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FIELD NOTE

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Two new capture records of the greater noctule bat *Nyctalus lasiopterus* (Schreber, 1780) in Slovenia

Nova podatka o ujetju velikega mračnika *Nyctalus lasiopterus* (Schreber, 1780) v Sloveniji

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The greater noctule bat (*Nyctalus lasiopterus*) is a very large bat species distributed in the Mediterranean region as well as in central and eastern Europe (Alcaldé et al. 2016) and has until recently only been assumed to occasionally appear in Slovenia (Petrinjak 2009). Until Presetnik & Knapič (2015) rediscovered *N. lasiopterus* in the country after more than 85 years, the only known confirmed location came from the Slovenian Littoral (Dal Piaz 1927). After discovering the species in 2013 and 2014 (Presetnik & Knapič 2015), a few new localities, detected by surveying bat echolocation calls, have been recorded in the south-western part of the country (Presetnik 2017, 2019, Presetnik & Šalamun 2019). In 2017, the first capture record of the species for the country followed when Zidar (2020) deployed mist-nets at a pond in the Istria region. This capture of *N. lasiopterus* was then followed in 2019 in two different regions by Gojznikar et al. (2020) in the Branica river valley, and Pavlovič et al. (2020) at Babna Polica. With this contribution, we wish to present two new capture records of the species, which add to the knowledge of its distribution and presence in Slovenia.

On 28 July 2020 we revisited the pond 350 m east from Poletiči (45.495674 °N, 13.867912 °N, 343 m a.s.l.), where Zidar (2020) made the first capture record in 2017. Mist-nets were erected along the pond's western, northern and eastern edges, covering around three quarters of the pond's perimeter (the southern bank was not enclosed). The total length of five nylon/polyester mist-nets covered 75 metres, with nets being erected approximately 4 metres in height. The field session was conducted between 20:36 (sunset) and 01:15 h. On another occasion, the mist-nets were erected on 9 August 2020 at a pond 700 m SE of Bukov vrh hill at the Poček military training ground near Postojna (hereinafter referred to as the Poček pond, 45.728980 °N, 14.245737 °E, 621 m a.s.l.). The shallow circular concrete-lined pond with a diameter of approximately 12 metres was completely surrounded by four nylon/polyester mist-nets in total length of 39 metres, erected approximately 3 metres in height. The area in the immediate vicinity of the pond consisted mainly of dry meadows, with closest mixed woodland edge c. 35 metres away. The field session began at 20:20 and ended at 23:20 h.

All caught bats were quickly removed from the mist-nets, then measured using a calliper (0.1 mm accuracy), weighed with a spring scale (0.5 g accuracy, max. range of 50 g) and determined using an identification key (Dietz et al. 2009). Sex, sexual activity, and age of each individual were determined (Haarsma 2008).

At the pond near Poletiči we caught two adult male *N. lasiopterus* (Tab. 1), which both showed signs of sexual activity (enlarged testes). The second caught male had a distinctly paler face (Fig. 1). According to Haarsma (2008), this could indicate an older individual. This conclusion, however, was not supported by absence of dental wear, which was similar to that of the first male. Additionally, we captured 17 individuals of *Pipistrellus kuhlii*, 14 of *Hypsugo savii,* 2 of *N. leislerii* and 1 of *Plecotus macrobullaris.*

Table 1. Measurements of captured *Nyctalus lasiopterus* individuals. Due to limitation with the maximum range of the spring scale (50 g), most individuals were too heavy to be weighed accurately. Abbreviations: M – male, AD – adult, AB – forearm length, T – testes, E – epididymis. Estimates of sexual activity: / - no signs; + - slightly swollen, ++ - swollen, +++ - very swollen, ++++ - extremely swollen.

Tabela 1. Meritve ujetih osebkov *Nyctalus lasiopterus*. Zaradi presežene zgornje vrednosti vzmetne tehtnice (50 g) je bila večina netopirjev pretežka za natančno tehtanje. Okrajšave: M – samec, AD – odrasel, AB – dolžina podlakti, T – moda, E – obmodki. Ocene spolne aktivnosti: / - ni sledov, + - rahlo napolnjeni, ++ - napolnjeni, +++ - zelo napolnjeni, ++++ - izredno napolnjeni.

