

The occurrence of the northern bat, *Eptesicus nilssonii* (Keyserling & Blasius, 1839), in Warsaw and its vicinity, Central Poland

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With 1 figure

European range of the northern bat (*Eptesicus nilssonii*) covers Scandinavia, Russia and certain areas in the central part of the continent (GERELL & RYDELL 2001). The Central European records of the species come mostly from mountainous regions (RYDELL 1999) so the species is described as 'high elevation' (JABERG & GUISAN 2001) or 'mountain' species (KAŃUCH & KRISTÍN 2006). In Poland it is regularly recorded in the north-eastern part of the country (RUPRECHT 1976, 1983, KOWALSKI et al. 1994, KASPRZYK 1997, KOWALSKI & LESIŃSKI 1997, LESIŃSKI 2001, RACHWALD et al. 2001, FUSZARA et al. 2002, KASPRZYK et al. 2002, RÓŻOWICZ-WITKOWSKA & WITKOWSKI 2002, WOJCIECHOWSKI & NEUBAUER 2002, MARZEC 2003, LESIŃSKI et al. 2006b), eastern part (SKURATOWICZ 1950, NIKODEM 1982, JURCZYSZYN 1994, SACHANOWICZ 2003), and in upland, montane and even alpine areas in the south (SKURATOWICZ & WARCHALEWSKI 1954, KRZANOWSKI 1963, LABOCHA & WOŁOSZYN 1994, KEPEL 1995, PIKSA 1998, PIKSA & NOWAK 2000, POSTAWA & ZYGMUNT 2000, SZKUDLAREK et al. 2002). Summer colonies of this species were found only in the north (KOWALSKI et al. 1994, POSTAWA & GAS 2003) and south of Poland (SKURATOWICZ 1948, KRZANOWSKI 1963, LESIŃSKI 2004, SACHANOWICZ & WOWER 2004, WOŁOSZYN et al. 2006). As for other parts of the country, the records of *E. nilssonii* are rather scarce (WAŁECKI 1881, ŁUKASIAK 1939, KRZANOWSKI 1961, RUPRECHT 1983, KOWALSKI et al. 1994, SZKUDLAREK et al. 2001) and the difficulties in concluding about its distribution are reflected in the maps published in different sources (STEBBINGS & GRIFFITH 1986, RYDELL 1999, GERELL & RYDELL 2001).

In the past, between the onset of faunistical bat studies in the 19th century and the 1990s, only two records of the northern bat were reported from the area surrounding Warsaw (WAŁECKI 1881, ŁUKASIAK 1939), separated by over 70 years. However, at the end of the 20th century one individual was observed twice (Feb. 26, 1994 and Mar. 3, 1994) at a wintering site – an abandoned fort (LESIŃSKI et al. 2006a), and one individual was found on Sep. 30, 1999 in a tall building in the Warsaw city center (LESIŃSKI et al. 2001).

Recently, additional five cases of the presence on the northern bat in Warsaw and its vicinity have been noted:

1. & 2. Single females found in buildings: on April 5, 2005, Warsaw, the KEN street (5th floor) [UTM EC 07], and on May 20, 2005, Warsaw, Dybowskię street (7th floor) [UTM EC 07].

3. One dead individual – road casualty – found on Sep. 14, 2005 in a peripheral district of Warsaw near the Radzyńska street (UTM EC09). Surrounding areas are covered by suburban buildings, allotment gardens and meadows. A woodlot (0.7 km² in size) is located 0.3 km from the place of finding.

4. Two hibernating individuals encountered on Dec. 9, 2006 in the fort "Brody" belonging to the Modlin fortress (UTM DD81), one still present there on Feb. 3, 2007. Bats were hanging from the ceiling in a moist, underground corridor. This site is located in agricultural landscape, with a forest of ca. 25 km² as close as 0.3 km.

