

Ground Squirrels: Their Ecology and Control

Scott B. Craven



The thirteen-lined ground squirrel is a common small mammal in Wisconsin. The damage caused by this species to turf and crops can be of economic significance as well as a considerable nuisance around homes and gardens. Control efforts are sometimes directed at the wrong animal because the thirteen-lined ground squirrel is often called a “gopher” or “mole.” True gophers do inhabit western Wisconsin and moles are found throughout Wisconsin, but their control is entirely different. Other common names for the ground squirrel include “thirteen liner,” “thirteen striper,” and “striped gopher.”

Identification

The thirteen-lined ground squirrel is a small burrowing rodent belonging to the squirrel family (Sciuridae). It is 4½ to 6½ inches long, not counting its 2½- to 5¼-inch tail. Adult ground squirrels weigh about 5 oz. in spring, about 9 oz. just before hibernating in the fall. They are brown with a whitish belly and 13 alternating light and dark stripes or rows of spots running the full length of the back. They have relatively large eyes, cheek pouches, four toes on their forefeet, five on their hindfeet. They sometimes look a bit like weasels when running or standing erect. Males are slightly larger than females, and young are miniatures of the adults.

The thirteen-lined ground squirrel closely resembles a chipmunk in size and shape. But these two species can be distinguished easily. A thirteen-lined ground squirrel always carries its tail straight out behind it when running. A chipmunk holds its tail upright. Chipmunks also have a stripe extending through the eye area.

The only other ground squirrel in Wisconsin is the Franklin’s ground squirrel, a grayish animal about the same size as a gray squirrel. Franklin’s ground squirrels, which are not common, live in

colonies. Thirteen-lined ground squirrels are solitary, but large numbers may be found in good habitat. Woodchucks also burrow, but they are much larger than ground squirrels.

Range

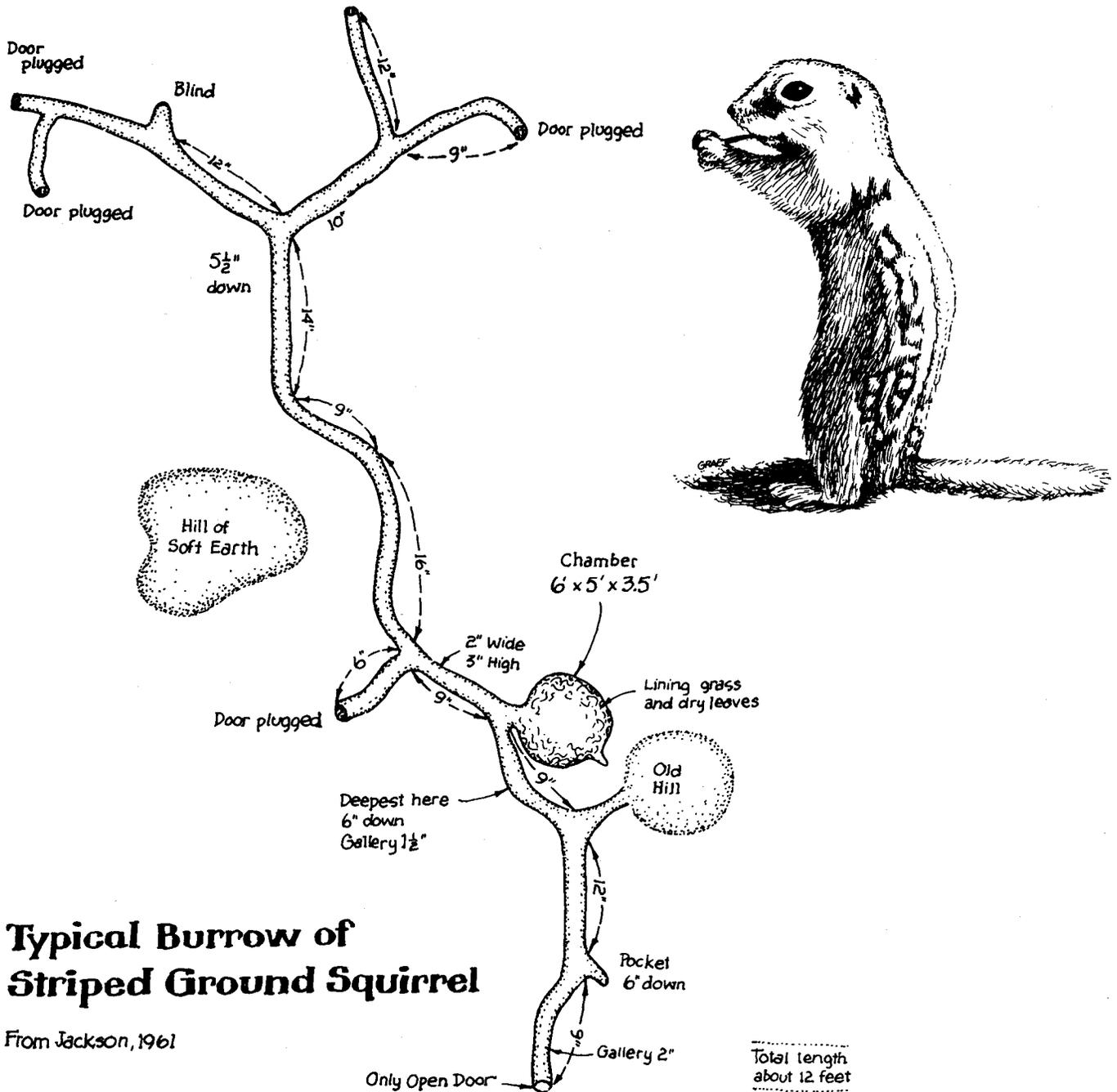
The thirteen-lined ground squirrel is found throughout Wisconsin. It is most abundant in the southern part of the state. Franklin’s ground squirrel is found only in southern and western Wisconsin and is very rare compared to the thirteen-lined ground squirrel.

