

Tree Squirrels: Managing Habitat and Controlling Damage

Missouri is home to three species of tree squirrels: the fox squirrel (*Sciurus niger*) and gray squirrel (*S. carolinensis*), both popular game animals; and the southern flying squirrel (*Glaucomys volans*), the smallest of the tree squirrel species in the state.

These squirrels provide relaxation and enjoyment for many Missourians who spend time observing or photographing wildlife. They seldom pose problems in rural areas, but it is not unusual for them to become a nuisance in urban areas (Figure 1). Occasionally, fox or gray squirrels enter attics and chimneys and cause damage to electrical wiring, siding or insulation. Squirrels may cause damage to home gardens and ornamentals; sweet corn, tomatoes and other vegetables or flower bulbs; and newly planted seeds in urban gardens. Squirrels also can become a nuisance around bird feeders, frightening birds and scattering seeds.



Figure 1. Squirrels can become a nuisance, especially in urban areas.

Fox squirrels

Fox squirrels are most common in urban areas and open woodlots. They are the largest of the three species, averaging 19 to 29 inches from nose to tail and weighing 1 to 3 pounds.

Fox squirrels are so named because their color often resembles the brownish, red-orange of the red fox. Not all fox squirrels exhibit this color, however. Fox squirrels can be black, white or various shades of brown or gray.

Fox squirrels often forage on the ground, but they need trees for escape cover and dens. Unlike gray squirrels, fox squirrels can be found in fairly open areas. Although populations may be more dense in forested areas, this species commonly inhabits urban areas, open woodlands and woodland edges. In general, fox squirrels spend the entire year in the vicinity of a specific nest tree and have a home range of 10 to 40 acres, depending on the availability of new food sources.

Gray squirrels

Gray squirrels are slightly smaller than fox squirrels, averaging 14 to 21 inches long and weighing 1 to 2 pounds. They are gray with white underparts and white-tipped tails.

Gray squirrels normally prefer areas with more forest cover than fox squirrels. Forests dominated by oaks and hickories are prime habitats for gray squirrels. Gray squirrels also prefer to spend more time in trees and do not forage on the ground nearly as much as fox squirrels. They usually live most of their lives in and around one or two den trees, seldom traveling farther than 200 yards from home.

Southern flying squirrel

The southern flying squirrel is typically only 8 to 11 inches long. The species lives throughout the state but, because of its nocturnal habits, is not commonly seen. Southern flying squirrels generally live in deciduous woodlands, preferring oak-hickory forests with an abundance of old, dead trees or rotten snags.

These squirrels do not fly but glide on broad flaps of loose skin that extends along each side from the front legs to the flanks. Flying squirrels move from one tree to another using their flat, broad tail as a rudder. Their home range is usually no more than an acre.

Flying squirrels are shy, strictly nocturnal animals, that use their large eyes and keen sense of smell for foraging at night. Although they prefer mature hardwood forests, they can also be found in abandoned orchards, parks and older suburban neighborhoods with mature vegetation.

Flying squirrels do not create as many problems as other tree squirrels, but they may move into attics, walls or vacant

Written by
Robert A. Pierce II, Fisheries and Wildlife State Specialist, School of
Natural Resources

cabins and cause damage. During winter, flying squirrels gather into communal dens and commonly use hollow tree cavities and snags.

Biology and behavior

Tree squirrels in Missouri mate when they are 1 year old. Although males are capable of breeding throughout the year, females generally mate during two periods a year, each being about two weeks in duration. The first mating period begins in late December or early January (squirrels in the southern portion of the state start to breed from two to four weeks before those in northern Missouri), and the second occurs from late May to early July. The gestation period is 42 to 45 days.

Tree squirrels nest in tree cavities, human-made squirrel boxes, or leaf nests. Cavities are the preferred nest site. Tree squirrels have litters of three or four young. They develop more slowly than other rodents. They are born naked and blind, with their ears closed. Fur develops during the first few weeks. The ears open at about four weeks, and by the sixth week, the eyes are open, too. The young are weaned and are on their own in two to three months.

Squirrels are active during the day, with most of their activity occurring in the early morning and in the late afternoon to early evening. They do not hibernate but are active year-round.

A squirrel's home range and daily movements vary widely. Most activity is concentrated within several acres, although individual squirrels have been reported to range from 1 to over 100 acres. Squirrels tend to move within their range according to the season and availability of food.

Squirrel populations will periodically rise and fall and are linked to the quantity and quality of available habitat. As with most small game species, squirrels have relatively high reproductive and death rates. Often, more than half of the squirrels in a population will die each year. Squirrels are a favorite food of many predators, including hawks, owls, snakes, foxes, house cats and dogs. Squirrels are also susceptible to a variety of parasites and diseases, including ticks, mange mites, fleas and internal parasites. In the wild, most squirrels live less than four years.

