Theriologia Ukrainica, **20**: 127–131 (2020)
p-ISSN 2616-7379 • e-ISSN 2617-1120
DOI: 10.15407/TU2014

COMPARISON OF NATURAL AND RE-INTRODUCED POPULATIONS OF THE STEPPE MARMOT (*MARMOTA BOBAK*) IN DONETSK OBLAST, UKRAINE

Eugen Skubak

Key words

steppe marmot, natural population, re-introduced population, Donetsk Oblast

doi

http://doi.org/10.15407/TU2014

Article info

submitted 27.05.2020
revised 07.08.2020
accepted 14.10.2020

Language

English, Ukrainian summary

Affiliations

Holy Mountains National Nature Park (Yarova, Ukraine)

Correspondence

Eugen Skubak; Holy Mountains National Nature Park; 281 Gutyanska St, Yarova, Donetsk Oblast, 84432 Ukraine; e-mail: nppsvyatygory@gmail.com; orcid: 0000-0003-1144-4574

Abstract

The paper presents data on distribution and abundance of the steppe marmot in the territory of two northern raions (districts) of Donetsk Oblast — Sloviansk and Lyman. Research was carried out in 2011 to 2020. In total, 284 burrows were recorded belonging to 25 home ranges. The largest marmot settlements in the studied territory comprise up to 29 burrows. The number of burrows on a home range varies from 1 to 29, in average 11.4. The total abundance of the steppe marmot is over 100 animals in Lyman Raion and over 20 individuals in Sloviansk Raion. The marmot population in Sloviansk Raion is re-introduced— 370 individuals were released in 1991, while the population in Lyman Raion is of rather natural origin. The optimal habitats for the steppe marmot are chalk slopes of southern exposure, where its home ranges consist of the highest number of burrows. Permanent inhabited burrows are located in the middle part of the slopes, whereas the vast majority of protective burrows are below the slope and at the bottom of the beams. All settlements are located on the right bank of rivers. The largest marmot settlements are confined to poor Cretaceous and, less frequently, sandy soils with sparse vegetation. The natural marmot population in Lymansky Raion shows a tendency to slow dispersal and population growth, while the abundance of the re-introduced population is much smaller than the number of released animals. The density of the natural population remains low despite the many uninhabited areas suitable for the marmots. Settlements are formed as separate disconnected groups. New marmot settlements are often formed in places of old settlements. Natural populations are more stable compared to re-introduced ones and the density of natural steppe marmot population is also higher. Poaching, especially in Sloviansk Raion, is a major threat to the marmot, as well as the overgrowth of the steppe by shrubs due to decrease in grazing. Marmot settlements on the Cretaceous steppes are almost insensitive to reduced grazing. In Lyman Raion, fires and ploughing of balka slopes, too, negatively affect the species. Development of epizootics is unlikely given the low density of the marmot. The marmot populations can be preserved and can even expand their range in the region if sufficient protection measures are provided.

Cite as

Skubak, E. 2020. Comparison of natural and re-introduced populations of the steppe marmot (*Marmota bobak*) in Donetsk Oblast, Ukraine. *Theriologia Ukrainica*, **20**: 127–131. [In English, with Ukrainian summary]

Theriologia Ukrainica, **20**: 127–131 (2020)
http://doi.org/10.15407/TU2014

COMPARISON OF NATURAL AND RE-INTRODUCED POPULATIONS OF THE STEPPE MARMOT (*MARMOTA BOBAK*) IN DONETSK OBLAST, UKRAINE

Eugen Skubak

Holy Mountains National Nature Park (Sviatohirsk, Ukraine)

