry is developed focusing on the exploitation of the natural aspects of the area. In this presentation, a review on the Vikos-Aoos National Park natural aspects as well as on the diachronic interaction between human societies, geomorphology and geology of the area is attempted. Furthermore, the conflicts which occur from this close coexistence are highlighted.

Slovak Karst National Park and its most important tourist sites

Alena Gessert, Janetta Nestorová-Dická

University of Pavol Jozef Šafárik Košice

The Slovak Karst National Park is the most typical plateau karst surface area of Slovakia. The presence of surface karst features is significant, especially dolines (more than 1000) as well as large karren fields and underground corridors. The territory became a national park in 2002, but before, since 1977, it was a protected area. This protection brought to the area not only new jobs but also restrictions, and the results are e.g. degraded karren fields. The most significant tourism spots are caves. Many of them, together with the caves of Aggtelek National Park are inscribed into the list of the Natural Heritage of UNESCO. The main shortcoming is the lack of propagation and the missing infrastructure. In comparison with other show caves of Slovakia, caves of Slovak Karst are poorly visited. The most interesting natural landmark is Zádiel valley attracting tourists with their rock formations and Háj valley, which is well known because of its travertine waterfalls and cascades.

Tara National Park

Ranko Milanović, Marijana Josipović

Tara NP

Tara National Park is a mountain area (part of Dinaric Arc) in the West of Serbia which has been under protection since 1981. The protected area includes nearly 25 thousand hectares, covering the greatest part of the Tara and Zvijezda mountain ranges, which are boarded by the Drina river.

Tara is a medium-high mountain with a limestone bedrock, having an average elevation between 1000 to 1200 meters above sea level, which is intercepted by numerous canyons and gorges, and rising mountain peaks – Kozji rid 1,591 m, Zborište 1,544 m. The lowest elevation point of the park is the river Vrelo, situated at 234 meters above sea level.

The greatest value of the Tara National Park are the mixed forests, covering over 80% of the park. The flora and fauna of the park are characterized by a large number of endemic species, which is significantly influenced by geological and geomorphological characteristics. So far, we have been able to register close to 1200 plant species, including the Serbian spruce (*Picea omorika*), an endemic species of spruce and a relic among coniferous plants which managed to survive the last ice age. Also, the Tara mountain brings refuge to over 140 bird species, 19 different species of fish and 58 species of mammals, among which is the largest brown bear population in Serbia. The main tourist attractions (viewpoints, springs, waterfalls) are closely related to relief features.

Landforms of Tara Mountain

Jelena Čalić

Geographical Institute Jovan Cvijić, Belgrade

Tara Mt. orographically belongs to the northern outskirts of the Internal Dinarides in western Serbia and eastern Bosnia and Herzegovina, where the highest peak of the whole massif, Veliki Stolac (1675 m a.s.l) is situated. *Sensu stricto*, Tara represents a relatively high, dominantly karstic plateau with average elevation of about 1200 m, outlined from western and northern sides by the course of the Drina River. As for the geological composition, Middle Triassic and Upper Triassic limestones dominate in the NW parts, Upper Cretaceous limestones and marls are present in the central area, while Carboniferous clastic complex and various constituents of the Jurassic ophiolitic mélange occupy relatively smaller portions. Regarding the morphogenetic processes, apart from the karstic and fluviokarstic, the active ones include the hillslope and fluvial processes. Deeply incised Drina River enabled the existence of nearly 1000 m of denivellation within the karstic vadose zone, which caused deep incision of surface waters and a number of vertical caves which are very difficult for exploration due to extremely narrow passages. Fluviokarstic relief is represented by deep canyons (Brusnica, Zvijezda, Rača, etc), extending from the plateau to the Drina River. High escarpments in limestone are characterised with screes in their foothills, while the plateau surface morphology depends on the lithological composition, forming the fluvial network on non-karstic rocks and karst depressions on limestones. Among the hillslope processes, the most significant for morphogenesis are colluvial processes, represented by landslides.

