

X — ANIMAL DAMAGE CONTROL

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ANIMAL DAMAGE CONTROL

C. S. DEPERNO, Department of Forestry

GENERAL PRACTICES

Before undertaking any control measures, read the North Carolina law regarding Wildlife Killed for Depredations or Accidentally (15 NCAC 10B.0106).

Damage caused by rodents, other mammals, and birds can be prevented or reduced by one or more of the following practices.

1. Removing or minimizing available food, water, and shelter. This includes general cleanup, rodent-proofing, and bird-proofing.
2. Using repellents.
3. Capturing offenders and releasing them away from the problem area.
4. Eliminating the offenders by trapping, shooting, or poisoning.

North Carolina legislation restricts the use of pesticides on wild birds and mammals to species that are not protected by the N.C. Wildlife Resources Commission and that have been *classified as pests* by the N.C. Pesticide Board.

Currently, five rodent and eight bird species have been classified as unprotected pests, and pesticides may be used in controlling these species subject to specific restrictions of the Pesticide Board.

These species are: Norway rat, black rat (roof rat), house mouse, pine vole and meadow vole, common grackle, boat-tailed grackle, brown-headed cowbird, red-winged blackbird, starling, English sparrow, pigeon, and gulls (near airports).

Federal, state, and local laws on animal control are rather strict and subject to change. Contact authorities at the N.C. Wildlife Resources Commission (512 N. Salisbury St., Raleigh, NC 27611; 919-662-4381); or State Director, USDA-APHIS, Wildlife Services (6213-E Angus Dr., Raleigh, NC 27617; 866-487-3297 or 786-4480) to clarify the current legal status of a particular control practice.

Report any rabid animals or suspected rabid animals to the local health department.

Traps or chemicals mentioned in this section can usually be purchased at hardware or farm supply stores. If not locally available, check with your county Extension agent.

For more information, the following publications are available at your county Cooperative Extension center:

Wildlife Damage Control: Controlling Vole Damage in Commercial Orchards and Ornamental Nurseries, AG-472-1;

Wildlife Damage Control: Snakes, AG-472-2; and

Wildlife Damage Control: Beavers, AG-472-4.

WILDLIFE KILLED FOR DEPREDATIONS OR ACCIDENTALLY

15A N.C. ADMINISTRATIVE CODE 10B .0106

a) Depredation Permit

1) **Endangered or Threatened Species.** No permit shall be issued to take any endangered or threatened species of wildlife listed under 15A NCAC 10I by reason of depredations to property. An individual may take an endangered or threatened species in immediate defense of his own life or of the lives of others without a permit. Any endangered or threatened species which may constitute a demonstrable but nonimmediate threat to human safety shall be reported to a federal or state wildlife enforcement officer, who, upon verification of the report, may take or remove the specimen as provided by 15A NCAC 10I .0102.

2) **Other Wildlife Species.** Except as provided in Subparagraph (1) of this Paragraph, the Executive Director or an agent of the Wildlife Resources Commission may, upon application of a landholder and after such investigation of the circumstances as he may require, issue a permit to such landholder to take any species of wildlife which is or has been damaging or destroying his property provided there is evidence of substantial property damage. No permit may be issued for the taking of any migratory birds and other federally protected animals unless a corresponding valid U.S. Fish and Wildlife Service depredation permit has been issued. The permit shall name the species allowed to be taken and, in the discretion of the Executive Director or an agent, may contain limitations as to age, sex or any other condition within the species so named. The permit may be used only by the landholder or another person named on the permit.

Wildlife Damage Control Agents. Upon satisfactory completion of Wildlife Resources Commission approved training and satisfactory demonstration of a knowledge of wildlife laws and safe, humane wildlife handling techniques, an individual may apply to the Wildlife Resources Commission (Commission) to become a Wildlife Damage Control Agent (WDCA). Those persons approved as agents by the Commission may then issue depredation permits to landholders and list themselves as a second party to provide the control service. WDCAs may not issue depredation permits for big game animals, bats, or species listed as endangered, threatened or special concern under Rules 10I .0103, .0104, and .0105 of this Chapter. WDCAs must report to the Wildlife Resources

Commission the number and disposition of animals taken, by county, annually. Records must be available for inspection by a Wildlife Enforcement officer at any time during normal business hours. WDCA status may be revoked at any time by the Executive Director when there is evidence of violations of wildlife laws, failure to report, or inhumane treatment of animals by the WDCA. WDCAs may not charge for the permit but may charge for their investigations and control services. To maintain a knowledge of current laws, rules, and techniques, WDCAs must renew their agent status every three years by showing proof on having attended at least one Wildlife Commission approved training course provided for the purpose of reviewing and updating information on wildlife laws and safe, humane wildlife handling techniques within the previous 12 months.

b) *Term of Permit*

Each depredation permit issued by the Executive Director or an agent shall have entered thereon a date or time of expiration after which date or time the same shall become invalid for any purpose, except as evidence of lawful possession of any wildlife that may be retained thereunder.

c) *Manner of Taking*

1) **Taking Without a Permit.** Wildlife taken without a permit while committing depredations to property may, during the open season on the species, be taken by the landholder by any lawful method. During the closed season such depredating wildlife may be taken without a permit only by the use of firearms.

2) **Taking With a Permit.** Wildlife taken under a depredation permit may be taken only by the method or methods specifically authorized by the permit. When trapping is authorized, to limit the taking to the intended purpose, the permit may specify a reasonable distance from the property sought to be protected, according to the particular circumstances, within which the traps must be set. The Executive Director or agent may also state in a permit authorizing trapping whether or not bait may be used and the type of bait, if any, that is authorized. In addition to any trapping restrictions that may be contained in the permit the method of trapping must be in accordance with the requirements and restrictions imposed by G.S. 113-291.6 and other local laws passed by the General Assembly. No depredation permit shall authorize the use of poisons or pesticides in taking wildlife except in accordance with the provisions of the North Carolina Pesticide Law of 1971, the Structural Pest Control Act of 1955, and Article 22A of Chapter 113 of the General Statutes of

North Carolina. No depredation permit shall authorize the taking of wildlife by any method by any landholder upon the lands of another.

