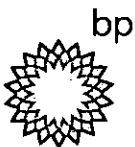
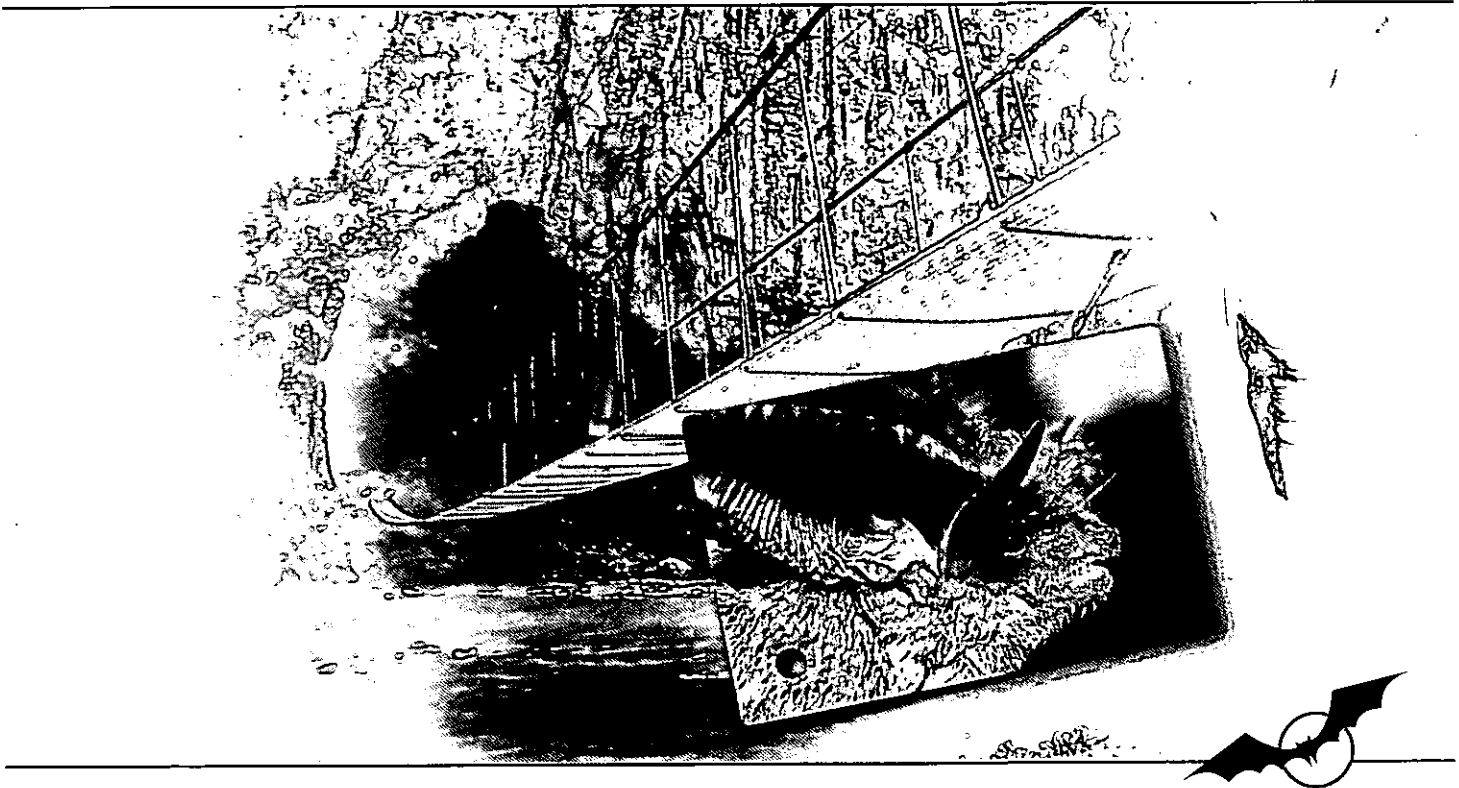


Survey of the Western and Southern Carpathians' underground bat habitats

Status and distribution of cave dwelling bats

2002-2003



DEFRA
Department for
Environment,
Food & Rural Affairs





Final report for the BP Conservation Programme & Bat Conservation Trust/DEFRA
Survey of the Western and Southern Carpathians' underground bat habitats Programme was
generously supported by:

British Petrol Conservation Programme Bronze Award 2002
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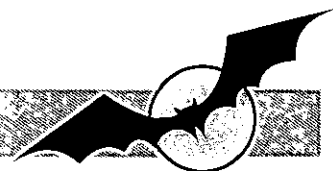
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Bat Conservation Trust

Layout by Lizard

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Summary

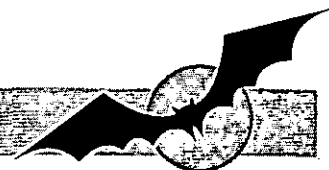
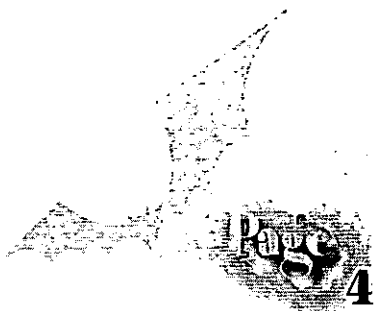
The Western and Southern Carpathians' large karstic areas provide many suitable underground roosts for large cave dwelling populations. Limited available data are still an obstacle in the conservation effort of these species and sites. During 10 months (April 2002-February 2003) the team has conducted a summer and a winter survey for 48 caves. These activities were connected with popularisation of bat conservation, through spreading leaflets and holding educational workshops. A database was built using unpublished and literature data of distributional records about 64 caves. Distribution maps and population status description for 19 bat species were provided. During surveys we recorded more than 85,000 specimens of 17 bat species. According to IUCN, from these species 7 are vulnerable and 4 species are near threatened. New distributional records were established for *Rhinolophus ferrumequinum*, *Rh. hipposideros*, *Rh. euryale*, *M. myotis/blythii*, *M. emarginatus*, *M. brandtii*, *M. nattereri*, *Plecotus austriacus*, *Pl. auritus*, *Barbastella barbastellus* and *Eptesicus serotinus*. We could offer estimation for the population size of *Rh. ferrumequinum*, *Rh. hipposideros*, *Rh. euryale*, *M. myotis/blythii*, *M. capaccinii* and *Miniopterus schreibersii*. We identified and described 10 key sites, as important for bat conservation, on regional and international level. Generally, the cave dwelling bats' sites have been seriously threatened by human activities, like unauthorized tourism, sometimes even vandalism (killing of bats, fire in caves) and stone excavations. To increase public awareness in conservation of cave dwelling bats, leaflets were made and distributed. In addition educational and training workshops were held for volunteers. During the programme we kept contact also with the mass media. In cooperation with the Institute of Speleology of the Romanian Academy of Science we made a proposal for obtaining protection status for important bat roosts: 10 caves within the target territories. The team members (Romanian and Polish students) collaborated during the programme with different national NGOs, as the Romanian Bat Protection Association, institutions and other international partners.





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Aims and objectives

The goal of the programme was to conduct a field survey on the Southern and Western Carpathians' underground sites. These activities were connected with popularization of bat conservation, by spreading leaflets and holding educational workshops. Literature and unpublished data were used for evaluation of population status and distribution of endangered cave dwelling bat species. Our goals were 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've enterprise the following activities:

Survey work

◆ Meetings between team members and volunteers took place to establish the details of the field surveys. We obtained necessary permissions for visiting caves with special protected status or touristical caves. Two surveys were conducted: one in summer (June 24-July 8, 2002), and one in winter (December 20-23, 27-28, 2002 and January 3-13, 2003). Travel was done by cars, as most of the caves are situated far from the main public transportation lines. During cave visits we used standard datasheets. Mist netting in front of the caves was done with nets produced by Ecotone, Poland. For each captured specimen, the next standard values were noted: emergence time, body mass (measured with portable Pesola spring scale), forearm length (using calipers to the nearest 0.5 mm), sex, age, 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. In this way we reduced the disturbance and obtained more accurate evaluation. Bat detectors (Petterson D200) were used in emergency situation, when large numbers of bats were present. The number of bat passes was recorded, per unit time basis.

