

Minnesota mammals

This is a short guide to Minnesota mammals, with information drawn from Hazard's Mammals of Minnesota (H), Walker's Mammals of the World, Whitaker and Hamilton's Mammals of the Eastern United States (WH), Jackson's Mammals of Wisconsin (J), and a few other sources. Lengths and weights, when given, are listed by source according to the initials in the previous sentence. This guide provides an introduction to Minnesota species, as an alternative to purchasing one of the books listed above.

Generally, the taxonomic names and organization follow the text. We will look at as many of these specimens as possible during this course. There are skins available of some of these species, and there are skulls of about 75% of Minnesota mammals in the UMD collection.

Order Didelphimorphia

Order	Family	Species	Common name
Didelphimorphia	Didelphidae	<i>Didelphis virginiana</i>	Opossum, Virginia opossum

Description: The opossum is the only marsupial present in Minnesota. It is similar in size to a large cat, but has much shorter legs. The muzzle is long and pointed and the prehensile tail is only lightly covered with hair. The coat is made of up long white guard hairs with a black-tipped underfur, so opossums appear gray or grizzled. Ears are not covered with hair. Both the ears and the tail can be shortened by freezing.

The skull is unique among Minnesota mammals because of the number of teeth, and also because of the relatively small braincase compared to similarly sized Minnesota mammals. Compare, for example, the braincase volume of an opossum to that of a much smaller squirrel. Opossums have 50 teeth (5/4 1/1 3/3 4/4), more teeth than any other Minnesota mammal.

Measurement	Average	Range	Source and Comments
Total length (mm)	759 762	694-803 666-883 650-825	Minnesota (H) Pennsylvania (WH) Wisconsin (J)
Tail (mm)	295 290	259-352 216-356 275-350	Pennsylvania (WH) Wisconsin (J)
Hind foot (mm)	67 66	61-80 60-75 62-75	Minnesota (H) Pennsylvania (WH) Wisconsin (J)
Ear (mm)	50	44-54	Minnesota (H) Wisconsin (J)
Body Weight			
Not sexed (kg)		2.2 – 4.0 2.7 – 5.0	Minnesota (H) Wisconsin (J)
Females (kg)	2.4	1.8 – 3.0	Pennsylvania (WH)
Males (kg)	3.4	2.2 – 4.0	Pennsylvania (WH)

Range and Habitat: Opossums are found in southern Minnesota, with some records in the central and west-central parts of the state, moving north in recent decades. Opossums are generalists in terms of habitat requirements. They can be found in forests, in farmlands, and urban and suburban areas. Range expansion has been associated with humans.

Natural History: The marsupium, or pouch is unlikely to be visible except in fresh specimens. There are 13 teats, 12 of which are arranged radially around one center teat. Newborn opossums are under 1.5 cm long and each attach to one teat. Gestation lasts about 12 days, and then the young are weaned at under 100 days of age. The mother carries the newborn opossums for over 60 days. Why is gestation so short?

Opossums are nocturnal. The prehensile tail is a clue that they occasionally spend time in trees. Opossums are omnivores, feeding on insects, small mammals, vegetation, fruits and berries, bird eggs, and other foods. Road-killed animals are also fed on by opossums.



Order Soricomorpha

Soricomorpha. Minnesota members of the order Soricomorpha are mouse-size or smaller, with pointed snouts, small eyes, and small or absent pinna (earlobes). The Soricidae (shrew) and Talpidae (mole) families are present in Minnesota.

Soricidae. Members of the shrew family, Soricidae, do not have a zygomatic arch, have short ears which appear hidden by fur, eyes that are visible but smaller, and relatively small size. There are 6 species in Minnesota, some common, some rare. Teeth are reddish-brown at the tips in all Minnesota (and North American) species of soricids.

Talpidae. Moles have a stouter, stronger appearing body than shrews. They have no external ears (pinna), reduced eyes, and strong front feet with broad palms.

Comparison of Minnesota Soricomorpha

Side by side comparison of study skins of Minnesota Soricomorpha. Fill in the full species name. Note the differences in body size and tail length relative to body length. Also note differences in pelage color among the specimens, within and between species.