Hydro-issues of Tara Mountain

Jelena Kovačević-Majkić

Geographical Institute Jovan Cvijić, Belgrade

Before the 1960s, water of Tara Mountain was a potential which was not used enough. Thanks to the amounts and quality, today waters are a resource. Furthermore, watercourses with steep slopes of riverbeds were usually a threat for local population, making damages to homes and agricultural fields. Tara Mountain waters are present as springs, watercourses and accumulations. As a karst mountain, Tara is in its highest parts poor in surface watercourses, and there are rare springs with small discharge. Karst springs with huge amounts of water occur on the contact with impermeable rocks, forming watercourses on the slopes of the Tara Mountain. Some of them are captured. Karst springs water has high quality, but could be quickly polluted, so those springs with settlements in their catchment area should be protected. The Drina River which flows on the north-west and north side of the mountain has great importance, since its hydro-potential is used by "Perućac" accumulation and Hydro-power system "Bajina Bašta". There is also the system of five hydro-accumulations making sufficient amounts of electrical energy and also preventing torrential floods. Accumulation Kruščica is used for water-supply. Water quality of the Tara Mountain belongs to the I class (springs and upper parts of the watercourses) and II class (middle and lower parts of the watercourses). Thanks to watercourses of high quality, there are habitats of fish species of Salmonidae family. Except that, different types of sport-recreational tourism are developed on the Drina River (swimming, rafting, sport fishing).

Tourism development in Tara NP: the community perspective

Jovana Brankov

Geographical Institute Jovan Cvijić, Belgrade

Academic attention has largely been focused on the social impact of tourism and understanding the local community's perception of this industry. The importance of tourist-resident interaction has been widely emphasized due to the fact that successful and sustainable tourism development is inextricably linked to the support provided by the local population. This is especially true on national parks with fragile environments and specific ecological status where tourism concentration encourages more interactions between tourists and residents and may offer more confirmation on environmental harm caused by this industry. A centralized approach to the planning and management of protected areas in Serbia in the past has minimized the role and significance of the local population living in the territory of the protected areas. Although the need to involve local residents in tourism planning and management in the communities has been recognized in the past several decades, there is not enough objective and systematically processed information on how local communities in the territory of national parks respond to tourism. In order to improve aforementioned scenario, we have studied the resident's perceptions and their involvement in the tourism industry in the NP Tara (Serbia) by applying the method of indicators of sustainable development of tourism of the World Tourism Organization (UNWTO). The results showed that tourism had a poor impact on the local community in terms of their knowledge and personal involvement in this industry. However, we also identified the positive attitude to tourism and a strong positive perception of the presence of tourists among the local population. This analysis provides inputs for directing future tourism programs and developing policies adjusted to the needs of the local community.

Development trends in the surroundings of the Krka National Park

Petra Radeljak-Kaufmann

Department of Geography, Faculty of Science, University of Zagreb

Through various functions, especially tourism and recreation, protected areas influence local development in areas that surround them. The Krka National Park is situated in the northern part of the Croatian coastal region of Dalmatia. It was proclaimed in 1985, protecting the Krka River and its waterfalls (its boundaries were revised in 1997).

The settlements near the Park have been characterised by depopulation and problems in socio-economic development, starting in the 1960s. Despite intense growth in tourist turnover, the Park has exercised almost no influence on the stabilisation of settlement patterns in this depopulated zone. However, some socio-economic impacts can be recognised, especially in the areas closest to main tourist points of the Park and along main routes leading to the Park's entrances. One of the important trends in the last decade has been the development of rural tourism in the wider area.

The karst geomorphological features of the Northern Velebit National Park (Dinaric karst, Croatia)

Neven Bočić

University of Zagreb, Faculty of Science, Department of Geography, Division of Physical Geography

The National Park is one of the highest legal forms of nature protection in Croatia. The only higher form of protection is the „strict reserve“. Of the total of 8 national parks in Croatia, there are five on land area and three on the Adriatic islands. Although they all have more or less pronounced karst characteristics, in some of them karstic forms are the primary phenomena. Such is the Northern Velebit National Park. It was founded in 1999 after major speleological discoveries in the area. The area of the Park is 109 km² and it extends from 518 to 1676 m asl. The emergence and development of the relief of northern Velebit are influenced by the geological and climatic conditions through the geological past and the recent period. In the wider area of northern Velebit, the following morphogenetic relief types have been developed: karst and fluviokarst influenced by slope, coastal, periglacial and glacial processes. Recently, karst processes have played the most important role in (re)shaping the landscape. The most abundant surface karstic forms are karren, dolines, uvalas and kuks (karst towers). Among the underground karst forms, the pits (vertical caves) are dominant. They are primarily created by the corrosion and erosion of water in the vadose zone, which is very deep. Therefore, there are three pits deeper than 1000 m, of which the Lukina jama - Trojama system is 1431 m deep, being the deepest pit/cave in the Dinarides. Pleistocene glaciation played a significant role in shaping the relief of this area. Glacial denudational and accumulative relief forms have been noted, as well as glacial influence on other morphogenetic types. Its most significant influence is visible on the development of surface but also in the underground karst forms (glaciokarst).

