

Additional information

Water Regime:

1. Ground waters

1.1. Karstic water

As the the Domica-Baradla Cave System is in a karstic region, the major part of the groundwater is stored in the tectonic fissures, fractures and dissolutional cavities of the karstified Triassic limestones and dolomites. The recharge derives from the rainfall infiltrating through the surface, and from meteoric waters flowing into the karst system through sinkholes.

1.2. Confined groundwater

In the Domica-Baradla Cave System area confined groundwater occurs only south from Aggtelek, in the 50-100 m thick Pannonian clayey-sandy-pebbly sediments. This sequence is considered more or less impervious because of its clay content, therefore only 5% of the rainfall can infiltrate. A part of the infiltrating water feeds the karst beneath, another part flows laterally towards the springs on the south. Some local springs discharge on the surface of the clayey pebble horizons.

1.3. Unconfined groundwater

Unconfined groundwater occurs only in the valleys of major streams, and in the fluvial pebbly sediments of basins.

2. Springs

Springs can be best characterised by discharge, which is determined by the geological-morphological build-up of the catchment area, and basically by climatic conditions (rainfall, evaporation, melting). Depending on these conditions, the discharge of a spring may vary between a few l/min and a few thousand l/min. In this area the Jósva spring has the biggest discharge with a minimum of 3900 l/min and a maximum of 450.000 l/min (and 1.200.000 l/min in 1959). In some springs lunisolar effects were demonstrated.

3. Surface waters

The area is part of the catchment area of the Sajó river, which flows into the Tisza.

4. Still waters

The surface of the Domica-Baradla Cave System is poor in still waters, the territory of them is small. The most well-known is the pond Vörös-tó, which has formed at the end of the 19th century in the area of a dolina, which got plugged by clayey sediments were eroded from the adjacent slope, after the demolishment of the vineyards. Another important example is the pond Aggteleki-tó, which formed by filling up of the sinkhole of the “Törökmecset” side-passage.

Some artificial ponds are also known near Aggtelek (which play role in the flood prevention of the Baradla cave) and in the Baradla cave (rowing pond).

Physical features of the site:

Geology and geomorphology: The Domica-Baradla Cave System is built up mainly of Triassic limestone with some dolomit. The Pelsőc-Aggtelek-Égerszög capture line goes here, which is the border of the covered and uncovered karstic area. The sinkholes of the cave system can be found along this capture line. The area is showing all the typical features of karstic region of medium height, such as small valleys, perennial- and large-discharge springs, brooks, scarcely forested or barren rocky mountain-sides and large dry dolines.

Physical features of the catchment area:

The site contains the Hungarian part of the Baradla-Domica cave system and its superficial catchment area. Geologically, it forms part of the Aggtelek–Rudabányai Hills. Despite its small size, it is a geologically rather complex system, with various types of sedimental rocks in different strata, with folded layers and tectonic faults. The site is made up mainly of Triassic hill ranges and surrounding as well as intersecting basins filled with Pannonic formations.

Two distinct landscape types can be found in the catchment area. In the north, the uncovered karst holds stony, rocky hillsides with mostly natural wooded vegetation, while in the south the karst is covered with gravel, and the acid soil thus formed holds secondary heather and acidophilous oak woodlands, as well as arable lands cultivated for centuries.

The primary forests of the karst were felled for Turkey oak bark, charcoal and lime burning. In the lower altitudes, arable lands and pastures were formed in the place of former forests. The remaining silviculture aimed at profit-making rather than maintaining near-natural conditions, so the native tree species were in many places supplanted by coniferous trees. Due to wrong forestry practices, exposed southern slopes were heavily eroded, and wooded vegetation still could not evolve. The emerging limestone karr can be seen near Aggtelek.

Dolines and sinkholes are organic parts of the Baradla cave system. Some of them, such as Zombor-lyuk, Kis- and Nagy-ravasz-lyuk are partly surrounded by woodlands, interrupting the monotonousness of arable lands.

Heather has developed and sustained as a result of animal grazing. Species-rich meadows in humid valleys have been maintained by mowing for haymaking.