Food habits

Fox and gray squirrels have similar food habits. They will eat a variety of native foods and quickly adapt to the availability of unusual food sources. Typically, squirrels feed on mast (wild tree fruits and nuts) in fall and early winter. Acorns, hickory nuts and walnuts are favorite fall foods. In late winter and early spring, they prefer tree buds. In summer, they will eat fruits, berries and other succulent plant materials. Fungi, corn and cultivated fruits are taken when available. During population peaks, when food may be scarce, squirrels may chew bark from a variety of trees.

Habitat management

Woodland habitats for squirrels must provide food sources and cover for adequate protection. Studies have shown that a pair of squirrels will use two or three leaf nests or dens at any given time of year. Cavities are often scarce in stands of timber that are less than 30 to 40 years old, so leaf nests must provide the shelter. Mature and overmature stands provide the most homes and food for squirrels. Squirrels will often build and use leaf nests in the summer, but these are not as desirable or as safe as den cavities.

Each pair of squirrels needs at least two dens; three are ideal. The pair will often live in one den until the female gives birth. At that time, the male is evicted from the den and will use an additional nest or den tree. The young also require dens; if none are available, they will either migrate or be eliminated by predators.

You can improve woodlot habitats for squirrels by planting nut trees, including hickory, pecans, walnuts and oaks. In existing woodlands, timber stand improvement practices can be conducted, taking care to leave trees with cavities and snags, which provide squirrel dens. Extremely dense stands of timber may require selective cutting to enhance the growth and nut production of beneficial mast-producing trees such as oaks and hickories.

If a woodland does not meet the minimum requirement for dens, a large, permanent squirrel population is unlikely. If the food supply is adequate but the number of natural dens is deficient, the population of squirrels can be increased by installing squirrel den boxes. Although probably not feasible in large forested areas, this technique certainly has merit in smaller woodlots. Start by placing one den box per acre; later you may want to increase them to two per acre. Plans for constructing squirrel den boxes are available from the Missouri Department of Conservation website at <http://mdc.mo.gov/discover-nature/how/woodworking/how-build-squirrel-den>.

Damage prevention and control

Tree squirrels may occasionally damage forest trees by chewing bark from branches and trunks. In nut orchards, squirrels can severely curtail production by eating nuts prematurely and by carrying off mature nuts. To protect seedlings and young trees from squirrels, place an expandable protective wrap around their trunks. Use a commercial wrap or make one from ¼-inch-mesh hardware cloth. Screens or wraps should extend 18 to 24 inches above the ground.

In residential areas, squirrels often travel power lines and short out transformers. They gnaw on wires, enter buildings and build nests in attics. Squirrels also occasionally damage lawns by burying or searching for and digging up nuts. They will chew bark and clip twigs on ornamental trees or shrubbery planted in yards. In gardens, squirrels may eat planted seeds, mature fruits or grains such as corn. Practices for ridding an area of squirrels include making the area less habitable, using repellents and trapping.

Exclusion and habitat modification

Excluding tree squirrels from buildings, vegetable gardens, valuable trees and shrubs, and other crops is the most practical and best protection against potential damage. Preventive maintenance is the best defense against unwelcome squirrels and other wildlife and is the basis of damage prevention recommendations offered in this guide.

Squirrel-proof your home by inspecting for potential entrances and making necessary repairs. Cover the inside of attic vents and similar openings with ½-inch hardware cloth, repair rotten boards along soffits or eaves, replace broken windows, cap chimneys, and fill openings made for utility pipes and electrical wiring. Squirrels can be prevented from traveling on wires by installing 2-foot sections of lightweight 2- to 3-inch-diameter plastic pipe. Slit the pipe lengthwise, spread it open, and place it over the wire. The pipe will rotate on the wire, making it difficult for squirrels to use as a travel route. Trim overhanging tree branches to prevent access to the roof.

If a squirrel is found in an attic or another part of the house, do not try to chase it out. Open a window or door and allow the squirrel to find its own way out. Alternatively, bait a live trap or cage trap with peanut butter or nutmeats. Once the squirrel is trapped, release it outdoors.

Protect valuable garden crops by building a fence of 1-inch-mesh wire. The fence should be at least 30 inches high and extend 6 inches below ground, with an additional 6 inches bent outward at a 90-degree angle to discourage burrowing. Electric fence can also serve to deter squirrels. Place at least two electrified strands about 3 inches from an existing fence, one 6 inches above the ground and the other at the fence height.

Protect planted bulbs with 1-inch-mesh poultry wire. Dig a trench slightly deeper than the desired depth of planting and fit the poultry wire in the bottom. Add soil and plant the bulbs. Place another strip of poultry wire over the plantings so that the bulbs are completely encased, and finish covering with soil.

