

**VANATORI NEAMT NATURAL PARK ADMINISTRATION  
ROMANIA**

**STUDIES AND RESEARCH  
IN VANATORI NEAMT NATURAL PARK**

**STUDII ŞI CERCETĂRI  
ÎN PARCUL NATURAL VÂNĂTORI NEAMŢ**

**VOL.I**

**Editors:  
RĂZVAN DEJU and SEBASTIAN CĂTĂNOIU**

**2005**

# RESULTS ON THE INVESTIGATION ON BATS' FAUNA IN VANATORI NEAMT NATURAL PARK AND CONSERVATION STATUS OF THE OCCURRING BAT SPECIES

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**Abstract.** In this paper we will present our results of bat research done within the Natural Park territory in 2002-2003. During the research we used mist nets, Heterodine bat detectors, and day time visits in the buildings and tree holes in the forests in order to identify the bat species. We found the following species: *Myotis bechsteinii* (Kuhl 1817), *Myotis mystacinus* (Kuhl 1817), *Myotis daubentonii* (Kuhl 1817), *Myotis nattereri* (Kuhl 1817), *Eptesicus serotinus* (Schreber 1774), *Nyctalus noctula* (Schreber 1774), *Pipistrellus pipistrellus* (Schreber 1774). As a conclusion of this study is that it would be important to start a bat monitoring program within the Park territory focused on the key species, and to assure the protection of bat habitats by keeping undisturbed the forests patches with old trees.

**Keywords:** bats, spreading, shelter.

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## Introduction

In this paper we will summarise the results of our research at the territory of Vanatori Neamt Natural Park done in 2002-2003. There are articles describing the Romanian bat fauna but there were no such studies within the Natural Park territory. (Dumitrescu M. et al. 1962-1963; Valenciuc N., 1992-1993; Valenciuc N., 2002). Therefore, our results can not be compared with older literature data.

The vegetation in the Park territory, the geographical position and the climate are suitable both for bats who have shelters in buildings and forests and to those who can be found in rock crevices.

## Materials and methods

The field work was performed in Augusts of 2002 and 2003. We checked similar places in both seasons and used the same methods.

The following methodology was used during our work:

- Mist netting (ornithological mist nets which were mounted after the sunset) for the identification of the individuals (there were identified the species, age, weight, forearm length, presence of parasites). After the measurements all the bats were released without any injuries.
- Detecting bats using Pettersson D100 and D200 heterodyne bat detectors in order to identify the flying species
- During day time we checked old houses, churches and we entered the attics of buildings in order to identify the possible shelters of building dwelling bats. The species were identified and the colony size was estimated by counting the individual numbers. In conditions of bad visibility we used binoculars and photos had been taken.
- In order to find the shelters of the forest dwelling bats we checked the artificial boxes for birds and the tree cavities.

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## Results and discussion

During the study we found the following bat species:

*Myotis bechsteinii* (Kuhl 1817)

*Myotis mystacinus* (Kuhl 1817)

*Myotis daubentonii* (Kuhl 1817)

*Myotis nattereri* (Kuhl 1817)

*Eptesicus serotinus* (Schreber 1774)

*Nyctalus noctula* (Schreber 1774)

*Pipistrellus pipistrellus* (Schreber 1774)

*Plecotus auritus* (Linnaeus 1758)

*Plecotus austriacus* (Fischer 1829)

### *Myotis bechsteinii*

This medium-sized bat is characterised by long ears, although they are shorter than those of long-eared bats. It is wide spread in central Europe, France and northern Iberian peninsula south to Italy, and to western Ukraine and Romania. (Burton.J., 2002) In combination with the broad wings, these ears enable the bats to detect and glean sitting prey from leaves and stems by performing slow search and hovering flights. Spiders and harvestmen (Phalangida) are also eaten frequently. In summer, Bechstein's bat uses forests more intensely than any other native bat species. Nursery colonies, which rarely consist of more than 20 females, are established in tree holes. Animals from several nursery colonies within a given forest area are closely related and form a social unit. On average, roosts are changed every two days. Single Bechstein's bats have also been found behind bark and in cavities as low as the base of the trunk. The foraging area of a nursery colony of 20 individuals covers at least 250 hectares consisting of multi-storied deciduous or mixed forest with a rather thin understory. (Meschede, A & Güthler, W. & Boye, P. 2001; Meschede, A. & Heller, K. G. 2000) Only underground winter shelters are known for Bechstein's bat.

We found the species at surroundings of Dragos Voda Bison Reserve territory in 09. 2003.

### *Myotis mystacinus*

The species is the smallest among the *Myotis* bats. It is widespread throughout in Europe except the extreme north and majority of Iberian peninsula. (Burton. J., 2002) It also occurs on many Mediterranean islands. Prefers the mountain and hill area occurs in deciduous forests. Forms small colonies in hollow tree, sometimes in buildings. Due to hibernation in caves or in rock crevices it is not sensitive to temperature variations. This bat often hunts over the water or along the forest edge. Its food consists of small flying insects (mosquitoes and other dipteras). The summer and winter roosts usually are close to each other.

