

Survey of Romania's underground bat habitats

Status and distribution of cave dwelling bats

2002–2004



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Summary

The present report is a compilation of the results of two BP Conservation Programme funded projects implemented in Romania: the Survey of Southern and Western Carpathians underground bat habitats in 2002–2003 and the Survey of the Eastern Carpathians and Dobrogea underground bat habitats in 2003–2004. The aims and objectives were to realize after 40 years the first full-scale census of cave-dwelling bat species. These programmes have been completed by a Romanian–Polish bat workers team. Fieldworks combined with conservation actions and public awareness have resulted the first precise estimation of the current state of cave-roosting bats, a list of key bat sites of the region, and a growing network of volunteers within the Romanian Bat Protection Association.

Exclusive data from 273 records of 22 bat species within 93 caves were used in the present report. According to IUCN, 8 of these 22 species are vulnerable and 4 species are near threatened. New distributional records and estimation for the populations' size were established. 14 important key sites for bat conservation were described. A strong cooperation between local stakeholders and NGOs, national authorities, natural reserves administration bodies and international partners was established.

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Aims and objectives

The goal of the programme was to undertake a field survey of Romania's karstic regions (the Carpathian Mountains and Dobrogea), rich in underground roosts. These activities were connected with the popularization of bat conservation by mass media sources, publications, by spreading leaflets, posters, multimedia CDs, holding educational lectures and organizing workshops for volunteers. Literature and unpublished data were used for evaluating the population's status and the distribution of cave dwelling bat species. Finally, the project proposed to identify key sites and obtain protected status for caves, which are important hosts for bats at regional or national level.

Methodologies and outputs

In order to achieve our aims we initiated the following activities:

Fieldwork

The surveys were done in summer (June 24 - July 8, 2002; June 6, 13-21; July 12-23, 2003), and in winter (December 20-23, 27-28, 2002; January 3-13, December 13-21, 2003; January 10-14, February 7, 14-16, 20-22, 2004). Altogether 16 team members and volunteers from Romania and Poland took part in the fieldwork expedition. Places were reached by cars, as most of the caves are situated far from the main public transportation lines. These caves were selected according to the following criteria: length, entrance dimension, number of large chambers, corridors and available literature data on bats. The altitude of the caves varied between 12 m to 1,503 m a.s.l. During cave visits standard datasheets were used and threats of the underground sites were recorded. Each visited cave position was established with GPS.

Mist netting in summer, in front of the caves, was done with nets produced by Ecotone, Poland. For each captured specimen, the following standard values were checked: emergence time, body mass (measured with portable Pesola spring scale with accuracy up to 0.25 g), forearm length (using calipers measuring with a 0.5 mm precision), gender, age and reproductive assessment. Bats were marked with impermanent markers to avoid recapturing. License for catching bats was obtained from the competent Romanian authority. Visual observations of the roosts were done during daytime. Sometimes we used binoculars. For counting large clusters of bats, we took photographs and used night vision camera. This way we reduced the disturbance of bats and obtained more accurate evaluation. Where a larger number of bats occurred, as an emergency tool, we used Petterson D200 bat detectors. The number of passing bats was recorded according to number/unit time.



Educational work and public awareness

The team prepared and edited a leaflet for popularizing bats and the conservation of cave dwelling bats. We edited 850 samples (A5 format, 8 pages), with colour photos, in Romanian, with a short English summary of the programme. It was distributed during survey work for local community members (schools), administration bodies of tourist caves and speleological clubs.

Bats of Romania. Knowing them, protecting them multimedia CD is the first sample of a series, which combines the classical morphological description for most of the European bats species with drawings, photographs and ultrasound records. Emphasized especially on the bats of Romania, available in Romanian language, it is a very useful educational and reference material both for amateur and professional bat workers.

Edited by the Romanian Bat Protection Association (RBPA), with the support of the BP Conservation Programme and Romanian Partnership Foundation, the CD has eight parts:

1. a short general description of European bats with implication on their conservation needs;
2. a description of the RBPA aims and objectives;
3. a description of scientific and educational programmes of RBPA starting in 1999;
4. an introduction in bat detector techniques – according to H. J. G. A. Limpens & A. Roschen – with detailed information on ultrasounds, bat detectors, recordings and monitoring techniques;
5. the identification of Romanian bats. Each of the 30 species has separated slides, including keys for identification, with description of morphological characters, drawings, and for most of them pictures. For 14 species ultrasound samples are presented: totally 78 recordings presenting different types of calls. The identification keys for this chapter are available also in a portable document format (pdf) ready to print;
6. a presentation of the National Bat Monitoring Programme;
7. the contributors of Bats of Romania CD;
8. the partners and foundations that supported the RBPA activity.



The CD was edited in 500 pieces and is distributed especially for the volunteers in the National Bat Monitoring Programme.

We held 20 popularizing lectures for children, scholars, students, speleological club members and national park staffs. The training courses (PowerPoint presentations and printed materials) contain information about bat biology and ecology, description of endangered cave dwelling species, monitoring methods and bat protection.

Web page: www.datec.ro/batprotection/bp

The programme webpage was realized in association with the RBPA. Contain general information about the objectives and outputs, interactive maps on species distribution. Contact addresses and info-line for visitors are provided.

During the programme we were in contact with mass media. Few newspaper articles, a radio interview and a short movie produced by the National TV regional staff about the winter fieldwork in January 2003 were realized.



The outputs were also offered for Eurobats, as additional material, beside the 2003 National Report – according to the Agreement on the Conservation of Bats in Europe. For the scientific community, our results were presented throughout 6 verbal and 3 poster presentations at symposiums in the United Kingdom (The National Bat Conference 2003, August 29-31, York), Ukraine (The Xth International Theriological Conference, October 6-10, 2003, Bakhchisarai, Crimea), Hungary (The IVth Conference on Bat Conservation in Hungary, November 21-23, 2003, Szögliget), Poland (The XVIIIth. National Chiropterological Conference, November 7-9, 2003, Janow Lubelski and The 3rd Seminar on the Carpathian Bats, November 28-29, 2003, Krakow), Brazil (The XIXth Annual Meeting of the Society for Conservation Biology, July 15-19, 2005, Brasilia) and Ireland (The Xth European Bat Research Symposium, August 21-26, 2005, Galway).

Data evaluation and conservation actions

Literature sources were overviewed for evaluating old data about bat populations. Since most of the publications don't give detailed results, in many cases we weren't able to establish bat populations trend. Usually literature sources mention only the presence or lack of specific species in caves, without exact numbers or estimations. To establish the distribution and population status of cave dwelling bats, besides the data collected during this programme, we used data collected after 1995, meaning 273 records of cave dwelling bats within 93 caves. Some of these data are the results of different survey works undertaken by the team members during last years. Based on these records, we give for each recorded species a short description, and we realized distribution maps with Dmap software. Each dot on the map represents an area of 10x10 km. One dot can show more roosts situated within the territory.

We identified key sites with a high biodiversity level on bat species. We proposed for the competent authorities, the Speleological Institute of the Romanian Academy of Science (R.A.S.) and the Board of the Natural Monuments / R.A.S. the protection of 10 important underground sites in the Western Carpathians. To obtain the protected status, these caves will be submitted to a legal procedure that will result a special appendix of the Law 462 (for the protection of natural habitats and wild life) from August 2, 2001. The law will be completed with the appendix that will contain the list of caves, as important bat roosts. In the present, for some of the key sites the RBPA prepares the necessary documentation to obtain the Natura 2000 protected status.



Detailed description of these key sites is presented below.

Our report and suggestions were sent to the administrative body of natural reserves, which host in their territories important caves for bat conservations (Retezat National Park, Cerna Valley – Mehedinti Natural Reserves, proposed National Park for Apuseni Mountains). The package can be useful for the future management or action plan in specific areas.

Bats of Romania and the legal framework of bat conservation

The 30 recorded bat species (out of 45 European species) sum up about 30% of our mammal fauna. With a various landscape – including the Carpathian Mountains and the Danube Delta – Romania provides many suitable habitats for an important bat population. Large karstic areas with more than 12,000 natural caves, host a large diversity of numerous bats. Some of these species, such as *Rhinolophus hipposideros*, *Rh. euryale*, *Rh. mehelyi*, *Myotis emarginatus*, *M. dasycneme*, *M. capaccinii* and *Barbastella barbastellus* are vulnerable according to IUCN. Dur-



ing the last decades, as in whole Europe, also in Romania most of the species show a continuous decline. Human activities have been generally recognized to be the main influence on changes in bat population. The conservation of bats identifies many problems. The bats generally congregate in summer colonies and winter aggregation, which have made them very vulnerable; they are highly mobile, migrant, requiring different type of roosts during the year; similarly, they are using a range of feeding sites throughout the year; their nocturnal life-style made them shady in the

eyes of the public. All these factors should be correctly interpreted to achieve an efficient long-term conservation strategy.

International commitments

In Romania, the legislative framework of bat conservation should be assured by the following agreements signed and accepted by the government:

- The Agreement on the Conservation of Populations of European Bats (London, 1991), accepted by Law 90/2000;
The agreement was established in 1991, by the Bonn Convention on the Conservation of Migratory Species of Wild Animals and contains 31 Parties. It protects all bat species. Article III lists Fundamental Obligations to conserve bat population. A Conservation and Management Plan and a range of Resolutions have been agreed to assist in implementing the Agreement. The Bonn Convention aims to conserve terrestrial, marine and avian migratory species throughout their range.
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 1979), rati-



- fied by Law 13/1998;
- European Directive 92/43/EEC and Directive 79/409/EEC, Annex II & IV, making part of Law 462/2001;
All bats are included in Annex IV and so are European Protected Species. In addition, 13 bat species are included (all of them occur in Romania – see list of species Annex I) in Annex II, which require very strict protection and designation of Special Areas for Protection.
- Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979), accepted by Law 13/1993;
All bats are included in Appendix III and require protection. All bats (except *Pipistrellus pipistrellus*) are included in Appendix II for special protection. The Convention has published European action plans for two bat species (both of them, *Rh. ferrumequinum* and *M. dasycneme* occur in Romania).
- Convention on Biological Diversity (Rio, 1992) ratified by Law 58/1994;
The Convention commits to the sustainable management of wild fauna, flora and habitats. The same meeting also adopted a Statement of Principles for the Sustainable Management of Forests, and Agenda 21 – An Action Plan for the Next Century (a political commitment to the integration of environmental concerns across a broad range of activities).
- Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar, 1971), ratified by Law 5/1991.
The Convention of Wetlands is the first modern global intergovernmental treaties on conservation and wise use of natural resources. Over the years, the Convention has broadened its scope to cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general.