Order	Family	Species	Common name
Insectivora	Soricidae	<i>Sorex cinereus</i>	Masked shrew

Description: The masked shrew is among the smallest mammals in Minnesota. Live specimens have a pointed nose, although some of the lab specimens have been stuffed so they have a rounded nose. The bi-colored tail (grayish above and lighter below) is more than 1/3 of total length. Fur is dark brown above and darker gray below.

Teeth are generally brown at the tips. Eyes and ears are not obvious.

Gestation is estimated at about 18 days, with 4 – 10 young being born. It is thought that young leave the nest when they are 9 to 10 days old.

The pygmy shrew (*S. hoyi*) can only be distinguished from the masked shrew by looking at the skull (see key and look at the differences in the skull under a microscope).

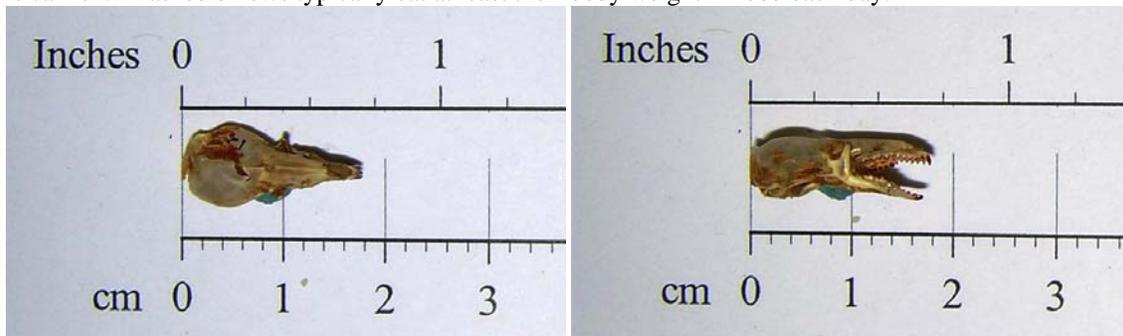
Measurements:

Measurement	Average	Range	Source and Comments
Total length (mm)	94	83-104	Minnesota (H)
	88	71 – 111	Unknown (WH)
		95-109	Wisconsin (J)
Tail (mm)	39	36-41	Minnesota (H)
		31-44	Wisconsin (J)
Hind foot (mm)	12	11-12	Minnesota (H)
		11-12.5	Wisconsin (J)
Ear (mm)	6	4-8	Minnesota (H)
			Wisconsin (J)
Body Weight			
Not sexed (g)	4.1	3.0 – 6.5	Minnesota (H)
		3.5 – 5.6	Wisconsin (J)

Range: Masked shrews are found throughout Minnesota.

Habitat: The masked shrew has been collected in grassland, coniferous, and deciduous forests.

Natural History: Masked shrews remain active throughout the year. Foods include insects, other arthropods, mice and other shrews, and some plant material. As with many animals, some of what is eaten is carrion. Masked shrews typically eat at least their body weight in food each day.



Order	Family	Species	Common name
Insectivora	Soricidae	<i>Sorex palustris</i>	Water shrew

