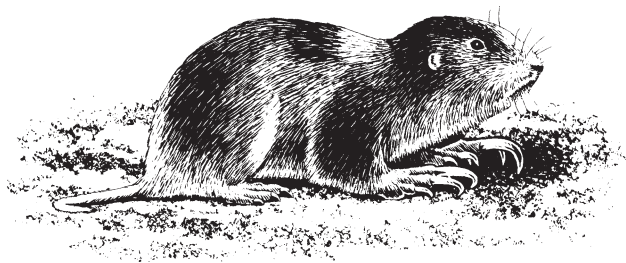


Managing Iowa Wildlife Pocket Gophers



Plains pocket gopher *Geomys bursarius*

Introduction

The plains pocket gopher, *Geomys bursarius*, is a stocky, medium sized, burrowing rodent found throughout Iowa. Its name comes from the fur-lined external cheek pouches in which the gopher carries food.

The plains pocket gopher should not be confused with other small mammals commonly called “gopher,” including the woodchuck (groundhog), 13-lined ground squirrels, Eastern chipmunk, meadow and prairie voles, short-tailed shrew, or Eastern mole.

The pocket gopher spends most of its life underground in a tunnel system that it digs by itself. It has many physical adaptations for digging. An average adult pocket gopher is 10 to 12 inches long and weighs about 1 pound. The pocket gopher's head is small and flattened, and the neck is short and stout. Its shoulders and forearms are broad, thick, and muscular, ideal for digging. The large front feet have long, robust claws used to dig, while the back feet are smaller, with short toes and claws. A pocket gopher's eyes are small and weak. The eyes secrete fluid that may be important in cleaning out dust and grit. The ears are small, rounded, and lie close to the head. The ears have valves so the pocket gopher can close them while digging. Hearing is relatively poor. The tail is short and nearly hairless.

The pocket gopher has four large, perpetually growing front teeth (incisors) that protrude from the mouth even when it is closed. The fur-lined lips close tightly behind the incisors, enabling the pocket gopher to cut roots and use the incisors for digging without eating

dirt. Fur-lined cheek pouches on either side of the mouth are used for carrying food to storage chambers but not for moving soil.

Life History and Ecology Behavior and Reproduction

Pocket gophers live a solitary life. Normally, there is only one gopher per tunnel system although there may be several tunnel systems (and pocket gophers) in one small area. They emerge above ground occasionally to look for food near the tunnel entrance. Young pocket gophers are sometimes seen traveling above ground in search of a new home area.

Pocket gophers are active year round. Most researchers report that pocket gophers feed or burrow at all hours of the day, although some believe that early morning, late afternoon, and nighttime hours are preferred.

Pocket gophers reach sexual maturity at the end of their first year. Mating takes place in the spring. Gestation (pregnancy) requires approximately four weeks. Litters of three to four young are born in April or May.

Food Habits

Pocket gophers are strict herbivores (vegetarians) that use a wide variety of plants for food, including both above ground and below ground parts of forbs, grasses, shrubs, and trees. They feed on plants in three ways: (1) by surfacing and eating above ground plant parts near the tunnel entrance; (2) by feeding on roots they encounter while digging; and (3) by pulling above ground vegetation into their tunnel, roots first. Plains pocket gophers prefer above ground plant parts, especially alfalfa, clover, and grass, when the plants are green and succulent. At other times, roots seem to be eaten more frequently.

Habitat

Pocket gophers use a variety of habitats. Plains pocket gophers live mostly in open areas such as prairies, meadows, pastures and other grasslands, cultivated fields of alfalfa and clover, and human-made habitats such as lawns, cemeteries, and playgrounds.

Soil types play an important role in determining where pocket gophers live. Preferred soils are usually light in texture, very porous, and well drained. Because pocket gophers live in a tunnel that is kept closed off from the surface, exchange of the air they breathe must take place through the soil. Thus, soils that are continuously wet and/or composed of small particles, such as clays, are usually avoided because they lack sufficient air spaces. Usually, sandy soils are avoided because they do not support tunnels very well. Likewise, rocky soils are not used because of the difficulties they present to digging.

Soil depth may affect the distribution of pocket gophers. Tunnels in soils less than 4 inches deep might cave in too easily. Shallow soils also prevent pocket gophers from digging deep enough to avoid extremes of soil temperature.

