

Vertebrate Pests (Ornamentals)

Problems with vertebrate pests rarely approach the magnitude of the problems caused by weeds, diseases, weather and insects. Under certain circumstances, however, vertebrate pests problems can be significant and difficult to deal with. Specific questions about laws regulating vertebrate pest control should be directed to the Arkansas Game and Fish Commission, 2 Natural Resources Drive, Little Rock, Arkansas 72205, (800) 364-4263 or (501) 223-6300, www.agfc.com. The following information will offer some basic guidelines for determining if vertebrates are a problem and how to control them if they become a problem.

Factors Affecting Control

Several factors complicate the control of vertebrates, including:

- **Mobility.** Certain mammals and birds may come from long distances to damage crops. Thus, they may spend most of their time where they are not a problem.
- **Unpredictability.** Many factors, such as population density, weather and availability of natural food, influence the transition of a normally harmless vertebrate population into the role of a pest problem.
- **Public perception.** The public holds most vertebrates, especially larger ones such as geese or deer, in high esteem. Efforts to control them can then become a complex social problem as well.
- **Legal status.** Most mammals and birds are provided some protection under state and/or federal law as game animals, migratory birds or endangered species. Thus, you need to be aware of the species involved in damage and the legal restrictions relative to controlling it.
- **Control techniques.** Often because of environmental complications or the legal status previously mentioned, control techniques are limited for vertebrate problems. Control may incorporate cultural practices or physical barriers, which admittedly break down under some conditions.

In ornamental plantings in Arkansas, some vertebrate pests that may occur include moles, skunks, armadillos, beavers, rabbits, deer and geese. All of the above except moles

and armadillos are either furbearers or game species and are protected under Arkansas and/or federal wildlife laws. The Arkansas Game and Fish Commission should be consulted for appropriate legal aspects concerning relief from nuisance animals.

Moles

The eastern American mole is the only mole of concern in Arkansas. Moles are not rodents and live underground, preferring moist soil. Moles are 4 to 9 inches long and have a rather short tail. Though rarely seen above ground, the eastern mole can be distinguished from other small mammals by its soft, velvety fur and huge, flattened front feet that are equipped with large, broad claws for digging. Eyes are tiny, like a pinhead, and the tail and feet are usually pink. Moles have no visible ears. Earthworms and insect larvae/grubs are their main food source.

Moles owe their status as pests to the feeding tunnels they construct as they burrow in the surface of lawns and golf courses. Moles dig two kinds of tunnels. The feeding tunnel is made only an inch or two below the surface of the ground by the mole "swimming" through the loose topsoil. This kind of runway leaves a ridge of earth on the surface of the ground. The tunnels interfere with mowing and expose roots to air, sometimes killing grass or other plants. More permanent tunnels are made 6 to 10 inches below the surface, and mounds of earth are thrown up at intervals. From the main tunnel of the mole run, a short shaft extends straight up to the surface. The soil that is expelled from this vertical shaft wells up like water, and successive loads form a nearly circular mound of which there may be "ripple marks" in the form of complete circles.

Toxic baits and fumigants are available for controlling moles; however, these control measures often are not very effective. Toxic baits are often based on peanuts, grain or other food items that are not the mole's preferred food, and thus moles seldom take poisonous baits. Fumigants may be inserted in surface feeding tunnels and may kill moles if they happen to be in the tunnels at the time of the treatment. When the use of poisons seems to be effective, the user has probably either frightened the mole out of his present runway by the scent or has

killed the food upon which the mole feeds. If moles are deprived of their food supply, they will be forced to seek another area. Several insecticides are capable of reducing populations of earthworms and soil insects to a point where the soil no longer provides sufficient food to fulfill the mole's daily requirements. The effect on the moles cannot be expected for several weeks, and moles can cause increasing damage as they search in a decreasing food supply.

Mole Control Techniques

The most effective method for controlling moles is the use of lethal traps, though this method is also time-consuming. Traps must be carefully placed so as not to arouse the suspicions of moles, which are very sensitive to unnatural changes in their environment.

To establish which tunnels are active, step down on tunnels in several places in the yard. Mark the tamped area with a peg or wire flag. If the tunnel has been pushed back up in a day or so, set the trap in that section of the tunnel. Seek a long, straight runway for setting the trap.

