



Rabbit

Ecology & Damage Management

Rabbits mean different things to different people. For hunters, the cottontail rabbit is an abundant, sporting and tasty game animal. But vegetable and flower gardeners, farmers and homeowners have very little to say in favor of the creatures. Your viewpoint about rabbits may very well depend on whether it is hunting season or gardening season.

Rabbits can do a lot of damage to flowers, vegetables, trees and shrubs, at any time of year and in places ranging from suburban yards to rural fields and tree plantations. Control is often necessary to reduce



Cottontail rabbit

Jeffrey J. Stoppel

damage, but complete extermination is not necessary, desirable or even possible. If control techniques are applied correctly, rabbits can be an attractive and interesting addition to the backyard or rural landscape.

DESCRIPTION

There are three kinds of wild rabbits in Wisconsin or, to be more precise, one type of rabbit and two kinds of hares. Rabbits and hares are active primarily



Range of the Eastern Cottontail rabbit in North America.

at night and feed on a variety of plants. All are prolific breeders. However, hares are generally larger overall than rabbits, and have longer ears and hind legs. Baby hares are born with fur and with their eyes open, while rabbits are born blind and hairless.

With its fluffy white tail, the **Eastern cottontail** is the true “bunny rabbit” of the bunch. It is also the smallest of the three species, weighing an average of 2 1/2 pounds. Grayish-brown overall, cottontails have a rusty-brown spot on the nape of the neck that further distinguishes them

from other rabbit species in the state. Although cottontails are most abundant in southern Wisconsin, they are found in every county of the state, and the total statewide population could very easily exceed several million.



Snowshoe hare in mostly white winter coat.

Terry Spivey, USDA Forest Service, bugwood.org

While cottontails retain their grayish-brown color all year, the **snowshoe hare** changes its coat from brown in summer to white in winter. It has large furred feet and is most common in the northern forests. The snowshoe can be as destructive in forests as the cottontail is in agricultural or suburban landscapes. Evergreens, and in particular Christmas tree, plantations may sustain serious damage from these animals.

(continued on page 2)

DESCRIPTION (continued)

The **jackrabbit** is actually a hare that found its way into Wisconsin from the west and south. A long, bounding gait and black-tipped ears are the mark of a jackrabbit. During the 1900s jackrabbits were released in central Wisconsin to bolster wild populations for hunting. As agriculture and development moved into the open marshes and grasslands the jackrabbits preferred, their population dwindled. There have been no records of jackrabbits for several decades and

most experts believe they are no longer present in Wisconsin. If you observe one, or find a dead one, it should be reported to a Wisconsin DNR office.

Although all rabbit species can cause landscape damage, this publication will focus on the Eastern cottontail rabbit. Many of the damage management options described here for the cottontail are also effective for other rabbit species.

FOOD

Rabbits' tastes in food can vary considerably by region and season. However, there is no season of the year when their appetites do not cause some problems.

In spring and summer, rabbits eat a variety of green plants, unfortunately including those in our vegetable and flower gardens. They will devour a wide selection of flowers, especially the first tulip shoots that appear in early spring, as well as many kinds of vegetables. Only a few crops – corn, squash, cucumbers, tomatoes, peppers and potatoes – are usually resistant to rabbit problems.

In fall and winter, rabbits switch to feeding on woody vegetation. In general, rabbits seem to prefer woody plants in the rose family. Apple trees, raspberries and blackberries are the most frequently damaged food-

“Only a few crops – corn, squash, cucumbers, tomatoes, peppers and potatoes – are usually resistant to rabbit problems.”

producing woody plants, although cherry, plum and nut trees may also be targets.

Among shade and ornamental trees, rabbits pre-

fer mountain ash, basswood, red maple, sugar maple, honey locust, ironwood, red and white oak and willow. Sumac, rose, Japanese barberry, dogwoods, and some woody members of the pea family may also be on the menu. Cottontails usually do not bother evergreens, although occasionally an area may have some damage or an unprotected nursery may have its young trees clipped. Sunscald, excessive drying in winter, and deer are more of a threat to ornamental evergreens than are rabbits.

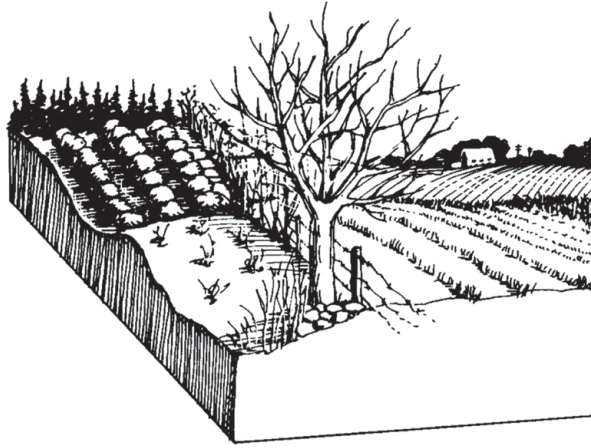


Apple tree branch browsed by rabbits in winter.

