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Occurrence of Sable (*Martes zibellina*, Carnivora, Mustelidae) beyond the Boundaries of the Species Range in the Middle Urals: Facts from 2014–2016

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Abstract—Eleven sables were captured in Sverdlovsk oblast, at distances of 133 to 203 km from the southwestern boundary of the species range, in 2014–2016. The capture sites were located within the species range of the pine marten. A brief description of the animals, photographs, morphometric data, and a map of capture sites are provided. Violation of the species range boundaries is enabled by local predominance of one species over another with regard to population size. An example of a female tagged in the Pechoro-Ilychskii Nature Reserve and caught a year later near the town of Karpinsk, 233 km from the tagging site, is given.

Keywords: pine marten, sable, species range, population size, migration
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A number of sables have been captured over the past six years in areas of Sverdlovsk oblast located at a considerable distance to the south of the southwestern boundary of the species range. Some of these instances were reported earlier (Monakhov, 2010, 2015). However, the number of such cases has increased in the two most recent hunting seasons. Data on sables captured in the central and southeastern regions of Sverdlovsk oblast in 2014/2015 and 2015/2016 are presented in Table 1, and capture sites are marked in Fig. 1.

Species (sable) identification according to the main classification criteria (Novikov, 1956; Geptner et al., 1967; Aristov and Baryshnikov, 2001; Monakhov, 2011) could be verified due to morphometric measurements, photographs, and biological sample preservation in most cases. The coat color in specimens 1–5 and 9 was typical for the sable, with lighter fur on the head and lower part of the neck. Body color ranged from sandy-beige to dark brown with a darker "band" on the back and black-brown tail and limbs. The fur structure was typical for the sable (soft and silky). The color categories of the skins (assessed according to the OST-NKZag-414 standard) ranged from "mekhovoi (fur)" to "vorotovoi tyomniy (collar dark)." A weak grayish hue was observed in most cases. The throat spot was conspicuous only in specimen 5 (orange-yellow, approximately 5 × 6 cm, with blurred boundaries). The claws were light gray, and the tip of the nose was black. The tail was short, hardly protruding beyond the hind limbs (from the last caudal vertebra, Fig. 2). The baculum had a forked shape typical for the sable in specimen 1, the condylobasal length of the skull was 80.5 mm, and the zygomatic width of the skull was 43.9 mm. The animals examined were typical representatives of the nominal Tobolsk subspecies *Martes zibellina zibellina*, which inhabits the specified part of the species range.

Information on other specimens was provided by huntsmen, hunting managers, and fur merchants and could generally be considered reliable.

The southernmost site of sable (specimen 3) capture in Sverdlovsk oblast was located near the border of Chelyabinsk oblast, 4 km to the northeast from Porotnikova village (approximately 56°46′ N), that is, 196 km from the nearest boundary of the species range. The capture sites for specimens 7, 9, and 10 were located at the greatest distance (about 200 km) from the southern boundary of the species range, near Nev'yansk town of Sverdlovsk oblast.

Specimen 11 merits special mention. A female sable caught in the upper reaches of the Pozhva River (Karpinsk raion) in January 2016 had an aluminum ear earring with the number 426. According to a personal communication from L.V. Simakin, executive director of the Pechoro-Ilychskii State Reserve, the animal was captured and tagged on February 21, 2015, at a stationary research station of the reserve (near the Elma River estuary in the upper reaches of the

Table 1. Data on sable hunted in Sverdlovsk oblast, beyond the species range, in 2014–2016

