Voles

Prepared by the National Wildlife Control Training Program. http://WildlifeControlTraining.com
Researched-based, certified wildlife control training programs to solve human – wildlife conflicts.
Your source for animal handling, control methods, and wildlife species information.

Figure 1. Meadow vole (*Microtus pennsylvanicus*). Photo by Stephen M. Vantassel.

Species Overview

Conflicts

Meadow voles (*Microtus pennsylvanicus*) and pine voles (*Microtus pinetorum*) may damage garden plants, flower bulbs, and girdle tree bark. Runways and tunnels can ruin lawns, golf courses, and ground covers. Meadow voles usually cause plant damage above ground. Pine voles are more fossorial (live underground) and frequently girdle plant root systems.

Legal Status

Voles are non-game mammals and can be controlled whenever they are causing damage.

Identification

Voles (Figure 1), also called meadow mice or field mice, are New World rodents. They are distinct from common woodland mice (*Peromyscus* spp.) and Old World house mice (*Mus musculus*). Twenty-three species of voles occupy the US; South Carolina has meadow voles and pine voles (*Microtus pinetorum*). Voles tend to have small, inconspicuous ears and eyes when compared to mice.

Look at tail length to distinguish between meadow and pine voles. If the tail length is longer than the length of the hind foot, it is a meadow vole. If the tail length is shorter than the length of the hind foot, it is a pine vole. It is important to distinguish between these two common species because of differences in behavior.

Physical Description

Voles are compact animals with stocky bodies, short legs, and short tails. The eyes are small and the ears are not very visible. Voles usually are brown or gray, although many color variations exist. Tentative identification of an individual can be made using the information provided in this chapter. For positive identification, use a field guide or contact an expert.

Meadow voles have a total length of 5½ to 7½ inches. The fur is gray to yellow-brown and obscured by black-tipped hairs. Northern subspecies may have red in their fur. Underparts are gray, sometimes washed with silver or buff. The tail is bicolored.

Pine voles have a total length of 4 to 6 inches. The brown fur is soft and dense. Underparts are gray, mixed with some yellow to cinnamon. The tail is barely bicolored or uniform in color.

Health and Safety Concerns

Voles pose no major hazard to public health. They may carry diseases such as plague (*Yersinia pestis*) and tularemia (*Francisilla tularensis*). Ectoparasites such as mites and ticks feed on voles. Use protective gloves when handling voles.

General Biology, Reproduction, and Behavior

Reproduction

Voles may breed throughout the year, but most commonly in spring and summer. Voles typically have one to five litters per year. Litter sizes range from 1 to 11, but most are 3 to 6. The gestation period is about 21 days. Young are weaned by the time they are 21 days old, and mature in about 35 days. Females can breed as soon as they reach maturity. The lifespan of a vole is short, ranging from 2 to 16 months.

Population levels generally peak every 2 to 5 years, although the cycles are not predictable. During population irruptions, densities of voles have risen to 4,000 voles per acre! Several hundred voles per acre are common in good habitat, such as orchards or shrubby meadows. Dispersal, food quality, climate, predation, physiological stress, and genetics influence the population levels.

Nesting/Denning Cover

Meadow voles usually establish nests above ground, or in shallow depressions. Pine voles typically establish complex burrow systems down to 4 feet belowground.

Behavior

Voles are active day and night, year-round. They do not hibernate. Voles construct many tunnels and surface runways with numerous entrances to a burrow. A single burrow system may contain a social group with several adults and young.

Habitat

Meadow voles prefer wet meadows and shrubland habitats. Pine voles prefer heavy ground cover along forest edges, abandoned fields, and orchards.

Food Habits

Voles eat a variety of plants, most frequently grasses and forbs. In late summer and fall, they store seeds, tubers, bulbs, and rhizomes. They primarily eat bark during winter, and will eat crops during spring and summer, especially when densities of voles are high. Occasionally they eat snails, insects, and the remains of animals.

Voice, Sounds, Tracks, and Signs

Pine voles make a high-pitched noise that may serve as a warning signal.

Damage Identification

The most easily identifiable sign of meadow voles is an extensive surface runway system (Figure 2) with several openings to burrows. Runways are 1 to 2 inches wide. Vegetation near well-traveled runways may be clipped close to the ground. Feces and small pieces of vegetation are found in runways. Pine voles do not use surface runways. Instead they build an extensive system of underground tunnels.