Jeffrey J. Strobel

HABITS & HABITAT

Rabbits are active year-round and primarily at night. Rabbits do not distribute themselves evenly across the landscape but tend to concentrate in favorable habitat like open grassy areas interspersed with suitable cover for escape from predators (think landscaped backyard). Cover may be in the form of a brush pile, or vegetation like bushes and evergreen trees.



Typical rural rabbit habitat.

Cottontails generally spend their entire lives in an area of 20 acres or less. Occasionally, they may move a mile or so from their summer range to winter cover or to a new food supply. Lack of food is usually the reason an animal will relocate. In suburban areas, rabbits are numerous and mobile enough to fill any “empty” spot created when other rabbits are removed.

REPRODUCTION

Rabbits do not live long, but they make the most of the time they have. Studies at the University of Wisconsin reveal that the average cottontail lives less than a year. Despite their short lifespan, cottontails can raise as many as six litters in a year, with the first litters being born as early as late March or early April. The average litter size is 6. The rabbit's gestation period is only 28 days, and a female is usually bred again within a few hours of giving birth. Under ideal conditions each pair of rabbits could produce 36 young from spring to fall. Fortunately, this potential is never reached. Weather, disease, predators, encounters with cars and hunters, and other factors combine to keep a lid on the population.

Rabbits give birth in a shallow nest scratched or dug into the ground and concealed by vegetation. Even open turf grass can provide sufficient cover and mowing may reveal a nest of young. The young are born nearly furless with their eyes closed. Their eyes open in 7-8 days and they are ready to leave the nest in 2-3 weeks.

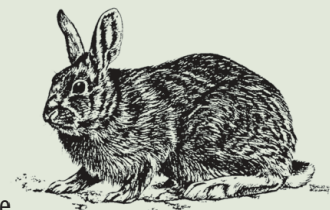
Contrary to popular belief, cottontails do not dig extensive burrows like some rabbit species. They use natural cavities, brush piles or burrows excavated by woodchucks or other animals. Underground dens are used primarily in very wet or bad weather and to escape pursuit.

Legal status

In Wisconsin, the owner or occupant of a parcel of land may hunt rabbits all year on that land, except for a short time near the gun deer season. Any agent of the landowner shooting or trapping rabbits must have a valid small game or trapping license, respectively. Consult Wisconsin Department of Natural Resources regulations for hunting dates and rules.

Tularemia

Tularemia is disease carried by rabbits and can be passed to people through a variety of transmission routes, including simply handling an infected rabbit or being bitten by a tick or other parasite that had previously been on an infected rabbit. The rabbit may show no ill effects of the disease. Use care in handling rabbits during the spring and summer (until about mid-September). Tularemia is usually not a problem after a hard freeze and during the winter, which is one reason why the Wisconsin rabbit hunting season opens in October. If fever, chills, aches and pains, or other symptoms develop within one or two weeks after handling rabbits, consult your physician.



IDENTIFYING RABBIT DAMAGE

In spring and summer, rabbits primarily feed on herbaceous plants. Stems nipped off cleanly at an angle are signs of rabbit foraging.

In fall and winter, rabbits switch to feeding on woody vegetation. Rabbits damage woody plants by gnawing bark or clipping off branches, stems and buds. The age and character of the bark can influence rabbit browsing. While the thick, rough bark of older trees often discourages gnawing, most young trees have smooth, thin bark with delicious green material just beneath. Such bark provides an easy-to-get food source for rabbits. Even on the same plant, rabbits will avoid the rough bark, but girdle the young, smooth twigs.

When the ground is covered with snow for long periods, rabbit damage to expensive trees and shrubs in plantations, parks, and private landscapes can be severe. Some young plants are clipped off at snow height, and larger trees and shrubs may be completely girdled. When the latter happens, only sprouting from beneath the damage or a delicate bridge graft around the damage will save the plant.