Comparison of natural and re-introduced populations of the steppe marmot (*Marmota bobak*) in Donetsk Oblast, Ukraine. — E. Skubak. — The paper presents data on distribution and abundance of the steppe marmot in the territory of two northern raions (districts) of Donetsk Oblast — Sloviansk and Lyman. Research was carried out in 2011 to 2020. In total, 284 burrows were recorded belonging to 25 home ranges. The largest marmot settlements in the studied territory comprise up to 29 burrows. The number of burrows on a home range varies from 1 to 29, in average 11.4. The total abundance of the steppe marmot is over 100 animals in Lyman Raion and over 20 individuals in Sloviansk Raion. The marmot population in Sloviansk Raion is re-introduced—370 individuals were released in 1991, while the population in Lyman Raion is of rather natural origin. The optimal habitats for the steppe marmot are chalk slopes of southern exposure, where its home ranges consist of the highest number of burrows. Permanent inhabited burrows are located in the middle part of the slopes, whereas the vast majority of protective burrows are below the slope and at the bottom of the beams. All settlements are located on the right bank of rivers. The largest marmot settlements are confined to poor Cretaceous and, less frequently, sandy soils with sparse vegetation. The natural marmot population in Lymansky Raion shows a tendency to slow dispersal and population growth, while the abundance of the re-introduced population is much smaller than the number of released animals. The density of the natural population remains low despite the many uninhabited areas suitable for the marmots. Settlements are formed as separate disconnected groups. New marmot settlements are often formed in places of old settlements. Natural populations are more stable compared to re-introduced ones and the density of natural steppe marmot population is also higher. Poaching, especially in Sloviansk Raion, is a major threat to the marmot, as well as the overgrowth of the steppe by shrubs due to decrease in grazing. Marmot settlements on the Cretaceous steppes are almost insensitive to reduced grazing. In Lyman Raion, fires and ploughing of balka slopes, too, negatively affect the species. Development of epizootics is unlikely given the low density of the marmot. The marmot populations can be preserved and can even expand their range in the region if sufficient protection measures are provided.

Key words: steppe marmot, natural population, re-introduced population, Donetsk Oblast.

Correspondence to: Eugen Skubak; Holy Mountains National Nature Park; 281 Gutyanska St, Yarova, Donetsk Oblast, 84432 Ukraine; e-mail: nppsvyatygory@gmail.com; orcid: 0000-0003-1144-4574

Submitted: 27.05.2020. Revised: 07.08.2020. Accepted: 14.10.2020.

Introduction

The marmot is an autochthonous species of the Eurasian steppe belt, and the area of Donetsk Oblast of Ukraine is part of the species' former range. Due to intense cultivation of the steppe, the species disappeared in the oblast and the last records of signs of the marmot are dated to the 1920s–1930s (Taranenko, 1997). Natural populations of the marmot have remained in the territory of neighbouring Kharkiv and Luhansk Oblasts, where in the mid-20th century the revival of the species has started. Attempts of re-introduction of the marmot in steppe reserves of Donetsk Oblast had failed, while the last attempt was made in 1989–1996, including the area of Sloviansk Raion (Tokarsky *et al.* 2006a). In the north of Donetsk Oblast, we first recorded the species in 2011 at the border with Luhansk Oblast.

Material and Methods

The first data on the marmot were recorded unintentionally during other planned field studies. In 2013, a young marmot was observed by employees of the Holy Mountain National Nature Park

near the Dovzhyk tract. In 2016, a marmot settlement with 7 burrows was found near the village of Serednie during expedition. More detailed census of the marmot was conducted in 2018 in Lyman Raion in basins of the rivers Nitrius and Zherebets. Additionally, a home range with 13 burrows was found in April 2018 on a steppe hill during ornithological observations on waterbodies of "Donrybkombinat" near Dolyna. In 2019–2020, additional planned studies were carried out in potential habitats in the north of Sloviansk Raion, Donets Oblast.

When examining a settlement, the number of burrows (absolute census) and their attendance (used or abandoned) were recorded. Wintering and nursing burrows could not be distinguished during a single observation. Geographical coordinates were also recorded as well as the width and height of entrances to the burrows. Due to the impossibility to estimate the real situation, the number of entrances was considered as the number of burrows. The marmots were observed visually in a number of settlements, while burrows of other species were identified based on structural features or signs of vital activity (excrements, footprints, etc.). As for a species with an expressed colonial lifestyle, the best characteristics to estimate the population abundance in the steppe marmot is the number of family or wintering burrow (Tokarsky *et al.* 2012). Thus, the number of burrows connected by clearly distinguishable trails was considered as the number of home ranges.

Results and Discussion

Steppe marmot distribution in Sloviansk Raion

In 1991, 370 marmots were released near Bohorodychne, Maiaky, and Mykolaivka villages, where the number of animals by 1996 decreased to 107 (Ugnevenko & Taranenko 1997). According to the locals, the marmot colony near Bohorodychne was completely wiped out by poachers. In 2018, a living marmot colony was found between Dolyna and Adamivka villages 7.5 km far from the release sites. During a second survey in April 2019, the colony was found uninhabited, presumably, again, as a result of poaching. A single burrow of the marmot was found on 5 September 2019 on a chalk hill in the Ploske tract (between villages Pryshyb and Sydorove) (Fig. 1).

