
TREE SQUIRRELS

Integrated Pest Management for Homes, Gardens, and Landscapes

There are four species of tree squirrels in California (excluding the small nocturnal flying squirrel, which is not considered a pest). Of the four species, two are native and two are introduced from the eastern part of the United States. In their natural habitats they eat a variety of foods, including a wide range of seeds such as pine nuts and acorns, fungi, insects, bird eggs, and young birds.

Squirrels can cause damage around homes and gardens, where they feed on a variety of fruits, nuts, and other crops and plants. They can also dig holes in garden soil or in turf, where they bury nuts, acorns, or other seeds. They can be a nuisance around structures by gnawing on telephone cables, chewing their way into wooden buildings, or invading attics. Tree squirrels carry certain diseases that are transmissible to people, and they are frequently infested with fleas, mites, and other ectoparasites.

IDENTIFICATION & BEHAVIOR

Tree squirrels are active during the day and are often seen in trees, running on utility lines, and foraging on the ground. Tree squirrels are easily distinguished from ground squirrels and chipmunks by their long bushy tails, their lack of markings (such as spots or stripes), and the fact that they escape by climbing trees and other structures. All are chiefly arboreal, although the fox and western gray squirrels spend considerable time foraging on the ground.

Tree squirrels do not hibernate and are active year-round. They are most active in early morning and late afternoon.

Eastern fox squirrels (*Sciurus niger*)

Eastern fox squirrels (Figure 1) were introduced from the eastern part of the



Figure 1. Eastern fox squirrel, *Sciurus niger*.

United States and are well established in most major cities of California. Some people enjoy seeing them and have introduced them into new territories. They are often observed in agricultural lands around these same cities.

Eastern gray squirrels (*Sciurus carolinensis*)

Eastern gray squirrels (Figure 2) were originally introduced from the eastern United States into Golden Gate Park in San Francisco. They are also established in areas of Calaveras, Sacramento, and San Joaquin counties and may be expanding their range.

Western gray squirrels (*Sciurus griseus*)

Native western gray squirrels (Figure 3) are found throughout much of California, primarily in oak woodlands of the foothills and valleys and in pine-oak forests, where they feed on a variety of seeds, fungi, and other plant materials.



Figure 2. Eastern gray squirrel, *Sciurus carolinensis*.



Figure 3. Western gray squirrel, *Sciurus griseus*.

PEST NOTES

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Figure 4. Native Douglas squirrel, *Tamiasciurus douglasii*.

Douglas squirrels (*Tamiasciurus douglasii*)

Native Douglas squirrels (Figure 4), sometimes called chickarees, are found in mostly conifer-forested regions of the north coastal area and along the Sierra Nevada mountain region.

Because of the habitat in which they thrive, Douglas squirrels are not usually large-scale pests. They may, however, become garden or home pests in some of the more remote rural areas.

LIFE CYCLE

Tree squirrels naturally nest in tree cavities, enlarged woodpecker holes, or high in a tree in a spherical nest they construct of twigs, leaves, and shredded bark.

Breeding occurs in the late winter or in the spring and, depending on the species of tree squirrel, produces one or two litters per year of three to five young. For those producing two litters, the breeding period is extended.

DAMAGE

Of the four tree squirrels, the eastern fox squirrel (sometimes called the red squirrel) is by far the most serious pest to homes and gardens in urban and suburban situations. In some cities, eastern fox squirrels have moved outward into agricultural land where they have become a pest of commercial crops.

Squirrels sometimes cause damage around homes and gardens, where they feed on immature and mature almonds, English and black walnuts, oranges, avocados, apples, apricots, and a variety of other plants. During ground

foraging they may feed on strawberries, tomatoes, corn, and other crops.

They also have a habit, mostly in the fall, of digging holes in garden soil or in turf where they bury nuts, acorns, or other seeds. This caching of food, which they may or may not ever retrieve, raises havoc in the garden and tears up a well-groomed lawn.

Squirrels sometimes gnaw on telephone cables and may chew their way into wooden buildings or invade attics through gaps or broken vent screens. They also have a tendency to strip bark (Figure 5) to feed on the juicy inner bark layer (cambium), causing injury to trees.

Tree squirrels carry certain diseases such as tularemia and ringworm that are transmissible to people. They are frequently infested with fleas, mites, and other ectoparasites.