In Romania occur 30 species (2 families) of bats (see species list in Annex I). Some or all of them are included in one of the followings:

1. EU Habitats and Species Directive, Annex II (14 spp.: *Rhinolophus blasii*, *Rhinolophus euryale*, *Rhinolophus ferrumequinum*, *Rhinolophus hipposideros*, *Rhinolophus mehelyi*, *Barbastella barbastellus*, *Miniopterus schreibersii*, *Myotis bechsteini*, *Myotis blythii*, *Myotis cappaccinii*, *Myotis dasycneme*, *Myotis emarginatus*, *Myotis myotis* and *Vespertilio murinus*);
2. Bern Species Action Plan (*Rhinolophus ferrumequinum* and *Myotis dasycneme*);
3. 14 of 16 Eurobats priority species (*Rhinolophus ferrumequinum*, *Rhinolophus hipposideros*, *Rhinolophus mehelyi*, *Rhinolophus euryale*, *Rh. blasii*, *Myotis bechsteini*, *Myotis cappaccinii*, *Myotis dasycneme*, *Myotis emarginatus*, *Pipistrellus nathusii*, *Barbastella barbastellus*, *Miniopterus schreibersii*, *Nyctalus lasiopterus* and *N. leislerii*).





Short characteristics of the cave dwelling bat fauna

During the programme we identified 22 species out of the 30 Romanian bat species. Most of them are highly cave-dependent species, such as *Rhinolophus* species, *Miniopterus schreibersii*, *Myotis myotis/blythii* and *M. capaccinii*. These form the major aggregations and nursery colonies throughout the year in the visited underground sites. Others use caves especially during migration and swarming period, such as *M. bechsteinii*, *M. nattereri*, *Nyctalus noctula* and *Plecotus* species. Some species, such as *Barbastella barbastella*, *M. daubentonii* and *Pipistrellus pipistrellus* are present predominantly in hibernation.

The size of winter aggregations (see Figure 1) is usually small, up to 200 specimens. Only 4% of the winter records included clusters formed by 2000–5000 animals, and 2% contained aggregations of 30000–50000 specimens.

Figure 1.

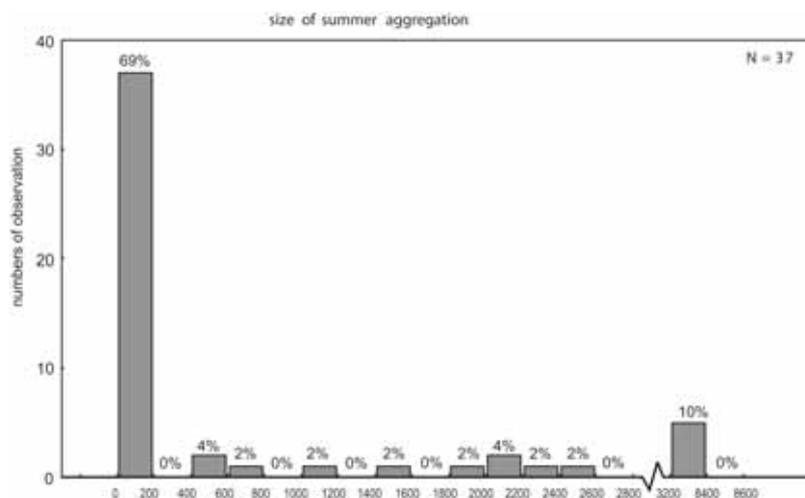
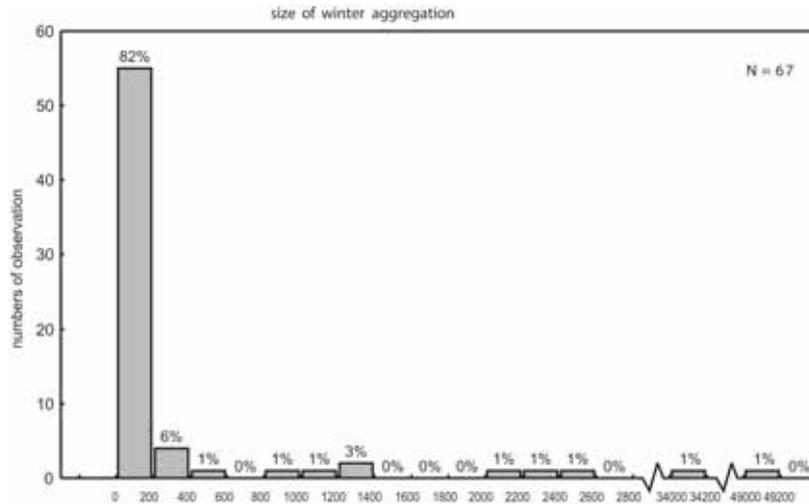


Figure 2.

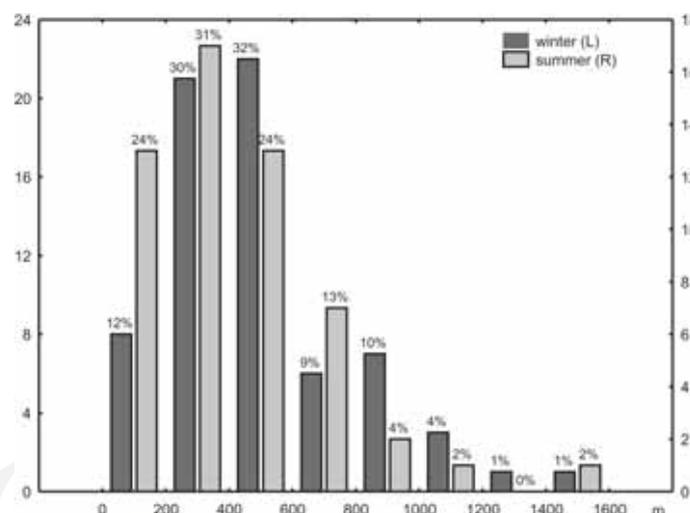


The size of the summer colonies show similar trends (see Figure 2): almost 70% are formed by less than 200 specimens, 10% are formed by 3200–8400 specimens, and there is no record of larger colonies than 10,000 bats.

The geographical distribution pattern is connected with the presence of the karstic areas and underground sites. Karstic areas are covering approximately 2% of Romania’s 237,500 square kilometres. 2/3 parts of these can be found in the Western and Southern Carpathians. The highly cave-dependent species’ distribution show similar patterns. The altitudinal distribution of species (see Figure 3) demonstrates the presence of the species on middle altitude. 71% of winter aggregations are situated between 200 and 700 m a.s.l. while 79% of summer colonies are located between 100–600 m a.s.l.

As a conclusion of our results, one can assume that Romania still hosts important bat populations on both regional and international level. 8 vulnerable European bat species can be met regularly in underground sites. Europe’s largest hibernaculum with more than 55,000 specimens of 10 species is located in the country. A detailed description of the key sites for bat conservation and the status of 22 bat species are presented above.

Figure 3.



Underground key sites for bat conservation in Romania

To design the key sites for bat conservation, we used the following criteria: number of species and specimens, which use the caves throughout a year, species' IUCN status and Eurobats priorities. Most of the following presented sites are proposed for Natura 2000 protected site status.

Southern Carpathians

Adam Cave

N 44052.285'

E022 024.495'

A vertical cave situated in Cerna Valley available only by climbing techniques, difficult to reach. Inside the cave there are two warm water springs, which lead to a 40° C air temperature and very high humidity. In summer, the cave is inhabited by thousands of bats. There is a nursery colony of *Myotis myotis/blythii*, *Miniopterus schreibersii* and *Rhinolophus euryale*. Additionally *M. capaccinii* and *M. emarginatus* were observed. Being a cave environment that provides very suitable nursery site for vulnerable and near threatened species, protected status is required. The only endangering factor is the presence of few speleologists, who are visiting the cave, during summer. Close to this cave and Baile Herculane city, other smaller cavities offer roosting places in addition for a nursery colony of *Rh. hipposideros* and also hibernating place for the mentioned species. Cerna Valley's caves are part of the Nera–Domogled Natural Reserve.

Muierii Cave

N 45011.583'

E023 045.227'

It is one of the most important hibernation sites for *Rh. ferrumequinum*. One can find there the largest aggregation of Greater Horseshoe bats, up to 1,600 individuals. In winter, *Rh. hipposideros*, *M. daubentonii* and *M. myotis* was additionally observed. Signs of nursery colonies are present, still, since many year bats don't use the cave in summer. The cave is a tourist site equipped with artificial lights, where colonized parts are protected (bat-friendly closed), but in winter, the guide shows tourists also the parts of the cave with bat aggregation, as curiosity. Further lobby work is required.

Gaura cu Musca Cave

N 44039.893'

E021 041.969'

Besides that it provides suitable conditions for *Rh. ferrumequinum*, *Rh. euryale*, *M. capaccinii* to hibernate, in summer hosts the largest known nursery colony of *M. capaccinii*, formed by approx. 500 specimens, mixed with over 1,000 individuals of *Myotis myotis/blythii*. The cave is situated on the Romanian–Serbian border, near the Danube River and the motorway. The access is easy, and the cave is often visited by local people and tourists. Human disturbance is very high.



Close to this cave, also in Danube gorges, there is the Gura Ponicoavei Cave, part of the Cazenele Dunării Natural Reserve. It is difficult to access it in winter because of the high water level, the snow and the very steep walls of the gorge. As a result of reservation management, for the future it is planned to make it more accessible for tourists. It didn't happen until now because the lack of financial background. For the moment, the cave hosts yearly at least 11 bat species (*R. ferrumequinum*, *R. hipposideros*, *R. euryale*, *M. daubentonii*, *Barbastella barbastellus*, *Plecotus auritus*, *Pipistrellus pipistrellus* and *Nyctalus noctula*), few hundred *Rhinolophus* species in hibernation and a large nursery colony of *M. schreibersii* and *M. myotis/blythii* of about 6,000–8,000 specimens.

Fusteica Cave

N 45001.760'

E022 054.162'

Situated in the center of Isvarna village, in the Valcan Mountains, this small cave hosts a larger mixed nursery colony of *M. capaccinii* (about 300 individuals) and *M. myotis/blythii* (about 2,000 individuals). As the site of the cave is far away from the main road and local people didn't pay to much attention for, it is almost a relict place for one of two well-known nursery colonies of *M. capaccinii*, situated at the most northern edge of distribution.



Western Carpathians

Huda lui Papara Cave

N 46023'04.5"

E 023017'32.6"

During wintertime, this cave hosts the largest known aggregation of 10 bat species in Europe. Sheltering up to 56,000 bats, it is a unique site, with high international importance. The fact is that here one can find the largest identified *M. schreibersii* aggregation from Romania, summing 30,000–33,000 specimens, a number, which increases the value of the site. Along with this species, there are present *M. myotis/blythii* with up to 4,500 specimens, *Rh. ferrumequinum* with about 700 individuals and *Barbastella barbastellus* with up to 50 specimens. Few decades ago, the cave was used for touristical purposes, but it has lost its administration body. Especially during summer, tourists frequently visit the cave. In wintertime the high water level makes difficult accessing it. Recently, the cave has received a new administration body that adopted a proper management plan for tourist exploit of the cave considering bat conservation recommendations.





