

An interesting observation of Eurasian beaver *Castor fiber* Linnaeus, 1758 in Vidovec Cave (Metlika, Slovenia)

Tinkara KEPIC^{1*}, Meta VALENCIČ¹, Mařisa SCHLAMBERGER¹, Tjaša TRAJBARIČ¹, Łukasz POPOWICZ¹, Annasibila POŽRL¹, Valentina JAKOB¹, Klara ŽOS¹, Ester PREMATE²

¹Društvo študentov biologije, Biološko središče, Večna pot 111, SI-1000 Ljubljana, Slovenia

²University of Ljubljana, Biotechnical Faculty, Department of Biology, SubBio Lab, Jamnikarjeva 101, SI-1000 Ljubljana, Slovenia

*corresponding author; E-mail: kepic.tinkara@gmail.com

Abstract. The Eurasian beaver is a common rodent which became extinct in Slovenia in the 18th century and reappeared in the 1990's. This field note describes an encounter with a beaver inside the Vidovec Cave (Metlika, Southeastern Slovenia). Apart from a sign of beaver presence, we also noticed a straw mat presumably used for sleeping. The described observation is probably the first of its kind in Slovenia, although similar observations are known from Croatia as well.

Izveleček. Zanimivo opažanje evropskega bobra *Castor fiber* Linnaeus, 1758 v jami Vidovec (Metlika, Slovenija) – Evrazijski bobrer je glodavec, ki je v Sloveniji izumrl v 18. stoletju in se ponovno naselil v devetdesetih letih prejšnjega stoletja. V terenski notici je opisano opažanje prisotnosti bobra in ležišča iz slame v jami Vidovec (Metlika, jugovzhodna Slovenija). Opisana najdba je verjetno prva tovrstna v Sloveniji, a so bila podobna opažanja že zabeležena tudi na Hrvaškem.

The Eurasian beaver (*Castor fiber*) is the largest European rodent, typically inhabiting water bodies such as rivers, streams or lakes. The animals themselves are rarely sighted directly, but their presence can be confirmed by finding faeces, footprints, lodges, dams, gnawed and fallen trees (Macdonald et al. 1995; Kryštufek et al. 2006).

The Eurasian beaver was widespread throughout Europe, but almost became extinct due to excessive hunting and trapping for fur at the end of the 19th century. In the 20th century, beavers were reintroduced in several countries. In 1998, dispersing animals from the reintroductions in Croatia in 1996 also reached the Slovene territory

via the Sava River (Kryštufek et al. 2006). In 2006, the beaver's presence was further confirmed along the border with Croatia, i.e., in the eastern parts of the Prekmurje and Dolenjska regions (Kryštufek et al. 2006). Since the first reappearance of the beaver in Slovenia, its abundance has increased. Kryštufek et al. (2006), for example, estimated that there were less than ten individuals on the Krka River, while a later study on the abundance of the beaver estimated the population size at between 168–392 individuals (Juršič et al. 2017). According to the Life Beaver project website (LIFE BOBER 2023), beavers in Slovenia currently live in the catchments of the Mura, Drava, and Sava Rivers.

Here we report an interesting observation of a single Eurasian Beaver in a cave near Metlika in the Bela krajina region, Slovenia. Around 3 p.m. on 19. 11. 2022 we entered the Vidovec Cave (latitude 45.645452, longitude 15.377206, Slovenian cadastral number 3342; eKataster jam 2023; Fig. 1) as part of a field excursion organised by the Biology Students' Society. The cave entrance is located east of the village of Božakovo in the Municipality of Metlika. The cave is a source cave, shaped by the Vidovec stream which permanently flows through it. The cave is about 270 m long and ends with a syphon (eKataster jam 2023). The Vidovec stream is a tributary of the Kolpa River, which is part of the Sava River catchment area (Fig. 1).

