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Bats of the Carpathian Region (Rakhiv)
Кажани Карпатського регіону (Рахів)

# Rare bat species of the southwest megaslopes of the Ukrainian Carpathians

Yuly I. KROCHKO

*Uzhgorod National University (Uzhhorod Ukraine)*
*e-mail: krochko@univ.uzhgorod.ua*

## Introduction

The southwest megaslope of the Ukrainian Carpathians includes the mountainous and piedmont territory. The list of rare bat species of the southwest megaslope of the Ukrainian Carpathians is compiled on the base of a long-lasting investigation of small mammals and generalisation of literature data (Abelentsev 1950, 1956; Tatarinov 1956–1973; Koliushev 1958; Krochko 1964–1998).

There are 13 rare bat species in the studied area (Table 1)[1]. At the same time, the presence of such species as *Myotis dasycneme*, *Miniopterus schreibersii* and *Vespertilio nilssonii* is not confirmed by actual material, which is why it demands further investigations in order to conclude on their occurence in the fauna of the studied region.

Table 1. Rare bat species of the Ukrainian Carpathians

| No. | Species | URDB | BC |
|---|---|---|---|
| 1 | *Rhinolophus hipposideros* | + | – |
| 2 | *Rhinolophus ferrumequinum* | + | – |
| 3 | *Myotis bechsteinii* | + | – |
| 4 | *Myotis daubentonii* | – | + |
| 5 | *Myotis dasycneme* | + | + |
| 6 | *Myotis nattereri* | + | – |
| 7 | *Myotis emarginatus* | + | – |
| 8 | *Miniopterus schreibersii* | + | – |
| 9 | *Barbastella barbastellus* | + | – |
| 10 | *Nyctalus leisleri* | + | – |
| 11 | *Pipistrellus nathusii* | – | + |
| 12 | *Vespertilio nilssonii* | + | + |
| 13 | *Vespertilio murinus* | + | + |

URDB — Ukrainian Red Data Book, BC — Bern Convention.

[1] When the record of *Myotis brandtii* will be confimed based on the skull of the only specimen from the Carpathian Biosphere Reserve (Pokynchereda), this list will include 14 species.

Additionally, attention should be paid to some other species, which are included in the Annex 2 of the Bern Convention, such as *Myotis blythii, M. myotis, M. mystacinus, Plecotus auritus, P. austriacus, Nyctalus noctula, Pipistrellus nathusii,* and *Eptesicus serotinus*.

To present the complete taxonomic and biological description of all rare species is unnecessary, because they were presented in a series of publications by V. Abelentsev (1956) and J. Krochko (1964–1999). In this article, we focus only on the sites of their present localities and the settlement characters, evaluation of population's condition, factors that made vulnerable and threaten the species, as well as on main conservation measures.

**Species description**

***Rhinolophus ferrumequinum* and *R. hipposideros*.** As presented in Table 1, these are well-distributed species in the studied region and can be found (with rare exception) in underground-type shelters. The settlings are solitary. Incompact colonies are characteristic except for *R. ferrumequinum*. This type of settling is observed in Mukacheve district, where the colony consists of up to 350 individuals. The total abundance of *Rhinolophus* in the studied area is relatively small (200–250 individuals of each species). During the last years, a tendency of increasing abundance of *Rhinolophus hipposideros* is noted. There is no essential threat for *Rhinolophus* populations, but the degradation of underground-type shelters leads to the redistribution of settlements. Potentially, privatisation of lands, including vineyards, will provide an opportunity to increase the number of *Rhinolophus* shelters and it will strengthen their total specific weight in the bat fauna of the studied region.

***Myotis bechsteinii***. The first records of this species in the Ukrainian part of the Carpathian region were reported by K. Tatarinov in 1949–1952. On the southeast megaslopes of the Ukrainian Carpathians, we registered them for the first time in the environs of village Glyboka in 1969. The first findings of this species belong to 1972, 1985, 1991, and 1998. In 1994, *M. bechsteinii* was registered in shelters of the Carpathians Biosphere Reserve. The species's biology is studied insufficiently, but based on the available data we consider that it is a settled solitary species in the studied area. It inhabits tree hollows and dungeons, hibernates in caves and dungeons.

***Myotis dasycneme*.** In the Ukrainian part of the Carpathian region, this species is know from Lviv region. On the southeast megaslope of the Ukrainian Carpathians, only one locality is know in village Sol, Velyko-Berezny district (1983). Since the record was found in autumn, probably it was a migrating animal. As there were no repeated findings, the present distribution of the species in the Transcarpathian region is dubious.

***Myotis daubentonii*.** One of the ecologically plastic species in the studied area. The number of *M. daubentonii* during the last years decreased because of tree cut-

tings on riverbanks and melioration works. According to V. Pokynchereda, it is one of the most abundant bat species in vicinities of Rakhiv.

***Myotis nattereri.*** One of the typically rare species of bats in the studied area, which is mostly related to the Transcarpathian lowland and reaches the altitude of 250–300 m. It is a solitary species inhabiting trees hollows and dungeons. The species number in the studied area is about 100–150 individuals.

***Myotis emarginatus.*** Until the beginning of 1990, it was known mainly from the plain regions. During the last years, it was found to hibernate in small numbers (near 10 individuals) in shelters of the Carpathians Biosphere Reserve. In our opinion, it is because of the current essential degradation of underground shelters in the plains and lowlands. The total number of the species in the studied territory is about 100 individuals.