Sighistel Valley caves

N 46031.398'

E022 033.229'

It is a natural reserve, where the valley hosts almost 40 caves. The majority of small sites cannot provide suitable conditions for larger bat colonies. But in wintertime, these cavities can serve as roosting places for solitary bats, such as *B. barbastella*, *P. auritus* and *M. daubentonii*. Two large caves are important hosts for bats. In winter, Coliboaia Cave hosts up to 800 hibernating individuals of *Rh. ferrumequinum*; in summer, offers shelter for a mixed nursery colony of *M. schreibersii* (~2,500 specimens) and *M. myotis/blythii* (~1,500 individuals). Magura Cave is also an important hibernacula for *Rh. ferrumequinum* and *Rh. hipposideros*. As the valley is a very popular place, in summer many tourists are visiting it. The Sighistel Valley is a local (county) natural reserve, but without any administration body.

Meziad Cave

N 46045.638'

E022 027.979'

A popular place for tourists, during summer visited daily by large groups, under guidance. The cave houses a nursery colony of *M. myotis/blythii* (~2,000 individuals) and *M. schreibersii* (~4,000 specimens). This colony of Schreiber's Bats is one of the largest in the Western Carpathians. In winter, 8 species of bats share this roost. The Greater Horseshoe Bat finds here a proper place for hibernation: an aggregation of about 450 specimens was observed. Besides the mentioned species, *Rh. hipposideros* and *B. barbastella* are also present with few 10 specimens. The tourists visit the cave in organized way, and the guides do not lead the visitors to places where bats could be disturbed.



*Tasad Cave**N 46°55,307**E 022°07,308*

This cave hosts the largest known *Rh. euryale* nursery colony. Situated on the northern border-line of distribution territory in Romania, this small cave provides suitable conditions for up to 500 specimens. The cave doesn't have any tourist value, it is located far enough from the main road, therefore only occasional visitors, mainly local people can affect the colony. Protected status is required for the site.

*Astileu Cave**N 47000.928'**E022 023.894'*

The cave is used for gaining water for the village bearing the same name. In the 1960's a dam was built inside the cave for capturing the water. Since then the cave is seldom visited, as local people use the gained water for drinking and cooking. This cave hosts the largest nursery colony (~ 5,000 bats) of *M. myotis/blythii* in the Western Carpathians. The cluster is mixed with approx. 1,000 *M. schreibersii*.

*Pestera cu Apa Cave from Valea Lesului**N 46049'29.2"**E 022033'27.4"*

It is one of the most important hibernaculum in the western part of the country. During the years, we have recorded 15 bat species, such as *R. hipposideros*, *M. dasycneme*, *M. emarginatus*, *M. bechsteinii*, *M. brandtii*, or *B. barbastellus*. *M. myotis/blythii* (up to 3,500 specimens) and *R. ferrumequinum* (up to 850 specimens), which form the main aggregations. Mainly speleologists visit the cave.





Eastern Carpathians

Meresti Valley caves

Situated on the northern edge of the Perșani Mountains, in the southern part of the Eastern Carpathians, it is a local natural reserve with own administration body. A popular place for tourists, in summer visited daily by groups, the main caves can be accessed only under guidance. The valley hosts more than 120 caves. The majority of small underground sites cannot provide suitable conditions for larger bat colonies. But these cavities have a very important role in swarming during migration. 17 bat species were identified in the valley. The biggest, the Orbán Balázs (No 14) cave, is populated during all year by bats. In summer there is a nursery colony of *M. myotis* and *M. blythii* species, including up to 2,500 individuals. In winter the cave is an important hibernating place for the „large *Myotis*” species up to 1,000 individuals and for *R. hipposideros* (about 140). During mating period individuals of 14 bat species were captured at the cave entrance, a result that shows the importance of the cave also in this period. The smaller caves (with a length between 11 and 300 m) are used by bats (*R. ferrumequinum*, *M. bechsteinii*, *M. nattereri*, *M. daubentonii*, *M. emarginatus*, *M. mystacinus*, *B. barbastellus*, *P. auritus*, *P. austriacus*, *M. schreibersii*, *P. pipistrellus*, *E. serotinus*, *V. murinus* and *N. noctula*) as mating roosts or hibernaculum.

Pestera Lilieilor Cave from Rarau Mountains

N47027.303

E025033.696

Located in North-Eastern Romania (Rarau–Giumalau Mountains), this tectonic cave is the only larger underground cavity – besides small abandoned mine galleries – in this region. Situated at an altitude of 1,503 m a.s.l., in a pine forest, the cave became the place of a very long-lasting bat research programme undertaken by N. Valenciuc starting from the 1970's. At that time, the cave was hosting one of the most important hibernating aggregation of *M. myotis* / *blythii* from the country, with over 7,000 specimens. Nowadays their number increased drastically to 2,300 individuals, probably due to the human disturbance. In summer the cave is used by few dozens of *M. myotis* and *M. blythii*, and in front of the entrance were caught also *M. brandtii*, *M. mystacinus*, *M. daubentonii* and *M. dasycneme*. The cave has a vertical entrance, and it is visited mainly by speleologist and batworkers. It is part of the Rarau–Giumalau Natural Reserve, and has its own administration body.

Dobrogea, Black Sea coast

The area is situated in South-Eastern Romania, at north surrounded by the Danube Delta, from west bordered by the Danube River, continuing towards south in Bulgaria, and limited by the Black Sea from east. Geologically, the territory is composed by old limestone and quaternary



loess area with strong surface erosion. Most of the caves are small (smallest than 100 m), situated under 70 m above sea level altitude. The cave-dwelling bat fauna of Dobrogea is the most studied in Romania in comparison with other, less explored territories. The articles, altogether reported 17 bat species, and they shown a rapid and continuously decline in the number of bats during the last 40 years. Nursery colonies of species such as *M. blythii*, *R. ferrumequinum*, *R. mehelyi* and *M. schreibersii* reported in the 1970's, nowadays almost disappeared: during the last four decades, their number decreased with over 95%.

Lilieilor from Gura Dobrogei Cave and Cheia Valley

N44030,239

E028025,582

Situated in the central part of Dobrogea, these are the largest natural underground cavities in Dobrogea. Pestera Lilielor Cave hosts the largest known nursery colony of *M. blythii* from the region, suming up to 100 specimens. In winter there were signalled few hibernating individuals of *R. ferrumequinum* and a sporadic occurrence of *M. schreibersii*, *R. mehelyi*, *E. serotinus*, and *M. daubentonii* was recorded. Cheia Valley, situated at 10 km distance from the cave, has a small limestone gorge at the altitude of 50 m a.s.l., which can provide during summer suitable habitats in rock crevices and small (< 10 m) caves mainly for solitary bats as *M. mystacinus* and *P. auritus*. Because of lack of interest from local administration, an effective protection of these sites can't be provided.

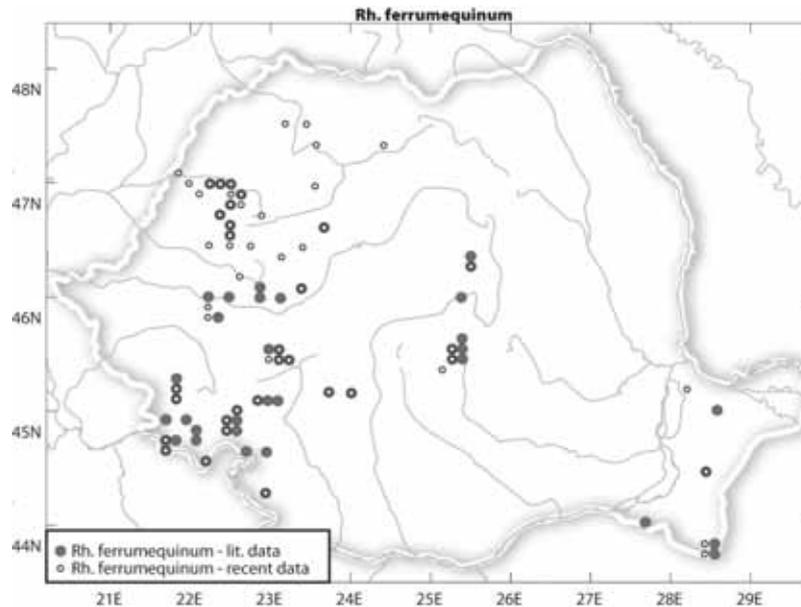
Hagieni Forest Reserve

N43048.460

E028028.025

Situated near to Mangalia city in Southern Dobrogea, within this forest reserve there is an artificial underground tunnel that was used for storing weapons during the 2nd World War. This artificial habitat provided suitable conditions for maternity colonies of *M. schreibersii* and *M. capaccinii*. Today, the site hosts nursery colonies of the mentioned species, up to 100 individuals. The forest reserve has its own administration body because of the watertank situated within. Regional protection for this particular site is more or less supplied.





Rhinolophus ferrumequinum (Schreber, 1774)

Distribution in Europe: Southern and Central Europe.

Habitat and population status: requires caves, mines and attic roosts. Widespread and relatively common, especially in the Western and Southern Carpathians. Found frequently in caves during winter; summer roosts are located mainly in attics, which cause the discrepancy between large winter and few summer records. Recorded 168 times, in 58 caves. The altitudinal span of the records extends from sea level (12 m) to 1,279 m; most often can be found between 300–700 m a.s.l. Recorded temperature within the hibernaculum varies between -1.2 and 13.4 °C, in summer roosts between 10 and 19.7 °C.

Large hibernation aggregations (from 100 to over 1000 bats) are present in 14 underground roosts. 1,634 specimens, within a cave in South Romania, sum the largest known aggregation. During summer, usually they form colonies about 10 specimens. In the '90s, Hungarian bat workers established migratory routes of the species within the Carpathian basin. Their attic dwelling nursery colonies, located in the floodplain of Tisa River, regularly hibernate in the caves of the Western Carpathian Mountains. The longest recorded movement is of 320 km. As a result of winter speleological activities, in few caves or stone quarries a drastical number decline was observed. Estimated number of specimens in one year in these caves is up to 6,000 individuals.

