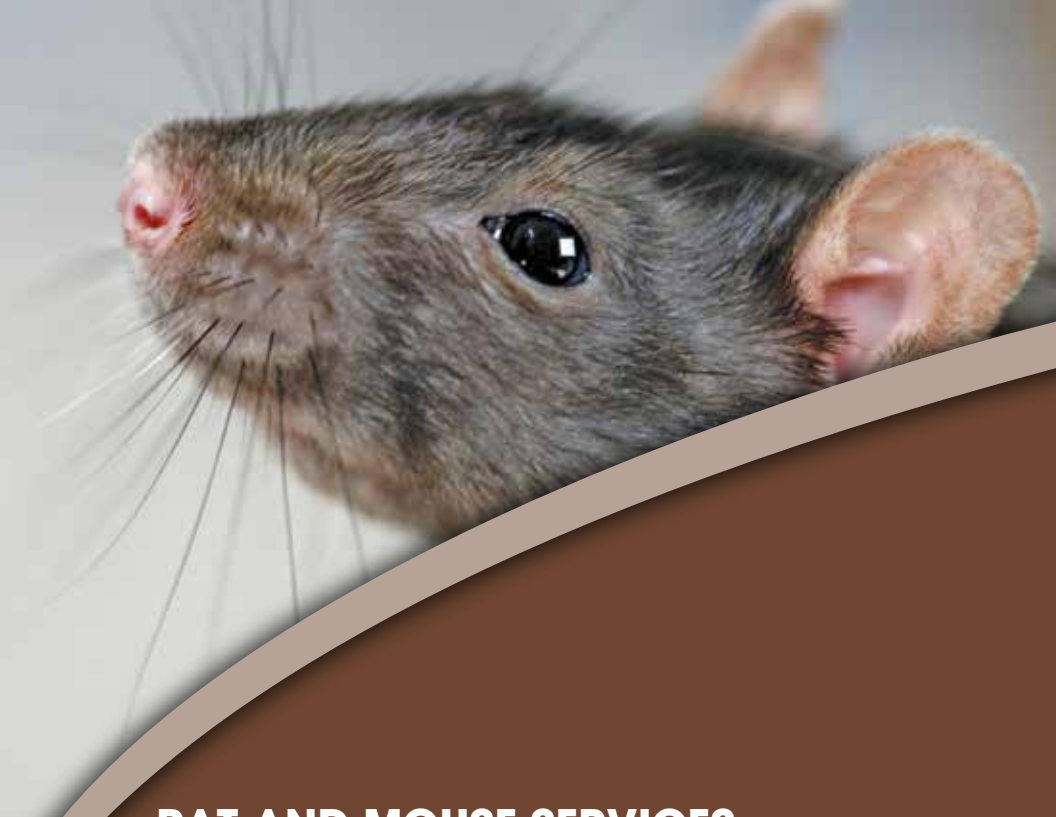


# RATS & MICE

## Prevention & Control



CONTRA COSTA  
**MOSQUITO  
& VECTOR  
CONTROL**  
DISTRICT



## **RAT AND MOUSE SERVICES**

Homeowners, business owners, or any group in Contra Costa County can request a site visit to assist them with rat and mouse issues. District services include identification (rats and mice 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 on private property, 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 and mice on your block is to work together with your neighbors. If your neighbors have rats and mice, 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 and mice cannot survive. Cooperation works!

The Contra Costa 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 (925) 685-9301 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*)\*\*

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## 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*)\*\*

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## 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			
	<i>Salmonellosis</i>	<i>Leptospirosis</i>	<i>Hantavirus</i>	<i>Arenavirus</i>
	A bacterial "food poisoning" that may be transmitted when rats and mice 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 and mice.	A viral disease that may be contracted through the direct contact with or inhalation of aerosolized infected mouse urine, saliva, or droppings.	A viral disease that may be contracted through the direct contact with or inhalation of aerosolized infected rat urine, saliva, or droppings.
House Mouse	✓	✓		
Roof Rat	✓	✓		
Norway Rat	✓	✓		
Deer Mouse	✓		✓	
Wood Rat	✓			✓
✓ indicates vector is known to carry disease. Rats and mice are not known to carry rabies.				

