

RABBITS



Figure 1. Eastern cottontail rabbit. Photo by Dallas Virchow.

OBJECTIVES

1. Explain how rabbit biology impacts control.
2. Communicate control options to clients.
3. Describe health risks posed by rabbits.

SUMMARY OF DAMAGE PREVENTION AND CONTROL METHODS

HABITAT MODIFICATION

Removal of brush piles, debris, dumps, and other cover

EXCLUSION

18-inch high fences with bases secured to the ground to protect gardens and shrubs

Hardware cloth cylinders will protect fruit trees and ornamental plants.

FRIGHTENING DEVICES

None are reliable

REPELLENTS

Capsaicin, [Naphthalene](#), thiram, [Potassium salts of fatty acids](#) and odor-based repellents

TOXICANTS

None are registered

FUMIGANTS

None are registered

SHOOTING

Sport hunting and routine shooting of problem individuals

TRAPPING

Commercial cage/box traps

SPECIES PROFILE

IDENTIFICATION

There are 13 species of cottontail rabbits (genus *Sylvilagus*), nine of which are found in North America north of Mexico. All nine species are similar in general appearance and behavior, but differ in size, range, and habitat. Such differences result in a wide variation of damage problems.

PHYSICAL DESCRIPTION

For the purposes of the discussion in this module about damage control and biology, the eastern cottontail rabbit is considered representative of the genus (Figure 1). Cottontail rabbits must be distinguished from jackrabbits and other hares, which are generally larger in size and have longer ears.

Cottontails appear gray or brownish gray in the field. Closer examination reveals a grizzled blend of white,

gray, brown, and black guard hairs over a soft grayish or brownish underfur, with a characteristic rusty brown spot on the nape of the neck. Rabbits molt twice each year but remain the same general color. They have large ears, though smaller than those of jackrabbits, and hind feet that are much larger than the forefeet. The tail is short and white on the undersurface, and its similarity to a cotton ball resulted in the rabbit's common name.

Most species prefer open, brushy, or cultivated areas, but some frequent marshes, swamps, or deserts. The swamp rabbit and the marsh rabbit (*S. palustris*) are strong swimmers. The eastern cottontail (*S. floridanus*) is the most abundant and widespread species.

The swamp rabbit (*S. aquaticus*), found in the southeastern states as far north as southern Illinois, may weigh up to 5 pounds. The eastern cottontail rabbit is approximately 15 to 19 inches in length and weighs 2 to 4 pounds. Males and females are basically the same size and color.

SPECIES RANGE

The eastern cottontail's range includes the entire US east of the Rocky Mountains and introductions further west. It extends from southern New England along the Canadian border west to eastern Montana and south into Mexico and South America (Figure 2). Refer to a field guide for information on other species of the genus *Sylvilagus*.

VOICE AND SOUNDS

Rabbits generally are silent, but can emit a high pitched squeal when they are in distress.



Figure 2. Range of the eastern cottontail in North America. Image by PCWD.

TRACKS AND SIGNS

Rabbit tracks are typically found in snow or fine soil (Figure 3).

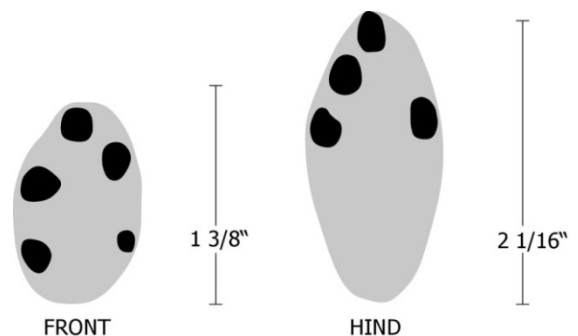


Figure 3. Tracks of the eastern cottontail rabbit. Image by Dee Ebbeka.

