

Terrell P. Salmon
Wildlife Extension Specialist
Department of Wildlife, Fisheries
and Conservation Biology
University of California
Davis, California 95616

W. Paul Gorenzel
Staff Research Associate
Department of Wildlife, Fisheries
and Conservation Biology
University of California
Davis, California 95616

WOODRATS

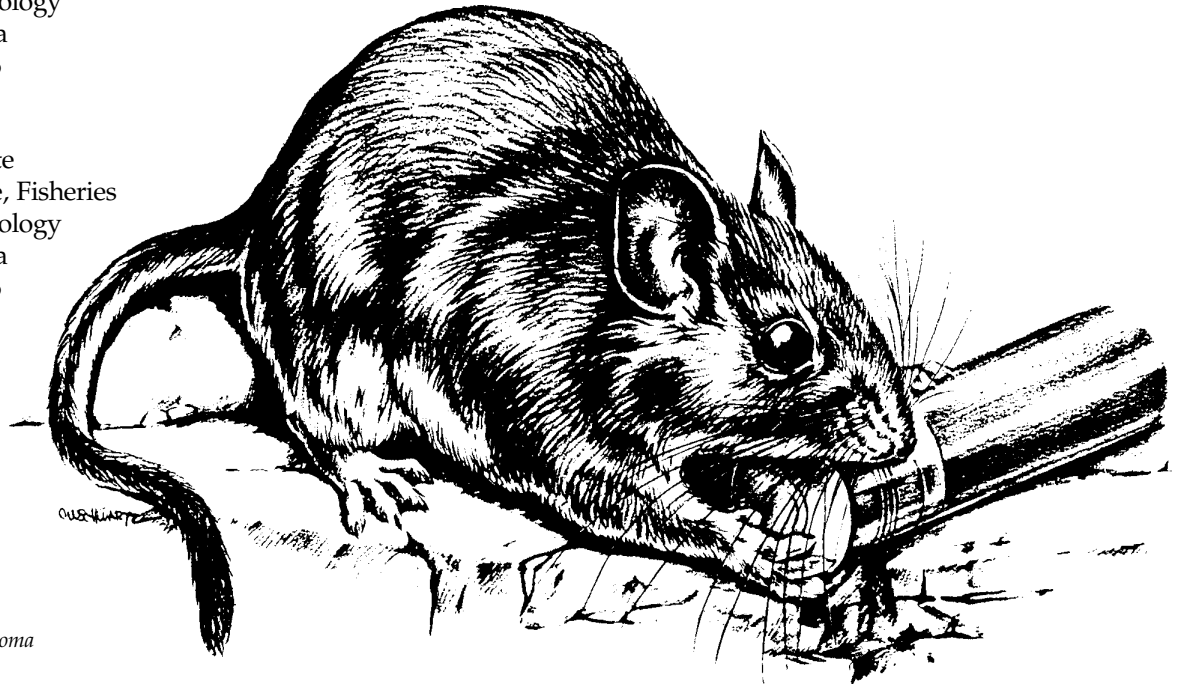


Fig. 1. Eastern woodrat, *Neotoma floridana*

Damage Prevention and Control Methods

Exclusion

Woodrats can be permanently excluded from buildings.

Cultural Methods

Not generally useful.

Trim lower branches of citrus trees.

Repellents

None are registered or considered effective at this time.

Toxicants

Anticoagulants (registered in some states).

Zinc phosphide (registered in some states).

Fumigants

Not useful.

Trapping

Rat snap trap.

Live traps.

Burrow-entrance traps.

Glue boards.

Shooting

Limited usefulness.

Other Control Methods

Destruction of dens.

Identification

Eight species of woodrats (genus *Neotoma*) occur in North America (Table 1). Locally known as pack rats or trade rats, these rodents are about the size of the common Norway rat. They are distinguishable from Norway rats by their hairy rather than scaly tail, soft, fine fur, and large ears. They usually have light-colored feet and bellies.



