

Institute of General and Experimental Biology, Mongolian Academy of Sciences;  
Ministry of Nature, Environment, and Tourism of Mongolia;  
Ministry of Education, Culture, Science, and Sports of Mongolia;  
Commission on Marmot Investigation of the Theriological Society at the Russian Academy of Sciences  
Mammalian Ecological Society of Mongolia;  
Joint Russian–Mongolian Complex Biological Expedition of RAS and MAS



Монгол улсын  
Мэргэжлийн  
Холбооны  
Хурлын  
Төрийн  
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PROCEEDINGS of the **7<sup>th</sup>**  
**International Conference**  
**on the Genus *Marmota***  
**Marmots of the**  
**Old and New World**

13–17, August, **2018** Ulaanbaatar, Mongolia

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Ministry of Nature, Environment, and Tourism of Mongolia

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Joint Russian–Mongolian Complex Biological Expedition of Russian Academy of Sciences and Academy of Sciences of Mongolia

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## THE POPULATION SIZE AND DISTRIBUTION OF MARMOTS IN RUSSIA

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The population size and distribution of marmots in the territory of Russia in the last 20 years have not undergone major changes, but there is a weak tendency of decreasing marmot numbers. In the Central, Privolzhsky and Southern federal districts the number of bobaks (*Marmota bobak*) is relatively stable. Now there is a tendency for a shift in the location of marmot colonies across the territory, caused by a decrease in grazing and increased mowing in agrolandscapes. Forage conditions for marmots have begun to deteriorate due to a decrease in grazing and overgrowing of colonies with high grass. It is especially difficult for marmots to survive in the early spring period, as last year's weeds cause the late growth of fodder plants and reduces visibility, which is unfavorable for marmots. Individuals have begun to migrate to more elevated areas, with better visibility. Migration is accompanied by greater individual mortality. In general, over the last five to ten years, the number of bobak has decreased very slightly and now amounts to 337.7 thousand of the European subspecies (*M.b.bobak*) and 75.5 thousand of the Kazakhstan subspecies (*M.b. schaganensis*). According to the estimates of specialists and hunting correspondents, the number of tarbagan (Siberian marmot; *M. sibirica*) and gray marmots (*M. baibacina*) also decreased very slightly and is estimated at 93 and 168.8 thousand individuals respectively. Forest steppe marmots (*M. kastschenkoi*) number about 14 thousand individuals and black-capped marmots (*Marmota camtschatica*) around 145.4 thousand. In total, the Russian marmot population is estimated at 834.9 thousand individuals, which is 6.6% of the total Eurasian marmot population.

Steppe species (tarbagan and bobak) can be considered evolutionarily most successful. At the beginning of the twentieth century, their total numbers exceeded 45 million and accounted for more than 90% of Eurasian marmots. The same species were less protected from humans and so experienced higher mortality than other marmot species. Today, the number of Eurasian marmots slightly exceeds 12.5 million, of which 81% are tarbagan or bobak.

Specialists of our institute have been monitoring the resources of game animals for more than 80 years - this is the so-called "Harvest Service". Marmots are among the species monitored. Information about marmot population size and distribution were gathered from special surveys, reports of our permanent and voluntary correspondents, and from literary and departmental sources.

The resources and distribution of marmots in the territory of Russia in the last 20 years has not undergone great changes, but there is a slight decrease in population size over time (Table 1, Figure 3), mainly related to the refinement of population estimation methods.