◆ Threats of the underground sites were recorded. Each visited cave position was established with GPS. We visited 48 caves altogether in the target areas. The team members and volunteers (15 persons) have spent 151 days on the field. We counted more than 85,000 specimens of 17 bat species. We established new distribution data for the following species: *Rhinolophus ferrumequinum*, *Rh. hipposideros*, *Rh. euryale*, *M. myotis/blythii*, *M. emarginatus*, *M. brandtii*, *M. nattereri*, *Plecotus austriacus*, *Pl. auritus*, *Barbastella barbastellus*, and *Eptesicus serotinus*. Details of find-



ings are available in the Confidential Report.

Educational work

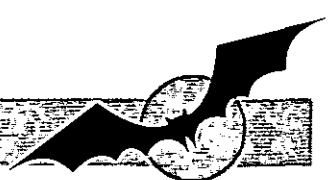
- ◆ We prepaid and edited a leaflet for popularizing bats and the cave dwelling bats conservation. We edited it in 850 samples (A5 format, 8 pages), with color photos, in Romanian language, with a short English summary of the programme. It was distributed during survey work for the local community members (schools), administration bodies of touristical caves, and speleological clubs.
- ◆ We hold 4 popularizing and training workshops for speleological club members. The training courses contain information about bat biology, endangered cave dwelling species, and monitoring methods. A few volunteers from involved clubs took part in the winter fieldwork.

Data evaluation, 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 the 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, beside the data collected during this programme, we used data collected after 1995. This ment a survey of cave dwelling bats in 64 caves, within the territory. The main parts of these data are the results of different survey works done by the team members during the last years. Based on these records, we gave for each recorded species a short description, and produced distribution maps, with Dmap software.
- ◆ We identified key sites with high diversity on bat species level. We proposed to competent authorities (Speleological Institute of the Romanian Academy of Science (R.A.S.) and Board of the Natural Monuments / R.A.S. the protection of 10 important underground sites in the West-

ern 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 02.08.2001. This law will be completed with this appendix, and will contain the list of caves, as important bat roosts. Detailed description of these key sites is presented below.

- ◆ Our report and suggestions will be sent in February 2003 to the administrative body of the natural reserves, which host on their territories important caves for bat conservations (Retezat National Park, Cerna Valley – Mehedinti Natural Reserves, Apuseni Mountains proposed National Park). This could be used for the future management or action plan in specific areas.

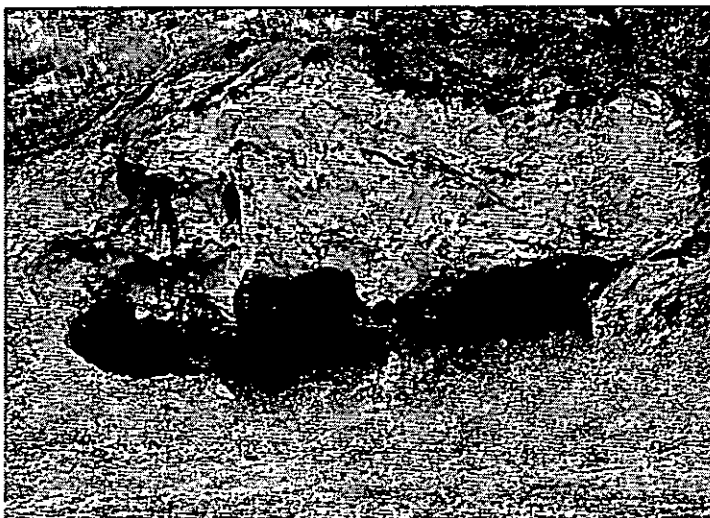


Public awareness

◆ We printed 850 leaflets, which were continuously handled to local stakeholders, community members, speleological clubs. During the programme we had contact with mass media representatives. The main publicity will be made on the 15-18 February this year, when the National TV regional staff will produce a short movie about the last survey work from this winter.

◆ For the scientific community, we presented our result during the 7th Advisory Committee Meeting of the Eurobats/UNEP, May 27-29, in Bucharest; and at the XIth European Bat Research Symposium, August 26-30, 2002, in Le Havre; A short communication will be edited in *Studia Chiropterologica*, Krakow.

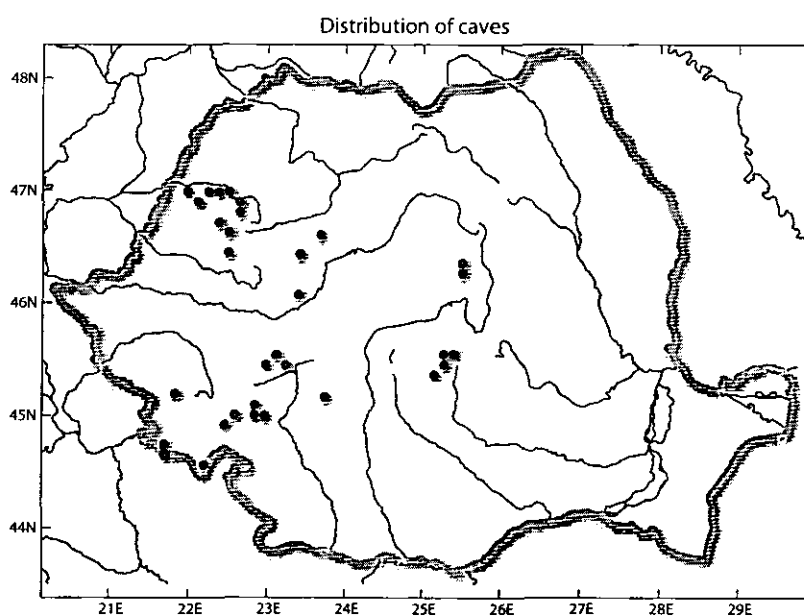
◆ The outputs will be offered also for Eurobats as an addition, next to the National Report for 2003, according to the Agreement on the Conservation of Bats in Europe.



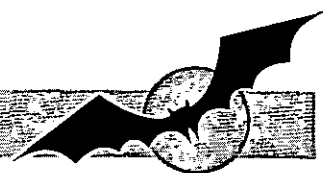
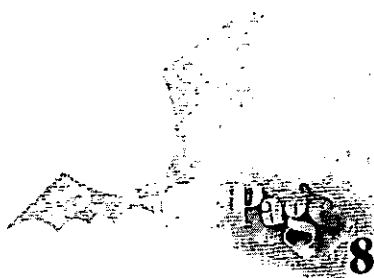


Characteristics of the cave dwelling bat fauna of Southern and Western Carpathians

The Southern and Western Carpathians mountains, in Romania, hold the largest karstic territories within the country. In Romania there are more than 12,000 caves, and 2/3 parts of these are situated in this area. Our caves were selected according to the following criteria: length, entrance dimension, number of large chambers, corridors and available literature data on bats. The caves are situated between 62 and 683 m altitude. The distribution of these caves is presented in Table 1.



During the programme we recorded 17 bat species out of the approx. 30 Romanian bat species. Some of them, as *Myotis nattereri*, *M. daubentonii*, *Plecotus austriacus*, *Pl. auritus* or *Eptesicus serotinus* occur accidentally and mainly in hibernation caves. Highly cave dependent species, like *Rhinolophus* species, *Miniopterus schreibersii* and *Myotis myotis/blythii* occur in a larger number. We could estimate precisely their population in the visited caves. We recorded new distributions for vulnerable species like, *Barbastella barbastellus* and *Myotis emarginatus*. Detailed description of each species is presented above.





West Carpathians

Huda lui Papara cave

N 46023'04.5"

E 023017'32.6"

This cave hosts during wintertime the largest known aggregation of 10 bat species in Europe. Hosting up to 56,000 of bats it is an unique site, with high international importance. The fact here we can found the largest know *M. schreibersii* aggregation from Romania, composed by 30,000 – 33,000 specimens, increases the value of the site. Beside of this species, there are present *M. myotis/blythii* with up to 4,500 specimens, *Rh. ferrumequinum* with up to 700 individuals, and *Barbastella barbastellus* with up to 50 specimens. The cave was used for touristical purposes few decades ago. Nowadays it has lost it's administration body. Tourists, frequently use the cave mainly in summer. In wintertime the high water level make difficult the access. It is the most important action for the bat conservation in Romania, to develop a proper management plan in the near future.

