SUMMARY

Distribution of noctule bat *Nyctalus noctula* (Schreber, 1774) in the Polish Tatra Mts

Noctule bat is a typical forest species, however it can be also found in big parks and gardens. It hunts for prey at high altitudes in open areas. Its flying apparatus allows a quick and straight-line flight (Norberg, Rayner 1987, Kunz, Racey 1998). It hibernates usually in tree hollows (Kowalski 1955, Pucek, Raczyński 1983, Wołoszyn, Bashta 2001, Grabińska, Bogdanowicz 2002), sometimes in buildings (Dzięgielewska, Dzięgielewski 2002, Szkudlarek et al. 2002), and very rarely in caves (Schober, Grimmberger 1991, Węgiel et al. 2001, Wieczorek 2001). Occasional migrations to the south of Europe have also been reported (Strelkov 1969). Noctule bat starts to feed before dusk; therefore it is an easy object for observation (Jaberg, Guisan 2001). The species is protected in Poland. It is protected also under international agreements: Bern Convention (Appendix II), Bonn Convention (Appendix II), and Habitats Directive of European Union (Annex IV) (Bogdanowicz 1999).

Kowalski et al. (1957) did not report the noctule bat from the Tatra Mts. neither after completing the project of ringing the bats in Poland nor in his review of Tatra mammals (Kowalski 1962). Although the noctule bat was observed up to 1900 m a.s.l. (Wołoszyn, Bashta 2001) there is no literature data on its occurrence in the Polish part of the Tatra Mts. (Profus 1996, Piksa 1998). Hitherto, it has been listed only from the Slovak part (Pjenčák et al. 2003).

The investigations were carried out in 8–27 August 2004, 25–30 August 2005 and 9–15 August 2006. The ultrasonic detector Pettersson D-100 was used. The observations were done at 20:00 until 21:30. When the noctule bats were detected, they were counted at the spot from which they flew out. The study was carried out mainly in the clearings within the lower forest zone. The sites were chosen according to the ease of access, mainly in the entry to a valley or in easily reached clearings.

The greatest number of noctule bats was found at Brzanówka clearing (940 m a.s.l.) – 5 individuals. At the remaining sites, we noted one to three individuals. The sites situated at the highest altitude were Królowe Rówieńki (1520 m) and Stare Kościeliska (971 m) clearings, while the other sites were situated at ca. 900 m a.s.l. (Table 1). In 2005, the study was continued mainly in the fragments of the Carpathian

beech forest near the "Droga Pod Reglami" route. We considered these sites the most suitable places to the noctule bats. However, no individuals of this species were found there. Probably, it might be too late to find them (the observation was after 25 August) or the atmospheric conditions were unsuitable, it was snowing on previous days, and the temperature was very low during the night. During that period, we found only one bat near the stadium in Zakopane (Table 1). In August 2006, we found only one noctule bat flying near the forester's lodge in the Królowe Rówieńki clearing. It was the highest recorded site of occurrence of the noctule bat in the whole Tatra Mts and in Poland.

Within the urban areas 5% of the noctule bat colonies occur in coniferous trees (Rajter et al. 1998). Therefore, it is possible that the coniferous forests may be used by this species in the Tatra Mts. The presence of the noctule bats at the beginning of August (before the migration starts) may suggest a possibility of the bat reproduction in the area. However, it is also possible that some of our late observations, especially of single individuals, reflect the beginning of migration. According to Strelkov (1969), the beginning of migration of noctule bat in Europe takes place at the end of August and in the first decade of September.

In the Slovak part of Tatra Mts, the records of the noctule bat were more numerous, especially when the detector was used (Pjenčák et al. 2003). The opening of the Alabastrová jaskyňa Cave at 1400 m a.s.l. was the highest site where the noctule bats were recorded. Other information on this species was derived from contemporary and subfossil pellets: in the 18th century bone debris, the remains of 185 noctule bats were found in the pellets of Eurasian eagle owl (Schaefer 1973, 1974).

The lack of information on noctule bats in the Polish part of Tatra Mts results from the fact that this species is not considered "a cave species". Until now, the studies were carried out mainly in the caves during winter, the hibernation period for bats (Kepel 1995, Piksa, Nowak 2000, Piksa et al. 2000, Nowak 2001, Piksa, Nowak 2001, Piksa, Nowak 2002a, Piksa, Nowak 2002b). The studies on bats in Tatra Mts. are usually done out of the migration and reproductive periods.

The noctule bat could have been a rare species in the Tatra Mts. at certain time. It could have been due to the extensive deforestation in the 19th and the beginning of the 20th century. This could have caused the shortage of suitable hiding places for bats. However, the main reason of the lack of data on the noctule bat occurrence in the Polish part of Tatra Mts. is the lack of proper investigation. Another

reason may be that the noctule bat is often omitted in publications just because it is considered a common species.