



## Follow-up Progress Report

# AGGTELEK BIOSPHERE RESERVE

JÓSVAFŐ  
2015



## **Aggtelek Biosphere Reserve**

### **GENERAL INFORMATION**

“Aggtelek” Biosphere Reserve (ABR) – like all other Hungarian BRs – was designated in 1979. Its original area was almost equal to the existing “Aggtelek” Landscape Protection Area, which is nationally protected and was pronounced by the Hungarian law. The “Aggtelek” Landscape Protection Area became a national park in 1985. So the original core area and the buffer zone are under the highest national level of nature protection.

The underground world of the ABR has been included in the UNESCO World Heritage List on December 9, 1995. The 712 caves along with other features currently identified make up a typical temperate-zone karst system where the variety of formations are concentrated to a restricted area. Because they display an extremely rare combination of tropical and glacial climatic effects, they make it possible to study geological history over tens of millions of years.

The whole biosphere reserve is the part of the Natura 2000 network (under both the Bird and the Habitat Directives).

It covers an area of 361.7 km<sup>2</sup>. 24% of this was designated as the core area, 65% as the buffer zone and the remaining 11% as the transition zone. In the north, it borders with the “Slovak Karst” Biosphere Reserve, Slovakia. ABR and “Slovak Karst” Biosphere Reserve belong to the “Gömör-Torna/Gemer-Turna” Karst area, which is the southernmost part of the inner limestone zone of the Northern Carpathians. The joined biosphere reserves are divided by the common border, but constitute an integral unit from a geographical, geological, hydrological and cultural perspective. The whole protected area covers some 560 square kilometres. 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 addressing the spread of invasive alien plant species. The protection and management of the two reserves is effective both at the national and on a trans-boundary level.

### **Topography of the region**

Low, karst mountain region with the altitude of 150-604 m. Topographically dominated by systems of karst plateaus dissected by deep valleys of river Bódva and several streams (for example Jósva, Tohonya, Ménes, Telekes streams).

### **Climate**

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 and the average temperature is only 15.5 °C in the growing season. Such values can be measured only in higher mountains in Hungary. The annual precipitation used to be between 600-700 mm, but it significantly decreased in recent years, the average dropping to about 400-500 mm. It is worth mentioning that the local microclimate is strongly influenced by the relief. On sunny summer days, the ambient temperature on the plateaus is affected significantly by intensive insolation. Local inversions arise between the warmer, sunnier, and therefore drier summit plateaus, and the cooler, wetter valley bottoms, which remain in shadow for most of the day.

### **Geology, geomorphology**

This is the most typical karst area in Hungary. It is built up mainly of Triassic limestone with some dolomite, clayey shale and sandstone. Quaternary sediments have mainly accumulated at the base of the plateau slopes. The area shows 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 and large dry dolinas, extended karst plateaus. Underground karst features are in extraordinary high concentration. The registered number of caves is more than 260, among which the large horizontal caves belonging to the water system of Jósva stream and the deep potholes of Alsó-hegy Plateau are the most impressive.

### **Soils**

The variety of soil types reflects the region's heterogeneous geological composition. Limestone, dolomites and their talus at the base of slopes are covered by the product of long-term weathering and fossil soils (terra rossa). Brown rendzinas, common rendzinas and luvisols occur on the lower slopes of valleys, where gravels or clayey materials have accumulated through the weathering of limestones. Cambisols and rendzinas are characteristic of plateau sites with fewer fine karstic forms and with thicker weathering deposits, often continuously covered by oak-hornbeam forest. In the basins, brown soils are found on the margins, and hydromorphic floodplain and floodplain gley soils in the floodplains.

## GENERAL INFORMATION ABOUT THE BIOLOGICAL DIVERSITY

The variety of habitats and the highly diverse vegetation reflect the specific climatic and geological conditions of the reserve, as well as the geomorphologically distinct karst phenomena. Its flora and fauna are one of the richest in Central Europe, with for example more than 1,400 vascular plant species and more than 2000 butterfly and moth taxa identified to date.

The most frequent forests are Carpathian oak-hornbeam forests and xero-thermophilous oak forests on alkaline bedrocks. These types are accompanied by xero-thermophilous Pontic-Pannonian oak forests, whose centre of occurrence is on the southern slopes of the plateaus. They are floristically very rich, including both steppe-forest and sub-mediterranean species. Beech forests form extrazonal small patches.

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) province of the Carpathian middle-mountains. Consequently, the fauna is a mixture of steppe, forest-steppe, deciduous forest, and boreomontane 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 their northern limit of distribution here, and both West and East Carpathian species are present.