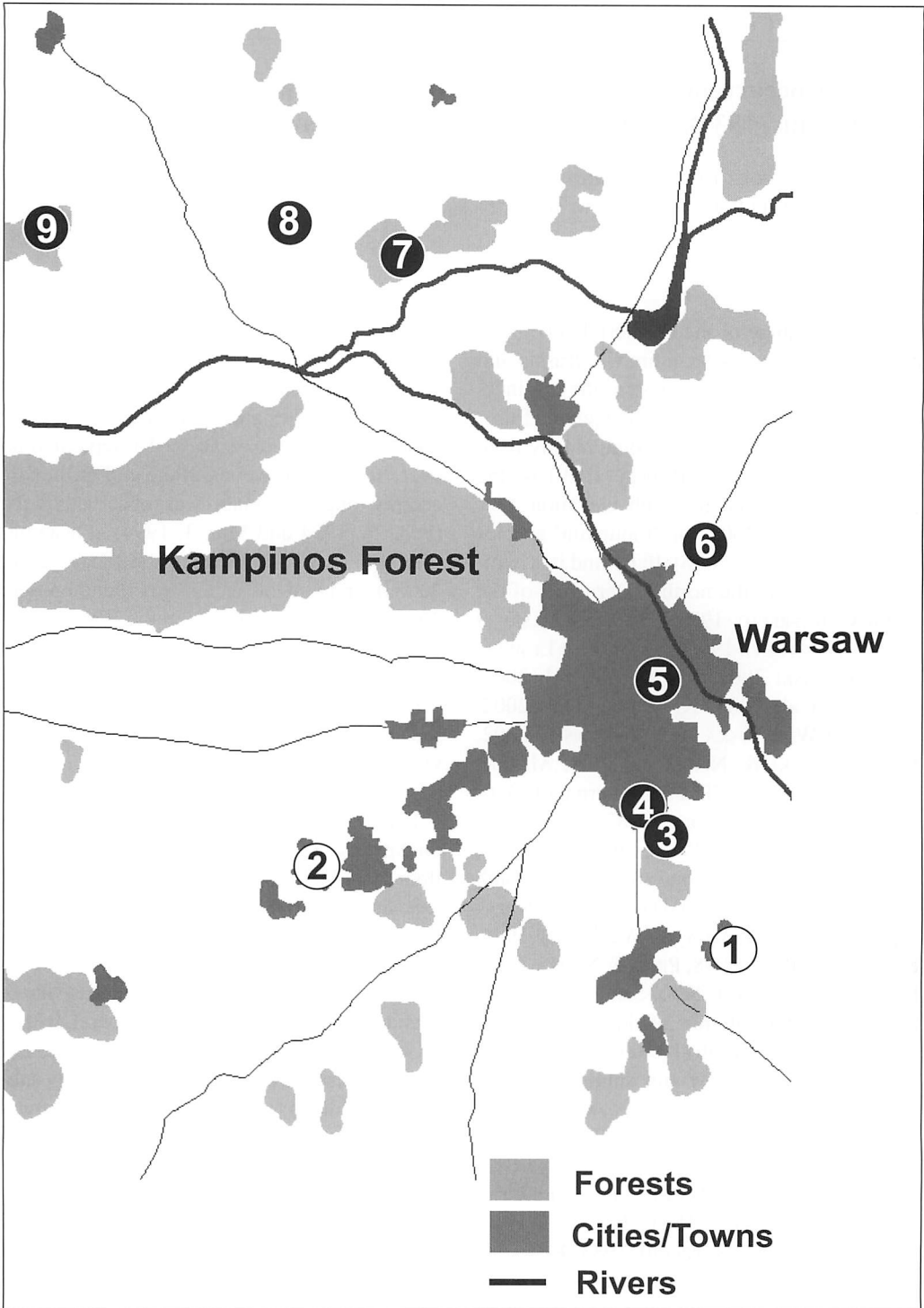


Fig. 1. Localities of the northern bat (*Eptesicus nilssonii*) in Warsaw and its environs.

Open circles – before 1940, black circles – after 1990

1 – Jeziorna (WAŁECKI 1866), 2 – Milanówek (ŁUKASIAK 1939), 3 – Warsaw, KEN str. (unpubl. data), 4 – Warsaw, Dybowskiego str. (unpubl. data), 5 – Warsaw city center (LESIŃSKI et al. 2001), 6 – Warsaw, Radzymińska str. (unpubl. data), 7 – Brody (unpubl. data), 8 – Błogosławie (LESIŃSKI et al. 2006a), 9 – Naruszewo (unpubl. data)

5. A mandible of *E. nilssonii* found in tawny owl (*Strix aluco*) pellets collected on May 25, 2007 in a loft situated on a large clearing inside a 18 km² forest near Naruszewo (UTM DD51). The length of the mandible – 11.1 mm, the height of mandibular ramus – 3.85 mm.