Figure 2. Trails cut into the grass and soil. Photo by the University of Nebraska-Lincoln (UNL).

Damage to Landscapes

Voles can damage lawns, golf courses, and ground covers with their tunnels and runways.

Voles can cause extensive damage to orchards, ornamentals, and tree plantings through girdling, usually in late fall and winter (Figure 3). Marks made by voles are about ⅛ inch wide, ⅜ inch long, and 1/16 inch or more deep. Marks made by gnawing by rabbits are larger and not distinct. Rabbits neatly clip branches at a 45° angle. Examine the damage and accompanying signs (feces, tracks, and burrow systems) to identify the animal causing the damage. Voles tend to damage to tree bark as high as the snow allows.

Figure 3. Seedling girdled by voles. Photo by UNL.

Damage to Crops and Livestock

Voles may damage field crops, such as corn, soybeans, alfalfa, clover, potatoes, and sugar beets. Runways and tunnels of voles interfere with crop irrigation by displacing water and causing soil erosion.

Voles do not pose a direct threat to animals, but may consume and contaminate stored feed.

Damage to Structures

Voles occasionally invade structures but usually present little threat. Voles often will enter buildings or greenhouses near suitable habitat during the first snowfall seeking warmth and potential food plants. Damage to stored plants in greenhouses can be substantial and costly.

Damage Prevention and Control Methods

Often, the control of voles may not appear to be justified in comparison to the damage, but the "ounce of prevention" rule often applies. Preventive measures that initially appear costly may be very economical in the long run.

Monitoring and timely control of voles is important because their populations can increase rapidly. Voles do not hibernate and can be controlled whenever damage reaches levels that are intolerable.

Habitat Modification

Remove or modify bird feeders to reduce spillage. Eliminate ground cover with either repeated close mowing or herbicides. Cultivate soil to destroy burrows and reduce cover. Mow grasses and other vegetation to less than 2 inches in height.

Voles are attracted to many types of natural and synthetic mulches, and weed prevention mats. The overhead cover provides excellent protection for their runways and creates ideal breeding conditions. If vole problems occur frequently, remove mulch and expose bare soil. About the only mulches that will not support a vole tunnel system are coarse stone or large chunks of pine bark. Voles will tunnel underneath shredded pine bark.

Exclusion

Use wire cages to protect trees and ornamental plants. Trench cages into the ground at least 2 inches, or surround them with coarse stone. Cages must be higher than the deepest anticipated snow depth during winter, or voles will climb over the top and girdle the trees. Plastic tree wraps are less effective because they tend to break down in UV light, and may unfurl in high winds, exposing tree bark.

Frightening Devices

No devices are effective in frightening voles.

Repellents

Registered repellents for voles include capsaicin and thiram. Fox and coyote urine are available either as a liquid or powder, although their effectiveness is uncertain. Follow all label and application instructions.

Toxicants

Registered toxicants include zinc phosphide and anticoagulants (e.g., chlorophacinone). Most products are restricted use, and only may be applied by certified applicators. Follow label directions carefully. Using t-tube bait stations will reduce non-target animal access to toxic baits. Toxic baits should be used as a last resort if exclusion or habitat modification has failed to reduce damage to tolerable levels.

Shooting

Shooting is not practical or effective for managing voles.

Trapping

Mouse snap traps, box traps (Sherman-type), and multiple-catch traps are effective for capturing voles. Set traps where vole activity is observed, such as near runways and burrow openings. Bait them with apple slices, the vole's favorite food. Cover traps or place them inside boxes, such as rodent bait stations, to prevent injury to non-target animals.

Other Methods

Provide perches in large agricultural areas for raptors that may feed on voles. Although raptors and other predators may take many voles, their impact is usually not enough to reduce vole population growth, especially during a population irruption.

Disposition

Relocation

Relocation of voles is not recommended.

Translocation

Translocation of voles is not recommended.

Euthanasia

Voles can be euthanized with carbon dioxide gas.

Resources

Government or private agencies, universities, extension service.

Web Resources

http://wildlifecontroltraining.com

http://icwdm.org/

http://wildlifecontrol.info