During our visit to the cave, we were surprised to observe a beaver swimming in the stream, about 40 m inside the cave. The animal retreated to the side of the stream and began swimming in the opposite direction deeper into the cave, where it hid in a narrow, flooded corner. The animal seemed wary but showed no aggression towards us. About 50 m from the entrance, a straw mat (Fig. 2) and a similar smaller but shapeless pile of straw were found lying on the muddy bank. We also noted beaver footprints in the mud in several places up to about 100 m inside the cave. The cave was visited again on 25. 12. 2022. Although the beaver was not observed on this day, the mat was still there.

To our knowledge, this is the first field observation of a beaver and its shelter in a cave in Slovenia. However, Pleistocene beaver remains from the last ice age in the Alpine region have confirmed that caves were used as shelters even before the extinction and reintroduction of beavers in Europe (Kryštufek et al. 2006). Remains of beaver bones were also found in several caves in Slovenia



(Kryštufek et al. 2006). In addition, there are several recent observations of beaver shelters in caves in Croatia. In the Plitvice Lakes National Park (Karlovac, Croatia), beaver shelters were found in the caves during a survey conducted on beaver population in this area (Augustinović 2022). The beavers in this area built shelters under waterfalls or chose caves instead of open parts of lakes and water bodies as their dwelling sites (Marijan Grubešić, pers. comm., January 2023). In close vicinity to the Vidovec Cave, a beaver was also observed dwelling about one kilometre inside the cave, which was formed by a sinking stream that resurfaces after one kilometre and flows into the Dobra River, Croatia (Marijan Grubešić, pers. comm., January 2023). Moreover, Gore and Wilson Baker (1999) reported similar behaviour in another beaver species. They observed beavers (*C. canadensis*) in Northern Florida, where the beavers used the caves as shelters but hypothesised

that unless the cave entrance was permanently flooded, caves served only as low-cost, temporary shelters for subadult beavers during the dispersal period. However, it can be assumed that beaver families only choose caves with permanent underwater entrances to provide sufficient protection. Mats made of vegetation, tracks, faeces and a subadult animal were found in observed caves (Gore & Wilson Baker 1999).

According to the available literature, the Beaver observed in the Vidovec Cave may have been a dispersing individual. However, further visits to the Vidovec Cave and perhaps observations with an infrared camera could provide additional insights into the use of the cave as a shelter by beavers and the regularity of this behaviour. Further targeted surveys could elucidate the role of caves in beaver ecology.

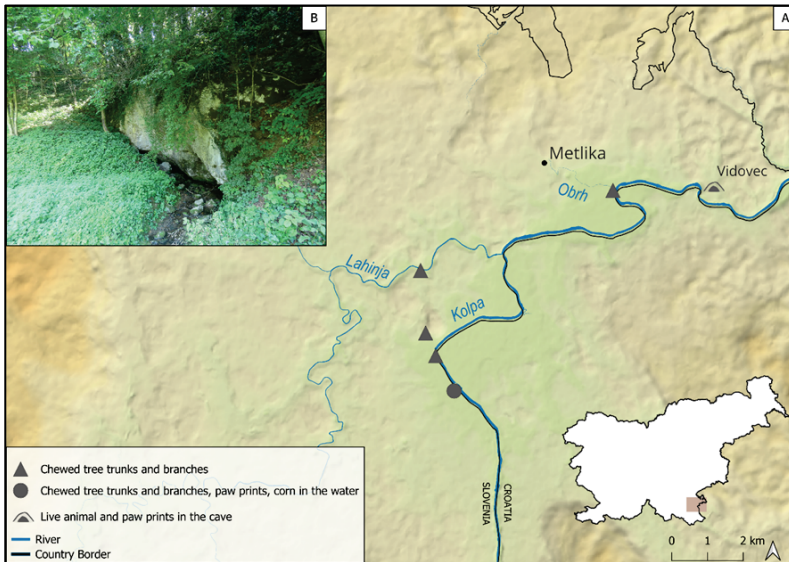


Figure 1. A: A map of the beaver presence in the south-eastern part of the Sava catchment in the surroundings of the Vidovec Cave where the beaver was observed. Data on other beaver occurrences is from the database maintained by the Inštitut Lutra (2023). Other map layers are from Copernicus data and information funded by the European Union - EU-DEM (EU 2016), and GURS (2010) (rivers and state border). Map produced with QGIS version 3.32.3. B: entrance of the Vidovec Cave. Photo: Primož Presetnik

