

Bat investigations in the Carpathian Biosphere Reserve

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In the Carpathian Biosphere Reserve, the main underground bat hibernation shelters are karst and pseudokarst (tectonic) caves and, to a lesser extent, mine shafts. Though bat fauna investigations of these hibernation sites had been initiated long before the reserve's establishment, they were carried out episodically. Regular observations of bats started in 1983 in the frames of Chronicle of Nature programme. The regular bat observations during the hibernation period were started in 1983 in caves Druzhba, Hrebin, and Molochny Kamin.

In 1983–1985, ringing of bats with bird rings* was carried out, but complete information on bat ringing is absent since the first journal of registration was lost. The marked animals belonged to 4 species: *Rhinolophus ferrumequinum*, *R. hipposideros*, *Myotis myotis*, and *Barbastella barbastellus*. In 1988, ringing of bats in the reserve was renewed and such questions as spatial, age and sex structures of hibernating bat populations began to be studied. Since 1988, a stable tendency of increase was noted in the number of *M. myotis*, *M. blythii*, *R. ferrumequinum*, and *R. hipposideros*, sometimes accompanied by sharp temporary decreases. For instance, a significant fluctuation in the number of *Myotis myotis* and *M. blythii* was revealed in the cave Hrebin from a sharp decrease in 1998 (about 50 %) to practically a total recovery of abundance in 1999. Other bat species did not change their number considerably in the past 50–90 years.

Based on results of more than 15 years of investigations and on survey of other existing data, 16 bat species were recorded in underground cavities of the Ukrainian Carpathians, such as *Rhinolophus ferrumequinum*, *R. hipposideros*, *Miniopterus shreibersi*, *Myotis blythii*, *M. myotis*, *M. bechsteini*, *M. nattereri*, *M. mystacinus*, *M. brandtii*, *M. emarginatus*, *M. daubentonii*, *Plecotus auritus*, *P. austriacus*, *Barbastella barbastellus*, *Eptesicus serotinus*, and *E. nilssonii*. The dominant species during the hibernation period are *Myotis myotis* and *M. blythii*, subdominant species are *Rhinolophus ferrumequinum* and *R. hipposideros*. The others belong to rare but regularly hibernating species. *Eptesicus serotinus* and *E. nilssonii* were identified during hibernation in caves of this region only twice and once, respectively. Since 1993, *Miniopterus shreibersi* has not been recorded here.

* Rings of the series "Moskva XB 3960**", 3966** and 3967**".