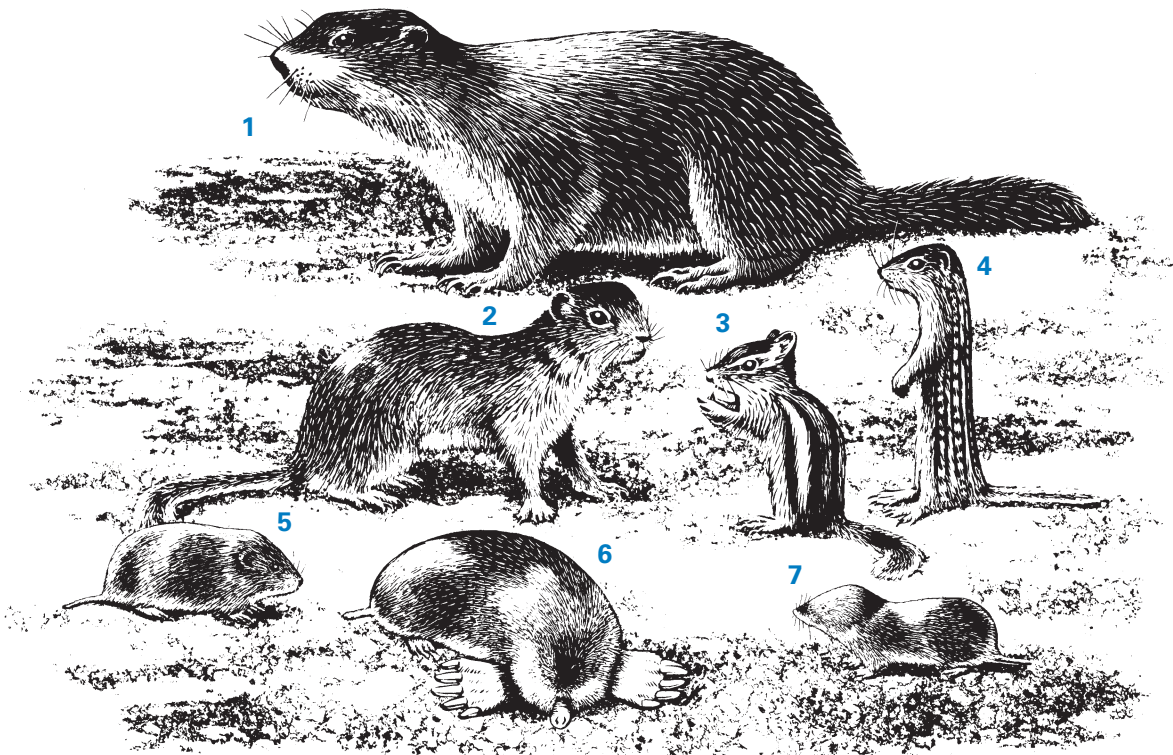
The chemical makeup of the soil may indirectly affect the distribution of pocket gophers by limiting the growth of plants gophers prefer. Although pocket gophers eat a variety of plants, an absence of favored plants may keep them away.

Tunneling

The pocket gopher's home is an extensive system of underground tunnels marked on the surface by mounds of excavated soil. Pocket gophers excavate tunnels by digging with their long curved front claws and clipping roots with their incisors.

Unlike ground squirrels and most other burrowing rodents, pocket gophers usually maintain a closed tunnel system. A pocket gopher comes to the surface to push up excavated soil or to explore for food in the area around the tunnel exit. When it returns to the tunnel, the pocket gopher re-plugs the opening with loosened soil.

The depth of the main tunnel depends on soil type and ranges from 4 to 12 inches below the surface. Side tunnels frequently branch from the main tunnel and end at a plug or a mound on the surface. Some side tunnels are plugged at the point where they branch from the main tunnel, making them appear abandoned. These tunnels may be used for access to the surface for feedings, for storing food, or for disposing of excavated soil.



Other mammals similar to the pocket gopher, from top to bottom: (1) Woodchuck, (2) Franklin ground squirrel, (3) Eastern chipmunk, (4) 13-lined ground squirrel, (5) Meadow or prairie vole, (6) Eastern mole, and (7) Short-tailed shrew

There also may be vertical, often spiral tunnels averaging 18 to 24 inches or more in depth, that connect the main tunnel system to a deeper system where the breeding and nesting chambers are found. Nest chambers are spherical, about 10 inches in diameter, and lined with dried grasses. Enlarged chambers found along the main tunnel system are probably resting and feeding stations since they contain no nesting material.