Three trap types are the harpoon, scissor-jawed and choker loop. The scissor-jawed and choker traps require digging and exposing the tunnel. The jaws or loops are set to encircle the tunnel and are triggered when the mole moves through the trap. The harpoon trap is set directly over the runway so that the supporting stakes straddle the runway and its spikes go into the runway. The trap is triggered when the mole's tunneling activity causes the soil to strike the pan and trigger the spikes. Set the trigger pan where it just touches the earth where the soil is packed down. Setting the trigger too high or too low will result in misfires. If any of these traps fail to catch a mole after 2 or 3 days, move the trap to a new location.

When using traps:

- Place a plastic pail with a warning sign over each trap.
- An average set will require 3 to 5 traps per acre.
- Check the trap every day.

Skunks

The striped skunk is the species most commonly encountered in Arkansas. They are black in color with distinctive white stripes that

extend laterally over the back. The adults normally weight about 6 to 8 pounds and are 24 to 30 inches long. Skunks have short, stocky legs and disproportionately large feet equipped with well-developed claws for digging. Skunks are usually active from early evening through most of the night. During the day they usually sleep in dens under logs, woodpiles or buildings.

The high nuisance value attributed to skunks is caused by their habit of burrowing in flowerbeds, lawns and golf courses in search of food. Skunks are carnivores and eat insects such as grasshoppers, beetles and crickets, as well as mice, moles, young rabbits, grubs, bees, wasps and their hives. Skunks also eat fruits, some grasses, leaves, buds, roots, nuts and grains. Insects, however, are a preferred food, and skunks often tear up and destroy turf during their search for white grubs and other insect larvae. Digging normally appears as 3- to 4-inch cone-shaped holes or patches of overturned sod. This grubbing activity is most common in the spring and fall when larvae are found near the soil surface.

Skunks are classified as furbearers and as such are protected in Arkansas by state regulations. A hunting license is required from the Arkansas Game and Fish Commission for either live trapping or administering lethal methods of control. With a hunting license, skunks may be live-trapped or killed during furbearing season. If skunk problems need to be handled outside furbearing season, a depredation permit is required. Contact the Arkansas Game and Fish Commission for information on obtaining this permit. Note that a depredation permit does not include permission to shoot skunks when local law prohibits discharge of firearms.

Skunks can carry rabies, and thus skunks that are overly aggressive or show abnormal behavior should be treated cautiously. The Arkansas Department of Health suggests that any skunk that is observed during daylight is acting abnormally and should be destroyed to prevent the spread of rabies. Contact the local animal control or sheriff's office for assistance with disposing of a rabid skunk. Avoid shooting or striking the head to protect against damaging the brain for testing for rabies, and keep in mind that most skunks will release their scent when shot, so try to avoid shooting them near buildings. If removing a potentially rabid skunk, gloves and/or shovels should be used. Place the skunk in a sealed plastic bag and bury the carcass where pets will not dig it up.

Skunk Control Techniques

Removal and relocation in combination with exclusion methods oftentimes is the best option for addressing skunk problems. Shooting is also an option, where legal and with proper hunting license or depredation permit. There are no toxicants or repellents registered for skunks.

Typically, skunk problems involve removing and excluding skunks from a den site. Avoid skunk removal from May through early August when den-bound, immobile young may be present. A combination of live trapping, relocation and exclusion are recommended as follows.

- **Live trapping.** Bait live traps with a few tablespoons of pet food having a fish base. When using a wire cage trap, place a tarp or plywood shell around the cage. Check the trap frequently, particularly in the summer, as skunks could die from excessive heat, leading to accusations of inhumane treatment. After a skunk is trapped, cover the opening so the skunk cannot see. With a minimum of jarring or shaking, the trapped skunk can be transported and released with little concern for a musk discharge. Leg-hold traps can be used to catch skunks, but because of odor problems, this method should not be used near housing.
- **Relocation.** When relocating skunks, transport them at least 10 miles and release in habitat far from human dwellings.
- **Exclusion.** Typically, more than one skunk occupies a denning site. Seal off all foundation openings except one. Cover openings with wire mesh, sheet metal or concrete. Skunks may dig to gain entry, so obstructions such as fencing should be buried 1 1/2 to 2 feet. In front of the remaining opening, spread a layer of flour on the ground. Typically, skunks are active at night. Check at night for tracks indicating the skunks have left the den and then seal the opening. To ensure no skunks are sealed inside, use one or both of the following approaches.
 - For several successive nights, unseal one opening at dark and place flour on the ground. After a couple hours, check for tracks exiting the den and reseal the opening. If no tracks are detected after several nights, seal the opening permanently.
 - Place a trap inside the sealed up area. Bait with pet food and water. Remove

and translocate any trapped skunks. Repeat until no skunks are trapped on successive days.