Sighistel Valley caves

N 46031.398'

E022 033.229'

It is a natural reserve, and the valley hosts almost 40 caves. The majority of small sites cannot provide suitable condition for larger bat colonies. But these cavities in wintertime could serve as roosting places for solitary bats as, *B. barbastella*, *P. auritus*, *M. daubentonii*. Two large caves are important hosts for bats. Coliboaia cave hosts in winter *Rh. ferrumequinum* up to 800 individuals hibernating; in summer housing 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.

Meziad cave

N 46045.638'

E022 027.979'

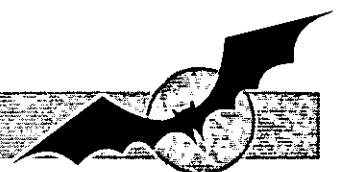
A popular place for tourists, visited daily in summer by large groups, under guidance. The cave houses nursery colony of *M. myotis/blythii* (~2,000 individuals), and *M. schreibersii* (~4,000 specimens). This colony of Schreiber's Bats is the largest in the Western Carpathians. In winter 8 species of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

Tasad cave

N 46'55,307

E 022'07,308

This cave host the largest known *Rh. euryale* nursery colony. On the borderline of the northern distribution's territory in Romania and Europe, this small cave provides suitable condition for up to 500 specimens. The cave doesn't have any touristical value, occasional visitors mainly local peoples can affect the colony. Protected status is required for the site.



Astileu cave

N 47000.928'

E022 023.894'

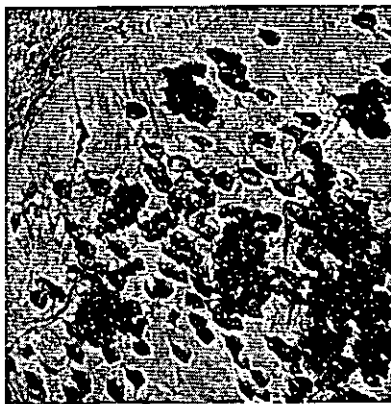
The cave is used for gaining water for the village, with the same name. In `60 was built a dam inside the cave for capturing the water. Since than the cave is not often visited, as the local people use the gained water for drinking and cooking. This cave hosts the largest nursery colony (~ 5,000 bats) of *M. myotis/blythii* in Western Carpathians. The cluster is mixed with approx. 1,000 *M. schreibersii*.

cu Apa din Valea Lesului cave N 46049'29.2"

E 022033'27.4"

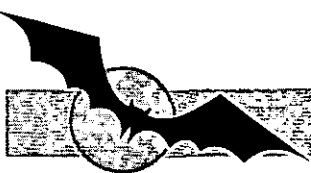
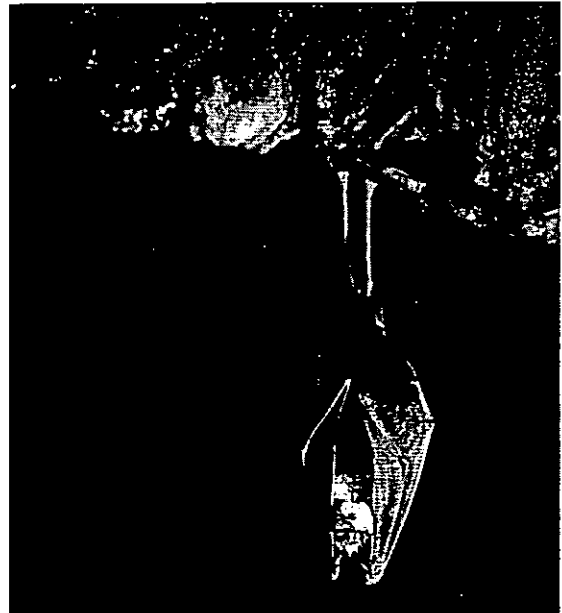
It is one of the most important hibernacula in the western part of the country. We have recorded during the years, 16 bat species, like *Rh. hipposideros*, *M. dasycneme*, *M. emarginatus*, *M. bechsteinii*, *M. brandtii*, or *B. barbastellus*. *M. myotis/blythii* (up to 3,500 specimens) and *Rh. ferrumequinum* (up to 850 specimens) compose the main aggregations. Mainly speleologists visit the cave.

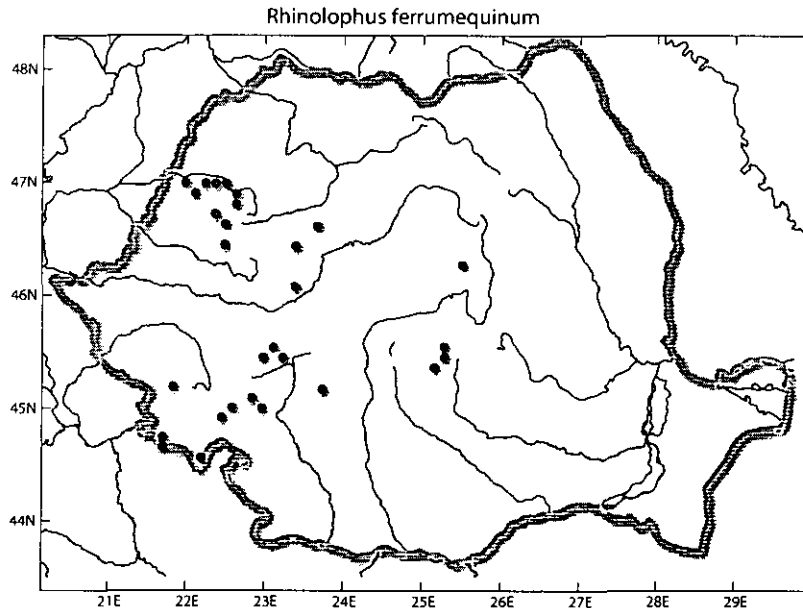
As a conclusion of our results we can assume that these regions in Romania still host important bat populations on regional and international level. The number of *Rh. ferrumequinum* and *M. schreibersii* decreases. As being transitional country, in Romania local people just now start to develop the regional and rural tourism. In many cases one of the touristical objectives are these caves. Proper management plans are rarely accepted, in most of the case are missing. From our experience the management plans do not consider the environmental point of view of caves protection. But we think that our work means an important step, to achieve our main objectives: to preserve and to restore the cave dwelling bat populations level. Further cooperation with these underground sites administration is required and highlighted in the near future.



This work gives an overview of the cave dwelling bat status and distribution in South and West Carpathians. The visited caves are the representatives ones for these areas. But still there are sites that never were surveyed. New records could be appearing in future. For a general overview of the bat fauna in Romania, is not enough to survey only the underground roosts. New techniques – like bat detectors, now are available for survey of the forest dwelling bats. To complete

this work, is needed more time, more human resource and last but not least, financial support.





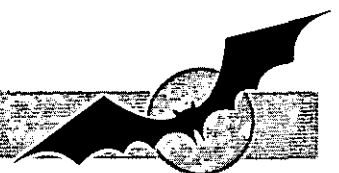
Rhinolophus ferrumequinum (Schreber, 1774)

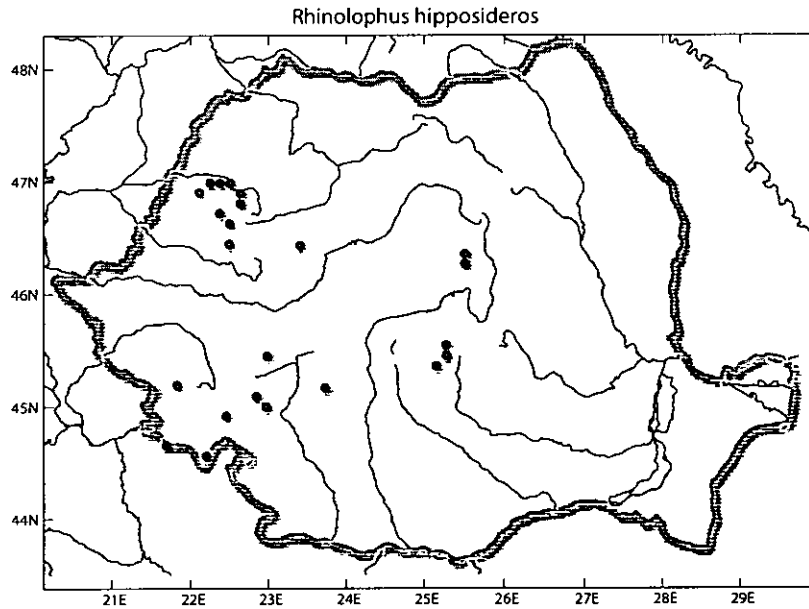
Distribution in Europe: Southern and Central Europe.

