

# The Desman and the Musk-rat

By V. G. Skoptsov

**The desman *Desmana moschata* is a valuable fur-bearing animal of Russian rivers. Numbers were building up until the introduction of the musk-rat from Canada brought a fierce and aggressive competitor for its habitat. The author suggests that the musk-rat is the cause of the decline in the numbers of the desman and is responsible, in at least one lake, for the disappearance of shell-fish, insects, fish, water rats and some breeding birds.**

**T**HE north American musk-rat, which abounds in Canada, was the first fur-bearing animal to be acclimatised in the USSR. Conditions in the two countries are very similar and the first attempts in 1928, on the island of Karagin, were immediately successful. In 1932 musk-rats were taken from the island to the mainland and put down in several areas, again with immediate success, so that by 1935 it was possible to start culling the animals for their fur.<sup>1</sup>

Unfortunately, warnings against introducing musk-rats into areas where they competed with the local fauna, in particular with native species of fur-bearing animals, such as the desman, were ignored. An eminent Soviet zoologist, Professor Manteifel, warned especially against introducing musk-rats into the Volga, Don and Ural rivers where the desman was established, and in 1958 an All-Union conference on the desman and the beaver passed a resolution urging the complete prohibition of musk-rat introductions in areas occupied by desmans. Both were ignored. Reports of increases in the musk-rats became more numerous while the numbers of desman steadily declined. Attempts were made to prove the possibility of the two animals co-existing,<sup>2</sup> but more recent work has now proved the opposite,<sup>3</sup> and shown that the main reason for the sharp check in the increase of desman numbers is due to the introduction of the musk-rat.

Until 1948 the Tambov region was the only part of the Soviet Union where desmans were sufficiently numerous to allow culling for the fur trade. In that year about 140 musk-rats were brought to Ivensky Razlivi, on the Isna, and to Lake Linovo; in 1951, 185 animals were put down in Lake Kochkino and 81 in Lake Christee. In the last-named lake they increased rapidly, and the effect on the flora and fauna was considerable, as Table 1 shows. The 1949 list was made by B. E. Kayandeev.

The musk-rats completely destroyed shell-fish and the big slow-moving insects. After their arrival eels, tench, and roach disappeared and the only birds that continued to nest on the lake shore and on the islands were white and yellow wagtails. Water-rats disappeared. Similar effects had already been observed in other European countries, notably France, Holland and England.<sup>4</sup> In 1962 rice sown in the lake was

**Table 1. Changes in the fauna of Lake Christee after the introduction in 1951 of musk-rats**

1949	1962
<b>MOLLUSCA</b>	
<i>Limnaea stagnalis</i>	<i>Planorbis planorbis</i>
<i>Radix ovata</i>	
<i>Limnaea trunculata</i>	
<i>Galba palustris</i>	
<i>Aplecsta</i>	
<i>Planorbis corneus</i>	
<i>Planorbis planorbis</i>	
<b>CRUSTACEA</b>	
<i>Daphnia pulex</i>	<i>Daphnia pulex</i>
<i>Cyclops strenuus</i>	<i>Cyclops strenuus</i>
<i>Diaptomus gracilis</i>	<i>Diaptomus gracilis</i>
<i>Gammarus lacustris</i>	
<b>INSECTA</b>	
<i>Libellula quadrimaculata</i>	<i>Libellula quadrimaculata</i>
<i>Cordulia aenea</i>	<i>Cordulia aenea</i>
<i>Agrion pulchellum</i>	<i>Agrion pulchellum</i>
<i>Agrion puella</i>	<i>Agrion puella</i>
<i>Sympetrum flaveolum</i>	<i>Danacia crassipes</i>
<i>Macrodrytes marginalis</i>	
<i>Lestes dryas</i>	
<i>Hydrous piceus</i>	
<i>Nauncoris cimicoides</i>	
<i>Notonecta glauca</i>	
<i>Nepa cinerea</i>	
<i>Danacia crassipes</i>	
<i>Danacia aquatica</i>	
<b>PISCES</b>	
<i>Carassius carassius</i>	<i>Carassius carassius</i>
<i>Misgurnus fossilis</i>	<i>Carassius auratus</i>
<i>Rutilus rutilus</i>	<i>Cyprinus carpio</i>
<i>Tinca tinca</i>	
<b>AMPHIBIA</b>	
<i>Rana esculenta</i>	<i>Rana esculenta</i>
<i>Rana temporaria</i>	<i>Rana temporaria</i>
<i>Rana terrestris</i>	<i>Rana terrestris</i>
<i>Triturus vulgaris</i>	<i>Triturus vulgaris</i>
	<i>Triturus cristatus</i>
<b>AVES</b>	
<i>Sterna hirundo</i>	<i>Sterna hirundo</i>
<i>Chlidonias nigra</i>	<i>Chlidonias nigra</i>
<i>Anas querquedula</i>	<i>Anas querquedula</i>
<i>Anas platyrhynchos</i>	<i>Anas platyrhynchos</i>
<i>Motacilla alba</i>	<i>Motacilla alba</i>
<i>Motacilla flava</i>	<i>Motacilla flava</i>
<b>MAMMALIA</b>	
<i>Desmana moschata</i>	<i>Ondatra zibethica</i>
<i>Ondatra zibethica</i>	
<i>Arvicola terrestris</i>	

