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Current status of forest-steppe marmot *Marmota kastschenkoi* settlements on the northern periphery of its range (Tomsk Oblast) and problems of its protection

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Abstract. The forest-steppe marmot, *Marmota kastschenkoi* was historically classified as a subspecies of the gray marmot *M. baibacina*. However, based on morphological, karyological, and ecological characteristics, it has been proposed to elevate its taxonomic status to that of a distinct species. This species was initially described as a subspecies from the vicinity of Tomsk, which represents the northern boundary of its geographic range. This marmot also inhabits Kemerovo and Novosibirsk Oblasts, as well as Altai Krai. It is estimated that the total population of forest-steppe marmots is approximately 13 000 individuals, which is the smallest number among all marmot species in Russia. The proposal to include this species in the Red Data Book of Russia has been put forward repeatedly, but unfortunately has not been implemented. The number of marmots in Tomsk Oblast is the smallest of all the regions where this species lives. Regrettably, contemporary data regarding this species in Tomsk Oblast are scarce. Population estimates ranging from several dozen to 200 individuals. The forest-steppe marmot is listed in the regional Red Data Book. The study is aimed to assess the current state of population of forest-steppe marmots within some existing colonies in Tomsk Oblast, as well as to quantify the number of burrows and family groups present within these colonies. The significance of this study is emphasised by the ongoing economic activities in proximity to marmot habitats. These activities, which include cottage construction and mining, pose a substantial threat to the survival of population of marmots in these rare settlements.

The article contains 5 Figures, 2 Tables, 23 References.

Keywords: marmots, colonies, number of families and animals, Western Siberia, conservation, Red Data Book

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Научная статья

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Современное состояние поселений лесостепного сурка *Marmota kastschenkoï* на северной периферии ареала (Томская область) и проблемы его охраны

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Аннотация. Лесостепной сурок *Marmota kastschenkoï* изначально был описан как подвид серого сурка *M. baibacina*. Однако на основании морфологических, кариологических и экологических характеристик было предложено повысить его таксономический статус до отдельного вида. Первоначально эта форма сурка была описана из окрестностей Томска, где и проходит северная граница его ареала. Лесостепной сурок также обитает в Кемеровской и Новосибирской областях, а также в Алтайском крае. Предполагается, что общая численность вида составляет около 13 000 особей, что является наименьшей численностью среди всех видов сурков в России. Неоднократно высказывалось предложение о включении этого вида в Красную книгу России, но, к сожалению, оно так и не было реализовано. Численность сурков в Томской области является наименьшей из всех регионов, где вид встречается. Современные данные об этом виде в Томской области фрагментарны. Оценки численности популяции в регионе варьируют от нескольких десятков до 200 особей. Вид занесен в региональную Красную книгу. Целью исследования является оценка современного состояния популяции лесостепного сурка в существующих колониях в Томской области, а также характеристика ряда колоний: количества нор и семейных групп, численность зверьков в них. Значимость данного исследования подчеркивается активизацией хозяйственной деятельностью вблизи мест обитания сурка. Эта деятельность включает дачное и коттеджное строительство, а также разработку полезных ископаемых и представляет существенную угрозу выживанию популяции сурков в этих редких поселениях.

Ключевые слова: сурки, колонии, число животных и их семей, Западная Сибирь, сохранение, Красная книга

