

# Aggtelek Biosphere Reserve

## Management Plan



Jósvafő

2015.

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## Introduction

Based on the 2013 report and UNESCO's recommendations, it has become obvious that the Aggtelek BR lacks an important and effective management tool, namely a dedicated biosphere reserve management plan since its establishment in 1979. Although there are several management plans affecting the BR, and in many ways they are in line with the BR management efforts, they do not cover the whole area (e.g. parts of the transitional zone), and definitely their focus is different to some extent. The advantage of this situation is, however, that the different management documents can be synchronized and the overlapping themes and tasks may gain even more importance.

The Aggtelek BR is a first generation biosphere reserve. The notion and practices of biosphere reserves have changed to some extent during the nearly 40 years of its designation. The management of the BR has been diligent to adopt these changes, but this important link has been missing. Thus it is also a tool to implement the *Seville Strategy* and the *Statutory Framework of the World Network of Biosphere Reserves* on local level.

The results of the document elaboration process and the major conclusion are that the sustainable development approach and the involvement of the stakeholders are the greatest challenges in the BR and definitely something to be reinforced in the period of 2015-2025. The planned management actions try to address these issues.

## 1. UNESCO MAB Programme

### 1.1. UNESCO Man and Biosphere Programme

Launched in 1971, UNESCO's Man and the Biosphere Program (MAB) is an Intergovernmental Scientific Program that aims to establish a scientific basis for the improvement of the relationship between people and their environment. The MAB Program develops the basis within the natural and social sciences for the rational and sustainable use and conservation of the resources of the biosphere and for the improvement of the overall relationship between people and their environment. It predicts the consequences of today's actions on tomorrow's world and thereby increases people's ability to efficiently manage natural resources for the well-being of both human populations and the environment.

By focusing on sites internationally recognized within the World Network of Biosphere Reserves, the MAB Program strives to:

- identify and assess the changes in the biosphere resulting from human and natural activities and the effects of these changes on humans and the environment, in particular in the context of climate change;
- study and compare the dynamic interrelationships between natural/near-natural ecosystems and socio-economic processes, in particular in the context of accelerated loss of biological and cultural diversity with unexpected consequences that impact the ability of ecosystems to continue to provide services critical for human well-being;
- ensure basic human welfare and a liveable environment in the context of rapid urbanization and energy consumption as drivers of environmental change;
- promote the exchange and transfer of knowledge on environmental problems and solutions, and to foster environmental education for sustainable development.

### 1.2. BIOSPHERE RESERVES IN HUNGARY

Hungary as a UNESCO member state joined the MAB program in the 1970s as one of the first countries. Five biosphere reserves were designated by the UNESCO until 1980, whereby the emphasis of the original nomination was to place international focus on the protection and scientific research of ecosystems that have a high natural value partly due to the extensive,

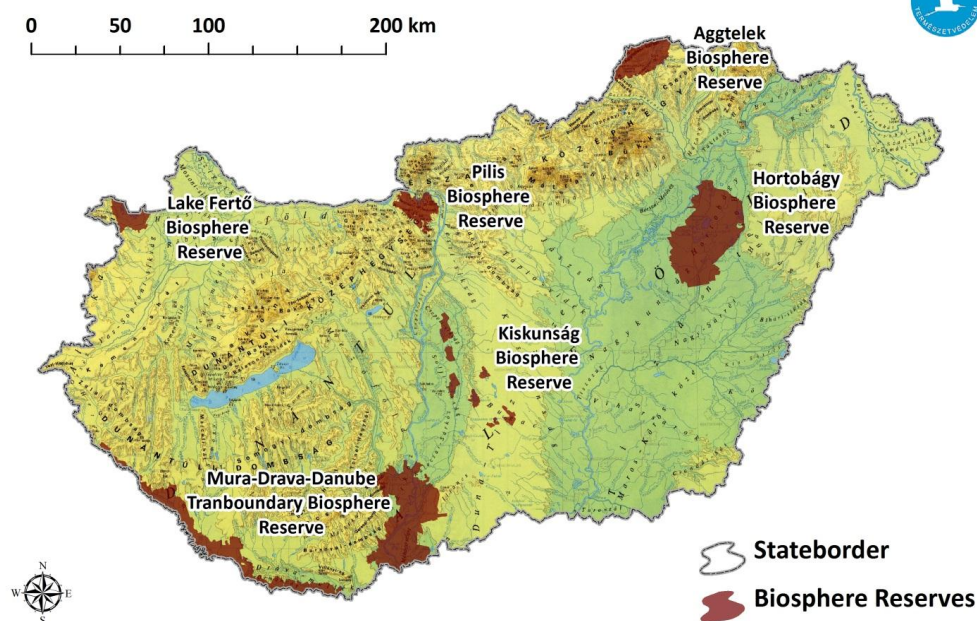
long-lasting interactions between man and nature, in other words “Man and Biosphere”. The sixth biosphere reserve (Mura-Drava-Danube Biosphere Reserve) was established in 2012.

**Date of designation:**

Aggtelek Biosphere Reserve	<b>1979</b>
Lake Fertő Biosphere Reserve	<b>1979</b>
Hortobágy Biosphere Reserve	<b>1979</b>
Kiskunság Biosphere Reserve	<b>1979</b>
Pilis Biosphere Reserve	<b>1980</b>
<i>Mura-Drava-Danube Transboundary Biosphere Reserve</i>	<b>2012</b>

The “first generation” biosphere reserves were established with the main objective to protect the natural values of the protected areas and with a lower level of interaction with local communities than is general nowadays in new biosphere reserves situated outside the legally protected areas. Following the Madrid Action Plan and Seville Strategy of the UNESCO it has been a challenge to review the management, but this revision has led to the establishment of a new zonation system, assignment of new functions to certain zones and a renewal and increase of interactions between biosphere reserves and local people. Strengthening the involvement of local communities and other stakeholders is an essential role of biosphere reserves.