LEGAL STATUS

Tree squirrels are classified as game mammals by the California Fish and Game Code and can be controlled only as provided by the hunting regulations. However, two exceptions exist for lethal removal of tree squirrels:

Eastern fox squirrels

Eastern fox squirrels found to be injuring growing crops or other property may be controlled at any time and in any legal manner by the owner or tenant of the premises without a permit.



Figure 5. Bark chewed off a branch by the eastern fox squirrel, *Sciurus niger*.

Gray squirrels

Any owner or tenant of land or property that is being damaged or destroyed, or is in danger of being damaged or destroyed by gray squirrels, may apply to the California Department of Fish and Wildlife (CDFW) for a permit to control such squirrels. The Department, upon receipt of satisfactory evidence of actual or immediately threatened damage or destruction, may issue a revocable permit for the removal and disposition of such squirrels.

When a permit to trap the gray squirrel is issued, the Department may designate the type of trap to be used, and may also require that squirrels be released in parks or other nonagricultural areas.

It is not legal to use poison baits to kill any tree squirrel species. Releasing any tree squirrel elsewhere is also illegal unless a proper permit is issued by CDFW.

MANAGEMENT

In urban and suburban areas, tree squirrels are difficult to control because of their great mobility, and because many people feed and provide nest boxes for the squirrels in order to encourage their presence. It is relatively easy to keep squirrels out of buildings, but keeping them out of a yard or garden is a continuous challenge.

Monitoring

The detection of tree squirrels is fairly easy because they are active during daylight hours and are highly visible. If tree squirrels visit your garden or yard on a regular basis, it is likely that damage will occur at certain stages of crop development, particularly with fruit and nut crops. If squirrels are seen in your trees, some kind of preventive action should be taken; squirrels can strip a tree of its crop in a short time.

Habitat Modification

Trees that overhang roofs or are close to telephone lines should be cut back to slow the movement of squirrels about the yard. Anything that can be done to make a garden less attractive to squirrels is helpful.

Exclusion

Screening or blocking all potential entrance sites such as small gaps under the eaves, overlapping roof sections, and knotholes, can prevent tree squirrel access to buildings. Because they often travel on overhead telephone lines, power lines, and fence tops, they frequently find entrances at about these heights. When even a small opening is found, they can enlarge it by gnawing.

In the absence of an obvious entrance, they can gnaw and create an entrance into an attic. Sheet metal or 1/4-inch wire hardware cloth are suitable materials for closing entrances. When closing entry routes, be sure there is not an animal inside the building. One way to test whether any squirrels are remaining is to plug the entrance with a loose wad of newspaper; if any remain inside they will remove the plug to get out.

It is virtually impossible to keep squirrels out of fruit or nut trees because of their superb climbing and jumping ability. Sometimes if there are other unprotected fruit or nut trees available to the squirrels, you can protect the crop of a single tree by netting it as you would to exclude foraging birds. While squirrels can readily gnaw through the plastic netting, they may not persist if enough alternative food is easily available.

Squirrels can be discouraged from digging up newly seeded or established crops by covering the rows with cage-like freestanding covers made of one-inch hexagon chicken wire.

If squirrels are present around bird feeders, they are usually able to raid them and steal the food. Numerous devices and methods are commercially available from specialty catalogs for physically excluding tree squirrels from feeders; some of these work better than others. Tree squirrels are amazingly clever and agile, so just about any feeder is susceptible.

Trapping

Several types of kill traps are useful for tree squirrel removal, but they must be set in a way that will not accidentally trap nontarget animals, including pets. This can be accomplished by placing the trap in a tree, on a rooftop, or inside a box or wire cage with entrances no larger than 3 inches in diameter. Remember, only eastern fox squirrels can be killed without a hunting license or permit.

All-metal tunnel or tube-type traps are becoming more popular for killing eastern fox squirrels (Figure 6). The design of these traps affords good protection to larger nontarget animals, and the trapped animal remains partially out of sight.

The Conibear #110 trap, a jaw-type body-gripping trap, is also an effective tree squirrel trap when set inside a trap box with the bait placed behind the trap.

Several choker-type box traps are sold for removing tree squirrels. They look similar to those used for trapping pocket gophers except that the triggers are

often reversed, so that the bait must be pulled to activate instead of pushed, as is the case with pocket gopher traps.

