

Controlling Rock Squirrel Damage in New Mexico



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INTRODUCTION

Rock squirrels are burrowing rodents found commonly throughout much of New Mexico. Rock squirrels' feeding and burrowing habits can create considerable problems for humans. Rock squirrels damage cropland by digging up recently planted seeds and eating newly sprouted plants. The squirrels' tunnel systems create unwanted diversions and valuable irrigation water losses. Rock squirrels have been known to pose problems around the house by feeding on flowers and vegetables planted by hard-working gardeners. Burrowing by rock squirrels on playgrounds and parks also can create significant problems for groundskeepers

charged with maintenance responsibilities. Therefore, it often becomes necessary to reduce or eliminate the problems associated with these animals.

IDENTIFICATION AND DISTRIBUTION

The rock squirrel (*Spermophilus variegates*) is a relatively large, heavy-bodied, ground squirrel with a moderately long, bushy tail (fig. 1). The head and body are about 10.5 inches long and the tail is approximately 8 inches. The squirrels have relatively large ears that extend above the tops of their heads. Their fur is usually brownish gray and mottled with white spots.

Rock squirrels frequently are confused with prairie dogs, because of their large body size. However, there are two distinguishing features of rock squirrels that allow for easy differentiation. The rock squirrel has a much larger tail. Prairie dog tails range from 1.5 to 4 inches in length, much shorter than the 8-inch rock squirrel tail. In addition, prairie dogs have small, reduced ears, whereas rock squirrels have fairly large ears that clearly reach beyond the crown of the head.

Rock squirrels occur from Mexico to northern Utah and Colorado. These rodents occupy nearly all of Arizona and New Mexico, with the exception of very high elevations. Rock squirrels live in rocky terrain, such as canyons and hillsides, but also are well-adapted to suburban and urban areas.

Seeds, nuts and berries are important food items for rock squirrels. Their diet can be very diverse. They will feed on acorns, pine nuts, juniper berries, mesquite buds and fruit from cactus. During the spring and early summer, rock squirrels also feed on green vegetation, such as grass, forbs and flowers.



Figure 1. Rock squirrel.

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Rock squirrels dig burrows for shelter from the weather, safety from predators and food storage. The burrow systems are occupied year after year and are extended in length and complexity each year. Numerous entrances for each burrow system are common.

The mating season for rock squirrels occurs between March and July. After a 30-day gestation period, a litter of five to seven pups are born. The pups live in nests constructed of grass within the burrow systems. Rock squirrels are fairly long-lived with a life span of four to five years. In captivity, some have lived as long as 10 years.

DAMAGE PREVENTION AND CONTROL METHODS

The rock squirrel is not listed as a protected species in New Mexico. A number of different methods can be used to control them and minimize damage. Where rock squirrel populations are high, several control methods may need to be used simultaneously. Repeated control efforts may be required over the long run to prevent a reinfestation from surrounding areas where rock squirrel control is not practiced.

Habitat Modification

Flood irrigation, as opposed to sprinkler or drip irrigation, may discourage rock squirrels in orchards and alfalfa fields. However, this practice will not remove them completely.

Rock squirrel populations can be reduced in crop fields by frequent tillage, especially deep disking or plowing. However, squirrels may move to the margins of the field and feed inward from the borders.

Eliminate areas used by squirrels as escape cover by removing abandoned irrigation pipes, rubbish heaps and rock piles.

Exclusion

Sometimes it may be possible to exclude rock squirrels from gardens or flowerbeds with fencing. This is only practical for small areas, because of the cost associated with this control method. A 4-foot fence constructed of small wire mesh with a sheet metal band at the top may help exclude rock squirrels. A sheet metal band 16-20 inches wide should be firmly affixed to the wire at the fence top to prevent squirrels from climbing over. The fence should be buried as deep as possible.

To prevent loss of fruit or nut crops, sheet metal cylinders placed around tree trunks may prove effective. The 4-foot-high metal barriers should be wrapped around the tree base.