To stop squirrels from stripping the bark off ornamental trees and shrubs, wrap trees with metal sheeting or protect them with squirrel baffles, as you would the pole for a bird feeder. Tree wrap keeps squirrels from gnawing on bark by keeping them out of the tree. Wrap all trees within branch-to-branch jumping distance. Be sure to allow for tree growth when wrapping. This method works well on trees that are near bird feeders or around your house. This method is not effective in areas with a continuous tree canopy that allows squirrels easy movement.

Feeding is the easiest way to prevent squirrels from stripping tree bark. Scatter shelled or cob field corn on the ground near the trees or bird feeder, or place it on a shallow feeding platform. Squirrels are fond of sunflower seeds and nuts, but feeding nuts can be expensive, especially when most are buried rather than eaten.

In backyards where squirrels are causing problems at bird feeders, provide an alternative food source. For example, wire or nail an ear of corn to a tree or fence post in an area away from the bird feeders.

Repellents

Naphthalene (moth balls) may temporarily discourage squirrels from entering attics and other enclosed spaces. However, naphthalene is not recommended for use in occupied areas of a building because it can cause severe physical distress to people. When this method is appropriate, use one pound of moth balls per 100 square feet of attic space. Supplement this method by the use of electric lights in attic spaces.

Chemical repellents can keep squirrels from burrowing in trees or gnawing on wood. Repellents will not stop the gnawing, but they can reduce the severity of the damage. The best repellent is one containing Thiram, a taste repellent that can be applied to seeds and bulbs. Thiram can also be applied to flowers, trees, shrubs, fences, siding and outdoor furniture.

Polybutenes are sticky materials that can be applied to buildings, railings, gutter downspouts and other areas to discourage squirrels from climbing. Because these materials can be messy, a preapplication with masking tape is usually recommended.

Squirrel Away is a deterrent that can be used to help keep squirrels from eating bird seed. It is a highly concentrated capsaicin, derived from hot pepper plants. This product is a bird seed supplement and can be an effective deterrent to squirrel activity at a bird feeder.

Be sure to follow all label directions when using a chemical repellent.

The University of Missouri intends no endorsement of products named here nor criticism of similar products that are not mentioned.

Trapping and hunting

A variety of traps will catch squirrels. If you have pinpointed the location where the squirrel is entering and you can access the area without injuring yourself, place a #110 conibear trap directly over the open entrance. This trap instantly kills an animal that passes through it.

Wire or cage traps also are commonly used to catch squirrels alive. The proper size cage trap has at least a 9-inch by 9-inch opening and is 24 inches long. A trap with a door on each end is preferable, so the squirrel can see through the trap. Baited traps work better than nonbaited types. Set the bait about 6 inches off the ground so that the scent drifts toward an approaching squirrel. Good baits to use in live traps are slices of orange and apple, shelled walnuts or pecans, and peanut butter. Other effective baits include sunflowers and corn. Tie trap doors open for a few days to allow squirrels to become accustomed to feeding in the traps. Then set the traps and check them twice daily. It is a good idea to set a trap directly in the squirrels' travel lane, and it may be necessary to build a fence to funnel the squirrel into the trap. Translocation of squirrels is a questionable practice and is generally not recommended because of the stress placed on transported and resident

squirrels and because of concerns about the transmission of diseases. For information on the various recommended methods for handling and disposing of a carcass, visit the carcass disposal page on the Internet Center for Wildlife Damage Management website, <http://icwdm.org/wildlife/euthanasia/CarcassDisposal.aspx>.

In areas where hunting is permitted, squirrels can legally be harvested as game animals during the regulated hunting

season. Because both fox and gray squirrels are game animals, be sure to contact the Missouri Department of Conservation before initiating any squirrel damage control program. Contact your University of Missouri Extension Center or the Missouri Department of Conservation for additional information on managing your woodland for wildlife and on controlling problems caused by nuisance tree squirrels.

ALSO FROM MU EXTENSION PUBLICATIONS

- G9425 *Solving Wildlife Damage Problems in Missouri*
- G9440 *Controlling Nuisance Moles*
- G9442 *Controlling House Mice*
- G9444 *Bait Stations for Controlling Rats and Mice*
- G9445 *Controlling Voles in Horticulture Plantings and Orchards in Missouri*
- G9450 *Snakes: Information for Missouri Homeowners*
- G9452 *Managing Woodchuck Problems in Missouri*
- G9453 *Managing Raccoon Problems in Missouri*
- G9454 *Managing Skunk Problems in Missouri*
- G9456 *Armadillos in Missouri: Techniques to Prevent and Control Damage*
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