

Acton WildAware Beacon Article

By Paula Goodwin

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Voles and Shrews

In habitat areas that are blanketed with snow cover this winter, voles, shrews and other small mammals have been relatively protected from freezing and predation. The subnivean layer, the narrow band of space between ground and snow maintains an almost constant temperature of 32 degrees F. Within this gap, small rodents travel from underground burrows to food sources hidden from view. *Naturally Curious* blog writer and author Mary Holland explains the mystery of finding holes about an inch wide in the snow in the middle of a field, with no tracks going in or coming out of it. "They are vents leading from the subnivean tunnels to the surface of the snow. Carbon dioxide from animal respiration as well as carbon dioxide released from the ground builds up to an unhealthy level in these tunnels. The holes we see in the snow are ventilation shafts, allowing the carbon dioxide to escape from the tunnels."

Meadow Voles (*Microtus pennsylvanicus*) are herbivorous rodents, having top and bottom incisors that grow continuously to keep up with their need to bite into and cut grasses, bark, tubers, seeds and plant stems. Active year round, their diet changes with the seasons. In summer they live on green plants such as grasses, clover and plantains. In the fall they consume grains and seeds, and during the winter they often feed on the bark and roots of shrubs and small trees. They occasionally eat insects. Meadow Voles grow to about 5-7 inches in length and weigh in at about 1.5 ounces. The fur color on their backs is variable, from very dark brown to a reddish-brown with long, coarse black hairs. Underside fur color is gray or white. Males and females are the same size and color. In general, voles resemble mice but have longer fur, smaller eyes, and shorter tails. Voles are frequently confused with moles (*Condylura cristata*), but they are unrelated. Moles are carnivorous, spending nearly all of their time beneath the surface of the soil, excavating and traveling through tunnels, feeding on insects, worms and grubs. Meadow Voles carry out much of their scavenging and feeding above ground.

Along with other species of voles, Meadow Voles live in open fields and grassland areas, along lakes and rivers, in orchards and suburban lawns. They are preyed upon by hawks, owls, snakes, Red foxes, coyotes, raccoon, weasels and in suburban areas, domestic house cats. Because they are so low on the food chain, voles are cautious and stay well hidden, traveling through mole tunnels, venturing out under cover of mulch, tall grass areas, brush piles, wood piles, beneath rocks, and in undisturbed backyard spaces. They travel to and from tunnel entrances along the same "runways". Although Meadow Voles have a short life span of around 1 year, they are abundant throughout Massachusetts. Combined with their ability to stay well hidden they reproduce rapidly and according to the Massachusetts Audubon Society, "prime vole habitat can support upwards of 300 voles per acre."

Also common to Massachusetts are Northern short-tailed shrews (*Blarina brevicauda*). Although close in size, unlike Meadow Voles they are not rodents. They are classified as insectivores, eating invertebrates such as earthworms, millipedes, spiders and insects. There are a few characteristics unique to Northern short-tailed shrews. Northern short-tailed shrews, especially males, release a musky odor from scent glands on their belly and sides that is thought to repel some predators. Northern short-tailed shrews have poor vision and to compensate for it they send out ultrasonic clicks, (similar to bats and dolphins), to communicate, find prey and navigate through tunnels. Due to their exceedingly high metabolism, shrews are constantly searching for food. A shrew's heart beat and breathing rate are each about 160 times per minute, about ten times that of humans. According to Smithsonian's North American Mammals web page, "Their day is organized around highly active periods lasting about 4.5 minutes, followed by rest periods that last, on average, 24 minutes."

Perhaps the Northern short-tailed shrews' most unique adaptation is that glands in their lower jaw secrete venom. According to the University of Michigan, "The (lower jaw) salivary glands of northern short-tailed shrews produce venom that is effective in immobilizing prey. This enables them to prey upon animals much larger than they are, including salamanders, frogs, snakes, mice, birds, and other shrews." Northern short-tailed shrews (bite) the venom into the prey until the prey is subdued." It is reported that if a shrew bites a person the site may swell and be painful for a few days. Because of its paralytic properties, the venom of the Northern short-tailed shrew has been researched and may potentially have pharmaceutical and cosmetic uses.

Resources

UMass Amherst The Center for Agriculture, Food and the Environment:

<http://ag.umass.edu/home-lawn-garden/fact-sheets/mole-vole-damage-to-lawns>

Naturally Curious with Mary Holland:

<https://naturallycuriouswithmaryholland.wordpress.com/2016/12/21/tunnel-vents/>

C&EN Chemical and Engineering, October 13, 2014

News:<https://pubs.acs.org/cen/critter/8242shrews.html>

MassAudubon:

<http://www.massaudubon.org/get-outdoors/wildlife-sanctuaries/blue-hills-trailside-museum/exhibits/seasonal-exhibit-animals>

Smithsonian National Museum of Natural History:

https://naturalhistory.si.edu/mna/image_info.cfm?species_id=25

BioKids Kids Inquiry of Diverse Species:

http://www.biokids.umich.edu/critters/Blarina_brevicauda/

Mass Wildlife Mammal

List<http://www.mass.gov/eea/agencies/dfg/dfw/fish-wildlife-plants/state-mammal-list.html>

Soricimed

<http://www.soricimed.com/news/soricimed%E2%80%99s-sor-c13-granted-orphan-drug-designation-pancreatic-cancer-us-fda>

Paula Goodwin is a member of the Acton Conservation Commission who introduced WildAware with Acton Natural Resource Assistant Bettina Abe. WildAware is a program sponsored by the Town of Acton Natural Resources Department that began in September and will continue through the summer of 2016. The purpose of WildAware is to educate the community about the existence and habits of wild creatures, and the goal is increased community awareness of shared habitats. For information, call 978-929-6634 or send email to nr@acton-ma.gov.