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Introduction

The forest-steppe marmot *Marmota kastschenkoi* Stroganov et Yudin, 1956 was long regarded as a subspecies of the gray marmot *Marmota baibacina* Kastschenko, 1899. It exhibits distinct differences in fur coloration on the chin and tail compared to the nominative form *M. baibacina*, which inhabits the vicinity of the village Cherga in the Altai Republic of Russia. The holotype of the forest-steppe marmot subspecies was originally described from the vicinity of Tomsk [1]. Subsequent studies revealed that forest-steppe marmot also inhabits the Novosibirsk and Kemerovo regions, as well as Altai Krai. In addition, a complex of new features of their morphology was identified. Some differences separating *M. kastschenkoi* from *M. baibacina* were found in the form of skull bones and os penis [2]. It also was revealed that the forest-steppe marmot has 36 chromosomes in contrast to the 38 found in the gray marmot, which served as a reason to raise the taxonomic status of the forest-steppe marmot to species [3]. In addition to morphology and karyology, there were significant differences in ecology - the forest-steppe marmot is the only species that lives on forested slopes and almost never used flat landscapes [4], and also has a geographical gap from the range of the gray marmot [5]. However, some data suggest a relatively weak differentiation of the forest-steppe marmot when analyzing various molecular markers, indicating that its taxonomic status may be closer to that of a subspecies [6, 7]. Thus, both scenarios are possible, when the forest-steppe marmot is recognized as a species or subspecies [8]. For example, in IUCN Red List (International Union for Conservation of Nature), the forest-steppe marmot is not distinguished as a separate species. The status of this species remains a subject of ongoing discussion. Nevertheless, it is important to note that this particular form is the least numerous within our fauna and warrants consideration for protected status, as well as recommendations for inclusion in the Red Data Book of the Russian Federation [3]. Unfortunately, this proposal has not yet been implemented. As an exception, this species of marmot has been included in the regional Red Data Book of Tomsk Oblast since 2003. Similar proposals have been put forth for the Altai Krai [9], where its population has also experienced a decline; however, these proposals have not yet to receive support. It is estimated that the total population of forest-steppe marmots (*M. kastschenkoi*) within their range is approximately 13 000 individuals, representing the smallest population among all marmot species in Russia. Within Tomsk Oblast, which lies at the northern periphery of this range, the population density is notably lower than in other regions where this species is present [10]. The forest-steppe marmot was historically widespread in the south of Tomsk Oblast (Fig. 1), particularly along the southern slopes of the terraces of the Tom River and its tributaries, including the Ushaika, Basandayka, and Tugoyakovka rivers. Approximately 15-20 local settlements of marmots were documented [11]. The biology of this marmot (nowadays known as *M. kastschenkoi*) has been relatively well characterized, encompassing aspects such as phenology, diet, burrows and colony structure, and daily activity. Unfortunately, contemporary information regarding this species in the Tomsk Oblast is exceedingly limited; estimates of population sizes have fluctuated from several tens [12] to approximately 200 individuals [10].



Fig. 1. Forest-steppe marmot *M. kastschenkoi* and the typical habitat of marmots in the vicinity of the city of Tomsk

These estimates are primarily based on expert opinion, as there is no complete data on colony sizes and animal populations. Recent findings include new encounters that confirm the presence of marmots in previously known colonies, as well as their disappearance from habitats due to anthropogenic transformation [13]. Some recent data on the forest-steppe marmot are available from Kemerovo Oblast [14, 15] and Novosibirsk Oblast [5], with less information available from Altai Krai [15, 16]. In the Tomsk Oblast, aside from the aforementioned limited data, no systematic research has been conducted.

The objective of this study is to assess the current status of forest-steppe marmot population in both existing and newly identified colonies within the Tomsk Oblast. This includes estimating the number of burrows, family groups, and individual animals within colonies, as well as evaluating the risks posed by anthropogenic activities to the marmot's settlements. In certain instances, economic activities threaten the survival of marmots in local settlements that is already in need of protection.

Material and methods

The studies were conducted in 2022-2024 in the south of Tomsk Oblast, which corresponds to the sub-taiga forest subzone of Western Siberia, where the northern boundary of the forest-steppe marmot distribution passes. We examined three colonies on the right bank of the Tom River south of Tomsk in the vicinity of the villages of Kolarovo, Baturino, and Vershinino (Fig. 2). All colonies were located on the territory of regional protected areas. Two of them, such colonies as Kolarovo and Luchanovo, are located on the regional protected recreational area "Coastal Slope of the Tom River". The third is on the territory of the buffer zone of the Larinsky Sanctuary.

The first colony, Kolarovo, was located on the slope of a ravine running from the road Tomsk-Yarskoye towards the Tom River. The coordinates of the colony are 84.9542°N, 56.3581°E. The colony is located between the villages of Anikino and Kolarovo and is 6 and 2 km away from them, respectively. The second colony, Luchanovo, got its name because it was located opposite the turnoff from the Tomsk-Yarskoye highway towards the village of Luchanovo. The colony is 0.7 km south of the previous one and is located in the next ravine.