PREVENTION AND CONTROL OF WILDLIFE DAMAGE — 1994

Cooperative Extension Division
Institute of Agriculture and Natural Resources
University of Nebraska - Lincoln

United States Department of Agriculture
Animal and Plant Health Inspection Service
Animal Damage Control

Great Plains Agricultural Council
Wildlife Committee

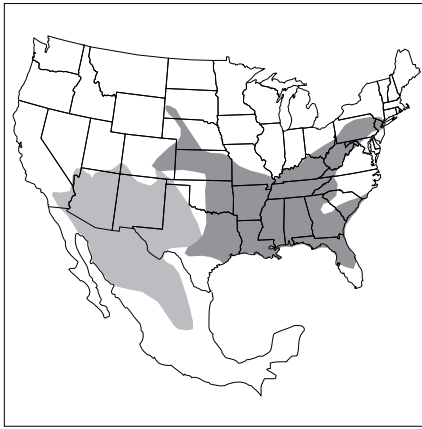


Fig. 2. Range of the eastern (dark) and whitethroat woodrats (light) in North America.

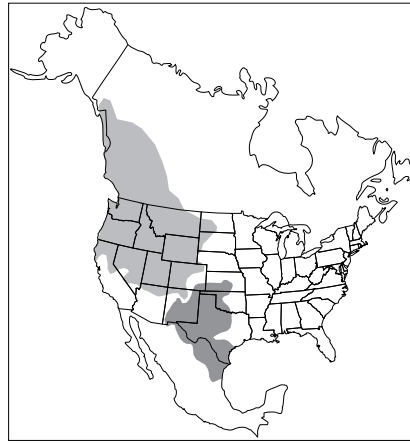


Fig. 3. Range of the southern plains (dark) and bushytail woodrats (light) in North America.

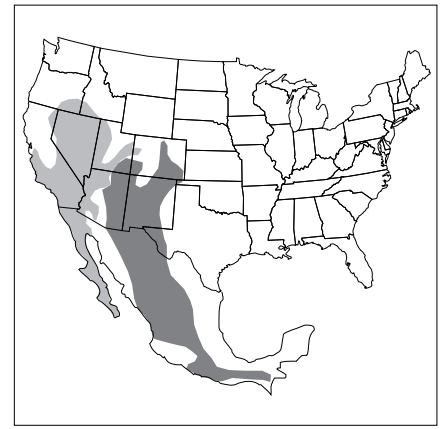


Fig. 4. Range of the Mexican (dark) and desert woodrats (light) in North America.

Range

The ranges occupied by woodrats are shown in figures 2, 3, 4, and 5.

Habitat

Each species of woodrat is generally restricted to a given type of habitat within its range. Woodrats occur from low, hot, dry deserts to cold, rocky slopes above timberline (Table 1).

Food Habits

The food habits of woodrats are relatively specific for the individual species. Species such as the bushytail woodrat, for example, feed primarily on green vegetation, twigs, and shoots, whereas the Mexican woodrat feeds on seeds, fruits, acorns, and cactus (Table 1). Woodrats may also be attracted to human food supplies in buildings. When nesting inside buildings, woodrats usually continue to

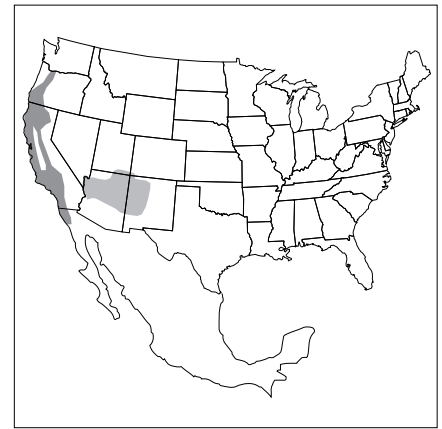


Fig 5. Range of the dusky-footed (dark) and Stephens woodrats (light) in North America.

Table 1. Woodrats (*Neotoma* spp.) in North America.

Species: Eastern woodrat (*Neotoma floridana*)
Description: Total length 14 to 17 inches (36 to 43 cm). Large grayish-brown woodrat with white or grayish belly. Tail shorter than head and body.
Habitat Preference: Rocky cliffs and mountain regions. Usually builds a home of sticks and debris.
Food Preference: Seeds, nuts, and fruits.