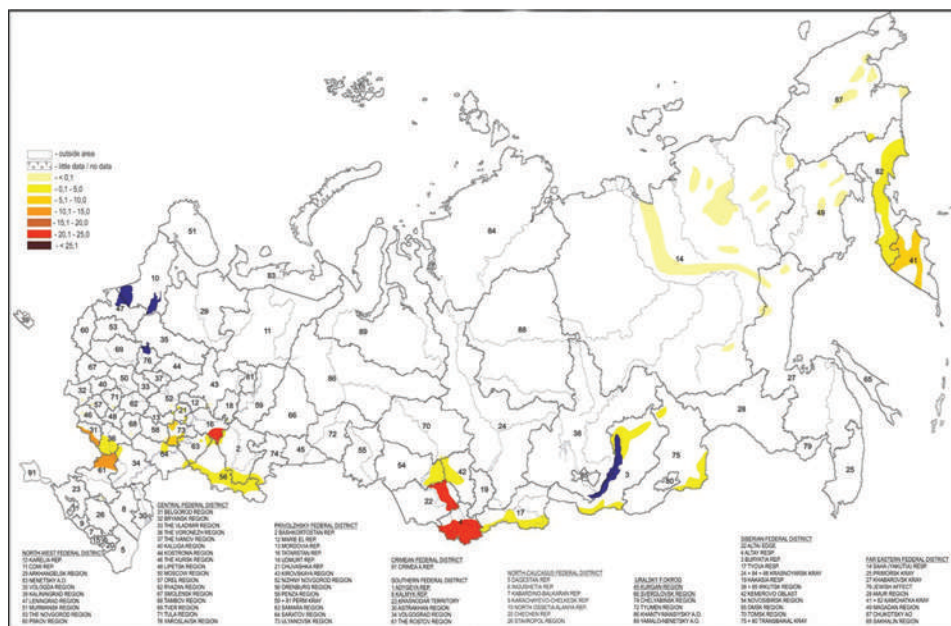




Федеральное агентство по охране животных  
 и биологического наследия

**Table 1.** Number of marmots in the territory of the Russian Federation, thousand individuals

| Федеральный округ | 2018 г.    | 2009 г.      | 2010 г.      | 2011 г.    | 2012 г.      | 2013 г.      | 2014 г.      | 2015 г.      | 2016 г.      | 2017 г.      |
|-------------------|------------|--------------|--------------|------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Центральный       | 82,3       | 83,4         | 83,4         | 84,7       | 84,9         | 88,1         | 103,6        | 86,5         | 86,5         | 88,1         |
| Приволжский       | 139,5      | 139,3        | 139,2        | 138,2      | 139,1        | 140,1        | 136,9        | 144,3        | 135,3        | 133,9        |
| Южный             | 80,5       | 83,2         | 83,2         | 85,7       | 86,2         | 86,9         | 138,0        | 165,0        | 158,4        | 154,2        |
| Уральский         | 36,0       | 36,0         | 37,0         | 37,0       | 37,0         | 39,0         | 38,0         | 38,5         | 34,3         | 37,0         |
| Сибирский         | 322,2      | 335,2        | 335,2        | 335,4      | 335,4        | 334,0        | 329,5        | 329,5        | 291,6        | 285,8        |
| Дальневосточный   | 139,5      | 140,0        | 140,1        | 144,0      | 144,0        | 142,6        | 143,9        | 143,9        | 140,2        | 135,9        |
| <b>Россия</b>     | <b>800</b> | <b>817,1</b> | <b>818,1</b> | <b>825</b> | <b>826,6</b> | <b>830,7</b> | <b>889,9</b> | <b>907,7</b> | <b>846,3</b> | <b>834,9</b> |



**Fig. 1.** Distribution of marmots in the territory of the Russian Federation, individual/1000 hectares

In the Central, Privolzhsky and Southern federal districts the number of bobaks (*Marmota bobak*) is relatively stable. Now there is a tendency for a shift in the location of marmot colonies across the territory, caused by a decrease in grazing and increased mowing in agrolandscapes. Forage conditions for marmots have begun to deteriorate due to a decrease in grazing and overgrowing of colonies with high grass. It is especially difficult for marmots to survive during the early spring period, as last year's weeds cause later growth of forage plants and reduced the visibility, which is unfavorable for marmots. Individuals have begun to migrate to higher elevations with better visibility. Migration is accompanied by increased individual mortality. Marmots are more likely to occur in the Saratov, Samara, and Ulyanovsk regions and in Tatarstan. In most populations in Europe-

an Russia in the Southern Urals, Kamchatka, and Altai, the population density of marmots has not changed.