Repellents

Rock squirrels cannot be frightened from their burrow sites by propane exploders or flagging. Chemical taste and/or odor repellents are ineffective in causing squirrels to leave or avoid an area.

Toxicants

Rodenticide-treated baits are the most economical control method for areas with high rock squirrel populations. However, extreme caution must be used when applying toxic baits of any kind to avoid accidental poisoning of applicators or nontarget animals.

Grain treated with zinc phosphide is available as a "ready-to-use" bait. Zinc phosphide is a restricted-use pesticide and can be used only by licensed pest control operators or people who have private applicator licenses from the New Mexico Department of Agriculture.

Because zinc phosphide is not highly palatable to squirrels, its effectiveness is improved with prebaiting. Place untreated bait in an area to entice animals to feed on the bait in large quantities, before applying bait actually treated with the toxicant. Apply about one teaspoon of untreated grain per burrow entrance. The untreated bait should be scattered on the bare ground over a 3- to 4-foot area next to the burrow entrance (fig. 2).



Figure 2. Application of untreated bait at a burrow entrance.

Apply bait treated with zinc phosphide only if the untreated bait is being readily consumed, which may take several days. If the untreated bait is not consumed, then zinc phosphide application should be delayed. Apply about one teaspoon of zinc phosphide treated bait per burrow entrance in the same way that the untreated bait was applied. Excess bait that is not eaten by rock

squirrels can be a hazard to nontarget wildlife or livestock. It is best to remove livestock, especially horses, sheep or goats from the pasture before applying bait. For best results, apply the toxic bait early in the day and restrict any human disturbance for several days.

Anticoagulant baits, such as diphacinone and chlorophacinone, are more expensive to use and require more bait because multiple feedings are necessary. Anticoagulant baits can be applied by hand like zinc phosphide or used in bait boxes for a continuous supply. Anticoagulant baits are not acute poisons but require multiple feedings to be effective. An aversion to the bait can develop, if the amount consumed is only enough to make the squirrel ill but not adequate to be lethal.

Fumigants

Fumigation of burrows can be an effective technique for controlling rock squirrels. But care must be exercised with all types of fumigants to avoid exposing anyone to toxic gases. Therefore, do not fumigate burrows near human dwellings. The fumes may seep into the buildings and create a significant hazard.

Fumigation is most effective during early spring, before the squirrels have time to reproduce. However, the cost of burrow fumigants and the associated labor to apply them make the cost about 8 to 10 times greater than control with zinc phosphide baits.

Gas cartridges are relatively easy to use and are available from commercial manufacturers, feed stores and garden supply centers. They consist of cylinders of combustible ingredients equipped with a fuse. To fumigate a burrow, place the cartridge at the entrance of the burrow and light the fuse (fig. 3). Using a shovel or stick, push the cartridge as far back into the burrow as possible. Quickly cover the burrow entrances with soil or sod and tamp tight to seal in the toxic gases (fig. 4).



Figure 3. Placing a gas cartridge into a burrow.



Figure 4. Covering the burrow entrance.

The method for using aluminum phosphide (Fumitoxin, or Phostoxin,) differs considerably from that for gas cartridges. Aluminum phosphide reacts with moisture, so protective gloves must be worn when handling the tablets. Place the prescribed number of aluminum phosphide tablets as far back into the burrow opening as possible (fig. 5). A 3- to 4-foot PVC pipe can be used to help place the tablets far into the burrow opening. Then insert a wad of crumpled newspaper into the burrow and seal it tightly with soil. The newspaper plug prevents the soil from covering the pellets, allowing them to react more readily with the soil moisture to produce the lethal phosphine gas. When the soil is dry, it may be necessary to pour 1 to 2 quarts of water down the burrow prior to depositing the tablets. As with zinc phosphide, aluminum phosphide is a restricted-use pesticide, which requires users be licensed by the New Mexico Department of Agriculture.



Figure 5. Placing aluminum phosphide tablets into a burrow.