***Miniopterus schreibersii.*** Until the middle of 1970, it was one of the most numerous bat species in the studied area. In the Transcarpathian region, near 15 colonies of this species were known, the number of each of them was 500 to 4000 individuals. Currently, the species' occurence in the studied region is duboius, but its absence should be not accepted as final. The latest information on this species belongs to the beginning of the 1990, when in the Carpathian Biosphere Reserve (Maramorosh massif, Dovharunya cave) near 200 individuals were found. Under the assistance of EUROBATs, we lead the species searches, but they semm to be futile so far. The works in this direction are continued, especially in the Uzhansky National Park and Zatysiansky regions of Transcarpathia. It is unrealistic that the species whose populations exist in northwest Hungary and Slovakia, has disappeared in Transcarpathia. Potentially, due to the mobility of the species, it will reappear in the region.

***Barbastella barbastellus.*** A typical rare species. Its populations in the studied area are stable, but not abundant. In some years, the species number in shelters during hibernation can reach from a single to 10 and more individuals.

***Nyctalus leisleri.*** It was distributed irregularly on a large part of Transcarpathia. It is one of the most rare bat species in the studied region. Currently, it is know only in the territory of the Carpathian Biosphere Reserve, where it was found by V. Abelentsev in 1963. In vicinities of village Drahovo (18.08.1990), male individuals flew into a house through the window. The number of dendrophyle species complex, and, probably, migrant bat species. Considering that the main part of the area of distribution is situated in the zone of the reserved forest, there are good conditions for the species preservation and reproduction.

***Pipistrellus nathusii*** deserves special attention. It is well-distributed in the forest and forest steppe zones of Ukraine. On the southwest megaslopes of the Ukrainian Carpathians, it is one of the rare species of bats and inhabits the piedmount areas. When hibernating, it is found in hollows of buildings in the lowland part of the Transcarpathian region in colonies together with *Pipistrellus pipistrellus*.

***Vespertilio nilssonii.*** Until 1990, it was one of the rare species of bats in the studied area, the number of which was not more than a few dozens of individuals. The present distribution of this species in the studied area needs to be revised and clarified.

***Vespertilio murinus.*** It is a typical rare species of bats, but during the last years thanks to detector registration it was revealed that the species' number increases in the territory of the Carpathian Biosphere Reserve (according verbal information of V. Pokynchereda).

**Discussion**

When elaborating measures on the protection of rare species, including of bats, the level of their sedentariness should be considered. There are two aspects. The first aspect is to elaborate measures on the protection of species that are settled. To predict the number and to protect these species for future we should take into consideration the article, which determines the status of the Ukrainian Carpathians. There are a few variants in this direction. The first variant is more optimal. The Ukrainian Carpathians, including the southwest megaslopes will become a cultural-recreational zone in which the industrial development will be limited. The building of cult objects will increase (churches, temples, *etc*.). Using poisonous chemicals against agricultural and forest pests increases. In this perspective, the abundance of bats, including rare species, first will stabilise. Based on current circumstances, dendrophyle species are an exception because there is a total chaos in forest economy. This phenomenon should be taken under control.

It should be noted that the tendency of population dynamics of some species is not even. A part of the well-distributed species, such as *M. blythii, M. myotis, N. noctula, P. pipistrellus,* and *E. serotinus* due to their high ecological plasticity can adapt to the different conditions of the environment and their number will be stable. The number of other species, such as *M. nattereri, M. emarginatus, M. schreibersi,* and *V. nilssonii* will decrease, untill they disappeare.

As an example, this process we can see in *M. schreibersii* and *V. nilssonii*.

The second aspect is elaboration of protection measures on species that carry out regular migrations to more or less large distances. When organising and conducting protection measures, attention should be paid to international aspect. Only the joint work of chiropterologists of the Carpathian region countries can conserve the bats biodiversity. First, cadaster maps should be created in all countries. The data from these maps will be transferred to the Carpathian bats atlas. This atlas should be a database on the bat fauna and contain information on the status of species, their distribution, abundance, seasonal dynamics, conservation measures, and their perspectives in the future.

In our opinion, interesting should be the reintroduction of species to places, where they occurred earlier, but now they are absent. There are some examples of such measures in other groups of animals. They should be used in bats too. In par-

ticular, such experiments should be realised with *M. schreibersi* or *V. nilssonii*, whose populations are large in countries of the Carpathian region. This is a difficult task and it demands a great care not to damage the populations, in which the reintroduction is carried out.

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**Резюме**


***Крочко Ю. Раритетні види кажанів південно-західних мегасхилів Українських Карпат.*** — Список раритетних видів кажанів південно-західних мегасхилів Українських Карпат складений на основі багаторічного дослідження автором цієї групи дрібних ссавців та узагальнення літературних даних. В районі дослідження до раритетних видів відноситься 13 видів кажанів: *Rhinolophus hipposideros, R. ferrumequinum, Myotis bechsteinii, M. daubentonii, M. dasycneme, M. nattereri, M. emarginatus, Miniopterus schreibersii, Barbastella barbastellus, Nyctalus leisleri, Pipistrellus nathusii, Vespertilio nilssoni, V. murinus*. У разі підтвердження знахідки черепа на території Карпатського біосферного заповідника (колектор В. Покиньчереда) слід додати і *Myotis brandti.* Останніми роками наявність *M. screibersii* та *V. nilssoni* не підтверджується фактичним матеріалом, що вимагає подальших ретельних досліджень. Приймаючи до уваги деградацію сховищ кажанів, при розробці заходів по охороні раритетних видів ми повинні врахувати важливість міжнародної співпраці. Тільки спільна праця науковців сусідніх країн може зберегти біорізноманіття кажанів в Карпатському регіоні. Вихідним у цій справі вважаємо створення карпатського атласу кажанів, який буде базою даних не тільки з видового складу і місць локалізації кажанів загалом, але й вміщувати відомості про їхній статус, ступінь осілості, чисельність тощо.