No.	Raion, locality	Date, sex	Hunter/collector	Geographical coordinates	Morphometry, cm	Photo	Distance from species range boundary, km
1	Talitsa, Borovaya village	November 16, 2014, male	A. Shikhov	57°16′ N 63°21′ E	BL = 43.5, tail = 14, forefoot = 9.3, ear = 4.2	+	149
2	Talitsa, Borovaya village,	December 3, 2014, male	A. Shikhov	57°16′ N 63°21′ E	BL = 50, tail = 18, forefoot = 9.2, ear = 4.4	+	150
3	Talitsa, Porotnikova	December 2, 2014, male	M. Smolov	56°46′ N 64°09′ E	–	+	196
4	Tugulym, Zubkovo	December 2014, male	I.P. Glukhov.	57°22′ N 64°10′ E	–	+	133
5	Tugulym, Zubkovo	December 2014, female	I.P. Glukhov	57°21′ N 64°07′ E	–	+	133
6	Nev'yansk, Serbishino	November 2014, sex unknown	V.G. Pautov	57°37′ N 60°22′ E	–	–	183
7	Nev'yansk, Tsementnyi	November 2014, sex unknown	D. Vladimirov	57°30′ N 60°05′ E	–	–	203
8	Alapaevsk, Neivo-Shaitanskii	January 2015, male	A.V. Onuchin	57°46′ N 61°18′ E	–	–	152
9	Nev'yansk, Seredovina	November 2015, male	I.M. Shumilov	57°29′ N 60°22′ E	CBL 86.9, ZW 51.3, MH 31.2 mm	+	198
10	Nev'yansk, Seredovina	November 2015, female	I.M. Shumilov	57°29′ N 60°22′ E	CBL 77.7, ZW 44.0, MH 29.2 mm	–	198
11	Karpinsk, Pozhva River	January 2016, female	A.N. Eroshin	60°06′ N 59°26′ E	Ear tag no. 426	–	233 (from tagging site)

Numbers of animals are the same as in Figs. 1 and 2. BL, body length; tail, tail length; forefoot, forefoot length; ear, ear length; CBL, condylobasal length; ZW, zygomatic width; MH, maximal height of the skull.

Pechora River, coordinates 62°1′30.587″ N, 58°46′37.581″ E), and thus it had covered a distance of 233 km in a year.

Local fluctuations in sable and marten population sizes and the population size ratio in a specific area, forest massif, or station during a particular period can explain the migration of sables to the south. We analyzed the data on population sizes of the two species in Sverdlovsk oblast. The data were collected during winter route censuses and provided by the Department for Protection, Control, and Regulation of Wildlife Use of Sverdlovsk oblast.

Noticeable changes in the abundance of sable near the southern boundary of the species range were only registered in the western part of Sverdlovsk oblast. The sable population size in the Serov raion was low in the 1980s (43 animals, on average, according to data for all years), reached 175 animals in the 1990s, remained at the level of 119 animals until 2006, and is at the level of 231 animals now. The average annual population size