When cottontails feed on the bark and inner bark layers of woody vegetation, their incisors leave telltale imprints. Although other wildlife gnaw on trees and shrubs, measuring the size of the incisor marks can help determine if rabbits or another gnawing animal caused

the damage. Cottontails have well-developed, large incisors (front teeth), two on the bottom jaw and two on the top jaw (not counting the 2, smaller peg-like incisors behind the large top incisors). The average width is 2.7 millimeters for upper incisors and 2.8 millimeters for bottom incisors. When browsing woody vegetation, rabbits leave a clean, angled (approximately a 45 degree angle) cut on relatively small-diameter woody vegetation and other plant material.

In addition to identifying rabbit damage from gnawing and browsing, other signs to look for include

tracks, pellets (sometimes also called scat or droppings), forms (small pockets the rabbit makes in vegetation), and nest burrows.

Cottontail tracks are best viewed in snowy or muddy conditions. The front tracks are oval shaped, measure about 1 inch long, and are usually placed between the hind tracks. The hind tracks are oblong and about 3 inches long.

Pellets are round and typically light brown in color, each measuring from $\frac{3}{16}$ to $\frac{7}{16}$ inches in diameter.

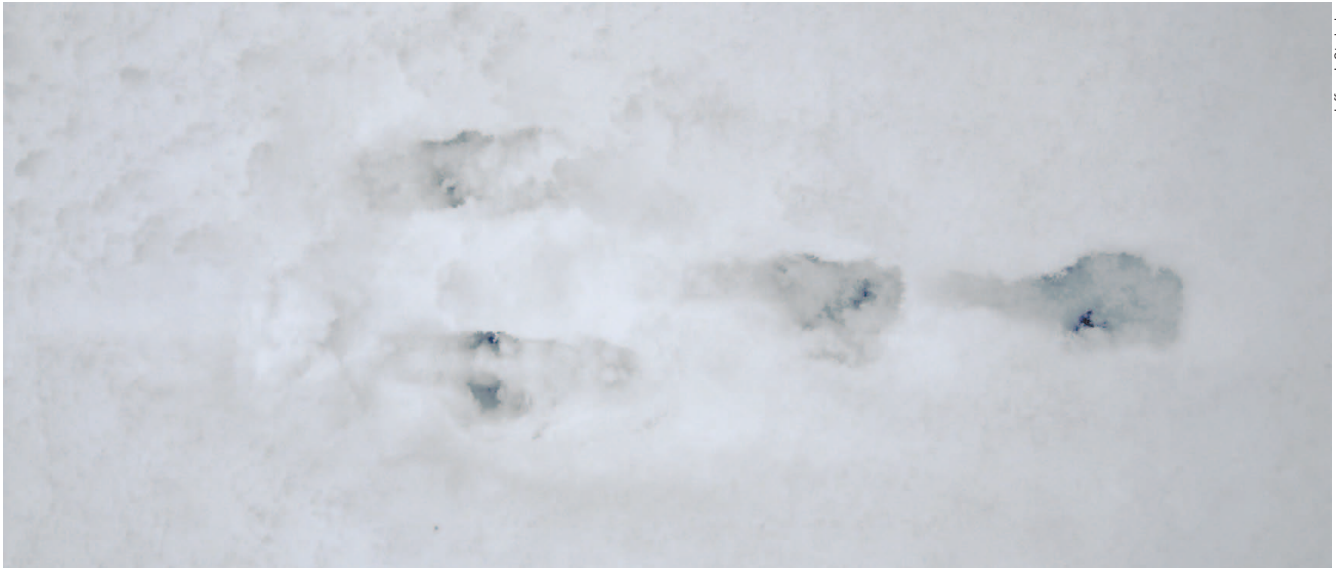
Forms measure about 6 to 8 inches long by 4 to 6 inches wide, whereas nest burrows measure 4 to 6 inches deep and 5 to 8 inches in diameter.

Nest burrows also commonly have belly fur from the mother rabbit mixed with surrounding natural materials like grass.



Jeffrey J. Strobel

A rabbit's incisors create a clean, angled cut on browsed woody plants.



Jeffrey J. Strobel

Cottontail rabbit track in snow.

CONTROLLING RABBIT DAMAGE

Because of the cottontail's reproductive potential no control is effective for more than a limited period. Control measures are most effective when used against the breeding population during the winter.

Natural Control

Floods, ice and subzero temperatures, parasites like ticks, fleas and botflies, and disease can weaken or kill rabbits. However, these natural population controls may not be enough in some situations. In these cases, you may need to give nature a bit of help.

There are two natural, or indirect, ways to reduce a local rabbit population. The first is to encourage, or at least avoid interfering with, the rabbits' natural enemies. Hawks, owls, fox, mink, weasels and snakes all help the farmer, gardener, homeowner and forester control rabbits. These animals should never be harassed or needlessly destroyed. In fact, it is against the law to kill hawks and owls, and fox and mink are protected during certain seasons as valuable furbearers. Even the family cat can be an effective predator on young nestling rabbits, although cats will kill birds and other desirable species as well.