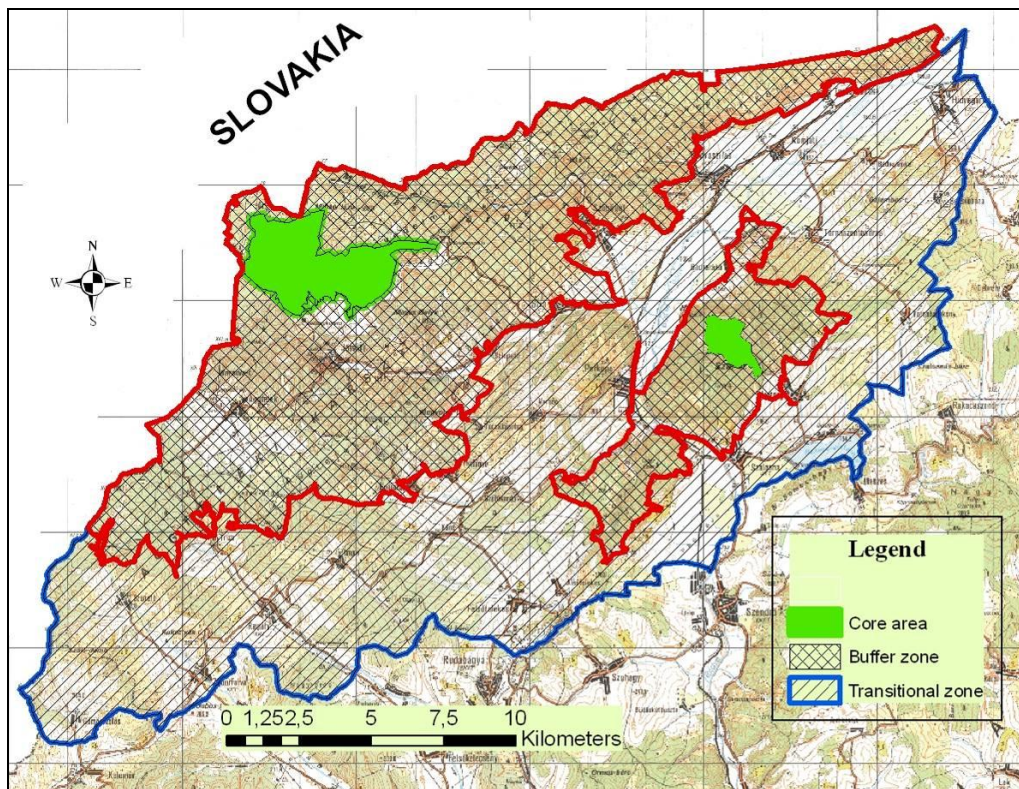
**Biosphere Reserves in Hungary**



## 2. The Aggtelek Biosphere Reserve

The Aggtelek Biosphere Reserve is situated in the north-eastern part of Hungary.

### 2.1. LOCATION MAP



### 2.2. LEGAL STATUS

The designation and protection of biosphere reserves has been integrated into the Hungarian law. In Hungary, the Minister of Nature Conservation can nominate an area as a biosphere reserve (Act LIII. of 1996 on Nature Conservation). The national law also provides that the areas with high nature values within the biosphere reserves, designated as core areas, are strictly protected.



The relevant national park directorates are responsible for the management tasks of the biosphere reserves, and nature conservation authoritative tasks are carried out by the regional nature conservation authority.

The main responsible organization of the MAB program in Hungary is the MAB National Committee, which holds its meetings once or twice a year. The Committee consists of 24 members, including the representatives of the Ministry of Agriculture (which is responsible for technical supervision of the MAB Programme), and the Hungarian UNESCO National Commission, academic researchers, organic farmers, tourism entrepreneur, ecotourism expert, NGO representative, leaders and managers of each biosphere reserve as well. The required management activities of the biosphere reserves are carried out by the related national park directorates by involving the local stakeholders.

### **2.3. MAIN ASSETS AND CHARACTERISTICS OF THE BR**

Aggtelek Biosphere Reserve (ABR) was designated in 1979. The ABR is situated in a low, karst mountain region with the altitude of 150-604 m. It is topographically dominated by karst plateaus dissected by deep valleys of river Bódva and several streams (e.g. Jósza, Tohonya, Ménes, Telekes streams). The climate is humid continental with long summers. The Carpathian Mountains have a relatively strong climatic influence upon the Aggtelek Karst. The average annual temperature is rather low, 8.2 °C. The average temperature is only 15.5 °C in the growing season. Such a low value can be measured only in higher mountains in Hungary. The annual precipitation used to be between 600-700 mm but it has significantly decreased during past years, the average being about 400-500 mm.

The territory of the ABR is the most typical karst area in Hungary. It is built up mainly of Triassic limestone with some dolomite, clayey shale and sandstone. The area demonstrates all the typical features of a karst region of medium height: deeply incised valleys, perennial- and large-discharge springs, brooks, scarcely forested or barren rocky mountain-sides large dry dolinas and extended karst plateaus. Underground karst features are in extraordinary high number here. The registered number of caves is more than 260, among which the large horizontal caves belonging to the water system of Jósza stream and the deep potholes of Also-hegy Plateau are the most impressive.

The variety of habitats and the highly diverse vegetation reflect its special climatic and geological conditions and the geomorphologically distinct karst phenomena. Its flora and fauna are one of the richest in Central Europe, with more than 1,400 vascular plants and more than 2000 butterfly and moth taxa identified.

The most frequent forests are Carpathian oak-hornbeam forests and xero-thermophilous oak forests on alkaline bedrocks. They are floristically very rich, including both steppe-forest and sub-Mediterranean species. Beech forests occur extrazonally in smaller patches on the slopes of deep valleys.

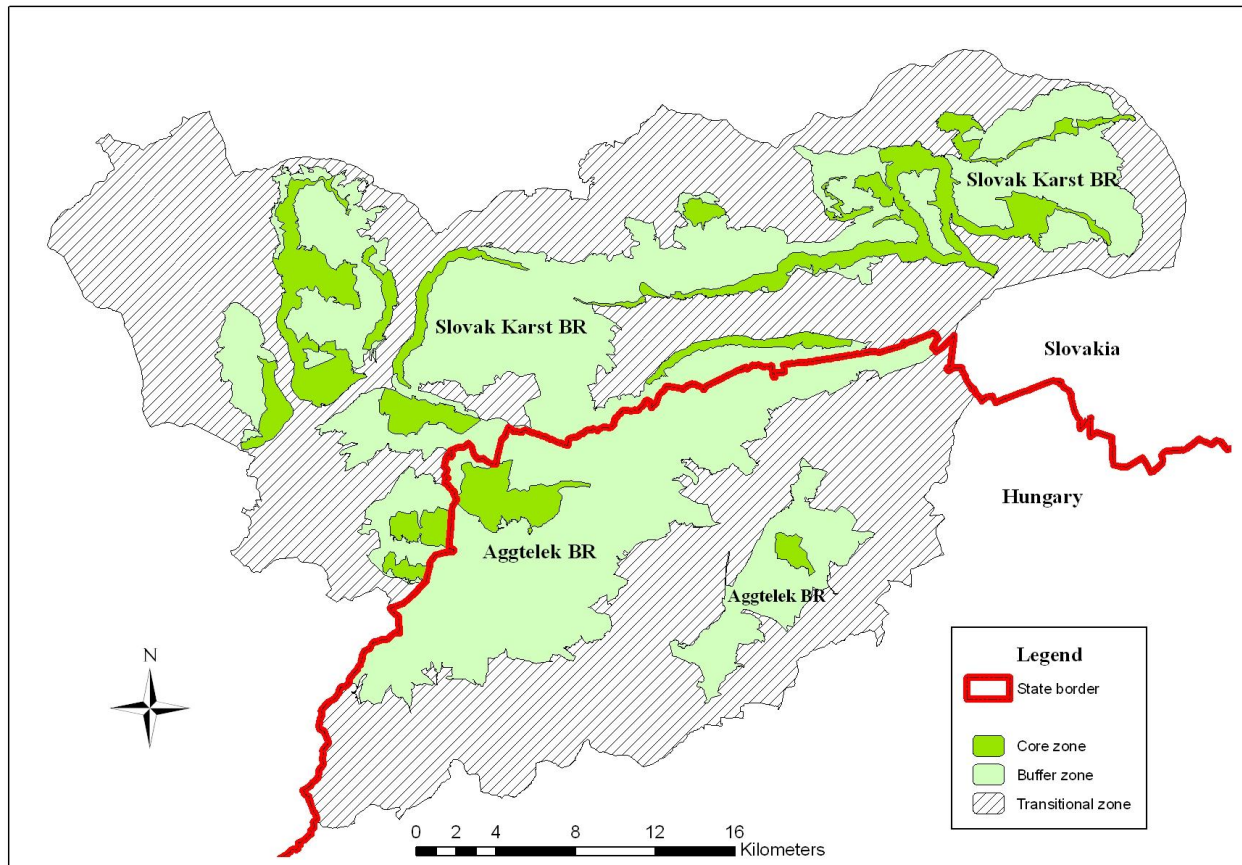
The uniqueness of the fauna of the ABR derives from the biogeographical location at the frontiers of (1) the Pannonian part of the Eurosiberian steppe province, (2), the deciduous broad-leaved woodland province, and (3) the province of the Carpathian middle-mountains. Consequently, the fauna is a mixture of steppe, forest-steppe, deciduous forest, and boreo-montane species. The dissected karst relief has provided habitats suitable for the development and persistence of many ecologically different faunal elements, including characteristic steppe xerothermic elements in all animal groups. The availability of water habitats (rivers and ponds in basins, and gorges below the plateaus) further increases species diversity. Many species reach the northern limit of their distribution here. Even both West and East Carpathian species are present.

