

HUDSONIA HARLEM VALLEY BIODIVERSITY MANUAL SUPPLEMENT

Shrews (*Soricidae*)

Seven species of shrew occur in New York State, all but one in the study area. Masked and short-tailed shrews are common; Pygmy shrew, smoky shrew, long-tailed shrew and northern water shrew are rare or scarce in New York, and therefore of conservation concern. Least shrew is historic in New York (**NHP G5 SH**), including the southern portion of the study area, but no extant occurrences are known.

Habitats in the Study Area

Shrews do not show strong habitat affinities, except for a tendency to use moist habitats with loose soils, deep leaf litter, or other dead plant remains (dead wood, grass) for burrowing or cover. Long-tailed shrew (*Sorex dispar*) prefers cool, moist, rocky habitats in montane forests, including talus slopes, boulder fields, old quarries, and wooded areas with stone walls (Whittaker and Hamilton 1998). Smoky shrew (*Sorex fumeus*) prefers hemlock-hardwood stands, but occurs in many types of moist forests, deciduous or mixed (Connor 1960). Ravines, talus slopes, and areas with logs or deep leaf litter are preferred to dry woods and marshes (Whittaker and Hamilton 1998). Pygmy shrew (*Sorex hoyi*) inhabits a wide range of natural landscapes, preferring moist or dry, open or sparsely wooded areas, such as brushy old fields and utility corridors (Connor 1960), and burrows extensively (Whittaker and Hamilton 1998). Northern water shrew (*Sorex palustris albibarbus*) occurs along rocky streams in forests, and in sphagnum swamps (Whittaker and Hamilton 1998). Least shrew (*Cryptotis parva*) prefers open grasslands, shallow marshes or grassy shrub lands. Burt (1972) states that these open habitats are typically devoid of stumps and logs.

Study Area Distribution

Smoky shrew is distributed sporadically throughout the state, and is likely to be found in high numbers in cool, moist areas with large stands of hemlock. In Connecticut this species prefers damp coniferous forest habitats near water (Goodwin 1935). Long-tailed shrew might occur in rocky, wooded habitat throughout the area, especially in or near talus slopes in mountainous terrain of the Hudson Highlands and along the New England border. It was reported from Mt. Graylock in Massachusetts (Goodwin 1935). Pygmy shrew is rare, and found primarily in northern and western New York, but may occur in the study area on the Rensselaer Plateau or northern Taconic Range. Least shrew and northern water shrew are more likely to occur in the southern part of the area.

Other Relevant Aspects of Ecological Niche and Behavior

Life activities of all shrews – hunting and eating prey, courting, mating and raising young – are conducted in concealment, in burrows or under leaf litter and other objects. Diets consist mostly of invertebrates, but smoky shrew also takes small vertebrates. High metabolic rates, common to all shrews, requires that these animals eat far more, and far more often, than most other mammals. Commonly, a shrew will pursue and eat prey animals day and night, resting only for short intervals. Breeding occurs from spring to autumn, with 1-3 litters per year for most species. Length of gestation is typically 18-24 days. In winter least shrews sometimes gather in groups of up to 30 individuals in underground chambers such as those of abandoned wasp nests (Reid 2006). Most shrews are terrestrial hunters, but northern water shrew dives year-round, even in

cold water (Whittaker and Hamilton 1998), and can walk on water by trapping air bubbles in the stiff hairs of their feet (Jackson, 1928).