Location	Date	Sex [Age]	AB (mm)	Mass (g)	Sexual activity	Remarks
Pond near Poletiči	28. 7. 2020	M [AD]	66.2	>48.0	T ++ E /	
Pond near Poletiči	28. 7. 2020	M [AD]	64.0	45.0	T + E /	pale facial skin
Poček pond	9. 8. 2020	M [AD]	65.8	>48.0	T ++++ E +(+)	
Poček pond	9. 8. 2020	M [AD]	64.0	>48.0	T +++ E +	
Poček pond	9. 8. 2020	M [AD]	67.8	>48.0	T +++ E /	

Figure 1. The pale-faced male *Nyctalus lasiopterus* (a) compared to its more usually coloured male conspecific (b) (both photographed at pond near Poletiči; photo: Jan Gojznikar).

Slika 1. Samec *Nyctalus lasiopterus* z bledo kožo obraza (a) primerjan z bolj običajno obarvanim sovrstnikom (b) (oba fotografirana na kalu pri Poletičih; foto: Jan Gojznikar).

At the Poček pond we caught three adult males of *N. lasiopterus* (Tab. 1) – all three with traits indicating sexual activity. We also caught two other *Nyctalus* species known to occur in Slovenia (Presetnik et al. 2009), with 2 individuals of both *N. leisleri* and *N. noctula*. Additionally, we recorded one individual of *Myotis myotis*, *M. nattereri* and *Pl. auritus* each.

So far, all capture records of the species in Slovenia have encountered exclusively male individuals (Zidar 2020, Gojznikar et al. 2020, Pavlovič et al. 2020, this study). Although Pavlovič et al. (2020) conclude that there is no proof of reproduction for Slovenia, we cannot exclude this possibility. Apparent signs of sexual activity in our caught males and those caught by Zidar (2020) and Gojznikar et al. (2020) could indicate that at least mating of *N. lasiopterus* may occur in Slovenia.

Our capture of *N. lasiopterus* at the pond near Poletiči shows that the capture by Zidar (2020) was not a chance finding of vagrant individuals. Instead, it suggests that the species is constantly present in the area, at least during the mid-summer months. After the long absence of record, our captures also suggest, together with other recent findings (Presetnik & Knapič 2015, Presetnik 2017, Presetnik 2019, Presetnik & Šalamun 2019, Zidar 2020, Gojznikar et al. 2020, Pavlovič et al. 2020), a possibility of the species becoming more common in the south-western part of the country. During the previous visit of the same pond at Poček twelve years ago, Zagmajster (2008) did not record *N. lasiopterus*, although a single mist-netting with no caught individuals does not prove the species absence. One of the possible explanations for the species becoming more common in Slovenia is perhaps climate change. Using modelling approaches, Rebelo et al. (2010) have suggested a future northward range expansion for many bat species of the Mediterranean biogeographic group, including *N. lasiopterus*, under the influence of climate change. Even though it has been demonstrated that this phenomenon has impacted distribution ranges of some other bat species, like *Pipistrellus kuhlii* (e.g., Ancillotto et al. 2016), further continental-wide research is required to corroborate this possibility for *N. lasiopterus*. Recent records of the species in Slovenia for now only imply that the species has become more common than previously observed, yet it would be nonetheless sensible to start considering this species in future conservation plans in Slovenia, at least within the south-western part of the country. Estók et al. (2007) have suggested that the species uses older trees with sufficient natural crevices for roosting, and since forested areas in Slovenia have been under increased pressure from logging in the last few years (e. g. Pisek & Poljanec 2020), *N. lasiopterus* should probably also be included in forest management plans. Additional research is also needed to unravel the status of the species in the country.