The second form of natural control is manipulation of the rabbits' habitat. Although frequently overlooked, removing brush piles, weed patches, junk dumps, stone piles and other debris where rabbits live and hide can be an excellent way to manage them. Keep in mind, however, that rabbits do very well in many different types of habitats, especially those found in suburban areas. You may do everything correctly in modifying the habitat to discourage rabbits, but your neighbors may do nothing, or may actually enjoy rabbits and thus provide habitat to attract rabbits. So, despite your diligence, rabbits may still frequent your yard.

Active control

In spite of all the natural factors that can help manage rabbit populations, additional steps may be necessary to protect valued plants. There are several active, or direct, ways to control rabbits, including trapping, shooting, repellents, and exclusion. Note that we have not listed poisoning. There are NO poisons registered for use against rabbits in

Wisconsin. Poisoning rabbits is **not** recommended. It is dangerous to other animals and humans. It is also illegal.

There is no question that rabbit populations often need to be controlled. But keep in mind that rabbit problems are a local problem. Extermination is neither feasible nor desirable, and your "pests" may be someone else's pleasure to observe and hunt.

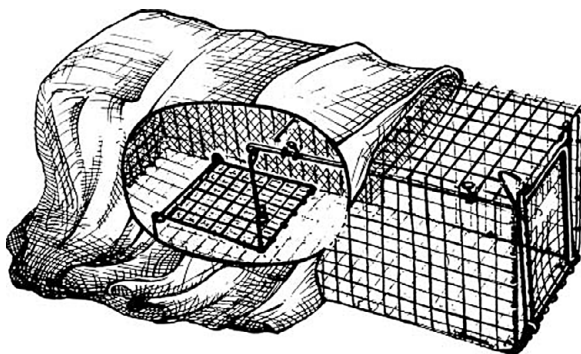
Shooting is a lethal, cost-effective, quick and easy solution, but make sure that local firearm laws allow it and that it is safe. You have to be persistent if shooting is the only technique you rely on.

Trapping is the best way to remove rabbits in cities, parks and suburban areas. The first step is to get a well-built and well-designed live trap. Several excellent styles of commercial live traps are available from garden centers, hardware stores and internet sites. Most commercial traps are wire and last indefinitely with proper care. Average cost is about \$45.

Place traps where you know rabbits feed or rest. Keep traps close to cover, so rabbits won't have to cross large open areas to get to them. If you use a commercial wire trap, you can make it more effective by covering it with canvas or some other dark material. Be sure the cover does not interfere with the trap's opening and closing. In winter, face traps away from prevailing winds to keep snow and dry leaves from plugging the entrance or interfering with the door.

Finding bait is not a problem. Dried corn still on the cob is a good winter bait. Impale a cob broken in half on the nail at the rear of the trap (commercial traps do not have a nail, so set the cob near the back of the trap). 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 or clover and dried apple are also good cold-weather baits. Apple, carrot and cabbage are good baits in warmer weather. A cabbage leaf rolled tightly and held together by a toothpick may prove irresistible.

Wisconsin state law requires that you check open traps at least once every 24 hours, so check traps daily to replenish bait or remove the catches – this is essential for effective control and to treat the animals humanely.



A cage trap half-covered when it is set, so you can later approach without being seen by the trapped animal.

Move traps to a new location if you haven't caught a rabbit within a week.

You can release rabbits in a rural area several miles from where you trap them providing you have permission from the landowner or land manager prior to release.

But do not simply drop them off where they may create a problem for someone else.

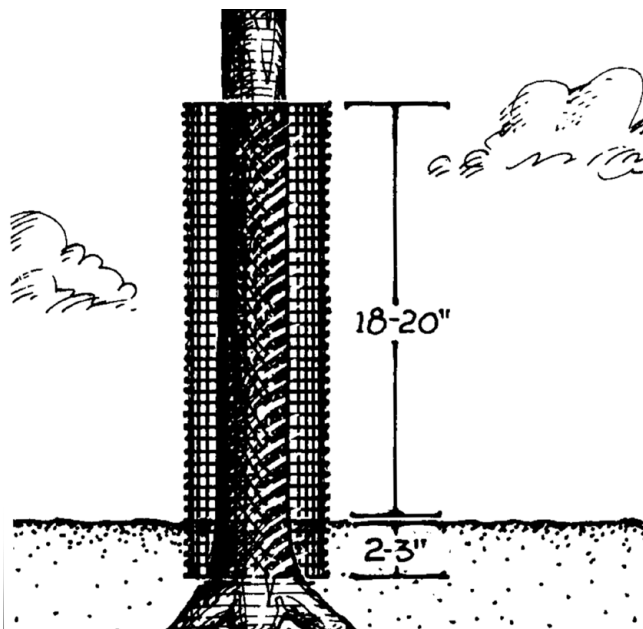
Keep in mind that removing rabbits by shooting or trapping one year will never guarantee that the rabbit population will be low the next year.