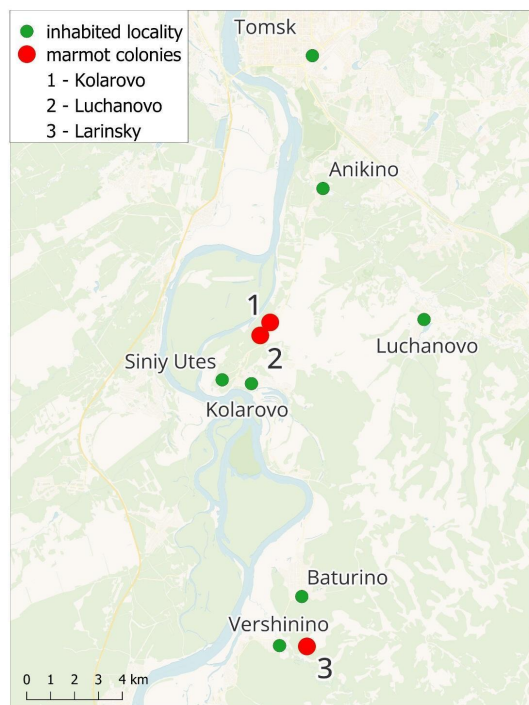


Fig. 2. Scheme of the study area and location of marmot colonies

Its coordinates are 56.3528°N, 84.9468°E. Both slopes inhabited by marmots have a southern orientation, covered with aspen *Populus tremula* L., silver birch *Betula pendula* Roth., and pine *Pinus sylvestris* L. The area around the colony is bounded by a damp lowland below, by bushes and a dirt road running through the forest towards the river bank above, and by a highway and arable land in the east. The third colony, Larinsky, was located in the buffer zone of the Larinsky Sanctuary approximately 2-2.5 km from Baturino and Vershinino in close proximity to another protected area, the Natural Monument "Zvezdny Klyuch". The coordinates of the colony are 56.2351°N, 84.9791°E. To the north, the colony is bounded by agricultural lands, and below by a path to the Natural Monument "Zvezdny Klyuch". The colony is located on a steep slope, also facing south and southwest. The slope is also covered with rare trees - pine, birch and aspen, as well as rosehip *Rosa majalis* Herrm, caragana *Caragana arborescens* Lam., rowan *Sorbus aucuparia* L. and bird cherry *Prunus padus* L. bushes.

The burrows were counted in autumn (October), when the grass had lodged, or in spring, when, on the contrary, the grass was flattened after the snow had melted. In each colony, the burrows were counted and mapped using GPS. The distances between the burrows were then measured in GoogleEarth.pro. The soil ejected in front of the burrows (the width of the burrow mounds) were measured using a tape measure with an accuracy of 0.5 m. Differences in the distances between the burrows within family groups and between individual family groups were compared using the Mann-Whitney test in the STATISTICA 8.0 program.

Observations began in the spring, namely in early or mid-April. The emergence of animals from hibernation was determined visually or by the appearance of paw prints and excrement near the holes. In all studied colonies first individuals were recorded in 2023 in the second ten days of April, and in 2024, in early April. Observations of the number of animals, family composition, and daily activity were carried out in April-May by visual observation method, using binoculars (BPC 12-40 TENTO) and Filin 120 camera traps. The camera traps were configured to operate continuously, capturing images and video both during daylight hours and at night. Observations were primarily focused on the colonies of Kolarovo and Luchanovo, selected for their accessibility and relatively compact size, which facilitated comprehensive data collection. The devices were triggered by any movement of individuals, which did not allow recognizing marmots individually, but was effective for analyzing the daily activity of *M. kastschenkoi* and identifying the number of animals in individual families. Such video registrations were conducted on May 2023 and April-May 2024 during a week every year. The term "family" was used to refer to a group of marmots of 2 and more individuals of different ages and sexes, jointly occupying a habitat with burrows of different types and guarding its boundaries from the appearance of strangers. The term "colony" is understood to refer to a settlement of 2 or more individuals, constituting 1 or more family groups, living in separate territories and having visual-auditory communication. The term "settlement" is understood to refer to a set of functionally interconnected individual families, concentrated in a certain type of landscape [17]. Colony and settlement in our case were the same concept.