3) **Intentional Wounding.** It is unlawful for any landholder, with or without a depredation permit, intentionally to wound a wild animal in a manner so as not to cause its immediate death as suddenly and humanely as the circumstances permit.

d) *Disposition of Wildlife Taken*

1) **Generally.** Except as provided by the succeeding Subparagraphs of this Paragraph, any wildlife killed accidentally or without a permit while committing depredations shall be buried or otherwise disposed of in a safe and sanitary manner on the property. Wildlife killed under a depredation permit may be transported to an alternate disposal site if desired. Anyone in possession of carcasses of animals being transported under a depredation permit must have the depredation permit in their possession. Except as provided by the succeeding Subparagraphs of (d)(2) through (6) of this Rule, all wildlife killed under a depredation permit must be buried or otherwise disposed of in a safe and sanitary manner.

2) **Deer.** The edible portions of up to five deer may be retained by the landholder for consumption but must not be transported from the property where the depredations took place without a valid depredation permit. An enforcement officer, if so requested by the permittee, shall provide the permittee a written authorization for the use by a charitable organization of the edible portions of the carcass. The nonedible portions of the carcass, including head, hide, feet, and antlers, shall be disposed of as specified in Subparagraph (1) of this Paragraph or turned over to a wildlife enforcement officer for disposition. When a deer is accidentally killed on a road or highway by reason of collision with a motor vehicle, the law enforcement officer who investigates the accident shall, upon request of the operator of the vehicle, provide such operator a written permit authorizing him to possess and transport the carcass of such deer for his or her personal and lawful use, including delivery of such carcass to a second person for his private use or the use by a charitable organization upon endorsement of such permit to such person or organization by name and when no money or other consideration of value is received for such delivery or endorsement.

3) **Fox.** Any fox killed accidentally by a dog or dogs, motor vehicle, or otherwise shall be disposed of as provided by Subparagraph (1) of this Paragraph. Any fox killed under a depredation permit may be disposed of in the same manner or, upon compliance with the

fur tagging requirements of 15A NCAC 10B .0400, the carcass or pelt thereof may be sold to a licensed fur dealer. Any live fox taken under a depredation permit may be sold to a licensed controlled hunting preserve for fox in accordance with G.S. 113-273(g).

- 4) **Furbearing Animals.** The carcass or pelt of any furbearing animal killed during the open season for taking such furbearing animal either accidentally or for control of depredations to property, whether with or without a permit, may be sold to a licensed fur dealer provided that the person offering such carcass or pelt for sale has a valid hunting or trapping license, provided further that, bobcats and otters may only be sold upon compliance with any required fur tagging requirement set forth in 15A NCAC 10B .0400.
- 5) **Animals Taken Alive.** Wild animals in the order Carnivora and beaver shall be humanely euthanized either at the site of capture or at an appropriate facility designed to humanely handle the euthanasia or released on the property where captured. Animals transported or held for euthanasia must be euthanized within 12 hours of capture. Anyone in possession of live animals being transported for relocation or euthanasia under a depredation permit must have the depredation permit in their possession.
- 6) **Wild Birds or Animals Killed Accidentally With Motor Vehicles or Found Dead.** A person killing a wild bird or wild animal accidentally with a motor vehicle or finding a dead wild bird or wild animal which was killed accidentally may possess that wild bird or wild animal for a period not to exceed 10 days for the purpose of delivering it to a licensed taxidermist for preparation. The licensed taxidermist may accept the wild bird or wild animal after satisfying himself that the animal was killed accidentally. The taxidermist shall certify and record the circumstances of acquisition as determined by his inquiry. Licensed taxidermists shall keep accurate records of each wildlife specimen received pursuant to the Rule as required by Rule 10H .1003 of this Chapter. Upon delivery of the finished taxidermy product to the person presenting the animal, the taxidermist shall give the person a receipt in the form required by the Wildlife

Resources Commission indicating the species, date of delivery, circumstances of initial acquisition and any other information that may be required on the form. A copy of this receipt shall be filed with the Wildlife Resources Commission within 10 days of the date of delivery of the mounted specimen. The receipt shall serve as the non-transferable permit for continued possession of the mounted specimen and shall be retained by the person for as long as the mounted specimen is kept. Mounted specimens possessed pursuant to this Rule may not be sold and, if such specimens are transferred by gift or inheritance, the new owner must apply for a new permit and must submit the written receipt originally obtained from the taxidermist to document the legality of possession. This provision does not allow possession of accidentally killed raptors; migratory birds; species listed as endangered, threatened, or of special concern under Rules 10I .0103, .0104, and .0105 of this Chapter; bear or wild turkey.

e) *Reporting Requirements*

Any landholder who kills a deer, bear, or wild turkey under a currently valid depredation permit shall report such kill on the form provided with the permit and mail the form immediately upon the expiration date to the Wildlife Resources Commission. The killing and method of disposition of every game animal and game bird, every furbearing animal, and every nongame animal or nongame bird for which there is no open season, when killed for committing depredations to property, without a permit, shall be reported to the Wildlife Resources Commission within 24 hours following the time of such killing, except that when the carcass or pelt of a fox, killed under a depredation permit, or of a furbearing animal, killed with or without a permit, is lawfully sold to a licensed fur dealer in this state the fur dealer is required to report the source of acquisition and no report is required of the seller.

If you have questions, contact:
N.C. Wildlife Resources Commission
NC State University Centennial Campus
1751 Varsity Drive
Raleigh, NC 27606
1-919-707-0010