## RATS & MICE: HABITATS ENVIRONMENTAL MANAGEMENT

Good environmental management is the most effective approach to controlling rats and mice. Homeowners can help control their populations by practicing the following:

- Remove or trim dense shrubbery.
- Trim climbing vegetation four feet from roof, walls, fences, utility poles and trees.
- Store wood and lumber piles at least 18 inches above the ground and 12 inches away from any structure.
- Harvest fruit and nuts as they ripen.
- Pick up fallen fruit and nuts on a daily basis.
- Feed pets amounts of food that will be totally consumed at each feeding.
- Keep shed doors closed at night and install screen on base of shed.



*Firewood stands are practical and easy to use.*

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# VEGETATION, WATER & FOOD

Rat and mouse control depends upon the elimination of three basic factors: Food, water, and harborage. Many plant species in Contra Costa County harbor rats and mice. The following plants should be avoided to prevent harborage and nesting, 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.*
- Pampas grass  
*Cortaderia selloana*
- Star jasmine  
*Trachelospermum jasminoides*
- Yucca  
*Yucca spp.*



**Ideal rat nesting area: large, overgrown area of ivy.**

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## Water

Repair leaky faucets and eliminate any other unnecessary standing water.

## Food that attracts rats and mice

- Ripe fruit and Vegetables
- Citrus and Berries
- Nuts
- Grass and bird seed
- Pet food
- Snails



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



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# 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 1/2 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.*

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# WHERE RATS & 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 crawlspace door with poorly fitted lid or 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 and mice 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 wallboard.
- 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.*

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# RATS & MICE: CONTROL

## BUILDING MAINTENANCE

Rats and mice can enter small exterior openings of a home. Openings such as those listed below should be screened with 1/4 inch galvanized hardware cloth and should be inspected twice a year.

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

### Rodent Proof Your Building To Prevent Rats and Mice From Entry

- Close all openings larger than 1/4 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 1/4 inch hardware cloth.
- Use sheet metal collars around pipe entrances on wooden walls.
- Use cement patch around pipes, in brick, stone or stucco walls.
- Use sheet metal edging along door bottoms to prevent entry from rats and mice.
- Tree limbs must be at least four feet from the roof and walls of the house.
- Gaps around pipes and electrical conduit should be sealed.



*Power supply hole sealed with metal flashing.\**



*Soffit vent hole sealed with screen.\**



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# METHODS OF CONTROL

## Trapping

Traps should always be kept away from children and checked on a daily basis. When trapping outdoors, traps have the potential to trap non-target animals such as cats, raccoons, opossums, skunks, squirrels, etc. Always read and follow trap labels.

## Size of Traps

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

## Bait Selection

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

## Placement of Traps

The placement of traps is crucial to their effectiveness. Place traps in areas frequented by rats and mice. Look for the presence of rat and mouse droppings when placing traps. Place the narrow end of the trap containing the trigger against a wall or known runway. Traps can also be attached to pipes or studs with wire, nail or screws.

## Setting the Traps

Prior to setting the traps it is always a good idea to pre-bait. Pre-baiting is when you apply food to the trap or around the trap without setting it. This allows rats and mice to become familiar with the trap as a food source. After the rats and mice have become familiar and have been feeding on the food on the trap, you can then set the trap by pulling back the trigger. **Caution: Always be alert and safe when you are setting a trap. They do have the potential to injure you!**

Ectoparasites, such as mites and fleas, may move from the dead animal and its nesting material to people or pets. Please see the **Clean Up** section on page 13 of this booklet.



*Mouse size (left) and rat size (right) snap traps.*

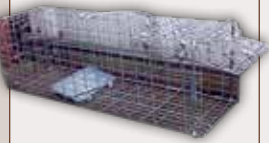





*Various traps side by side against a wall (see pgs 10-11).*

# TYPES OF TRAPS

Always follow the instructions listed on the trap label and keep away from children and pets.

TRAP TYPE	DESCRIPTION	SAFETY AND PRECAUTIONS
 <p><b>Wooden Snap Trap</b></p>	<p>Economical and re-usable. Approved for household and outdoor use. Better in dry locations. Comes in rat and mouse sizes. Rat or mouse triggers the pedal and the trap immediately springs closed.</p>	<p>Wooden snap traps can catch non-target animals. If there is a possibility of trapping a non-target, place a box or container with a small hole on each side over the trap.</p>
 <p><b>Power Spring Trap</b></p>	<p>Re-usable. Powerful spring snap. Good in wet areas because it is made of plastic. Comes in rat and mouse sizes. Rat or mouse triggers the pedal and the trap immediately springs closed.</p>	<p>Very powerful! Power snap traps can catch non-target animals. If there is a possibility of trapping a non-target, place a box or container with a small hole on each side over the trap.</p>
 <p><b>Easy/Quick Set Trap</b></p>	<p>Re-usable. Easy to set. One-step open and close mechanism. Good in wet areas, because it is made of plastic. Comes in rat and mouse sizes. Rat or mouse triggers the pedal and the trap springs closed.</p>	<p>Easy/quick set traps can catch non-target animals. If there is a possibility of trapping a non-target, place a box or container with a small hole on each side over the trap.</p>

