Natural Heritage & Endangered Species Program

Commonwealth of Massachusetts
Division of Fisheries & Wildlife
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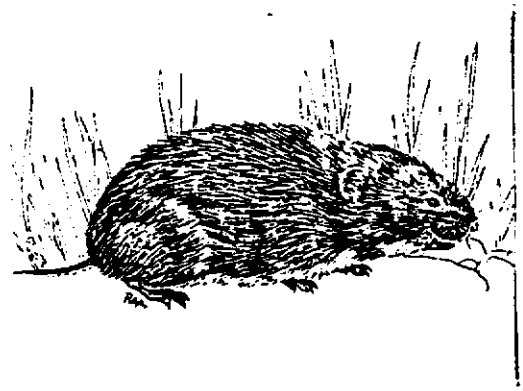
MASSACHUSETTS SPECIES OF SPECIAL CONCERN

Southern Bog Lemming
(Synaptomys cooperi)

ETYMOLOGY: Synaptomys cooperi combines the Greek words synaptein, meaning "to unite," and mys, meaning "mouse"; cooperi alludes to William Cooper, the zoologist who collected the first specimen. This species is commonly referred to as a Lemming Mouse, Lemming Vole, and Bog Mouse. Synaptomys cooperi cooperi Baird and Synaptomys cooperi stonei Rhoads are both valid names for subspecies occurring in Massachusetts.

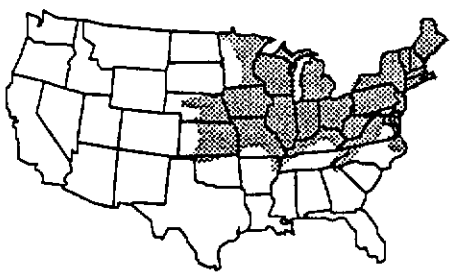


DeGraaf, Richard M. and Rudis, Deborah D. New England Wildlife: Habitat, Natural History, and Distribution. General Technical Report NE 108. Broomall, PA: U.S. Dept. of Agriculture, Forest Service, Northeastern Forest Experiment Station, 1986.

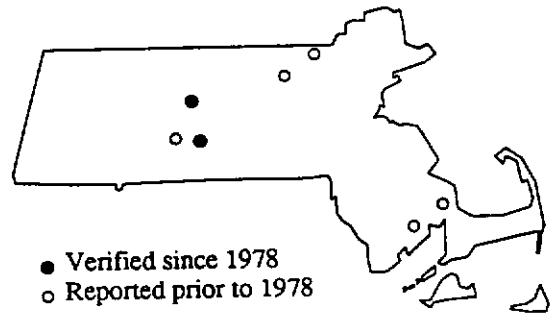
DESCRIPTION: The Southern Bog Lemming is a small, chunky rodent with small eyes and ears that are nearly concealed in the long, loose, shaggy fur. The skull is broad, and the short rostrum (snout) gives this species an abrupt profile. This species is distinguishable by the combination of its short tail (only slightly longer than its hindfoot) and grooved upper incisors. The forefoot has four toes and the hind foot five. Females have six mammae.

The sexes are colored alike, with no apparent seasonal variation. The adult pelage (fur) is brown to chestnut above, with a grizzled appearance. The sides and underparts are silvery, with no sharp line of demarcation on the sides. The tail is indistinctly bicolored, brownish above and whitish below. The feet are brownish black. Old males may have white hairs growing from the center of the hip glands. Immatures are darker and duller than adults. A single annual molt occurs from spring to autumn.

The sexes are equal in size. Measurements range from 11.5–13.5 cm (4.5-5.3 in) in total length, the tail 1.8–2.4 cm (0.7-0.9 in). Weights vary from 20-40 g (0.7-1.4 oz).



Range of the Southern Bog Lemming



Distribution in Massachusetts

SIMILAR SPECIES IN MASSACHUSETTS: The Southern Bog Lemming resembles the Eastern Meadow Vole (Microtus pennsylvanicus) but is smaller and has a much shorter tail. Both species are grassland animals but the Southern Bog Lemming is more adaptable and is found in many situations which the meadow vole usually avoids. The Southern Bog Lemming occurs in what is essentially sub-marginal meadow vole habitat. The larger, more aggressive meadow vole will appropriate the best of the moist, lush meadow areas or grassy bogs for its own use wherever possible, forcing the Bog Lemming into diverse types of habitat, which appear to have little in common - dry upland fields and wet sphagnum bogs. The Southern Bog Lemming, however, with its heavier jaw musculature and broader incisors, may just be adapted for differing species of plants than the meadow vole.