The boundaries of the colony and its ranges were established based on the identification of the most peripheral observed burrows. Burrow classifications - namely wintering, feeding, and protective - were assigned in accordance with the criteria outlined by Bibikov [18]. Schemes of the maps of marmot colonies within the Tomsk Oblast were generated utilizing the QGIS software, with the OpenStreetMap (OSM) Standard serving as the foundational reference for these maps. Family group structures were ascertained either through direct visual observation or, in cases involving larger colonies with extensive areas, by noting the presence of significant burrow emissions. Each group had wintering burrows with several exits, grouped by 4-8 and located close to each other with a common burrow mound of significant size. A relatively precise enumeration of animals was achievable in only two colonies (Kolarovo and Luchanovo), where observational conditions permitted accurate assessments. In the Larinsky colony, the number of animals estimated was derived through expert extrapolation, utilizing the count of wintering burrows here and identified family groups, in conjunction with the average number of individuals per family observed in other colonies. This methodology allows for a systematic estimation of the total marmot population within the Tomsk Oblast, predicated on the approximate number of known and identified settlements.

Anthropogenic factors were identified on the basis of observations during the study period and data accumulated in previous years on human activities in the region, supplemented by information obtained from various regional open media.

Results

Description of colonies, number of burrows, families and individuals. In the study area we examined three colonies - Larinsky, Kolarovo and Luchanovo (Table 1, Figs. 2 and 3). The colonies in the table are listed in order of their area. In the largest colony - Larinsky, 143 burrows and 8 family groups were noted, in Kolarovo 36 burrows and 2 family groups (some of the burrows in this colony were uninhabited), in Luchanovo there were 26 burrows and 3 families. Thus, the average number of families in the colonies was 3.3 and the average number of burrows was 68. The length of the slopes occupied by the colonies ranged from 200 to 500 m.

In each family area, groups of 4-8 closely spaced burrows were noted on the elevated parts of the slope and were characterized by dense trampled platforms merging into a common burrow mound, forming the core (center) of the family plot. We suggest that 1-2 of these burrows in each group were wintering burrows. From them, paths went to single burrows (feeding, protective, some served as latrines) on the family plot, and paths also went to neighboring family groups. The distances between the nearest burrows within family groups ($\bar{x} = 13.4 \pm 1.8$) were significantly smaller than the distance between the nearest burrows of neighboring families ($\bar{x} = 63.3 \pm 31.5$, $Z = -2.12$, $p < 0.05$).

Almost all burrows had burrow mounds. Some were small - from 0.5 to 1.5 m, but in all three colonies at least one of the families had a large mound, reaching 5-6 m in width, which indicates the longevity of the colonies [19]. The Kolarovo colony was discovered in 2009, i.e. it has existed for at least 15 years. The number of animals in one of the families living in it was also maximum - 8 (later one of the animals from this family was hit by a car on the highway). In other colonies (Luchanovo and Larinsky) in families we observed in spring a maximum of 2-3 marmots at a time. Based on the number of family groups and registered animals in individual families, we calculated that up to 25 animals live in the Larinsky colony, 4-5 animals in the Luchanovo colony, and 9 animals in the Kolarovo colony. Hence, the average animal number in the colony was 13.3 and the average number of animals in one family was 3.2.