TRAP TYPE	DESCRIPTION	SAFETY AND PRECAUTIONS
<p><b>Live Trap</b></p> 	<p>Re-usable. Humane, prevents injuries to rodents. Easy to bait and set. Better for rats than mice. Good in all locations. Rat or mouse triggers the pedal and the trap door falls closed.</p>	<p>Live traps can catch non-target animals. If there is a possibility of trapping a non-target, place a box or container with a small hole on each side over the trap. You can also cover the trap for safety.</p>
<p><b>Multi-Catch Trap</b></p> 	<p>Re-usable. Safe, humane, and an effective method of catching multiple rats and mice. Most commonly used for mice. Better for indoor use. No setting is required. One-way doors allow entry, but prevents escape.</p>	<p>Multi-catch live traps prevent non-targets from entering and are a good choice if you have children and pets.</p>
<p><b>Glue Board Trap</b></p> 	<p>Single use. Disposable. Easy to use. Approved for indoor use. Better in dry locations. Sticky surface catches rats and mice. Recommended for mice control.</p>	<p>Glue board traps can catch non-target animals. If there is a possibility of trapping a non-target, please make the tray into a house by folding the sides.</p>
<p><b>Electronic Zap Trap</b></p> 	<p>Re-usable. Easy to use. Approved for indoor use. Only in dry locations. Requires batteries. Rat or mouse enters the unit and is electronically shocked.</p>	<p>Electronic zap traps prevents most non-targets from entering, but do keep away from pets and children.</p>

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# CHEMICAL CONTROL

## BAITING WITH RODENTICIDES

**Always follow all label precautions and recommendations and keep away from children. Always wear personal protective equipment such as rubber gloves.**

When rodenticides and other poisons are used, Contra Costa Mosquito and Vector Control District suggests always following the label and to consider the impact on non-target animals before placement. Rodenticides should always be secured in a tamper-resistant bait station to prevent children, pets and non-target animals from gaining access to the bait.

Bait stations should be checked on a weekly basis to ensure there is a constant supply of rodenticide for the rat and mouse population. This also prevents the possibility of resistance. Bait stations are available in a wide variety of shapes and sizes or can be constructed by the homeowner.



*Tamper-resistant bait station.*



*Open bait station with bait blocks.*

## Repellents

Contra Costa Mosquito and Vector Control District does not suggest using repellents or ultra sonic devices.



*Sonic Pest Chasers.*

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# CLEAN UP

## RAT AND MOUSE DROPPINGS AND URINE

### **Never sweep or vacuum rodent droppings, urine and nesting material.**

Never sweep or vacuum rat or mouse 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**

1. Mix a solution of one-part bleach and nine-parts water in a spray bottle or use a general purpose household disinfectant.
2. Wearing rubber gloves, spray the solution or disinfectant on the droppings, urine and nesting material.
3. After a couple of minutes, use a damp paper towel to wipe up the disinfected droppings, urine and nesting material.
4. Using the same solution or disinfectant, clean the area where the evidence was present.
5. Place the paper towels and waste materials in a plastic bag.
6. 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.
7. Seal the bag and place it in an outside garbage can.
8. Wash the now un-gloved hands with soap and warm water.