### Main habitats within the whole territory of BR:

- Caves
- Springs, streams, rivers,
- Calcareous rocky slopes with chasmophytic vegetation,
- Sub-continental steppe grasslands,
- Rupicolouspannonic grasslands (Stipo-Festucetaliapallentis),
- Medio-European calcareous scree of hill and mountain levels,
- Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and sub mountain areas, in Continental Europe),
- Lowland hay meadows (*Alopecuruspratensis*, *Sanguisorbaofficinalis*),
- Mountain hay meadows,
- Asperulo-Fagetum beech forest,
- Thermophilous oak forest,
- Pannonian scrub woods,
- Hornbeam and oak forest
- Medio-Europaeen beech forests)

### UNIQUE PLANT SPECIES:

- *Cypripedium calceolus*
- *Dracocephalum austriacum*
- *Echium russicum*
- *Eleocharis carniolica*
- *Himantoglossum caprinum*
- *Onosma tornense*

## UNIQUE ANIMAL SPECIES

- *Barbastella barbastellus*
- *Barbus meridionalis petenyi*
- *Canis lupus*
- *Cerambyx cerdo*
- *Citellus citellus*
- *Lycaena dispar*
- *Lynx lynx*
- *Maculinea teleius*
- *Miniopterus schreibersi*
- *Misgurnus fossilis*
- *Morimus funereus*
- *Myotis bechsteini*
- *Myotis blythi*
- *Myotis dasycneme*
- *Myotis emarginatus*
- *Myotis myotis*
- *Unio crassus*
- *Vertigo moulusiana*

### Species of traditional or commercial importance:

- flower of *Tilia plathyphyllos*, *Tilia cordata*,
- plant of *Centaureum minus*, *Hypericum perforatum*,
- fruit of *Cornus mas*, *Crataegus monogyna*, *Prunus spinosa*, *Rosa* spp.,
- seed of *Alnus*, *Sorbus* spp., *Acer* spp.,
- edible mushrooms,
- *Helix pomatia*

### The following species are hunted in the BR only outside the core areas, and there are temporal and spatial restrictions in effect:

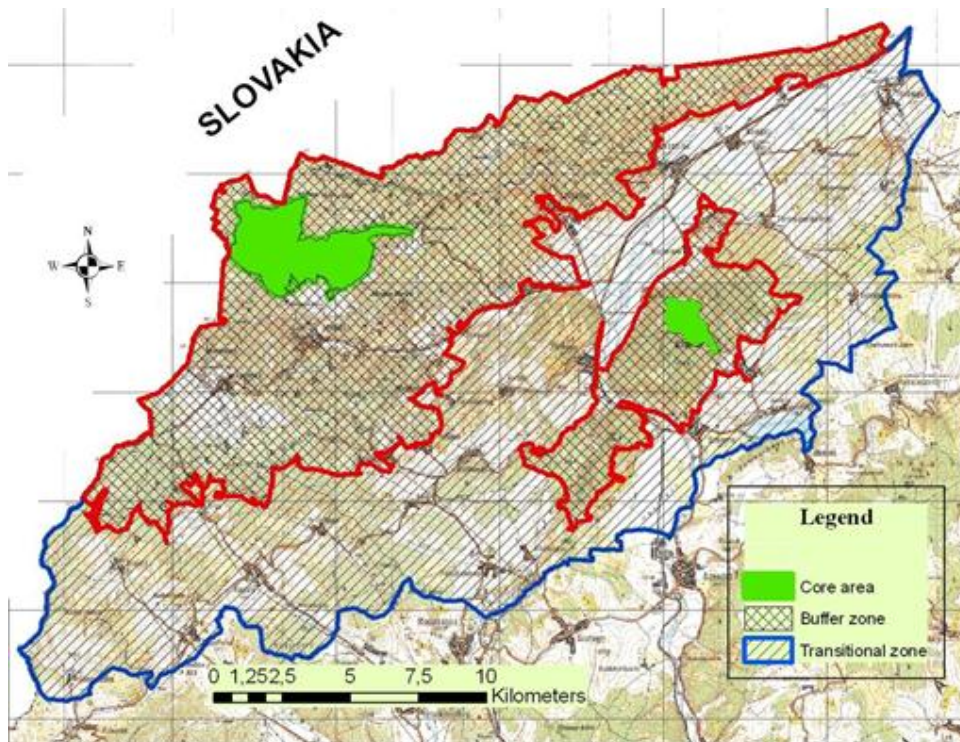
*Anas platyrhynchos*, *Phasianus colchicus*, *Lepus europaeus*, *Cervus elaphus*, *Capreolus capreolus*, *Ovis musimon*, *Sus scrofa*, *Vulpes vulpes*.

**Forestry:** 75% of the area of the BR is wooded. Forest management activities are restricted in time and space in 43% (6.500 ha) of the forests.