DESCRIPTION OF POTENTIAL ANIMAL PESTS

C. S. DEPERNO, Department of Forestry

TABLE 10-1. DESCRIPTION OF POTENTIAL ANIMAL PESTS

Animal	Description	Indicators or Signs of Presence	Range and Habits	Bait or Control
BAT*	At least nine species. Mouselike body 3 to 5.5 in. long, including tail, wingspread 6 to 16 in. Prominent ears.	Strong odor, noise, or movement, and squeaking. Brown stains (rubs) near openings or vents in roof. Bats seen entering or leaving premises at dusk or dawn.	Statewide. Roosts in caves, hollow trees, attics, and walls by day. Nocturnal, insectivorous. Some species hibernate in attics, but most are migratory.	See ANIMAL CONTROL SUGGESTIONS.
BEAVER*	Very large rodent with brown to reddish brown fur, large orange incisors, and a large, flat, scaly tail. Weight up to record of 120 lb, length to 48 in, including an 11-in. scaly tail. Webbed hind feet to 7 in. long.	Girdled and felled trees, mud and stick dams, trails to terrestrial feeding sites. Dens may be lodge style of sticks and mud in middle of pond or on bank.	Statewide. Eats wide variety of herbaceous and woody plant material. Most active from dusk till dawn. Needs constant supply of water; ponded areas may cover a hundred or more acres in flat terrain. Potential for significant timber loss in bottomland drainages.	Protect gardens with electric fence, individual trees with wire mesh and pond drains with a wire cage. Remove local populations by trapping. No depredation permit needed. See AG-472-4.
BOBCAT*	Brown and buff mixed with black and gray. Weight 15 to 35 lb. Total length 24 to 40 in. Short tail. Bobbing motion noticed while running.	Will cache food; vegetation scratched over remains of kill. Round, 2-in. footprints without claw marks. Droppings contain bone fragments and mouse and/or rabbit hair.	Statewide. Prefers thickets, river bottoms, swamps, and brushy areas. Seldom seen. Feeds primarily on rodents, rabbits, poultry, birds, amphibians, and rarely on livestock and game.	Use a No. 2 or 3 steel foot trap. Hunt or use predator call for sport. Check NCWRC laws and regulations for details.
CHIPMUNK*	Small, striped, squirrel-like rodent; grayish or reddish brown.	1.5- to 2-in. open burrows with few signs of digging.	Piedmont and western part of state. May dig flower bulbs or seeds. Occasionally damages truck crops. Hibernates.	Use a small box-type live trap or kill trap (wooden-base rat snap) placed under a board or bucket at holes or near runways.
COTTON RAT* (field rat)	Up to 12 in. long, including 5-in. tail; dark brown, grizzled appearance. Scaly and nearly hairless tail. Hindfoot to 1.3 in. long.	Trails in grass, nests of cut grass usually above ground. Burrows with several 1.5- to 2-in. openings.	Statewide. Lives in dense cover, field edges, and wet sites. May damage alfalfa, cotton, and row crops.	Use a small box-type live trap or kill trap (wooden-base rat snap) placed under a board or bucket at holes or near runways.
COWBIRD*†	Robin-sized. Males glossy black with brown head. Females plain gray with pale throat.	Damage to corn occurs when grackles expose ears.	Statewide, chiefly in eastern half. Forms large winter roosts with red-winged blackbirds and starlings.	See ANIMAL CONTROL SUGGESTIONS.
COYOTE*	Medium dog size, 20 to 50 lb. Gray or reddish-gray hair. Ears pointed, muzzle long and narrow, and a bushy tail. Length from tip of nose to end of tail up to 48 inches.	Hindfoot diameter is 2 to 2 ¾ inches with claw marks. Scat is doglike and often contains hair and bone. Dens at bases of trees in cultivated fields and pastures, brush covered slopes, sandy ridges and caves.	Statewide. All habitats. Eats vegetables, crops, rodents, fruits, poultry, game, and livestock. Will scavenge.	Shoot, trap, and animal husbandry practices.
CROW*† (American and Fish)	Abundant in the state. Solid black; about 17 in. long with long, rounded wings. Larger than blackbird.	Roosting in trees along planted fields. Uprooted seedlings; mature corn opened and shattered.	Statewide, except for high mountain peaks.	See ANIMAL CONTROL SUGGESTIONS.
ENGLISH SPARROW	Small, reddish brown; upper parts streaked with black. Gray underparts. Males have black throat and gray cap.	Soiling of feed lots and window ledges.	Statewide. Feeds and roosts in flocks of 100 to 300 birds. Frequents feed lots; roosts on ledges of buildings and in trees, vines, and shrubs.	See ANIMAL CONTROL SUGGESTIONS. No depredation permit needed.
FIELD MOUSE,* DEER MOUSE, WHITE-FOOTED MOUSE	Up to 6 in; tan above, light below; tail furred and bicolored. Large ears and eyes.	0.75-in. footprints and tail drag marks. Seed dug when no sprout visible. Sprouts dug from side, not pulled. Holes in bare, freshly planted fields and sparse cover.	Statewide. Often follows other rodent burrows.	Trap with small snap or mouse-size box traps or use glue boards within residences. See RODENTICIDE section.
FLYING SQUIRREL	Head and body 6 in. with 4-in. tail. Unique folds of loose skin on sides of body allow gliding. Thick, soft fur is gray.	Seldom seen; active at night. Eats seeds, nuts, insects, and bird eggs.	Statewide. Lives in holes in trees, buildings.	Invades attics where movements and food storage usually require removal by trapping. See ANIMAL CONTROL SUGGESTIONS.
GRACKLE*† (Common and boat-tailed)	Slightly larger than robin; long, keel-shaped tail. Iridescent, glossy black.	Sprouting corn pulled up. Mature corn ears opened and shattered.	Statewide, chiefly in eastern half. Forms large winter roosts with red-winged blackbirds, cowbirds, and starlings.	See ANIMAL CONTROL SUGGESTIONS.
GRAY FOX*	Small dog-sized, to 15 lb and measures 32 to 45 inches long from nose to tip of tail. Bushy tail is black-tipped with a black central stripe. Grizzled gray to reddish color.	Small, dainty, doglike tracks, 1 to 2 in. wide with claw marks. Large burrows under rocks or in hollow logs or dens in piles of sawdust. Climbs trees readily.	Statewide. Prefers brush, timbered, and swampy areas. Mostly nocturnal. Opportunistic carnivore. Eats rodents, squirrels, birds, eggs, turtles, insects, fruits, poultry, and game.	Occasional rabies carrier. Report any rabid animals or suspected rabid animals to local health department. Contact N.C. Wildlife Commission about depreddating animals.