Due to the natural migration patterns of marmots in the European part of Russia (Volograd, Voronezh, and Belgorod regions), many isolated subpopulations have been joined in a larger population with a mosaic distribution across the territory. Observed habitat use and population trends have been confirmed in two regions of the European part of Russia - in the Kursk and Orel regions. In general, over the last five to ten years, the number of the bobak has decreased slightly and is now at 337.7 thousand individuals of the European subspecies (*M.b.bobak*) and 75.5 thousand of the Kazakhstan subspecies (*M.b. schaganensis*) (Table 2). According to the estimates of specialists and hunting correspondents, the numbers of tarbagan (*M. sibirica*) and gray marmot (*M. baibacina*) have also decreased very slightly and are estimated at 93 and 168,8 thousand individuals respectively. Forest steppe marmots (*M. kastschenkoi*) number about 14 thousand individuals and black-capped marmots (*Marmota camtschatica*) at 145.4 individuals.

In total, the Russian marmot population is estimated at 834.9 thousand individuals, which is 6.6% of the total Eurasian marmot population.

**Table 2.** The number of different species of marmots in Russia, thousand individuals

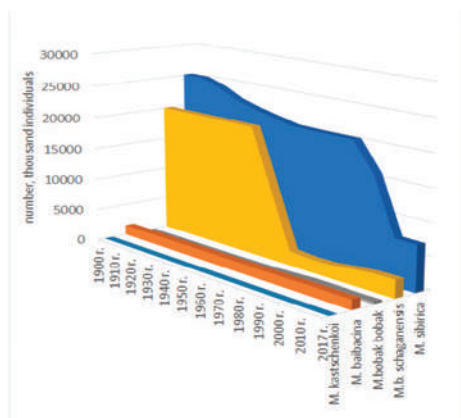
| Species and subspecies of marmots |                           | 2013 г.      | 2014 г.      | 2015 г.      | 2016 г.      | 2017 г.      |
|-----------------------------------|---------------------------|--------------|--------------|--------------|--------------|--------------|
| <i>Marmota bobak</i>              | <i>M.b.bobak</i>          | 278,1        | 341          | 356,6        | 341,7        | 337,7        |
|                                   | <i>M.b. schaganensis</i>  | 76,0         | 75,5         | 77,7         | 72,8         | 75,5         |
| <i>Marmota kastschenkoi</i>       |                           | 12,8         | 15,0         | 15,0         | 14,5         | 14,5         |
| <i>Marmota baibacina</i>          |                           | 208,2        | 207,5        | 207,5        | 172,1        | 168,8        |
| <i>Marmota sibirica</i>           |                           | 101,9        | 95,9         | 95,9         | 94,7         | 93,0         |
| <i>Marmota camtschatica</i>       | <i>M. c. doppelmayri</i>  | 11,1         | 11,1         | 11,1         | 10,4         | 9,5          |
|                                   | <i>M. c. bungei</i>       | 32,6         | 32,9         | 32,9         | 33,1         | 33,4         |
|                                   | <i>M. c. camtschatica</i> | 110,0        | 111,0        | 111,0        | 107,0        | 102,5        |
| <b>Total</b>                      |                           | <b>830,7</b> | <b>889,9</b> | <b>907,7</b> | <b>846,3</b> | <b>834,9</b> |