GENERAL BIOLOGY

REPRODUCTION

Rabbits generally live 12 to 15 months and only about one rabbit in 100 lives through a third fall, though cottontails can raise as many as six litters in a year. Typically, individuals produce two to three litters per year in northern parts of the range and five to six in southern areas. In the north

(Wisconsin), first litters are born as early as late March or April while in the south (Texas), litters may be born year-round. Litter size also varies with latitude; rabbits produce five to six young per litter in the north and two to three in the south. The gestation period is only 28 or 29 days and females are usually bred again within a few hours of giving birth. Rabbits give birth in a shallow nest depression in the ground. Young cottontails are born nearly furless with their eyes closed. Their eyes open in seven to eight days, and they leave the nest in two to three weeks.

Under good conditions, each pair of rabbits could produce approximately 18 young during the breeding season, though this potential is rarely reached. Weather, disease, predators, encounters with cars and hunters, and other mortality factors combine to control rabbit populations.

NESTING/DENNING COVER

Cottontails do not dig their own burrows, as the European rabbit does. Cottontails use natural cavities or burrows excavated by woodchucks or other animals. Underground dens are used primarily in extremely cold or wet weather and to escape pursuit. Brush piles and other areas of cover are often adequate alternatives to burrows.

In spring and fall, rabbits use a grass or weed shelter called a "form." The form is a cavity on the surface of the ground, usually made in dense cover. It gives the rabbit some protection from weather, but is largely used for concealment. In summer, lush green growth provides both food and shelter leaving little need for a form.

BEHAVIOR

Rabbit population numbers may change seasonally. Spikes in numbers occur in the spring and summer followed by significant declines in winter.

HABITAT

Cottontails are not distributed evenly across a landscape. They tend to concentrate in favorable habitat such as brushy fence rows or field edges, gullies filled with debris, brush piles, or landscaped backyards where food and cover are suitable. They rarely are found in dense forests or open grasslands, but fallow crop fields may provide suitable habitat.

Cottontails generally spend their entire lives in an area of 10 acres or less. Occasionally they may move a mile or so from summer range to winter cover or to a new food supply. Lack of food or cover usually motivates a rabbit to relocate. In suburban areas, rabbits are numerous and mobile enough to fill any empty habitat created when other rabbits are removed. Population density varies with habitat quality, but one rabbit per acre is a reasonable average.

FOOD HABITS

Rabbits eat flowers (e.g. tulips) and vegetables (e.g., peas, beans, and beets) in spring and summer. In fall and winter, they damage and kill valuable woody plants by clipping and gnawing the bark (Figure 4), particularly when snow fall is heavy. Only crops such as corn, squash, cucumbers, tomatoes, potatoes, and some peppers, seem to be immune from rabbit problems.

Food preferences vary considerably by region and season. In general, cottontails seem to prefer plants of the rose family. Apple trees, black and red raspberries, and blackberries are the most frequently damaged food-producing woody plants, although cherry, plum, and nut trees are damaged also.



Figure 4. Unprotected trees severely girdled by rabbits. Photo by Stephen M. Vantassel.

LEGAL STATUS

In most states, rabbits are classified as game animals and are protected except during the legal hunting season.

DAMAGE IDENTIFICATION

Rabbit damage can be identified by the appearance of gnawing on older woody growth (Figure 5 and the clean-cut, angled clipping of young stems (Figure 6). Distinctive round droppings (Figure 6) in the immediate area are a sign of rabbit presence also.

DAMAGE TO STRUCTURES

Rabbits rarely damage structures. If damage occurs it is usually in the form of gnawing on wood edges.



Figure 5. (Left) Cutting by a deer. (Right) Cutting by a rabbit. Note the clean 45-degree angle. Photo by Stephen M. Vantassel.



Figure 6. Rabbit droppings in winter tend to be filled with wood remnants. Photo by Stephen M. Vantassel.

DAMAGE TO LIVESTOCK AND PETS

Rabbits are generally not a threat to other animals. However, diseases and parasites they may carry can infect pets that attack or come into proximity with them.

DAMAGE TO LANDSCAPES

Among shade and ornamental trees, the hardest hit are mountain ash, basswood, red maple, sugar maple, honey locust, ironwood, red and white oak, and willow. Sumac, rose, Japanese barberry, dogwood, and some woody members of the pea family are among the shrubs that may be damaged by cottontails. Evergreens seem to be more susceptible to rabbit damage in some areas than in others. Young trees may be clipped off, and older trees may be deformed or killed.

