

STATE
THREATENED

Northern Bog Lemming

(*Synaptomys borealis*)



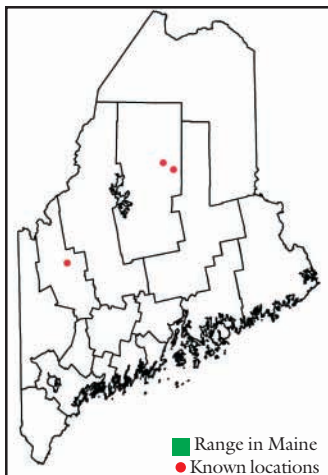
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Description

The northern bog lemming is among Maine's rarest and most elusive mammals. Like the Canada lynx, it is more numerous in the North and reaches the southern edge of its range here. Unlike the lynx, it has not received federal listing attention, associated research, and surveys, and its status remains a mystery.

The northern bog lemming is a small mammal about the size of a vole (about one ounce). The bog lemming has a blunt nose, short tail, and somewhat grayer coat than the common red-backed vole (*Clethrionomys gapperi*). The upper parts are dull brown, and are slightly brighter on the rump. Toward the head the fur has a grizzled appearance. The underside is grayish. The tail is brown above and paler below, and the feet are dark grayish. Bog lemmings have a groove along the outer edge of each incisor, which similar-looking species of voles do not have.

Two species of bog lemmings, the northern and southern (*S. cooperi*), live in Maine. They are very similar in appearance and are difficult to distinguish. Unlike the southern bog lemming, the northern species has rusty-tipped fur at the base of the ears. Also, female northern bog lemmings have eight mammae, while southern bog lemmings only have six. Tooth structures



must be examined under magnification to confirm identification of the two species. The northern bog lemming does not have closed triangles on the outer surface of its molars, and it has a sharp projection pointing back from the roof of the mouth.

Range and Habitat

The northern bog lemming is widely distributed across northern North America, ranging from Alaska to Labrador and south to Washington and Maine. This species has not been found in great numbers anywhere, with the exception of moderate-sized populations in Alaska and around the Hudson Bay. It is less common at the southern extent of its range, which includes Maine and adjacent New Hampshire.

In Maine, the northern bog lemming has been found at five locations, including two sites in Baxter State Park. The species has also been captured in three locations in New Hampshire: along the Wild River not far from the Maine/New Hampshire border, near the base of Mt. Washington, and on Mt. Mooselauke. Most occurrences are at elevations of 2000 feet or greater. In other parts of the species' range, it occurs at much lower elevations, where its habitat needs are provided by a northern tundra-like habitat, rather than an alpine environment.

The northern bog lemming usually occurs in moist, wet meadows or boggy areas, often in conjunction with arctic or alpine tundra and spruce-fir forests. Frequently it occurs near a spring or other source of water or near lush, mossy logs and rocks. Specimens found in Maine are associated with deep, moist sphagnum, both in low- and high-elevation settings.

Life History and Ecology

Limited information is available on the ecology of this species. The northern bog lemming constructs runways above ground or below the leaf litter. The nest is located either above ground concealed in vegetation, or several inches below ground. It is lined with dried leaves and grasses, and occasionally fur. Northern bog lemmings are social animals that live in colonies. Foods include sedges, grasses, raspberry seeds, and the fungus *Endogone*. Predators may include mammals, hawks, owls, and snakes. Little is known about the species' reproductive behavior, although it may be similar to that of the southern bog lemming, which breeds throughout the year and may produce several litters. The gestation period lasts 21-23 days, and a litter may contain 1-8 young. When born, the young are blind, naked, and helpless, and weigh about a tenth of an ounce.

Threats

Because the northern bog lemming is found in so few sites and in such low numbers in Maine, it is vulnerable to extirpation. Suitable habitat is not abundant in Maine. Mountain elevations above 2,700 feet are subject to special regulations in Maine, but development of ski areas or wind power could be harmful. Wind power development has been proposed for one known site in western Maine. The discovery of northern bog lemmings at low-altitude spruce-fir forests in Baxter State Park may indicate broader habitat use. Sensitive microhabitats (especially wet, sphagnum ground cover) within forests could be altered by logging equipment on non-frozen ground. Additional research is needed to better understand the full range of habitats used. Competition with other small mammals may also limit the species' distribution.

Conservation and Management

The northern bog lemming was listed as threatened in Maine in 1986, because of its apparently low numbers and limited distribution. As yet, no specific conservation plans have been implemented for this species. Further information on habitats used by the species in Maine is needed to develop appropriate conservation measures. Moist, high-elevation mossy areas seem to be optimal habitat. The northern bog lemming shares these habitats with other rare small mammals, including the yellow-nosed vole and rock shrew (both Species of Special Concern). Once the lemming's habitat needs are better understood, land use should be carefully planned to protect the lemming and other rare species. System-

atic small mammal surveys are needed. A recent small mammal inventory in northwestern Maine yielded two new records of northern bog lemmings.

Recommendations:

- ✓ Prior to land development or forest harvesting, consult with a biologist from MDIFW to assist with planning.
- ✓ Deliver any bog lemming specimens to MDIFW to confirm identification. Note the site location as accurately as possible so MDIFW can locate and protect associated northern bog lemming populations.
- ✓ Minimize impacts to high elevation habitats that may potentially harbor northern bog lemmings and associated species (cool, moist, mossy areas of a boreal or alpine character). Survey these areas for the species' presence.
- ✓ To preserve the vegetation and physical structure required by the northern bog lemming, do not stray off marked trails, especially in fragile alpine areas on Mt. Katahdin, Bigelow Mountain, and high elevation areas on the Appalachian Trail. 🐾