Species: Southern plains woodrat (*Neotoma micropus*)
Description: Total length 13 to 14 inches (33 to 36 cm). Steel-gray woodrat with white hairs on throat, breast, and feet. Blackish tail.
Habitat Preference: Semi-arid brushland, low valleys, and plains.
Food Preference: Cactus, seeds, and acorns.

Species: Whitethroat woodrat (*Neotoma albigula*)
Description: Total length 13 to 15 inches (33 to 38 cm). Body is gray, belly is white. Hairs on throat and feet white. Tail whitish to brown.
Habitat Preference: Brushlands and rocky cliffs with shallow caves. Builds a house 2 to 3 feet (0.6 to 0.9 m) high made of sticks and rocks.
Food Preference: Cactus, beans and seeds, leaves of plants, especially new growth.

Species: Desert woodrat (*Neotoma lepida*)
Description: Total length 10 to 13 inches (25 to 33 cm). Body pale to dark gray washed with fulvous. Belly grayish to fulvous. Slate gray at base of hairs.
Habitat Preference: Desert floors or rocky slopes. House usually on ground or along cliffs.
Food Preference: Seeds, fruits, acorns, and cactus.

Species: Stephens woodrat (*Neotoma stephensi*)
Description: Total length 10 to 14 inches (25 to 36 cm). Body grayish buff, darker on top, belly washed with buff. Dusky wedge on top hind foot. Tail slightly bushy on end, whitish below, blackish above.
Habitat Preference: Juniper woodlands.
Food Preference: Primarily juniper.

Species: Mexican woodrat (*Neotoma mexicana*)
Description: Total length 12 to 13 inches (30 to 33 cm). Gray to black in color. Tail distinctly bicolored with white below, black above.
Habitat Preference: Rocks and cliffs in mountains. Does not normally build houses.
Food Preference: Acorns, nuts, seeds, fruits, and cactus plants.

Species: Dusky-footed woodrat (*Neotoma fuscipes*)
Description: Total length 14 to 18 inches (36 to 46 cm). Body gray-brown above, gray to white below. Tail slightly paler below. Dusky hairs sprinkled on hind feet.
Habitat Preference: Dense chaparral, riparian thickets, deciduous or mixed woodlands. Builds large stick houses on ground or in trees.
Food Preference: Variety of seeds, nuts, acorns, fruits, green vegetation, and fungi.

Species: Bushytail woodrat (*Neotoma cinera*)
Description: Total length 15 to 16 inches (38 to 41 cm). Body varies from pale gray to nearly black. Has a long, bushy squirrel-like tail.
Habitat Preference: High mountains. Climbs about cliffs easily. Does not normally build houses.
Food Preference: Green vegetation, twigs, and shoots.

feed outside. Trails 3 to 4 inches (8 to 10 cm) wide from the building to the outside may be visible.

General Biology, Reproduction, and Behavior

Woodrats climb readily and are usually active at night. Most species build a large stick den or house on the ground or in trees, but some species live in rocky outcroppings. These houses are typically occupied by one individual or by a female and her young. One animal may inhabit several houses. A nest, usually made of finely shredded plant material, is located within the larger house. Breeding usually occurs in the spring. Woodrats produce 1 to 4 young per litter and may produce more than 1 litter per year in the southern parts of the United States.

Damage and Damage Identification

Populations generally are fairly dispersed, but economic damage to agricultural crops can occur in limited areas. Agricultural damage results when woodrats clip small twigs and branches, and when they debark citrus and other fruit trees and seedling and sapling conifers, especially redwoods. Loss of trees can occur.

Woodrats are sometimes a nuisance around cabins, outbuildings, and other infrequently used structures or vehicles. As the name "packrat" implies, they have a tendency to pack away small objects such as jewelry, cooking and eating utensils, can tabs, and other items. At times, this behavior can become a nuisance to backpackers and others. More seriously, woodrats may also shred upholstered furniture and mattresses for lining nests, and may take up residence in parked vehicles, gnawing on wires and other mechanical components.