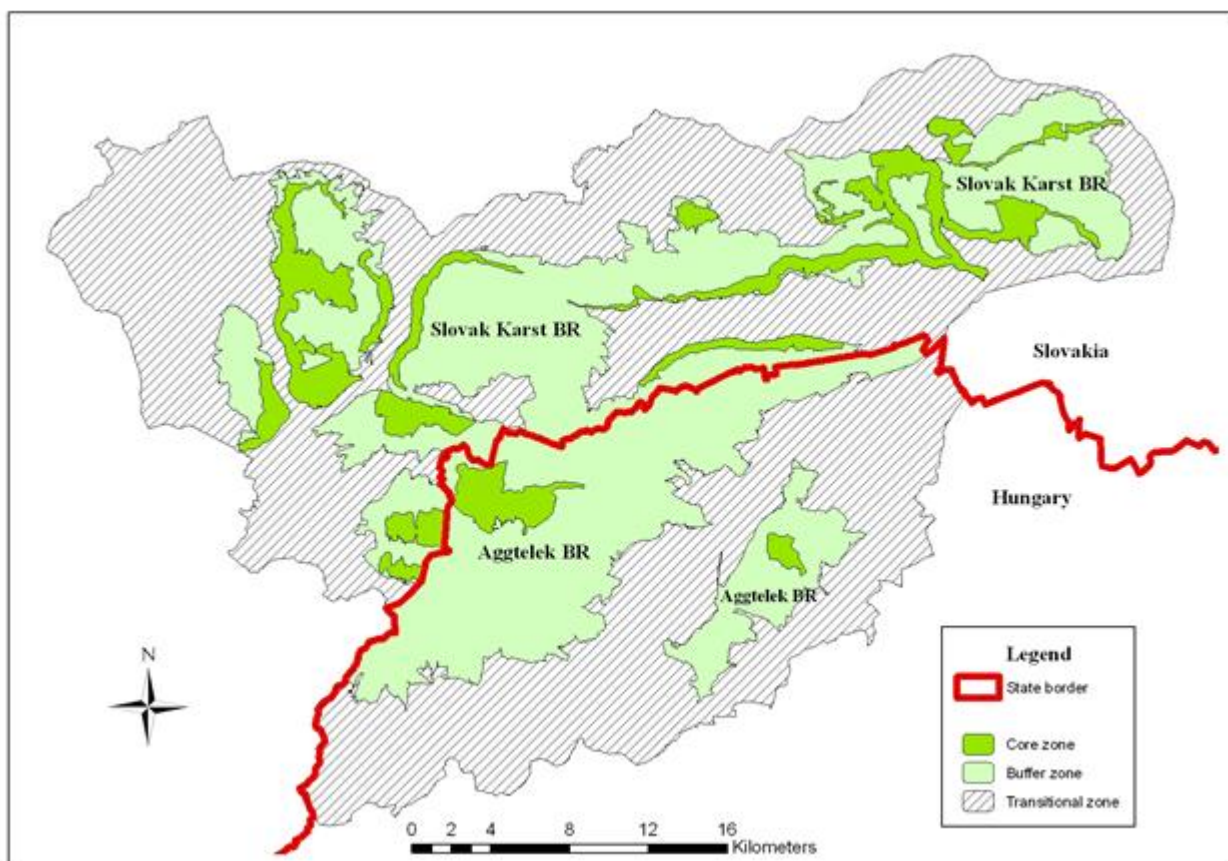
## The evolution of the zonation system

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. During this process the core and buffer zone were reshaped again.



**The zonation system of the Aggtelek Biosphere Reserve**



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

## **ZONATION**

### **CORE ZONE**

*Size: 1,386 ha*

The core zone represents the most typical forests (e.g. thermophilous oak forest, Pannonian scrub woods, hornbeam and oak forest Medio-European beech forests) and mountain hay meadow habitats of the region.

In the core zone the main goal of land use is nature conservation. Conservation efforts 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 activity is possible but only with conservation purposes. The whole core area is strictly protected and is part of the Natura 2000 network (under both the Bird and the Habitat Directives). Basically, no human interference and management activity is allowed.

The core zone has no human inhabitants at all.

### **BUFFER ZONE**

*Size: 18,797 ha*

The buffer 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 goal of the buffer zone is, in particular to preserve the core zone and mitigate the effects coming from outside. However, the buffer zone is also very valuable in itself. Because the management is done mainly with conservation purposes, all activities may strengthen the conservation function of the core zone. Additional functions of the buffer zone are research and preservation with professional and educational purposes. Specialized active nature management and research are supported. The practice of traditional forms of extensive farming is not only possible but also desirable here. Here we can find two small settlements (Aggtelek, Jósvalfő), with approx. 1000 inhabitants, tourist caves, information centres, so tourism and recreation are also appearing here, but not as the main function. 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 part of the Natura 2000 network.

Mushroom picking, forest fruit collecting is allowed in a moderate level in this zone.

### **TRANSITION ZONE**

*Size: 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 agro-environmental scheme targeting Environmentally Sensitive Areas. Some parts of the transition zone are also included in the Natura 2000 network. Implemented arrangements provide important conservation functions for these territories, as well.

In general, the transition zone functions as an interface area of nature conservation and local development.

The development function is basically connected to buffer and transitional 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 as High Nature Value areas. Farmers have the opportunity to apply for financial support if they adjust their farming to environmental and nature conservation prescriptions.. Forestry, pasturing, mowing, cultivation of arable lands and old orchards and tourism activities can be pursued under control of nature conservation, while the collection of mushroom and forest fruits is allowed with no restrictions. Research and education functions are also present in this zone.

The transitional zone has the majority of the inhabitants. The BR is situated in the administrative area of the following settlements: Aggtelek, Jósvafő, Szuhafő, Ragály, Imola, Kánó, Felsőtelekes, Alsótelekes, Szőlősardó, Teresztenye, Tornakápolna, Szinpetri, Égerszög, Bódvaszilas, Zádorfalva, Gömörszőlős, Trizs, Perkupa, Varbóc, Szin, Szalonna, Martonyi, Komjáti, Bódvarákó, Tornaszentandrás, Tornabarakony, Becskeháza, Bódvalenke, Hidvégdó, Tornanádaska. Major activities and sources of income are agriculture, forestry and tourism.



## **Progress on the implementation of the Seville Strategy – Design a management structure to make the reserve more inclusive**

The biosphere reserve, local governments, alliances of settlements and local enterprises cooperate. The aim of this cooperation is promoting the economic and social development of the biosphere reserve and the region. The biosphere reserve management intends to extend this cooperation in order to turn attention to nature conservation, sustainable development, ecosystem services, local products and the world heritage title.