The character of the bark on woody plants also influences rabbit browsing. Most young trees have smooth, thin bark with green food material just beneath it. Such bark provides an easily accessible food source for rabbits. The thick, rough bark of older trees often discourages gnawing. Even on the same plant, rabbits avoid the rough bark but girdle the young sprouts that have smooth bark.

Rabbits damage a wide variety of flowers. The most commonly damaged flowers are tulips; they especially like the first shoots that appear in early spring. Rabbits consume peas, beans, and beets, pruning them to ground level. Crops such as corn, squash, cucumbers, tomatoes, potatoes, and some peppers, seem to be immune from rabbit damage.

Rabbits damage woody plants by gnawing bark or clipping off branches, stems, and buds. In winter in northern states, when the ground is covered with snow for long periods, rabbits may severely damage expensive home landscape plants, orchards, forest plantations, and park trees and shrubs. Young plants are clipped off at snow height and large trees and shrubs may be completely girdled. When the latter happens, only sprouting beneath the damage or a bridge graft around the damage will save the plant.

HEALTH AND SAFETY CONCERNS

Tularemia is the most notable disease associated with rabbits. Tularemia is caused by bacteria that can be contracted by humans through the bite of a rabbit, tick, or flea, or by handling the carcass of an

infected animal. Symptoms in humans include fever, swollen lymph nodes, and swelling around the bite, typically appearing within 3 to 14 days of exposure. The infection is rarely fatal to humans provided antibiotics are administered quickly.

To reduce the risk of contracting tularemia, avoid direct contact with rabbits that are dead, emaciated, or exhibit abnormal behavior such as lethargy, incoordination, and lameness. Take precautions against ectoparasites (ticks and fleas) and wear latex or vinyl gloves when handling and butchering rabbits. Discard rabbits with livers covered in small white spots. In case of illness, inform medical personnel of any contact with rabbits; the symptoms of tularemia are easily confused with the flu.

Rabbits infected with Shope's fibroma virus have fleshy finger-like growths protruding from various parts of their body. These growths occasionally make rabbits look like they have antlers and led early Europeans to believe that infected rabbits were a different species. This may have given rise to the mythical "jackalope." Whereas rabbits afflicted with Shope's fibroma virus can raise concern among onlookers, it mostly affects cottontail rabbits and is not contagious to humans.

Rabbits can carry ticks infected with diseases such as Lyme disease. Lyme typically manifests with flu-like symptoms, so consider a tick-borne illness if anyone has symptoms within 3 weeks of handling rabbits.

DAMAGE PREVENTION AND CONTROL METHODS

INTEGRATED PEST MANAGEMENT

TIMING, ECONOMICS, AND METHODS

No lethal control is effective for more than a limited period of time because of cottontail's reproductive potential. Control measures are most effective when used against a breeding population during the winter. Habitat modification and exclusion techniques provide long-term, non-lethal control.

Exclusion is effective any time when it is properly installed. Trapping is most effective when rabbits are food stressed in the winter months.

Rabbit damage rarely reaches economic significance in commercial fields or plantations, but there are exceptions. For example, marsh rabbits have been implicated in sugarcane damage in Florida. Growers should always be alert to the potential problems caused by locally high rabbit populations.

HABITAT MODIFICATION

Removing brush piles, weed patches, dumps, stone piles, and other debris where rabbits live and hide is an excellent way to manage rabbits. It is effective especially in suburban areas where fewer suitable habitats are available.

Vegetation control along ditch banks or fence rows will eliminate rabbit habitat in agricultural settings but is likely to have detrimental effects on other species, such as pheasants. Always consider the consequences before carrying out any form of habitat management.

EXCLUSION

One of the best ways to protect a backyard garden or berry patch is to install a fence. It does not have to be tall or especially sturdy. A fence of 2-foot (60-cm) chicken wire with the bottom tight to the ground or buried a few inches is sufficient. The mesh should be 1 inch or smaller so that young rabbits will not be able to go through it. A more substantial fence of welded wire, chain link, or hog wire will keep rabbits, pets, and children out of the garden and can be used to trellis vine crops. The lower 1½ to 2 feet should be covered with small mesh wire. A fence may seem costly but with proper care it will last many years and provide relief from the constant aggravation of rabbit damage.