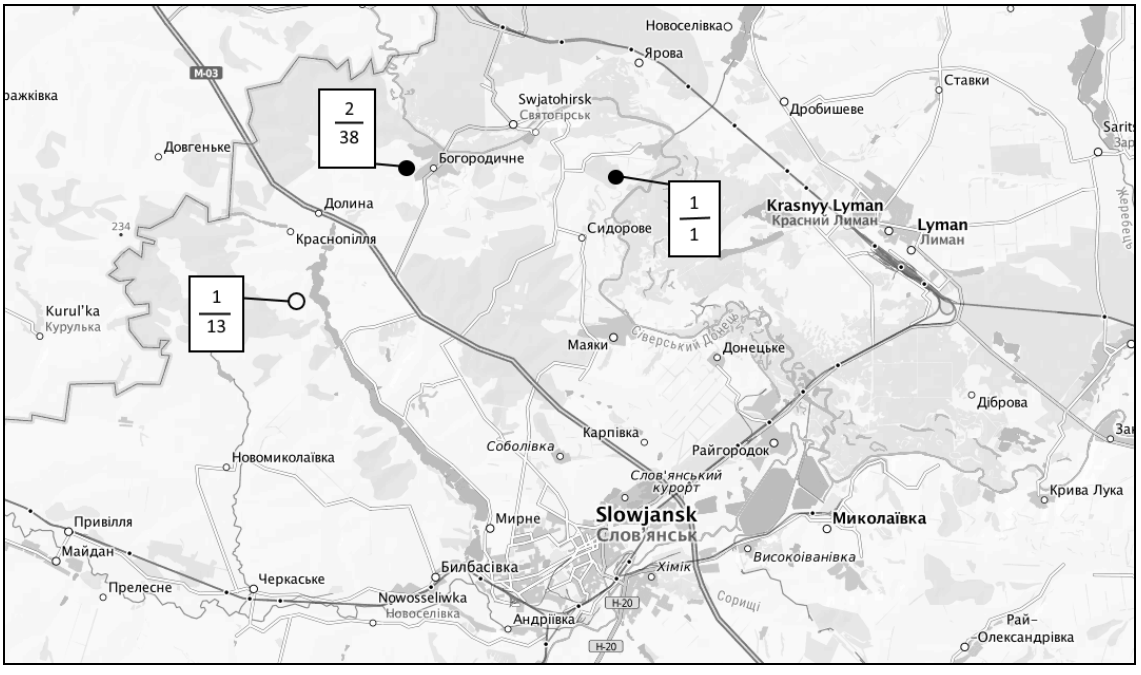

Fig. 1. Distribution of the steppe marmot in Sloviansk Raion of Donetsk Oblast. Number of home ranges in the colony / total number of burrows. Colonies: ● — existing; ○ — extinct.

Рис. 1. Поширення бабака в Слов'янському районі Донецької області. В чисельнику – кількість сімейних ділянок в колонії, в знаменнику — загальна кількість нір. Колонії: ● — існуючі; ○ — зниклі.

During a second survey on 23 April 2020, fresh marmot excrements were found near the burrow. The closest release site is Maiaky. In spring 2020, two marmot families were found in a chalk balka near Bohorodychne having 29 and 9 burrows, respectively. The bigger settlement is located close to the village, which is uncommon for the species in the region, and might indicate a decrease in poaching. The colony is locates in an area, where until the mid-1990s a settlement had already existed, which was destroyed by poachers. In Sloviansk Raion, most of the marmot settlements are located on chalk hills with sparse xerophytic vegetation.

As of 2020, four marmot settlements are known in Sloviansk Raion, one of which is abandoned. The total abundance of the species is about 20 individuals, although yet undiscovered families may also exist. A partially successful re-introduction of the species in region can be stated: the species have survived for 30 years since the time of release and inhabited new sites, although its number has substantially decreased. Further prospects of the marmot depend on poaching intensity. If poaching is eliminated the establishment of the species may be expected on chalk slopes of the northern part of the raion. Living among sparse vegetation on chalk, this population is less susceptible to the intensity of grazing.

Steppe marmot distribution in Lyman Raion

All settlements are located in the right-bank part of the basins of the rivers Nitrius and Zherebets, where the relief is more divided. Nursing burrows are located in the middle part of slopes, while protective burrows are in the bottom of balkas and at the edge of the home range. In large marmot families, there is a well-developed and clearly visible system of trails between the burrows, while in young settlements trails are mildly expressed. In total, 21 marmot colonies were recorded in Lyman Raion with 231 burrows, of which 10 settlements with 117 burrows in the Nitrius basin and 11 settlements with 115 burrows in the Zherebets basin (Fig. 2).