Surface Mounds

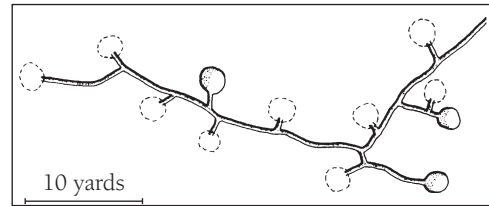
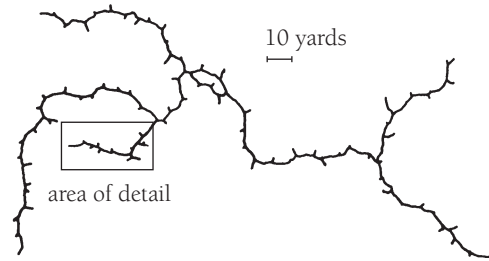
Mounds of excavated soil are left at places where the pocket gopher has surfaced. The mound is typically a large, fanshaped pile. The pocket gopher pushes soil out of its slanting exit tunnel to the front, right, and left. The mouth of the exit tunnel is marked by a circular plug of earth, 1 to 3 inches in diameter, that is slightly lower than the rest of the mound surface. In contrast, mounds made by moles are “volcano-shaped” because moles push dirt out of their vertical exit tunnel and let it fall freely in all directions. No dirt plug marks the mouth of the mole’s tunnel.

Loosened soil and rocks from excavated tunnels are usually the only materials a pocket gopher brings to the surface. Old nest materials, unused food, and feces all remain in the tunnel system usually in abandoned and plugged side tunnels or in currently unused chambers.

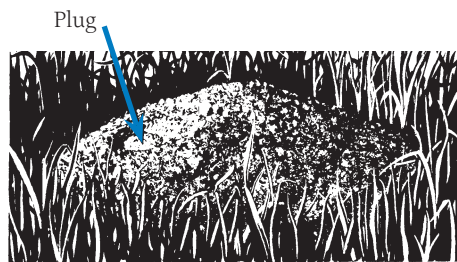
Economic Impact and Management

Pocket gophers can be a nuisance, but they also benefit the soil and vegetation in many ways. Unfortunately, the positive effects are not as visible as the mounds in a hayfield, lawn, or pasture.

It has been estimated that an average pocket gopher can move more than 1 ton (2,000 pounds) of soil to the surface each year. This earth-moving is beneficial because it mixes, aerates, and loosens the soil, all of which benefit plants. Pocket gopher tunneling allows air and water to reach plant roots, promoting growth. Their soil-mixing activities make more nutrients available to the upper layers of soil, thus further encouraging plant growth. Pocket gophers contribute to increased soil fertility by adding organic matter in the form of buried vegetation, unused food caches, and feces, and to soil formation by bringing subsoil material to the surface where it can be subjected to weathering.



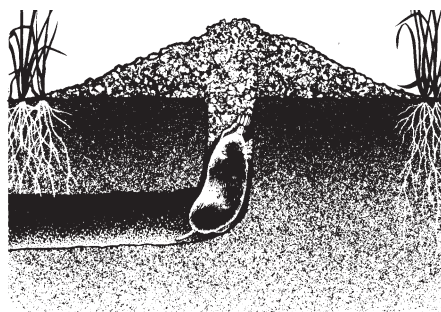
Pocket gopher tunnel systems



Gopher mound



Pocket gopher using nose and front feet to tamp earthen plug to tunnel



Mole pushing dirt through vertical tunnel to surface of ground

Comparison of pocket gopher and mole signs

Fresh soil in mounds provides a seedbed for grasses and forbs, which helps to increase the variety of plants on a site. Weeds, such as dandelions that often replace grasses and other useful plants in overgrazed pastures, are a favorite food of pocket gophers because of the weeds' large roots. By removing these weeds the pocket gopher may hasten the return of desirable plants. In fact, in native prairies, pocket gophers are critical in maintaining the amazing plant diversity of prairies.

Pocket gophers can cause severe damage and economic losses to farmers, ranchers, foresters, and even home gardeners. In Iowa, pocket gophers cause the loss of forage in alfalfa fields by eating plant parts and burying plants with mounds. Mounds also are a nuisance during mowing and may damage mower sickles or tractors. Pocket gophers can cause havoc when they enter lawns, gardens, or orchards. Their gnawing can damage plastic irrigation pipe and underground cables. They can pose a problem in tree plantations or orchards by feeding on tree roots, girdling stems, and clipping twigs. Pocket gopher tunnels in ditch banks or earthen dikes can channel rainfall, thus hastening soil erosion.