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Animal	Description	Indicators or Signs of Presence	Range and Habits	Bait or Control
GRAY SQUIRREL	Up to 18 in. long; excellent tree climber; bushy tail; grayish color. Tail 8 1/2 in. long.	Twigs clipped; fruit and nuts of large trees eaten; footprints 2 to 2.5 in.	Lives close to trees and shrubs; eats nuts and fruits and occasionally girdles bark; may move into attics.	See ANIMAL CONTROL SUGGESTIONS.
GROUNDHOG* (Woodchuck)	A large, grizzled brown, burrowing rodent. Weight 4 to 15 lb. Thick bodied, short tail, short legs, coarse fur.	Large burrows with earth mounded and scattered at entrance in fence rows, hedgerows, meadows, hayfields, and edges of woods.	Mountains through piedmont. Multiple entrances to den. Mainly vegetarian. Hibernates during the winter.	Use body grip or box-type live trap. Shoot.
GULLS*†	Robust birds with long, pointed wings and webbed feet. Tails usually square.	Large flocks near dumps, cultivated fields, lakes, and rivers.	May be seen occasionally in the piedmont but more common near the coast.	See ANIMAL CONTROL SUGGESTIONS.
HOUSE MOUSE	Up to 5 in.; long, nearly hairless tail; body about same color top and bottom.	Feed sacks cut; holes 1 in. and less; footprints less than 0.5 inch. Nests on finely shredded material. Black-colored droppings the size of grains of rice.	Statewide. Lives in walls, furniture, feed sacks, and other enclosures. Can live without water for a long time.	Trap with small snap or mouse-size box traps or use glue boards within residences. For poison, see RODENTICIDE section.
HOUSE RAT (Norway)	Up to 18 in. long; tail length less than head and body; dark brown color; hindfoot 1.5 in. or more.	Feed sacks cut; gnawed holes; droppings up to 0.75 in., footprints 1.5 in.; underground burrows nearby.	Statewide. Good climber. Lives at ground level in burrows, litter, walls, and other protective enclosures.	Use environmental control. Minimize food, shelter, and water. Set snap traps and rat-size glue boards. For poison, see RODENTICIDE section. No depredation permit needed.
MEADOW VOLE* (Meadow Mouse)	3.5- to 5-in.-long body and head; tail longer than length of hind leg; dark brown color. Tail bicolored. Lighter belly. Rather long, grizzled fur.	Small, shallow burrows and trails in grass. Trees or shrubs gnawed from ground level up under mulch or snow cover.	Statewide. Damage occurs to trees and shrubs from slightly below ground level and up. Lives in areas of dense cover.	Environmental control through close mowing or clean cultivation. Use of mouse traps placed in runs and covered with tar paper or large flower pot is the only control method available to home owners. For poison, see RODENTICIDE section and AG-472-1.
MOLE* (Eastern)	4 to 6 in.; short tail and pointed nose. Very short, paddlelike front feet; eyes and ears not visible. Very soft fur.	Extensive ridges, sometimes with mounds 1 to 2 in. high with lumpy appearance; ridges pushed up instead of dug out; no gnawings.	Statewide. Lives underground; makes tunnels, sometimes small mounds; feeds on worms, and insects, but not plants.	Use spear-type traps for best control. Ground insecticides will lessen food supply and give some control.
MUSKRAT*	Dark or reddish-brown, ratlike rodent; 20- to 24-in. total length; tail 8 to 10 in., hairless, scaly, flattened from side to side. Weight 2 to 4 lb.	Houses of rushes, etc. or burrows in banks, with entrances below water level. Trails at water's edge.	Statewide. Eats aquatic plants; occasionally animal material and crops. Burrows into earthen dams.	See ANIMAL CONTROL SUGGESTIONS.
NUTRIA*	Large, ratlike, brownish rodent. The most noticeable characteristics are its size and a long, round tail that is scantily haired. Weight 15 to 18 lb.	Bank burrows or platform nests anchored to marsh vegetation. Worn trails, eaten-away marsh vegetation. Trails at water's edge.	Northeastern coastal area of state. An introduced species. Feeds upon rushes, grasses, seeds, roots, and coarse vegetation. It usually consumes food on shore in evening.	Use No. 1.5 foot trap, box trap, or body-grip trap.
OPOSSUM*	Generally light gray. Average length 33 in., including a 12-in. rat-like prehensile tail. Female has pouch for carrying young (marsupial). Weight up to 15 lb.	Omnivorous; particularly detrimental to poultry. Badly mauled poultry typical of opossum kill.	Statewide. Prefers living by streams or swamps in wooded areas. Lives in hollow logs, rocks, crevices, etc. Frequently found in towns and cities, killed by vehicles.	Easily caught in box-style live traps.
PIGEON	Crow-sized. Slate blue background, two black wing bars. Greenish purple sheen to neck feathers.	Soiling of feed lots and window sills.	Statewide. Feed, roost, and loaf in flocks, except in breeding season.	See ANIMAL CONTROL SUGGESTIONS. No depredation permit needed.
PINE VOLE* (Orchard Rat)	Body and head about 3 to 4.25 in. long with tail shorter than length of hind leg; dark brown with reddish tinge.	Soft, spongy ground. Extensive underground burrows. Plants severed or girdled underground or dying without visible cause. Quarter-sized holes in lawns without soil mounds.	Statewide. Lives underground. Feeds on roots and bases of plants below ground level. Damage prevalent on bulbs, ornamental shrubs, and apple trees. Often follows mole runs and other burrows.	Close mowing and clean cultivation deter voles. Set mouse traps in runs, and cover them with tar paper or large flower pot. For poison, see RODENTICIDE section and AG-472-1.
RABBIT* (Cottontail)	Up to 15 in. long, including 2-in. fluffy tail. 2.5 to 4 lb. Long ears.	Presence indicated by round fibrous pellets. Gnawing and clipping of vegetation at 45° angle.	Statewide. Feeds on all parts of plants. Prefers succulent foods-young shoots and vegetables.	See ANIMAL CONTROL SUGGESTIONS.
RACCOON*	Small dog-sized; black face mask; color rings on tail; grizzled gray color. Good climber. Weight to 35 lb.	2- to 3-in. handlike tracks; seeds dug, leaving 2-in. holes. Ripening corn opened and eaten. May den in structures, including attics and chimneys.	Statewide. Prefers wooded areas around water; eats fish, waterfowl, poultry, eggs, grain, and fruits.	In urban settings, remove any excess pet food immediately after feeding (dog, cat, etc.) or feed pets indoors. See ANIMAL CONTROL SUGGESTIONS. Occasional rabies carrier. Report rabid animals or suspected rabid animals to local health department. Contact N.C. Wildlife Commission about depredating animals.