Woodrats can be an important factor in the transmission of certain diseases,

most notably plague, where this disease occurs. Dead or dying woodrats should not be handled.

Legal Status

Woodrats are classified as nongame animals. In most states they can be taken (controlled) when they threaten or damage property. Check with your local wildlife or agriculture department for laws and regulations specific to your area. For example, the Key Largo woodrat (*Neotoma floridana smalli*) was federally listed as endangered in 1991.

Damage Prevention and Control Methods

Exclusion

When nuisance problems occur in and around buildings, exclusion is the most effective method of eliminating damage. Woodrats may be excluded from buildings by the same methods used to exclude Norway and roof rats (see **Rodent-proof Construction and Exclusion Methods**). Since several species of woodrats are agile climbers, all entrances to buildings, including those at the attic level, must be closed. Cracks and openings in building foundations, and any openings for water pipes, electric wires, sewer pipes, drain spouts, and vents must be sealed. Also check for openings in attic vents, broken roof shingles, or other gaps next to the eaves. No hole larger than 1/2 inch (1.3 cm) should be left unsealed. Make sure doors, windows, and screens fit tightly. If gnawing is a problem, edges can be covered with sheet metal. Coarse steel wool, wire screen, and lightweight sheet metal are excellent materials for plugging gaps and holes. Plastic sheeting, wood, or other less sturdy materials will likely be gnawed away. When rodent-proofing, be sure the woodrat is not trapped inside the building. One way to accomplish this is to install a temporary gravity door made of sheet metal or rigid mesh wire, hinged at the top, over entrance holes. The woodrats can push it open to exit but cannot reenter.

Repellents

Objectionable odors from substances like mothballs (naphthalene), or tacky substances, may make an enclosed area temporarily less desirable for woodrats, as for other mammals. Likewise, noxious tastes may make an item less palatable. No woodrat repellents, however, are registered by the EPA. In general, chemical repellents are not considered a practical solution to woodrat problems.

Toxicants

Toxicants available for woodrat control include anticoagulants and zinc phosphide, registered under Special Local Needs 24(c) provisions. Registered products vary among states. When using toxic baits, follow label instructions carefully.

Anticoagulants are effective for woodrat control and are especially suited for use around structures because of their low hazard to pets and children. Most baits formulated for commensal rats and house mice give effective woodrat control. Anticoagulants work by interfering with the blood-clotting mechanism. Death usually occurs 4 to 5 days after feeding on bait begins. With most anticoagulants, such as chlorphacinone or diphacinone, feeding must occur daily for 4 to 5 days. Finely ground or meal-type anticoagulant baits are recommended. Since woodrats have a tendency to pack away items, pellet bait should be avoided since it is often cached at the nest site. Cached bait is probably not effective in minimizing reinvasions of the area, so it is essentially wasted and may present hazards to nontarget species.

Anticoagulants are usually put out in bait boxes, but woodrats tend to fill boxes with sticks and other debris. Therefore, use open bait containers. Bait exposed in this manner must be placed so nontarget species, pets, and children do not have ready access to it. Access to the bait by pets can be minimized by inverting a wooden crate over the bait tray. Baiting sites should be located near existing woodrat runways, feeding sites, or nests.

Anticoagulant paraffin bait blocks have also proven valuable for woodrat control. Because of the paraffin, the bait has more resistance to molding caused by moisture and, therefore, lasts longer. These bait blocks are particularly useful in mountain cabins or other structures where woodrats gain access when the building is unoccupied. The bait block should be nailed or tied down to prevent the woodrat from packing it away. When the label permits, bait blocks may also be wired to tree limbs or other elevated locations. For additional information on anticoagulant baits see **Norway Rats**, **Roof Rats**, and **Vertebrate Pesticides**.

In agricultural situations, zinc phosphide is a Restricted Use Pesticide and must be applied by a certified applicator. Steam-rolled oats or oat groats treated with 2.0% zinc phosphide are generally very effective on woodrats. Usually, tablespoon (4 g) amounts are scattered in runways near the nest site. Zinc phosphide bait should be applied in late afternoon just prior to woodrats' night-time feeding. Feeding on a sub-lethal amount of zinc phosphide bait can result in bait shyness. Therefore, do not use zinc phosphide more than once per 6-month period.

