



Austin-Travis County Health & Human Services Department



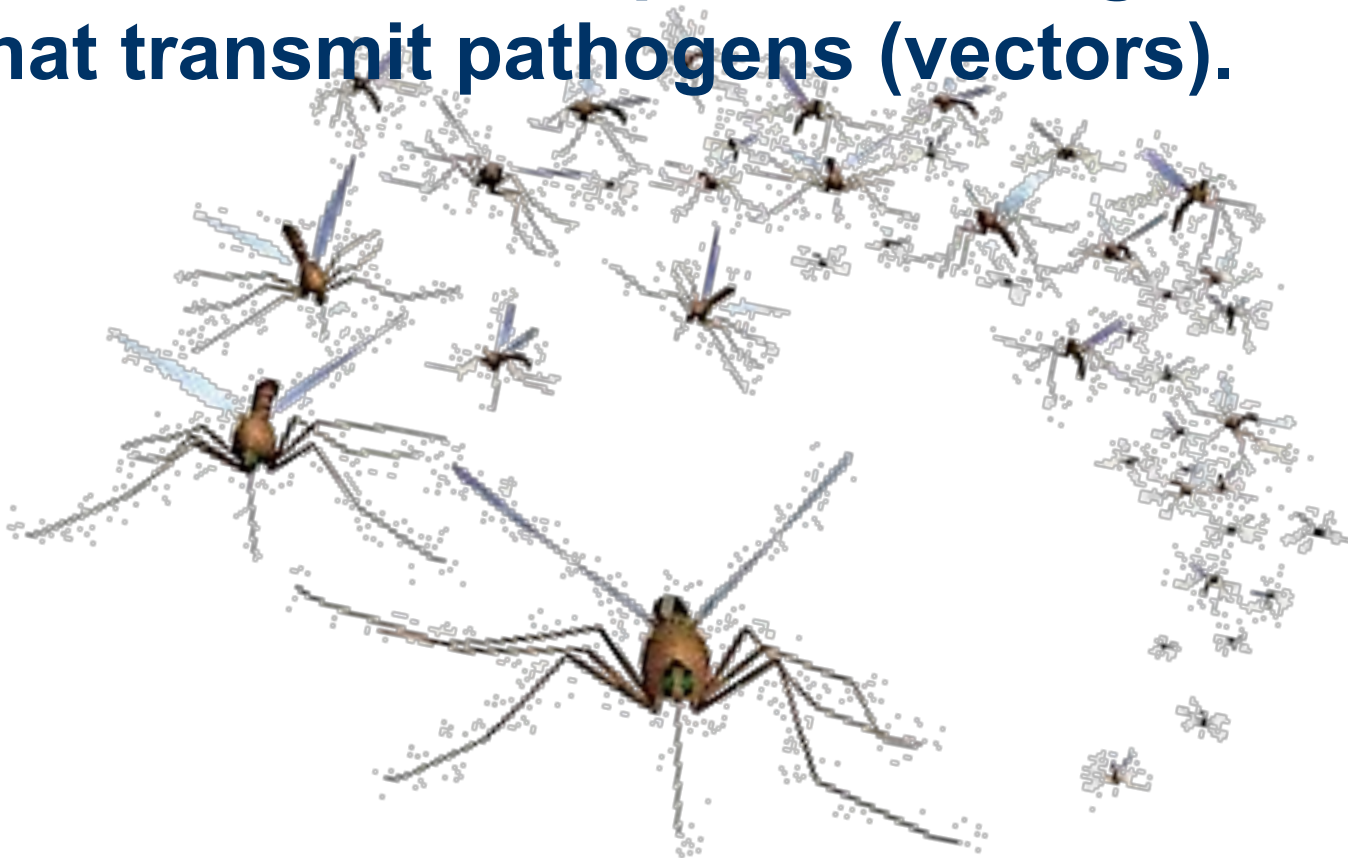
Environmental Health Services Division Environmental Vector Control



Goal



- Reduce human exposure to organisms that transmit pathogens (vectors).



Program Staff & Service Areas

Supervisor – Sabrina Vidaurri, MS, R.S.

6 - Full-time field staff (year-round)

1 - Part-time field staff (seasonal - May through September)

All Program staff hold a Non-Commercial Political Subdivision Pesticide Applicator license issued by the Texas Department of Agriculture for health-related pest control (rodent & mosquito).

