

The largest hibernaculum of *Barbastella barbastellus* in Central Europe (Chiroptera: Vespertilionidae)

Największe zimowisko *Barbastella barbastellus* w środkowej Europie (Chiroptera: Vespertilionidae)

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Abstract. A mass hibernaculum of the barbastelle was found in an old sewer collector of the former ammunition factory at Krzystkowice (a part of Nowogród Bobrzański) near Zielona Góra, western Poland, in 2005. The highest number of barbastelles was observed there in the year of discovery – altogether 1,870 individuals. It is the largest hibernation site of this species in Central Europe.

Key words. Hibernation, barbastelle, Poland.

The distribution range of the barbastelle *Barbastella barbastellus* (Schreber, 1774) stretches from Spain in the west, through Wales, England, Norway, Sweden and Latvia in the north, to Belarus, Ukraine, Caucasus, Daghestan, Azerbaijan, Armenia and Crimea in the east and the north-western part of Africa in the south (STEBBINGS & GRIFFITH 1986, RYDELL & BOGDANOWICZ 1997). The midpoint of its distribution range is situated in the central part of Europe. Many hibernacula of this species are located in Poland, Czech Republic and Slovakia (RYDELL & BOGDANOWICZ 1997). The largest hibernacula have been found in Slovakia (abandoned railway tunnel: 6800–7800 individuals; UHRIN 1995) and in the Canyon Cave in the Caucasus (over 7000 individuals) (GAZARYAN 2003).

A mass hibernaculum of the barbastelle was found at Krzystkowice (a part of Nowogród Bobrzański) near Zielona Góra (UTM WT 14; 51° 49' N, 15° 13' E, 75 m a. s. l) in western Poland. The bats hibernate in an old sewer collector of the former ammunition factory. It is about 1 km long and about 2 m high with ventilation chimneys from 6 to 13 m high. The site was visited for the first time on 5 March 2005 and during the following years (2006–2013), regular checks took place in January or February (Table 1). Preliminary information on this discovery was reported at the Polish Bat Research Conference and mentioned in the book of abstracts (WOJTASZYN et al. 2005).

The highest number of wintering barbastelles was observed during the first visit of this site on 5 March 2005 when 1,870 individuals of *Barbastella barbastellus* were recorded. In the following years, a lower number of bats was observed (Table 1). Apart from barbastelles, a small number of individuals of other bat species was detected: *Myotis daubentonii* – max. eight individuals, *Myotis myotis* – max. six individuals, *Plecotus auritus* – max. three individuals, *Eptesicus serotinus* and *Pipistrellus* sp. – one individual each (Table 1).

In some West European countries, *B. barbastellus* is considered to be a threatened species. For instance, in the Netherlands and Belgium, the barbastelle has been observed only at single localities during the last decades (FAIRON & BUSCH 2003, HERMANN et al. 2003). Moreover, in the largest hibernacula of this

Table. 1. Numbers of bats wintering in the former ammunition factory at Krzystkowice in the years 2005–2013

Tab. 1. Tab. 1. Liczba zimujących nietoperzy w dawnej fabryce amunicji w Krzystkowicach w latach 2005–2013

Legend / legenda: *Bbar* = *Barbastella barbastellus*, *Mdau* = *Myotis daubentonii*, *Eser* = *Eptesicus serotinus*, *Paur* = *Plecotus auritus*, *Mmyo* = *Myotis myotis*, *Pip* = *Pipistrellus* sp., *Chir* = Chiroptera indeterminata

date of visit \ species data kontroli \ gatunek	<i>Bbar</i>	<i>Mdau</i>	<i>Eser</i>	<i>Paur</i>	<i>Mmyo</i>	<i>Pip</i>	<i>Chir</i>	total suma
5 March 2005	1870	7	–	2	–	–	6	1885
10 February 2006	1331	7	–	3	–	–	3	1344
19 February 2007	855	8	–	1	–	–	3	867
3 February 2008	1583	7	–	2	1	–	3	1596
7 February 2009	1694	3	1	–	–	–	8	1706
20 February 2010	1317	–	–	–	–	–	–	1317
27 February 2011	1352	–	1	1	1	1	4	1360
8 February 2012	1383	–	–	2	3	–	–	1388
2 February 2013	1315	2	–	3	6	–	1	1327

species in Europe, an extreme decline in numbers was observed at the end of the 20th century. In a mine near Bodenmais in Bavaria the number of hibernating *B. barbastellus* decreased from 3000 individuals in the 1970s to 300–400 individuals in the 1980s and 1990s (RICHARZ 1989, RUDOLPH et al. 2003), and in the



Figs. 1, 2. Aggregations of barbastelles in ventilation chimneys, 7 February 2009 and 20 February 2010 (photo by W. STEPHAN).

Rys. 1, 2. Zgrupowania mopków w kominach wentylacyjnych, 7. 2. 2009 i 20. 2. 2010 (zdjęcia: W. STEPHAN).

mine at Libanka in Slovakia – from 2000 individuals in the 1960s to 550 individuals in 1987 (PALÁŠTHY & OLEJÁR 1963, DANKO & MIHÓK 1988). The same downward trend was visible in the largest hibernaculum of this species in the abandoned railway tunnel at Dielik in Slovakia, where the number of barbastelles dropped from 6800–7800 in 1993 to about 1000 individuals in 1999 and in 2001, only six individuals were recorded there (UHRIN 1995, UHRIN et al. 2002, M. UHRIN – pers. comm.). The hibernaculum of barbastelles discovered at Krzystkowice is the biggest in Poland. Other important hibernation sites in the country host smaller numbers of individuals of this species, e.g. in the Nietoperek Bat Reserve the highest number of recorded barbastelles was over 1300 individuals in 1992 and in the bunkers at Mamerki it was 593 individuals in 1997 (FUSZARA et al. 2003a, b, LESIŃSKI et al. 2005).

The former ammunition factory at Krzystkowice is the largest hibernaculum of the barbastelle not only in Poland but also in the whole Central Europe. A larger winter colony of this species has been recently observed only in the Caucasus (GAZARYAN 2003).

At the site, majority of the barbastelles were found hibernating in large aggregations: several dozen to several hundred individuals (Figs. 1, 2). Formation of big clusters by *B. barbastellus* was also observed at other mass hibernation sites in Slovakia and in the Caucasus (UHRIN 1995, PALÁŠTHY & OLEJÁR 1963, S. GAZARYAN pers. comm.).

This site is now protected by law within the Natura 2000 network, under the name “Barbastelle tunnel near Krzystkowice” PLH080024.

STRESZCZENIE

Liczne zimowisko mopek stwierdzono w zachodniej Polsce – w Krzystkowicach koło Zielonej Góry (UTM WT 14; 51° 49' N, 15° 13' E). Nietoperze hibernują w dawnym kolektorze ściekowym nieczynnej fabryki amunicji. Najwyższą liczbę zimujących nietoperzy obserwowano w 2005 roku, stwierdzono wówczas 1870 osobników mopka. To stanowisko jest obecnie największym znanym zimowiskiem mopka nie tylko w Polsce lecz w całej Europie Środkowej. Obiekt jest objęty ochroną w sieci Natura 2000 pod nazwą „Mopkowy tunel koło Krzystkowic” PLH080024.

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