In some cases, the use of second generation anticoagulants (for example, brodifacoum, bromadiolone) or other toxicants (cholecalciferol) may be permitted for woodrat control. Based on Section 2 of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act), EPA ruled that it is legal, unless otherwise specifically prohibited, to use a pesticide against a target species not listed on the label if the label directions for a listed pest are followed. The site to be treated must be mentioned on the label and there must be reason to believe the application will be effective. For example, the use of cholecalciferol to control woodrats in or around buildings could be permissible because the label lists Norway or roof rats and specifies in or around buildings. Not all states accept the EPA ruling. Check with the appropriate pesticide enforcement agency prior to pursuing this course of action.

Trapping

The majority of woodrat problems in structures can be dealt with by using one or several traps. Woodrats show little fear of new objects in their environment and are easily trapped. The standard rat snap trap is quite effective for woodrats. Trap bait should be wedged into or tied to the treadle. Good baits include nut meats, bacon rind, peanut butter and oatmeal, prunes, raisins and other dried fruit, and biscuits.

Live catch traps, using the same baits as above, can be used for woodrats. Release of trapped animals is not recommended and may be against local fish and game regulations. Also, many studies have shown that animals released into new areas often die from exposure, predation, or competition with resident animals.

Burrow-entrance traps such as the No. 110 Conibear® trap may also be useful for woodrat control. The trap is placed in nest openings or other restricted travelways and is triggered when the woodrat passes through the trap opening. When traps are set in this manner, baiting is not necessary, but care must be taken to avoid nontarget animals.

Glue boards are also effective for trapping woodrats. These work on the same principle as flypaper; when a rat attempts to cross a glue board, it gets stuck. Glue boards tend to lose their effectiveness in dusty areas, and temperature extremes may affect the tackiness of the adhesive. In many cases, woodrats trapped on glue boards will not die immediately. If they don't, they can be euthanized by placing the board in a plastic bag and adding carbon dioxide gas.

Remember, all traps and glue boards should be placed so that children, pets, and other nontarget animals do not have access to them.

Other Methods

Destroying woodrat nests has been suggested as a method of control. When a nest is destroyed, the animals may run for cover, thus exposing them to predation by humans or dogs. This

method of control is time-consuming and probably of limited value. Once the woodrats in an area are controlled, however, destroying their nests may reduce invasion by other woodrats.

Economics of Damage and Control

Nationally, woodrats are a minor pest. They only occasionally become numerous enough to cause significant agricultural damage. In most cases, woodrats are a nuisance around vacation homes, cabins, and other out-buildings. Their stick nests can be extensive and their physical presence and droppings are often objectionable. Woodrats can carry diseases and ectoparasites. Therefore, close association with humans is undesirable. In most nuisance situations, control can be accomplished by the resident or homeowner.

Acknowledgments

Figure 1 from Schwartz and Schwartz (1981).

Figures 2, 3, 4, and 5 adapted from Burt and Grossenheider (1976) by David Thornhill.

For Additional Information

Burt, W. H., and R. P. Grossenheider. 1976. A field guide to the mammals, 3d ed. Houghton Mifflin Co., Boston. 289 pp.

Linsdale, J. M., and L. P. Tevis. 1951. The dusky-footed wood rat. Records made on Hastings Natural History Reservation. Berkeley, California. 675 pp.

Schwartz, C. W., and E. R. Schwartz. 1981. The wild mammals of Missouri, rev. ed. Univ. Missouri Press, Columbia. 356 pp.

Vorhies, C. T., and W. P. Taylor. 1940. Life history and ecology of the white-throated wood rat, *Neotoma albigula* Hartly, in relation to grazing in Arizona. Univ. Arizona Tech. Bull. 49:467-587.

Wiley, R. W. 1980. *Neotoma floridana*. Mammal. Species. 139:1-7.

Editors

Scott E. Hygnstrom
Robert M. Timm
Gary E. Larson