Odor Abatement

When a skunk raises its tail, it is a warning. When a skunk's hind legs begin hopping, leave the vicinity as quickly as possible. Ordinarily, there is no discharge. But, if a skunk believes it is in danger, one discharge will not empty the reservoir. Many people find the odor repugnant or even nauseating. Because of its persistence, the scent is difficult to remove. Diluted solutions of vinegar or tomato juice can have limited effectiveness when applied to pets, people or clothing. Clothing can be soaked in weak solutions of household chlorine bleach or ammonia, but oftentimes the clothing is also ruined using this treatment. For spraying under foundations or structures, a number of skunk deodorizers are on the market. These offer some relief by masking, rather than removing, the odor.

Armadillos

The armadillo is mainly nocturnal during the summer and may be diurnal during the winter. It digs burrows that are usually 7 inches to 8 inches in diameter and as much as 15 feet in length. The burrows are located in rock piles and around stumps, brush piles and dense woodlands. More than 90 percent of the armadillo's diet consists of insects, but the animals also feed on lizards, frogs, snakes, bird eggs, berries, fruits and roots. An armadillo pursuing insects in the ornamental landscape or in turf will tear and uproot an area similar to skunks but at somewhat deeper depths.

The young are born in a nest within the burrow. The female produces only one litter each year in March or April. The litter always has quadruplets of the same sex and each appears identical since they are derived from a single egg. The armadillo has poor eyesight but a rather keen sense of smell. In spite of its cumbersome appearance, the agile armadillo can run well when in danger.

Armadillo Control Techniques

Since most of the damage caused by armadillos is a result of their rooting for insects and other invertebrates in the soil, an insecticide may be used to remove the food sources and make areas less attractive to armadillos. Also, trapping armadillos has proven to be a fairly

successful elimination method. Armadillos can be captured in live or box traps such as the Havahart or Tomahawk. If bait is desired, use overripe or spoiled fruit. Other suggested baits are fetid meats or mealworms.

Beavers

Beavers are classified as furbearers and as such are protected in Arkansas by state regulations. A hunting license is required from the Arkansas Game and Fish Commission for either live trapping or administering lethal methods of control. With a hunting license, beavers may be live-trapped or killed during furbearing season. If beaver problems need to be handled outside furbearing season, a depredation permit is required. Contact the Arkansas Game and Fish Commission for information on obtaining this permit. Note that a depredation permit does not include permission to shoot beavers when local law prohibits discharge of firearms.

In Arkansas, beavers rarely present a problem in the urban landscape, but when they do, they gnaw and fell trees and dam drainages, flooding yards, parks and other areas. The only way to manage a beaver problem in urban landscapes is to live trap and relocate the beavers. Shooting is seldom an option in urban situations. Likewise, there are no pesticide products for repelling beavers. To obtain assistance in controlling beavers, contact the Arkansas Game and Fish Commission

Rabbits

Rabbits are considered game species and are protected under Arkansas and/or federal wildlife laws. The Arkansas Game and Fish Commission should be consulted for appropriate legal aspects concerning relief from nuisance animals. While being desired as small-game animals, rabbits can also be serious pests, particularly during the winter when they browse on the bark and branches of ornamental trees and shrubs. When natural controls fail to keep rabbit populations within tolerable limits, nursery and landscape managers may be forced to implement control measures on their properties.

One frequently overlooked control measure is removing brush piles, stone and trash heaps, weed patches and other structures that rabbits use for refuge. By eliminating this "cover," managers are making their properties less desirable rabbit habitats.

No lethal chemicals are registered for rabbit control, although a wide variety of repellents is available. Repellents are sometimes used to help reduce plant damage. Rabbits may eat repellent-treated plant parts when more palatable food is not available. Repellents should be applied to plant parts that will be within the reach of rabbits when snow is on the ground. Because all repellents degrade due to rain, wind and sunlight, several applications may be necessary.