The biosphere reserve management has designed a management structure and developed a management plan – in line with the Seville Strategy and the Statutory Framework – to make the reserve more inclusive of stakeholders and to ensure the direct participation of stakeholders in managing.

Within this strategy the management supports several activities for attracting tourism, which can somehow be connected to nature conservation and sustainable development (e.g. village days, artistic camps, nature conservation camps), and for example organises courses for local people, where our experts train cave or field tour guides.

### **Management Plan**

In 2014-15 a management plan was elaborated in line with the Seville Strategy and the Statutory Framework.

For protected parts of the BR a nature protection management plan has been also compiled. The management plan was synchronized with the developed/revised zonation system and utilization plans of the biosphere reserve.

As it has been mentioned, the underground world of the ABR and the Slovak Karst Biosphere Reserve is inscribed to the UNESCO World Heritage List. The biosphere reserves are divided by the common border, but constitute an integral unit from geographical, geological, hydrological, biological and cultural aspects. An integrated management plan has been prepared for the transboundary site. According to this, the administrative bodies in two countries also carry out joint projects including research and monitoring.

### **Cooperation with other Biosphere Reserves**

ABR has specific agreement with the Slovak Karst Biosphere Reserve. The active cooperation targets synchronized research and monitoring programs (e.g. large carnivores, bats, birds, vascular plants), and special management mainly to control the spreading of invasive alien plant species. The cooperation is also intensive in speleological researches and education. Regular common programs happen in the latter topic (e.g. green island: lectures and exhibitions in both biosphere reserves, photo exhibitions, conferences, workshops).

ABR has continuous professional collaboration with other BR managing organizations in Hungary, further national park directorates and the Ministry of Agriculture.

The Framework Convention on the Protection and Sustainable Development of the Carpathians („Carpathian Convention”) was signed in May, 2003 in Kiev. The ABR was involved in this Network of Protected Areas. The main goals of the convention are very similar to MAB purposes. The Directorate takes part in the elaboration of strategies and action plans.

## **Cooperation with other stakeholders in the biosphere reserve**

The biosphere reserve management tries to reintroduce grazing in cooperation with local farmers. Without grazing, biological succession continues and shrubs overgrow grasslands within some years. To prevent this, the ABR has intensive intercourse with land managers (farmers) for years. The busiest periods are in spring and summer when numerous questions arise, mostly concerning the timing and methods of mowing and different requirements of licensing.

The dialogue and collaboration is progressive with Északerdő Forest Company which is the largest land manager in the BR. Professional staff of the ABR management help the planning process and supervise the execution of silviculture activities. The focus of forestry is more and more 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 not used for logging increased, the size of the core area has been enlarged and the areas cultivated with selective timbering and along with ensuring the constant coverage with forest has also grown.

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 researchers of Debrecen University and Hungarian Natural History Museum carry out the most important programs. 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. As the result of different research programmes, 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.

### **A) Conservation Function**

98.9 % of the core and the buffer zones are owned by the state and managed by Aggtelek BR (28.2%) and Északerdő Zrt. (state forestry company).

The most important habitat rehabilitation and restoration activities focus on montane grassland habitats (hay meadows, pastures). 16% of the total area of the BR is covered by different grasslands. Most of these grasslands were created in the 17th-19th centuries by clear-cuts. Meadow steppe plant species formed valuable associations on the regularly managed (mowed, grazed) meadows. Several protected plant and animal species inhabit these lands therefore these are some of the most valuable habitats in the ABR. When the livestock grazing ended in the region, the traditional management also stopped and shrubs began to occupy these open lands. Part of these projects dealt with the restoring of several meadows on 95.8 hectares.

Nowadays the removal of aggressively spreading invasive plant species (*Amorpha fruticosa*, *Ailanthus altissima*, *Solidago* spp, etc.) is a big challenge. The management of invasive species is a very complex and complicated task among conservation activities. The *Solidago* species spread on abandoned plough lands and grasslands especially in the surroundings of settlements. The effective removal requires permanent management. The applied technology includes regular mowing and the careful application of chemicals. This management is implemented on 500 hectares every year. The forceful spreading of *Ailanthus altissima* causes problems especially on rocky slopes. As part of habitat rehabilitation individuals growing seeds were eradicated first then almost all spears were removed on the most important hillside (Alsóhegy) where the strictly protected endemic Tornaian yellowdrop (*Onosma tornense*) lives. According to the experiences, which are consistent with other

observations collected from international and national publications, the exclusively applicable technology is the use of chemicals. For maintaining the actual supportable conditions further continuous management is needed.

Another conservation activity is the replacement of non-native tree species (evergreens, *Robinia*) with native species (e.g. turkey oak, hornbeam). The coverage of evergreens was about 8.1% of ABR territory in 1979 which has been decreased to 5.12% by the restoration works. Robinia forms about 1.2% of woods. The maintenance of this actual state can be regarded as a remarkable result because of the very strong spreading ability of this species.

Intensive conservation programmes for bats, carnivores, birds and protected vascular plants are also carried out (insulation of pylons, habitat and roost management etc.).

