

# RATS

## PREVENTION AND CONTROL



PROTECTING PUBLIC HEALTH SINCE 1915



## RAT SERVICES

Homeowners, business owners, or any group in Marin/Sonoma Counties can request a site visit to assist them with rat issues. District services include rodent identification (rodent need not be present) and advice for prevention and control. We make house calls! Detailed report may be issued. District employees do not bait or set traps, but provide valuable, detailed information, guidance and recommendations.

## WHAT CAN YOU DO?

You can host a block party in your neighborhood. An effective way to get rid of rats on your block is to work together with your neighbors. If your neighbors have rats, so do you! Organize and call the people in your neighborhood together. As a group, you can make a commitment to make your neighborhood a place where rats cannot survive. Cooperation works!

The Marin/Sonoma Mosquito & Vector Control District may arrange a speaker for your block party or supply visual aids, fliers, brochures, or other helpful materials free of charge. Call 707.285.2200 to set up a presentation.

## GENERAL INFORMATION

**ROOF RAT** *Rattus rattus* (also known as Black, Fruit, Ship)

- Tail** Longer than head and body combined
- Body** Slender
- Ear** Large
- Eye** Large
- Nose** Pointed

Roof Rat droppings actual size:



Roof Rat (*Rattus rattus*)\*\*

**NORWAY RAT** *Rattus norvegicus*  
(also known as Wharf, Sewer, Brown, Common)

- Tail** Shorter than head and body combined
- Body** Heavy, thick
- Ear** Small
- Eye** Small
- Nose** Blunt

Norway Rat droppings actual size:



Norway Rat (*Rattus norvegicus*)\*\*

**HOUSE MOUSE** *Mus musculus*

- Feet** Small
- Head** Small
- Can enter through a hole 1/4" in diameter

Mouse droppings actual size:



House Mouse (*Mus musculus*)\*\*\*

## DISEASES

Rodent	Disease			
	Salmonellosis	Leptospirosis	Hantavirus	Arenavirus
	A bacterial "food poisoning" that may be transmitted when rodents contaminate food by contact with their own feces or urine.	A bacterial disease that may be contracted through contact with water or ingestion of food contaminated with urine of infected rats.	A viral disease that may be contracted through the direct contact with or inhalation of aerosolized infected rodent urine, saliva, or droppings.	A viral disease that may be contracted through the direct contact with or inhalation of aerosolized infected rodent urine, saliva, or droppings.
House Mouse	✓	✓		
Roof Rat	✓	✓		
Norway Rat	✓	✓		
Deer Mouse	✓		✓	
Wood Rat	✓			✓

✓ indicates vector is known to carry disease. Rodents are not known to carry rabies.

## RATS & VEGETATION

Many plant species in Marin/Sonoma County harbor rats. Whenever possible, these plants should be replaced with species that achieve the desirable effects of ground cover, but will not contribute to the rat problem. Characteristics to look for in a desirable ground cover are:

- Plants should be low growing, not more than 10 inches in height.
- They should not be climbers.
- Fruiting plants should not be used.
- Plants should provide soil stabilization.
- Plants should require a minimum amount of water once established.
- Once established, plants should be properly maintained.

## HABITAT & FOOD

In the bay area, rats may live or establish nests in the following areas. These plants should be avoided, if possible.

- Ivy  
*Hedera spp.*
- Arbovitae  
*Thuja orientalis*
- Bamboo  
*Bambus spp.*
- Palm trees
- Blackberries  
*Rubus spp.*
- Honeysuckle  
*Lonicera caprifolium*
- Italian Cypress  
*Cupressus sempervirens*
- Juniper  
*Juniperus spp.*
- Lombardy poplar – Italic  
*Populus nigra*
- Pampas grass  
*Cortaderia selloana*
- Star jasmine  
*Trachelospermum jasminoides*
- Yucca  
*Yucca spp.*
- Other heavy shrubbery



Ideal rat nesting area: dark space between fences covered with ivy.

Rats prefer to feed on:

- Avocados
- Berries
- Citrus
- Grass and bird seed
- Ivy
- Nuts
- Pet Food
- Ripe fruit
- Snails



Watch for signs of rats such as hollowed-out oranges either on the ground or still attached to the tree.

## RECOGNIZING RAT ACTIVITY

The homeowner should be alert for these signs of rat activity:

- Damaged, partially eaten walnuts, acorns, oranges, avocados, or other fruits and nuts.
- Broken snail shells under bushes, on fences, or near or in nesting sites.
- Signs of gnawing on plastic, wood, or rubber materials.
- Greasy rub marks caused by the rat's oily fur coming in contact with painted surfaces or wooden beams.
- Rat droppings (feces) are usually signs of significant rat activity. The droppings are randomly scattered and will normally be found close to a rat runway, feeding location, or near shelter. They are dark in color, spindle shaped, and are about ½ inch long.
- Droppings found in forced air heaters, swimming pool heater covers, and water heater closets.
- Visual sighting on utility cables, tops of fences, or in trees.
- Sounds (gnawing, etc.,) from attics, sub-floor areas, and walls.