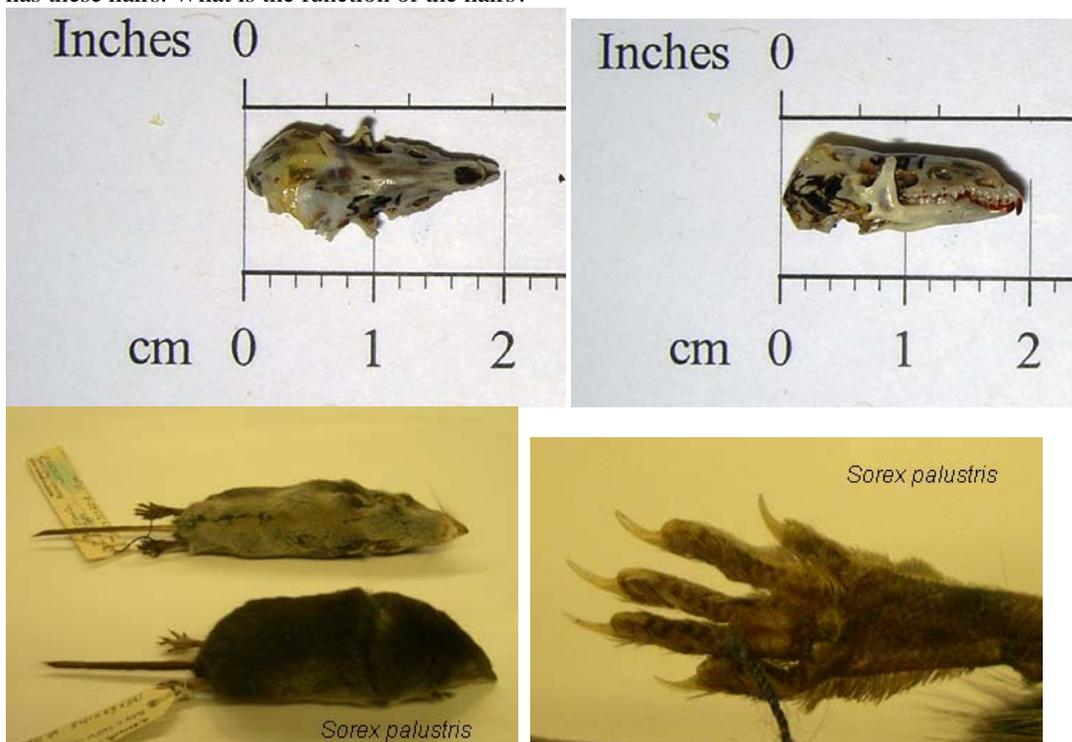
Description: The water shrew is larger than other long-tailed shrews in Minnesota (genus *Sorex*), with a length of 136 to 158 mm, and a tail length of 62 to 76 mm. The large size can be used to differentiate from other *Sorex* species in Minnesota, and the long tail differentiates it from the short-tailed shrew (*Blarina brevicauda*, see below). The fur is black above and silvery-gray ventrally.

Measurement	Average	Range	Source and Comments
Total length (cm)	149	136-158 138-164	Minnesota (H) Wisconsin (J)
Tail (cm)	67	62-76 63-72 63 - 72	Minnesota (H) Unknown (WH) Wisconsin (J)
Hind foot (cm)	19	18-21 19-21 19 - 20	Minnesota (H) Unknown (WH) Wisconsin (J)
Ear (cm)	9	7-11	Minnesota (H)
Body Weight			
Mixed	14.4	11.4-19.1 12-18	Minnesota (H) Wisconsin (J)

Range: Northern third of Minnesota, primarily the forested regions.

Habitat: Generally found in forested areas near running water.

Natural History: One feature to look for are the stiff hairs on the hind feet. No other shrew in Minnesota has these hairs. What is the function of the hairs?



Order	Family	Species	Common name
Insectivora	Soricidae	<i>Sorex arcticus</i>	Arctic shrew

Description: The arctic shrew is intermediate in size between the water shrew and the masked shrew with a length of 106 to 112 mm, and a tail length of 36 to 45 mm. Note the long tail again, although also note that on some of the specimens the tail has been shortened after preparation.

For quick identification, look at the color pattern present on most adult specimens: dark brown above, light brown sides, and then a gray ventral surface. As with other species, look at the tooth patterns in the key.

Measurements:

Measurement	Average	Range	Source and Comments
Total length (mm)	109	106-112 114 - 126	Minnesota (H) Wisconsin (J)
Tail (mm)	40	36-45 38 - 46	Minnesota (H) Wisconsin (J)
Hind foot (mm)	14	12-15 14 - 15	Minnesota (H) Wisconsin (J)
Ear (mm)	8	7.4 – 10	Minnesota (H) Wisconsin (J)
Body Weight			
Male and Female	9.1	7.1 – 11.7 7 - 11	Minnesota (H) Wisconsin (J)

Range: Northern third of Minnesota, primarily the forested regions.

Habitat: Generally found in forested areas near swamps or other water. Cedar, larch (tamarack), or spruce cover types.

Natural History: Foraging on insects and larvae as is typical of insectivores. Have been seen capturing grasshoppers when air temperature is cold (why when cold?).



Order	Family	Species	Common name
Insectivora	Soricidae	<i>Sorex hoyi</i>	Pygmy shrew

Description: The pygmy shrew, as the name implies, is the smallest mammal in Minnesota, although its measurements overlap those of the masked shrew. Length range is 75 to 91 mm, with tail length of 27 to 34 mm. The only way to reliably distinguish a pygmy shrew from a masked shrew, as pointed out above, is by seeing dentition.

