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# Conservation measures for protection of important numerous bat colonies in Bulgaria

## Erhaltungsmaßnahmen zum Schutz von wichtigen Fledermauskolonien in Bulgarien

## Mesures de conservation pour la protection d'importantes colonies de chauves-souris en Bulgarie

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### Summary

The study on the situation of vulnerable bat colonies in Bulgaria was performed during 1997-1998. During this period the quantity of bats in four important nursery colonies and another five hibernation roosts were monitored. Proposals for legal protection of numerous bat colonies and conservation measures were made to the Ministry of Environment and Waters.

### Zusammenfassung

Die Untersuchungen zur Situation der anfälligen Fledermauskolonien in Bulgarien wurden von 1997-1998 durchgeführt. In dieser Periode wurden die Bestände der Fledermäuse in vier wichtigen Wochenstuben und fünf Überwinterungsschlafplätzen überwacht. Anträge zum legalen Schutz der zahlreichen Fledermauskolonien und Erhaltungsmaßnahmen wurden beim Ministerium für Umwelt und Wasser gestellt.

### Résumé

L'étude sur la situation des colonies vulnérables de chauves-souris en Bulgarie a été réalisée en 1997-98. Pendant cette période, le nombre de chauves-souris dans quatre importantes colonies de reproduction et dans cinq autres quartiers d'hiver a été suivi. Des propositions pour la protection légale des grandes colonies de chauves-souris et des mesures pour la conservation ont été faites au Ministère de l'Environnement et des Eaux.


### Introduction

Bat fauna in Bulgaria is represented by 29 species that have been protected by law since 1986 (N 1021/1986 of the Ministry of Environment). Thirteen bat roosts (natural caves) were established in 1989 as most important for bat conservation in Bulgaria (BESHKOV, 1993). These caves are inhabited by reproductive and/or hibernating colonies of hundreds to thousand individuals of the species *R. ferrumequinum*, *R. euryale*, *R. blasii*, *M. myotis/blythii*, *M. capaccinii*, *M. schreibersii*. Seven of these bat roosts are protected by law but the others need emergent legal protection. The intensive human activities (amateur and speleological tourism, using of some caves for mushrooms or cheese production) in many bat roosts disturb bats or destroy bat communities. The administrative and practical protection measures as well as the education program for bat conservation among the local people in Bulgaria are still insufficiently developed.

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### Material and methods

Summer and winter censuses of bats in four of the most endangered bat colonies located in central-western Bulgaria (Fig. 1) were checked in the years 1997-1998. These colonies inhabit long natural caves as only Haidushkata cave is protected by law (since 27.05.1976). The number of bats was compared with the literature data representing the situation of these colonies in 1988-1989. The proposed (BESHKOV and coll. 1990) field method assessing the surfaces covered by the colonies was used during the observations.

This project was realised in cooperation with the Regional Inspections of Environment. Practical conservation measures for preservation of bat communities were proposed to the Bulgarian Ministry of Environment and Waters.

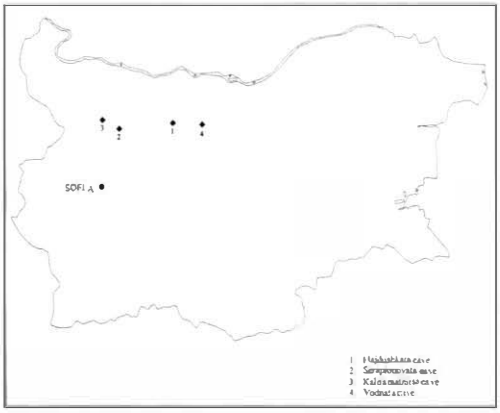


Fig. 1. Colonies

Abb. 2. Kolonien

Graph. 2. Colonies

## Results

The observed bat colonies were formed mainly by the six colonial cave-dwelling species *Rhinolophus ferrumequinum*, *Rhinolophus euryale*, *Myotis myotis*, *Myotis blythii*, *Myotis capaccinii* and *Miniopterus schreibersii* which number varied in different seasons and years. The observed changes in bat communities and negative factors endangering the colonies were used as criteria in realisation of specific conservation measures. The main dangerous human activities and the reaction of bats in different roosts were ascertained. The effectiveness of the project required realisation of practical activities.

### Species composition and vulnerability of investigated colonies

#### I. Protection of numerous nursery colony

Hajdushkata cave is a long horizontal cave located in karstic area of North Bulgaria. It is inhabited mainly in nursery periods where the most numerous species is *M. schreibersii*. Since the early 80ies the number of bats (more than 5000 individuals) has changed (Fig. 2) and recently it reaches up to 3500 individuals. The reproductive females of *M. schreibersii* usually came in April as *M. myotis* and *M. capaccinii* formed their nursery colonies in May. Reproductive colony of *R. euryale* permanently inhabits the entrance hole of the cave.