Cylinders of ¼-inch wire hardware cloth will protect valuable young orchard trees or landscape plants (Figure 7). The cylinders should extend higher than a

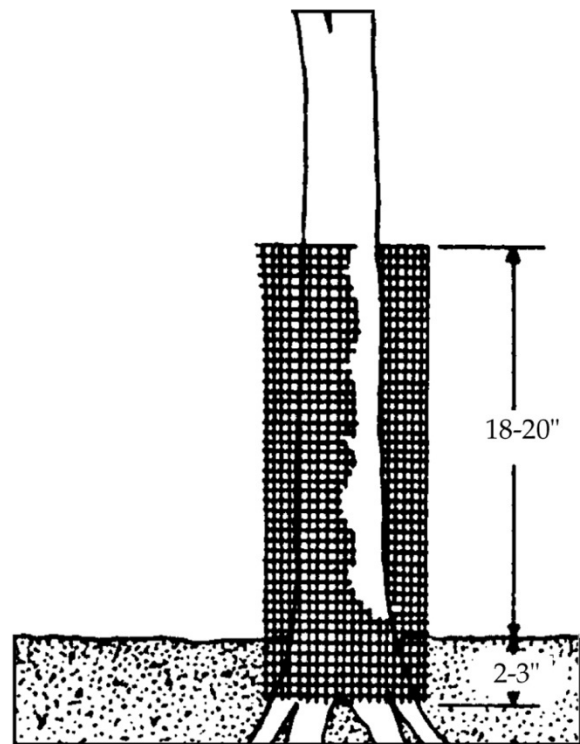


Figure 7. Hardware cloth cylinders will protect trees from rabbit damage. Image by PCWD.

rabbit's reach while standing on the expected snow depth, and stand 1 to 2 inches out from the tree trunk. Larger mesh sizes, ½ to ¾-inch, can be used to reduce cost, but be sure the cylinder stands far enough away from the tree trunk that rabbits cannot eat through the holes. Commercial tree guards or tree wrap are another alternative. Several types of paper wrap are available, but they are designed for protection from sun or other damage. Check with your local garden center for advice. When rabbits are abundant and food is in short supply, only hardware cloth will guarantee protection. Small mesh (¼-inch) hardware cloth also protects against mouse damage.

A dome or cage of chicken wire secured over a small flower bed will allow vulnerable plants such as tulips to get a good start before they are left unprotected.

FRIGHTENING DEVICES

Frightening devices are not effective for rabbit control.

REPELLENTS

Most rabbit repellents are not registered for use on plants destined for human consumption. Repellents fall into two categories: taste and odor.

Taste repellents make the plant less palatable for rabbits and are typically applied directly to the plant. Examples are those containing capsaicin or hot pepper extract (Deer Off™, Get Away™, Scoot™, Shotgun™). Their effectiveness tends to be short-lived and requires reapplication after sprinkler irrigation, rain, or new growth occurs. The duration and effectiveness of some repellents can be extended by mixing them with an anti-transpirant, such as Vapor Gard™ or Wilt-Pruf™.

Odor repellents keep rabbits from an area by fear or foul smell. A wide variety of active ingredients are used, including: ammonium or potassium salts of soaps (M-Pede™; Ropel™), eggs (DeFence®), thiram (Spotrete™), predator urine (Shake-Away™), or garlic (Sweeny's® Deer & Rabbit Repellent). They are typically applied to soil in the perimeter area and/or on plant foliage to repel rabbits.

Some odor and taste repellents contain more than one active ingredient. Check the label for proper application rate, method, and site before applying any repellent. The value of any repellent can be effectively reduced by wind, water, plant growth, and animal pressure. Even the best repellents must be reapplied according to label directions.

Daffodils are poisonous to rabbits. Plant them in place of tulips to ensure reliable blooming bulbs in the spring.

TOXICANTS

No toxicants are registered for rabbit control.

FUMIGANTS

No fumigants are registered for rabbit control.