Being a small bat of only 5 to 7 grams, Brandt's bat is highly mobile. When considering the needs of this bat, the importance of links between forests and the surrounding landscape become clear. Females of a tree-dwelling nursery colony regularly flew up to 11 km along hedges and ditches to their foraging areas. They hunted to a great extent inside their roost forest, mainly before the young were born. We found the species in the following places: Icoana Valley in 29.07.2002, Secu Monastery in 31.07.2002, Cuvioasa Teodora cave near Sihla Hermitage in 01.08.2002, Chitele pond in 02.08.2002, vicinity of forest road Alunul - Faget in 02.08.2002.

### *Myotis daubentonii*

The species is strongly connected with the presence of water. It hunts exclusively over its surface (ponds, lakes). It occurs in majority of Europe apart from northern Scandinavia, Italy and larger part of the Balkans (Burton. J, 2002). Winter roosts usually are located under the ground. Its

migration rout between the summer and winter roosts is up to 100 km. Daubenton's bats are typical tree dwellers. In summer can be found in hollow trees more often than in buildings. It typically hunts in prolonged flights at a constant low height above the water surface, continually raking insects from the surface as it flies. It feeds mostly with dipteras. Suitable roosts for establishing nursery colonies are found in surrounding forests. Those bats easily cover distances of seven to eight kilometres between roost and hunting area. Nevertheless, tree holes (like woodpecker holes or cracks in stems, often in living trees) are more suitable when they are located at forest edges and no further away than 1.5 km from the nearest water. (Meschede, A & Güthler, W. & Boye, P. 2001; Meschede, A. & Heller, K. G. 2000)

The species is rare in Romania (Dumitrescu M. & colab., 1962-1963; Valenciuc N., 1992-1993; Valenciuc N., 2002). We found the species at following places within the Park area: Dragos Voda Bison Reserve in 30.07.2002, Secu Monastery in 31.07.2002, vicinity of forest road Alunul - Faget in 02.08.2002.

### *Myotis nattereri*

This species is similar in size to Bechstein's bat and the brown long-eared bat. All three species weigh about 10-12 g. It is wide spread throughout the Europe, except northern Scandinavia and Balkans. (Burton. J., 2002) In summer, Natterer's bat lives in tree holes as well as in cavities and in buildings. Even trees of a small diameter may be of interest for it. Roosts are changed every one to four days. The importance of woods as hunting grounds may vary with the season. Thus, the energy reserves needed for hibernation are partly acquired in forests. Natterer's bat hunts in all layers between the canopy and the understory (Meschede, A & Güthler, W. & Boye, P. 2001; Meschede, A. & Heller, K. G. 2000). Some of its prey is gleaned from surfaces. Winter roosts are found in underground cavities.

It was found in Icoana Valley in 29.07.2002.

### *Eptesicus serotinus*

The species can be found in Europe as far north as southern England, Denmark and southern Sweden. (Burton. J., 2002) It has a bigger size and feeds with bigger flying insects. It is adapted perfectly to the anthropogenic environment. In summer forms nursery colonies exclusively in attics or in the crevices of buildings. It hibernates in underground habitats: caves, cellars, building crevices. Low temperatures are well tolerated by the species.

It was found in: Dragos Voda Bison Reserve in 30.07.2002, Secu Monastery in 31.07.2002, Cracaoani lake in 02.08.2002.

### *Nyctalus noctula*

It is widespread over the most of Europe, including many islands, except of Ireland, Scotland and Scandinavia (Burton. J., 2002). Hunting for prey usually starts well before sunset, the bats often compete with swallows. It has an acrobatic, high altitude flight. Due to it's great body size, the species hunts and consumes large insects, mostly *Carabidae* and moths from the genus *Noctuidae*, etc. Hibernation takes place in building crevices or in caves. Being a migratory species, it can travel up to several hundred kilometres between roost sites. During migration in April, May, and again starting at the end of August, large numbers of noctules become concentrated particularly along rivers. Here, riparian forests play an important role in providing roost sites and foraging grounds during migration and hibernation.

Weighting about 30 g, the noctule is thought to be the biggest native bat species next to the greater mouse-eared bat. Characteristics are the velvet-like brownish fur, relatively short and broad ears and a mushroom-like lobe at the base of the ear. Long and narrow wings enable fast hunting flights in the open air. Most of the nursery roosts, where 20 to 50 females noctules are known for their

large hibernating colonies. Old trees can also accommodate several hundred bats in holes and cracks. Noctules live in tree roosts year-round, being located in branches as high up as the tree top. During summer, roosts are sometimes changed every two to three days. Several tree holes in close proximity are necessary for social behaviour, particularly in the mating season.

We found the species in Icoana Valley in 29.07.2002, Dragos Voda Bison Reserve in 30.07.2002, Secu Monastery in 31.07.2002, Sihla Hermitage in 01.08.2002, vicinity of forest road Alunul - Faget in 02.08.2002, Cracaoani Lake 02.08.2002.