The underground world of the ABR on December 9, 1995 has been included in the UNESCO World Heritage List.

In the north, it borders with Slovak Karst Biosphere Reserve, Slovakia. The Slovak Karst BR has an area of 361.7 km<sup>2</sup>. The core area constitutes 24%, the buffer zone 65% and the transition zone 11 %.

ABR and the Slovak Karst Biosphere Reserve belong to the Gömör-Torna/Gemer-Turna Karst Region which is the southernmost part of the inner limestone zone of the Northern Carpathians. The biosphere reserves are divided by the common border, but constitute an integral unit from geographical, geological, hydrological and cultural aspects. The whole protected area covers some 560 square kilometers. ABR has a special agreement with the Slovak Karst Biosphere Reserve. The very active cooperation basically targets synchronized research and monitoring programs, as well as special management projects against the invasive alien plant species.





***Location of the Slovak Karst Biosphere Reserve and the Aggtelek Biosphere Reserve***

## **2.4. ZONATION**

The original core area was enlarged from 230 hectares to 1.168 hectares in 2007. The determination of the core area is promulgated in a ministerial decree (7/2007. (III. 22.) decree of KvVM). According to the statutory framework, the zonation has been established in the Aggtelek Biosphere Reserve in 2012. During this process, the buffer zone was reshaped and the transition zone was assigned.

Following recommendations of the International Co-ordinating Council (ICC) of the Man and the Biosphere (MAB) Programme, the management of the BR improved the zonation again in 2015 in order to meet the criteria of the statutory framework and to fulfil the three functions. As a result, we further developed the zone system and a new core area was designated.

#### 2.4.1. Core zone

*The role of the core area is to protect biological diversity, monitoring minimally disturbed ecosystems, and undertaking non-destructive research and other low-impact uses (such as education). In addition to its conservation function, the core area contributes to a range of ecosystem services. Employment opportunities can also complement conservation goals (e.g. environmental education, research, environmental rehabilitation and conservation measures, recreation and eco-tourism).*

Area: 1 386 ha

The core zone represents the most typical forests (e.g. thermophilous oak forest, Pannonian scrub woods, hornbeam and oak forest Medio-Europaeen beech forests) and the mountain hay meadows of the region. There are no settlements inside the zone. The whole core zone is state-owned.

The main goal of land use in this zone is nature conservation. The preservation must assure the self-governing function of nature but some essential active management activities are also allowed. Approximately half of the core area met the criteria of a scientific reserve, where management is not allowed at all. In some places some management activities are possible but only with conservation purposes. All the core area is strictly protected and part of the Natura 2000 network (under both the Bird and the Habitat Directives). Basically, no human interference and management activity are allowed.

#### 2.4.2. Buffer zone

*The buffer zone surrounds or adjoins the core areas, and is used for cooperative activities compatible with sound ecological practices, including environmental education, recreation, ecotourism, and applied and basic research. They also have an important connectivity function in a larger spatial context as they connect biodiversity components within core areas with those in transition areas.*

Area: 18 797 ha

The core zone represents the typical series of habitats from the calcareous rocky slopes with chasmophytic vegetation to thermophilous oak forests, beech forests and different meadows.

The primary purpose of the buffer zone is to preserve the core zone and mitigate the effects coming from outside, although the buffer zone is also very valuable itself. Because the management is done mainly with conservation purposes, all activities may strengthen the conservation function of the core zone. Beside this, research and preservation with professional and educational purposes are also very important functions. The practice of traditional forms of extensive farming is not only possible but also desirable here. Here we can find two small settlements, tourist caves, and information centers. Although tourism and recreation appear here, these are not the main functions.

The water catchment area of the Baradla Cave in the buffer zone (2075,3 ha) was designated as Ramsar Site in 2001. The whole buffer zone is also the part of the Natura 2000 network.

#### **2.4.3. Transition Zone**

*Transition area with a central function in sustainable development which may contain a variety of agricultural activities, settlements and other uses and in which local communities, management agencies, scientists, non-governmental organizations, cultural groups, economic interests and other stakeholders work together to manage and sustainably develop the area's resources.*

Area: 25 127 ha

The transition zone is not legally protected by national law but this area is also under a moderate control of the ABR's management. Sustainable cultivation in harmony with the aims of nature conservation is allowed, which is additionally supported by agri-environmental schemes targeting Environmentally Sensitive Areas. Some parts of the transition zone are also designated as Natura 2000 site. Implemented arrangements provide important conservation functions for these territories, as well. The development of the transition zone followed the suggestions of the Advisory Committee for Biosphere Reserves. Discussions with stakeholders and public consultations have started for years.

The development function is basically connected to buffer and transition zones in the ABR. Traditional forms of extensive farming, e.g. pasturing and mowing, are preferable in these zones. The whole transition zone and some part of the buffer zone are included in an agricultural program and are designated as High Nature Value areas, as well. Farmers accepting to adjust their farming activities to environmental and nature conservation objectives have the opportunity to apply for support. Settlements are also included in the transition zone. Forestry, pasturing, mowing, cultivation of arable lands and old orchards and tourism activities can be pursued under the control of nature conservation. Research and education functions are also present in this zone. Thus this zone particularly functions as an interface area of nature conservation and local development.