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RED FOX*	Medium dog-sized to 15 lbs and measures 36 to 41 inches long from nose to tip of tail. Primarily, reddish with white-tipped tail and white throat. However, 3-color phases (red, yellow, black) may occur.	Triangular foot prints with claw marks. Dens in burrows located in cleared or semicleared areas, under stumps, and vegetated slopes.	Statewide. Prefers fairly open country; agricultural areas and forest edges. Mostly nocturnal. Eats rodents, birds, fruits, poultry, livestock, and game.	Occasional rabies carrier. Report rabid animals or suspected rabid animals to local health department. Contact N.C. Wildlife Commission about depredating animals.
RED-WINGED† BLACKBIRD	Robin-sized. Male black with red-wing patch; female brown with heavily striped underside.	Corn husks opened during soft dough stage. Soft kernels fed upon. Fungi and molds may develop on corn.	Statewide, chiefly eastern half. Forms large winter roosts with grackles, cowbirds, and starlings. Migrates north in early spring. During late summer and early fall, roosts with out blackbirds and starlings.	See ANIMAL CONTROL SUGGESTIONS.
ROOF RAT (Black or Brown)	Up to 17 in. long; tail longer than head and body; dark brown, lighter belly. Hindfoot 1.5 in. or less.	1.5-in. holes in feed sacks; droppings to 0.5 in.; large, gnawed holes; 1- to 1.5-in. tracks. Smears and swing marks.	Statewide, especially coastal area. Excellent climber; lives above ground in walls, litter, etc.	Similar to house rat. See RODENTICIDE section. No deprecation permit needed.
SKUNK*	House cat size; black with white markings; bushy tail; bad smell. Poor climber.	Rooting in lawns or other fertile spots that have been pushed up instead of dug; tracks usually dainty, from 1 to 3 in.	Statewide. Roots for insects; literally "upends" some areas; hunts mice and eggs around farm buildings. Common rabies carrier.	See ANIMAL CONTROL SUGGESTIONS.
SNAKES (37 species in N.C.)	Beneficial for their predation on rodents. Six species are venomous. Cottonmouths, copperheads, and three species of rattlesnakes have a pit between eyes and nose with vertical eye pupil. Coral snakes have round pupils and yellow, red, and black rings encircling body. Yellow and red bands touch and the nose area is black.	Droppings with white ends similar to that of birds, shed skins.	Coral Snake (rare)-found in sandhills and coastal plain. Cottonmouth Moccasin-found in sandhills and coastal plain. Copperhead-statewide. Others-nonvenomous species are represented throughout state. Venomous species often nocturnal during summer months. All hibernate.	See ANIMAL CONTROL SUGGESTIONS and AG-472-2.
STARLING	Robin-sized. Large yellow beak; gold-flecked, iridescent blue-black plumage. Delta shape of wing in flight. Short tail.	Soiling of feed lots and window ledges. Nests in holes.	Statewide, chiefly in eastern half. Feeds, roosts, and loafs in flocks during nonbreeding season.	See ANIMAL CONTROL SUGGESTIONS. No deprecation permit needed.
WHITE-TAILED DEER*	Length 65 to 70 in.; height at shoulder 30 to 40 in.; weight 75 to 250 lb. Reddish brown hair; slender, long-legged. Males have antlers.	Tracks are best sign. Twigs and leaves clipped off raggedly about 24 in. above ground. Raisin-sized, tear-shaped pellets in groups of 10 to 25.	Statewide. Found in all habitats from rural farming communities to urban residential subdivisions. Active any time of the day. Primarily feeds on agricultural crops, grasses, fruits, mushrooms, acorns.	For population control, see ANIMAL CONTROL SUGGESTIONS.
WOODPECKER*†	Birds with sharply pointed beaks used for chipping and digging. Stiff tail and gripping toes.	Drumming sounds on trees or buildings. Some peck holes in siding for nest cavity. Cedar-sided houses frequently damaged.	Statewide. Undulating flight patterns.	Woodpeckers are federally protected. Prevent access by tacking netting, used to prevent bird damage to blackberries, to eaves and to side of house. They may be discouraged by using frightening devices, such as rubber snakes, pie pans, metal streamers, or other materials that either flash or scare. Attaching bags of suet to trees may provide food, and thus prevent birds from drilling on siding. If the problem persists, contact State Director, USDA-APHIS-Wildlife Services Agency, 6213-E Angus Drive, Raleigh, NC 27613, (919) 786-4480.

* Covered by N.C. law regarding Wildlife Killed for Depredations or Accidentally (10B.0106). Under North Carolina law, all moles are classified as wild, nongame animals. No hunting or trapping seasons are established for moles, and they are subject to all applicable state laws and regulations. Therefore, moles cannot be killed without requesting and receiving a permit from the North Carolina Wildlife Resource Commission (NCWRC). In North Carolina, several species of moles occur in very low numbers, so the NCWRC protected all mole species.
 † Covered by Migratory Bird Treaty Act (50 CFR 21).