6 Districts within

- City of Austin
- Unincorporated Areas in Travis County



Mosquito Control



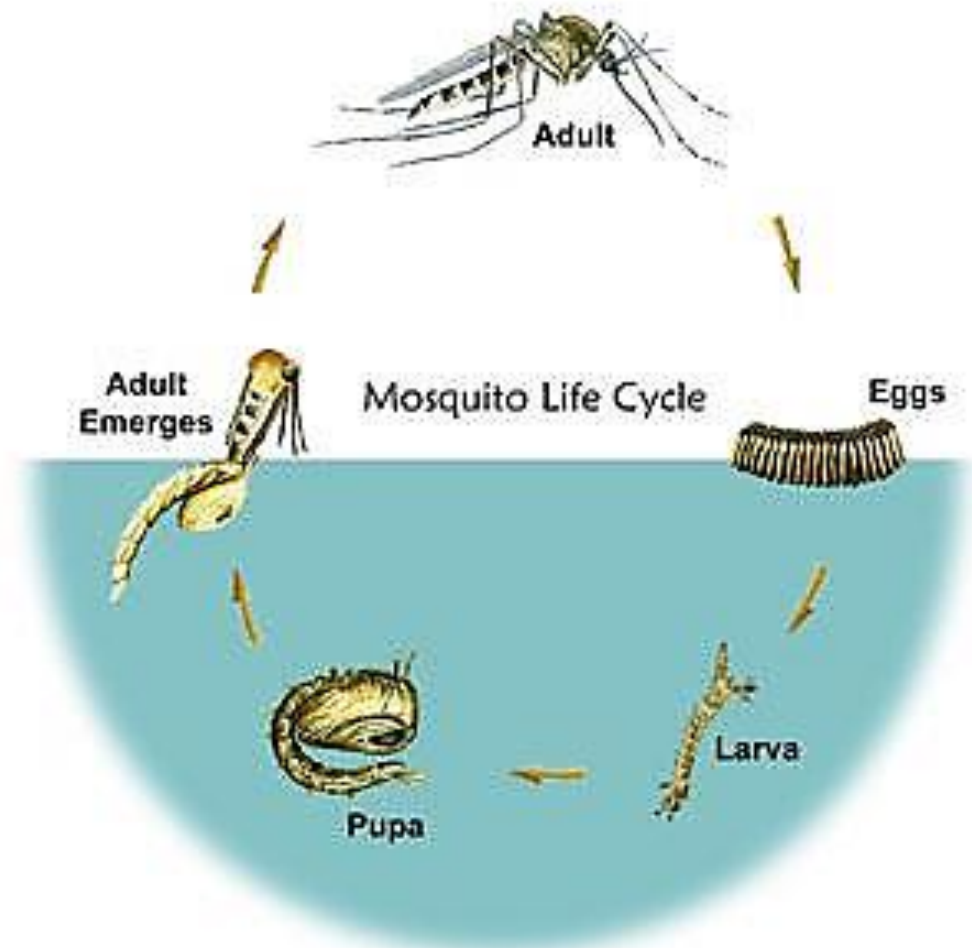
Mosquitoes in Austin/Travis County of Public Health importance

- The female mosquito bites for a blood meal to produce eggs
- The mosquito may transmit arboviruses that can cause illness to humans
 - Culex sp.
 - West Nile Virus, Saint Louise Encephalitis
 - Aedes sp.
 - Dengue, Chikungunya, Zika

Life Cycle



The length of time for the entire life cycle to occur depends on species and temperature. In prime conditions this cycle can occur in as little as four days or as long as a month. For example the *Aedes* mosquito can complete the entire life cycle in about 8-10 days.



Culex quinquefasciatus

- Common name:
Southern house
mosquito
 - Female
 - Dusk to dawn feeder
 - Prefers an avian blood meal but will also feed on other mammals
 - Lays eggs in rafts in stagnant, organic-rich water



Aedes sp.

- Aedes ablopitus (Asian tiger mosquito)
Aedes aegypti (Yellow fever mosquito)
 - Female
 - Day feeder
 - Prefers a human blood meal but will also feed on other mammals
 - Lays single eggs on sides of water holding containers
 - Examples: flowerpots, spare tires

Aedes sp.