Table 1
Comparison of different characteristics of studied colonies

Colony	Number of burrows	Square of the colony (ha)	Number of families	Burrow mound width lim (min-max); $M \pm SE$, m	Number of individuals
Larinsky	143	2.7	8	(0.5-5.0); 1.51 ± 0.11	up to 25
Kolarovo	36	0.63	2	(0.5-6.0); 1.55 ± 0.56	9
Luchanovo	26	0.22	3	(1.5-5.0); 2.2 ± 0.48	4-5

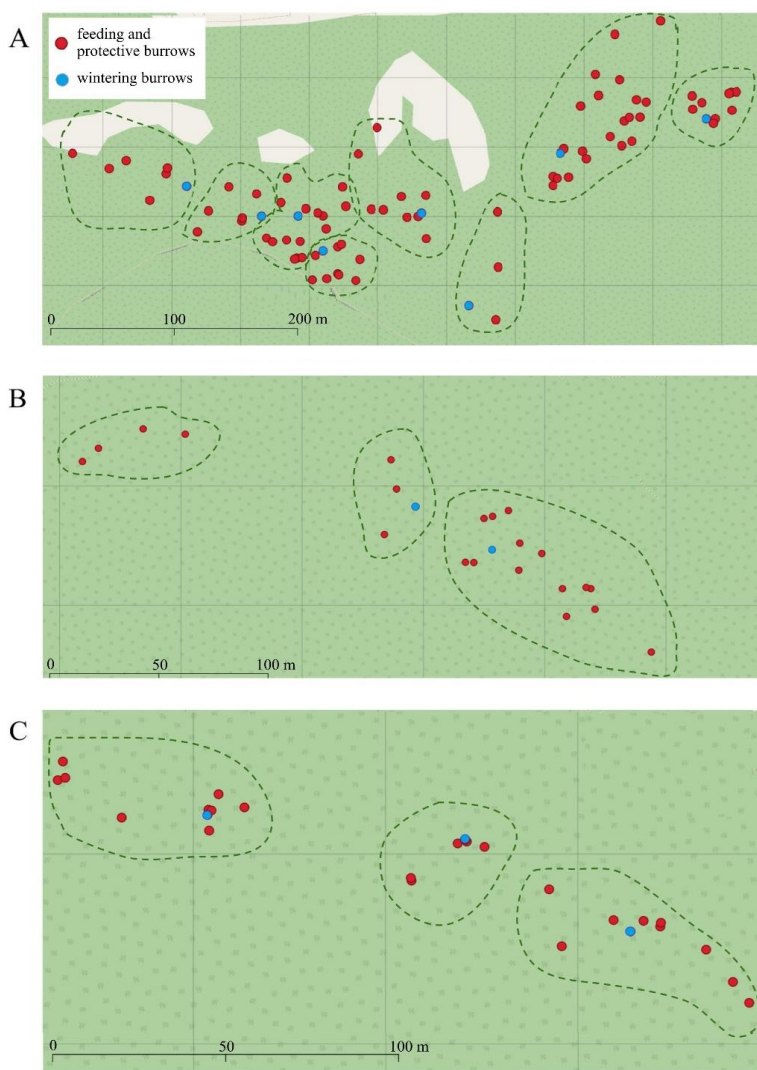


Fig. 3. Scheme of the colonies studied with family groups outlined, where
A - Larinsky colony, *B* - Kolarovo colony, *C* - Luchanovo colony

Anthropogenic activity, predators and protection. A variety of anthropogenic impacts, directly and indirectly affecting marmots, were identified in the colonies we studied (Table 2). Among the factors, we highlight the presence of stray dogs both single and in packs barking at the marmot burrows, and uncontrolled dog walking, riding enduro motorbikes, and ATVs on the slopes, occupied by marmots. The potential threats that can lead to the loss of the colonies are the expansion of the cottage construction near Luchanovo and Kolarovo colonies as well as exploration and development of gold dangerously close to the Larinsky colony (Figs. 4 and 5).

Table 2

Types of economic activities on the territory of marmot colonies in Tomsk Oblast

Type of activity	Kolarovo colony	Luchanovo colony	Larinsky colony
Birch sap collection	+	+	-
Dogs walking with owners, stray dogs and free range dogs	+	+	+
Recreation (excursions, mushroom and berry picking)	+	+	+
Riding enduro motorbikes and ATV's	+	+	-
Animal deaths on the road	+	+	-
Waste dumping	+	+	-
Cottage and country house construction	+	+	-
Developing of gold mining	-	-	+

Of the natural predators which are potentially dangerous to the marmots we revealed a nest of a black kite *Milvus migrans* (Boddaert, 1783), which was found near the colonies, and camera traps recorded foxes *Vulpes vulpes* Linnaeus, 1758 visiting the colony at night and early morning hours in two colonies (Kolarovo and Luchanovo). A badger *Meles leucurus* Hodgson, 1847 was also recorded at night in one of the colonies.