ANIMAL CONTROL SUGGESTIONS

C. S. DEPERNO, Department of Forestry

TABLE 10-2. ANIMAL CONTROL SUGGESTIONS

Problem Areas	Repellent Formulation	Application Methods	Rates or Procedures	Mode of Action	Remarks
BAT					
Gray bats and Indiana bats are classified as endangered species.					
Attics	Flood lights in attic. Other repellents, such as mothballs, are usually not successful.		Illumination works best on repelling colonies that have just begun.		All bats in North Carolina are beneficial insectivores. Removal or displacement of large colonies should be carried out under the supervision and guidance of federal or state agencies and licensed pest control operators. Exclusion of large natal colonies during April through August should NOT occur until after the young have left the structure.
	Ultrasound devices in attic.		Ultrasound is a new technique that has not been evaluated and may not work.		
			Bat proofing is the only permanent solution.	Seal all but a few openings with hardware cloth or steel wool for smaller openings. Wait a few days then seal remaining openings half hour after dark.	
COWBIRD					
Covered by Migratory Bird Treaty Act (50 CFR 21).					
All problem areas		Scare tactics.	Propane exploders, shell crackers, and electronic sound devices.		Use combination of scare devices; vary times and locations. Be persistent.
Feedlots	4-Aminopyridine 1.0% (Avitrol)	Prebait with untreated grain, then replace with treated grain. Carefully observe cowbirds' habits to establish feeding habits and locations to prevent ingestion by desirable or non-target birds.	Rates vary with extent of bird infestation.	Blocks potassium channels resulting in increased cholinergic nervous system activity.	Restricted label. For use by or under the supervision of government agencies or pest control operators. Follow label instructions carefully.
Structures, nesting and roosting sites	4-Aminopyridine 0.5% (Avitrol)			Blocks potassium channels resulting in increased cholinergic nervous system activity.	
Standing field corn (<i>NOT SWEET CORN</i>)	4-Aminopyridine 0.33% (Avitrol)	Same as Feedlots, but ground and air application permitted.	Same as Feedlots.	Blocks potassium channels resulting in increased cholinergic nervous system activity.	Same as Feedlots.
CROW					
Covered by Migratory Bird Treaty Act (50 CFR 21).					
Newly planted and standing crops		Scare tactics.	Propane exploders and shell crackers.		Use combination of scare devices; vary times and locations. Be persistent.
Newly planted corn fields	4-Aminopyridine 1.0% (Avitrol)	Prebait with untreated corn, then replace with treated corn. Be careful to place treated corn in the crows' feeding area to prevent ingestion by desirable or nontarget birds.	Rates vary with extent of bird infestation.	Blocks potassium channels resulting in increased cholinergic nervous system activity.	Restricted label. For use by or under the supervision of government agencies or pest control operators. Follow label instructions carefully.
ENGLISH SPARROW					
Structures, nesting and roosting sites		Scare tactics.	Propane exploders and shell crackers.		Use combination of scare devices; vary times and locations. Be persistent.
		Roost barrier (Nixalite).	Attach to ledges.		Longlasting way to prevent birds from roosting.
	Polybutenes 97%	Paste.	Spread on ledges.	Surface repellent that results in an unpleasant sticky sensation.	Follow label instructions carefully.
	Polybutenes 48%	Liquid spray.	Spray on shrubs and rafters.	Surface repellent that results in an unpleasant sticky sensation.	Follow label instructions carefully.
	4-Aminopyridine 0.5% (Avitrol)	Prebait with untreated grain, then replace with treated grain. Carefully observe sparrows' habits to establish feeding habits and locations to prevent ingestion by desirable or non-target birds.	Rates vary with extent of bird infestation.	Blocks potassium channels resulting in increased cholinergic nervous system activity.	Restricted label. For use by or under the supervision of government agencies or pest control operators. Follow label instructions carefully.

TABLE 10-2. ANIMAL CONTROL SUGGESTIONS (continued)

Problem Areas	Repellent Formulation	Application Methods	Rates or Procedures	Mode of Action	Remarks
GRACKLE					
Covered by Migratory Bird Treaty Act (50 CFR 21).					
All problem areas		Scare tactics	Propane exploders, shell crackers, and electronic sound devices.		Use combination of scare devices; vary times and locations. Be persistent.
Standing field corn (<i>NOT SWEET CORN</i>)	4-Aminopyridine .03% (Avitrol)	Prebait with untreated grain then replace with treated grain. Carefully observe grackles' habits to establish feeding habits and locations to prevent ingestion by desirable or nontarget birds. Ground and air application permitted.	Rates vary with extent of bird infestation.	Blocks potassium channels resulting in increased cholinergic nervous system activity.	Restricted label. For use by or under the supervision of government agencies or pest control operators. Follow label instructions carefully.
GULLS					
Covered by Migratory Bird Treaty Act (50 CFR 21).					
On or near airport runways when endanger air traffic; normally fall and winter flocks cause problems.		Scare tactics	Propane exploders and shell crackers.		Use combination of scare devices; vary times and locations. Be persistent.
	4-Aminopyridine 25% (Avitrol)	Prefeeding with bread is essential to deterrence. Carefully observe gulls' habits to prevent ingestion by desirable or nontarget birds.	Rates vary with extent of gull problem. May need to retreat after rain.	Blocks potassium channels resulting in increased cholinergic nervous system activity.	<i>FOR PROFESSIONAL USE ONLY.</i> Gulls are protected by law and treaty. Use under U.S. Fish and Wildlife Service or state game commission supervision. Both federal and state permits are required to use this method of bird control.
MUSKRAT					
Covered by 15 NCAC 10B.0106. A depredation permit is needed prior to setting a trap for this species. Where shooting is recommended, a depredation permit is also needed unless the animal is in the act of destroying property.					
Water control structures and dams		Trapping	Use 1.5 foot trap, #110 body-grip trap, single-catch box trap, or live catch muskrat colony trap. Place traps in muskrat trails and at feeding sites. Bait live-catch traps with carrot or apple.		Check traps daily.
PIGEON					
Structures, nesting and roosting sites		Scare tactics	Propane exploders and shell crackers.		Use combination of scare devices; vary times and locations. Be persistent.
		Roost barrier (Nixalite)	Attach to ledges.		Longlasting way to prevent birds from roosting.
	Polybutenes 97%	Paste	Spread on ledges.	Surface repellent that results in an unpleasant sticky sensation.	Follow label instructions carefully.
	Polybutenes 48%	Liquid spray	Spray on shrubs and rafters.	Surface repellent that results in an unpleasant sticky sensation.	
	4-Aminopyridine 0.5% (Avitrol)	Prebait with untreated corn that looks the same as treated corn. Carefully observe pigeons' habits to establish proper feeding locations to prevent ingestion by desirable or nontarget birds. Place bait in high locations and on high ledges.	Rates vary with extent of pigeon infestation.	Blocks potassium channels resulting in increased cholinergic nervous system activity.	Restricted label. For use by or under the supervision of government agencies or pest control operators. Follow label instructions carefully.
In and around farm buildings; pipe yards; loading docks; building tops; inside other buildings; bridges		Shooting			Discharging firearms within city or town limits is typically illegal.

