

Plains Pocket Gophers

More Than A Nuisance

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Although plains pocket gophers (*Geomys bursarius*) are seldom seen, they inhabit vast acreages of rangeland. The relationship between plains pocket gophers and rangeland productivity has been the source of many unanswered questions. Many ranchers consider the plains pocket gopher to be merely a tolerable nuisance, but recent research at the University of Nebraska has shown that they may reduce productivity by substantial amounts. Pocket gophers spend most of their lives underground, thus are seldom seen. These rodents have been confused with the prairie dog (*Cynomys ludovicianus*), 13-line ground squirrel (*Spermophilus tridecemlineatus*), and eastern mole (*Scalopus aquaticus*).

Description

Plains pocket gophers have several specific adaptations for life underground. They have small eyes, inconspicuous ears, powerful forequarters and long claws on their forefeet. There are large incisors on both top and bottom jaws with two grooves on the face of each upper tooth. These teeth are used in digging while specialized lips behind the front teeth prevent soil from entering the mouth. Pocket gophers were named for the large pouches on either side of the outside of the mouth cavity. The color of the plains pocket gophers ranges from sandy brown to dark chocolate brown. Size varies considerably: adult gophers captured in eastern Nebraska were approximately one foot (31 cm) long and weighed an average of one pound (454 g); those captured in western Nebraska typically weighed 8½–10½ ounces (240–300 g).

Mound Building

The presence of gophers is obvious from the mounds of soil they build. These are different in appearance from soil disturbances caused by other rodents. Typical gopher mounds are fan shaped, 12 to 18 inches (30–46 cm) wide and 4 to 6 inches (10–15 cm) high. Ground squirrels dig burrows below the soil surface but they leave their entrance open, and no soil mounds are present. Ground squirrels sometimes move into gopher tunnels, which may create the impression that they did the digging. Moles leave piles of soil on the surface but their burrowing leaves distinct ridges of sod. This is due to the fact moles eat insects and generally burrow in sod searching for food. Gophers also burrow in search of food, but their tunnels are never so near the surface as to leave ridges. Pocket gopher mounds are formed as the gopher digs its tunnel and pushes loosened soil out of the tunnel to the surface, forming a mound of soil.



Plains pocket gopher.

These rodents are active year around. Their presence is most apparent in the spring and fall, when they build numerous new mounds. One gopher may build 100 mounds in a single year and move 2.25 tons (1.8 metric tons) of soil to the surface. The extent of their burrowing depends on the amount of food available. The burrow or tunnel system of a single gopher may range over 200 feet (60 m) and include over 100 mounds. Tunnels are generally parallel to the surface of the ground, but deeper tunnels lead to nest and food caches. The depth varies with soil type. Sandy ones are from 8 to 24 inches (20 to 61 cm) deep, while the nest may be as deep as 5 or 6 feet (152 to 183 cm). In heavier soils tunnels are generally 6 to 20 inches (15 to 51 cm) deep.

Only one gopher occupies a burrow system, except during the breeding season and while caring for young when more than one gopher may occur per tunnel system from February (onset of breeding season and while caring for young). Hence, more than one gopher may occur per tunnel system from February (onset of reproduce until they are a year old, then they generally bear a single litter of three to four young between March and May of each year. Young gophers frequently move to new areas by traveling above ground. Abundant infestation is considered to be 4 to 8 per acre (10 to 20 per hectare).

Affect on Rangeland Vegetation

Gophers affect rangeland productivity in several ways. Their mounds may cover from 5 to 25% of the soil surface. The deposited soil may prevent growth of the underlying vegetation.

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Rangeland infested by Plains pocket gopher.

Since the soil of mounds is not protected by vegetation for some time, loss of soil through accelerated wind and water erosion may occur. More importantly, pocket gophers compete directly with livestock by consuming range plants, both above and/or below ground. Up to 70% of the diet of the plains pocket gopher may be made up of roots. The northern pocket gopher (*Thomomys talpoides*) have been shown to prefer forbs, but grasses constitute the bulk of the diet of the plains pocket gopher.

Research has shown that plains pocket gophers decrease forage production from rangeland. The amount of the decrease varied between range sites and range conditions classes within sites. Plains pocket gophers preferred range sites in good to excellent conditions, because grass species were more vigorous and had larger root systems. In some cases, production was cut in half by the gophers. Grass species preferred included sand bluestem [*Andropogon hallii* Hack.] prairie sandreed [*Calamovilfa longifolia* (Hook.) Scribn.] and needleandthread [*Stipa comata* Trin. and Rupr.].

A decline in range condition closely follows after infestation of an area. Desirable perennial grasses rapidly decline, accompanied by an increase in annual grasses and forbs. This causes the rodents to move into a previously uninfested area to seek food, and causes abandonment of the weedy areas. Secondary succession begins to occur and improves the abandoned area, but it may be interrupted or delayed by the presence of domestic livestock. Research in eastern Nebraska has shown that gophers also cause approximately a 25% reduction in yields of alfalfa [*Medicago sativa* L.].

Some activities may be beneficial. Gophers loosen compacted soil, allowing better aeration and increased water infiltration, and increase soil fertility by adding excrement and burying vegetation.

Control

Gophers have a variety of natural enemies including great horned owls, rattlesnakes, bull or gopher snakes, coyotes, weasels, badgers, and foxes. There are no predators, however, that will effectively limit their numbers. Poison bait (strychnine

alkaloid coated grain) or traps can be used as control measures, but neither of these methods will completely rid an area. Trapping is only feasible on rather small areas. Control on vast acreages of rangeland is not practical with the current control measures.

Poisoning with the use of the burrow builder may be practical on hay meadows and improved pastures. It makes an artificial tunnel and places the bait in a single operation. This machine is most effective when used in spring or fall. The soil must be moist enough to hold its shape when compressed. The torpedo must be drawn through the ground parallel to the surface. To check whether it is made properly, walk on a newly made tunnel. A good tunnel should be about as deep as natural systems in the area. However, depth is less important than a good tunnel. Constructing artificial tunnels at 25–40 foot (8–12 m) intervals should give effective control 80 to 95% of the time. The wider interval is effective during spring, but they should be less widely spaced in late summer and fall. Reinvasion of a treated area can be minimized by completely enclosing the field with artificial tunnels, and retreatment may be necessary in 2 to 4 years.

The bait has an effective life of 2 to 3 weeks and should be applied at a rate of 1 pound per acre (1.12 kg per ha). Strychnine is relatively safe, since it tastes very bitter to humans and there are no secondary effects (other animals will not die from eating the flesh of poisoned gophers). However, it is possible for an animal to get a lethal dose of strychnine by eating a gopher with poisoned grain in its cheek pouches. Spilled bait should be cleaned up or buried. Do not apply bait to the ground surface, because surface baiting is not effective and other animals may consume the bait.

Summary

Proper range management favors plains pocket gophers. Gophers are attracted to areas of high and improving range condition, where they utilize the more vigorous plants. Range managers must be aware of the fact that these rodents may interfere with their goal of maximizing rangeland productivity. Grassland, livestock, and pocket gophers interact in a fashion that affects not only forage available for livestock now but also the future condition of the range.