There are also some restoration works to eliminate illegal waste disposal. During the implementation of this project several different illegal and 2 legal but not appropriately implemented waste disposal sites were removed from the territory of the BR. In the close vicinity of Szögliget and Jósvalfő, in the buffer zone, deposits of inert waste and garbage (8000 m<sup>3</sup>) were eliminated. The only legal deposit in the BR was also closed and 15 000 m<sup>3</sup> waste was taken away in 2009-2010.

### **Saving and creating landscape values in the ABR**

The Aggtelek BR's management tends to save traditions and landscape values during its conservation, management and development work. The restoration and the supporting of the traditional land use, which were introduced herein above, help to conserve landscapes and landscape values as well.

Another activity to save and create (or recreate) the landscape values is to preserve and renovate the traditional buildings connected to the original rural life. Most of the buildings belonging to the ABR management were renovated preserving the original structures. One of the biggest projects was the renovation of an old granary in Bódvaszilás. The old and abandoned building has gained similar appearance inside and outside like the original, and has got a new function (exhibition) to meet the needs of tourism.

## **B, Development function**

### **Population living in the BR**

	<i>permanently</i>	<i>seasonally</i>
<i>Core Zone:</i>	0	0
<i>Buffer Zone:</i>	approx. 1000	approx. 1200
<i>Transition Zone:</i>	approx. 10.000	approx. 10.500

There are two small villages with approximately 1000 inhabitants inside the BR and 20 along the border of the BR. There are no major towns in the territory of the BR, the nearest one is Miskolc with approx. 160.000 inhabitants. Miskolc is situated 70 km from the BR.

The major activities and sources of income are agriculture, forestry and tourism. Arable lands predominate in the transitional zone. More than 40% of the population is unemployed. This high rate is due to the economic changes (collapsed industry and agricultural co-operatives). Generally the population is aging, young people moved to the towns. Because of this fact the traditional cultivation methods are vanishing. This causes a lot of problems from the point of view of nature conservation, because hayfields, old orchards and pastures have become abandoned, that is why all the management activities connected with these species-rich habitats are in the responsibility of the national park directorate. Due

to the economic hardship, poor families make a living from collecting firewood and natural resources from the protected territory.

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

### **Contact and cooperation with local organizations, local governments and inhabitants**

Having the duty to define long term development strategies and short term actions, local governments are key stakeholders and cooperation partners in the BR management. Sharing information and knowledge with local government is mutually important to make sure that informed decisions are made. The information flow is active between the BR management and local governments. As it was mentioned before, the Aggtelek BR management supports some activities for attracting tourism, which can somehow be 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.

Some of the major local producers (e.g. producers of forest fruit products, mushroom products, traditional Hungarian fruit spirit called “pálinka”, herbs, honey etc.) are important stakeholders includes, that also provide tourism services and programmes. The Aggtelek Biosphere Reserve Brand is to be established with the cooperation of tourism businesses and local products producers. Hopefully it will help the development of marketable local products (mostly fruits, mushrooms and wood products) and the system of local markets. 27 forest fruit and mushroom products (jams, spirits), 2 tourists services have already been certified as local brand. The most active cooperating stakeholders are: Gömöri Környezet- és TájfejlesztőEgyesület/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.

The demand from non-governmental organizations, local people, visitors and economic stakeholders for the use of the territory of the BR is continuously increasing. However, in line with the main purposes of the protected area only environmentally sustainable activities are allowed in the BR.

Most of the tourist activities are concentrated on tourist caves which are situated in the buffer zone. The number of people visiting also other parts of the BR is much smaller. The largest caves (e.g. Baradla, Béke, Rákóczi) have been substantially modified as “show-caves” to allow human use, which includes 120,000 visitors annually. These caves are also in good condition and monitoring programmes are in place.

Among the recreation and sport activities the most popular ones are orienteering and hiking on tourist trails. During the authorization process, the biosphere reserve management prescribes spatial- (no entry into the core zone) and temporal restrictions (limitations during the vegetation period) for effective nature protection. E.g. the most significant tourist route which had crossed the core area was re-directed.

Tourist associations organize guided tours for their members 5-10 times a year. The number of non-organized visitors is not very significant, according to our estimation this number is about 8,000–12,000 annually.

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 Roznava (Slovakia); Kárpát Euroregio Kosice (Slovakia).

### **Enhancing traditional land use**

The area of ABR is covered basically by low mountain forests, so intensive farming has a secondary relevance compared to silviculture. Agriculture is present especially on the surrounding areas of the two small settlements (Aggtelek and Jósvalfő) which are wedged in the territory of the biosphere reserve, more precisely, the buffer zone. These two villages have very special situation due to the fact that they are completely surrounded by natural values. The extent of grasslands has been decreased intensively during the last decades because of the decline of grazing animals. Without grazing the biological succession starts and shrubs overgrow the grasslands within some years. Therefore the biosphere reserve management intends to reintroduce grazing in cooperation with local farmers. To maintain the most important grasslands, the ABR manages many territories with mowing, shrub-shredding and grazing by hucul horses. Some local farmers also keep grazing animals in small numbers, however, this activity would be required on a much bigger area in the BR.

The rehabilitation of abandoned orchards is a fairly new element among management activities. These habitats have multiple functions: being very similar to steppe woodlands they host a number of vulnerable species, they are valuable elements of landscape and good resources of local fruit varieties which are more resistant to diseases.