Aedes aegypti



Aedes albopictus

Integrated Mosquito Management (IMM)

- Site assessments
- Surveillance
- Public Education
- Application of control measures
- Evaluation of effectiveness



DEFEND YOURSELF!



- Clean rain gutters and downspouts.
 - Cover or discard old tires.
 - Eliminate all standing stagnant water.
 - Clean birdbaths and wading pools weekly.
 - Keep grass and vegetation trimmed.
 - Store containers so they don't hold water.
 - Repair leaky faucets.
- Follow the 3 D's
 - Drain
 - Dress
 - DEET

Site Assessments



- Standing/stagnant water
- Dense vegetation
- Adult mosquitoes/larvae

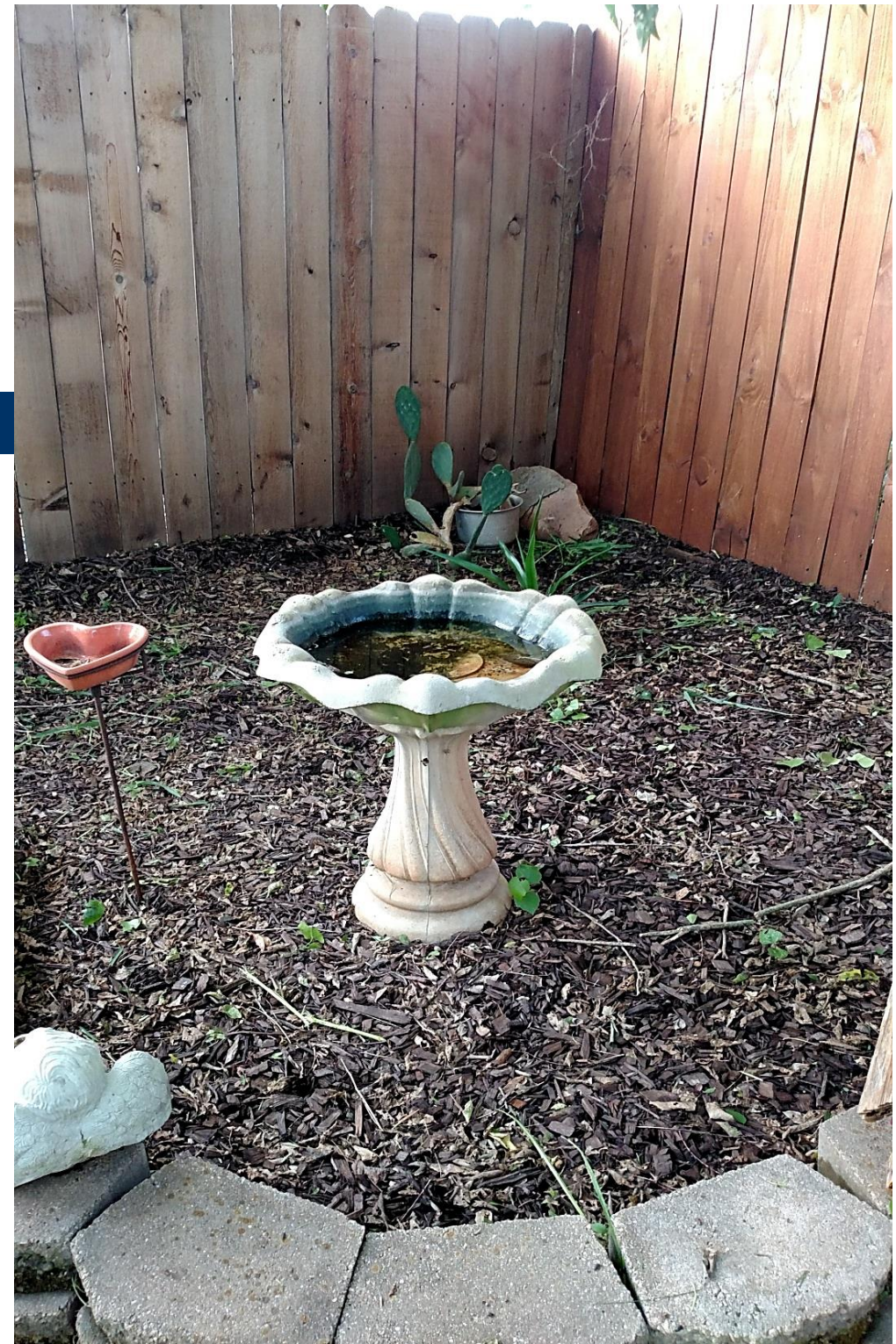














Surveillance



- Larvae collection
- Adult mosquito collection



Surveillance



- Larvae
 - Dipper



- Adults
 - CDC Gravid trap
 - Submitted to TX DSHS lab



Surveillance



Surveillance



STINKY WATER RECIPE (for 55 Gallons)

1 lb. - horse manure (semi-dry), 2 ounces - dried brewers yeast

2 ounces - egg white powder, 1 lb. - straw or grass clippings (dry)

1 – Small burlap bag*

Place manure, brewer's yeast and egg white powder into a burlap bag and **hand mix together well.**

Place a rock or fishing weight in the bottom of the bag that's large enough to weigh it down.

Place straw or grass clippings in the burlap bag on top of the manure, brewer's yeast and egg white powder mixture.

Fill the barrel with water.