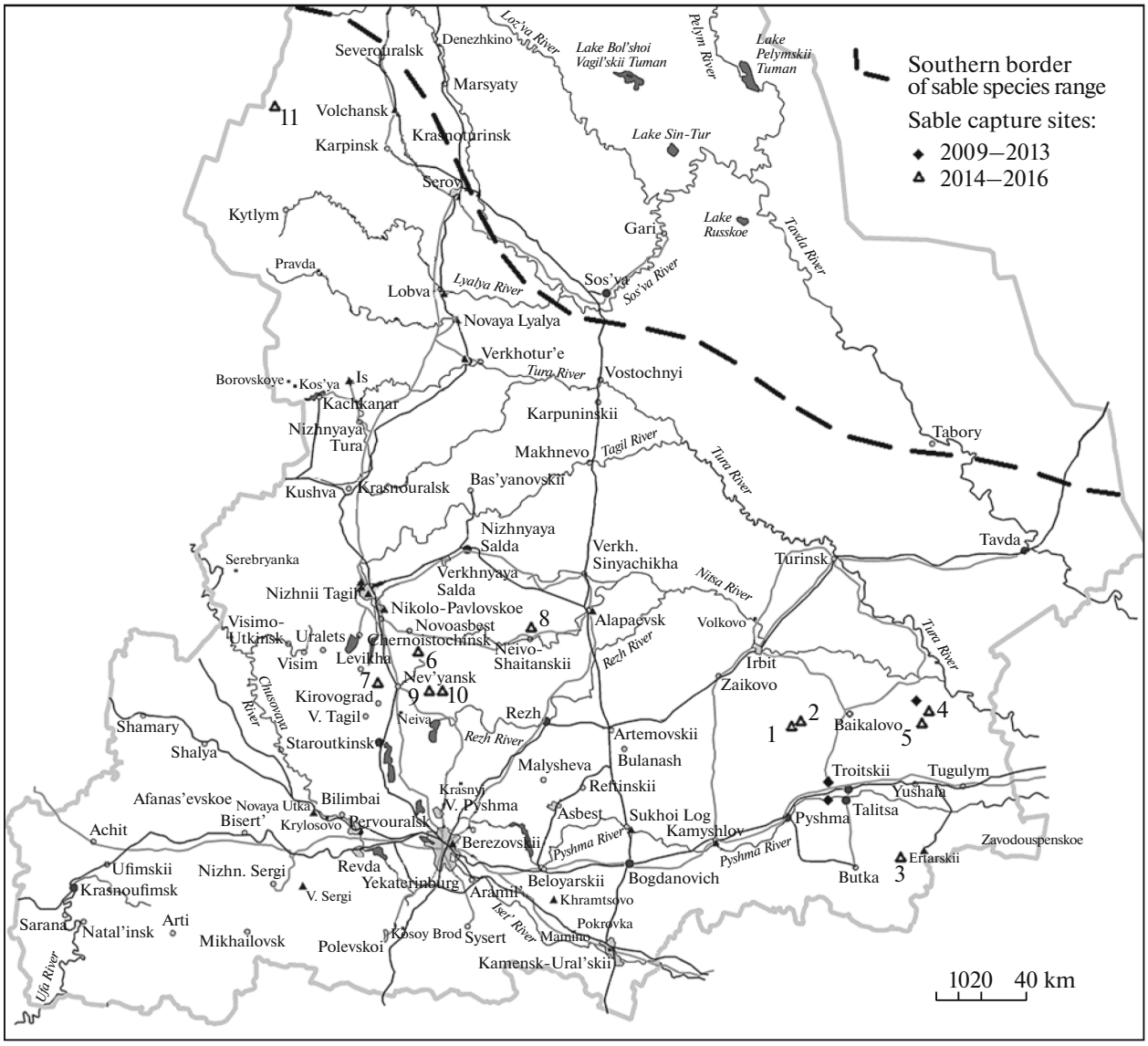

Fig. 1. Places of sable capture beyond the boundaries of the species range in Sverdlovsk oblast in 2009–2016. The section of the species range boundary is marked according to (Monakhov, 2010). 1–11, specimen numbers.

in the Severouralsk raion was 27 animals until 1993 and then five animals until 2005 (there were breaks between censuses). Sables were not found in the area between 2004 and 2008, and the population size was 66 animals between 2010 and 2016. Three animals were sighted in Krasnotur'insk raion in 2012, and two, in 2016. Sables were seen in Karpinsk raion in 2007–2010, where the average population size was 13 animals, and the current population size is 47 animals. Some hunters reported that up to ten sable individuals per hunter per season were captured in Severouralsk and Karpinsk raions.

Sables were not sighted in the central raions (Alapaevsk, Artemovsk, Rezh, Nev'yansk, Nizhnyaya Salda, Makhnevo, and Verkhotur'e). However, the pine marten population size in Nev'yansk raion dropped to 100 animals or fewer in 2014 and 2015 (Fig. 3a), and the sable population size in the more northern neighboring raions (Serov, Ivdel', Severouralsk, and Karpinsk) increased at the same time, becoming 20 to 23 times higher than the marten population size. One can assume that this larger population size permitted a relatively easy expansion of the sable population into Nev'yansk raion in 2014–2015.