International legal & conservation status

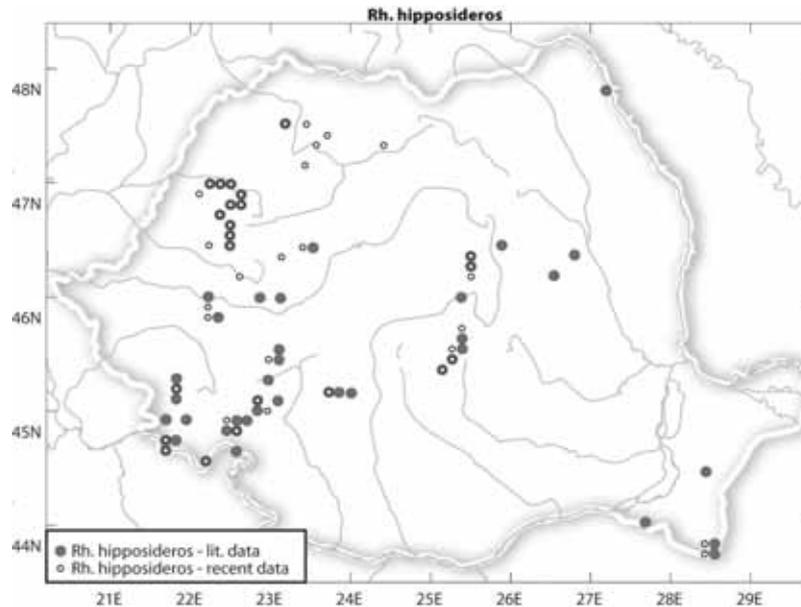
Bern Convention, Appendix II;

Bonn Convention, Appendix II;

EU Habitat and Species Directive, Annex II & Annex IV;

IUCN Red List LR: nt;

Key species for the National Bat Monitoring Programme.



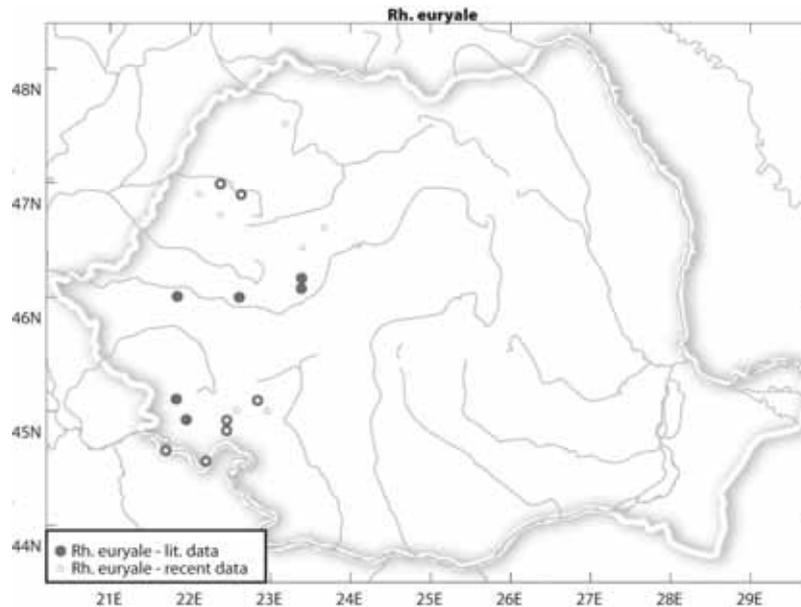
Rhinolophus hipposideros (Bechstein, 1800)

Distribution in Europe: Western, Central and Southern Europe.

Habitat and population status: roosts in caves throughout the year, but during summer months, frequently found in buildings. An endangered species both in Europe and Romania. Widespread in the research territories, recorded 90 times, in 35 caves. The altitudinal distance of the records range from 60 m to 1,117 m.; most often can be found between 300–600 m a.s.l. Recorded temperature within the hibernacula expands from -1.2 to 13.4 °C; in summer roosts between 9.3 and 23.5 °C. It forms colonies and aggregations, from few specimens up to 100 individuals. The largest cave nursery colony (80 specimens), composed by females with youngsters, was located in the Cerna Valley, South Romania. The main hibernation aggregation can be found in Varghis Gorge, Eastern Carpathians. In this cave was observed a yearly increasing number of *Rh. hipposideros*; nowadays the aggregation is summed by over 140 individuals. Usually, one can meet colonies from 5 individuals up to 30–50 specimens. We identified 8 important sites, where the number of the bats exceeded 30 individuals during last years. The population size of the *Rh. hipposideros* has apparently stabilized. Winter can cause negative effects. Estimated number of specimens during one year in these caves is up to 1000.

International and conservation status:

Bern Convention, Appendix II;
Bonn Convention, Appendix II;
EU Habitat and Species Directive, Annex II & Annex IV;
IUCN Red List VU A2c;
Key species for the National Bat Monitoring Programme.



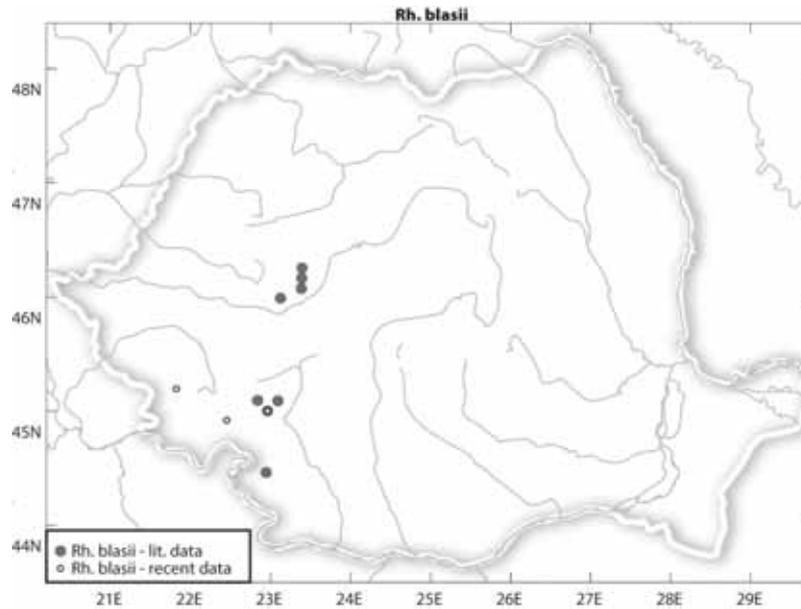
Rhinolophus euryale Blasius, 1853

Distribution in Europe: the southern part of European continent, with the northern border located in Central France, Southern Slovakia and Western Romania.

Habitat and population status: roosts during the whole year in underground sites. Populations declined during the last decades in most of their range. We recorded it 34 times, in 16 underground sites. The altitudinal range of the records expands from 60 m to 600 m; most often can be found between 100–400 m a.s.l. In comparison to *R. ferrumequinum* and *R. hipposideros*, this species predominate on lower altitudes. Temperature within the hibernaculum was recorded from -1.2 to 13.5 ($32!$) °C; in summer roosts, between 12.5 and 37 °C. In the Southern Carpathians they occur more frequently than in the western part. We recorded only 3 stable nursery colonies, one composed by approx. 500 specimens. In winter they form aggregations of few specimens, up to 20 individuals. They can share hibernation clusters with *Rh. ferrumequinum*. They disappeared from several western sites, mentioned by the literature as hosting territories for the Mediterranean Horseshoe Bat, in 1960. Special attention should be paid for those cavities where this bat roosts. Total protection of these caves should be required. Estimated number of specimens in one year in these caves is up to 1,500.

International and conservation status:

Bern Convention, Appendix II;
Bonn Convention, Appendix II;
EU Habitat and Species Directive, Annex II & Annex IV;
IUCN Red List VU A2c.



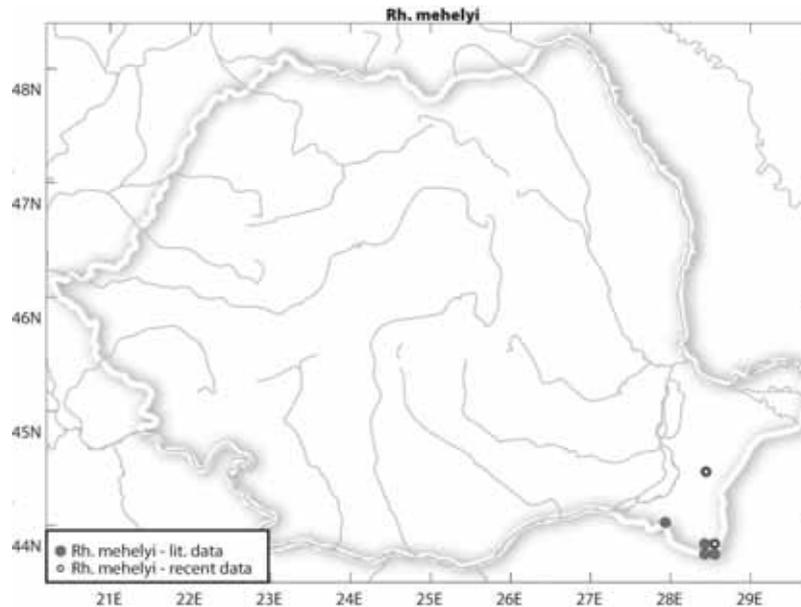
Rhinolophus blasii Peters, 1866

Distribution in Europe: from Balkans up to South-Western Romania

Habitat and population status: roosting sites in caves. Population status is unknown. Between 1950-1960, signalled in literature in 12 caves. After 1995, only 3 doubtful data is available. It is the rarest European horseshoe bat. It is data deficient in Romania.

International and conservation status:

Bern Convention, Appendix II;
 Bonn Convention, Appendix II;
 EU Habitat and Species Directive, Annex II & Annex IV;
 IUCN Red List LR: nt.



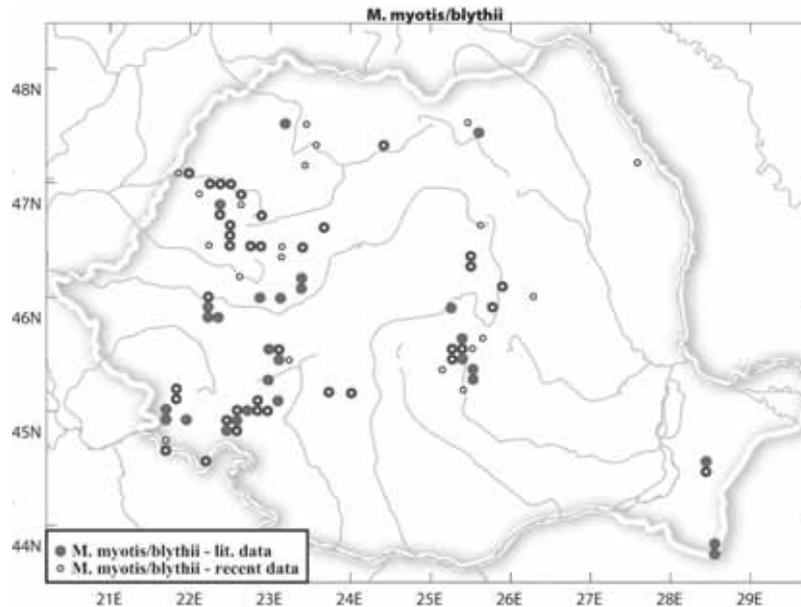
Rhinolophus mehelyi Matschie, 1901

Distribution in Europe: the Balkans, with Danubian Lowland (Bulgaria, Serbia) as northern limit of distribution range that reach Romanian Dobrogea in the eastern part.