Up to now, nine localities of *E. nilssonii* have been noted in Warsaw and neighbouring areas (Fig. 1). Of that number, seven were recorded during the last 13 years and five during just the last three years, so the increase in the rate of encountering of the species seems rather marked. There are, of course, at least two possible explanations of such increase: either the species occurs now in the area more regularly than before, or the increase in the number of records merely reflects an increase in the research effort of local bat workers. It cannot be denied that bats are studied much more intensively now than they were in the 19th or the first three quarters of the 20th century.

However, it should be noted that in the Modlin fortress system, a complex of 14 hibernation sites (old forts) monitored regularly since 1979, in which several hundreds of individuals hibernate each year (LESIŃSKI 1988, FUSZARA & FUSZARA 2002), the presence of *E. nilssonii* was recorded only four times at two sites. Also, the calls from the general public – a new and very important source of information on the occurrence of bats – over the last 13 years revealed regular occurrence of the parti-coloured bat *Vespertilio murinus* (LESIŃSKI et al. 2001; own unpublished data), a species previously not recorded in Warsaw and its vicinity, while at the same time only three northern bats were found that way. So, at least in these two examples the species does not seem to follow the pattern of increased encounter rate with increased research effort: in the first case *E. nilssonii* was recently recorded twice while no changes in the monitoring regime took place since the 1980s, in the second one – no new records were noted since 1999 in spite of the still growing number of calls from the general public about the presence of bats in apartments etc.

E. nilssonii is relatively rare in Poland which is suggested by its a low share (0.4 %) in a large sample (n = 1240) of bats caught by barn owls (RUPRECHT 1979). It was absent among the 145 bats mist-netted in the forest near Naruszewo (LESIŃSKI et al. 2006a), where the tawny owl has captured one individual. Moreover, it has not been recorded during a long-term study in the Kampinos Forest, the largest wooded area situated in the vicinity of Warsaw (LESIŃSKI 2003). However, rare as the bat seems to be, especially in this part of Poland, the possibility of the presence of local small populations is probable.

Admittedly, none of the records from Warsaw and its vicinity confirms breeding of the northern bat in the area. The closest known maternity colony of *E. nilssonii* inhabited a church loft in Brodowe Łąki (KOWALSKI et al. 1994), about 100 km north from the localities described in this paper. The northern bat is generally described as sedentary, but the longest migration distance recorded for the species is 115 km (KRAUS & GAUCKLER 1966), so colonizing the area does not seem impossible, especially since it was suggested that the species may be widening its range (AHLÉN & GERELL 1989, ZUKAL & GAISLER 1989).

Also, the scarcity of records of *E. nilssonii* may be partially due to the fact that it is quite an elusive species, not easily found in roosts (SKIBA 1990) and easily overlooked in detector studies in areas where – like in Central Poland – the serotine (*Eptesicus serotinus*) is very abundant so any *Eptesicus*-like signals are likely to be classified as *E. serotinus*, even if they are not very typical. Further research should be undertaken to clarify the status of the northern bat in this part of Poland.

Summary

Nine records of *Eptesicus nilssonii* are known from Warsaw and its surroundings (2 before 1940, 7 after 1990). During the last years, this species was recorded in hibernation sites (2 times), in owl-pellets (1), killed by vehicles on the road (1) and in tall buildings (3). Increasing numbers of recent findings indicate that *Eptesicus nilssonii* is still a permanent element of the bat fauna of Central Poland though it's a rare species with a small population.

Zusammenfassung

Zum Vorkommen der Nordfledermaus, *Eptesicus nilssonii* (Keyserling et Blasius, 1839), in Warschau und seiner Umgebung (Zentral-Polen)

9 Funde der Nordfledermaus (*Eptesicus nilssonii*) sind aus Warschau und seiner Umgebung bekannt (2 vor 1940, 7 nach 1990). In den letzten Jahren wurde die Art in Winterquartieren (zweimal), Eulengewöllen (einmal), durch den Autoverkehr getötet (einmal) und in hohen Gebäuden (dreimal) nachgewiesen. Die zunehmende Anzahl der rezenten Funde zeigt auf, daß *E. nilssonii* immer noch ein ständiges Element der Fledermausfauna Zentral-Polens ist, obwohl die Art selten und die Population vermutlich klein ist.