Fig. 4. Kolarovo and Luchanovo colonies of forest-steppe marmots on the protected area and anthropogenic activity

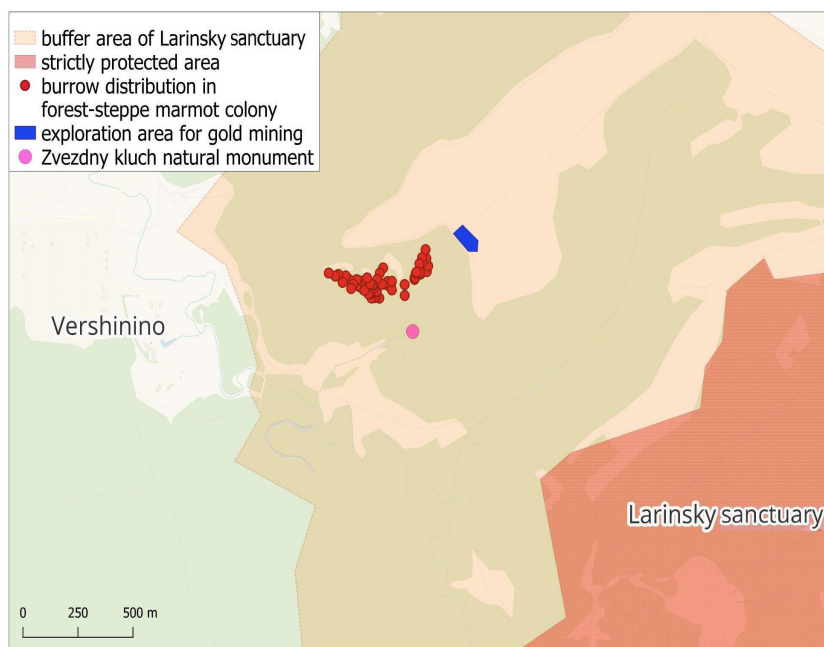


Fig. 5. Larinsky colony of forest-steppe marmot and anthropogenic activity nearby

Discussion

The current state of the forest-steppe marmot in the Tomsk Oblast remains poorly studied. From the beginning of the 20th century to the present day, literature provides data on about 25 known colony sites in the vicinity of Tomsk. All of them are located in the Tomsk Oblast on the right bank of the Tom River and its tributaries - Ushaika, Basandaika, Tugoyakovka. In the past the colonies of marmots were known near villages Lyazgino, Kornilovo, Novo-Mikhailovka, Zavarzino, Bodazhkovo, Safronovo, Arkashovo, Bogashovo, Petukhovo, Rodionovo, Anikino, Luchanovo, Kolarovo, Kazanka, Vershinino, Baturino, Yarskoye, Larino, Plotnikovo [1, 11, 12, 20, 21].

Each of the subsequent publications, referring to the previous one, stated the disappearance of marmots from previously known colony sites. Thus, in the work Moskvitin and Moskvitina [20] it is mentioned that marmots survived only in the area of the villages of Yarskoye and Vershinino. But in recent years, relying on our own observations, as well as due to the facts of photo registration of marmots and the posting of photographs by zoologists and nature lovers on database sites, such as Inaturalist.org, several new marmot habitats have been identified, for example, in the area of the Kolarovo biological station of the Tomsk state university, and in the area of the Bakhtin cemetery [12]. These new findings, when compared with previous data, actually rediscover marmot old habitats [11]. On the one hand, it can be assumed that marmots continued to live in the mentioned territory all this time, remaining barely noticeable, or slightly