SHOOTING

Shooting individual rabbits may be an effective short-term solution to damage problems. A .22 caliber pellet gun is usually effective for stalking rabbits. However, once a rabbit is removed more rabbits will likely move into the area. Alabama regulation 220-2-.27 allows a property owner or tenant to remove one rabbit per incident that is causing damage to said individual's property without a permit. Local laws and ordinances may prohibit the discharge of firearms in your area.

When a rabbit problem arises where the use of guns is impractical, the use of lurchers (specially bred and trained running dogs) may be a solution. With this method one or two dogs are used. The rabbit is illuminated with a spotlight, the dog is slipped from its collar, and quickly returns with the rabbit unharmed to be humanely dispatched. This method is silent and deadly and accounts for many hundreds of rabbits a year.

TRAPPING

Trapping is the best way to remove rabbits in cities, parks, and suburban areas. Some biologists believe that wooden box traps are more effective than cage traps. Traps should be 9 x 10 x 24 inches (Figure 8). Place traps where you know rabbits feed or rest. Keep traps near cover so that rabbits will not have to cross large open areas to get to them. In winter, face traps away from prevailing winds to keep snow and dry leaves from plugging the entrance or interfering with the door. Check traps daily to replenish bait or remove the catch. Daily checks are essential for effective control and for humane treatment of the animals. Move traps if they fail to make a catch within a week.



Figure 8. Rabbit box trap. Photo by Stephen M. Vantassel.

Cob corn (dry ear corn) or dried apples make good bait, even in winter. Impale the bait on the nail or position it at the rear of the trap (commercial traps may not have a nail). When using cob corn, use half a cob and push the nail into the pith of the cob; this keeps the cob off the floor and visible from the open door. Dried leafy alfalfa and clover are also good cold weather baits.

Apples, carrots, cabbage, and other fresh green vegetables make good baits in warmer weather or climates. These soft baits become mushy and ineffective once frozen. Good summer bait for garden traps is a cabbage leaf rolled tightly and held together by a toothpick. For best results, use baits that are similar to what the target rabbits are feeding on.

A commercial wire trap can be made more effective (especially in winter) by covering it with canvas or some other dark material. Be sure the cover does not interfere with the trap's mechanism.

Two-door traps (7 x 7 x 30 inches) can be placed at openings under fences and along trails. Both single-door and two-door traps can be made more effective by installing wings either with fencing or boards as is done with armadillos.

BODY-GRIPPING TRAPS

Body gripping traps are not recommended for rabbit control.

FOOTHOLD TRAPS

Foothold traps are not recommended for rabbit control.

SNARES

Snares are not recommended for rabbit control.

HANDLING

RELOCATION

Alabama regulation 220-2-.27 prohibits relocation of rabbits across a county line or major river drainage.

TRANSLOCATION

Alabama regulation 220-2-.27 prohibits translocation of rabbits across a county line or major river drainage. Release rabbits in rural areas several miles from where they have been trapped if local regulations allow translocation. Do not release them where they may create a problem for someone else.

EUTHANASIA

Carbon-dioxide is the best method for euthanizing rabbits.

DISPOSAL

Refer to Volume 1 of the National Wildlife Control Program and your state regulations regarding carcass disposal.

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RESOURCES

KEY WORDS

Wildlife, wildlife control, damage management, nwco, cottontail, rabbit

ON-LINE RESOURCES

<http://pcwd.info>

<http://icwdm.org>

<http://wildlifecontroltraining.com>

QUESTIONS FOR REFLECTION

1. Before initiating a trapping program for rabbits, what must your client understand?
2. Describe where you should set your traps.

3. What should you keep in mind prior to applying repellents to plants?
4. How does one distinguish between deer browsing and rabbit browsing?
5. You recently resolved a rabbit problem and have begun to develop flu-like symptoms. What should you do?
6. A client is concerned about the risks posed by a rabbit with strange tumors (growths) protruding from its body. What should you tell him?

DISCLAIMER

Implementation of wildlife damage management involves risks. Readers are advised to implement the safety information contained in Volume 1 of the National Wildlife Control Training Program.

Some control methods mentioned in this document may not be legal in your location. Wildlife control providers must consult relevant authorities before instituting any wildlife control action. Always use repellents and toxicants in accordance with the EPA-approved label and your local regulations.

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