Twist the burlap bag and securely attach a sufficient length of cord to allow the bag to hang down half way in the barrel and lowered as the water is drawn down.

Let stand for 3 – 4 days before use.

* Double bagging is not necessary

Surveillance



- Larvae

- Identify species
- GPS locations for GIS mapping
- Tailor larviciding to reduce dependence on adult mosquito control
- Historical records of seasonal mosquito activity

- Adult

- Use data to assess disease presence
- ID geographic risk areas
- Assess need for and timing of controls measures
- Monitor control measure effectiveness to improve prevention
- Better understand transmission cycles and vector species

Public Education

- Environmental Health Services offers
 - Site Assessments
 - Presentations upon request
 - Regularly hands out flyers on reducing mosquito breeding to public
 - Partners with other COA Departments

Application of control measures

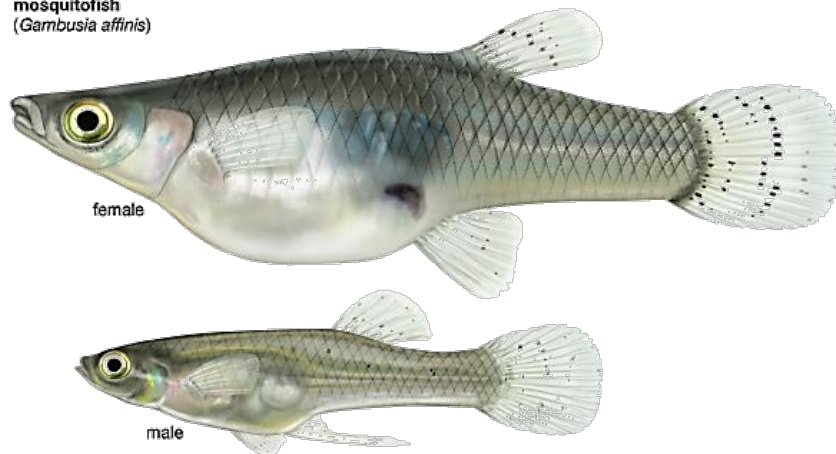
- Biological Controls
 - Source reduction
- Cultural/Physical Controls
- Chemical Controls

Biological Controls

(Source Reduction)

- *Gambusia affinis*
(Mosquito fish)

mosquitofish
(*Gambusia affinis*)



female

male

3 centimetres
1 Inch

© 2012 Encyclopædia Britannica, Inc.

- B.t.i. (*Bacillus thuringiensis*)
 - Larvacide that kills mosquitoes during the larval stage or development. It is made from a naturally occurring bacterium in the soil. The product kills larvae by damaging their digestive system.