The only other species with which a Southern Bog Lemming might be confused is the Pine Vole (Microtus pinetorum); also known as the Woodland Vole. Pine Voles are russet or auburn, not dull grey-brown, with sleek, mole-like pelage and ungrooved incisors. Like the Bog Lemming, the Pine Vole inhabits diverse habitats. It is found in deciduous forests, grasslands, meadows, and orchards. The Pine Vole also occurs in marshes and swamps but favors well-drained uplands.

RANGE: The Southern Bog Lemming occurs from Quebec, west to southeastern Manitoba, south to southwestern Kansas, east through northern Arkansas and Kentucky, south to western North Carolina and Virginia and western Maryland to the Atlantic coastal plain of Maryland, Delaware, and New Jersey, and northward through New England to Cape Breton Island.

HABITAT IN MASSACHUSETTS: The common name Bog Lemming is misleading when attempting to locate the favored habitat of this elusive microtine. Its habitat is highly variable comprised of bogs, especially with sphagnum; sedge-meadows in old-growth forest, clear-cuts in forests, open grasslands, orchards, postfire successional communities, and even cornfields. In Massachusetts, Synaptomys cooperi is know to date only from Ware and the Belchertown Bog, Hampshire County; and New Salem, Franklin County. Synaptomys cooperi stonei is known from cranberry bog habitats in Plymouth and Wareham, Plymouth County.

LIFECYCLE/BEHAVIOR: The Southern Bog Lemming is active year-round as well as active both day and night. This species is a quiet, unobtrusive little field vole who generally travels slowly. If frightened, it can move fast and can swim well. It occurs in scattered colonies often of a very temporary nature and is sometimes found with red-backed mice, meadow voles, moles, shrews, white-footed mice and deer mice. Evidence of these colonies are piles of grass cuttings, each an inch or so in length; circular patches of grass several feet in diameter, yellowed and dry, where the stems have been nibbled out from beneath; and small bright green oval scats (droppings). This green excrement is a unique characteristic of a Bog Lemming; other voles tend to void darker feces.

Bog Lemmings create a complex system of short criss-crossed tunnels or burrows with side chambers which are used for feeding, resting, storing food. These tunnels measure about 2–5 cm (1–2 in) in width and are 15–30 cm (6–12 in) below the surface. They are well defined and maintained and may contain little piles of cut grass stems and bright green scat. They are built in sphagnum and deep leaf mold by the cutting and trimming activities of foraging individuals using specially adapted molar teeth. These teeth never form closed roots and continue to grow out of the gums as fast as the vole wears them down.

Breeding occurs from early spring to late autumn, and the gestation period is 21 to 23 days. The globular nest is usually an enlarged section of the burrow, lined with dried leaves of grasses and sedges and sometimes with bits of fur and feathers. Its exterior diameter is 15–20 cm (6–8 in) with the interior diameter 5–8 cm (2–3 in). It may have 2 to 4 entrances. In winter, the nest may be found 10–15 cm (4–6 in) underground; in summer it is often concealed in tussocks of grass or amid other surface cover. Several litters are produced annually which may contain from one to eight young, but two to five is usual. Newborns are blind, naked, and helpless at birth and weigh an average of 4 g (0.14 oz). Growth is rapid, and hair is evident when young are about 6 days old. Their eyes open when they reach 10 to 12 days of age, and weaning is completed by the end of their third week of life. The life expectancy of a Southern Bog Lemming is 1 to 1 1/2 years.

The diet of the Southern Bog Lemming consists of succulent stems, leaves, and seeds of grasses and sedges—namely poverty grass, timothy, and blue grass. In addition, ferns, mosses, liverworts, fungi, ground pine, bark, and insects are occasionally consumed. The Bog Lemming has many predators including foxes, skunks, weasels, house cats, and

raccoons. Several species of owls, hawks, and snakes also take a toll on this species. Fleas, ticks, lice, mites, and chiggers infest the Southern Bog Lemming externally, and it harbors internal parasites such as tapeworms, flukes, and roundworms.

POPULATION STATUS IN MASSACHUSETTS: Historically, the Southern Bog Lemming has been extremely rare in Massachusetts. Records show that prior to 1978, six individual sighting or "populations" were documented from five different locations (Belchertown, Dunstable, Lunenburg, Plymouth, and Wareham). Since 1978, there have been 4 verified sightings in two locations (New Salem and Ware) reported to the Massachusetts Natural Heritage and Endangered Species Program. The Southern Bog Lemming is presently listed as a "Species of Special Concern" in the state of Massachusetts.

MANAGEMENT RECOMMENDATIONS: The greatest threat to the Southern Bog Lemming is destruction of habitat. Protection of woodland vernal pools with understory, sedge meadows and wooded wetland type habitats need to be maintained. Populations of the Southern Bog Lemming are small and isolated. Every effort should be made to protect these populations as natural reestablishment will be difficult if one is lost.

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