Current scientific research and facilities:

The **Complex Ecological State Assessment** of the Aggtelek National Park and Biosphere Reserve started in 1992 as well as in the other national parks in Hungary in the frame of a long term, nation-wide programme. This programme was based on former investigations and has used unified methods and generally the same taxa have been studied. This programme has four aims:

- At first the main aim is to assess the present state of the national park and biosphere reserve according to the most important habitats and species.
- The second is that the result of the CESA would be the basis for updating the **zonation** of the national park - according to the actual situation and possibilities and the basis for the suitable **management plan** for the different zones.
- The third aim is that this complex research project would be the first step of a **long term biodiversity monitoring** and also an attempt of a nation-wide **biomonitoring** which will be applied not only for survey of protected areas.
- The results of the complex ecological assessment and the monitoring system give the scientific background of the **active nature management** and the **restrictions** of any human activity inside the NP.

Abiotic research:

Completed:

- geological mapping,
- complex assessment of strictly protected caves, springs and sinkholes.

Ongoing: geomorphology, meteorology, complex assessment of other protected caves.

Biotic research: (Complex Ecological Assessment)

**The target animal groups of the CESA in ANP
1992-93-94**

Type	The method of sampling
Ornithological and mammological survey:	
Dinamics of different bird population:	- spot mapping - Passeriformes: 3x10 ha - spot mapping - birds of prey: 20 000 ha - line mapping: 4 lines - species research: Hazelgrouse, Corncrake, Barn owl, White stork, Red-backed shrike
Survey of small mammals	- live traps
Data of bird migration	- ringing
*Herpetological survey:	- observation
Orthoptero-faunistical survey:	- dish trapping
Lepidoptera survey:	- collection by singling - light trap *- observation (for protected species)
*Micro-lepidoptera survey:	- singling - light trap
*Trichoptera, Plecoptera and Ephemeroptera surveys:	- collection by singling - light trap
*Odonata survey:	- singling - identification of larvae and the exuvia
*Araneae survey	- pitfall traps
Comparing survey of Carabidae populations:	- pitfall traps
Survey of Diptera:	- Malaise traps - singling
Estimating deer population:	- observation - method of Langvatn

**CESA for the vegetation in the ANP
1992-94**

Type	The method of sampling
1992-93	
Botanical survey: setting up a flora list of vascular plants	- based on the Herbaria of Hungarian Nature History Museum - based on literature - observation
coenological survey	- coenological relevé - 16 spots

Survey of the changing of vegetation and land-use:	- analysis of air photo series (1952, 1971, 1988)
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1994	
Botanical survey: setting up a flora list of vascular plants survey of the Cryptogamic flora (Lichens and Mosses)	- observation - based on the Herbaria of Hungarian Natural History Museum and the Esterhazy Teachers Training College in Eger - based on literature - observation - collection
coenological survey	- coenological relevé - 40 spots
investigation of the ecological demands of <i>Onosma tornense</i>	- 3 study spots: 10x10 m divided into 50x50 cm microquadrat
survey for estimation the damage done by game on isolated sample areas	- 6 quadrats (10 x 10 m) with 6 control area

Recent, ongoing	
Botanical surveys: - setting up a flora list of vascular plants - National Biomonitoring Programme (NBmR) - Natura 2000 survey programme	
Zoological surveys: - setting up a fauna list of different vertebrate and invertebrate groups - National Biomonitoring Programme (NBmR) - Natura 2000 survey programme - special chiropterological survey programme (effective management, translocation project, effects of climate change on bats etc)	

Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

Environmental education and public awareness:

- The National Park organises different **summer-camps** for pupils and students: "explore the nature"-camps, work camps (bird-ringing camp, habitat-restoration camp, research camp).
- The National Park organises **fieldtrips** for students of secondary schools, universities and postgraduate students.
- The specialised staff of the National Park usually hold **lectures** on the natural and cultural heritage of the region for tourist-groups, students and local people.

Training programmes for specialists:

- The Aggtelek National Park **helps the teachers' work** in local nursery, primary and secondary schools and organises different programmes and competitions for local children.

- The National Park with the help of other governmental and non-governmental organisations organises **conferences** and **training programmes** on nature conservation, management and education.
- The National Park organises **fieldtrips** for students and postgraduate students.

Facilities for education and visitors' centers:

- Exhibition: Natural assets of Aggtelek National Park,
- Village Museum at Jósvalfő,
- 2 study trails.

Current recreation and tourism:

Annually 100-120.000 (national: 90%, foreign: 10%) tourists visit mainly the Baradla showcave.

Type of touristic activities: caverouting, tracking on tourist paths and study trails, hunting.

Facilities for tourist: hotels, tourist hostels, campsites, private rooms, restaurants, tourists paths, study trails.

Bibliographical references:

The following studies were published in 1997, the book entitled: Research in Aggtelek National Park and Biosphere Reserve (Proceedings of "Research, Conservation, Management" conference, Vol. II.), edited by E. Tóth - R. Horváth, published by the Aggtelek National Park Directorate.