Slika 1. A: Zemljevid pojavljanja bobra v jugovzhodnem delu porečja Save, v bližini jame Vidovec, kjer je bil opažen bober. Podatke o pojavljanju bobra smo pridobili iz zbirke podatkov Inštituta Lutra (2023). Drugi uporabljeni sloji so podatki Copernicus in informacije, ki jih financira Evropska unija - EU-DEM (EU 2016) in GURS (2010) (sloj rek in državna meja). Zemljevid smo izdelali s programom QGIS verzija 3.32.3. B: Vhod v jamo Vidovec. Foto: Primož Presetnik



Figure 2. Beaver straw mat inside the Vidovec Cave.
Photo: Łukasz Popowicz.

Slika 2. Bobrovo ležišče iz slame v jami Vidovec.
Foto: Łukasz Popowicz.

Acknowledgments

We are grateful to Dren Dolničar and Eva Pavlovič who visited and checked the cave for beaver presence on 25. 12. 2022. We would also like to thank Prof Dr Marijan Grubešić from the Faculty of Forestry and Wood Technology, University of Zagreb, and Lutra, Institute for Conservation of Natural Heritage, Slovenia, who shared their observations and data with us.

References

Augustinović M. 2022. Beaver (*Castor fiber*) Population Size in Plitvice Lakes National Park and Its Impact on the Tufa. Session I – Beaver and Environment. In: Cosma E-M, Spătaru C-G, editors. Book of Abstracts of The 9th International Beaver Symposium. Ilfov (RO): Editura Silvică - »Marin Drăcea« National Institute of Research-Development in Forestry (INCDS). p. 18.

eKataster jam. 2023. Cave 3342; [accessed 8.10.2023].

<https://www.katasterjam.si/caves/3342>

[EU] European Union. 2016. EU-DEM v1.1. Copernicus Land Monitoring Service; [accessed 19. 10. 2023].

<https://land.copernicus.eu/imagery-in-situ/eudem/eu-dem-v1.1>

[GURS] Geodetska uprava Republike Slovenije. 2010. Zvezna vektorska kartografska zbirka podatkov; [accessed 19.10.2023].

<https://egp.gu.gov.si/egp/>

Gore JA, Wilson Baker W. 1999. Beavers Residing in Caves in Northern Florida. Journal of Mammalogy. 70(3): 677-678.

<https://doi.org/10.2307/1381451>

Inštitut Lutra. 2023. Bobrosled (project LIFEBOBER).

Juršič K, Zupančič K, Šet J, Mazinjanin K. 2017. Ocena številčnosti populacije evrazijskega bobra *Castor fiber* Linnaeus, 1758 na reki Krki in njenih pritokih v letu 2017. Natura Sloveniae. 19(2): 29-46.

<https://doi.org/10.14720/ns.19.2.29-46>

Kryštufek B, Hudoklin A, Pavlin D. 2006. Bober (*Castor fiber*) v Sloveniji. Scopolia. 59: 1-41.

LIFE BOBER. 2023. Osebna izkaznica. Ljubljana: Lutra, Inštitut za ohranjanje naravne dediščine (LIFE Beaver); [accessed on 16. 10. 2023].

<https://life-beaver.eu/o-bobru/osebna-izkaznica/>

Macdonald DW, Tattersall FH, Brown ED, Balharry D. 1995. Reintroducing the European Beaver to Britain: nostalgic meddling or restoring biodiversity? Mammal Review. 25(4): 161-200.

<https://doi.org/10.1111/j.1365-2907.1995.tb00443.x>