Description and Identification

Shrews resemble mice but are distinguished by having 5 toes on each foot (mice have 4 toes on each forefoot, 5 on each hind foot). Shrews are further characterized by short ears (sometimes concealed by fur), dark bead-like eyes, and chestnut-pigmented teeth that appear stained. Body length varies little among the 4 shrew species discussed here (50-75 mm), with overlap among the species. Shorter tails of pygmy shrew (25-36 mm) and least shrew (12-19 mm) distinguish them from long-tailed shrew (tail length 56-64 mm) and smoky shrew (tail length 44-51 mm). Shrews are covered with short fur, varying in color from gray in long-tailed shrew to gray-brown in smoky shrew to cinnamon brown in least shrew. The tail of smoky shrew is paler and more yellowish beneath, but this difference may be subtle in some individuals. Smoky shrew, long-tailed shrew and least shrew display seasonal differences in coat color: smoky shrew is a browner shade of gray in summer, long-tailed shrew a paler gray in winter, and least shrew darker and more reddish brown in winter (Choate et al. 1994). Least shrew differs in having 30 teeth, not 32 teeth as in the other species. In pygmy shrew, 3 of the 5 unicuspid teeth are normal-sized, and two are so reduced as to be nearly invisible. Shrews are difficult to identify to species and expert identification may be required. Northern water shrew is perhaps the easiest to identify because of its large size (140-165 mm), bicolored tail, and webbed hind feet with fringed hairs.

Threats and Conservation

Due to short individual lifespan, shrew populations may turn over within one year and consequently are vulnerable to disturbances, especially those that dry out soils or reduce food and shelter (e.g. fire, clear-cutting), or impede movement of shrews (Beauvais, G. P. and J. McCumber. 2006). Northern water shrew is subject to loss of water quality from development, logging, agriculture, and other human activities (Wisconsin Department of Natural Resources 2006). Decline of hemlock from hemlock woolly adelgid (*Adelges tsugae*) may have an impact on smoky shrew in the southern part of the area.

Survey Technique Constraints

High metabolism, secretive behavior, and sheer speed present several constraints. Trapping specimens for archival collections or laboratory analysis may require different methods for different species. Sunken cans partly filled with water have been effective for pygmy shrew (Connor 1960). Smoky shrews can be caught in snap traps or live-trapped on the ground surface. Some times of year may be better than others for trapping; a number of studies indicate that success in trapping long-tailed shrew is greater in spring and fall than at other times of year (Connor 1960). The fragility of these tiny mammals makes capturing live shrews hazardous; trapped shrews can soon die of starvation or exhaustion. Shrews can sometimes be observed darting in and out of a stone wall or a soil bank with overhanging roots. In general, surveys for shrews should be left to experts, due to problems identifying species and preserving specimens. However, it is worth examining shrews found dead if they are in good condition; sometimes frozen specimens may be presented to an expert for identification (as with any specimen, it is crucial to maintain an accurate record of date, locality, habitat, and collector's name with the specimen).

References to Identification Literature

Reid, F.A. 2006. A Field Guide to the Mammals of North America North of Mexico, fourth edition. Houghton Mifflin Co. Boston, Massachusetts. 579 p.

Choate, J. R., J. K. Jr., and C. Jones. 1994. Handbook of Mammals of the South-Central States. Louisiana State University Press. Baton Rouge, LA. 304 p.

References cited

Beauvais, G. P. and J. McCumber. 2006. Pygmy Shrew (*Sorex hoyi*): A Technical Conservation Assessment . University of Wyoming. Laramie, WY. 34 p.

Burt, W. H. 1972. Mammals of the Great Lakes Region. University of Michigan Press. Ann Arbor, MI. 246 p.

Connor, P.F. 1960. The Small Mammals of Otsego and Schoharie Counties, New York. New York State Museum and Science Service Bulletin number 382. The University of the State of New York; The State Education Department. Albany, NY. 84 p.

Goodwin, G. G. 1935. The Mammals of Connecticut. State of Connecticut Geological and Natural History Survey. Hartford, Connecticut. 221 p. + plates.

Jackson, H. 1928. A taxonomic review of the American long tailed shrews. *N. Amer. Fauna*, 51: 1-238.

Whitaker, J.O. and W.J. Hamilton. 1998. Mammals of the eastern United States, third edition. Cornell University Press. Ithaca, NY. 583 p

Wilson, D.E., S. Ruff, Eds. 1999. The Smithsonian Book of North American Mammals. Washington, D.C.: Smithsonian Institution Pr., 1999. 750p.

Wisconsin Department of Natural Resources. 2006. Water Shrew Species Profile. <http://dnr.wi.gov/org/land/er/wwap/explore/profiles.asp?Mode=detail&Species=AMABA01150>. Madison, WI.



Photo: USDA Forest Service, Northeast Region