## 2.5. MAIN STAKEHOLDERS AND OWNERSHIP IN THE REGION

This section will give an insight into the ownership structure of the ABR and its transitional zone. Also the main, most relevant stakeholders are described and listed.

There are several levels of stakeholders related to the ABR issues. It is pivotal that these levels are to be conscious of their own role and responsibilities and that these levels can communicate with each other. The management of the Aggtelek Biosphere Reserve has the responsibility to raise awareness of the objectives of nature conservation and the institution itself and to involve the public in their implementation. It also means the involvement of the related stakeholders. The biosphere reserve, local governments, alliances of settlements and local enterprises has started cooperation for the development of the region. The aim of this cooperation is promoting the economic and social development of the biosphere reserve and the region.

### 2.5.1. Ownership and management

The 98,9 % of the core zone and buffer zone is owned by the State of Hungary and managed by the ABR management (28,2%) and the Északerdő Ltd. (a state forestry company). The Északerdő Ltd. is one of the largest stakeholders in the BR. Only 1,1% of these two zones, including small vineyards, orchards and pastures are privately owned and managed. The ownership structure of the transitional zone is more colourful with low level of state

ownership; notable owners include: municipalities, companies (agricultural, industrial and commercial), private, churches, state, other.

### 2.5.2. Inhabitants and settlements

The BR is very sparsely populated, with the total of ca. 8-10 000 people. The core zone has no human inhabitants at all. In the buffer zone there are only two settlements (Aggtelek, Jósvalfő), with approx. 1000 people. The majority of the inhabitants lives in the transitional zone.

The BR is situated in the administrative area of the following settlements:

Aggtelek, Jósvalfő, Szuhafő, Ragály, Imola, Kánó, Felsőtelekes, Alsótelekes, Szőlőszárdó, Tereszténye, Tornakápolna, Szinpetri, Égerszög, Bódvaszilas, Zádorfalva, Gömörszőlős, Trizs, Perkupa, Varbóc, Szin, Szalonna, Martonyi, Komjáti, Bódvarákó, Tornaszentandrás, Tornabarakony, Becskeháza, Bódvalenke, Hidvégardó, Tornanádaska.

The major activities and sources of income are agriculture, forestry and tourism. Arable lands predominate the transitional zone, while extensive animal husbandry (grazing livestock) is of small scale. More than 40% of the population is unemployed. This high rate is due to economic changes (collapsed industry and agricultural co-operatives). Generally the population is aging, young people move to towns. Because of this fact the traditional cultivation methods are vanishing. Owing to the economic hardship, the poor families make a living from collecting firewood and natural resources from the protected territory.

### 2.5.3. Cooperation with local governments

Having the duty to define long term development strategies and short term actions, local municipalities are key stakeholders and cooperation partners in the BR management. It is mutually important to share information and knowledge with local authorities. Therefore information flow between the BR management and local governments is rather active.

The Aggtelek BR management supports some activities (village days, artistic camps, nature conservation camps) which attract tourists and can be somehow connected to nature conservation and sustainable development by providing equipment, printed materials or specialists (lectures, field programs). The BR management also organizes courses for local people, where our experts train cave or field tour guides.

#### **2.5.4. Authorities**

While authorities are in place to safeguard legal activities in every fields of life, due to characteristics of the BR, authorities of nature conservation, agriculture and construction are the most important from the perspective of the reserve. The most important regional authority is the Government Office of Borsod-Abaúj-Zemplén County in Miskolc. It is responsible for all environmental and nature conservation issues of the region.

#### **2.5.5. Nature conservation organisations (state)**

Beside the nation-wide cooperation of ABR, it has continuous professional collaboration with other BR managing organizations in Hungary, other national park directorates and the Ministry of Agriculture.

Although the area on both sides of the state border is linked in nature and history, recent politics did not allow for the region to be considered as one for the biggest part of the past century. Today there is an effective co-operation between the Aggtelek and Slovak Karst BR.

#### **2.5.6. Tourism organizations**

Besides nature-based tourism, tourist caves are the biggest attractions of the region.

There is 1 office of the national tourist information network (Tourinform – Aggtelek) offering publications, personal and on-line information service, as well as some booking (accommodation, programmes) services.

The most important cooperation partners:

- Magyar Turizmus Zrt. Regionális Marketing Igazgatóság/ Regional Marketing Headquarter of Hungarian Tourism Ltd
- Hungarian Hikers Association
- Tourist Information Center in Rožňava (Slovakia)
- Kárpát Euroregio Košice (Slovakia)

#### **2.5.7. NGOs**

Several NGOs were registered in the region related to different activities. The most active NGOs are in nature conservation and local folk tradition. The smaller ones mainly organize local programmes and provide valuable contribution to data collection initiatives on



environmental and nature conservation issues. The bigger ones are able to launch full-sized research and/or development projects. Nurturing traditions and cultural heritage are very frequent among the activities of NGOs and local initiatives, as well.

### Nature conservation

The most active nature conservation NGOs are:

- Holocén Természetvédelmi Egyesület/ Holocén Nature Conservation Association
- Zöld Akció Egyesület/ Green Action Association
- Magyar Madártani és Természetvédelmi Egyesület / BirdLife Hungary (particularly the bird-watching programmes are popular; they have a strong international network capital, their programmes are of high professional quality (bird ringing etc.) and in line with the ABR's principles)
- WWF Magyarország/ WWF Hungary (monitoring and protection programmes of large carnivores)
- Ökológiai Intézet a Fenntartható Fejlődésért Alapítvány/ Ecological Institute for Sustainable Development (cooperation in „Ecotourism in Biosphere Reserves in Central and Eastern European Countries” project)
- CEEWEB for Biodiversity (cooperation in ecotourism)

### Ecotourism, public awareness

The most active NGOs in the field of ecotourism and public awareness are:

- Ökológiai Intézet a Fenntartható Fejlődésért Alapítvány/ Ecological Institute for Sustainable Development (cooperation in „Ecotourism in Biosphere Reserves in Central and Eastern European Countries” project)
- CEEWEB for Biodiversity (cooperation in ecotourism)
- „Jósvafőért” Alapítvány és Jósvafői Egyházközség/”For Jósvafő” Fund and Local Protestant Church Community

### Local economy, local products, local markets, sustainable development

The most active partners are:

- Gömöri Környezet- és Tájfejlesztő Egyesület/Gömör Environment Protection and Local Region Development Association (Local Product and Fruit Festival)

- Ökológiai Intézet a Fenntartható Fejlődésért Alapítvány/ Ecological Institute for Sustainable Development (cooperation in „Ecotourism in Biosphere Reserves in Central and Eastern European Countries” project)
- CEEWEB for Biodiversity (cooperation in ecotourism)
- ALMA-Centrum/ Apple Center (Slovakia)
- „Jósvafőért” Alapítvány és Jósvafői Egyházközség/”For Jósvafő” Fund and Local Protestant Church Community
  - ALMA-Centrum/ Apple Center (Slovakia)

The geographical scope of their activities is not restricted to one settlement; it even extends to the BR area.