As you can see from the specimen label (skull only, we do not have a study skin at UMD) the pygmy shrew used to be placed in its own genus (*Microsorex*). It would look very similar to the masked shrew if we had a skin.

Measurements:

Measurement	Average	Range	Source and Comments
Total length (mm)	85 84 73.5	75-91 80 – 98	Minnesota (H) Maine (WH) Indiana (WH) Wisconsin (J)
Tail (mm)	29.5 30 24.6	27-34 21-28 28 – 32	Minnesota (H) Maine (WH) Indiana (WH) Wisconsin (J)
Hind foot (mm)	9.4 10 8.2	8-11.5 6-9 9 – 11	Minnesota (H) Maine (WH) Indiana (WH) Wisconsin (J)
Ear (mm)	4	3-6	Minnesota (H)
Body Weight			
Male and Female (g)	3 2.0	3-6 2.5 – 3.0 1.3-2.9 2.2 – 3.8	Minnesota (H) Maine (WH) Indiana (WH) Wisconsin (J)

Range: Northern third of Minnesota, primarily the forested regions.

Habitat: Most often found in wet habitats near water.

Natural History: May be less common than other shrews, or may just be more difficult to trap. Differences in habitat use or prey consumption compared to other shrew species are not known.



Order	Family	Species	Common name
Insectivora	Soricidae	<i>Blarina brevicauda</i>	Short-tailed shrew

Description: The short-tailed shrew has a larger body size than most of the long-tailed shrews and has a short tail relative to its body length. Teeth differentiate the short-tailed shrew (and all shrews) from voles and mice. Fur is generally a slate or blackish color, although it is variable.

Measurement	Average	Range	Source and Comments
Total length (mm)	115 129.0 124	124-134 100.0-126.0 118 – 139	Minnesota (H) Indiana (WH) New York (WH) Wisconsin (J)
Tail (mm)	23 25.0 24.8	22-27 19.0-25.0 23 – 32	Minnesota (H) Indiana (WH) New York (WH) Wisconsin (J)
Hind foot (mm)	16.0 14.3 15.0	16-17 9.0-16.0 15 – 17	Minnesota (H) Indiana (WH) New York (WH) Wisconsin (J)
Ear (mm)	7	6-8	Minnesota (H) Wisconsin (J)
Body Weight			
Mixed (g)	27.3 17.5 19.3	22.9-35.5 11.0-26.3 18 - 30	Minnesota (H) Indiana (WH) New York (WH) Wisconsin (J)

Range: Distributed throughout Minnesota.

Habitat: Wooded and open habitats, wooded habitats can be either coniferous or hardwoods. Seems to be able to use drier habitats than other shrew species, perhaps due to slightly larger size.

Natural History: The short-tailed shrew is common in Minnesota. As with other shrews, they consume insects, arthropods, and other small vertebrates. The submaxillary glands produce a poison, as discussed in the text, that will kill a mouse.



Order	Family	Species	Common name
Insectivora	Soricidae	<i>Cryptotis parva</i>	Least shrew

Description: The least shrew is rare in Minnesota and only one specimen has been collected in southeastern part of the state. There are no specimens from Minnesota in the UMD collection, but there is one specimen from Kansas.

Measurements:

Measurement	Average	Range	Source and Comments
Total length (cm)	80	-	Minnesota (H)
	83	-	New York (WH)
	75	-	Virginia (WH)
	79.5	38 – 82	Wisconsin (J)
Tail (cm)	20.9	-	Minnesota (H)
	17.5	-	New York (WH)
	16.4	-	Virginia (WH)
	21.0	13 – 18	Wisconsin (J)
Hind foot (cm)	11.5	-	Minnesota (H)
	11.0	-	New York (WH)
	10.6	-	Virginia (WH)
	11.0	9.5 – 11	Wisconsin (J)
Ear (cm)			
Body Weight			
Male and Female		4.2-5.6	Minnesota (H)
		4.5-5.0	New York (WH)
		4.0-5.0	Virginia (WH)
		4.2 – 5.6	Wisconsin (J) – same numbers as MN--check

Range: Southeastern corner of Minnesota

Habitat: Open areas with grass and shrub cover.