TABLE 10-2. ANIMAL CONTROL SUGGESTIONS (continued)

Problem Areas	Repellent Formulation	Application Methods	Rates or Procedures	Mode of Action	Remarks
RABBIT (cottontail)					
Covered by 15 NCAC 10B.0106. A depredation permit is needed prior to setting a trap for this species. Where shooting is recommended, a depredation permit is also needed unless the animal is in the act of destroying property.					
Ornamentals, garden shrubs, vegetables, and trees	Ammonium soap 15% liquid (Hinder)	Paint or spray on plants	Rates vary according to crop or plant. See label directions.	Repellent resulting in an unpleasant odor/ taste.	May be used on home gardens. Follow label instructions carefully.
	Dried blood 15% Tobacco dust 70% (Rabbit and Dog Chaser)	Ring soil around plants, trees, and shrubs with several inch-wide bands.	Use every 2 to 3 weeks.	Repellent resulting in an unpleasant odor/ taste.	Follow label instructions carefully.
		Trapping	Bait box traps with apple.		Can be box trapped during hunting season with hunting license; other times, permit required.
		Fencing	2-in. mesh or smaller fencing dug in ground 2 in., 2 ft high all around garden.		
		Shooting			Discharging firearms within city or town limits is typically illegal.
RACCOON					
Covered by 15 NCAC 10B.0106. A depredation permit is needed prior to setting a trap for this species. Where shooting is recommended, a depredation permit is also needed unless the animal is in the act of destroying property.					
Gardens and fields; Attics and other structures		Trapping	Live trap with box-style trap. Bait with sweet roll or corn-on-the-cob. Place bait at rear of trap to prevent stealing by raccoon. Secure trap to tree or stake. Set a steel foot-hold trap with dirt hole.		Check traps daily. Raccoons can be vicious when trapped. Contact local state agencies (NCWRC) and licensed pest control operators for advice.
		Shooting			
Chimneys		Exclusion			All chimneys should be protected from animal entry by installation of a wire chimney cap.
RED-WINGED BLACKBIRD					
All problem areas		Scare tactics	Propane exploders, shell crackers, and electronic sound devices.		Use combination of scare devices; vary times and locations. Be persistent.
Feedlots	4-Aminopyridine 1.0% (Avitrol)	Prebait with untreated grain then replace with treated grain. Carefully observe birds' habits to establish feeding habits and locations to prevent ingestion by desirable or non-target birds.	Rates vary with extent of bird infestation.	Blocks potassium channels resulting in increased cholinergic nervous system activity.	Restricted label. For use by or under the supervision of government agencies or pest control operators. Follow label instructions carefully.
Structures, nesting and roosting sites	4-Aminopyridine 0.5% (Avitrol)			Blocks potassium channels resulting in increased cholinergic nervous system activity.	
Standing field corn (NOT SWEET CORN)	4-Aminopyridine 0.03% (Avitrol)	Same as Feedlots, but ground and air application permitted.	Same as Feedlots.	Blocks potassium channels resulting in increased cholinergic nervous system activity.	Same as Feedlots.

TABLE 10-2. ANIMAL CONTROL SUGGESTIONS (continued)

Problem Areas	Repellent Formulation	Application Methods	Rates or Procedures	Mode of Action	Remarks
SKUNK					
Covered by 15 NCAC 10B.0106. A depredation permit is needed prior to setting a trap for this species. Where shooting is recommended, a depredation permit is also needed unless the animal is in the act of destroying property.					
Houses and barns			Exclusion.		Place flour at entrance to crawl space to determine if skunks have left. Once gone, seal the area. To get rid of skunk odor, use a garden sprayer to mist strong smelling areas with a solution of 1 gal vinegar with 1 cup liquid cleanser. Bury clothes. Report rabid or suspicious animals to local health department.
Gardens		Trapping	Live trap with box-style trap. Bait with fish or fish-flavored cat food. Covering trap with a tarp will reduce the chance of spray.		Check traps daily and release nontarget animals.
		Shooting			In agricultural settings, producers may shoot a skunk in the act of destroying property; however, it is strongly advised to contact the local Wildlife Enforcement officer or Wildlife Biologist with the N.C. Wildlife Resources Commission to obtain a Wildlife Depredation Permit. Discharging firearms within city or town limits is typically illegal.
SNAKES					
Gardens and houses		Environmental	Remove debris, trash, woodpiles, thick vegetation, and food sources.		No methods are totally effective. Take sensible precautions. Learn the difference between venomous and nonvenomous snakes. Snakes are very beneficial. No chemical controls available.
		Snake-proofing	Screen or fill any openings into house. Check door sills and where pipes enter.		
		Fencing	18- to 36-in. high, 0.25 in. mesh buried several in. below surface. Keep a 2- to 3-ft strip outside fence free of vegetation.		
		Rodent glue boards	Staple several glue boards to a piece of plywood and place next to foundation under house.		Remove snakes without harming them by pouring mineral spirits or vegetable oil on the snake and glue board. Always use glue boards inside residences, never outdoors.

TABLE 10-2. ANIMAL CONTROL SUGGESTIONS (continued)