destroyed by the musk-rats.

But the desmans came off worst. The musk-rats did not compete with them for food because the desman feeds mainly on shell-fish and the musk rat on young stems, leaves, shoots and roots of the water plants; only lack of vegetable food makes it turn to crayfish, big water bugs, shell-fish, frogs and occasionally fish. But they did compete with desmans for habitat and shelter. I have watched the more aggressive and vicious musk-rats drive the desmans from their holes and occupy them. It is very rare to see a fight over a hole.

Disputes are most easily observed during the spring heat of the two species which takes place simultaneously. At this time the desmans gather in small groups of three to five animals in shallow water near the banks. Three or four males, making squeaking and gurgling noises, pursue a female round a snag or a half-submerged bush, but a single male musk-rat will disperse the "dancers", breaking its way into the group, squealing viciously and biting them, until the desmans dive or swim away without offering resistance. The musk-rat then pursues the female, which dives, and may pursue her underwater for a considerable time. The musk-rat bites the female desman at the top of the tail or at the scent gland, with the result that the female does not return to the site of the heat for a long time, and the males, which have waited for it, swim away. In other instances, a musk-rat has been seen to chase a male desman underwater, and the squeals of both animals could be heard as they fought submerged, the desman often leaving the field of battle badly wounded.

The fluctuations in the desman numbers in the Tambov region according to figures kindly supplied by the chief inspector of hunting, Zarutsky, are: 1958, 9000; 1959, 12,000; 1960, 11,000; 1961, 10,000; 1962, 9,000. Reports show that the musk-rat has driven out the desman in the Ryazan, Kirov and Vladimir regions, and in the Markov autonomous republic.

The problem of the relation between these two ecologically incompatible species is important, both for zoological and economic reasons, and needs further investigation.

## REFERENCES

1. S. A. PREDTECHENSKI, 1928. Some information on the rarest and most interesting ground vertebrates of the Tambov Region.
2. L. P. BORODIN. The desman and the musk-rat, the ecological relations of the species, their economic significance. *Bulletin No. 1 MOIR. 1965.*
3. L. V. SHAPOSKNIKOV, F. D. SHAPOSKNIKOV, 1949. On co-existence of the desman, the musk-rat and the beaver, *Zoology* 28, 4.
4. L. P. BORODIN. Russian desman, Saransk, 1963.
5. F. D. SHAPOSKNIKOV, 1951. Some data about the acclimatising of the beaver, the musk-rat and the desman in Pustiny Zakaznik of the biological station of the Yorny University. *Scientific paper of Yorny University Biological series, No. 19.*
6. N. LAVROV, 1965. The musk-rat on three continents. *Hunting, No. 12.*
7. V. G. SKOPTSOV, 1964. The musk-rat and the desman. *Hunting No. 8.*
8. V. G. SKOPTSOV, 1965. La desman russe. *Science et vie, France.*