Control

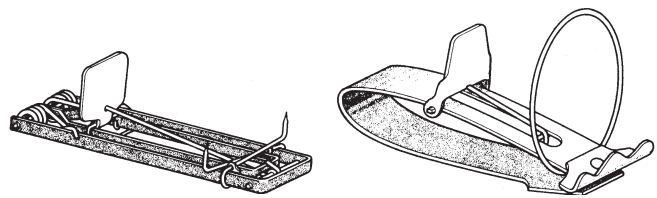
Like all animals, the pocket gopher is neither all good nor all bad. Decisions on whether to control pocket gophers may be influenced by their benefits, which are long term and not always appreciated, and the damage they cause, which is obvious and sometimes substantial in the short term. When pocket gophers become a nuisance to humans they can be controlled in several ways.

The best control is achieved when pocket gophers are actively working near the surface, which is usually in the spring and fall. Attempting to control the pocket gopher at other times may waste time, money, and labor.

Trapping

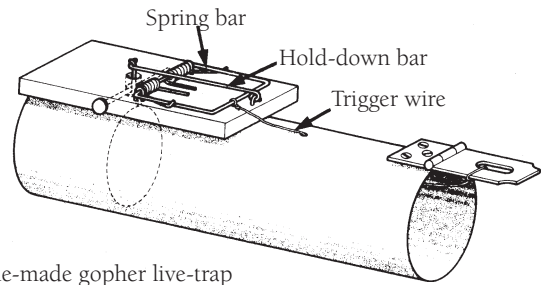
Trapping is a common way to control small pocket gopher infestations but may not be practical where large hayfields, pastures, tree plantations, or even lawns are involved.

Success depends on proper placement of the traps. Traps should be set where there are fresh workings visible on the surface. The first step in trap placement is to find the tunnels. The procedure will vary whether you set the traps in the main tunnel or the exit tunnel.



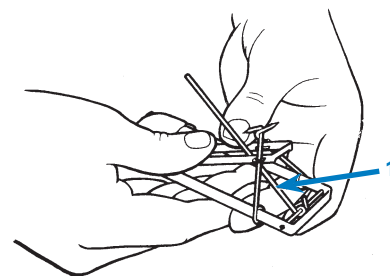
Macabee gopher trap

Victor® Gopher Getter

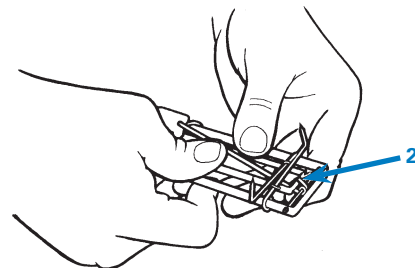


Home-made gopher live-trap

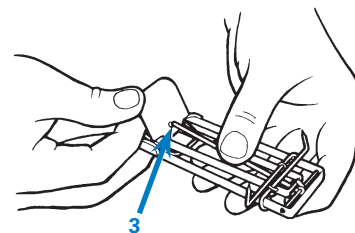
Several types of gopher traps are available, including the Macabee, Victor® Gopher Getter, and home-made gopher live-traps



Hold trap exactly as in illustration; be sure left index finger holds trigger (1) in upright position



Press thumbs down; with left index finger, guide hook on trigger (2) over end of trap frame



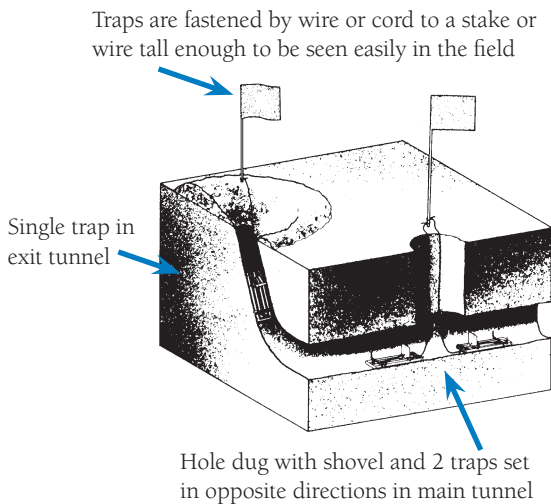
Still holding frame down, place the other end of the trigger (3) in the small hole in the plate

How to set a Macabee trap

To locate the main tunnel, probe the ground with a metal rod about 12 to 18 inches away from the mound on the same side as the plug. To locate the exit tunnel, probe several inches away from the mound on the plug side (you will know when you have located the tunnel by the decreased friction on the rod). The exit may be plugged with up to several feet of soil, but usually fresh mounds are plugged only a few inches.

Dig down with a trowel until you find the tunnel, and then remove any soil plugging the tunnel so that traps can be placed far back from the opening. Set and place two traps, one in each direction. The trigger should be set so it faces away from the opening. Attach a piece of wire to each trap and fasten the wire to a metal stake on the surface so neither the pocket gopher nor a predator can pull it away.