Habitat and population status: roosting sites in caves. It is one of the rarest middle size horseshoe bats from Europe, which occur in larger number only in Bulgaria and Greece. It is seriously threatened in Romania. Originally, the species was described based on a specimen captured in Romania (Bucharest!), but literature data mention only the Black Sea coast and Dobrogea as the distribution area of the species. Recorded in at least 7 caves, with nursery colonies formed by 500 bats in 1974 (J. Cerveny), today there is only one nursery colony of 75 bats – with youngsters. Recorded 3 times, in 2 caves, on sites ranging from 25 m to 107 m a.s.l. Recorded summer temperature close to the colony was of 22.2 °C; during winter, isolated individuals were found at 9.9 °C. During a year, the estimated number of specimens in Romanian Dobrogea is about 100.

International and conservation status:

Bern Convention, Appendix II;
Bonn Convention, Appendix II;
EU Habitat and Species Directive, Annex II & Annex IV;
IUCN Red List VU A2c.



Myotis blythii (Tomes, 1857) & **Myotis myotis** (Borkhausen, 1797)

Distribution in Europe: throughout the whole Europe.

Habitat and population status: throughout the year, one can find them mainly in caves, but nursery colonies occur also in attics. It is one of the most widespread and abundant species, which we found 158 times, in 61 caves. The altitudinal span of the records is from 40 m to 1,503 m, most frequently between 100–1,000 m a.s.l. Recorded temperature within the hibernacula varies between -3.2 and 13.4 °C; in summer roosts, between 8 and 20.3 °C.

Since these sibling species overlap in the majority of our target areas, adequate identification was not always possible, we discuss them together. The only exception of overlapping is Dobrogea, where only *M. blythii* occur, and North–Eastern Carpathians, where *M. blythii* is present mainly in winter, but do not form nursery colonies during summer. Large nursery colonies, up to 5,000 specimens, occur in the southern and western parts of the country. Some hibernation aggregations are composed by 3,000–4,000 specimens. They are located mainly in the western part of the country. 12 important sites were identified, where number of bats exceeds 1,000 specimens. Summer colonies were found more frequently than winter aggregations. These species usually form summer clusters with *M. schreibersii*, and in south, also with *M. capaccinii*. Roosts, present in a large number of clusters, require protection. Human activities inside the caves can be the main threat for these species. Estimated number of specimens during a year, within the target caves, is up to 50,000.

International and conservation status:

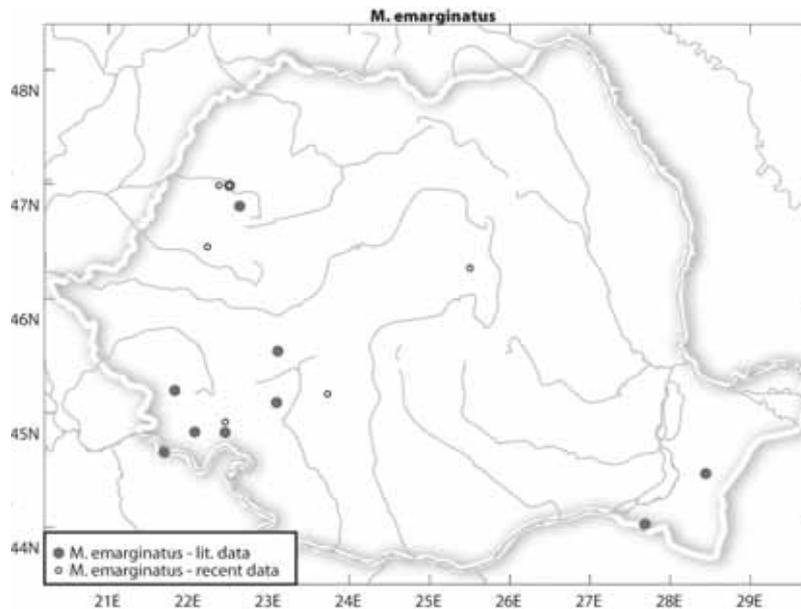
Myotis blythii

Bern Convention, Appendix II;
Bonn Convention, Appendix II;
EU Habitat and Species Directive,
Annex II & Annex IV;

Myotis myotis

IUCN Red List LR: nt.
Key species for the National Bat Monitoring
Programme.





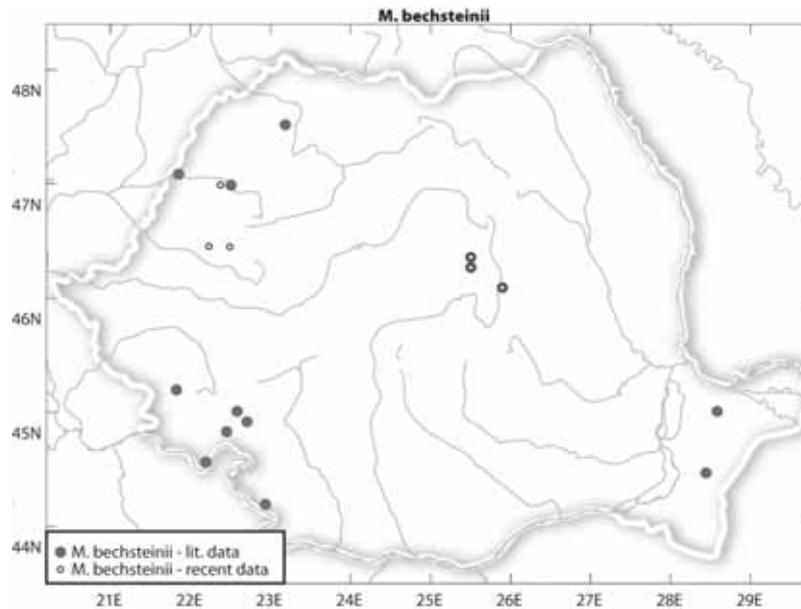
Myotis emarginatus (Geoffroy, 1806)

Distribution in Europe: mainly in Southern, South-Eastern and Central Europe.

Habitat and population status: a cave and attic dwelling bat. Numerous populations live in the Balkans and France, rarely in other areas. It is one of the rarest bats in Romania. Until 1995, according to literature, it has been only one sample recorded in Romanian caves. Since then it was found in small number in church and house attics and few underground sites. We observed it 11 times, in 9 caves. The altitudinal spread of the records expands from 295 m to 977 m a.s.l. Recorded temperature within the roosts varies between -0.1 and 12.5 °C. In exceptional cases, the number of bats exceeds 10 individuals. Usually they are solitary during winter, or they were caught, in summer, by mist netting in front of caves. In the present there is no record of nursery colony or larger winter aggregation of the species in caves.

International and conservation status:

Bern Convention, Appendix II;
Bonn Convention, Appendix II;
EU Habitat and Species Directive, Annex II & Annex IV;
IUCN Red List VU A2c.



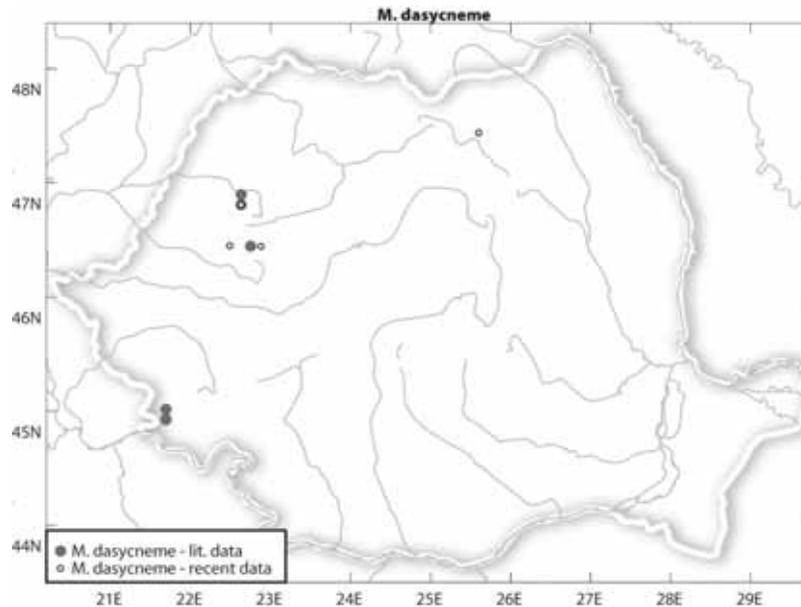
Myotis bechsteinii (Kuhl, 1817)

Distribution in Europe: from Western Europe to east of Ukraine, with the northern border in Southern Sweden.

Habitat and population status: it seems to be a sedentary species, characterized by insular distribution. Restricted to natural, mainly deciduous forest with high proportion of old trees, it is rarely found in underground shelters. It is considered rare almost everywhere, common only in adequate habitats. Our records from caves come from summer and autumn mist nettings. There were 8 records, from 7 shelters. The altitude of the sites varies from 380 m to 823 m a.s.l. Temperature within caves diverge from 5 to 12.5 °C. As a forest dwelling species, it is data deficient in Romania.

International and conservation status:

Bern Convention, Appendix II;
 Bonn Convention, Appendix II;
 EU Habitat and Species Directive, Annex II & Annex IV;
 IUCN Red List VU A2c.



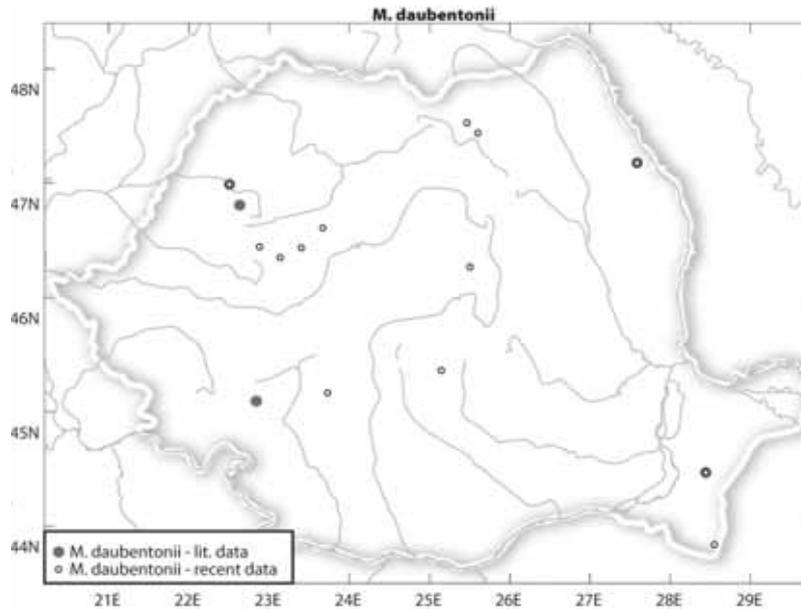
Myotis dasycneme (Boie, 1825)

Distribution in Europe: restricted to several countries. It occurs in the Netherlands, Northern Germany, Southern Sweden, Denmark, Poland, the Baltic region, Hungary, Slovakia, Ukraine and Romania.