Apuseni Nature Park - geography and tourism

Zoltán Imecs

Hungarian Geographical Institute of Babeş-Bolyai University, Cluj Napoca

The aim of the presentation is to offer a brief introduction about Apuseni Nature Park. After presenting the position of the Park in Europe, in comparison with the other subjects of the research project, the position inside the Apuseni Mountains is presented. With a surface of 760 km² the park is situated on a mountain region with an average altitude of 1120 meters a.s.l. The relief is characterised by large plateaux on the metamorphic rocks, smaller plateaux and steep rocky walls, gorges on the karst regions. The waters are tributary to three main rivers diverging from the central part towards North-East, South-East and West. All of them belongs to Tisa basin. In the middle of karst there are several endorheic areas with complex karst systems. Almost 70% of the park is covered by forests. From administrative point of view the area of the park belongs to three counties and 17 communes. In these local administrative units are 53 settlements, most of them being dispersed in the mountains. The population inside the park is about 9000 inhabitants. The park is crossed by more than 180 km of paved and 110 km of unpaved road. These are completed by several km of forest roads. There are many natural touristic destinations most of them connected to karst landforms, which occupies almost 40% of the total area. These are caves, sinkholes, gorges, dolines, ponors and karst-springs. All these attractions are linked by more than 200 km of marked trails. The tourism is supported by more than 100 accommodations with a total capacity of more than 2500 beds. All of these are in the nearby communes. The presentation is completed by a short description of the most important, most visited attractions illustrated with a lot of pictures.

Apuseni Nature Park – a park for nature and people

Alin Mos

director, Apuseni Nature Park Administration

Apuseni Natural Park with an area of 75,784 hectares is the third largest park in Romania's 29 national and natural parks, located in western Romania in the north-central part of the Apuseni Mountains. It was first proposed for being declared a national park in 1928 by the Romanian scientist Emil Racovita, being declared by law as a natural park only in 2000. Its natural park management category according to the Romanian legislation is equivalent to the V IUCN category protected landscape, with the main purpose of protecting some of the most important karst areas at national level located in the Apuseni Mountains. That is why Apuseni Natural Park has a geological, biological and cultural importance at national level in terms of conservation, protecting a unique landscape in Romania.

The Park Administration was established in 2004 with the role of ensuring the management of this protected area, being assisted in the decision making process by a Scientific Committee consisting of experts and scientists and also by an Consultative Committee for Administration made up of the main stakeholders, respectively public authorities, education and research institutions, local companies and non-governmental organizations. Starting with 2014, the Park Administration administers alongside the Apuseni Natural Park a number of 3 Natura 2000 sites as well as 55 nature reserves and nature monuments that overlap entirely or partially with the park. Management is carried out on the basis of a management plan developed and implemented in close collaboration with the Scientific Committee, as well as with the Consultative Committee for Administration.

The natural capital is very rich, with over 1550 species of plants identified so far, out of which 96 are protected as well as more than 1380 species of animals out of which 147 are protected. Six habitats of community interest have also been identified, of which 6 are priority habitats. Underground habitats are well represented, with more than 1500 caves in the territory of the park, some of which are particularly important at national and international level.

The cultural capital is determined by the diversity of the local socio-economic systems, the park being located on the surface of three different counties (Bihar, Cluj and Alba), having on its territory a number of 55 localities with a population of approximately 10,000 inhabitants. The main pillars of the local economy are the exploitation and processing of wood, animal husbandry and tourism, with economic activities being subject to a special regulation and control regime in which the park administration ensures the application of appropriate protection and conservation measures.

Because 2/3 of the park's surface is private property and mainly belongs to local communities, the park administration must ensure the direct involvement of landowners or land managers in managing biodiversity conservation by ensuring sustainable use of natural resources. To this end, the park administration has implemented numerous projects and programs to help local communities adapt the local economy to the needs of protecting and preserving the park's natural capital and to develop new products and marketing tools tailored to new market requirements to ensure the incomes necessary for living conditions appropriate to the needs and aspirations of members of local communities.

Due to the quality of the natural capital, its importance and attractiveness, but also due to the projects and programs made by the park administration together with the local communities that ensure the sustainable development of the local economy, especially of the tourism, the Apuseni Natural Park was declared European Destination of Excellence (EDEN) by the European Commission.

Ecosystem service mapping for the sustainable development of karst areas

Eszter Tanács, Réka Aszalós, Béla Kuslits, Ágnes Vári, Ildikó Arany

Centre for Ecology of the Hungarian Academy of Sciences

The project 'Ecosystem services of karst protected areas – driving force of local sustainable development' (Eco Karst), funded by the EU Territorial Cooperation Programme (Interreg), has started in 2017 and is ongoing until June 2019, involving seven case studies in seven karst areas in seven countries. The main objectives of the project are to map and evaluate the ecosystem services (ES) of the karstic areas, to explore 'pro-biodiversity business' (PBB) potentials and create local action plans – all with the active participation of stakeholders. A PBB is dependent on biodiversity for its core business and through that, besides providing jobs and income to the local population, it also contributes to biodiversity conservation. ES maps and valuation provide important information to ensure that the resulting action plans are sustainable and support biodiversity.