Habitat management carried out by the Aggtelek BR has long tradition in the ABR. Management follows a strict and pre-planned scheme during the management activities. While the total area under active management is 1300 hectares, due to limited capacities ABR staff manages only one-third of this. The remaining 900 hectares are managed by contracted undertakers from the close surroundings. 280 hectares are rented by local people who generally manage the territories by grazing and/or mowing. Renting of woodlands is not allowed. Management activities of leaseholders are strictly regulated in their contracts. The ABR annually contracts with 15-20 persons in average.

In the framework of the High Nature Value Area Programme, an area based agri-environmental scheme, a great part of the region (53,712 ha) has been designated as the “Észak-Cserhát” High Nature Value Area (HNV) in 2009.. The agri-environmental scheme is available on 27,534 ha, out of which 10,641 ha is located inside the ABR, while many other remarkable territories are within the transition area. 15 farmers are involved in the program in the territory of the BR. The ratio of the privately owned land properties within the program is small in the BR, just around 1%. The ABR manages 660 hectares within this HNV program. All agricultural management activities have to be consistent with the conservation task of the BR.

Two larger programs are implemented for grasslands (I, II) and one for arable lands (III), as explained in more details below:

I.) Grassland management with conservation purposes, especially for the effective preservation of Corncrake (*Crex crex*) on grasslands. Measures include the limitation of earliest mowing; prohibition of any chemicals; regulation of grazing.

II.) Grassland improvement and grazing with conservation purposes. Measures include the limitation of first mowing; prohibition of any chemicals; regulation of grazing. Further goal is to create more suitable habitats for other threatened grassland species.

III.) Protection of game birds on arable land. Measures include the limitation of chemicals; prescriptions concerning the types and rotation of growing and the timing of harvesting; limiting the maximum field size etc. Further goals are the protection of birds of prey and partridge and maintaining high biodiversity in agricultural habitats.

### **Validation of landscape protection in different levels of plans**

The ABR takes part in discussion and authorization of regional and local land use and architectural plans. During these consultations for the management of the biosphere reserve promotes national and international landscape protection directives and standards. In the planning process, regular consultations with the stakeholders and planning offices are organised, which help to find consensus among all the parties in many cases.

The ABR management often takes in concrete permitting procedures, with the goal to save the traditional structure of land use and settlements and adjust the new investments to the local natural and landscape values.

### **Tourism, ecotourism**

The Aggtelek Biosphere Reserve is very suitable for various types of tourism, such as excursion, recreation, adventure tourism, active (sports) tourism, ecotourism, cultural and artistic tourism, medicinal tourism.

The tourism of the ABR is concentrated in three visitor centres of primary importance:

(I) Aggtelek, surrounding of the main entrance of the Baradla Cave, TOURINFORM Information Center (information point, gift shop), Baradla Hostel and Camping;

(II) Jósvalfő, surrounding of the entrance of the Baradla Cave (information point, gift shop), Tengersizem Hotel, headquarters of the ABR;

(III) Vörös-tó Visitor Center (information point, gift shop, lecture room, exhibition).

Visitor centres of secondary importance are:

(I) Bódvarákó, entrance of the Rákóczi Cave (information point, gift shop);

(II) Szögliget, Salamander house;

(III) Jósvalfő, Kúria Education Center;

(IV) Bódvaszilás, NaturArt Granary

**Typical leisure time activities:** *cave tours, surface hiking, study trail tours, riding, cultural and artistic events* (10-15 programs annually), *wedding in the cave* (8-10 weddings annually)

**Baradla Cave (Aggtelek - Jósvalfő):** The majority of tourists of the biosphere reserve visit first of all the Baradla Cave, developed for the entertainment of the general public, and open for guided tours all year round. Considering the average of the last ten years, 130 000 tourists visited the cave annually.

**Hucul stud (Jósvalfő):** The basic task of the stud is to preserve the gene pool of the "Hucul" traditional horse breed. The stud also has an important role in conservation processes. Nowadays the horses of the BR take part in equestrian competitions, education, tourism, traditional shows. The management organizes children camps, mounted tours, „shadow ranger” tours all the year round.

**Baradla Study Trail:** This is a 7.5 km surface trail connecting the entrances of the Baradla Cave situating in Aggtelek and Jósvalfő. In this trail the visitor can get geographical, zoological, botanical and cultural information on the national park from 18 information boards.

**Tohonya-Kuriszlán Study Trail:** This is a 9 km circuit around Jósvalfő, introducing mostly the geographical assets of the BR, with the help of 26 information boards.

### Visitor and educational centres and display houses

Name and type	Number	Capacity (no. of visitors)
<b>Visitor and educational centres</b>		
Tourinform Office, Aggtelek		
Vörös-tói Visitor Centre, Aggtelek Vörös-tó	3	20 + 50 + 45
Kúria Education Centre, Jósvalfő		
<b>Museums, exhibitions</b>		
H. Kessler Memory House		
Nature Art Granary	5	20+80+40+50+45
Mohos Peat Bog House		
Tengerszem Hostel		
Kúria Education Centre, Jósvalfő		

### Study trails/study paths

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

### Commercial accommodation places managed by the ABR

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

### Public relations (2014-2015)

<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 Jósvafő 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 occasion /year

There are 27 forest fruit and mushroom products (jams, spirits, desiccated mushroom etc.), and 2 tourists services have already been designated as local brand.