Habitat and population status: recorded mainly in riparian vegetation and open water surface; during hibernation appearing in underground roosts. It is one of the rarest bat species in Europe. We recorded it 14 times in a small number, in 3 caves located in the Western Carpathians and in 1 cave from the Eastern Carpathians. Our observing is based mostly on mist netting records of individuals during late spring to early autumn period, in front of the caves, or visual observation of wintering bats (no more than 15 specimens in one cave). Temperature measured during hibernation was between 8 and 9.8 °C. In the summer of 2003, by trapping two individuals at Pestera Liliecilor Cave from Rarau Mountains (Eastern Carpathians), we established a new altitudinal record for the species: 1,503 m a.s.l. in an unusual habitat of the species, the alpine pine forest. These records also prove for the first time the presence of the species in the eastern part of Romania (Moldova). Before 1995, it was never observed in caves. Additional bat detector records of the species were undertaken in the same region, close to stagnant waters. It seems to be present in a larger number in the western part of Romania, in the Cris Rivers' valleys (connected with Tisa River, and probably with the Hungarian pond bat populations), but is missing from the Danube Delta and the Danube Valley. Its population status is little known in Romania.

International and conservation status:

Bern Convention, Appendix II;
Bonn Convention, Appendix II;
EU Habitat and Species Directive, Annex II & Annex IV;
IUCN Red List VU A2c.



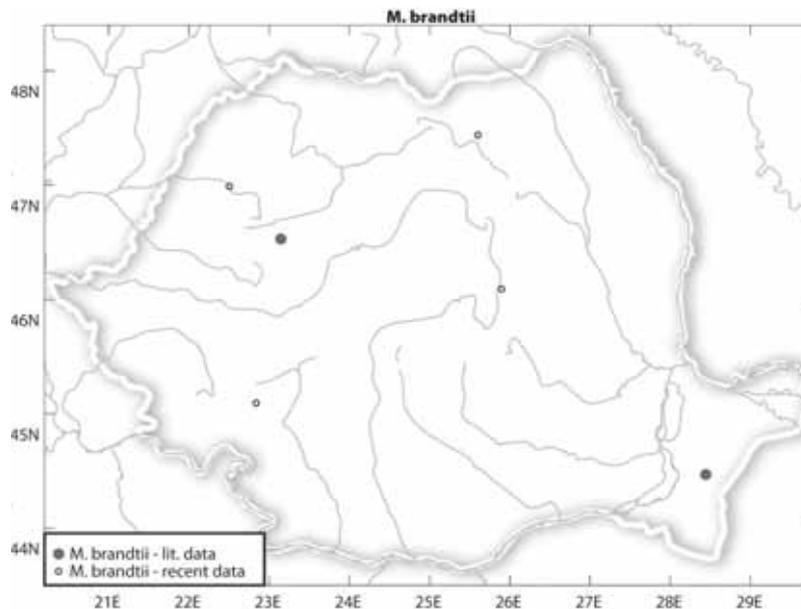
Myotis daubentonii (Kuhl, 1817)

Distribution in Europe: from the western part of Europe to the Urals, and from Central Scandinavia to Northern Greece.

Habitat and population status: it is associated with lakes, streams and forests. During hibernation one can meet them also in underground spaces. It is a common and widespread species in Europe, similarly in our research area. It has 45 records, from 24 underground sites. The altitudinal span of the records range from sea level (25 m) to 1,503 m., most often found between 100–600 m a.s.l. Recorded temperature within the roosts varies from -1 to 12.5 °C. Observation was possible mainly during hibernation, and sometimes by mist netting in autumn. Usually we've met only isolated individuals in winter, but summer bat detector records reveal that is a common species in riparian areas. As for other dendrophilous species, the current knowledge of its distributional status is also not complete.

International and conservation status:

Bern Convention, Appendix II;
Bonn Convention, Appendix II;
EU Habitat and Species Directive, Annex IV.



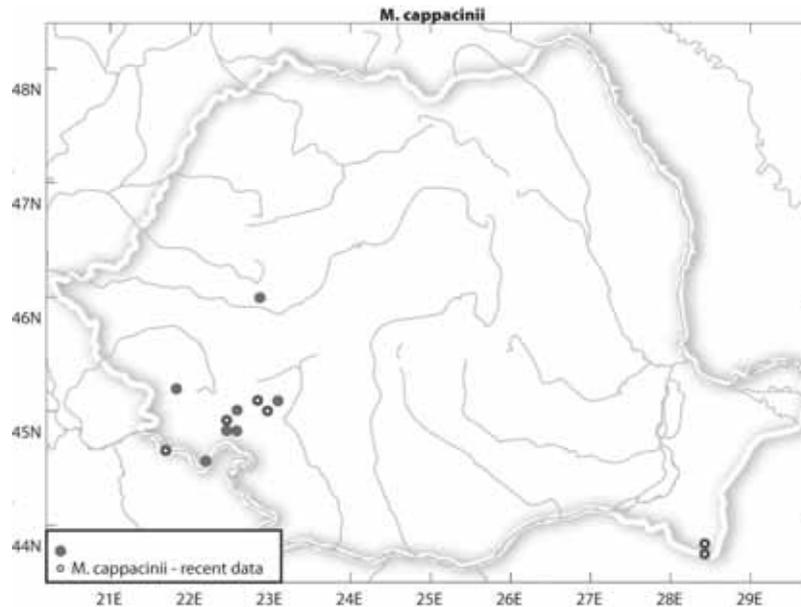
Myotis brandtii (Evermann, 1845) & **Myotis mystacinus** (Kuhl, 1817)

Distribution in Europe: these sibling species' distribution in Europe seems to be widespread and common in Northern Europe, rare and fragmentally in the central and south-eastern part of the continent.

Habitat and population status: *M. brandtii* occur more frequently than *M. mystacinus*, in woodland and water areas, less often on human settlements. Both species hibernate in underground shelters. In Romania, *M. brandtii* was first signalled in 1986, by Grimmberger in the Dobrogea region. This information was unknown for Romanian bat workers until 1999. In Carpathians, Szanto found this species for the first time in 1996. Since then, *M. brandtii* and *M. mystacinus* are found more often. There are 19 records, from 9 caves. The altitude of the sites varies between 33 m and 1,503 m a.s.l. Temperature within the caves diverge from 5.6 to 20.3 °C. Few mist netting records, in front of different shelters, provide evidence for *M. brandtii*, which seems to be present in all geographical regions of Romania. Where identification was not possible, for hibernating individuals we noted *M. brandtii/mystacinus*. Both species are considered rare in Romania, with an unknown population status. The identification of these morphologically closed sibling species, which recently were split into four species (*M. brandtii*, *M. mystacinus*, *M. alcathoe* and *M. aurescens*) (Benda & Tytsulina, Helversen et al), is difficult. New species potentially are present in the bat fauna of Romania, as both occur in the neighbourhood countries. But until now, their presence was not confirmed.

International and conservation status:

Bern Convention, Appendix II;
Bonn Convention, Appendix II;
EU Habitat and Species Directive, Annex IV.



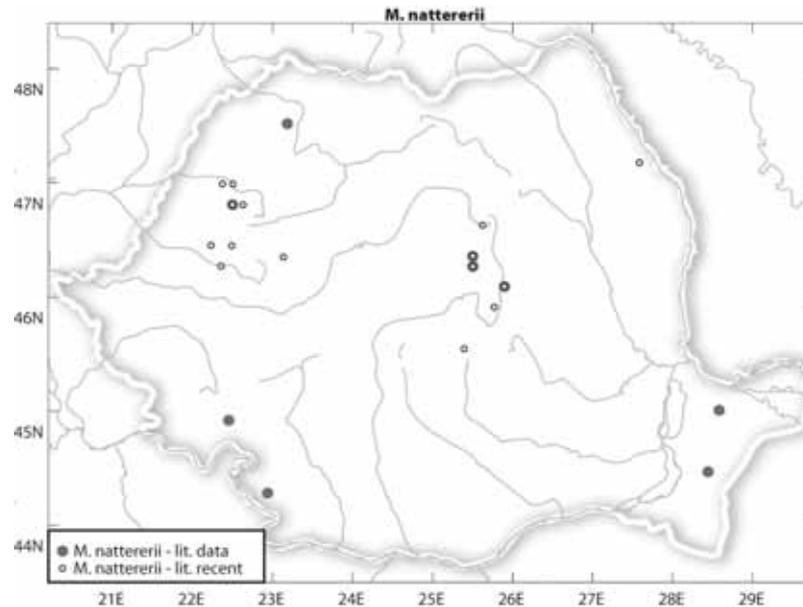
Myotis cappacini (Bonaparte, 1837)

Distribution in Europe: eastern coast of Iberia and Southern Europe, with the northern limit in Romania.

Habitat and population status: It is a cave dwelling bat, which occurs during the whole year in underground shelters. Requires warm caves, not far away from water sources. Is a highly endangered bat species within all Europe, also in Romania. It was recorded 17 times, in 8 underground sites. The altitudinal span of the records varies from sea level (15 m) up to 742 m;; most often can be found between 50–400 m a.s.l. Recorded temperature within the roosts is between 2 and 7.5 °C, in winter; 10.8 and 15.8, in summer. It is a rare bat species, and shows a distributional discontinuity in Romania. It has one population on the Danube Valley, on the southern slopes of South-Western Carpathians, and another population occurs in Dobrogea, the cost of the Black Sea. It disappeared from several sites mentioned by literature sources from the 1960's. Few hundred females sum nursery colonies. In summer, usually they form clusters together with *M. schreibersii* and *M. myotis/myotis*. We identified two important sites, both hosting nursery colonies, one of these with approx. 500 specimens. In winter, there were found only small aggregations of few 10 specimens. Total protection of nursery sites is required. Human activities within the caves can cause negative effects. During a whole year, the total number of individuals in these caves is up to 1,500 specimens.

International and conservation status:

Bern Convention, Appendix II;
 Bonn Convention, Appendix II;
 EU Habitat and Species Directive, Annex II & Annex IV;
 IUCN Red List VU A2c.



