PROGRAM & CONFERENCE PROCEEDINGS

24th Annual Meeting of the International Hamster Workgroup

October, 1–5, 2017, Uglich, Russia

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KMK Scientific Press
2017

Cricetus cricetus: distribution and population in Western Siberia, retrospective and current state

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The Common hamster, *Cricetus cricetus* (Linnaeus, 1758), occupies a vast range in Eurasia, showing preference for steppe and forest steppe landscapes (Pavlinov, Lisovsky, 2012). It is an agrophilous species with a marked tendency towards adaptation to human habitats.

The distribution and population of the hamster has decreased dramatically in large parts of its European range, which made several countries acknowledge it as a threatened species (Ziomek, Banaszek, 2007; Rusin et al., 2013; Poplavskaya et al., 2015). The analysis of the current status of the species (Surov et al., 2016) shows that in Europe it has been comprehensively studied, whereas Western-Siberian (WS) populations are overlooked yet. However, this part of the range comprises its north-eastern edge where natural and anthropogenic conditions are quite different from that of European part. . Western Siberia is a large region with prominent zonality, extensive forests and swamps and dense hydrographic network. The hamster habitats are concentrated in the south-western parts of WS: the southern taiga subzone, aspen and birch forests, forest steppe and steppe. The hamster avoids mountains of southern WS (the Altai Mountains, Kuznetskiy Alatau, the Sayan Mountains) and occupies predominantly submontane steppes and forest steppes (Yudin et al., 1979).

The present study employs data on the hamster abundance from the databank of the ISEA SB RAS Laboratory for zoological monitoring. Long-term surveys were carried out using both pitfall traps (cylinders or cones placed in either ditches or along fences) and break-back traps. Results were reduced to abundance indices obtained on the cylinder traps: numbers for 100 break-back trap-days were doubled (Ravkin, Livanov, 2008). Survey data were collected in different habitats on the West Siberian Plain (in the periods 1961–1999 and 2000–2015) and in Altai-Sayan highlands (1959–2015). In 2016–2017, the data on species occurrence and abundance were gathered via public surveys and partial capturing in the subzone of aspen and birch forests and forest steppe zone of the plain. It is important to note that the hamster is trapped in the pitfalls and break-back traps solely by accident, therefore its distribution and espe-

cially population dynamics can be assessed only roughly and approximately. Since survey numbers are means for zones and subzones (not accounting for the hamster's preferred habitats), they can reflect greater or lesser habitability of landscape units for this species.

On the West Siberian Plain, the hamster was captured in crop fields, villages, cities and meadows, swamps, copses and forests adjacent to the fields. It clearly avoids dense forestlands, extensive swamps and low floodplains flooded during high water period. It can be found on high floodplain sections along dry valleys next to the farmlands. In Altai-Sayan highlands, the hamster mostly occurred in meadow steppes, forest and steppe-and-forest shrub meadows, dark taiga (aspen and fir), parvifoliate, larch and parvifoliate forests, pine and sea buckthorns plantations, coal mine dumps, as well as subalpine and alpine meadows in low-density forests.

The mean for all habitats by zones and subzones is 0.07 animals per 100 trap-days with abundance dropping northwards and southwards: 0.03 animals in the southern taiga and forest steppe and 0.04 in steppe. Thus, the population density on the West Siberian Plain is the highest in the southern subzones of the forest zone and is lower in the forest steppe and steppe zones. In Altai-Sayan highlands the index is significantly higher (0.5–0.8).

On the sites, where the survey had been conducted for many years, the hamster was not captured every year. For example, in the northern forest steppe (L.Yerdakov, personal communication), where the capturing continued for 21 years, the hamster was found 12 times only, and its abundance fluctuated from 0.2 to 0.08. In the dry pine-forest of the forest steppe zone of the Ob river region, it occurred only twice during the period from 1988 to 2015, and its number was very low (0.01–0.06).
The analysis of the obtained data compared to relevant research evidence (Laptev, 1958; Yudin et al., 1979) suggests that the hamster's occurrence and distribution have seriously decreased. This may be associate with the fact that the distribution and population of hamster used to be primarily evaluated by the amounts of fur production. In the above mentioned years fur was not produced, which could potentially account for the hamster's lower occurrence. However, its widespread occurrence in 2016–2017 can be proved by numerous complaints by the people from countryside and suburbs where it destroys a large part of fruit and vegetable crops and intrudes the basements of buildings. People report that, judging visually and by the number of captured animals, in the south-

ern subzone of the forest zone and in forest steppes of WS, the hamster either grew in number or started to inhabit places where it has not recently been found. It should be noted that the hamster reproduces intensely: in some cases females produce up to 11–16 pups, and as early as by the next June another pregnancy occurs. In general, we can thus conclude that the trend towards population decrease, registered in the 1980s, was followed by its growth in 2015–2017. At the same time, the disastrous state of the species in its European range raises concerns about its future in this part of the range. For example, the early 1950s already witnessed a dramatic decline of its population caused by the large-scale skin production (Moskvitina et al., 2016). Current instability of the hamster population and occurrence may result from both scarcity of local population and habitat fragmentation, which hinders reproduction and reduces genetic diversity. We believe, however, that the adverse factors observed in Europe (Surov et al., 2016) can not yet fully develop in Western Siberia. In the circumstances of the global climate change the eastern part of the range is more favourable for the hamster as climate conditions in Siberia (snow cover duration and melting periods, its stability, depth and structure) can ensure proper wintering under long exposure to low temperatures. This in turn can facilitate the hamster's reproductive potential, which also depends upon weather conditions during breeding season and when it prepares for hibernation. The growth of the hamster population over the last two years can quite possibly be a result of the optimum combination of abiotic factors of the environment.

The data on the hamster distribution and numbers collected for many years in WSS shows the instability of the species population. Factors that lead to such instability are yet to be discovered. The original cause of this state of events could have been long and intense pressure from harvesting, which, together with the transformation of the environment, has formed smaller populations and fulfilled the species tendency to adapt to human habitats. The damage that the hamster causes to people's farms and property when living in close proximity makes stakeholders to take measures against hamsters, which again leads to the decline of its population. Anthropogenic transformation of landscapes and people's economic activity in Western Siberia have the strongest negative impact in areas of intensive farming, that is primarily in plain and submontane parts of Altai.

Monitoring of the hamster population in Western Siberia should serve to assess its numbers in different landscape zones and to study characteristics of its ecology to have a fair view of the state of its population in Asian part of the range.

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