Figure 6. Cage-type live trap for catching rock squirrels.

Note of Caution: All label directions for toxic baits or fumigants must be followed exactly to be safe and to remain in compliance with federal and state laws.

Trapping

Trapping can be effective in removing rock squirrels living in a relatively small area. It also can be an effective control practice in areas where toxic baits or fumigation cannot be used safely. As with all trapping, be sure you are not violating any state or local laws.

Several types of traps are available for squirrels. Standard live traps are the most common type for catching rock squirrels (fig. 6). Live traps are useful, particularly in residential areas where the previous kill-type traps may be inappropriate. Remember to use the proper trap size. The dimensions for live traps are expressed in inches for length, width and height. The appropriate trap sizes for rock squirrels are 16 x 5 x 5, 19 x 6 x 6 and 24 x 6 x 6. Traps can be set at burrow openings and along trails. However, it is necessary to cover the trap with a tarp, burlap bag or some similar material when the trap is placed on the ground. This will protect against being sprayed if a skunk is captured in the trap. Read NMSU Cooperative Extension Service Guide L-204 "Controlling Skunks in New Mexico" if this occurs. The exception is for spotted skunks, which do not climb readily. Therefore, elevating the trap well above ground usually precludes the need to cover the trap when trapping rock squirrels. Bait traps with pecans, walnuts, almonds, slices of orange or apple, or pieces of melon.

Squirrels that have been captured in a live trap can be destroyed in a humane manner or released in a remote

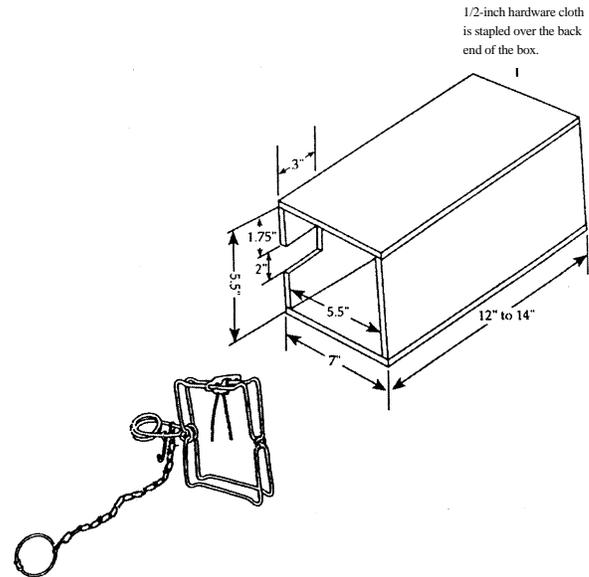


Figure 7. Wooden trap box to hold a Conibear trap.

location. To release the rock squirrel unharmed, be certain to transport the animal several miles away to prevent it from returning. But do not release the squirrel in an area where it can create problems for other people. Releasing a rock squirrel unharmed in no way ensures that it will survive. Releasing animals into unfamiliar surroundings can predispose them to hazards that may result in their death.

An unbaited Conibear trap (No. 110) with a jawsread of 4.5-inches is effective when set over a burrow entrance. If you cannot set the trap directly over a burrow opening, you can place the trap in a wooden box (fig. 7). The trap box makes the Conibear trap more versatile, because it can be set in trails or near burrow openings. The types of bait previously discussed are placed inside of the trap box to entice the squirrels to enter. Be certain not to place a Conibear trap in areas where pets, nontarget wildlife or children may encounter them.

Other Control Methods

Using a shotgun or rifle may be effective when rock squirrel numbers are low or the removal of a single problem animal is necessary. However, it is illegal to discharge a firearm within city limits and, therefore, shooting is limited to rural situations.

The information given herein is supplied with the understanding that no discrimination is intended and no endorsement is implied by NMSU's Cooperative Extension Service.

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Much of the information for this publication was adapted from:

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Figure 6 was taken directly from Marsh (1994).

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