changing the position of their settlements. Compared to other marmot species living in open biotopes, finding colonies of forest-steppe marmots and counting them is much more difficult. This is explained by the habitat of this species on rather steep forested hills, which in the summer are covered with tall grass, making them inconspicuous. Therefore, it is best to search for settlements and count the animals only in the spring - specifically in April and May - since in June the tall grass no longer allows this. On the other hand, marmots from a number of colonies could really disappear for a while due to extermination and disturbance, but could later restore their numbers and return, having settled from other places. Unfortunately, we cannot answer this question unequivocally. In different cases, these can be different scenarios. The fact that marmots could continue to live in the same territory is indicated by the presence of large burrow mounds in all the colonies found - in the Kolarovo colony marmots were found in 2009 - there is a car road and tramped people's paths nearby, people collect mushrooms and birch sap every year, facts of the presence of dogs have been revealed, and despite the disturbance factor, the colony has existed for at least 15 years. The following facts support another hypothesis, according to which the number of marmots has increased in the Tomsk Oblast in recent years and, as a result, it has become more noticeable, has settled and returned to its former places and is developing new ones. For example, this is consistent with the fact that a marmot was discovered in the vicinity of the village of Nikolaevka, 30 km northeast of Tomsk [12]. This is 20 km further from the nearest places of known colonies found in the last century near the villages of Lyazgino, Novo-Mikhailovka [1], although it is known that marmots are capable of covering such distances in about a day [14]. We assume that when examining previously known habitats of the forest-steppe marmot to the northeast, east and south of Tomsk, we can both find it in its former habitats and discover new, previously unknown settlements. It is important to note that both historically and currently, in the vicinity of villages that serve as reference points for locating marmot colonies, there may exist multiple colonies rather than a singular one. Consequently, our two identified colonies - Luchanovo and Kolarovo - are designated by different names for the sake of convenience; however, both are situated near Kolarovo. Furthermore, it is acknowledged that there is a third colony in this area that has not been studied, indicating that within the vicinity of a single village, there may be three distinct colonies. At the same time, the presence of colonies to the south of Tomsk, approximately 10 km on the right bank of the Tom was mentioned in the work of Laptev and Yudin [11], but currently it is difficult to say whether they existed all this time or not. Compared to other areas where the marmots existed in Tomsk region previously, this territory (Kolarovo and Luchanovo colonies) has been less exposed to anthropogenic impact, and since the beginning of the 21st century, a protected natural area has been organized here - "The coastal slope of the Tom River". Larinsky colony is in the Larinsky sanctuary and the Natural monument "Zvezdny Klyuch".

Comparing the sizes of the identified colonies with data on marmot colonies in other areas, we can state that in Tomsk they are relatively small. Thus, the number of families in Luchanovo and Kolarovo is 3 and 2 with the number of

animals up to 10, slightly more in Larinsky colony - 8 families and about 25 animals. For example, in the Topkinsky district of the Kemerovo Oblast, forest-steppe marmot colonies with the number of animals up to 85 and the number of families - 10-24 have been described [14]. Also, our colonies are smaller compared to the colonies of the bobak *Marmota bobak* Müller, 1776 in Chuvashia [22], where the number of families in the colonies ranged from 14 to 46, and the number of burrows from 168 to 558 (including uninhabited). Our colonies had from 26 to 143 burrows. If we compare modern colonies with those in the same territory in the last century [11], then judging by the size of one of the colonies given in the work, the number of burrows in it reached 73, of which 12 were wintering and 61 were protective and feeding. From this we can conclude that the colonies in the studied territory are generally comparable. One of our colonies - Larinsky is larger, with 143 burrows, the other two (with 26 and 36 burrows) are smaller. Also, if we judge the size of the colonies by the length of the slopes on which they were located, then in the same work [11] it is said that the slope with one of the colonies in the area of the village of Lyazgino could reach 1 km, which is more than our colony in the area of the Larinsky sanctuary (0.5 km), and several times more than the colonies of Kolarovo and Luchanovo (Fig. 2).

According to a number of sources, the number of forest-steppe marmots in the Tomsk region is estimated at approximately several dozen [12] to 0.2 thousand individuals [10], however, this is rather an expert assessment based on the number of previously known colonies and facts of confirmation of new finds, but no work provides data on real survey data. Based on the number of animals in the identified colonies - an average of 13, and the number of known settlements - about 10 and possibly more, the number may be close to the estimate proposed by V.I. Mashkin [10], who estimated the number of marmots in the Tomsk region at about 200 individuals.