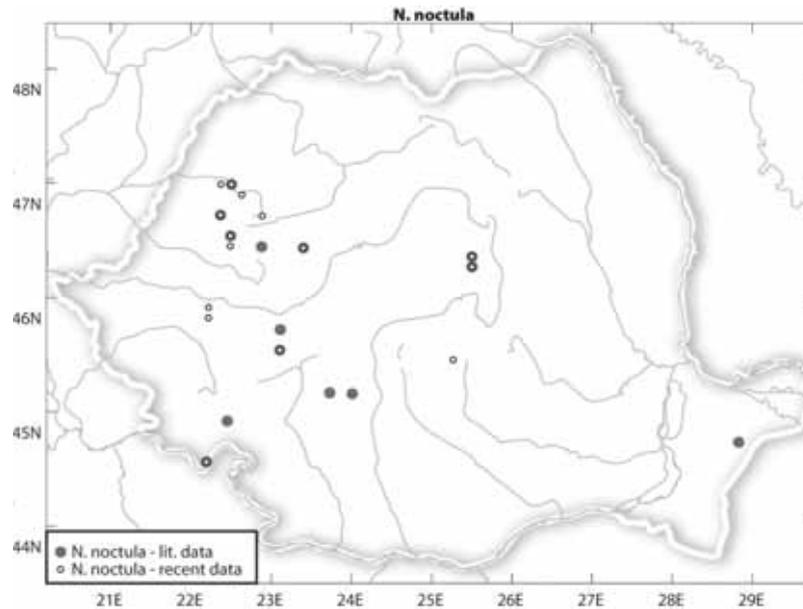
Myotis nattereri (Kuhl, 1817)

Distribution in Europe: widely distributed throughout Europe.

Habitat and population status: it is a forest dwelling bat, which occur in buildings and bat boxes during summer, in shelters, also in caves and mines during winter. Few individuals were recorded 15 times in 12 underground sites, mainly during autumn by mist netting and in hibernation. The altitudinal span of the records range from 328 to 1.032 m a.s.l. Recorded temperature within the roosts varies between 0.1 and 7.4 °C. No summer colony is known, but during hibernation, the species was identified with a total number of 35 bats in two caves in the Moneasa region (Western Romania). As the species occur accidentally in caves, there is very few information about the status of population and its distribution.

International and conservation status:

Bern Convention, Appendix II;
Bonn Convention, Appendix II;
EU Habitat and Species Directive, Annex IV.



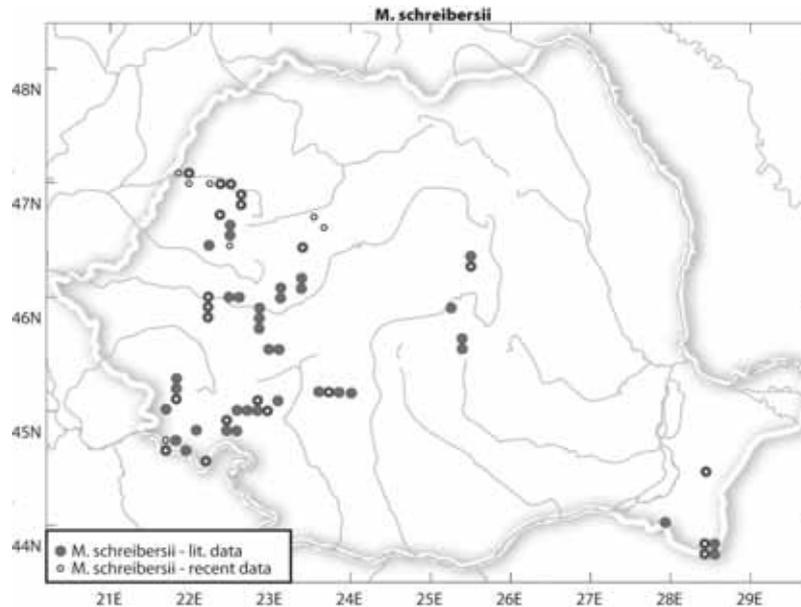
Nyctalus noctula (Schreber, 1774)

Distribution in Europe: widespread, from the Iberian Peninsula to Ural.

Habitat and population status: this species use trees throughout the year, but nowadays it seems that the species has adapted also to buildings, particularly in Central Europe. This mainly forest dwelling bat is considered frequently in Romanian caves, especially during the mating and hibernation period. We recorded it 23 times in 9 caves. The altitude of the sites varies from 60 to 1,279 m a.s.l.; most often recorded between 300–600 m. Temperature measured in caves ranges from -1.2 up to 12.5 °C. Most of our records originate from mist netting in front of caves, during late August and September. But they are also present in caves during hibernation, represented by few isolated specimens, up to more than 1,000 individuals. They could form free hanging clusters together with *Pipistrellus pipistrellus* as in Huda lui Papara Cave, or could be present in rock crevices at cave entrance. The Noctule bat is common and abundant in Romania; their observation in caves seems to be a particularity of the hibernating bat aggregations.

International and conservation status:

Bern Convention, Appendix II;
 Bonn Convention, Appendix II;
 EU Habitat and Species Directive, Annex IV.



Miniopterus schreibersii (Kuhl, 1817)

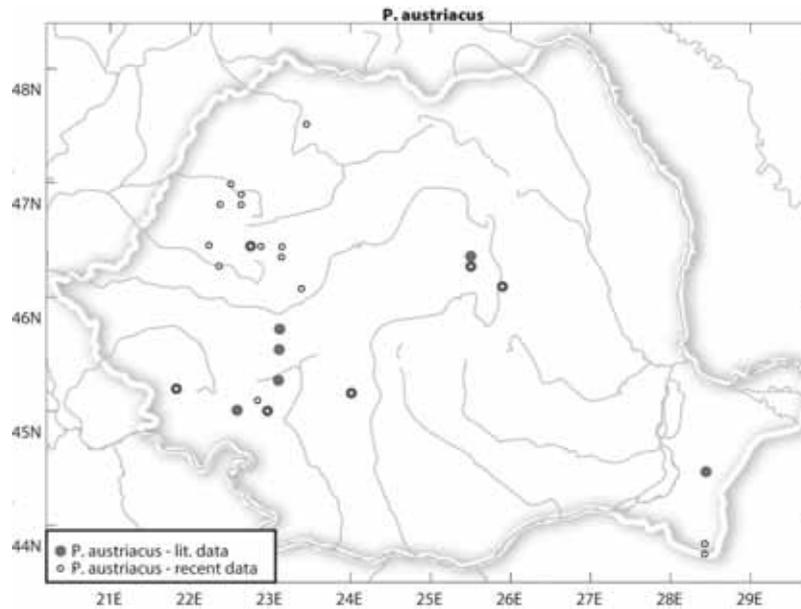
Distribution in Europe: Southern Europe, from Iberia to Caucasus.

Habitat and population status: during the whole year, the species use almost exclusively underground sites. They form large nursery colonies, of few thousand bats, sometimes together with *M. myotis/blythii*, in south also with *M. capaccinii*. Decline of species became evident at the northern border of distribution, also in Romania. Nursery colonies described in the '60s, formed by 12,000 specimens, nowadays disappeared. *M. schreibersii* vanished from almost half of the sites mentioned in the literature as hosting this species 4 decades ago. We recorded 88 it times, in 25 caves. The altitudinal span of the records varies from the sea level (12 m) to 823 m,,; most often can be found between 200–550 m a.s.l. The general distribution pattern of the species is similar to that of *R. ferrumequinum* and *M. myotis/blythii*, present frequently in the south and western regions of the country. It inhabits lower altitude karstic areas. Temperature within the hibernacula ranges from –1.7 to 11 °C; in summer roosts between 9.3 and 15.8 °C.

We identified 7 important sites, where maternity colonies of the species are larger than 1,000 individuals (can reach 4,500 specimens). Hibernaculum rarely host up to few hundred bats, with one exception: Huda lui Papara Cave, which hosts a very large aggregation of 30,000–33,000 specimens during the winter months. Human disturbance can cause dramatic damages. Since most of the population is concentrated in few roosts – especially in this unique hibernation site, which is also Europe's largest hibernaculum – effective protection measures are urgently required. The estimated number of specimens, during a year, within the target caves reaches 60,000.

International and conservation status:

Bern Convention, Appendix II;
Bonn Convention, Appendix II;
EU Habitat and Species Directive, Annex II & Annex IV;
IUCN Red List LR: nt;
Key species for the National Bat Monitoring Programme.



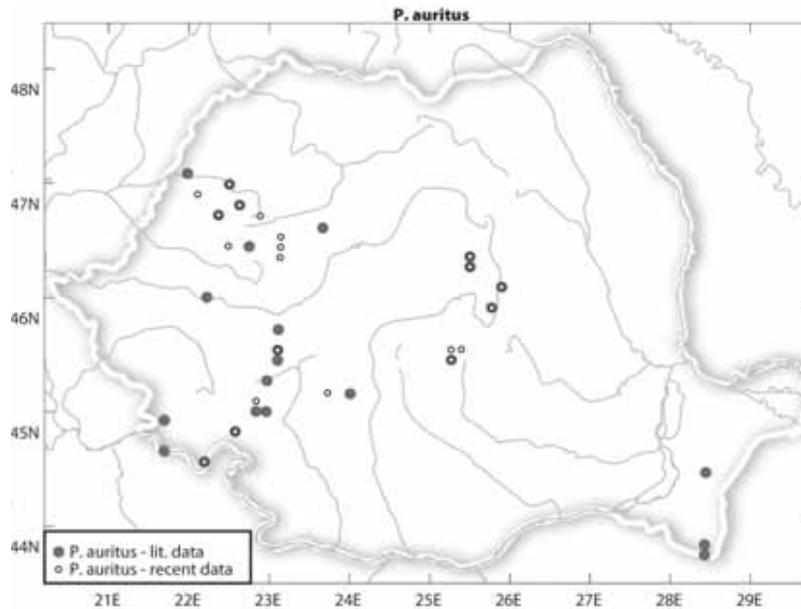
Plecotus austriacus (Fischer, 1829)

Distribution in Europe: widespread in Western, Southern, Central and Eastern Europe.

Habitat and population status: it is associated with open agricultural landscapes, and frequently occurs on human settlements. Hibernates in buildings, caves and trees. Relatively numerous throughout Europe, and also Romania. We recorded it 14 times in 13 caves, mainly solitary individuals, usually by mist netting in front of the caves and in hibernation, during winter months. The altitudinal range of the records varies between sea level (12 m) and 1,032 m; the temperature of the sites between -2.4 and 13.1 °C.

International and conservation status:

Bern Convention, Appendix II;
 Bonn Convention, Appendix II;
 EU Habitat and Species Directive, Annex IV.