Speleological and Geological Research in the territory of Aggtelek National Park

- Lerner, J. - Kövesdi, J.: Management Plans for the World Heritage sites - Application of the IUCN Guidelines for the Cave and Karst Protection.
- Szunyogh, G.: A Review and Evaluation of the Speleological Treasures of the Béke Cave with the Intention to Target a Complex Scientific Analysis.
- Szunyogh, G.: The Mending of Man Made Destruction in the Béke Cave and Ways of the Restoration of the Original Condition.
- Sásdi, L.: Karst drainage systems established by water tracing methods in Aggtelek N. P.
- Szablyár, P.: The Role of Karstic Springs in the Development of Industries in Jósvalfő.
- Dr. Dénes, Gy.: The source of the Jósval Stream and the name of the town of Jósvalfő.
- Less, Gy.: The evolution of the geological structure of the Aggtelek-Rudabánya Mts.
- Knauerné Gellai, M. - Baross G.: Geological bearings of the study-paths of the Aggtelek N.P.
- Knauer, J.: Relation between morphology and rock-outcropping on some plateaus near Jósvalfő.

Results of CESA in ANP

- Horváth, R. - Tóth, E.: Biodiversity Research in Aggtelek National Park and Biosphere Reserve
- Varga, Z.: Biogeographical outline of the fauna of Aggtelek Karst and surrounding areas
- Rácz, I. - Parragh, D. - Mező, H.: Studies on Orthoptera fauna of Aggtelek Karst
- Szabó, S. - Varga, Z.: Changes in species composition and abundance of Lepidoptera in the Aggtelek Karst
- Papp B. - Rajczy M.: Bioindication of habitat conditions with Bryophytes at some streams in Aggtelek National Park and Balaton-felvidék region, Hungary
- Boldogh, S. - Gombkötő, P.: Monitoring and Conservation of House-dwelling Bat Colonies in Administrative Area of Aggtelek National Park
- Horváth, R.: Investigation of bird communities using spotmapping in the territory of Aggtelek National Park
- Horváth, R. - Farkas, R. - Kovács, K.: Red-backed shrike scientific research in Aggtelek National Park
- Kovács, B.: Fish-faunistic data from the river Bódva in the area of the ANP
- Hoitsy, Gy.: Fish-fauna of the waters in the Aggtelek National Park
- Dudás, Gy.: The spiderfauna of National Park at Aggtelek

- Orci Kirill, M.: A comparative study on grasshopper (Orthoptera) communities in the Aggtelek Biosphere Reserve
Dósa, G.: *Inula ensifolia* (Asteraceae) as food plant preferred by daily butterflies (Lepidoptera: Rhopalocera)
Deli, T.: Malacofaunistic researches in the National Park of Aggtelek
Gyarmati, A. - Marschall, Z.: Bryoflora of ANP
V. Sipos, J. - Varga, Z.: Phytocenology of semi-dry grasslands (Cirsio-Brachypodion) in the Aggtelek Karst
Vasas, G. - Locsmandi, Cs.: The macroscopic fungi (Basidiomycetes) of the Aggtelek Karst

The following studies were published in 2003, the book entitled: Researches in Aggtelek National Park and Biosphere Reserve, edited by S. Boldogh, published by the Aggtelek National Park Directorate.

- B. Szűts F.: Ecological investigation and point-mapping of the distribution of *Onosma tornense* Jáv.
Schmotzer, A.: Preliminary results of the long-term monitoring of grassland management systems.
Molnár, T. - Magura, T.: Study of the carabid fauna of the Aggtelek National Park.
Rácz, I.A.; Nagy, A., Orci, K.M.: Orthoptera assemblages in different habitats of the Aggtelek Karst (North-East Hungary).
Boldogh, S., Szentgyörgyi, P.: Research on Corncrake (*Crex crex* L. 1758) in the administrative area of Aggtelek National Park between 1997 and 2002.
Farkas, R.; Boldogh, S.; Szentgyörgyi, P.; Bartha, Cs.: Research on Bee-eater (*Merops apiaster* L. 1758) population and its conservation in North Hungary.
Nagy, D.: Research on historical land use in the Gömör-Torna Karst I. Reconstruction of former landscapes in the Aggtelek National Park on the basis of military surveys I-III.

Beyond these articles this book contains the list of all diploma works and reports on researches took place in the administrative area of ANP between 1996 and 2003.