The presence of sable in the stepped of Pyshma, Talitsa, Baikalovo, and Slobodoturinsk raions of the southeastern part of the oblast was not registered in any censuses. The visits registered in 2009–2013 (Monakhov, 2010, 2015) coincided with oppositely directed trends in population size changes for the two

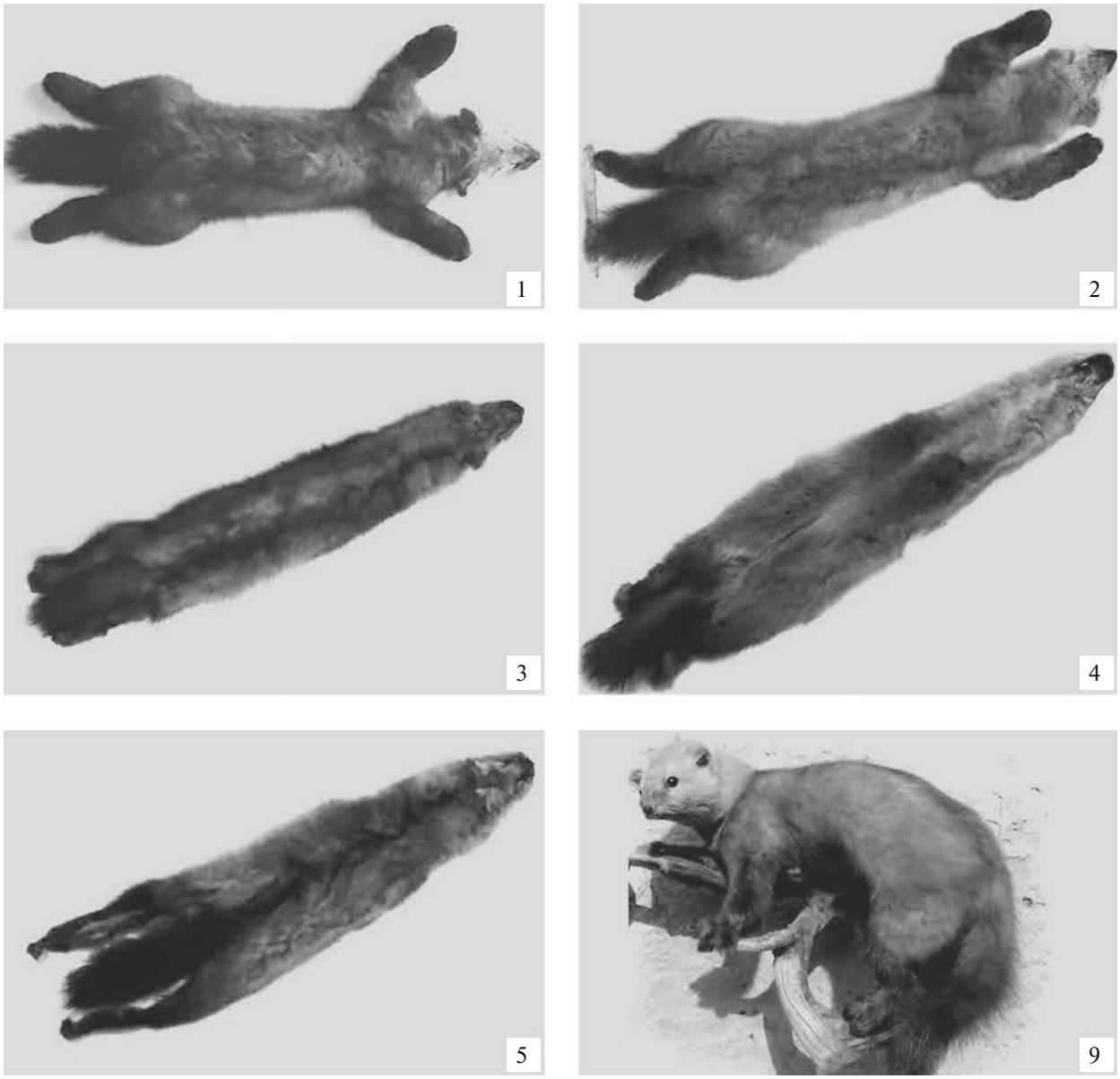

Fig. 2. Carcasses and skins of sables captured in 2014–2015 beyond the boundaries of the species range. Specimen numbers correspond to those given in the Table 1. Specimen 4 was photographed from the ventral side. Photos by I.P. Glukhov and the author (specimen 9).

species (Fig. 3b). However, the pine marten began to prevail over the sable in 2014, when the marten population size peaked and the number of sables in the eastern (Tabory and Gari) raions continued to decline. The marten remained the dominant species in 2015, regardless of a sharp decline in population size, and therefore sable visits to the area were no longer observed.