*Rats often use the same trails repeatedly.\**



*Gnawing on wires with droppings.\**



*Droppings on fenceline.*

## WHERE RATS AND MICE COMMONLY ENTER HOMES

- Broken or missing foundation vent screens.
- Vent screens on new structure where foundations are faced with brick (screens may have space at bottom or sides).
- Holes in foundation vents or screens where new piping or wiring was installed.
- Outside crawl hole with poorly fitted lid or no tight covering.
- During construction, space not closed where two different roof planes meet (called a "birdsnest" by carpenters).
- Spaces between heavy roof shakes (especially along ridge of roof).
- Attic vent screens broken or left off.
- Space between roof jack and vent pipe from stove fan (also sometimes enters kitchen cabinet along side vent pipe).
- Enters garage under or on sides of large garage door; under side door to garage where threshold is left off and through doors left open constantly.
- From garage, rats enter attic or under house: Between roof boards on shingle roofs; into holes where piping enters walls or through foundation; along rafters, gnawing through common wall sheet rock.
- Holes in exterior walls of house made by residents.
- Holes from new construction – "add ons" around areas where new construction meets old.
- Poorly fitting outside doors, leading to garage, patio, etc.
- Open wooden meter boxes (in older homes).
- Brick chimneys which have settled away from house.
- Tile roof missing end caps.



*Check for loose mesh in foundation vents.*

## RAT CONTROL ENVIRONMENTAL MANAGEMENT

Rat survival depends upon the existence of three basic environmental factors.

### FOOD, WATER AND HARBORAGE

Good environmental management practice is the most effective approach to rat control. Environmental sanitation and good house keeping are the first steps in a successful rat control program. The homeowner can help control rat populations by practicing the following:

- Harvest fruit and nuts as they ripen.
- Pick up fallen fruit and nuts on a daily basis.
- Never leave uneaten pet food outside overnight.
- Keep palm trees and yucca plants well trimmed. Algerian ivy and other thickly matted plants should be removed or trimmed well away from the roof, walls, fences, utility poles, and trees.
- Repair leaky faucets and eliminate any other unnecessary standing water.
- When renovating the yard or planning new landscaping, ground cover unsuitable for roof rat harborage should be considered as a substitute for Algerian ivy.
- Store wood and lumber piles at least 18 inches above the ground and 12 inches away from any structure. Storage boxes should be stacked close together and in an orderly fashion. Clean up debris piles.



Hollowed-out oranges.



Firewood stands are practical and easy to use.

## RAT CONTROL BUILDING MAINTENANCE

Rats can enter even small exterior openings of a home. Openings such as these should be screened with ¼ inch galvanized hardware cloth and inspected at least twice a year.

- Basement windows and ventilation ports
- Attic vents and louvers
- Vent pipes and shafts

### RAT PROOF YOUR BUILDING TO PREVENT RAT ENTRY

- Close all openings larger than ¼ inch to exclude rats and mice. Inspect twice a year.
- Repair or replace damaged vent screens.
- Screen vents, holes and overlapping roof with 16 or 20 gauge ¼ inch hardware cloth.
- Use sheet metal collars around pipe entrances on wooden walls.
- Use cement fill around pipe in brick, stone, or stucco walls.
- Use sheet metal edging along door bottoms to prevent entry and gnawing rats.
- Tree limbs should be kept well away from the roof and walls of the house.
- Gaps around pipes and electrical conduit should be sealed, and cracks around doors and windows should be weather proofed.



Power supply hole sealed with metal flashing.\*



Soffit vent hole sealed with screen.\*

## TRAPPING

Trapping rodents is a perfectly acceptable method of control. Trapping is especially desirable when poisons cannot be used near food, small children, or where domestic animals or livestock are present. Indoors, traps should be used to prevent the serious odor problems that can occur when poisoned rodents die in inaccessible areas.

**Wear rubber gloves whenever handling traps. Check daily.**

### TYPES OF TRAPS

Rodent “snap traps” are inexpensive and are available in two sizes. The smaller trap is designed for mice and the larger is designed for rats. It is very important to choose the proper size trap. Several rat traps should be set to maximize trapping effectiveness.



Rat-sized snap trap.



Mouse-sized snap trap.