Habitat and population status: requires caves, mines and attic roosts. We found it in 51 caves on target territories. It is the most widespread species in the Western and Southern Carpathians. Large hibernation aggregations (from 100 to over 1000 bats) are present in 9 underground roosts. 1,634 specimens, within a cave in South Romania, compose the largest known aggregation. During summer, usually they form colonies about 10 specimens. Summer roosts are located mainly in attics, which cause the discrepancy between large winter and few summer records. Hungarian bat workers established migratory routes in the '90s. Their attic dwelling nursery colonies, located in the floodplain of Tisa River, regularly hibernate in the caves of the Western Carpathian Mountains. The longest record movement is of 320 km. As a result of winter speleological activities, in few caves or stone quarries a drastical number decline was observed. The estimated number of specimens in these caves, during one year, is about 4,750 bats.

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)

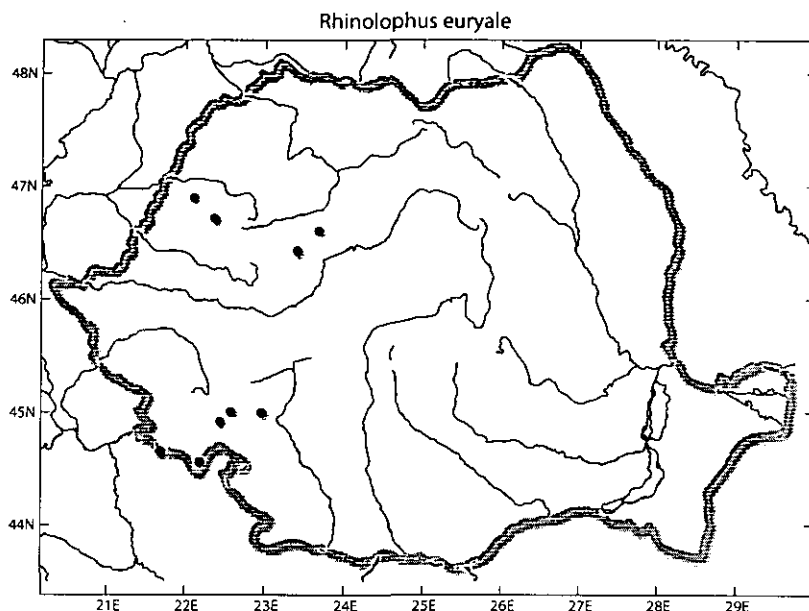
Distribution in Europe: Western, Central and Southern Europe.

Habitat and population status: roosts in caves throughout the year, but frequently in buildings, during summer months. It is an endangered species both in Europe and Romania. Widespread in the research territories, recorded in 42 caves. Compose colonies and aggregations, from few specimens up to 100 individuals. The largest nursery colony (80 specimens), composed mainly by females with young's, was observed for the first time in the summer of 2002, in the Cerna Valley. The largest hibernation aggregation lives in a cave from the South-Eastern Carpathians (120 bats). Usually one can meet colonies from 5 individuals up to 30-50 specimens. The populations size of the lesser horseshoe bat apparently stabilized. Human disturbance can cause negative effects in winter. Estimated number of specimens in one year in these caves is up to 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;
 Key species for the National Bat Monitoring Programme.





Rhinolophus euryale Blasius, 1853

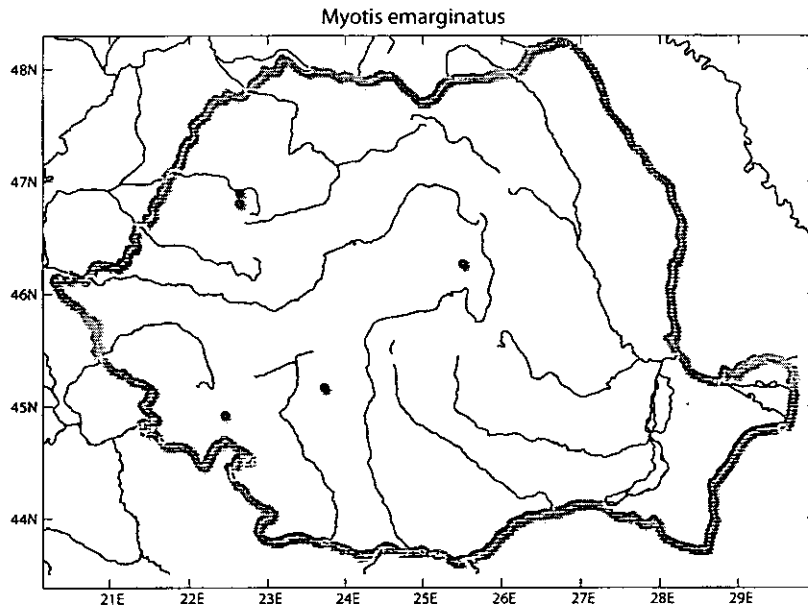
Distribution in Europe: southern part of the European continent, with northern border in central France, southern Slovakia and western Romania.

Habitat and population status: roosts during the whole year in underground sites. Populations declined during the last decades in most of their range. They can be found in only 12 caves. In the Southern Carpathians they occur more frequently than in the western part. We recorded only two stable nursery colonies, one composed by approx. 500 specimens. In winter they form aggregations of few specimens, up to 20 individuals. They 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 these bats roosts. Total protection of these caves should be required. Estimated number of specimens in one year in these caves is up to 1,000.

International and conservation status:

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





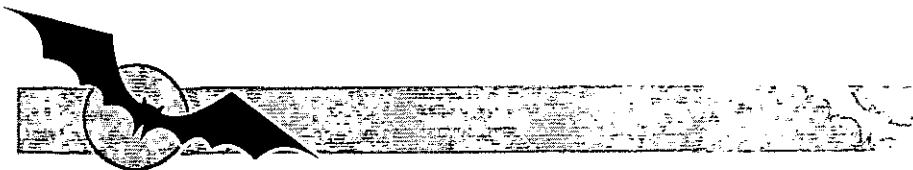
Myotis emarginatus (Geoffroy, 1806)

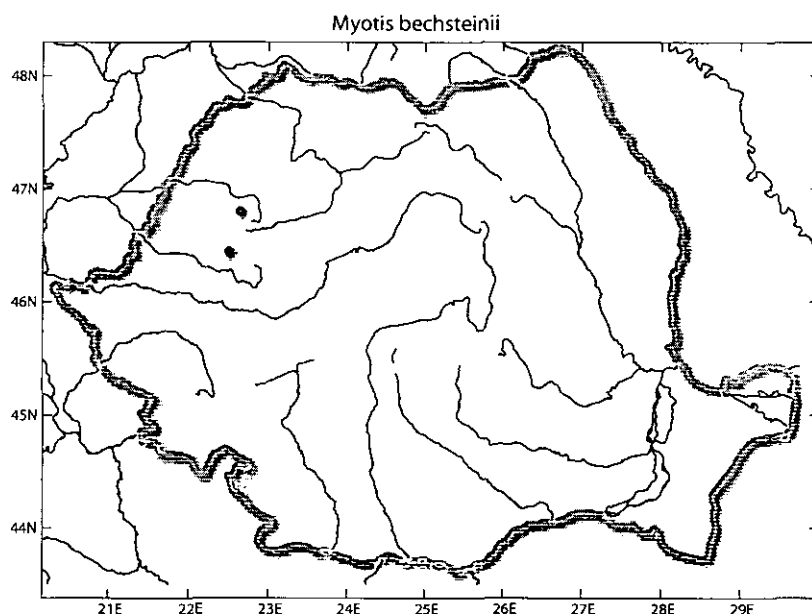
Distribution in Europe: mainly in Southern, South-Eastern and Central Europe

Habitat and population status: it is a cave and attic dwelling bat. Numerous populations live in the Balkans and France, rarely in others areas. It is one of the rarest bats in Romania. According to literature, until 1995 it has been only one sample recorded in Romanian caves. Since than it was found in church attics and few underground sites, in small numbers. We observed it only in 4 caves. Last observation of 8 specimens was made in South Romania, in January 2003.