There is no reason to assume a considerable change in the southern boundary of the sable species range, as quite a few sables were reported to migrate to the south (three animals per year, on average). The boundary of the sable species range in the Urals has remained stable for almost 60 years (Koryakov, 1948; Poluzadov, 1955, 1973; Bakeev, 1973; Bolshakov et al., 2000; Monakhov, 2000; Bakeev et al., 2003). The study by Bolshakov et al. (2000) was the only one to report that the boundary of the species range crossed the Ural Ridge at the latitude of the town of Novaya Lyalya. Pavlinin (1963) reported "separate records" of sable in Makhnevo, Novaya Lyalya, Verkhnyaya Salda, and Nizhnii Tagil raions, but no sable sightings to the south of 58° N were reported earlier.

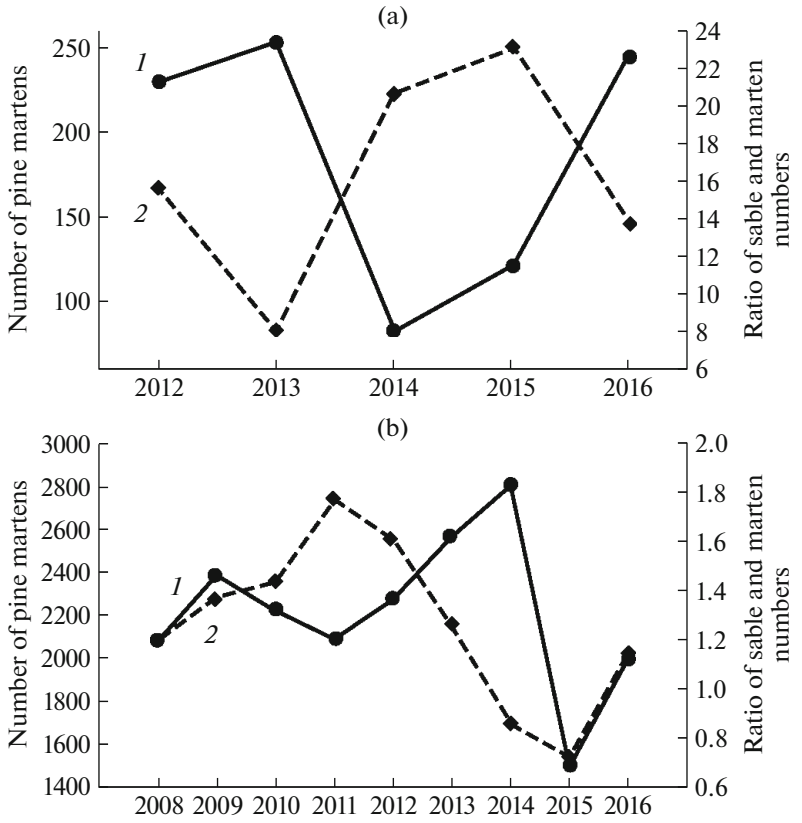

Fig. 3. Marten population size (*1*) and the ratio of sable and marten population sizes (*2*) in the (a) central and (b) southeastern areas of Sverdlovsk oblast.

The westernmost part of the species range boundary in the oblast might need some correction, since sable dwelling and capture in Severoural'sk and Karpinsk raion have acquired the character of a stable pattern. It is only necessary to determine the extent of sable expansion towards the south in these areas in recent years.

According to the results of winter root censuses, the sable and marten population size and density are desynchronized in the Middle Urals, an area coinhabited by these species. Therefore, the population size for one species can locally exceed that for the other species in certain years, and this enables the sable to make short raids into the territory usually occupied by the pine marten. Migrations can be stimulated by other factors, such as hunting, distinctive features of the food available, trophic niche separation (Korytin, 2011; Monakhov, 2012, 2015, 2016), and the like.

As a conclusion, one can say that the occurrences of sable in marten habitats beyond the southern boundary of the sable species range observed in the Urals in recent years can be explained by temporary predomination (with regard to population size) of one species over another of taxonomically and ecologically similar species.