Bait selection is important for trapping success. Peanut butter, nutmeats, bacon, pieces of apple, candy and moistened oatmeal are effective baits. For best results, try several different baits to see which is most acceptable by rodents.

Placement of snap traps is crucial to their effectiveness. Place traps in areas frequented by rats. Rats establish runways along fence tops and next to walls. Look for the presence of rat droppings when placing snap traps. Place the narrow end of trap containing the trigger against a wall or known runway. Snap traps can also be attached to pipes or studs with wire, nail, or screws.

Ectoparasites, such as mites and fleas, may move from the dead animal and its nesting material to people or pets. It's important to remove the traps daily and to properly clean the area. Please see the Clean Up section on page 13 of this booklet.

## SETTING A SNAP TRAP

To set a snap trap, apply the recommended bait to the trigger. Pull back the bail with your thumbs. Hold the bait in place with one thumb while attaching the bar to the trigger tab. Carefully place the trap as recommended above. Better results are usually obtained if two traps are set side by side. It is also a good idea to pre-bait, that is, use a baited, but unset trap so that the rodent can become familiar with the baited trap. When bait is taken, re-bait and set the trigger.

The working parts of the trap should be oiled occasionally using mineral oil - never petroleum based oils such as 3-in-1 or WD-40. These oils may act as a repellent to rodents. Never store traps near insecticides or other chemicals, or handle domestic animals or pets before setting out traps. This also can cause traps to take on a repellent odor.



Proper trap placement on beams and rafters. Note rub marks on beams indicating rat trails.



Properly placed traps at floor level.

Improperly placed traps at floor level.

## CHEMICAL CONTROL RAT BAITS

The Marin/Sonoma Mosquito & Vector Control District does not advocate the use of rodenticides, but does recognize that there may be situations in which it is deemed necessary. Rodenticides must be used cautiously and in consideration of non-target animals.

Most rodenticides presently available for rat control are anticoagulants. All placed rodenticides must be checked often and replenished immediately when the supply is low. When the job is finished, uneaten rodenticides should be removed and disposed of according to the label.

Homeowners may purchase rodenticides at nurseries, feed stores, and hardware stores. All rodenticides should be handled carefully. **Always follow all label precautions and recommendations.**

When using baits outdoors, it is important to use only those materials that are registered for outdoor use.



Open bait station with bait blocks.

Weatherproof baits in secured tamper-proof bait stations should be used outdoors. Tamper-proof bait stations prevent children, pets, and nontarget animals from gaining access to the bait, as well as protect the rodenticide from weathering. It is not recommended to use bait indoors. When first put out, bait boxes should be checked daily to be sure there is an ample supply of fresh bait available to the rodent population. Bait boxes are available commercially in a variety of shapes and sizes or can be constructed by the homeowner.

A Marin/Sonoma Mosquito & Vector Control District Vector Control Technician can advise homeowners on appropriate baiting and/or trapping procedures, and will provide other information on the control and prevention of rodent problems. Should the homeowner wish to use the services of a licensed pest control operator, the yellow pages of the phone directory may be consulted under the heading Pest Control.



Tamper-proof bait station.

## CLEAN UP RODENT FECES AND URINE

Never sweep or vacuum rodent evidence including feces, urine and nesting material. When these substances are swept or vacuumed they can break up, forcing virus particles into the air where they can easily be inhaled, infecting the person doing the cleaning. Hantavirus and Arenavirus are transmitted in this manner.

### Steps for cleaning:

- a. Make a solution of one-part bleach and nine-parts water in a spray bottle or use a general purpose household disinfectant such as Lysol®.
- b. Wearing rubber or plastic gloves, spray the solution or disinfectant on the dried urine, feces and nesting material until the substances are soaking wet.
- c. Let the wet materials soak for five minutes.
- d. After five minutes, use a damp paper towel to wipe up urine, droppings and nesting material.
- e. Place the paper towel and waste materials in a plastic bag.
- f. Then, using the same solution or disinfectant, mop or sponge off the area where the rodent evidence was located.
- g. Once finished, put the sponge or mop head into the bag with the rodent evidence.
- h. Wash gloved hands with soap and warm water or spray with disinfectant or solution before removing them. Place them in the plastic bag as well.
- i. Seal the bag and place in a lidded garbage can.
- j. Wash the now un-gloved hands with soap and water.

Once the newly cleaned area is dry (in approximately 30 minutes) it's ready for reuse.



Always wear protective gloves when handling or cleaning rodent evidence.