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 Azc.





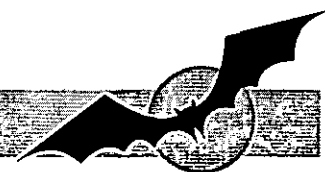
Myotis bechsteinii (Kuhl, 1817)

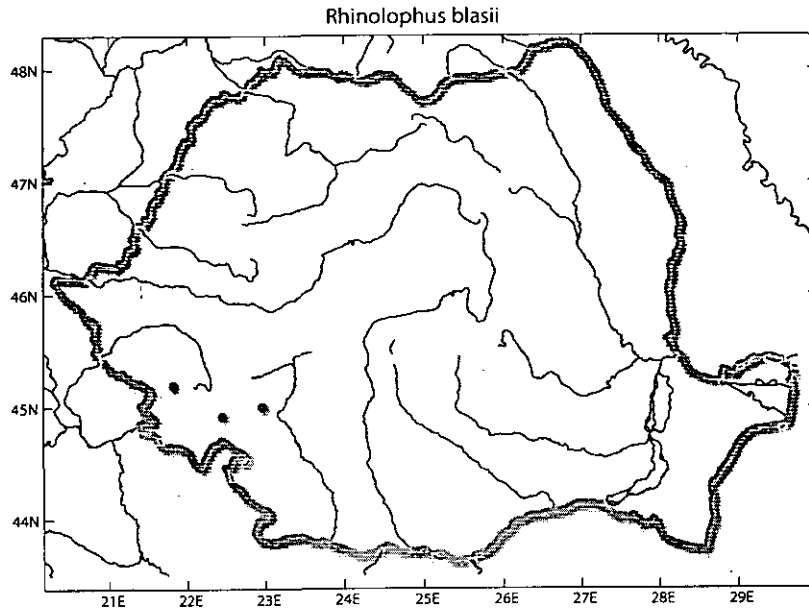
Distribution in Europe: from Western Europe to east of Ukraine, with the northern border in southern Sweden.

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, rarely found in underground shelters. It is considered rare almost everywhere, common only in adequate habitats. Our records from caves came from summer and autumn mist nettings. 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.





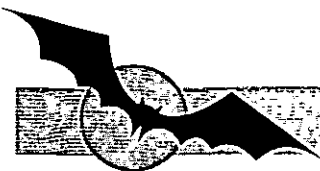
Rhinolophus blasii Peters, 1866

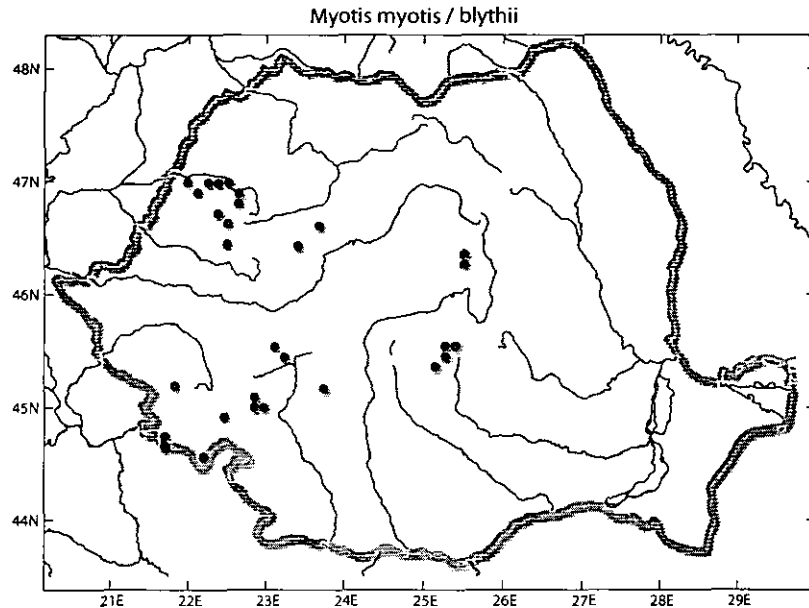
Distribution in Europe: from Balkans up to South-Western Romania

Habitat and population status: roosting sites in caves. Population status is not known. Signed in literature, between 1950-1960, 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.





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

Distribution in Europe: throughout 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 in 44 caves. Since these sibling species range overlap in the research territory, and adequate identification was not always possible, we discuss the theme together. 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. Summer colonies were found more frequently than winter aggregations. These species usually compose 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 in one year, within the target caves, is up to 28,800.

International and conservation status:

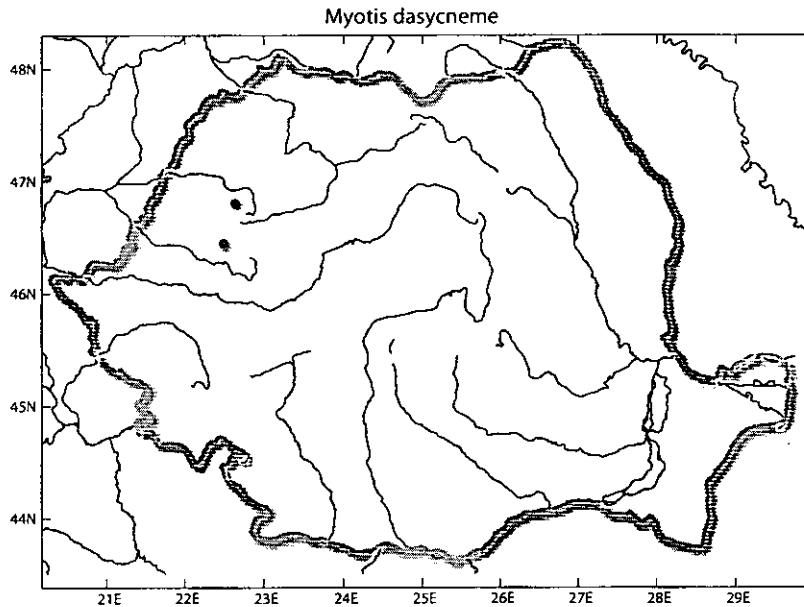
Bern Convention, Appendix II;
Bonn Convention, Appendix II;
EU Habitat and Species Directive, Annex II & Annex IV;

Myotis myotis

IUCN Red List LR: nt.

Key species for the National Bat Monitoring Programme.





***Myotis dasycneme* (Boie, 1825)**

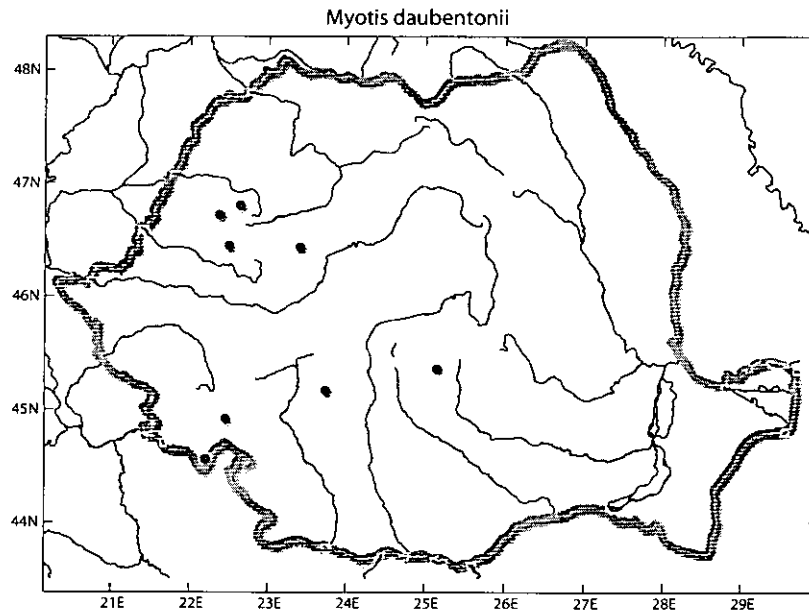
Distribution in Europe: restricted for several countries. Occur in Netherlands, northern Germany, southern Sweden, Denmark, Poland, the Baltic region, Hungary, Slovakia, Ukraine and Romania.