References

- AHLÉN, I., & GERELL, R. (1980): Distribution and status of bats in Sweden. In: HANÁK, V., HORÁČEK, I., & GAISLER, J. (eds.): *European Bat Research 1987*. Charles University Press, Prague, 319-325.
- FUSZARA, E., & FUSZARA, M. (2002): Zimowy monitoring liczebności nietoperzy zasiedlających forty modlińskie na Mazowszu w latach 1989-1999. *Nietoperze* 3, 89-99.
- , -, & WOJCIECHOWSKI, M. (2002): Monitoring liczebności nietoperzy w zimowiskach na Pojezierzu Mazurskim w latach 1992-1999. *Ibid.* 3, 65-75.
- GERELL, R., & RYDELL, J. (2001): *Eptesicus nilssonii* (Keyserling & Blasius, 1839) – Nordfledermaus, 561-581. In: KRAPP, F. (ed.): *Handbuch der Säugetiere Europas*. Bd. 4: Fledertiere. Teil I: Chiroptera I. Aula-Verlag, Wiebelsheim.
- JABERG, C., & GUIGAN, A. (2001): Modelling the distribution of bats in relation to landscape structure in a temperate mountain environment. *J. Appl. Ecol.* 38, 1169-1181.
- JURCZYŃSKI, M. (1994): Nietoperze (*Chiroptera*) Roztoczańskiego Parku Narodowego i otuliny. *Fragm. Faun. Mus. Zool. Polon.* 37, 389-399.
- KANUČ, P., & KRISTÍN, A. (2006): Altitudinal distribution of bats in the Polana Mts area (Central Slovakia). *Biologia, Bratislava*, 61, 605-610.
- KASPRZYK, K. (1997): Fauna nietoperzy Polski Północno-Wschodniej – aktualny stan wiedzy. *Acta Univ. Nicolai Copernici, Biol.* 53, *Nauk. Mat.-Przyr.* 98, 77-85.
- , RUCZYŃSKA, I., & WOJCIECHOWSKI, M. (2002): Zimowy spis nietoperzy na Pomorzu Nadwiślańskim w latach 1996-1999. *Nietoperze* 3, 39-52.
- KEPEL, A. (1995): Nietoperze zimujące w jaskiniach tatrzańskich – wyniki spisów przeprowadzonych w sezonach 1992/93, 93/94 i 94/95. *Prz. Przyr.* 6(2), 75-80.
- KOWALSKI, M., KRASNODĘBSKI, I., & LESIŃSKI, G. (1994): Występowanie mroczka poźlocistego (*Eptesicus nilssonii* Keyserling et Blasius, 1839), na Nizinie Mazowieckiej i Podlaskiej. *Ibid.* 5(1), 83-86.
- , & LESIŃSKI, G. (1997): Nietoperze w polskiej części Twierdzy Brześć. *Kulon* 2, 83-86.
- KRAUS, M., & GAUCKLER, A. (1966): Zwei wiederentdeckte bayerische Fledermausarten, das Graue Langohr, *Plecotus austriacus* (Fischer, 1829), und die Nordfledermaus, *Eptesicus nilssonii* (Keyserling et Blasius, 1839). *Mitt. naturhist. Ges. Nürnberg* 1, 1-5.