Plecotus auritus (Linnaeus, 1758)

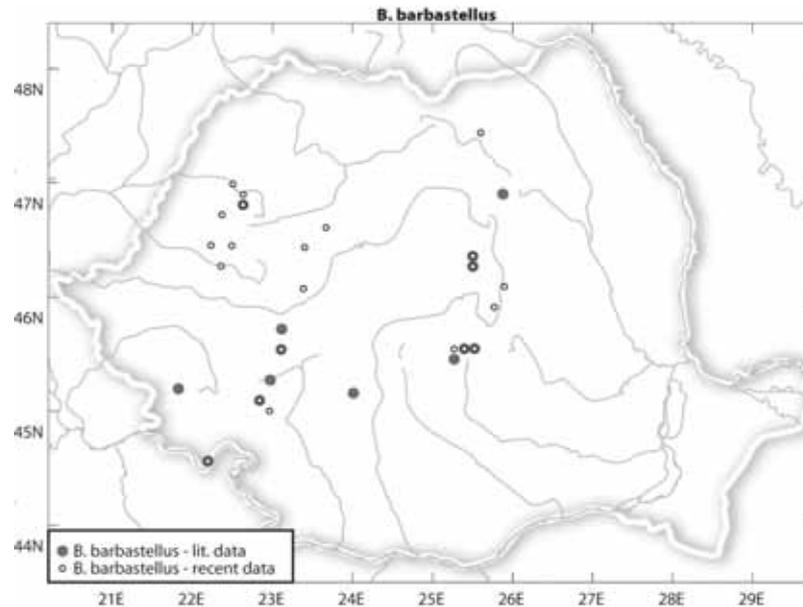
Distribution in Europe: widespread throughout the European continent.

Habitat and population status: generally a woodland species, relatively restricted to mountain areas, which uses also roof spaces of buildings during summer. Hibernates in buildings, trees, caves and mines. It is abundant in Northern Europe, but it is rather rare in the south. It is widespread in Romania; we observed mainly solitary individuals 32 times, in 21 caves. The altitudinal range of the records varies between sea level (33 m) and 1,279 m a.s.l., predominantly found at medium height (500–900 m). Temperature of the sites varies from 0.6 to 20.3 °C.

In comparison with *P. austriacus*, it is more common, found often in caves during hibernation and migration, but as a forest dwelling species, little is known about the population's status.

International and conservation status:

Bern Convention, Appendix II;
Bonn Convention, Appendix II;
EU Habitat and Species Directive, Annex IV.



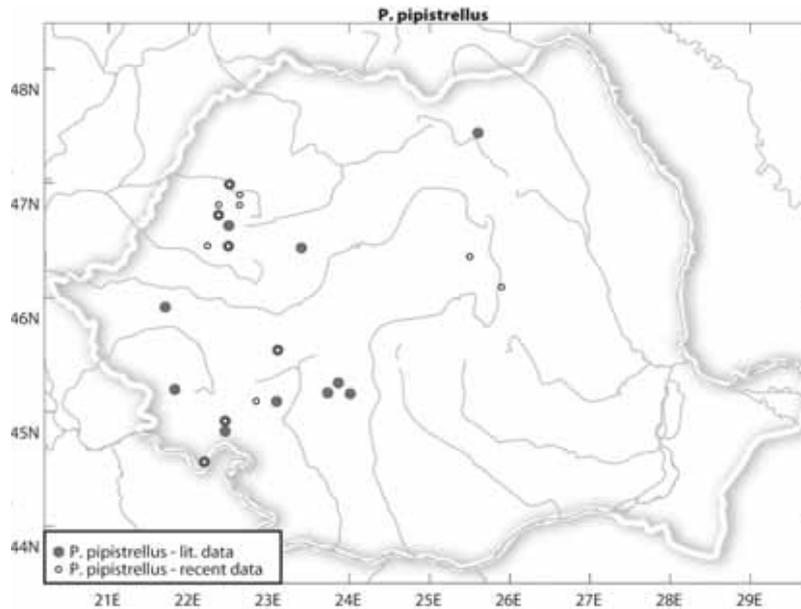
Barbastella barbastellus (Schreber, 1774)

Distribution in Europe: throughout the European continent, except most of Scandinavia and much of Southern Europe.

Habitat and population status: it seems that it prefers the forest habitat, in the cold sub-mountain and mountain zone. During winter, roosts in tree hollows, buildings, also in underground sites. A population decrease has been reported in most of its European range. It is one of the rarest bats in Western Europe. Last year's research in Romania proved that it is more abundant than was supposed in the past. Its presence, until 1995, was mentioned only in 6 caves. We've met it 43 times in 18 caves, mainly in winter. The occurrence and density of this bat seems to be higher in the Western Carpathians than in the Southern ones, and is missing from Dobrogea region. The altitudinal range of the records is from 60 m (the only exception recorded less than 300 m) to 920 m a.s.l., predominantly found at medium height (300–600 m). Temperature of hibernaculum varies between -3.2 and 6.2 °C. Larger aggregations of Barbastelle (up to 50 specimens) are recorded in two huge underground systems (Huda lui Papara Cave and Sura Mare Cave), where their number is probably underestimated. It is very sensitive to disturbance. Hibernation roosts, where it is present in a higher number, should be protected.

International and conservation status:

Bern Convention, Appendix II;
 Bonn Convention, Appendix II;
 EU Habitat and Species Directive, Annex II & Annex IV;
 IUCN Red List VU A2c.



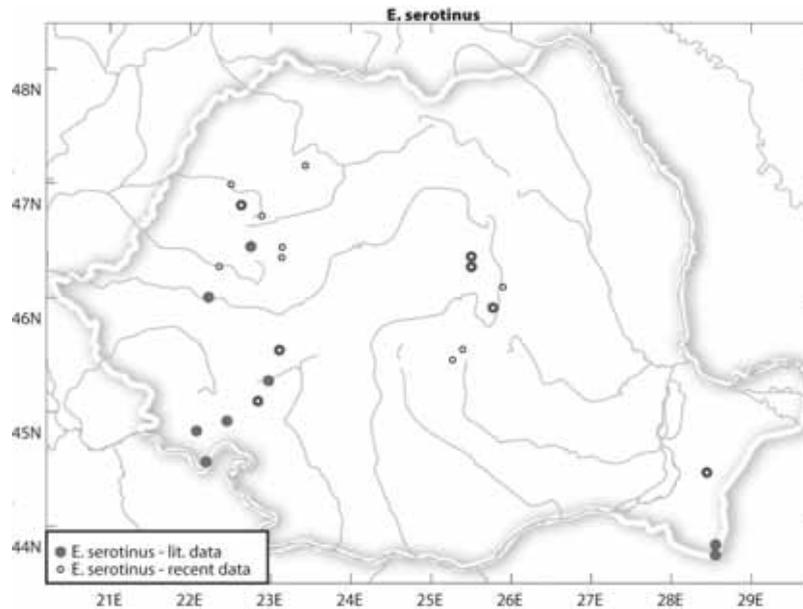
Pipistrellus pipistrellus (Schreber, 1774)

Distribution in Europe: widely distributed in Europe.

Habitat and population status: occurs in tree holes, bat boxes, buildings, particularly in the Carpathian basin, where it uses caves for hibernation. It is one of the most common bat species in Europe. It is a cryptic species (*P. pipistrellus*/*P. pygmaeus*), and its distribution range cover the main part of Europe, also Romania. Until now, in caves, we recorded only *P. pipistrellus*. It is a common and relatively abundant species in Romania. We observed it 14 times in 13 caves. The altitudinal range of the records is from 60 to 1,032 m; most often can be found between 300–600 m a.s.l. Temperature of the sites varies between –1.7 and 12 °C. Very large aggregation occurs during winter months; other findings were results of mist netting during summer and autumn period. Two caves (Huda lui Papara Cave and Sura Mare Cave) host the main aggregations, which sum approx. 50,000 individuals. Other smaller clusters, from 100 up to 1,000 Pipistrelle are present in 4 caves. They could form free hanging clusters on the cave cellars, and can be found also in rock crevices. Human disturbance, during wintertime, can cause the decrease of the aggregation numbers. These two remarkable caves require protection measures during hibernation.

International and conservation status:

Bern Convention, Appendix II;
Bonn Convention, Appendix II;
EU Habitat and Species Directive, Annex IV.



Eptesicus serotinus (Schreber, 1774)

Distribution in Europe: widespread in most of the European continent, except northern countries.

Habitat and population status: highly synantropic species, with summer roosts mainly in buildings, occasionally in trees. For hibernation they use building attics and crevices; in South-Eastern Europe one can meet them also in caves. Population probably is stable within its range. In Romania, we recorded it 19 times in 12 caves, in small numbers, mainly during hibernation, or they were caught during summer by mist netting in front of the caves. The altitudinal span of the records is from 50 to 1,279 m a.s.l. Temperature of the sites varies between 5.6 and 11.3 (19) °C. As this species is not a characteristic bat for caves, little information is known about its distribution status.

International and conservation status:

Bern Convention, Appendix II;
 Bonn Convention, Appendix II;
 EU Habitat and Species Directive, Annex IV.

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List of bat species and their status in Romania

THE NAME OF THE SPECIES	NATIONAL PRIORITIES			NATIONAL MONITORING	IUCN STATUS
Rhinolophus blasii 1,2		M			LR:nt
Rhinolophus euryale 1,2		M			VU A2c
Rhinolophus ferrumequinum 1,2	H			C	LR:nt
Rhinolophus hipposideros 1,2	H			C	VU A2c
Rhinolophus mehelyi 1,2	H				VU A2c
Myotis bechsteinii 1,2	H				VU A2c
Myotis blythii 1		M		C	LR:lc
Myotis capaccinii 1,2		M			VU A2c
Myotis dasycneme 1,2	H			O	VU A2c
Myotis daubentonii			L	D	LR:lc
Myotis emarginatus 1,2		M			VU A2c
Myotis brandtii			L		LR:lc
Myotis myotis 1		M		C	LR:nt
Myotis mystacinus			L		LR:lc
Myotis nattereri		M			LR:lc
Vespertilio murinus			L		LR:lc
Eptesicus nilsonii			L		LR:lc
Eptesicus serotinus			L	D	LR:lc
Pipistrellus nathusii 2		M		O	LR:lc
Pipistrellus pipistrellus			L	D	LR:lc
Pipistrellus kuhlii			L		LR:lc
Pipistrellus pygmaeus			L	D	
Hypsugo savii			L		LR:lc
Nyctalus lasiopterus 2		M			LR:nt
Nyctalus leisleri 2		M			LR:nt
Nyctalus noctula			L	D	LR:lc
Plecotus auritus			L		LR:lc
Plecotus austriacus			L		LR:lc
Barbastella barbastellus 1,2	H			O	VU A2c
Miniopterus schreibersii 1,2	H			C	LR:nt

National priority (H = high; M = medium; L = low)

National monitoring (C = cave monitoring; D = detector monitoring; O = other monitoring)

¹EU Annex II, ²Eurobats

VU – Vulnerable; LR:nt – Lower Risk near threatened; LR:lc – Lower Risk least concern



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Survey of Romania's
Underground Bat Habitats
Status and distribution of cave dwelling bats
2002-2004