Habitat and population status: recorded mainly in riparian vegetation and open water surface; during hibernation appearing in underground roosts. It's one of the rarest bat species from Europe. We recorded it in a small number (up to 15 specimens), only in winter, in 3 caves located in the Western Carpathians. Additional bat detector records of the species were undertaken in the same regions, near to stagnant waters. It was never observed in caves before 1995. 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.





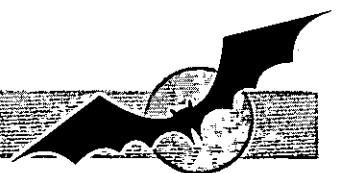
Myotis daubentonii (Kuhl, 1817)

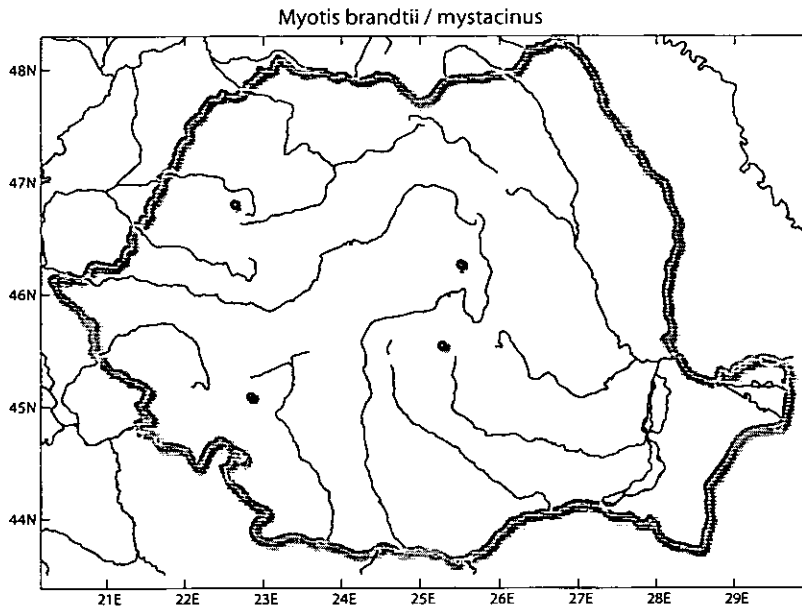
Distribution in Europe: from the western part of Europe to the Urals, and from central Scandinavia to northern Greece.

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 was recorded in 10 caves, 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. It was never observed in caves before 1995.

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)

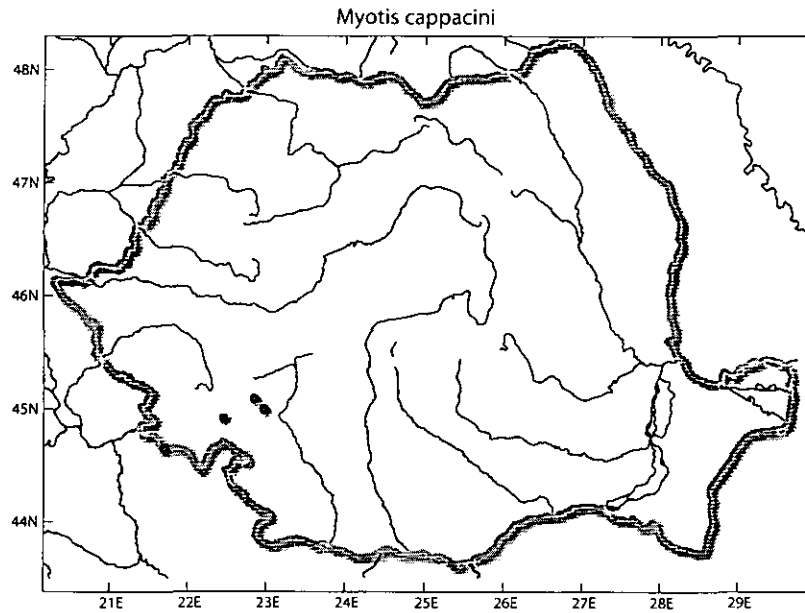
Distribution in Europe: these sibling species distribution in Europe seems to be widespread and common in northern Europe, rare and fragmentally distributed in the central and south-eastern part of the continent.

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 by Grimmberger in 1986, in the Dobrogea region. This information was unknown for Romanian bat workers until 1999. In Carpathians Szántó found this species for the first time in 1996. Since than *M. brandtii/mystacinus* was found in 4 caves, located in the Western and Southern Carpathians. Two mist netting records, in front of different shelters, provided evidence for *M. brandtii*. 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.

International and conservation status:

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





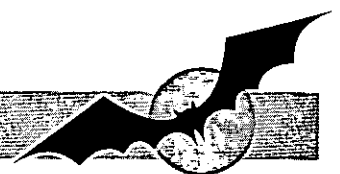
***Myotis capaccinii* (Bonaparte, 1837)**

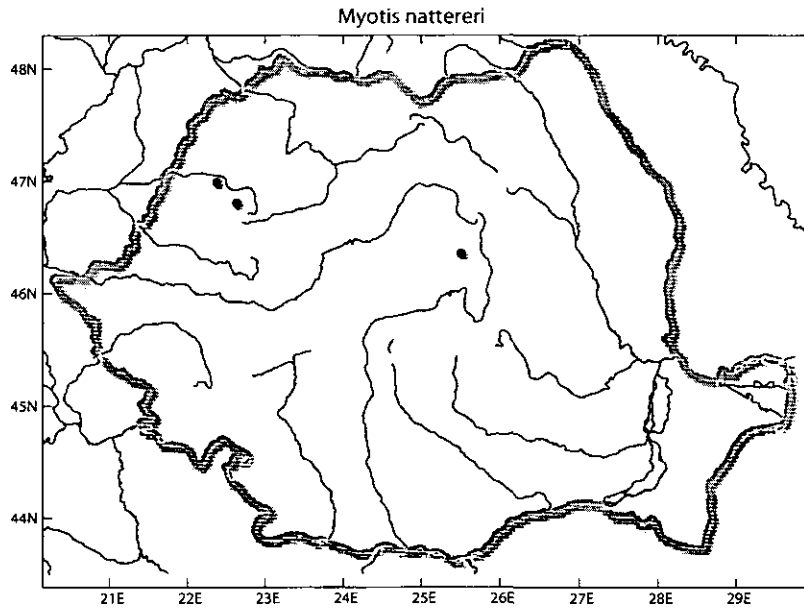
Distribution in Europe: eastern coast of Iberia and southern Europe, with the northern limit in Romania.

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 bodies. Few hundred females compose nursery colonies. In summer usually they form clusters together with *M. schreibersii* and *M. myotis/myotis*. Is a highly endangered bat species within all Europe, also in Romania. It occurs only in the southern part of the country. It was recorded in 6 caves, with only two nursery colonies, one of these with approx. 500 specimens. Total protection of nursery sites is required. Human activities within the caves can cause negative effects. The total number of individuals, in one year, in these caves is up to 1,100 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.