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References

Alcaldé J., Juste J., Paunović M. (2016): *Nyctalus lasiopterus.* The IUCN Red List of Threatened Species 2016: e.T14918A22015318. https://dx.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T14918A22015318.en [accessed on 23. 12. 2020]

Ancillotto L., Santini L., Ranc N., Maiorano L., Russo D. (2016): Extraordinary range expansion in a common bat: the potential roles of climate change and urbanisation. Sci. Nat. 103: 15.

Dal Piaz G. B. (1927): I Mammiferi fossili e viventi delle TreVenezie. N. 2: Chiroptera. Studi Trentini. Serie II, Scienze Naturali ed Economiche 8: 171-194.

Dietz C., von Helversen O., Nill D. (2009): Bats of Britain, Europe and Northwest Africa. A&C Black, London, 400 pp.

Estók P., Gombkötő P., Cserkész T. (2007): Roosting behaviour of the greater noctule bat *Nyctalus lasiopterus* Schreber, 1780 (Chiroptera, Vespertilionidae) in Hungary as revealed by radio-tracking. Mammalia 71(1-2): 86-88.

Gojznikar J., Mlakar Medved M., Grgurevič S. (2020): Results from the Bat research group on Biocamp 008 biological camp, 28 July – 3 August 2019, Šempeter pri Novi Gorici and Čepovan (Slovenia). Hypsugo 5(2): 33-43.

Haarsma A.J. (2008): Manual for assessment of reproductive status, age and health in European Vespertilionid bats. Electronic publication. Version 1. Hillegom (Holland), 62 pp.

Pavlovič E., Bombek Ž., Grgurevič S. Rajh M. (2020): Results of bat surveys from the biology students research camp »Biology and Ecology Research Camp – Stari trg pri Ložu 2019« (Slovenia). Hypsugo 5(2): 14-32

Petrinjak A. (2009): Veliki mračnik *Nyctalus lasiopterus* (Schreber, 1780). In: Presetnik P., Koselj K., Zagmajster M. (Eds.), Atlas netopirjev (Chiroptera) Slovenije, Atlas of bats (Chiroptera) of Slovenia. Center za kartografijo favne in flore, Miklavž na Dravskem polju, pp. 94-95

Pisek R., Poljanec A. (Eds.) (2020): Poročilo Zavoda za gozdove Slovenije o gozdovih za leto 2019. Zavod za gozdove Slovenije, Ljubljana, 121 pp.

Presetnik P., Koselj K., Zagmajster M. (Eds.) (2009): Atlas netopirjev (Chiroptera) Slovenije, Atlas of bats (Chiroptera) of Slovenia. Center za kartografijo favne in flore, Miklavž na Dravskem polju. 152 pp.

Presetnik P., Knapič T. (2015): First confirmations of the greater noctule bat *Nyctalus lasiopterus* (Schreber, 1780) presence in Slovenia after more than 85 years. Nat. Slov. 17(1): 41-46.

Presetnik P. (2017): Visoka pestrost netopirjev v Parku Škocjanske jame. Proteus 79(7-9): 439-445.

Presetnik P. (2019): Poročilo o delu skupine za netopirje, ježe in občasno ostale sesalce. In: Bizjak N., Presetnik P. (Eds.), Raziskovalni tabor študentov biologije Marezige 2018. Društvo študentov biologije, Ljubljana, pp. 88-92.

Presetnik P., Šalamun A. (2019): First record of the European free-tailed bat *Tadarida teniotis* (Rafinesque, 1814) in Slovenia. Nat. Slov. 21(1): 47-53.

Rebelo H., Tarroso P., Jones G. (2010): Predicted impact of climate change in European bats in relation to their biogeographic patterns. Glob. Change Biol. 16(2): 561-576.

Zagmajster M. (2008): Netopirji. In: Tome D. (Ed.), Naravovarstveno ovrednotenje izbranih vojaških območij v Sloveniji: primerjalna študija z referenčnimi območji, CRP Znanje za varnost in mir 2006-2010. Nacionalni inštitut za biologijo, Ljubljana, pp. 280-297.

Zidar S. (2020): First capture of the greater noctule bat *Nyctalus lasiopterus* (Schreber, 1780) individuals in Slovenia. Nat. Slov. 22(1): 35-38.