Problem Areas	Repellent Formulation	Application Methods	Rates or Procedures	Mode of Action	Remarks
SQUIRREL (gray and flying)					
Covered by 15 NCAC 10B.0106. A depredation permit is needed prior to setting a trap for this species. Where shooting is recommended, a depredation permit is also needed unless the animal is in the act of destroying property.					
Houses, shrubs, and trees		Trapping	Suitable size live (box-style) trap. Bait with peanuts, walnuts, peanut butter, or black oil sunflower seeds. Prebait for several days with trap doors secured in open position.		Check live traps daily. Release nontarget animals immediately. Release squirrels at least 10 miles away. If squirrels are in the house, repair building after last squirrel is removed.
		Shooting			Discharging firearms within city or town limits is typically illegal.
STARLING					
All problem areas		Scare tactics.	Propane exploders, shell crackers, and electronic sound devices.		Use combination of scare devices; vary times and locations. Be persistent.
Feedlots	4-Aminopyridine 1.0% (Avitrol)	Prebait with untreated grain, then replace with treated grain. Carefully observe starlings' habits to establish feeding habits and locations to prevent ingestion by desirable or nontarget birds.	Rates vary with extent of bird infestation.	Blocks potassium channels resulting in increased cholinergic nervous system activity.	Restricted label. For use by or under the supervision of government agencies or pest control operators. Follow label instructions carefully.
Structures, nesting and roosting sites	4-Aminopyridine 0.5% (Avitrol)	Mix with shelled corn in hopper before planting.	One packet per bushel of shelled corn.	Blocks potassium channels resulting in increased cholinergic nervous system activity.	Same as Feedlots.
Standing field corn (<i>NOT SWEET CORN</i>)	4-Aminopyridine 0.03% (Avitrol)	Same as Feedlots, but ground and air application permitted.	Same as Feedlots.	Blocks potassium channels resulting in increased cholinergic nervous system activity.	Same as Feedlots.
WHITE-TAILED DEER					
Covered by 15 NCAC 10B.0106. A depredation permit is needed prior to setting a trap for this species. Where shooting is recommended, a depredation permit is also needed unless the animal is in the act of destroying property.					
Ornamentals, garden, field crops, and forest regeneration		Scare tactics	Propane exploders, shell crackers, and human hair hung in bags around the area.		Results may vary. Deer quickly become habituated. Many devices are expensive, require maintenance, and are dangerous.
	Soap	Hang small bars of soap from branches, using 20 lb-test fishing lines.	One bar per shrub, several per tree, replace weekly.	Repellent resulting in an unpleasant odor/taste.	Aromatic soap brands may be effective. However, results may vary and deer may become habituated.
	Ammonium Soap 15% Liquid (Hinder)	Painting or spraying	Rates vary according to crop or plant. See label directions.	Repellent resulting in an unpleasant odor/taste.	May be used on home gardens. Follow label instructions carefully.
	Add putrified egg solid containing the fungicide Thiram (Big Game Repellent, Deer Away, Hinder)	Spray all parts of plant within reach of animal; repeat as needed to protect new growth. Spray twigs and trunk of dormant trees to 5 ft. high.	Instructions for use vary depending on formulation or brand.	Repellent resulting in an unpleasant odor/taste.	<i>DO NOT</i> treat vegetables, fruits, or plant parts to be eaten. Spray on dry day. Clean sprayer immediately. Follow instructions carefully. Results will vary and applications may need to be numerous and often.
		Fencing	Electric fence, high-tensile wire fence, 8 ft high woven wire, mesh fences		Must be properly maintained. Initially very expensive, however, over the long run may be cost effective.
		Shooting			In agricultural settings, producers may shoot a deer in the act of destroying property; however, it is strongly advised to contact the local Wildlife Enforcement officer or Wildlife Biologist with the N.C. Wildlife Resources Commission to obtain a Wildlife Depredation Permit. Discharging firearms within city or town limits is typically illegal.

RODENTICIDES
C. S. DEPERNO, Department of Forestry

TABLE 10-3. RODENTICIDES

Compound	For Use On	Formulation	Food-Handling Establishments		Farm Use ¹	Precautions and Remarks
			Inside	Outside		
Brodifacoum	Norway rats, Roof rats, House mice	Commercially prepared baits .005% ⁴	Yes	No	Yes	Active against Warfarin-resistant rats. For use in homes, industrial buildings, and commercial buildings. Keep away from humans, domestic animals, and pets.
			No	Yes	Yes	For retail sale to and use by pest control operators only. For use in and around the periphery of homes, industrial, commercial, and public buildings in urban areas.
Bromadiolone	Norway rats, Roof rats, House mice	Commercially prepared baits .005% ⁴	Yes	No	Yes	For use in and around the periphery of homes, industrial, commercial, and public buildings in urban areas.
Bromethalin	Norway rats, House mice	Commercially prepared baits 0.1% ⁵	No	No	Yes	Keep away from humans, domestic animals, pets, and wildlife.
Cholecalciferol (Rampage)	Norway rats, House mice	Commercially prepared bait .15% ⁶	No	No	Yes	Keep away from humans, domestic animals, pets, and wildlife.
Chlorophacinone²	Norway rats, Roof rats, House mice	Commercially prepared baits .005% ⁴	Yes	Yes	Yes	Keep away from humans, domestic animals, pets, and wildlife.
		Tracking powder 0.2% ⁴	Yes	No		For use as a tracking powder in prescribed and specific operations.
	Meadow voles ³ Pine voles ³	Commercially prepared baits .005% ⁴		Yes	Yes	Registered for home use. Follow label directions. See AG-472-1.
Diphacinone²	Norway rats Norway rats Roof rats House mice	Commercially prepared baits .005% ⁴	Yes	Yes	Yes	Keep away from humans, domestic animals, pets, and wildlife.
	Meadow voles ³ Pine voles ³	Commercially prepared baits .005% ⁴			No	Not registered for home use. Follow label directions.
Warfarin²	Norway rats, Roof rats, House mice, Pine voles ³	Powder concentrate 0.5% ⁴	Yes	Yes	Yes	Place baits in area inaccessible to children, pets, wildlife, and domestic animals or in tamper-proof bait boxes.
		Commercially prepared baits .025% ⁴				
Zinc Phosphide	Norway rats, Roof rats, House mice	Commercially prepared baits 2% ⁷	No	Yes		For retail sale to and use by pest control operators only. (Not for home use.)
		Tracking powder 10% ⁷	Yes	No		For retail sale to and use by pest control operators only. (Not for home use.)
		Commercially or farm-prepared baits 2% ⁷			Yes	For retail sale to and use by pest control operators only. (Not for home use.)
	Meadow voles ³ Pine voles ³	Commercially prepared grain baits 2% ⁷			Yes	Broadcast application is ineffective against pine voles. For retail sale to and use by pest control operators only. (Not for home use.)

- ¹ Additional instructions on control of rodents on farms may be found in *Poultry Science and Technology Guide No. 4*, which is available at your county Cooperative Extension Center.
- ² Requires multiple feedings to kill.
- ³ Apply rodenticides for vole control only after harvest or during the dormant period. Do not pick or use any drops after rodenticide application. Do not allow animals to graze in treated orchard.
- ⁴ Mode of action: anticoagulant.
- ⁵ Mode of action: oxidative phosphorylation of central nervous system.
- ⁶ Mode of action: calcium mobilizer.
- ⁷ Mode of action: phosphine gas.

FISH CONTROL
C. S. DEPERNO, Department of Forestry

Address inquiries about fish control to the county wildlife law enforcement officer or to other representatives of the Boating and Inland Fisheries Division of the North Carolina Wildlife Resources Commission.

In overpopulated waters, reducing numbers may improve fish growth. Sometimes it is desirable to eliminate a fish population so that a more preferred mix of species can be introduced. All population control measures in public waters must, by law, be undertaken only by the North Carolina Wildlife Resources Commission. Within limits of available personnel, the Wildlife Resources Commission provides advice on materials and methods for fish control and help in determining if waters are public or private.