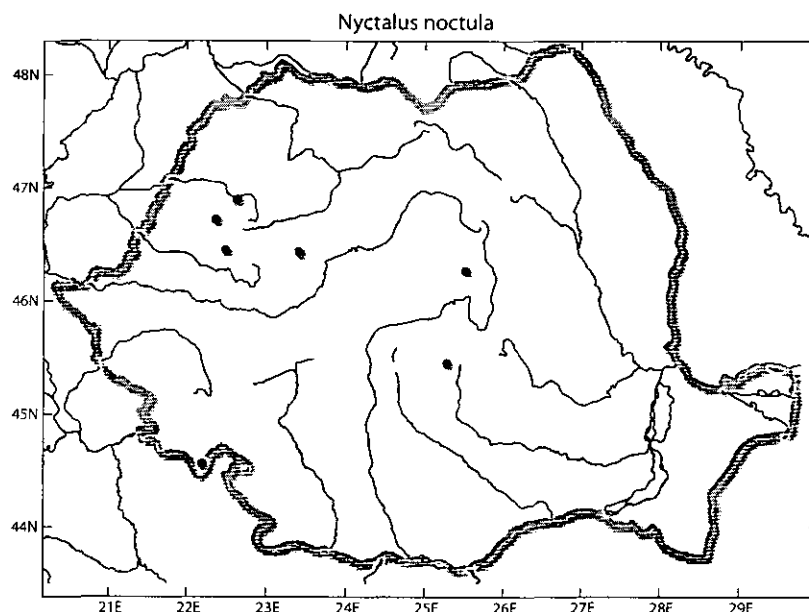
Myotis nattereri (Kuhl, 1817)

Distribution in Europe: widely distributed throughout Europe.

Habitat and population status: it is a forest dwelling bat, which occur during summer in buildings, bat boxes, during winter in shelters, also in caves and mines. Very few individuals were recorded, only in 3 underground sites, mainly during autumn by mist netting, and in hibernation. According to literature, it was never observed before in caves in the target area. As the species occurs accidentally in caves, there is very few information about population's status.

International and conservation status:

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



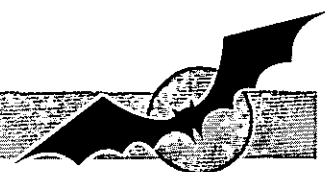
Nyctalus noctula (Schreber, 1774)

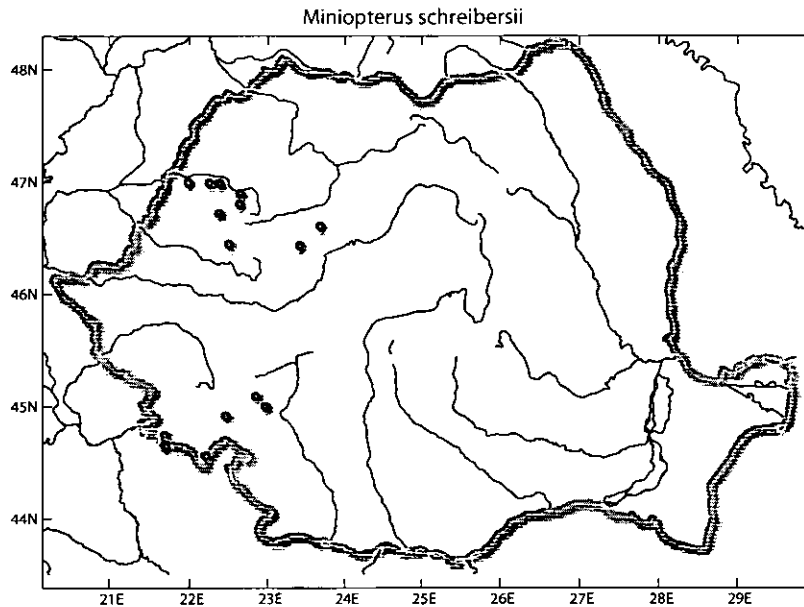
Distribution in Europe: widespread, from the Iberian Peninsula to Ural.

Habitat and population status: this species use trees throughout the year, but nowadays it seems that it has adopted buildings, particularly in Central Europe. This mainly forest dwelling bat seems to use frequently caves, predominantly in mating and hibernation period in Romania. We recorded in 7 caves, by mist netting in late August and September, the Noctule bat. But also they are present in caves during hibernation, represented by few isolated specimens, up to 1,000 individuals. They form clusters together with *Pipistrellus pipistrellus*. 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)

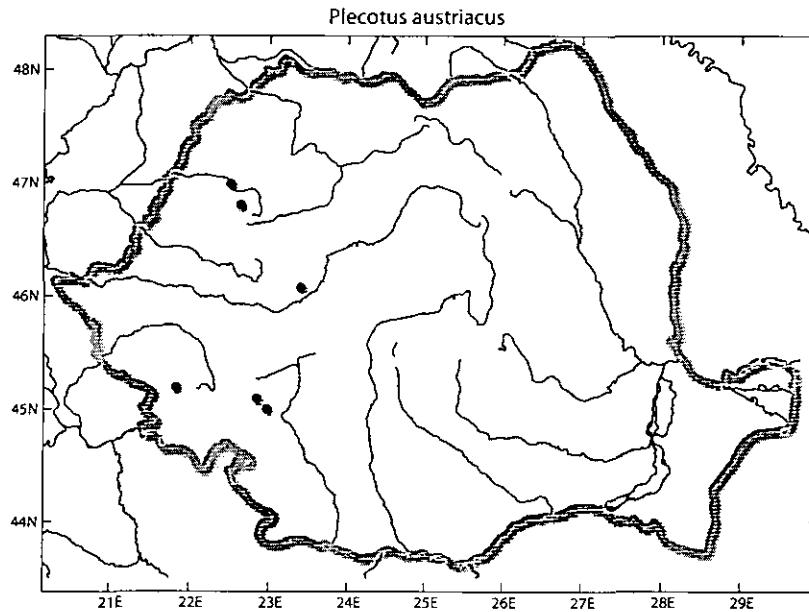
Distribution in Europe: southern Europe, from Iberia to Caucasus.

Habitat and population status: they use almost exclusively underground sites, during the whole year. They form large nursery colonies, of few thousand bats, sometimes together with *M. myotis/blythii*, in south also with *M. capaccinii*. Decline of species is evident in the northern border of distribution, like Romania. Colonies composed by 12,000 specimens, described in the '60s, nowadays disappeared. *M. schreibersii* disappeared from almost half of the sites mentioned in the literature as hosting this species 4 decades ago. We found the Schreibers's bat in 20 caves. 7 maternity colonies from 400 up to 4,500 individuals are located in the area. Only one cave host a very large aggregation of 30,000-33,000 specimens, during the winter months. Other hibernacula rarely host up to few hundred bats. Human disturbance can cause dramatic damages. Since most of the population is concentrated in few roosts, especially in this unique hibernation site, effective protection measures are urgently required. Estimated number of specimens, in one year, within the target caves is up to 47,800.

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)

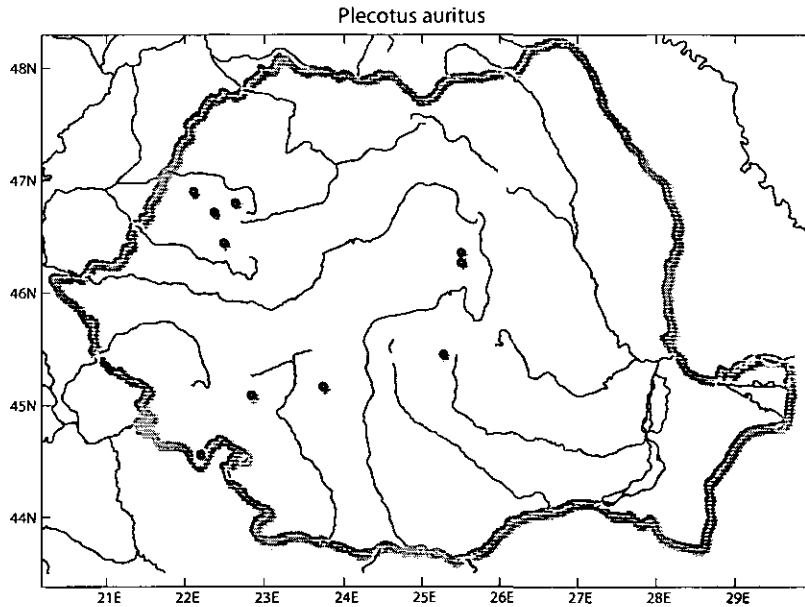
Distribution in Europe: widespread in Western, Southern, Central and Eastern Europe

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. We recorded it in 8 caves, mainly solitary individuals, usually during winter months. No literature data from the caves is available.