The timing of the spring awakening of marmots in the Tomsk Oblast has changed little compared to the last century; depending on the weather, this could occur throughout April [23]. It was found that, compared to previous data [11], daily activity in one of our colonies was somewhat different. Marmots began to appear on the surface earlier - at 6-7 am, and hid later in the evening - at 8-9 pm. We did not observe night activity, as noted in the Kemerovo Oblast [14].

An assessment of anthropogenic activities in the vicinity of the studied marmot colonies revealed that disturbances resulting from human visitation for various non-hunting purposes (no instances of poaching were documented) exert a negligible impact on marmot populations. All surveyed colonies have coexisted with this level of disturbance over an extended period. In contrast, the presence of domestic dogs poses a more significant threat, as they can attack and potentially eliminate marmots; we have observed hunting dogs in the area. The regulation of dog presence is lacking in all protected areas, resulting in no formal violations, yet this factor could have an exceedingly detrimental effect on marmot survival. In recent years, a new recreational activity - extreme driving over rugged terrain using enduro motorcycles and ATVs - has emerged. Such activi-

ties have been noted in proximity to the Kolarovo and Luchanovo colonies, with one uninhabited marmot settlement identified near the village of Anikino, where riding on enduro motorbikes was registered. While the correlation between this recreational activity and the abandonment of the settlement remains speculative, we consider it to have a significant negative influence.

Furthermore, we would like to emphasize two potentially hazardous activities that, if pursued, could unequivocally lead to the extirpation of marmots from the studied colonies. The first involves the ongoing expansion of cottage construction along the Tomsk-Kolarovo road from the village Siny Utes direction. Over the past decade, construction has progressed rapidly from both Anikino and Siny Utes, with approximately 1 km separating the outermost residences from the boundaries of the Luchanovo colony. Historically, in the early 2000s, the protected area encompassing the coastal slope of the Tom River extended to Siny Utes [21], as indicated by signage; however, it appears that the boundaries have since changed, leading to increased development in this area and raising concerns about further encroachment on marmot habitats. The second critical economic activity posing a threat is occurring in proximity to the Larinsky colony. The TISK Geogold company has initiated exploratory drilling for gold within the buffer zone of the Larinsky sanctuary, adjacent to the "Zvezdny Klyuch" nature monument, which houses a marmot colony. While such activities are legally permissible within this zone, they raise concerns due to the unique ecological value of "Zvezdny Klyuch" - a spring characterized by a small waterfall cascading down travertine steps - which could be endangered. Notably, neither the regulations governing the natural monument nor other documentation acknowledges one of the largest nearby colonies of the rare forest-steppe marmot, which is listed in the regional Red Data Book.

Conclusion

We conducted an estimation of burrow numbers, family units, and individual forest-steppe marmots across three colonies located in the southern Tomsk Oblast, within the subtaiga subzone. Based on the average number of animals in the colonies (13.3) and data indicating approximately 10 meeting places associated with marmot settlements in recent years, we estimate that the total population of forest-steppe marmots in the region could approximate 150 individuals. Future surveys are planned for additional sites where marmots have been previously documented. Given that populations in other areas of Western Siberia - namely, the Kemerovo Oblast, Novosibirsk Oblast, and Altai Krai - are also reported to be low, and considering that this species represents the smallest of the marmot taxa, we advocate for the potential inclusion of this form in the Red Data Book of the Russian Federation. Each of the surveyed colonies possesses significant aesthetic, educational, and scientific value, thereby warranting recommendations for the establishment of small protected areas designated as Natural Monuments to enhance their conservation. Currently, several anthropogenic activities posing threats to marmot populations have been identified within the vicinity of the

surveyed colonies. These include recreational enduro motorbiking and ATV usage on slopes inhabited by marmots, the expansion of cottage construction in the Bank Slope area of the Tom River Protected Area, and the potential initiation of gold extraction activities within the Larinsky sanctuary. Through this publication, we aim to raise awareness regarding the risk of losing one of the largest colonies of this rare species in our region.

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