The main drivers of change in Eurasian marmot population size are related to human activities (Abelentsev, 1971, 1975, Bibikov, Zimina, 1983, Mashkin et al. 2010). Among the most significant cause of marmot population decreases, three are worth noting (Fig. 2). Significant reduction in the number of tarbagan is associated with their extermination in the fight against plague in the early twentieth century. These losses are estimated at about 4 million individuals. From the plowing of habitat, the bobak suffered a greater population decrease than other species. It is very difficult to estimate the reduction of the European bobak population in central and eastern Europe prior to the twentieth century, but in Kazakhstan and Russia the plowing of virgin lands in 1953-1965 reduced the number of marmots by more than 15 million. Tarbagan populations decreased by 7.5 million from mortality from snaring in Mongolia in the first decade of this century (Kolesnikov et al. 2009). In other areas of Eurasia marmot populations have increased with the help of humans (Litvinenko, 1928; Migulin, 1928; Milkov, Dvurechensky, 1974; Abrakhina, 1983; Mashkin, 1989; Tokarskii et al., 1990, 1991). The alpine marmot (*Marmota marmota*) population has doubled (increasing by 60-70 thousand individuals) and the population growth of colonies of European bobak in Russia and Ukraine is estimated at about 350

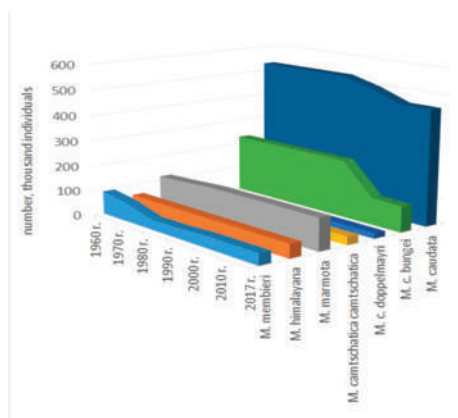


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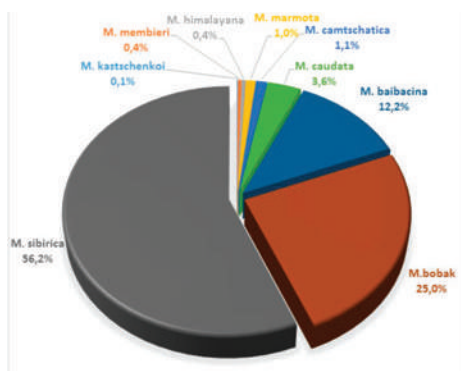
thousand individuals (Fig. 3). Overall, however, population trends represent a net loss. The Eurasian marmot population decreased by 35 million individuals over the last century under the influence of anthropogenic factors. Steppe species (tarbagan and bobak) can be considered evolutionarily most successful. At the beginning of the twentieth century, their total numbers exceeded 45 million and accounted for 94% of Eurasian marmots. The same species was less protected from humans than other species and their populations suffered the greatest declines Today, the overall Eurasian marmots population slightly exceed 12.5 million, of which 81% are tarbagan and bobak (Fig. 4). Most Eurasian marmots live in Mongolia (Fig. 5). We need develop strategies for protecting marmots and their habitat to conserve this "TERRA MARMOTA" for our descendants.



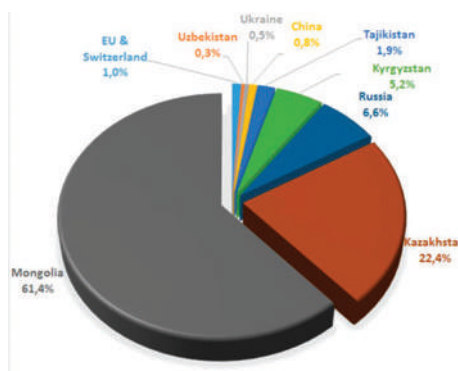
**Fig. 2.** Population trends for the "steppe" marmots of Eurasia



**Fig. 3.** Population trends for the "mountain" marmots of Eurasia.



**Fig. 4.** The relative abundance of different species of Eurasian marmots.



**Fig. 5.** The relative abundance of marmots in different countries of Eurasia.

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