### *Pipistrellus pipistrellus*

The smallest species in Europe, it is widespread in Eurasia and northern Africa. Prefers both meadows and mountains as its habitat. It is well adapted to anthropogenic environment. Roosting in hollows and tree branches or in building crevices. Often hibernates in big colonies in caves the species has no special needs concerning temperature and humidity. Hunts close to the ground for small insects. (Schober, W. & Grimmberger, E. 1997) We have found the species in the following places: Icoana Valley in 29.07.2002, Dragos Voda Bison Reserve in 30.07.2002, Chitele Lake in 02.08.2002, vicinity of forest road Alunul - Faget in 02.08.2002, Cracaoani Lake in 02.08.2002.

### *Plecotus auritus*

This bat has strikingly big ears, which together with the broad wings allow for a slow and successful foraging flight even when manoeuvring through dense vegetation. Its presence often is connected with deciduous forests. It can be found in the most of Europe except extreme north Iberian peninsula and south western France. (Burton, J., 2002) In Romania it prefers mountain areas. Does not migrate so the summer and winter roosts are close to each other. In summer this bat forms small colonies in tree hollows. Colonies of females - so-called nursery colonies - are found in tree holes, sometimes quite small, with free access or covered by foliage. Long-eared bats mainly hunt for moths, including forest pests such as the gypsy moth. It hibernates in underground habitats: caves, cellars, building crevices. Low temperatures are well tolerated by the species. Accidental findings in cut trees reveal that now and then tree holes are used as winter shelters as well.

### *Plecotus austriacus*

The distribution of this species is not too large. The species has big ears similar to *Plecotus auritus* but it can be distinguished by its greyish underfur and wider tragus. It can be found in hilly area and grassland habitats. Being adapted perfectly to anthropogenic environment the species forms colonies exclusively in attics and crevices of buildings. Hibernates in the cellars or in caves, so it does not display any preference towards temperature and humidity. Guano of the species was found in the attic of Secu Monastery.

## **Conclusions**

The diversity and number of bat species are always good indicators of the habitat quality. Bats are associated especially with old undisturbed forests, wetlands and pastures. They are promising where the environment is healthy and stable. The decline in number and species of bats inform us about the loss of the natural habitats. Pollution, extended agricultural activities, intensive forestry production and many other human activities are always posing threats to our bat populations.

The conservation status of all microchiropteran bats has been assessed using criteria developed by IUCN The World Conservation Union (Hutson, A. M. & Mickleburgh, S. P. & Racey, P. A. 2001)

Species name	National Priorities	National monitoring	IUCN status
<i>Myotis bechsteinii</i> <sup>1 2</sup>	H		VU A2c
<i>Myotis daubentonii</i>	L	D	LR:lc
<i>Myotis mystacinus</i>	L		LR:lc
<i>Myotis nattereri</i>	M		LR:lc
<i>Eptesicus serotinus</i>	L	D	LR:lc
<i>Pipistrellus pipistrellus</i>	L	D	LR:lc
<i>Nyctalus noctula</i>	L	D	LR:lc
<i>Plecotus auritus</i>	L		LR:lc
<i>Plecotus austriacus</i>	L		LR:lc

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

National monitoring (D = detector monitoring)

<sup>1</sup>EU Annex II, <sup>2</sup>Eurobats

IUCN STATUS: VU Vulnerable; LR:nt Lower Risk near threatened; LR:lc Lower Risk least concern  
(Murariu, D. 1995-1996)

It would be important to start a monitoring programme of the key species and to assure the protection of the bat shelters by keeping undisturbed the old, hollow trees.

### Acknowledgements

We would like to thank to the Vanatori Neamt Natural Park for the possibility of research. Also many thanks for Deju Razvan who guided and supported us during our work in the Park territory. Without contribution of Barti Levente, Jere Csaba, Doczy Annamaria and Szanto Laszlo this research work would not be possible, many thanks for them as well.

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#### REZULTATELE STUDIULUI ASUPRA FAUNEI DE LILIECI A PARCULUI NATURAL VÂNĂTORI NEAMȚ ȘI STATUTUL DE CONSERVARE A SPECIILOR GĂSITE

**Rezumat.** În acest articol sunt prezentate rezultatele obținute în urma studiului efectuat pe teritoriul Parcului Natural Vânători Neamț în anii 2002-2003. În cursul acestor studii am utilizat plase, detectoare de ultrasunete heterodyne, în timpul zilei am verificat adăposturile posibile: clădiri și scorburi pentru a identifica speciile de lilieci. Am găsit următoarele specii: *Myotis bechsteinii* (Kuhl 1817), *Myotis mystacinus* (Kuhl 1817), *Myotis daubentonii* (Kuhl 1817), *Myotis nattereri* (Kuhl 1817), *Eptesicus serotinus* (Schreber 1774), *Nyctalus noctula* (Schreber 1774), *Pipistrellus pipistrellus* (Schreber 1774). Ca concluzie a acestor studii putem menționa că ar fi important începerea monitorizării liliecilor pe teritoriul parcului, și asigurarea conservării habitatelor cheie păduri bătrâne și arbori cu scorburi.

**Cuvinte cheie:** lilieci, răspândire, adăpost.

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