Biological Controls

(Source Reduction)

- FourStar (Briquets & Granular)
 - *Bacillus sphaericus* & *Bacillus thuringiensis* subspceies *israelensis*
 - Larvacide that kills mosquitoes during the larval stage or development
- Attractitve Toxic Sugar
 - The special combination of fruit extracts in the formula acts as a bait to attract mosquitoes searching for a sugar meal, and the encapsulated garlic is a gut toxin

Cultural/Physical Controls (Source Reduction)

- Stormwater Ponds

- Retention/detention
- Water quality



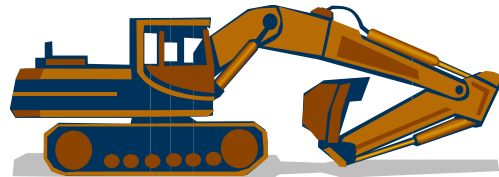
- Waste Disposal

- Landfills
- Sanitary sewer



- Drainage

- Land grading
- Barrier placement



- Maintenance

- Lighting
- Structural repairs



Chemical Controls

Adulticides

Applied with truck mounted ultra-low volume (ULV) cold fogging unit (limited basis)

- **Scourge**
 - Resmethrin
(synthetic pyrethroid)*
- **Bio-Mist**
 - Permethrin
(synthetic pyrethroid)*

* man-made version of the chemical found in chrysanthemum flowers

Larvicides

Applied at specific locations by a licensed applicator

- **Altosid** (pellets/briquettes)
 - Methoprene**

** insect growth regulator

Thermal Fogger



ULV Cold Fogger



Mosquito Misting Systems

- According to the EPA in November 25, 2014
 - “Outdoor residential misting systems have not yet been studied sufficiently to document their effectiveness in controlling mosquitoes or other yard and garden pests, nor have they been scientifically proven to control or prevent the spread of West Nile Virus or other diseases.”
- The American Mosquito Control Association discourages mosquito misting systems due to:
 - Unnecessary insecticide use
 - Lack of efficacy data
 - Non-target impacts (bees, dragon flies)
 - Promotion of insecticide resistance (when using Pyrethrins or other chemical control)
 - Risk of pesticide exposure
 - Incompatible with integrated pest management practices

Plants to Consider

- In planning your garden consider planting these plants
 - Marigolds
 - Basil
 - Lemon Balm or Horse Mint (Is invasive, consider planting in pots)
 - Catnip (Is invasive, consider planting in pots)
 - Lavender
 - Floss Flower

Helpful Sites

- American Mosquito Control Association
 - <http://www.mosquito.org>
- Texas A&M Agrilife Extension
 - <http://citybugs.tamu.edu>
- EPA Mosquito Control
 - <http://www2.epa.gov/mosquitocontrol>
- National Pesticide Information Center
 - <http://npic.orst.edu/index.html>



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Environmental Health Services Division Environmental Vector Control

Questions



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Program website:

<https://www.austintexas.gov/department/environmental-vector-control>

Rodent Control



Rodent Component (Non-regulatory)

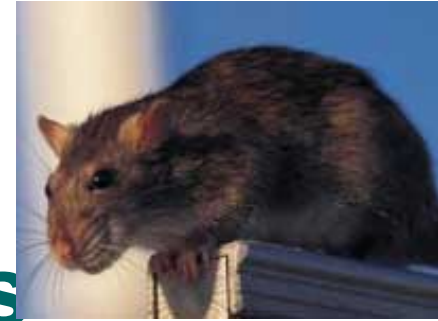


The Rodent component of the Program involves activities related to the control of commensal rodents. These animals are not only responsible for substantial property damage; they may also transmit several diseases of public health concern including:

- murine typhus,
- plague,
- salmonellosis,
- trichinosis,
- leptospirosis
- and rat-bite fever.

State issued non-commercial pesticide applicator license limits the provision of Program services to individual residential property owners only.

Rodent Site Assessments



IPM (Integrated Pest Management) Elements

- Inspection
- Identification
- Sanitation
- Rodent Proofing (exclusion)
- Trapping & Baiting