- KRZANOWSKI, A. (1961): Weight dynamics of bats wintering in the cave at Puławy (Poland). *Acta Theriol.* 4, 249-264.
- , (1963): Kompletna lista nietoperzy Puław. *Prz. Zool.* 7, 284-286.
- KURSKOV, A. N. (1981): Rukokrylye Belorusii. *Nauka. Minsk*.
- LABOCHA, M., & WOŁOŹYŃSKI, B. W. (1994): Dekady Spisu Nietoperzy (DSN) na Wyżynie Krakowskiej. [In:] WOŁOŹYŃSKI, B. W. (ed.): *Zimowe spisy nietoperzy 1988-1992. Wyniki i ocena skuteczności. CIC ISEZ PAN. Kraków*, 104-122.
- LESIŃSKI, G. (1988): Skład gatunkowy i liczebność nietoperzy w fortach modlińskich w ciągu roku. *Prz. Zool.* 32, 575-587.
- , (2001): Nietoperze *Chiroptera* Kotliny Biebrzańskiej i terenów przyległych. *Parki Nar. Rez. Przyr.* 20(2), 51-64.
- , (2003): Nietoperze. In: *Kampinoski Park Narodowy*, R. ANDRZEJEWSKI (ed.), *Kampinoski Park Narodowy, Izabelin*, 1, 647-654.
- , (2004): Najliczniejsza w Polsce kolonia rozrodcza mroczka poźlocistego *Eptesicus nilssonii*. *Nietoperze* 5, 117-118.
- , FUSZARA, E., FUSZARA, M., & KOWALSKI, M. (2001): Charakterystyka miejskiego zgrupowania nietoperzy Warszawy. *Ibid.* 2, 3-17
- , -, -, & WOJCIWICZ, B. (2001): The parti-coloured bat *Vespertilio murinus* in Warsaw, Poland. *Myotis* 39, 21-25.
- , GULATOWSKA, J., KOWALSKI, M., FUSZARA, E., FUSZARA, M., & WOJCIWICZ, B. (2006a): Nietoperze Wysoczyzny Północnej. *Nietoperze* 7, 39-55.
- , KOWALSKI, M., WOJCIWICZ, B., GULATOWSKA, J., SZARLIK, A., & NITKIEWICZ, T. (2006b): Zimowanie mroczka poźlocistego *Eptesicus nilssonii* w rejonie Kotliny Biebrzańskiej. *Ibid.* 7, 11-18.
- ŁUKASIAK, J. (1939): Badania nad fauną helmintologiczną Polski. *Fragm. Mus. Zool. Pol.* 4(5), 93-106.
- MARZEC, M. (2003): Zimowanie nietoperzy w piwnicach na terenie leśnym i otwartym. *Nietoperze* 4, 141-145.
- MASING, M., & LUTSAR, L. (2007): Hibernation temperatures in seven species of sedentary bats (*Chiroptera*) in northeastern Europe. *Acta Zool. Lituonica* 17, 47-55.
- MASING (sic!), M. V. (1980): O mestach zimovki rukokrylych v Estonii. In: KUZJAKIN, A. P., & PANJUTIN, K. K. (eds.): *Rukokrylyje*. *Nauka. Moskva*, 196-198.
- NIKODEM, Z. (1982): Materiały do fauny nietoperzy (*Chiroptera*) Lubelszczyzny. *Prz. Zool.* 26, 197-205.
- PAUZA, D. H., & PAUZIENE, N. (1998): Bats of Lithuania: distribution, status and protection. *Mammal Review* 28, 53-67.