---

## RECOMMENDATIONS FOR RODENT CONTROL

### EXCLUSION (Exterior)

1. Repair foundation, attic, and gable vent screens with ¼ inch hardware cloth, or replace vent screens.
2. Repair gaps and breaks in exterior walls.
3. Repair voids where roof lines overlap, with ¼ inch hardware cloth or suitable materials to prevent rodents from entering attic.
4. Seal gaps around pipes and wiring that enter through exterior walls.
5. Install, repair, or replace door or rodent proof screen in foundation crawl space opening.
6. Seal gaps (at corners, on sides and under), garage doors and side doors.
7. Keep pet doors closed at night and whenever possible during the day.
8. Install "rat guards" on utility lines that allow rodents access to building.
9. Screen off all openings around perimeter of decks or spas.
10. Keep sheds closed and screen off base of shed.
11. Install spark arrester on chimney.
12. Repair voids where fireplace/chimney has separated from walls.
13. Keep all doors and windows closed at dusk and until dawn.
14. Repair lateral sewer lines to prevent rodents from entering the structure.

15. Install barriers between home and fence lines, patio covers, or sheds that allow rodents to jump, climb, or travel to roof.
16. Seal all holes, gaps and openings in roof.
17. Fill holes in and under foundation walls.

### EXCLUSION (Interior)

18. Seal all holes and gaps around pipes located under sinks in kitchen, bathrooms, and utility rooms.
19. Seal off all voids/gaps in water heater closet, furnace/AC closet, or any other area where pipes and wiring enter walls, floors, or ceilings.
20. Repair heater and air conditioning vents and duct work.
21. Seal all gaps and holes between interior garage walls and main house.
22. Repair holes in interior walls, floors, or ceiling.
23. Seal off voids/gaps behind cabinets, shelves, bookcases, or any other built-ins that create "dead space" where rodents could nest or travel.

### FOOD

24. Keep all garbage cans, recycle bins and dumpsters secured and tightly covered.
25. Feed pets amounts of food that will be totally consumed each feeding.
26. Harvest all ripe food from trees, gardens, and keep off the ground.

---

## FOOD (continued)

27. Eliminate snail population.
28. Store pet foods in metal containers.
29. Remove bird feeders and bird food. Discontinue wildlife feeding.
30. Prevent pet food from falling under decks.
31. Use proper composting techniques to eliminate food source for rodents.
32. Remove stored foods in garage or place in metal containers.
33. Repair leaky faucets and eliminate any other unnecessary standing water.

## HARBORAGE & VEGETATION

34. Remove any trash that has accumulated. Clean up debris.
35. Cut back all trees, vines and shrubs four feet from roof.
36. Store all firewood or lumber 18 inches above the ground and 12 inches away from any structure.
37. Thin out or remove ivy or any other ground cover that could harbor rodents. Keep ground cover away from fences, utility poles, walls, and trees.
38. Remove any old, unused furniture, appliances, containers, abandoned vehicles, or any other items that could harbor rodents.
39. Trim palm trees and/or install rodent barriers to prevent rodents from crawling up tree trunks.

---

## TRAPPING

40. Place traps in areas frequented by rodents. Follow instructions in this rodent pamphlet and the information provided by the vector control technician.

## BAITING

41. Place tamper resistant bait stations outside. Use only secured rodenticide bait blocks inside bait stations. Read and follow label directions and recommendations.

## SAFETY-DROPPINGS

42. Wear rubber gloves and dust mask or respirator.
43. Do not vacuum or blow areas that could cause contaminates to become air born.
44. Remove rodent droppings by spraying droppings with a disinfectant and then wiping up with a wet, disposable paper towel. Put droppings in plastic bag, seal, and place in a trash can.

## SAFETY-DEAD RODENTS

45. Wear rubber gloves. Spray dead rodents with disinfectant. Remove the dead rodent from the trap, or pick up the dead rodent with a shovel, and put it in a double plastic bag. Seal bag and place it in a trash can.



## OUR SERVICES

The Marin/Sonoma Mosquito & Vector Control District is committed to protecting the health and welfare of the communities in which we serve. Our programs and services are supported by property taxes and are provided free of charge to all residents in Marin and Sonoma counties.

### ***Our services include:***

- Mosquito Control & Mosquitofish
- Ground-Nesting Yellowjacket Control
- Rodent Control Advice

\* Photos used with permission courtesy of [www.aaanimalcontrol.com](http://www.aaanimalcontrol.com)

\*\* Photo used with permission courtesy of University of California Statewide IPM Program. © by the Regents of the University of California, Jack Kelly Clark-photographer.

\*\*\* Photo used with permission courtesy of Manuel Godoy



### **Marin/Sonoma Mosquito & Vector Control District**

595 Helman Lane, Cotati, CA 94931

Monday through Friday 7:00am to 3:30pm

**1.800.231.3236 or 707.285.2200**

**[www.msosquito.com](http://www.msosquito.com)**