Live trapping and removal is another approach to rabbit control that helps reduce plant damage and preserves a small-game resource. Generally, rabbits forage in an area of only a few acres. Transferring captured rabbits to an appropriate area outside this range makes their return unlikely.

Tree guards are probably the surest way to prevent rabbit damage. When installing these guards, be certain that the barrier will extend above the snow cover. A two-foot chicken wire fence around the perimeter of a garden can eliminate damage problems for a relatively small investment. In some areas, rabbit problems will reoccur, although sporadically.

Deer

Deer are one of the most prized of Arkansas' wildlife species. Deer hunting alone contributes millions of dollars to the state's economy, but the big-game animal is also a cherished sight for vacationers and landowners alike. Deer, however, also feed on nursery and landscape plants, sometimes causing serious losses. Because deer are a public resource, managers whose plants are killed or damaged by feeding must rely on protective controls like frightening devices, repellents and fences. Where allowed, hunting during the legal season may also be a solution to deer problems. A variety of repellents are available. These repellents range from human hair placed in small mesh bags and hung from branches to a number of commercial products. Two types of repellents, contact and area, are frequently used. Contact repellents, such as hot pepper sauce, are applied directly on the plants to be protected. Unlike contact repellents, which make treated plant parts unpalatable, area repellents repel by smell alone.

Fences are the only sure way to eliminate deer damage. Both wire-mesh and electric fences are used. Electric fences are cheaper to build than mesh fences but are more expensive

to maintain and may fail for a variety of reasons. There are a number of deer-fence designs, and researchers are continually working on improvements.

Geese

Wild geese are a federally protected migratory species. Domestic geese, such as white geese and graylags, are not under the jurisdiction of the Arkansas Game and Fish Commission or the federal government. Because wild geese are federally protected, USDA Wildlife Services (501-362-5382, 870-673-1121) can provide the best information concerning alternatives for controlling geese problems. Resident Canada geese should be referred to the Arkansas Game and Fish Commission (800-364-4263).

Canada geese need a permanent body of water on which to land, escape, rest and roost. They also need a suitable open feeding area that provides a place to land, has good visibility of the surrounding territory and has abundant tender young grass and other vegetation for feeding. Canada geese in Arkansas consist of both migratory and nonmigratory populations. Migratory birds nest in Canada and migrate south for the winter.

Most complaints about damage come from areas where birds congregate in public or private ponds and feed in mowed areas in parks, near beaches and on golf courses and lawns. Fecal droppings damage lawns and golf greens and can limit recreational use of the area. Fecal contamination of water may pose a local pollution problem, although typically it is not a threat to human health. Geese defending their territory can injure people who come too close.

Goose Control Techniques

Hunting

Geese may be taken during declared open hunting seasons. Hunting, where safe and legal, is the preferred method of reducing nonmigratory waterfowl, and over time, may serve to decrease damage. Hunting also makes frightening techniques more effective. In some cases, local ordinances would need to be changed to permit hunting in nontraditional areas such as parks and golf courses. Special restrictions on hours and dates open to hunting can be implemented. Contact the Arkansas Game and Fish Commission for current information on waterfowl hunting regulations and seasons.

Discontinue Feeding

Well-fed domestic “park ducks” and geese serve as decoys, encouraging wild birds to congregate in unnaturally high concentrations. Therefore, discontinued feeding should be the first control measure.

Frightening

Geese can be repelled by almost any large foreign object or mechanical noise-making device. Frightening devices should be in place before the start of the damage season to prevent geese from establishing a use pattern. To prevent birds from becoming accustomed to the frightening device, it should be moved every 2 or 3 days and used in varying combinations.

Visual repellents such as flags, balloons and scarecrows can be used at a density of one per 3 to 5 acres before waterfowl settle into the area. If birds are already present, an additional one or more visual repellents per acre may be necessary. Because geese can quickly acclimate to stationary visual repellents, reinforcement with audio repellents may be necessary. A unique “nonstationary” visual repellent on the market is a simulated floating alligator head for small ponds. However, the effectiveness of this product has not been studied.

Pyrotechnics, shell crackers or other noise-making devices can be effective if used before birds become established. A disadvantage is that neighbors may not appreciate the loud noises that are produced. A less-invasive product on the market is a programmable electronic device that plays recorded goose alarm calls in random combinations. The recordings can be set to play at dawn and dusk using multiple speakers to create natural sound patterns of disturbed geese.