International and conservation status:

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





Plecotus auritus (Linnaeus, 1758)

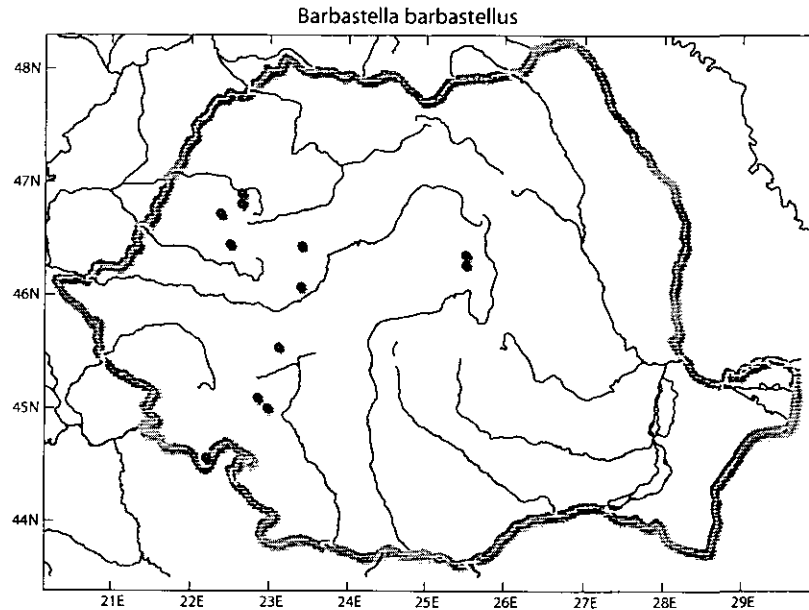
Distribution in Europe: widespread throughout the European continent

Habitat and population status: Generally a woodland species, but uses also roof spaces of buildings in summer. Hibernates in buildings, trees, caves and mines. It is abundant in Northern Europe, but it is rare in the south. It is widespread in Romania; we observed solitary individuals in 13 caves. As a forest dwelling species, is not common in caves, and 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.





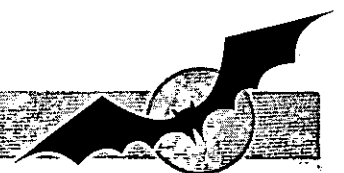
Barbastella barbastellus (Schreber, 1774)

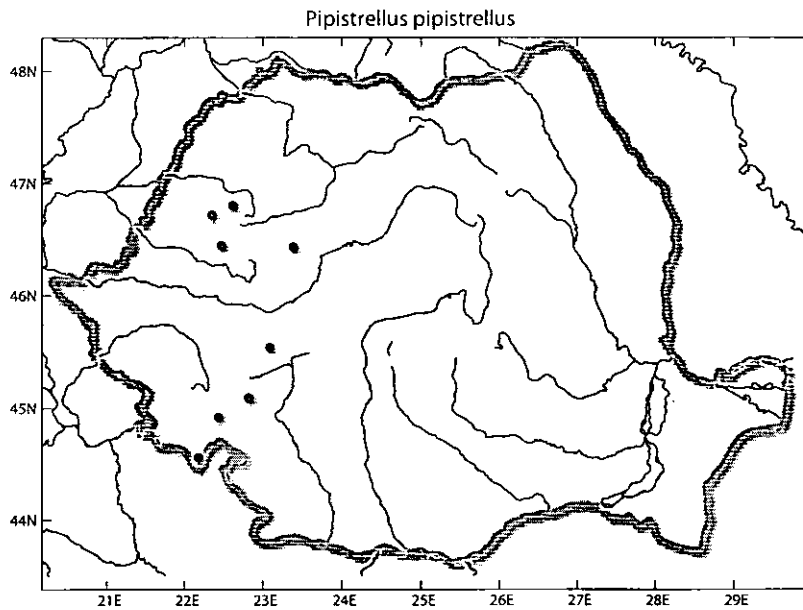
Distribution in Europe: throughout the European continent, except most of Scandinavia and much of Southern Europe.

Habitat and population status: it seems that it prefers the forest habitat, in the submontane and montane zone. Roosts in tree hollows, buildings, during winter also in underground sites. A population decrease has been reported in most of its European range. Is one of the rarest bats in Western Europe. Last year's research in Romania proved that is more abundant than was supposed in the past. His presence, until 1995, was mentioned only in 4 caves. We've met it in 16 caves, mainly in winter. The occurrence and density of this bat seems to be higher in the Western Carpathians than in the Southern ones. Larger aggregations of Barbastelle (up to 50 specimens) are recorded in huge underground systems, 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..





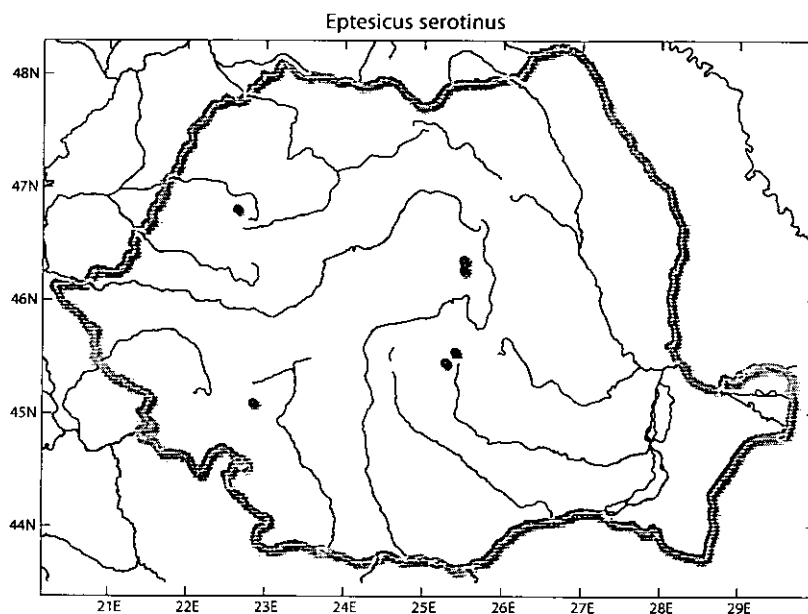
Pipistrellus pipistrellus (Schreber, 1774)

Distribution in Europe: widely distributed in Europe

Habitat and population status: Occurs in tree holes, bat boxes, buildings, and particularly in the Carpathian Basin, where it uses caves for hibernation. It is one of the most common bat species in Europe. They are cryptic species (*P. pipistrellus*/*P. pygmaeus*), and the distribution range overlap in the main part of Europe, also in Romania. Our records in caves, until now, were only *P. pipistrellus*. It is a common and relatively abundant species in Romania. We recorded it in 9 caves. Very large aggregation occurs during winter months, other findings were the results of mist netting during summer period. Two caves host the main aggregations, which are composed by approx. 50,000 individuals. Other small clusters, from few tens up to 400 pipistrelle are present in 4 caves. Human disturbance, during wintertime, can cause the increase 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.



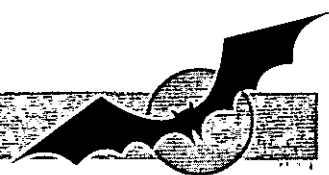
Eptesicus serotinus (Schreber, 1774)

Distribution in Europe: in most parts of the European continent, except the 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 the South-Eastern Europe one can meet them also in caves. Population probably is stable within its range. In Romania, we recorded it in 6 caves, in small numbers, mainly during hibernation. As this species is not a characteristic bat for caves, little information is known about population status.

International and conservation status:

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





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Reported by Levente Barti, Anna Gas, Zoltán Nagy, Tomasz Postawa, László Szántó





Survey of the Western and Southern Carpathians'
underground bat habitats
Status and distribution of cave dwelling bats
2002-2003