Habitat and General Biology

The thirteen-lined ground squirrel prefers grassy areas, although it avoids dense stands of tall grass. It is rarely found in woods or low wet areas. It is strictly a diurnal (daytime) animal and seems to be most active on bright sunny days. It is not gregarious and does not form dense colonies. Although its population averages perhaps 2-8 per acre, higher populations may occur in especially favorable habitat such as golf courses, parks, pastures, and cemeteries.

The ground squirrel seldom ranges more than 200 feet from its burrow, which may be 15-20 feet long and have two entrances. Signs of digging will only be apparent at one entrance, if at all. The animal also uses secondary escape burrows, which are much shorter and have a single entrance. This has important control implications, which I’ll point out later. Ground squirrels can climb but seldom do.

The ground squirrel is a true hibernator. It enters its burrow in October and emerges in late March or April. Ground squirrels breed in early spring and give birth in May after a gestation period of 28 days. Average litter size is 7-10. The young quickly become independent and are capable of leaving their natal burrow at six weeks of age.



Typical Burrow of Striped Ground Squirrel

From Jackson, 1961

Food Habits

Thirteen-lined ground squirrels eat a variety of seeds, other plant parts and insects. On the negative side, they readily eat seeds of cultivated peas, cucumbers, squash, melons and corn as well as some garden vegetable plants and flowers. They may store some grain during the summer and fall, but they do not feed during hibernation. On the positive side, ground squirrels

also eat weed seeds and significant numbers of insects, especially grasshoppers, caterpillars and crickets. Ground squirrels are part of the food base for a variety of hawks, snakes and mammalian predators.

Legal Status

The thirteen-lined ground squirrel is not protected by state or federal law, but some control

measures may be prohibited by local regulations. Check local regulations before undertaking a control program.

Damage Prevention and Control

Damage occurs when ground squirrels dig up newly planted seeds; eat sprouting seeds; eat or damage garden vegetables, leafy plants, or flowers; or burrow in well-maintained grassy areas, around structures or in earthen dikes.

Recommended control varies with the scope of the problem. Toxic bait may be the only practical solution on a farm, but a trap or a few gallons of water to flush the animal from its burrow may be adequate in a suburban backyard. An integrated control program, incorporating several techniques often results in faster and more effective control. Control efforts must be persistent, as ground squirrels may reinfest an area from surrounding habitat. Begin control at the first sign of spring activity before litters are born and compound the problem.

Exclusion

Although ground squirrels are capable of digging and perhaps even climbing, squirrel-proof fences can be constructed of wire mesh or sheet metal. Mesh size should be ½ inch or less. The material and labor costs of a ground squirrel-proof fence make it a poor alternative to other, more efficient control techniques.

Cultural Methods (Habitat Modification)

There are few cultural practices useful in controlling ground squirrels. You may be able to discourage the animals by cultivating crop fields and gardens. You may also be able to keep ground squirrel numbers down by allowing grassy areas to grow into dense stands, although this practice may not be compatible with the use of surrounding areas. You may considerably reduce ground squirrel damage by planting as early as weather and soil conditions allow.

Repellents

There are no repellents currently registered for ground squirrel control. Preliminary testing at the University of Nebraska suggests that seed treatment repellents such as Mesuroi[®], now labeled as a bird control product, are effective in controlling seed consumption. Such products may become available in the future. Traditional mammalian repellents such as moth balls, dried blood meal, or thiram-based deer and rabbit repellents may

provide some ground squirrel control, but consider these only as a last resort.

Toxicants

Rodenticides currently provide the cheapest and most effective method for controlling ground squirrels in large areas. Registered products include strychnine and zinc phosphide. Both are "restricted use pesticides," which means you must obtain appropriate state permits and/or certification before using them. Before using any toxicants, consult state regulations. Extension agents can recommend local sources of supply. Newly developed anticoagulant rodenticides, as well as other products not mentioned in this bulletin, may soon be available for ground squirrel control.