Dogs trained to chase waterfowl have been used to protect golf courses and orchards. In certain situations, they can be very effective, such as when geese become adapted to pyrotechnics and other forms of hazing. Dogs can be free running, on slip-wires, tethered, contained by an underground “invisible fence” or controlled by a handler. On one golf course in Oregon, a professional dog trainer used four border collies to frighten geese three to five times per day for the first several days. The geese soon left, and hazing diminished over time. The golf course purchased one dog to continue the program.

All applicable laws must be observed when using these devices, particularly those governing loud noises, discharging of firearms, use of

pyrotechnics and use of free-ranging dogs. Note that nesting waterfowl cannot be harassed without a federal permit. In addition, flightless geese should not be harassed.

Habitat Modification

There are several ways to make a pond and its surroundings unattractive to waterfowl. However, these practices may also degrade habitat quality for other wildlife and fish species, so use with caution. Constructing an abrupt 18- to 24-inch vertical bank at the water's edge will deter geese. On levees or banks, use large boulder riprap, which geese cannot easily climb over. Eliminate emergent aquatic vegetation with herbicides or an aquatic weed harvester or by temporarily draining the pond. If possible, allow woody brush to grow around shorelines.

On lawns or areas surrounding ponds, reduce or eliminate fertilizer applications so that grass is less nutritious for grazing waterfowl. If possible, increase grass height to 10 to 14 inches, especially along shorelines. Consider replacing large lawn areas with clumps of shrubs or trees, ground covers such as myrtle or less palatable grass species such as fescue. Planting trees will interfere with the birds' flight paths, and shrubs reduce the birds' ability to see from the ground. Landscaping techniques that reduce the birds' view to less than 25 to 30 feet discourages grazing, especially if harassment programs are also used.

Exclusion

Canada geese may be discouraged from using ponds by installing a 30- to 36-inch high poultry wire fence at the water's edge. (This technique, however, is not effective for ducks.) Geese are reluctant to pass under a wire fence, so installing a single-strand fence or one made of Mylar flashing tape at a height of about 15 inches may discourage geese from entering an area. Good results have been reported using 20-pound test, or heavier, monofilament line to make a two- to three-strand fence in situations where aesthetics preclude the use of wire fencing. String the first line 6 inches off the ground, with each additional line spaced 6 inches above the preceding line. Suspend thin strips of aluminum foil at 3- to 6-foot intervals along lines to increase visibility of the barrier for wildlife and people.

To stop waterfowl from using lakes, ponds or reservoirs, construct overhead grids of thin cable visible to both humans and waterfowl. White or brightly colored cables may improve visibility. Because these materials are extremely light, several hundred feet can be supported between two standard 5-foot steel fence posts. Grids on 20-foot centers will stop geese, and grids on 10-foot centers will stop most ducks. When necessary, grid lines should be installed high enough to allow people and equipment to move beneath them. Excessive rubbing will result in line breakage, so grid wires should be tied together wherever lines cross. Attach lines independently to each post and not in a constant run, to prevent having to rebuild the entire grid if a line breaks. Polypropylene UV-protected netting can be used to provide total exclusion from a lake or pond. Support the netting with 0.19-inch 7 x 19 strand galvanized coated cable on 20-foot centers.

Repellents

Repellents can be effective for short-term control. Methyl anthranilate is a chemical that has taste and olfactory repellent properties that can be sprayed on turf. Other chemicals may be on the market as well. Once the repellent dries, it does not wash off the grass, even in heavy rain. However, mowing treated grass will expose untreated grass to geese and reduce the repellent's effectiveness. One study of a product with methyl anthranilate indicated that treating the first 100 feet of turf from the water's edge reduced bird activity over the remainder of the area; therefore, treating the entire area was unnecessary. Additionally, methyl anthranilate was mixed and applied with the herbicide 2,4-D, which did not change its effectiveness in repelling geese. Repellents, when used in combination with other techniques, may help reduce goose damage to lawns, golf courses and other turf areas.

Summary

The key to controlling nuisance flocks of geese is promptness and persistence. Methods of controlling damage will work only as well as their implementation. Once nuisance waterfowl are gone from an area, the area must be made unattractive to waterfowl so they will not return. As soon as one goose or duck lands, it should be frightened until it leaves. Otherwise, the bird will act as a decoy and attract others.