### C) Research and educational functions

#### National Biodiversity Monitoring System (NBmR)

There are many research programs in the BR, several of which are included in the National Biodiversity Monitoring System (NBmR). The NBmR has standard methods, protocols to investigate the different habitats, communities and species. The main aims of the NBmR programs are to follow the condition of protected and threatened natural values, to observe actual status of flagship species in different communities and to collect data on living resources of the country.

Research themes in the National Biodiversity Monitoring System are the followings:

Project	Components	Taxon/research objects
I. Investigation of protected and threatened species	I/a. Vascular plant species	<i>Aconitum variegatum</i> subsp. <i>gracile</i> , <i>Adenophora liliifolia</i> , <i>Astragalus vesicarius</i> subsp. <i>albidus</i> , <i>Campanula latifolia</i> , <i>Cypripedium calceolus</i> , <i>Daphne mezereum</i> , <i>Dianthus plumarius</i> subsp. <i>praecox</i> , <i>Dracocephalum austriacum</i> , <i>Echium maculatum</i> , <i>Eleocharis carniolica</i> , <i>Erythronium dens-canis</i> , <i>Gentiana pneumonanthe</i> , <i>Geranium sylvaticum</i> , <i>Himantoglossum caprinum</i> , <i>Iris sibirica</i> , <i>Lindernia procumbens</i> , <i>Onosma tornense</i> , <i>Parnassia palustris</i> , <i>Phlomis tuberosa</i> , <i>Pulsatilla grandis</i> , <i>Thlaspi jankae</i> , <i>Traunsteinera globosa</i>
	I/b. Cryptogams	<i>Dicranum viride</i>
	I/c. Invertebrates	<i>Lycaena dispar</i> , <i>Libelluloides macaronius</i> , <i>Paracaloptenus caloptenoides</i> , <i>Pholidoptera transsylvanica</i> , <i>Stenobothrus eurasius</i>
	I/d. Vertebrates	Amphibia, Reptilia, Chiroptera, <i>Citellus citellus</i>

III. Different habitats of Hungary	III/a. Habitats	T5x5_055 – Aggtelek T5x5_069 – Jósvalő T5x5_094 – Tornanádaska
	III/b. Small mammals/ owl pellet analyses	All species.
IV. Invasive alien plants	IV/a. Plant species	Ailanthus altissima, Ambrosia artemisiifolia, Amorpha fruticosa, Asclepias syriaca, Cleistogenes serotina, Echinocystis lobata, Fallopia x bohémica, Solidago canadensis, Solidago gigantea
IX. Dry meadows	IX/a. Plant associations	Campanulo-Festucetum pallentis, Seslerietum heuflerianae
	IX/b. Invertebrates	Aranea, Blattodea, Formicidae, Gastropoda, Heteroptera, Lepidoptera, Orthoptera
X. Mountain hay meadows	X/a. Plant associations	Luzulo-Callunetum, Polygalo-Brachypodietum
	X/b. Invertebrates	Aculeata, Aranea, Coleoptera, Heteroptera, Lepidoptera, Orthoptera
	X/c. Orthopteran assemblages and connected plant associations	Orthoptera Pulsatillo-Festucetum rupicolae Arrhenatheretalia
XI. NATURA 2000	XI/a. Molluscs	Vertigo angustior, Vertigo mouluisiana
	XI/b. Lepidopterans	Leptidea morsei, Colias myrmidone
	XI/c. Dragonflies	Leucorrhinia pectoralis
	XI/d. Orthopterans	Pholidoptera transsylvanica, Isophya stysi, Paracaloptenus caloptenoides, Stenobothrus eurasius, Isophya costata
	XI/e. Beetles	Rosalia alpina, Morimus funereus
	XI/g. Dormouse monitoring	All species.
	XI/h. Plant species	Adenophora liliifolia, Cypripedium calceolus, Dracocephalum austriacum, Echium maculatum, Eleocharis carniolica, Himantoglossum caprinum, Galanthus nivalis, Onosma tornense, Pulsatilla grandis, Thlaspi jankae
	XI/i. Habitats	3150, 3270, 4030, 4030, 40A0, 5130, 6110, 6190, 6210, 6230, 6240, 6410, 6430, 6440, 6510, 6520, 7220, 9130, 9150, 9180, 91E0, 91G0, 91H0, 91M0
Others	Butterflies of wet meadows	Maculinea teleius, Aricia eumedon

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 ABR also initiates and performs research programs: investigations of large carnivores, effects of artificial lighting on bats, monitoring of birds (white stork, corncrake, birds of prey and migration of passerines), bats and other synanthropic species, invasive plants and effective defences against them, general state assessment on 100 quadrates by