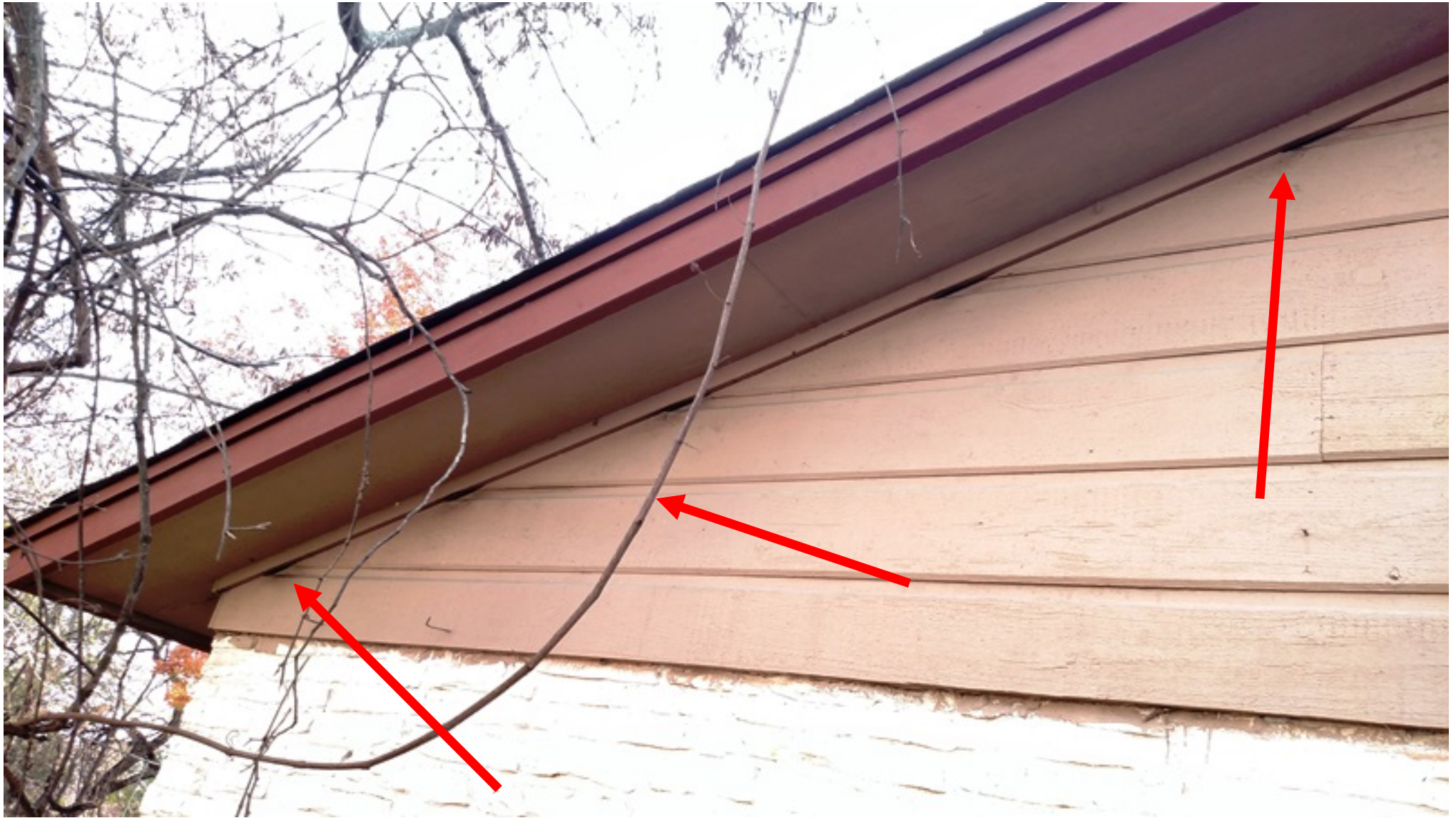


Rodent Site Assessment: Inspection

- Property from street/driveway
 - Identify objects hanging over/next to the home
 - Power lines
 - Trees
 - Decks, porches, down spouts
 - Any structures close to house
 - Walk outside of structure
 - Holes in siding, up or under eaves, or at ground level
 - Look for rub markings along structure(s)
 - Follow rub markings to entry point

Rodent Site Assessment: Inspection

- Items on property
 - Identify any sheds, animal enclosures, bird houses, fountains (water source), detached garages, playscapes, etc.....
 - Items located on ground
 - General junk/debris piles
 - Any holes in ground
 - Bushes or shrubs, mulch
 - Composting bins
 - Food sources (under bird feeders, pet food bowls, etc.....)