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REFERENCES

Aristov, A.A. and Baryshnikov, G.F., *Mlekopitayushchie fauny Rossii i sopredel'nykh territorii. Khishchnye i lastonogie* (Mammals of Russia and Adjacent Countries: Carnivores and Pinnipeds), St. Petersburg: Zool. Inst., Ross. Akad. Nauk, 2001.

Bakeev, N.N., Sable, in *Sobol', kunitsy, kharza* (Sable, Martens, and the Yellow-Throated Marten), Moscow: Nauka, 1973, pp. 14–16.

Bakeev, N.N., Monakhov, G.I., and Sinitsyn, A.A., *Sobol'* (Sable), Vyatka: VNIIOZ, 2003.

Bol'shakov, V.N., Berdyugin, K.I., Vasil'eva, I.A., and Kuznetsova, I.A., *Mlekopitayushchie Sverdlovskoi olasti* (Mammals of the Sverdlovsk Oblast), Yekaterinburg: Yekaterinburg, 2000.

Geptner, V.G., Naumov, N.P., Yurgenson, P.B., Sludskii, A.A., Chirkova, A.F., and Bannikov, A.G., *Mlekopitayushchie*

Sovetskogo Soyuza (Mammals of the Soviet Union), Moscow: Vysshaya Shkola, 1967, vol. 2, part 1.

Koryakov, B.F., Distribution and commercial use of sable in the Urals, *Trudy VNIO*, 1948, vol. 8, pp. 84–103.

Korytin, N.S., Changes in the numbers of predatory mammals in the Middle Urals caused by anthropogenic factors, *Russ. J. Ecol.*, 2011, vol. 42, no. 3, pp. 231–235.

Monakhov, V.G., Population analysis of sables in the Ural–Ob region of the species range, *Russ. J. Ecol.*, 2000, vol. 31, no. 6, pp. 422–428.

Monakhov, V.G., Records of sable outside its range in southern Sverdlovsk region in winter of 2009–2010, *Zool. Zh.*, 2010, vol. 89, no. 11, pp. 1394–1397.

Monakhov, V.G., *Martes zibellina* (Carnivora: Mustelidae), *Mammalian Species*, 2011, vol. 43, no. 1, pp. 75–86.

Monakhov, V.G., Dynamics of resources of species of the genus *Martes* in the Middle Urals for 20 years, in *Materialy mezhdunarodnoi nauchno-prakticheskoi konferentsii "Okhrana i ratsional'noe ispol'zovanie zhivotnykh i rastitel'nykh resursov"* (Proc. Int. Sci.-Pract. Conf. "Conservation and Sustainable Use of Animal and Plant Resources"), Irkutsk, 2012, pp. 244–250.

Monakhov, V.G., New records of catching sables outside of specific range in Sverdlovsk region, *Vestn. Okhotoved.*, 2015, vol. 12, no. 1, pp. 94–98.

Monakhov, V.G., Winter diet in sable (*Martes zibellina*) and pine marten (*Martes martes*, Carnivora, Mustelidae) from the Urals, *Zool. Zh.*, 2016, vol. 95, no. 9, pp. 1087–1095.

Novikov, G.A., *Khishchnye mlekopitayushchie fauny SSSR* (Carnivorous Mammals of the Fauna of the USSR), Moscow: Akad. Nauk SSSR, 1956.

Pavlinin, V.N., *Tobol'skii sobol'* (Tobol Sable), Sverdlovsk: UFAN SSSR, 1963.

Poluzadov, N.B., Sable in the Sverdlovsk oblast, in *Zapiski Ural'skogo otdela Geograficheskogo Obshchestva SSSR* (Transactions of the Urals Division of the Geographical Society of the USSR), Sverdlovsk: KOIZ, 1955, vol. 2, pp. 159–164.

Poluzadov, N.B., *Ural i prilegayushchaya chast' Zapadnoi Sibiri,* in *Sobol', kunitsy, kharza* (Urals and the Adjacent Part of Western Siberia. Sable, Martens, and the Yellow-Throated Marten), Moscow: Nauka, 1973, pp. 52–59.

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