The ecosystem service mapping and assessment combined a wide range of different disciplines and methods. Due to huge differences in data availability in the partner countries, customized methodologies were developed for the assessment for each case studies. In order to provide a sufficient representation of local stakeholders, an initial social network analysis has been carried out. A preliminary ES list was assessed against selection criteria by expert scoring, resulting in specific lists of priority ES in each area. EUNIS level 3 habitat maps have been prepared as the basic inputs for the ES mapping, which were, for most individual ES assessment, further specified and customized. The ES capacities are mapped by rule-based extended matrix models, with a set of rules incorporating additional influencing factors into the estimated values. At the end of the work, the suggested methods of the ecosystem service mapping together with experiences and lessons learned from the seven case studies will be summarized in five Guidance Packages.

Special biological values of a karst national park (Aggtelek National Park)

Tibor Standovár

Department of Plant Systematics, Ecology and Theoretical Biology, Eötvös University, Budapest

In this short presentation I will not try to give a thorough overview of the biological values of the NP. Instead, I focus on a few peculiarities that have consequences on the flora and fauna of the NP. As a karst national park the occurrence of caves provide special habitats for certain animal groups. Also, karst geomorphology on the surface creates special microclimate that helps the survival of species otherwise not present. Karst regions can have rather poor site conditions, which make them unsuitable for agricultural use, and also rather sensitive to land-use. In this respect, a short history of land-use and its biological consequences will be also shown. Finally, the effect of the presence of country border is also discussed.

The changing idea of the creation of national parks in Hungary - a brief historical overview

Margit Kószegi

Department of Regional Science, Eötvös University, Budapest

The phrase of National Park is a common notion to people in the 21st century, both in Hungary and in the world; it means real and known (and experienced in many cases) space and activities connecting to it. It is a social construction; therefore, the framework of its interpretation is always changing, depending on time and space. Discourses behind the idea of the national park and the process of implementation are different in time and space too. In this paper, we introduce the history of these discourses and place the Hungarian viewpoints to the international trends.

Karst and national parks in a European context

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Among IUCN categories, probably the 'national park' is the most respected and the best-known category. It is an interesting question to what extent karst landscapes are represented in this category. Another question is, where mass tourism reaches karst areas, is the natural heritage violated in some way or not. Due to the extreme increase of tourism some karst phenomena like caves or gorges became popular tourist targets. Although many karst terrains were known for tourists since long ago, new trends like adventure tourism can be also important due to activities such as canyoning, canoeing or caving. Moreover, geotourism is also a new possibility that may increase the awareness of tourists also in relation with karst terrains. However, not only the viewpoints of tourism, but the relative intactness of karst landscapes is also a significant factor, which made it possible to designate nature protection areas on karsts. We examined these questions in a European context. Based on scientific literature, internet resources and by own field experiences we have collected a list of European national parks with karstic regions. We compare their geomorphological and geological values and monuments, analyse their statistical characteristics and spatial distribution within Europe. Based on some selected examples, we try to characterize their role and potential in the tourism of national parks, and in the regional development in general. Since the foundation of Yellowstone National Park (1872), the national park (NP) concept has been transformed several times. Important elements of the present NP concept are: the protection of „pristine” nature, national identity, tourism, protection of cultural landscapes and historical heritage, recreation, scientific research, education, ecological values, biodiversity, investigation of climate change effects. The first NP was established in Europe in Sweden at 1908, since there are more than 460 NP in European countries.

Based on literature, internet resources and own field experiences we have collected a list of European national parks with karstic regions. Based on examples we present the different possibilities of the karstic areas of the different national parks in terms of tourism. The first NP with karst terrains was founded in Spain at 1918 (Picos de Europa NP and Ordesa y Monte Perdido NP). There are NPs with large amount of visitors, for example Picos de Europa NP 1.8 million visitors/year, Plitvice Lakes NP (Croatia) 1.3-1.5 million visitors/year. Since its opening to the public in 1819, more than 38 million 'adventurers' have visited the Postojna Cave (Slovenia). In some places NP managers had to limit the number of visitors, for example the number of visitors at Skradinski buk waterfall in Dalmatia's Krka National Park (Croatia) will be limited to 10,000 at a time due to concerns over safety and damage to the landscape. In other cases, there are less visited NPs, for example The Burren NP (Ireland) with an estimated 75,000 visitors/year.