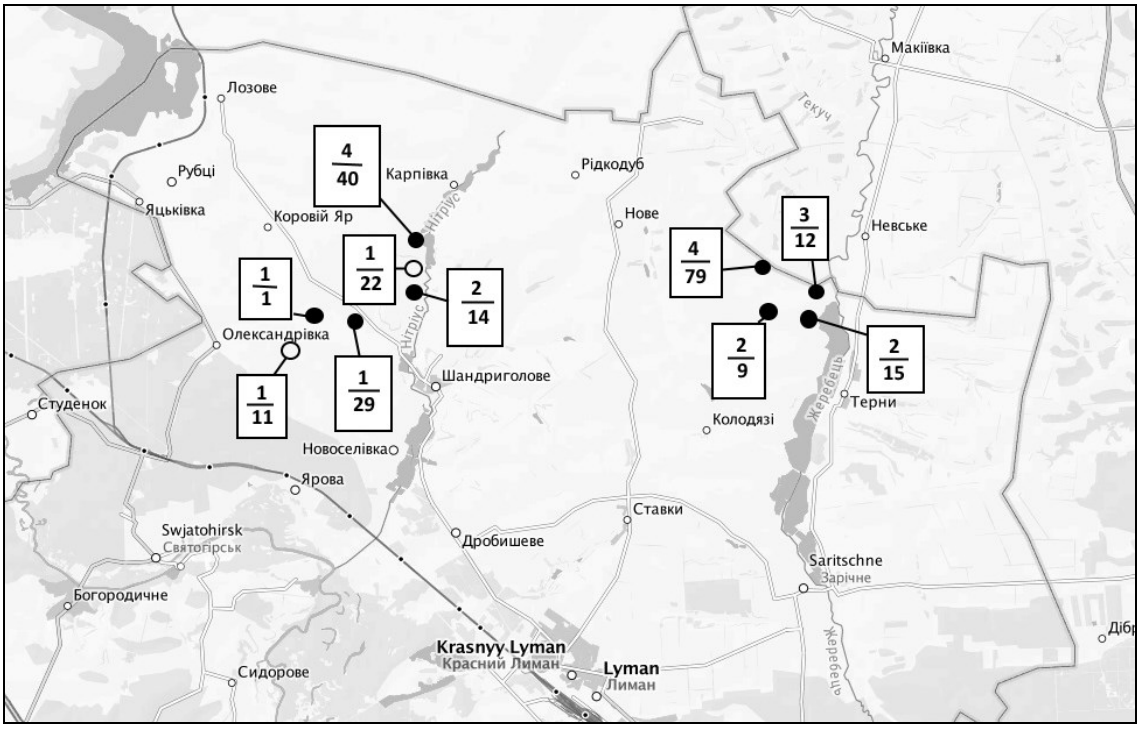

Fig. 2. Distribution of the steppe marmot in Lyman Raion of Donetsk Oblast. Number of home ranges in the colony / total number of burrows. Colonies: ● — existing; ○ — extinct.

Рис. 2. Поширення бабака в Лиманському районі Донецької області. В чисельнику – кількість сімейних ділянок в колонії, в знаменнику — загальна кількість нір. Колонії: ● — існуючі; ○ — зниклі.

Of the latter, 7 colonies were found on the Didiv Yar Balka at the border of Donetsk and Luhansk Oblasts. The largest marmot settlement consisting of 29 burrows is located west of Serednie village in the Nitrius basin. Two settlements of the Didiv Yar Balka have 25 burrows each.

All of the largest settlements are located on chalk slopes of southern exposure on a considerable distance from human settlements and roads, which are obviously favourable conditions for the steppe marmot in the region. In the Nitrius basin, the negative effect of fires on the marmot was noted, while in the Zherebets basin such effect has the ploughing of balka slopes. Ploughing of the bottom of balkas does not affect negatively the steppe marmot. The marmot population is possibly suffers from poaching too.

The total abundance of the steppe marmot in Lyman Raion is about 100 individuals. Most probably, the species has dispersed to the raion's territory from the neighbouring Kharkiv and Luhansk Oblasts. The marmot's dispersal from the release sites in Sloviansk Raion is almost entirely impossible due to natural obstacles (a wide forest stripe in the floodplain of the Siversky Donets). A survey of neighbouring raions of Kharkiv and Luhansk Oblast can shed light on this issue: in case of finding marmots here, it will allow to consider the full merger of the Kharkiv and Luhahsk populations of the species, which have started yet in the 1990s.