Exclusion

One of the best and most inexpensive ways to protect a backyard garden or berry patch is to exclude rabbits by putting up a fence. It doesn't have to be tall or especially sturdy. A fence of 2-foot chicken wire with the bottom tight to the ground or buried a few inches is sufficient. Be sure the mesh is 1 inch or less so that young rabbits will not be able to go through it. Or, you can build a more substantial fence of welded wire, chain link or hog wire. Such a fence will also keep pets and children out of the garden and can be used to trellis vine crops. The lower 1½ feet should be covered with 1-inch wire mesh.

Cylinders constructed of wire hardware cloth with mesh size of ¼ inch will protect valuable young orchard trees or landscape plants (see illustration). One-quarter-inch mesh hardware cloth also protects against mouse damage. Commercial tree tubes are also available at your local garden center or via the internet. The cylinders should extend above expected snow depth and stand an inch or two out from the tree trunk. To protect the tree from mold, fungus, and boring insects, any debris that collects inside the cylinder (i.e., between the tree and cylinder) should be routinely removed.

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Wire mesh cylinder around a young tree trunk.

Chemical Repellents

Several chemical repellents may discourage rabbits from browsing vegetation. There are numerous formulations and brand names available at garden centers. Most are based on a few common active ingredients: blood, thiram (a fungicide), capsaicin (what puts the hot in hot peppers), and other natural and synthetic ingredients.

Repellents can be classified according to two general categories – contact (or taste) repellents, and area (or odor) repellents. Contact repellents are liquid formulations that are sprayed or brushed on plants to give them an unpleasant taste. An animal that samples the plant will either find it distasteful and/or become temporarily physically ill (stomach cramps, diarrhea, vomiting). Area repellents produce an odor that is noxious to animals and must be placed in the immediate area where protection is desired. Examples of area repellents used for rabbits are naphthalene mothballs or dried blood meal.

Rigorous scientific testing of these products has been limited. Thus, you must often rely on advertising, testimonials, and your own experience or that of a friend. For a current listing of repellents, enter “rabbit repellents” in your computer’s search engine or visit the website for the Internet Center for Wildlife Damage Management at <http://www.icwdm.org>

Regardless of the repellent you choose, always follow exactly the application directions on the container. Remember that repellents are not designed to be used on plants or plant parts destined for human consumption. Repellents protect only the parts of the plant they contact; new growth that emerges after application is not protected. Some repellents may need to be reapplied after heavy rains. When rabbits are abundant and hungry, use other control techniques along with chemical repellents.

Home Remedies

Many people have a favorite rabbit remedy. Some people will place a piece of rubber hose on the ground to simulate a snake and scare rabbits away. Another remedy calls for placing large, clear glass jars of water in a garden. Supposedly, rabbits are terrified of their distorted reflections. There are many other such tricks. Feel free to try them out, but do not bet your annual fruit or vegetable production on their working.

Rather than gimmicks, we recommend an appropriate program of removal, mechanical protection and habitat cleanup. A rabbit or two may get around your defenses, but the problem will certainly be reduced.

Rabbit

Ecology & Damage Management

This fact sheet is part of a series designed to help you successfully manage wildlife damage problems on your property. The series includes additional publications which focus on controlling damage from specific animals, plus an introduction to wildlife damage management.

INFORMATION ABOUT RABBIT ECOLOGY AND DAMAGE CAME FROM:

Elbroch, M. 2003. *Mammal tracks and sign: A guide to North American species*. Stackpole Books, Mechanicsburg, PA.

Elbroch, M. 2006. *Animal skulls: A guide to North American species*. Stackpole Books, Mechanicsburg, PA.

Stokes, D., and L. Stokes. 1986. *Guide to animal tracking and behavior*. Little, Brown and Company, Boston, MA.

This publication is available in pdf format at: wildlifedamage.uwex.edu

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G3997-004 I-02-2012

Graphic design by Jeffrey J. Strobel,
UW-Extension Environmental Resources Center.