#### 2.5.8. Businesses

Mainly in the transitional zone there are some — mostly agricultural and industrial — firms of different sizes. Besides some small-hold owners of grazing livestock (e.g. Szinpetri, Jósvafő), two major firms can be mentioned in the buffer zone (Szin, Komjáti). There are also some important stakeholders and major role players engaged in producing local products (forest fruit products, mushroom products, pálinka –a traditional Hungarian fruit spirit–, herbs, honey etc.), while they also provide tourism services and programmes (EFFICIENT Gazdasági Tanácsadó és Szolgáltató Kft., FRUKTÁRIUM Gömör-Tornai Kft., Koltayné Zsoldos Krisztina „Királyi csemegék”; Gömör-Tornai Ökoturisztikai és Környezeti Nevelési Bt.).

One of the largest stakeholders is the state owned Északerdő Ltd, which manages approx. 60% of the forest in the ABR.

#### 2.5.9. Public collections and institutions

Museums are of great importance in this respect, since they not only collect and catalogue the objects of cultural and natural heritage, but they also play an important role in interpretation. With few exceptions of the ABR facilities and small local museums (village museums – Aggtelek, Jósvafő, Szögliget), most museums are, in fact, situated outside of the BR. The major collections and museums (with the themes of their collections):

- The Largest Book of the World, Szinpetri (the largest book, exhibition on printing and paper making – the book is on the values of the ABR)

- Barlangkutatói Múzeum, Bódvaszilas / Museum of Speleology, Bódvaszilas (nature conservation, cave protection, speleology)
- Tájház, Jósavafő /Village Museum, Jósavafő (folk culture, village history, speleology)

Other cultural institutions organize Aggtelek BR related events sporadically.

#### **2.5.10. Research and education institutions**

As a result of a written agreement, the ABR management houses the Nature Conservation and Forestry Department of the Debrecen Agriculture University. Students actively participate in the activities of the Department mostly in field research programmes.

The BR also offers education opportunities for primary and secondary level students. The ABR has written agreements with 32 elementary schools. These include thematic competitions, summer camps, and live-in heritage education programmes, so-called “forest schools”. The educational centre of the BR provides several special educational programmes (lectures, field activities) in different topics (e.g. natural values of the Aggtelek BR, Man and Biosphere, traditional land-using in the BR, food of the ancestors (traditional food and local products), ecology and environment protection etc.).

The BR management also has very good cooperation with the Hungarian Natural History Museum and the National Museum, as well as with other regional museums which often carry out surveys and assessments in the BR.

#### **2.5.11. Public involvement**

A fine example for the involvement of volunteers and local people is the Vadonleső (“Wildwatcher”) Programme. This Internet based programme collects distribution data about carefully selected 16 (plant and animal) species of Hungary (e.g. hedgehog, bog turtle, moles, squirrels and snowdrop), which are common and more or less easily detectable, but need protection or are endangered for some reason. The programme works since 2009, using a GoogleMap based interface, in on-line mode. The program is very popular, in the region of the biosphere reserve (mainly in popular touristic destinations) as well. This is well demonstrated for example by the fact that every 8th salamander data is coming from this small region.

### 3. Management Concept

#### 3.1. VISION OF THE MANAGEMENT CONCEPT

The vision of the Aggtelek Biosphere Reserve is to find the synergy between biodiversity and sustainable development in order to ensure the coexistence of local people and the unique flora and fauna in the next century. In order to achieve this, the BR shall “protect, promote and propagate”.

##### **Protect biodiversity and natural resources**

Restore and maintain the ecological integrity of the region by providing residents, businesses, and others with resources and information to actively manage or steward their lands in a sustainable way and ensure connectivity between protected areas.

##### **Promote sustainable development**

Catalyse ideas and initiatives for a cross-section of economic sectors by integrating sustainability concepts into business practices to enhance profitability and corporate responsibility.

##### **Propagate sustainability through education**

Enhance local environmental awareness and skills by providing learning opportunities for all ages, focused on our natural and cultural resources, as well as sustainability issues, and enable public participation in conservation and sustainable development activities.

The ABR has many values of extraordinary significance. These assets can only be sustained by continued traditional land use and management, while the conservation of the upper- and underground assets (caves, hidrogeological system, forests) requires active protection, too.

## 3.2. MAIN OBJECTIVES OF THE AGGTELEK BIOSPHERE RESERVE, ACCORDING TO THE TRIPLE FUNCTION

### 3.2.1. Conservation

In everyday practice the management calls the attention of the local communities and visitors to the national and international importance of the BR. Management planning is supported by the zonation system, while legislation (e.g. nature conservation law) and the state ownership of land with management responsibilities delegated to the biosphere reserve are the main guarantees of efficient protection.

#### 3.2.1.1. Core zone

The main goal of management in the core zone is conservation. In this zone, the preservation must assure the self-governing function of nature but some essential active management activities are also allowed. The most part of the core zone meets the criteria of a scientific reserve, where management is not allowed at all. In some parts some management is possible but only with conservation purposes. The core zone is strictly protected by law.

#### 3.2.1.2. Buffer zone

The main goal of management in the buffer zone is also conservation. This zone is also very valuable itself. Because the management is done mainly with conservation purposes, all activities carried out may enhance the conservation function of this zone and the core zone. Besides conservation, its functions are research and preservation with professional and educational purposes.

The main objectives of the buffer zone are:

- To reduce the negative impact of surrounding human activities to core areas as much as possible by protecting the ecological functions of the territory.
- To maintain the ecological corridors between the core zone and the transitional zone giving the chance for regular migration or dispersion of species, as well as the necessary genetic exchange.
- To maintain different grasslands, forests, traditional orchards and other important habitats by traditional and suitable modern practices.

These areas are used extensively by different agricultural activities (grazing, mowing), and forestry in accordance with the conservation management strategy. Controlled hunting, tourism activities (horse riding, hiking, wildlife watching etc.), with some restrictions are also allowed here. There are habitat restoration projects in this zone, as well.

#### 3.2.1.3. Transition zone

The main objectives for this zone are to:

- promote environment friendly agriculture and forestry to protect the natural values of the zone.
- promote cooperation and multi-purpose use of land by local communities.
- provide areas for sustainable development.

This zone is also very valuable in itself. It is not legally protected but under the moderate control of the ABR management. Sustainable cultivation in harmony with the aims of nature conservation is allowed, which is additionally supported by the agro-environmental scheme targeting Environmentally Sensitive Areas. The implemented arrangements provide important conservation functions for this zone, as well.

### **3.2.2. Sustainable development**

#### 3.2.2.1. Core zone

Since it is a dedicated reserve area which is strictly protected, sustainable development is not a relevant issue here.

The practice of traditional forms of extensive farming e.g. pasturing and mowing is not only possible but also desirable here. All agricultural management activities have to be consistent with the main task of the BR which is preservation. Measures include the limitation of the date of the earliest mowing; prohibition of any chemicals; regulation of grazing. Further goal is to create more suitable habitats for other threatened grassland species. Other tasks besides the conservation and traditional land uses of this zone are tourism and recreation; here we can find settlements, tourist caves, information centres etc.