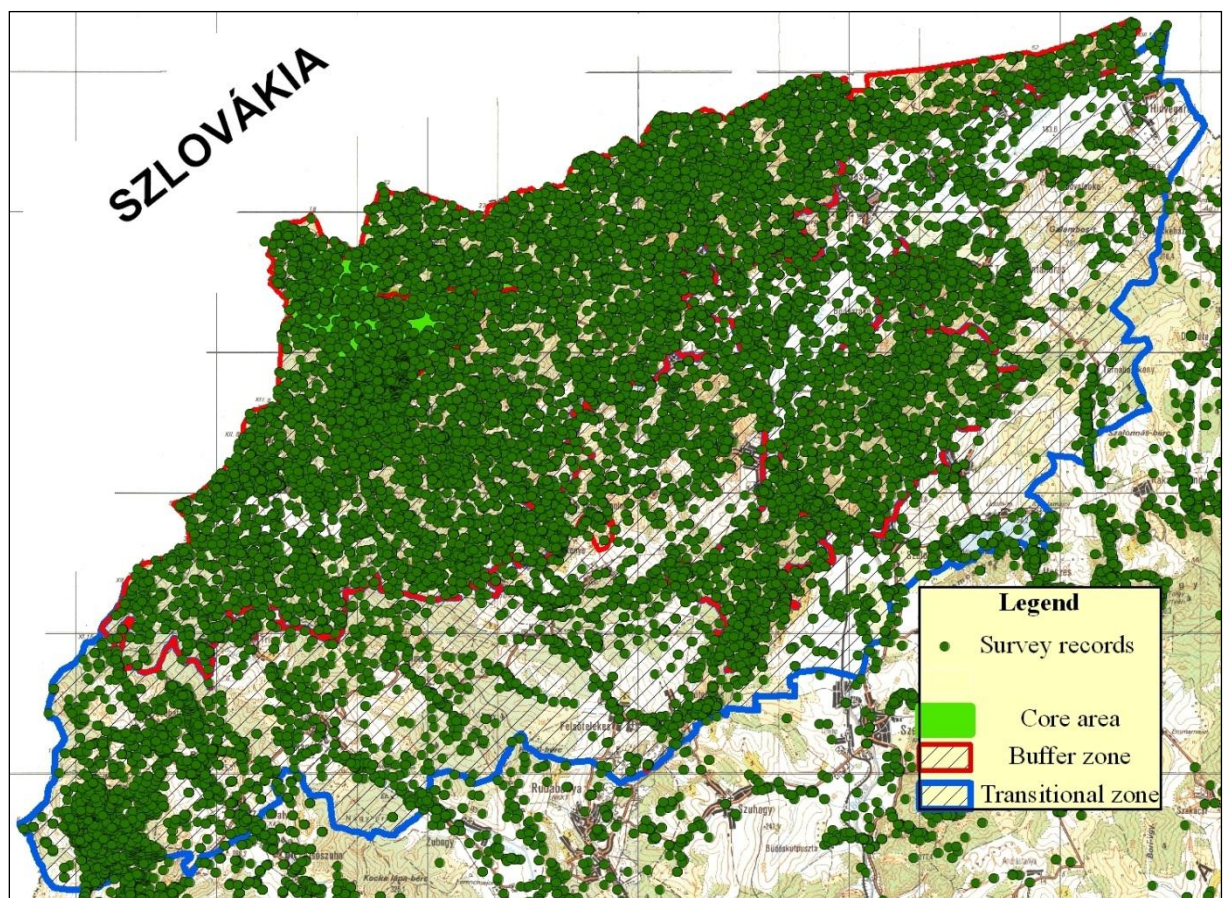
making coenological observations. The habitat map of the biosphere reserve was completed in the near past.

Researches of forest reserves are also carried out in the territory of (I) Alsóhegy, (II) Haragistya – Lófej and (III) Nagy-oldal Forest Reserve (the last two partly overlap with the core area of the BR).

A fine example for the involvement of volunteers and local people is the Vadonleső (“Nature-watcher”) Programme. This Internet based programme collects distribution data about 16 carefully selected (plant and animal) species of Hungary (e.g. hedgehog, bog turtle, moles, squirrels, snowdrop), which are common and more or less easily detectable, but need protection or endangered for some reason. The programme works since 2009, using GoogleMap based interface, in on-line mode. The program is very popular, in the region of the biosphere reserves (mainly in touristically popular regions) as well. This is well demonstrated by the fact that for example every 8th salamander data is coming from this small region. Mapped data from volunteers exactly figure out the distribution range of the species registered by specialist in the last decades. Data provided by volunteers shows a coherent picture and is suitable for describing trends of the occurrence of the species.

### Survey records of different species in the Aggtelek BR.

By the result of different researches, the territory of the ABR is one of the most investigated and well-known protected territories in the country.



The BR also offers education opportunities for primary and secondary level pupils. ”. 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, foods of the ancestors (traditional foods and local products), ecology and environment protection etc.).

## **Future plans**

Regarding the long-term plans, the cooperation with local farmers and other stakeholders is to be enhanced. The size of rehabilitated and maintained orchards should be increased. The development of marketable local products (mostly fruits, mushrooms and wood products) and the system of local markets are attached to this topic tightly. The Aggtelek Biosphere Reserve Brand is to be established with the cooperation of tourism businesses and local products producers.

The rehabilitation and reconstruction of mountainous grassland habitats (hay meadows, pastures) should be continued and completed. The 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; these works also should be continued and completed. Adjustment of public lighting systems of BR settlements in order to meet “Dark Sky Park” requirements is also an important task of the near future. Further development of nature tourism, particularly special tours (birding, animal and plant watching), including capacity building and infrastructure development is also justified.

On-line education programmes and competitions have to be established for the primary and secondary school age students, these should be carried on, and new themes are to be introduced. The webpage content constantly needs supervision and up-date. Educational programmes at community festivities have to be continued and increased. It is important to promote awareness and communication as basic tools for the proper understanding of the values of the Aggtelek Biosphere Reserve, and urging support for maintaining it as an outstanding national and international asset.