General characteristics of the populations

Most of the marmot settlements in Donetsk Oblast are located in balka systems, mainly on slopes of southern exposure. The number of burrows on a home range varies from 1 to 29 with an average of 11.4, which is a rather high number for the species in general, though quite typical for its Ukrainian populations (Tokarsky, 1997). This can be explained by low population density and, respectively, large area of home ranges, as well as by occurrence in habitats with divided relief that complicates the lookout for predators. The number of burrows likely depends also on the age of the settlement. Permanent living burrows are located in the middle part of slopes, while protecting burrows are located mainly in the lower part of slopes and in the bottom of balkas.

The largest marmot settlements are confined to poor chalky and, less commonly, sandy soils with sparse vegetation. The marmot's preference of slopes of southern exposure might be related not only to temperature regime but also to the more xerophytic vegetation on these slopes. The marmot inhabits chernozemic and meadow soils only if cattle grazing is present. The species usually avoids to settle near human settlements and roads, although it may occur on pastures close to villages if sites that are more favourable are absent in the area. The steppe marmot does not avoid close ploughed lands and they can even remain in the area when their home range is ploughed. Marmots willingly use fallow lands with weeds for feeding, but penetration of cultivated lands was not observed.

The main limiting factors for the marmot are anthropogenic such as direct extirpation and ploughing or building in steppe sites, although the latter became less common. Another significant limiting factor is the overgrowth of the steppe by shrubs due to decreased grazing. Large fires that almost entirely damage the plant cover are dangerous on chalky areas. Predators such as foxes, wolves, and feral dogs can prey on individual marmots but their impact on the population is hard to estimate. Epizooties at such a low density of the marmot are highly unlikely.

The expansion of the natural marmot population takes places along with the decrease of the species' general abundance (Tokarsky *et al.* 2006*b*). The marmot's natural population in Lyman Raion demonstrates a tendency of low dispersal and of abundance growth, while the abundance of the re-introduces population is far less than the number of released animals. The density of the natural population remains low despite that there are many uninhabited areas suitable for the marmot. Settlements are formed as separate disconnected groups. Natural populations are more stable compared to re-introduced ones due to immigration of individuals from other parts of the species range. The density of natural marmot populations is also higher. Based on our observations, the chances of successful re-introduction are considerably higher if old abandoned marmot burrows are present in the area. New marmot settlements are often formed in the place of old colonies, especially when there is a lack of favourable habitats.

References

Taranenko, L. I. 1997. On the former distribution of the steppe marmot in Donetsk Oblast. *In: Proceedings of the International Seminar on Marmots of the CIS Countries*. ABF Publishing House, Moscow, 41–42. (In Russian)

Tokarsky, V. A. 1997. *The Baibak and Other Species of the Genus Marmot*. Kharkiv Theriological Society, Kharkiv, 1–303. (In Russian)

Tokarsky, V. A. V. V. Grubnik, A. S. Avdeev. 2006*a*. Reacclimatization of the marmot (Marmota bobak Mull., 1776) in Ukraine (Kharkiv, Poltava, Sumy, Zaporizhzhia, and Dnipropetrovsk Oblasts). *The Journal of V. N. Karazin Kharkiv National University. Series Biology*, No. 748 (4): 100–109. (In Russian)

Tokarsky, V. A., V. I. Ronkin, G. A. Savchenko. 2006*b*. Key ecological factors of revival of the European subspecies of the steppe marmot in the middle of the XX century and the decrease of its abundance on the verge of the 20th and 21st centuries. *The Journal of V. N. Karazin Kharkiv National University. Series Biology*, No. 729: 193–201. (In Russian).

Tokarsky, V. A., G. A. Savchenko, V. I. Ronkin. 2012. The history of investigation and dynamics of growth of Velikiy Burluk population of the steppe marmot. *The Journal of V.N.Karazin Kharkiv National University. Series: biology,* No. 1008: 156–164. (In Russian)

Ugnevenko, V. P, L. I. Taranenko. 1997. Results of the settlement of the steppe marmot in the Donetsk region. *In: Proceedings of the International Seminar on Marmots of the CIS Countries*. ABF Publ. House, Moscow, 49–50. (In Russian)