### 3.2.2.3. Transition zone

The main objectives for this zone are to promote environment friendly and sustainable use of agricultural land via the agri-environmental scheme targeting High Natural Value Areas and to ensure cooperation with local communities to develop the “Biosphere Reserve Product” brand.

Sustainable cultivation in harmony with the aims of nature conservation is allowed, which is additionally supported by the agri-environmental scheme targeting Environmentally Sensitive Areas. All agricultural management activities have to be consistent with the main task of the BR which is preservation. Traditional forms of extensive farming, e.g. pasturing and mowing, are preferable in these zones.

### **3.2.3. Research, display and education**

While research and education functions are related to all zones, the display activities should be concentrated in buffer and transitional zones.

Research activity can be carried out in all areas of the BR (obviously only environment friendly methods are allowed); but in case of tourism and education programmes it is more favourable if these are generally localized to buffer and transitional zones. The main objectives of the education activities are the natural and cultural heritage, sustainable development and traditional land use. Making citizens aware of their responsibilities towards future generations is a very important aim .

#### **3.2.3.1. Research**

Research is very important from the point of view of conservation as well. It gives the background for the proper management of the area. The ecological investigation and monitoring of the different zones from external sources are funded.

Main objectives are:

- Development of interdisciplinary and innovative research tools for biosphere reserves is encouraged in order to improve tools for adaptive management of these territories.
- Participation in national and local environmental monitoring programmes.
- Continuing the long-term scientific monitoring programme, as it constitutes for adaptive management.

#### 3.2.3.1.1. Core zone

One of the main goals in the core zone is research which should focus on the self-governing function of nature, effects of climate change and ecosystem services. The BR management has to initiate and perform different, mainly long term research programmes here. The core zone is the site of only scientific research, but this way it is possible to involve university and college students for internship programmes.

#### 3.2.3.1.2. Buffer and transition zone

Research activity with environment friendly methods can be carried out in these zones. Researches focusing on invasive plant species and their effective control, traditional land use, fire regimes, active management, sustainable development and management, effects of artificial lighting on nature are not only possible but also desirable here.

An important objective is to expand the possibilities of tourism (horse-tourism, cave tourism, regular events etc.) in the region. Increasing the popularity of local events, the participation of local population is also an important goal.

#### **3.2.3.2. Education and display**

Environmental education, and education for sustainable development with display, forms an integral part of the strategy to be implemented in biosphere reserves.

Main objectives for environmental education and display are to:

- Respect natural and cultural heritage.
- Favour responsible relationships with the environment and ensure better land management through the acquisition of necessary knowledge.
- Make citizens aware of their responsibilities towards future generations.

##### 3.2.3.2.1. Core zone:

Intensive education activities and display is not allowed at all in this zone. It is the site of strictly scientific research, but this way it is possible to involve university and college students for internship programmes.

**3.2.3.2.2. Buffer zone:**

This is and should be the area of on-site education programmes. The selection of topics is diverse. There is a Tourinform Office in Aggtelek village. It provides a significant number of jobs (information service, guiding, handcrafts, local products etc.). Teachers are a special target group and play an important role in the dissemination of information and active involvement of children.

**3.2.3.2.3. Transition zone:**

This is and should be the area of on-site education programmes. The selection of topics is diverse (NaturArt Granary in Bódvaszilas, local museums etc.). On-line education programmes and competitions have to be established for the primary and secondary school children, these should be carried on, and new themes are to be introduced. The webpage content constantly needs supervision and up-dating. Educational programmes at community festivities have to be continued and increased.

**3.3. SITUATION (strength/advantages and weaknesses from management point of view)****SWOT ANALYSIS OF THE AGGTELEK BR**

The SWOT analysis takes the approach to investigate these issues according the main functions of the biosphere reserve.

Conservation			
Strengths	Weaknesses	Opportunities	Threats
C1. Effective legal protection in the core and buffer, and partially in the transitional zone.	- C1. Special regulations and legal exemptions have been partially or not introduced.	C1. The need has been identified; decision and policy makers have been convinced.	• C1. Legal obstacles and prolonged action lead to loss of assets.
C2. Institutional framework is in place. • Experienced and professional staff.	C2. Capacity and resource utilization.	C2. Rearrangement of capacities and resources.	C2. Economic and political pressure takes over conservation interests.
C3. Rich and diverse ecological values.	C3. There are natural and social phenomena (biological succession, aging etc.) which interfere with the natural systems and impact species and habitats.	C3. There are experiences of how to best mitigate these and there are funds available to complete the work. • International programmes and initiatives exist.	C3. • New challenges occur that cannot be handled on local level (e.g. climate change) • Migration routes and ecological corridors diminish. Habitat

			isolation.
C4. A distinct natural and cultural heritage.	C4. Lack of concerted efforts and action to sustain both the natural and cultural heritage.	C4. <ul style="list-style-type: none"> <li>• The World Heritage status of the core and buffer zones.</li> <li>• Strong local identity taking pride in the cultural heritage.</li> </ul>	C4. Loss of living traditions and traditional knowledge.
<b>Sustainable development</b>			
<b>Strengths</b>	<b>Weaknesses</b>	<b>Opportunities</b>	<b>Threats</b>
S1. Diversity of stakeholders	S1. Limited means of communication without a structural framework.	S1. Mutual interests exist; common platforms can be found/created. <ul style="list-style-type: none"> <li>• Joint efforts, concerted actions have better results.</li> </ul>	S1. Uneven power of stakeholder groups.
S2. Agriculture (animal husbandry, fructiculture and forestry) provides jobs and employment for locals, while part of the heritage resources and has maintaining effects on wildlife.	S2. <ul style="list-style-type: none"> <li>• Reduced ability to rethink the old contents in a new form to adapt to modern day requirements – it results in a gap between heritage and economic requirement.</li> <li>• Low level of local market (development)</li> </ul>	S2. <ul style="list-style-type: none"> <li>• Adaptive approach to a rich heritage.</li> <li>• Strong local identity taking pride in the cultural and natural heritage.</li> </ul>	S2. <ul style="list-style-type: none"> <li>• Modern, intensive technologies are more profitable and outperform traditional ones. Without a proper compensation system, a degradation of traditional knowledge.</li> <li>• The national framework of state land lease is not/little adapted to local needs.</li> </ul>
S3. <i>Tourism</i> A diversity of assets that attract visitors (mainly caves).	S3. <ul style="list-style-type: none"> <li>• Lack and insufficiencies of tourism products.</li> <li>• Insufficient institutional framework, lack of a tourism management plan.</li> <li>• Decreasing local market.</li> <li>• Localized pressure</li> </ul>	S3. <ul style="list-style-type: none"> <li>• There is a growing demand of nature-based and agro-tourism, organic products.</li> <li>• Government incentives and available funds.</li> </ul>	S3. <ul style="list-style-type: none"> <li>• Potential partners (tourism businesses) do not cooperate.</li> <li>• Disadvantageous spatial and temporal distribution of tourists.</li> </ul>
<b>Research</b>			
<b>Strengths</b>	<b>Weaknesses</b>	<b>Opportunities</b>	<b>Threats</b>
R1. Bio-monitoring system is in place. <ul style="list-style-type: none"> <li>• Specialists are</li> </ul>	R1. Certain (necessary) topics have little or no research history, or no	R1. Needs have been identified.	R1. <ul style="list-style-type: none"> <li>• No/limited financial sources.</li> </ul>