Natural History: Insectivore as are other shrews. Relatively little is known about this species.



Order	Family	Species	Common name
Insectivora	Talpidae	<i>Scalopus aquaticus</i>	Eastern mole or prairie mole

Description: The eastern mole is larger than the star-nosed mole, which are the two mole species present in Minnesota. Length is 155 to 185 mm, tail length of 21-30 mm. Fur is dark brown to grayish, and it has a silvery sheen. The muzzle has no fur, nor do paws or tail.

Note the difference in the skull from the top on the two mole species (see picture). Front feet are large in both mole species, as compared to the shrews. Teeth are not brown-tipped in the moles either, while the teeth are brown-tipped in shrews from Minnesota.

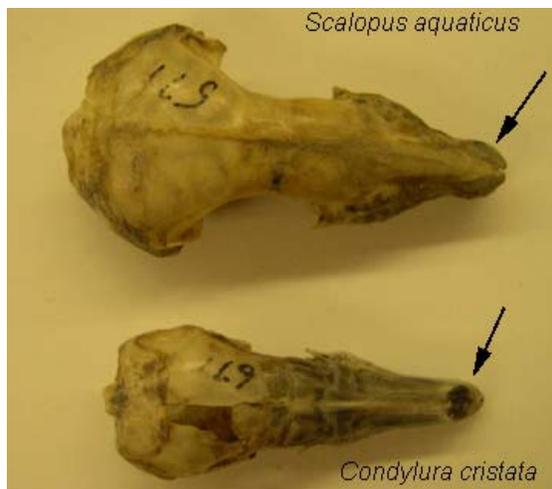
Measurements:

Measurement	Average	Range	Source and Comments
Total length (mm)	188	152-184	Minnesota (H)
	171	155-185	Not given (WH)
		175 – 206	Wisconsin (J)
Tail (mm)	26.5	21-30	Minnesota (H)
	26.0	22-30	Not given (WH)
		28 – 38	Wisconsin (J)
Hind foot (mm)	26	19-25	Minnesota (H)
	23	18-21	Not given (WH)
		22 – 25	Wisconsin (J)
Ear (mm)			Minnesota (H)
Body Weight			
Male and Female		75-120	Minnesota (H)
		40-50	Not given (WH)
		75 - 120	Wisconsin (J)

Range: Found in southern portion of Minnesota, from Twin Cities to SW corner of state. Most northern of species range other than Michigan. Alternate common name is the prairie mole.

Habitat: Moles generally live in open areas and not wooded areas, and despite the latin name, they are not characteristic of aquatic habitats.

Natural History: Moles are fossorial, digging tunnels under the ground. Generally their diet is invertebrates. Temporary tunnels are close to the surface and used for foraging, permanent tunnels with nests are deeper under the surface.



Order	Family	Species	Common name
Insectivora	Talpidae	<i>Condylura cristata</i>	Star-nosed mole

Description: The star-nosed mole is about the same size as the eastern mole, with length of 182-199 mm, and tail length of 70-82 mm. In some areas apparently the star-nosed mole is smaller than the eastern mole, but not in the Minnesota specimens.

The tail is longer, as is evident from the study skins. Most distinctive, however, are the long tail and the papillae on the nose. The nose was discussed in lecture.

Measurements:

Measurement	Average	Range	Source and Comments
Total length (mm)	190 188 165	182-199 158-170	Minnesota (H) New York (WH) South Appalachia (WH) Wisconsin (J)
Tail (mm)	74 66.5 60	70-82 57-63	Minnesota (H) New York (WH) South Appalachia (WH) Wisconsin (J)
Hind foot (mm)	27 26 25	 24-26	Minnesota (H) New York (WH) South Appalachia (WH) Wisconsin (J)
Ear (mm)			Minnesota (H)
Body Weight			
Male and Female	53.5 52.0	47.1-60.0	Minnesota (H) New York (WH) South Appalachia (WH) Wisconsin (J)

Range: Star-nosed moles are present in the forested regions of Minnesota.

Habitat: Typically found in wet habitats, and is an accomplished swimmer.

Natural History: Star-nosed moles feed on invertebrates like most insectivores. They burrow in ground, but not as well as the eastern mole. Unlike the eastern mole, the star-nosed mole is aquatic and will feed on underwater invertebrates.