Experiment with trap type and placement. Some trappers have more success when they leave trap-set tunnels completely open to the surface, thus attracting pocket gophers who are caught when they try to plug the holes. Others close off the tunnel completely.



Methods for placing kill traps for pocket gophers

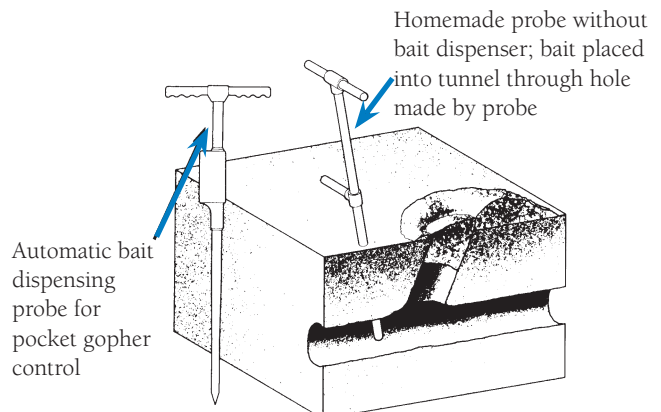
Toxicants

The most economic and efficient method of controlling pocket gophers is to use toxic bait. Landowners who feel justified in using poison, find no legal restrictions to its use, and have no ethical qualms about introducing toxic chemicals into the environment will find several rodenticides available for use. The active ingredient in some is zinc phosphide (2%). This chemical reacts with the stomach acids and forms phosphine gas, killing the individual animal. No secondary poisonings—killing animals that may eat the carcass of the poisoned animal—occur with zinc phosphide, making it safer than many other single-dose poisons. Anticoagulants also are available. These include chlorophacinone and diphacinone. Treated grain, such as milo or barley, or cut vegetables serve as bait. **Note:** Ask your local extension agent about current restrictions on use of these poisons before applying them.

To poison pocket gophers, the bait must be placed in their tunnel systems by hand or by a special machine known as a burrow builder.

Hand Baiting

Bait can be placed in a tunnel system by hand excavation or by using one or two types of special, hand-operated probes. First locate the main and/or side tunnels as previously described for trapping. Then dig down with a trowel to expose the tunnel. Place a tablespoon of bait deep into the tunnel in each direction away from the opening; then backfill the hole with loose soil so light will not penetrate into the tunnel system. The bait should be effective for at least two weeks. To ensure control, place bait in each tunnel system in at least two or three places. A relatively new type of bait contains a grain mixture plus the anticoagulant, diphacinone, in a paraffin block, which increases the bait's effective life.



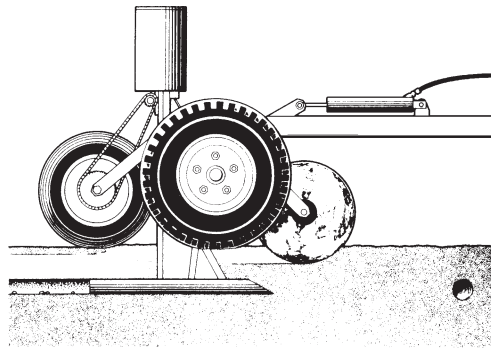
Using hand-operated probes

To bait without digging up tunnels, place a probe where you expect to locate the main tunnel system. When using a reservoir-type bait probe dispenser, push the probe into the tunnel system (you will know when you have located the tunnel by the decreased friction on the probe); then push a button to release a measured dose of bait into the tunnel. A probe without bail reservoir is used to make small holes into the tunnel system, through which a tablespoon of bait is dropped by hand. The hole is then backfilled to exclude light.

To ensure that non-target species are not exposed to poison baits, all applications must be below ground. Clean up, and properly dispose of all spilled bait.

Mechanical Burrow Builder

The mechanical burrow builder is a tractor-drawn machine that excavates an artificial burrow and then automatically dispenses poison bait into the burrow so large areas can be economically treated for pocket gopher control. Many counties own burrow-builders, check with the local office of the Iowa State University Extension Service, Farm Service Agency, Natural Resource Conservation Service, or Soil and Water Conservation District.



Tractor-drawn mechanical burrow builder

Revised by Jason O'Brien, interim extension wildlife specialist and James Pease, former extension wildlife specialist. Originally prepared by Kurt A. Johnson and James Pease, former extension wildlife specialists. Artwork by Rex Heer, media graphics artist.

File: Wildlife 6

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