Poison bait is most effective in spring or late summer when ground squirrels gather seeds in their cheek pouches. To avoid poisoning game birds, domestic poultry or other wildlife, place the bait directly in the ground squirrel burrows. Do not scatter bait on the soil surface except in cases of extreme ground squirrel damage. Ground squirrels are not likely to find bait scattered in tall grass or other ground cover. Use any poisoned bait with extreme caution to avoid danger to yourself, children, pets, seed-eating nontarget wildlife and livestock. Follow label instructions to the letter! Placement, quantity of bait, timing and handling instructions will vary with the toxicant.

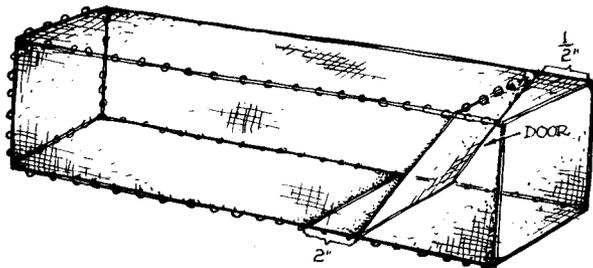
Fumigants

Ground squirrels can be killed in their burrows by several toxic or suffocating gasses. Commercial, easy-to-use gas cartridges are available from hardware stores, U.S. Fish and Wildlife Service supply depots (for professional staff), garden supply centers and seed catalogues. Most types are fitted with a fuse to be lighted, and should be placed as far back in the burrow as possible. Cover the burrow entrances quickly so that the gas penetrates the entire burrow. Fumigation is most effective when soil moisture is high. You can also fumigate with the carbon monoxide-rich exhaust of an older model car or tractor. Other fumigants such as aluminum phosphide tablets are registered in some states, but are not currently available in Wisconsin.

Do **not** fumigate burrows under or around buildings. The fumigant could seep into buildings and create a hazard for occupants. Fumigate during spring, summer and early fall before ground squirrels plug their burrows with soil prior to hibernation.

Trapping

Several types of traps are very effective for small areas. You can make a simple burrow entrance trap to capture ground squirrels alive. Use a 12 x 20-inch piece of $\frac{1}{2}$ inch-mesh hardware cloth for the main body of the trap. Bend it with three consecutive lengthwise right-angle folds to form a rectangular box 3 x 3 x 20 inches. Use hog rings to join the free wire edges, or crimp the edges together securely. Close one end with a 3-inch square piece of hardware cloth. The door is a piece of hardware cloth $2\frac{3}{4}$ x 8 inches. Attach one end of the door to the top of the trap; recess the point of attachment at least $\frac{1}{2}$ inch to permit free movement of the door when it is placed into a burrow. Bend the opposite end of the door so that when the door is closed, about two inches of the door are in contact with the trap floor (see diagram). Set the trap by wedging the door end firmly into the squirrel's burrow entrance, with the closed end pointing into the air. It may help to prop the trap in position with a block of wood or other suitable object. Gravity will hold the door closed until the squirrel pushes past it as it leaves its burrow. For best results, set traps at burrows which squirrels have been seen to enter recently. Trapped animals may be moved or disposed of humanely.



A simple wooden-base, snap-type rat trap is probably the most readily available, lethal trap. Bait the trigger with peanut butter, grain, nuts or whatever food the ground squirrels are damaging. Fasten solid baits like nuts to the trigger with a thread or wire. Place the traps near burrows, along runways or where damage is occurring. During early summer, use several mouse-size

traps with the rat traps; young ground squirrels may not be large enough to spring a rat trap. Anchor traps so that they cannot be dragged away. To be most effective, bait and place the traps unset for several days to allow the ground squirrels to get used to them, then set the traps. Check traps frequently and place them to minimize the risk of capturing animals other than ground squirrels.

Shooting

If local laws and safety considerations allow, shooting can eliminate some animals. A .22 caliber rifle or pellet gun is ideal.

Other Methods

Plugging burrows with soil, rocks or other debris does not discourage ground squirrel activity. However, as I mentioned earlier, some ground squirrel burrows are quite short and shallow. These, and even the longer nesting burrows, can be flooded with a hose or 3-4 gallons of water. This often brings the ground squirrel to the surface where it can be dealt with. Water can also be used along with the burrow entrance trap to capture the animal alive. Flooding around structures, steps or sidewalks may be ineffective if the ground squirrel has burrowed into a cavity that provides an air space. In such cases, use another method of control.

Reference to products in this publication is not intended as an endorsement to the exclusion of others which may be similar. Persons using such products are responsible for their use according to the current label directions of the manufacturer.

For More Information

- Jackson, H.H.T. 1961. *The mammals of Wisconsin*. Univ. of Wisconsin Press. pp. 130-142.
- Schwartz, C.W. and E.R. Schwartz. 1981. *The wild mammals of Missouri*. Univ. of Missouri Press. 356 pp.
- Wobeser, G.A. and F. Leighton. 1979. A simple burrow entrance live trap for ground squirrels. *J. Wildl. Management* 43 (2):571-572.

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