In fact, a tree squirrel trap can be made by modifying certain wooden choker-type gopher traps. To modify a gopher trap, lengthen the trigger slot with a rattail file so the trigger can swing unhindered and the squirrel can pass beneath the unset trap. Remove the back and replace it with 1/4-inch mesh hardware cloth, which allows the squirrels to see the bait from both ends but prevents access without passing through the trap. For a dual-trap assembly, place two box traps back-to-back and secure them to a board (Figure 7).

Before placing traps, determine the squirrels' travel routes, and locate traps in or as close to them as possible. Trees and rooftops are often good locations for placement.

Locate and secure traps so that they cannot be easily dislodged. Anchor them with a wire or light chain so a predator cannot carry the trap and the captured animal away. Bait the traps but do not set them for several days to allow the squirrels to steal the bait and become accustomed to the trap. Once the bait is regularly eaten, set the traps, and rebait, tying the bait to the trigger with fine thread or string.

Use rubber, latex, nitrile, or plastic gloves when handling dead squirrels. Place dead squirrels in a plastic bag and seal to confine any ectoparasites (fleas, etc.). The securely bagged carcasses can then be discarded in a garbage can.



Figure 6. Tunnel trap set to trap tree squirrels such as the eastern fox squirrel, *Sciurus niger*.



Figure 7. A pair of box-type gopher traps set on tree limb to trap tree squirrels such as the eastern fox squirrel, *Sciurus niger*.

Sometimes ordinary rat snap-traps are suggested for tree squirrels, but these are often not powerful enough to kill mature squirrels and are best not used. There are other kill traps available for squirrel-sized animals, but these are not always sold locally and may have to be ordered from a trapper supply firm.

Live-catch traps. Live-catch cage traps are also available, but once caught the squirrel must be euthanized, presenting a problem for some. Remember, releasing any tree squirrel elsewhere is illegal unless a proper permit is issued by the California Department of Fish and Wildlife beforehand, and the issuance of such a permit is unlikely in most situations.

Methods of euthanasia considered humane by the American Veterinary Medical Association include gassing with carbon dioxide and shooting. Drowning is not an approved method of euthanasia and is illegal in California. Considering this problem, live-catch traps are not recommended in many situations.

A kill trap is usually the most effective way to thin out the population, though new squirrels will move in to fill the void. Trapping usually becomes an ongoing process, once the neighborhood is populated with tree squirrels.

Other Control Methods

Although some chemical repellents are registered for use to keep tree squirrels out of an area, their effectiveness is questionable. There are also repellents that are added to birdseed that are supposed to prevent squirrels from feeding on the seeds. However, these, too, have not shown to be effective.

Tree squirrels quickly become habituated to frightening devices using visual or sound cues, and pay little attention to them after a couple of days. A number of these devices are on the market, but none have proven very effective.

Where shooting is not prohibited and firearms can safely be used, the eastern fox squirrel can be taken (killed) at close range with a pellet gun. Check with local authorities to determine if this method is legal in your area.

Tree squirrels are quick to escape when pursued by predators. Some dogs that have full run of the yard will keep squirrels at bay. Predators in urban and suburban areas generally have little effect on tree squirrel populations.

REFERENCES

- Baldwin, R. A., and R. Meinerz. 2015. Tree squirrels. Pages 284–290 in *Vertebrate Pest Control Handbook*, R. A. Baldwin, editor. Sixth edition. California Department of Food and Agriculture, Sacramento, CA. <http://vpcrac.org/about/vertebrate-pest-handbook>.
- Salmon, T. P., D. A. Whisson, and R. E. Marsh. 2006. *Wildlife Pest Control Around Gardens and Homes*. 2nd ed. Oakland: UC ANR Publication 21385. 122 pp.

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Pest Notes are available at ipm.ucanr.edu.



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phone numbers, or visit: ucanr.edu/County_Offices.

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To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar products that are not mentioned.

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WARNING ON THE USE OF CHEMICALS

Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original, labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Pesticides applied in your home and landscape can move and contaminate creeks, rivers, and oceans. Confine chemicals to the property being treated. Avoid drift onto neighboring properties, especially gardens containing fruits or vegetables ready to be picked.

Do not place containers containing pesticide in the trash or pour pesticides down the sink or toilet. Either use the pesticide according to the label, or take unwanted pesticides to a Household Hazardous Waste Collection site. Contact your county agricultural commissioner for additional information on safe container disposal and for the location of the Household Hazardous Waste Collection site nearest you. Dispose of empty containers by following label directions. Never reuse or burn the containers or dispose of them in such a manner that they may contaminate water supplies or natural waterways.

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