Although the bat population was stable during the period of observation it is considered to be CRITICALLY VULNERABLE. The following negative factors were established: direct disturbance of the colony (frequently using

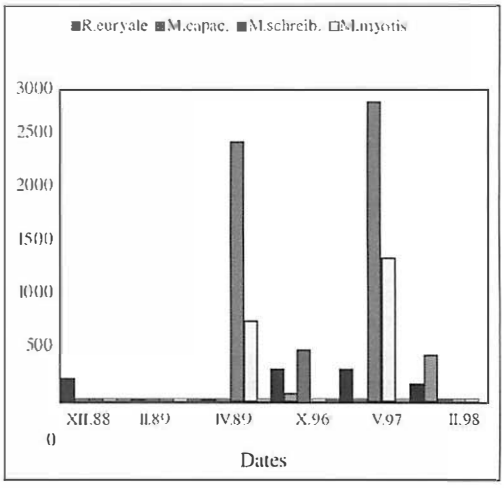


Fig. 2. Changes in number of bats (n) in „Hajdushkata" cave

Abb. 2. Veränderungen in der Anzahl der Fledermäuse (n) in der Höhle „Hajdushkata"

Graph. 2. Evolution du nombre de chauves-souris (n) dans la grotte de „Hajdushkata"

torches in the cave by occasional visitors, making fires, high extent of pollution); cases of extraction of guano during the reproductive periods; lack of effective control of visitations.

#### II. Protection of important bat colonies in the Natural Park „Vratchanski Balkan" (north-western Stara Planina Mountain)

Many long caves are known on the territory of Vratchanska Mountain but only two of them are inhabited by numerous bat colonies that need special protection. A commission of specialists from the Institute of Zoology and Regional Inspection of Environment was formed in March 1998 to realise control and monitoring of bat populations in these caves and to make proposals for their legal protection.

„Serapionovata cave", distr. Cherepish, was inhabited by 5 bat species as their number varied during the observations (Fig. 3). The number of hibernating individuals of *R. ferrumequinum* varied from 80 to 150. *M.*

*schreibersii* dominated during the nursery periods (up to about 2600 individuals) as *M. capaccinii* was not permanently observed there.

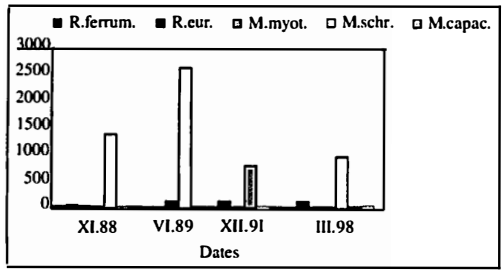


Fig. 3. Species composition and number of bats (n) in „Serapionovata" cave

Abb. 3. Artenzusammensetzung und Anzahl der Fledermäuse (n) in der Höhle „Serapionovata"

Graph. 3. Composition des espèces et nombre de chauves-souris (n) dans la grotte de „Serapionovata"

According to BESHKOV (1993) „Kalna matnitsa" cave is inhabited by a mixed nursery colony of *M. myotis* and *M. schreibersii* as the number of bats reaches up to about 2000 individuals. On 28.04.1997 we established a colony of about 2500 *M. schreibersii*, 1000 *M. myotis/blythii* and isolated specimens of *R. hipposideros* and *R. ferrumequinum*. Control visits of the cave are necessary to be made in the next seasons. Indication tables will be installed at the entrances of these caves immediately after their status (National Monuments) will be officially announced.

## III. Restoration measures in „Vodnata cave" nursery roost

„Vodnata cave", distr. Lovetch, is a long natural cave. The huge entrance hole has been used in the past for cheese production. That is why the deposits in the cave were destroyed and the main entrance was closed. Since the 80ies there have not been performed such human activities and in July 1988 a numerous nursery colony of about 3000 *M. schreibersii* and few *R. ferrumequinum* existed there. „Vodnata cave" is also important hibernation quarters for about 50 *R. ferrumequinum* (01.1989) and 360 *R. euryale* (03.1996).

In 1997 intensive mushroom production has begun and the main entrance was almost entirely closed what restricted bats to enter the roost. Immediately we informed the Regional Inspection of Environment and the first conservation measure was to open the main entrance of the cave and to make it suitable for freely using by bats. The control visits in May 1998 showed vast recovering of the nursery colony.

Another five important caves we included in the program for monitoring of bat communities in central-western Bulgaria. The results of winter counts in comparison with the available previous data (Table 1) explained variability of bat populations. „Devetashkata", „Suhi pech" and „Topljia" caves are important nurseries of *M. schreibersii* and *M. myotis/blythii*. Regular monitoring research will to be performed there. Colonial cave-dwelling bats of the karstic regions of central-west Bulgaria are most vulnerable because of the intensive speleological and amateur tourism. The program for bat conservation in Bulgaria is focused mainly on legal protection and monitoring of important roosting sites.

| Species | *R. ferrumeq.* | | *R. euryale* | | *M. myot/bly* | | *M. capacc.* | | *M. schreib.* | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n | | n | | n | | n | | n | |
| Name of roosts | 89-91 | 1998 | 1989 | 1998 | 1989 | 1998 | 1989 | 1998 | 1989 | 1998 |
| "Devetashka" cave * | - | | - | 250 | - | | - | | - | 11 000 |

Table 1. Number of established bat species (n) in some hibernation shelters of central-west Bulgaria. The colonies protected by law are marked with „*"

Tab. 1. Anzahl der vorhandenen Fledermausarten (n) in einigen Überwinterungsquartieren in Zentral-west-Bulgarien. Die durch Gesetz geschützten Kolonien sind markiert mit „*"

Tableau 1. Nombre et espèces de chauves-souris dans quelques sites du centre et de l'ouest de la Bulgarie. Les sites protégés par la loi sont marqués d'un „*"

## References

BESHKOV, V. and coll. (1990): Investigation of situation and the extent of vulnerability of bat colonies in Bulgaria in regard with their protection., Sofia, Project N 15/948 of Ministry of Environment, 60 p.

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