available. • Huge amount of available biotic data.	monitoring follow-up. Capacity and resource utilization		• Research results are little/not translated into management activities.
R2. National level tourism research exists.	R2. No site specific and systematic research on carrying capacities has been carried out.	R2. Needs have been identified.	R2. • No/limited financial sources. • Research results are little/not translated into management activities.
<b>Education</b>			
<b>Strengths</b>	<b>Weaknesses</b>	<b>Opportunities</b>	<b>Threats</b>
E1. Environmental education for 3-18 years old children; field study and internship, thesis opportunities for students. • Teachers of local educational institutions are thoroughly involved.	E1. Insufficient human capacities (number of staff). Capacity and resource utilization	E1. Increasing interest and popularity of these programmes.	E1. Budget cuts usually affect this field in the first place.

- The area of the BR (mainly the Baradla cave and its surroundings) is a very popular destination for tourists. Mainly in the buffer and the transitional zone, there are many programmes provided by the Aggtelek BR Management, e.g. cave tours, rutting deer and starry sky tours. Regular events are held annually, aim to involve the community, popularize traditional activities, lifestyle and sell local products.
- Activity and Infrastructure options in ecotourism and environmental education

### Visitor and educational centres and display houses

Name and type	Number	Capacity (no. of visitors)
<b>Visitor and educational centres</b>		
Tourinform Office, Aggtelek	3	20 + 50 + 45
Vörös-tói Visitor Centre, Aggtelek Vörös-tó		
Kúria Education Centre, Jósvalő		

<b>Museums, exhibitions</b>		
H. Kessler Memory House		
NatureArt Granary		
Mohos Peat Bog House		
Tengerszem Hostel		
Kúria Education Centre, Jósvalő		
	5	20+80+40+50+45

### Study trails/study paths

Name and type	Number	Capacity (no. of visitors)
<b>Baradla</b> study trail		
<b>Tohonya-Kurisztlan</b> study trail		
<b>Szadvár</b> study trail		
<b>Bódva-völgyi</b> study trail		
<b>Zöld határ</b> experience trail		
<b>Fürkész</b> trail		
	6	40-50/each

### Commercial accommodation places managed by the ABR

Name	Address	Capacity (number of guests)
Tengerszem Hostel and Educational Centre	3758 Jósvalő, Tengerszem o. 2.	43 (45)
Baradla Camping and tourist Hostel	3759 Aggtelek, Baradla o. 1.	300
Kövirózsa Guesthouse	3759 Aggtelek, Deák F. u. 20.	20
Szalamandra Guesthouse and Camping	Szögliget, kültelek	100



**Public relations**

<b>Exhibitions, displays, fairs</b>	
Travelling and Holiday Exhibition, Budapest	
International Hunting Exhibition, Putnok	
Mályi Nature Conservation Festival	
Week of Hungarian National Parks	
Hunting Day of Borsod County, Edelény	
Annual Jószaft International Hucul Horse Races and International Farrier Competition	
Hungarian Agricultural and Food Exhibition (OMÉK), Budapest	
Pumpkin Festival, Őrség, Szalafő	
International Hucul Days, Regietów, Poland	
<b>website: <a href="http://www.anp.hu">www.anp.hu</a></b>	
<b>radio reports, television appearances in the last 2 years</b>	23 occasions
<b>public press relations</b>	2 occasions
<b>NETA (National Touristic Database)</b>	400 touristic objects
<b>website</b>	<a href="http://www.anp.hu">www.anp.hu</a> , <a href="http://www.anp.nemzetipark.gov.hu">www.anp.nemzetipark.gov.hu</a> , <a href="http://www.kuriaoktatokozpont.hu">www.kuriaoktatokozpont.hu</a>

**Special Guided Tours in the last 2 years (2014, 2015)**

- “Winter on the Aggtelek Karst”
- Guided Botanical Walk (spring)
- Wandering on the top of the Baradla Cave
- Orchidea walk
- Hubert Kessler commemorating walk
- Guided geomorphological and geological walk
- “Sunset” walk
- “In the church of the nature” walk
- “Rutting Deers” walk
- Santa Claus walk

Youth Camps organized by the ABR management: Camp for young naturalists I-II.

Craft workshops for children: 8 occasions /year

- 27 forest fruit and mushroom products (jams, spirits, desiccated mushroom etc.), and 2 tourists services have already been certified as local brands.
- The BR also offers education opportunities for primary and secondary level pupils. The ABR has written agreements with 32 elementary schools.
- The extent of traditionally used orchards and pastures are intensively diminishing.
- High pressure of tourism on natural values (e.g. caves, habitats) can be possible, if the number of visitors increases. Environmentally unsound agriculture practices (e.g. monocultures, usage of pesticides and fertilizers etc) threaten the caves, the outstanding cave biota and the landscape; these also threaten the unique flora and fauna.

The ABR management houses the Nature Conservation and Forestry Department of the Debrecen Agriculture University. The ABR keeps good connection with scientists working in the area. Many different programmes have been carried out and many others are in process. The most important programs are carried out by the researchers of Debrecen University and Hungarian Natural History Museum. The BR management also has very good cooperation with the National Museum, as well as with other regional museums, which often carry out surveys and assessments in the BR. By the result of different researches, the territory of the ABR is one of the most investigated and well-known biosphere reserves in the country. There are approx. 300 000 biotic data which are collected in the BR.

Within the High Value Natural Areas (HVNA) programme, as members of EU's Agri-environmental Scheme, there is a designated HVNA in the region, which has the name of Észak-Cserhát MTÉT (legal designation in 2009). Its area is 53.712 ha but the Agri-environmental Scheme (AES) can be supported only on 27.534 ha. 10.641 ha are located inside of the ABR and many other remarkable territories are in the transitional area, as well. 15 farmers are involved into the programme in the territory of the BR. The ratio of the privately owned land properties within the programme is small in the BR, just around 1%. The Directorate manages 660 hectares within this HVNA program.

### 3.4. Cooperation in the biosphere reserve

Without grazing biological succession starts and shrubs overgrow the grasslands within some years. Therefore, the biosphere reserve management tries to reintroduce grazing in cooperation with local farmers. The ABR has held continuously developing intensive intercourse with land managers (farmers) for years. This practice should be continued.

The dialogue and collaboration is progressive with the Északerdő Forest Company which is the largest land manager in the BR. The professional staffs of the BR help the planning process and supervise the execution of silviculture activities. The focus of forestry has become oriented to better management practices such as selective timbering, selective cutting and removing of non-native species in the BR. As a result, the area, which is not used for logging, has been increased, the size of the core area has been enlarged and the areas cultivated with selective timbering which result constant coverage with forest also has grown. The cooperation should be continued.