- PETERSONS, G., & VINTULIS, V. (1998): Distribution and status of bats in Latvia. *Proc. Latvian Acad. Sci., Sec. B* **52**(1/2), 37-43.
- PIKSA, K. (1998): The chiropterofauna of the Polish Tatra Mountains. *Vespertilio* **3**, 93-100.
- , & NOWAK, J. (2000): The bat fauna of the Polish Tatra caves. In: *Proceedings of the VIIIth EBRS 1. Wołoszyn, B. W. (ed.): CIC ISEZ PAN. Kraków, 181-190.*
- POSTAWA, T., & GAS, A. (2003): Fauna nietoperzy Wigierskiego Parku Narodowego (północno-wschodnia Polska). *Studia Chiropterologica* **3-4**, 31-42.
- , & ZYGMUNT, J. (2000): Zmiany liczebności nietoperzy (*Chiroptera*) w jaskiniach Wyżyny Częstochowskiej w latach 1975-1999. *Ibid.* **1**, 83-114.
- RACHWALD, A., BORATYŃSKI, P., & NOWAKOWSKI, W. K. (2001): Species composition and activity of bats flying over rivers in the Białowieża Primeval Forest. *Acta Theriol.* **46**, 235-242.
- RÓŻOWICZ-WITKOWSKA, A., & WITKOWSKI, W. (2002): Nowe stwierdzenia miejsc hibernacji nietoperzy na Warmii. *Nietoperze* **3**, 243-246.
- RUPRECHT, A. L. (1976): Nowe obserwacje nad nietoperzami (*Chiroptera*) Białowieży. *Prz. Zool.* **20**, 115-123.
- (1979): Bats (*Chiroptera*) as constituents of the food of Barn owls *Tyto alba* in Poland. *Ibis* **121**, 489-494.
- (1983): 0023. *Eptesicus nilssoni* (Keyserling & Blasius, 1839). [In:] PUCEK, Z., & RACZYŃSKI, J. (eds.): *Atlas rozmieszczenia ssaków w Polsce*. PWN, Warszawa, text, 72-73, maps, 49.
- RYDELL, J. (1999): *Eptesicus nilssonii*. [In:] MITCHELL-JONES, A. J., et al. (eds.): *The Atlas of European Mammals*. Poyser Natural History. London, 140-141.
- SACHANOWICZ, K. (2003): Zimowe stwierdzenia nietoperzy *Chiroptera* w południowej części Wysoczyzny Drohiczyńskiej i w regionie Podlaskiego Przełomu Bugu (Nizina Podlaska). *Nietoperze* **4**, 5-19.
- , & WOWER, A. (2004): Mroczek pozłocisty *Eptesicus nilssonii* (Keyserling et Blasius, 1839) w miastach Aglomeracji Górnośląskiej – wyniki obserwacji wstępnych. *Mat. XVIII OKCh, Toruń*, 21-22.
- SKIBA, R. (1990): Zur Verbreitung der Nordfledermaus, *Eptesicus nilssoni* (Keyserling & Blasius, 1839), im Schwarzwald der Bundesrepublik Deutschland. *Myotis* **28**, 59-66.
- SKURATOWICZ, W. (1948): Badania nad fauną ssaków Zamojszczyzny. *Fragm. Faun. Mus. Zool. Pol.* **5**, 233-292.
- (1950): Badania nad składem pokarmu puszczyka (*Strix aluco* L.) w latach 1946/48. *PTPN. Wydz. Mat.-Przyr.*, Pr. Kom. Biol. **12**(4), 1-10.
- , & WARCHALEWSKI, E. (1954): Przyczynę do fauny drobnych ssaków Podkarpacia. *PTPN, Wydz. Mat.-Przyr.*, Pr. Kom. Biol. **15**(2), 119-129.
- STEBBINGS, R. E., & GRIFFITH, F. (1986): Distribution and status of bats in Europe. *Institute of Terrestrial Ecology NERC, Monks Wood.*
- SZKUDLAREK, R., PASZKIEWICZ, R., BLOHM, T., NOWAK, E., & LUPICKI, D. (2001): Bunkry Ziemi Lubuskiej jako schronienia nietoperzy. *Nietoperze* **2**, 85-92.
- , -, HEBDA, G., GOTTFRIED, T., CIEŚLAK, M., MIKA, A., & RUSZLEWICZ, A. (2002): Atlas rozmieszczenia nietoperzy w południowo-zachodniej Polsce – stanowiska zimowe z lat 1982-2002. *Ibid.* **3**, 197-235.
- WALECKI, A. (1866): Przegląd zwierząt ssących krajowych. *Bibl. Warsz.* **2**, 413-457.
- WOJCIECHOWSKI, M., & NEUBAUER, G. (2002): Zimowanie nietoperzy na terenie Suwalskiego Parku Krajobrazowego w latach 1998-1999. *Nietoperze* **3**, 33-37.
- WOŁOZYN, B. W., LABOCHA, M., GALOSZ, W., & POSTAWA, T. (1996): Stan zbadania chiropterofauny Bieszczadów – w polskiej części Międzynarodowego Rezerwatu Biosfery "Karpaty Wschodnie". In: WOŁOZYN, B. W. (ed.): *Aktualne problemy ochrony nietoperzy w Polsce*. CIC ISEZ PAN, Kraków, 157-180.
- ZUKAL, J., & GAISLER, J. (1989): K vyskytu a zmenám početnosti netopýra severního, *Eptesicus nilssoni* (Keyserling et Blasius, 1839), v Československu. *Lynx* **25**, 83-95.

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