*Always wear protective gloves when handling or cleaning rat or mouse evidence.*

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# RECOMMENDATIONS FOR RAT AND MOUSE CONTROL

## EXCLUSION (Exterior)

1. Repair foundation, attic, and gable vent screens with 1/4 inch hardware cloth, or replace vent screens.
2. Repair gaps and breaks in exterior walls.
3. Screen off voids where roof lines overlap, with 1/4 inch hardware cloth to prevent rats and mice from entering attic.
4. Seal gaps around pipes and wiring that enter through exterior walls.
5. Secure or replace outside crawlspace door.
6. Install or replace weather stripping under or on sides of the garage or side door.
7. Keep pet doors closed at night and whenever possible during the day.
8. Screen off all openings around perimeter of decks or spas.
9. Keep sheds closed and screen off base of shed.
10. Install spark arrester on chimney.
11. Repair voids where fireplace/ chimney has separated from walls.
12. Keep all doors and windows closed at dusk and until dawn.
13. Repair lateral sewer lines to prevent rats and mice from entering the structure.
14. Install barriers between home and fence lines, patio covers, or sheds that allow rats and mice to jump, climb, or travel to roof.
15. Seal all holes, gaps and openings in roof.
16. Fill holes in and under foundation walls.

## EXCLUSION (Interior)

17. Seal all holes and gaps around pipes located under sinks in kitchen, bathrooms, and utility rooms.
18. 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.
19. Inspect heater and air conditioning vents and duct work and repair if damaged.
20. Seal all gaps and holes between interior garage walls and main house.
21. Repair holes in interior walls, floors, or ceiling.
22. Seal off voids/gaps behind cabinets, shelves, bookcases, or any other built-ins that create "dead space" where rats and mice could nest or travel.

## FOOD

23. Keep all garbage cans, recycle bins and dumpsters secured and tightly covered and clean up debris piles.
24. Feed pets amounts of food that will be totally consumed each feeding.
25. Harvest all ripe fruit, vegetables, seeds and nuts from trees and gardens and keep them off the ground.
26. Eliminate snail population.
27. Store pet foods in metal containers.
28. Remove bird feeders and bird food. Discontinue wildlife feeding.



29. Prevent pet food from falling under decks.
30. Use proper composting techniques to eliminate food source for rats and mice.
31. Remove stored foods in garage or place in metal containers.
32. Repair leaky faucets and eliminate any other unnecessary standing water.

**HARBORAGE AND VEGETATION**

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

**RAT AND MOUSE SIGNS & EVIDENCE:**

	Location	Rat or Mouse Species
<input type="checkbox"/> Droppings <input type="checkbox"/> Gnawing		
<input type="checkbox"/> Dead/Live Rodents <input type="checkbox"/> Nests		
<input type="checkbox"/> Rub Marks <input type="checkbox"/> Burrows		
<input type="checkbox"/> Urine Stains/Odor		
OTHER:		

**TRAPPING**

38. Place traps in areas frequented by rats and mice. Follow instructions in this booklet and the information provided by the vector control technician.

**BAITING**

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

**SAFETY-DROPPINGS**

40. Wear rubber gloves and dust mask or respirator.
41. Remove rat or mouse droppings by first spraying droppings with a disinfectant and then wiping up with a wet, disposable paper towel. Put droppings into plastic bag, seal it, and place in a trash can.
42. Do not vacuum or blow out areas that could cause contaminants to become airborne.

**SAFETY-DEAD RATS AND MICE**

43. Wear rubber gloves. Spray dead rats or mice with disinfectant. Remove the dead rat or mouse from the trap or pick up the dead rat or mouse and place it in a plastic bag. Seal the bag and place it in another plastic bag and seal. Discard the bag in the trash.

# NOTES

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## ABOUT CONTRA COSTA MOSQUITO & VECTOR CONTROL DISTRICT

### *Protecting Public Health Since 1927*

Early in the 1900s, Northern California suffered through epidemics of encephalitis and malaria, and severe outbreaks of saltwater mosquitoes. At times, parts of Contra Costa County were considered uninhabitable resulting in the closure of waterfront areas and schools during peak mosquito seasons. Recreational areas were abandoned and Realtors had trouble selling homes. The general economy suffered. As a result, residents established the Contra Costa Mosquito Abatement District which began service in 1927.

Today, the Contra Costa Mosquito and Vector Control District continues to protect public health with environmentally sound techniques, reliable and efficient services, as well as programs to combat emerging diseases, all while preserving and/or enhancing the environment.

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

### **FREE Services for Contra Costa County Residents**

**MOSQUITOES**  
*Inspection & control*

**YELLOWJACKETS & BEES**  
*Ground-nest & swarm control*

**RATS & MICE**  
*Inspection & advice*

**MOSQUITOFISH**  
*Free for residential ponds*

**TICKS**  
*Tick identification*

**SKUNKS**  
*Inspection & assistance*

**PUBLIC EDUCATION**  
*Literature & presentations*



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