ABR has specific agreement with the Slovak Karst Biosphere Reserve. The very active cooperation basically targets synchronized research and monitoring programs, as well as special management projects against the invasive alien plant species. The cooperation should be continued and new projects started

Beside the nation-wide cooperation of ABR, it has continuous professional collaboration with other BR managing organizations in Hungary, further national park directorates and the Ministry of Agriculture. The good collaboration should be maintained.

### 3.5. FUTURE PLANS

#### 3.5.1. Proposed means and tools to be established

- *Aggtelek BR Forum/ Aggtelek BR Council*: In order to bring together the various stakeholders, and strengthen networking, as well as creating a platform for sharing ideas, discuss problems, and jointly work towards solutions. It is also an opportunity to report on progress and outcomes. It should have four divisions: economy – NGOs – municipalities – science and education. Its main functions could to advise and consult on particular issues. While its decisions are not obligatory for the decision makers, it helps them to make informed decision that most serves the public good.

- *Utilizing communication tools*: internet and the ABR website have to be improved. E-newsletter has to be launched. Promoting greater participation is needed in the local media (local TV, local newspapers).

### 3.5.2. Plans in conservation

- Rehabilitation and reconstruction of mountainous grassland habitats (hay meadows, pastures) should be continued and completed.
- Removing of aggressively spreading invasive plant species (e.g. *Amorpha fruticosa*, *Ailanthus altissima*, *Solidago* spp.) and replacement of non-native tree species have been partially completed but the work should be continued and completed.
- Revisions of lighting systems and streetlights at the BR settlements, and improvements of these in order to make lighting compatible with the “Dark Sky Park” requirements.
- A fairly new element in the management activities is the rehabilitation of abandoned orchards. This steppe woodland like habitats is not only perfect habitats for vulnerable species but valuable landscape elements and good resources of local fruits, as well. The size of rehabilitated and maintained orchards should be increased.

### 3.5.3. Plans in researches

- In the core zone (Haragistya) which is the most important site of long-term monitoring projects (e.g. forests, effect of climate change, ecosystem services, species invasions), the previously started researches have to be continued
- Further researches are also much needed in the Pannonian and especially the local endemic species to enhance conservation efforts. New researches have to be started and continued in the following topics: understudied taxa, experimental research on fire management, study of natural disturbance processes and their effect on the mosaic structure – also in relation with climate change issues, research of grazing and mowing patterns and their ecological effect.
- Survey is needed in the vase of artificial lighting objects that are obtrusive in the landscape and have negative effects on the wildlife.
- Local effects of climate change (with respect to natural assets and resources, socio-economic outcomes – models and mitigation plan)

Cultural heritage:

- Scientific and engineer survey of buildings and structures (location, type, state of conservation, suggested action, etc.)

Tourism:

- Carrying capacity survey at selected sampling sites
- Visitor studies (incl. motivations, preferences and satisfaction; attitude change; effect of interpretation services, etc.)

### 3.5.4. Plans in education, display and local development

- The people in the buffer and transitional zone are particularly sensitive in respect of the BR, so management efforts should focus on awareness raising (education, PR activities) and influencing regional policies and subsidies. The seemingly colliding interests have to be harmonized.
- Rehabilitation of traditional structures and buildings using traditional materials, craftsmanship and technologies has to be carried out.
- Most of the grasslands in the buffer zone were created in the 17th-19th centuries by clear-cuts. Meadow steppe plant species formed valuable associations on the regularly managed (mowed, grazed) meadows. When the livestock grazing ended in the region, the traditional management also stopped and shrubs began to occupy these open lands. Therefore the numbers of grazing animals should be increased.
- Under- and overgrazing must be avoided together with intensive hay farming due to their damaging effects on the grasslands.
- Cooperation with farm owners and tenants of pastures is to be enhanced.
- Development of marketable local products (mostly fruits, mushrooms and wood products) and the system of local market.
- The Aggtelek Biosphere Reserve Brand is to be established with the cooperation of tourism businesses and local products producers.
- On the market side the number of visitors is to be increased but their annual visitation curve should be optimized (the number of high pressure peak days should be reduced).

- Nature based tourism, particularly special tours (birding, animal and plant watching) is to be improved with capacity building and infrastructure development.
- Cultural heritage and heritage products have to gain more importance in the tourism offer – enhancement of quality and quantity.
- An increased promotion of the BR is to be achieved.
- A complex tourism management plan for the BR is to be elaborated.
- Educational programmes at community festivities have to be continued and increased.
- Development of surface tourist services and infrastructure at the World Heritage Listed Baradla Cave (e.g. build a World Heritage Centre”, development of tourism programs, development of study paths and tour routes,



## APPENDIX I. – ABBREVIATIONS

BR – Biosphere Reserve

ABR – Aggtelek Biosphere Reserve

ANP – Aggtelek National Park

ANPD – Aggtelek National Park Directorate

**APPENDIX II. – PHOTO GALLERY OF THE BR'S MAIN ASSETS**



**Jósvalfő – a village in the biosphere reserve**



**The Baradla cave is a very popular touristical destination**

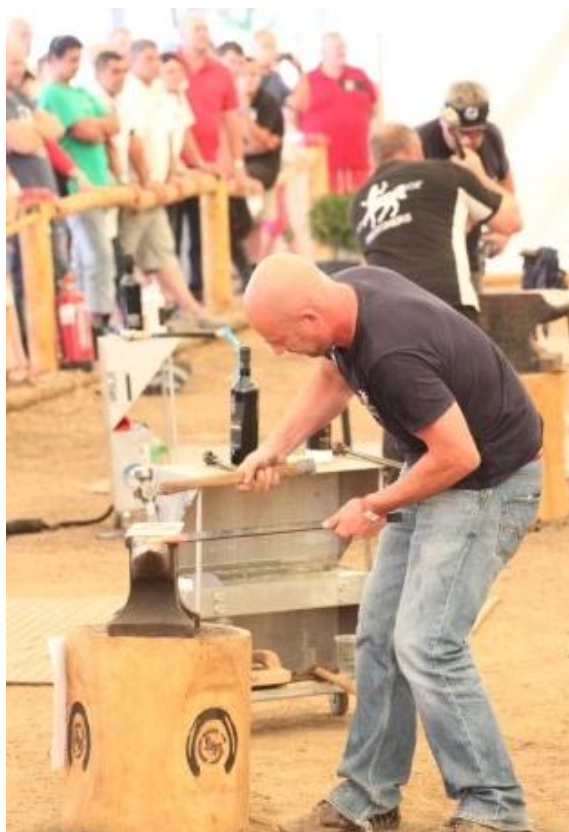




**The „Hucul” is a characterized horse of the region**



**Cycling is a popular free-time activity in the biosphere reserve**



**Farrier competition**



**Choir concert in the Baradla cave**





Traditional fruits on the Fruit Festival



Environmental education in the biosphere reserve





**Astronomical event**



**Visitor centre at Aggtelek**