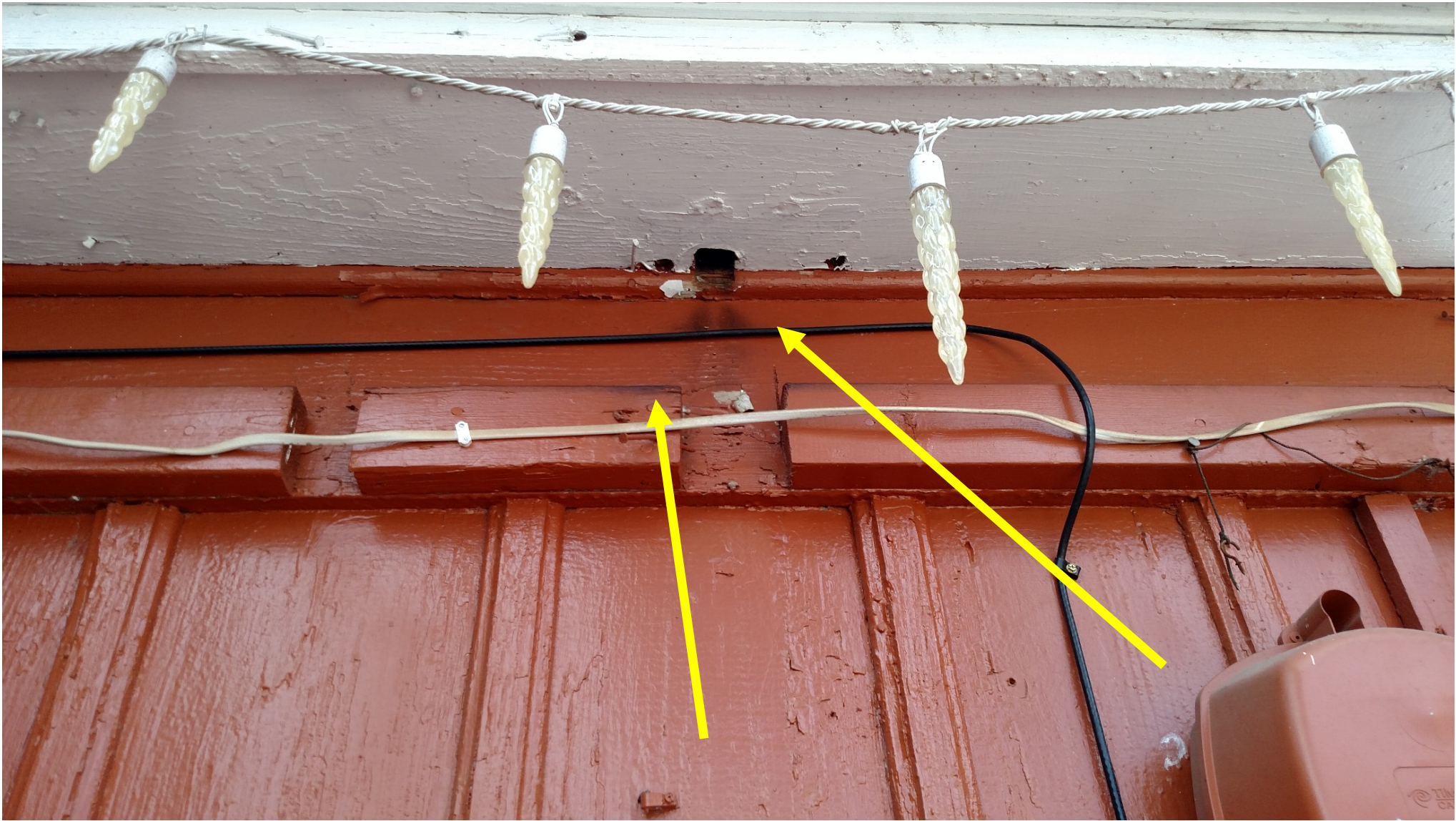














Rodent Site Assessment: Inspection

- Inside structures
 - Food sources
 - Dog Food, Bird Seed, Cat Food, Human Food
 - Water sources
 - Under sinks, Pet Water Bowls, Hot Water Heater
 - Nesting Materials
 - Plastic, Towels, Bedding, Newspaper











To recommend for an AGC...
FOR YOUR SAFETY
READ BEFORE LIGHT
WARNING: If you do not follow these instructions,
you may create a fire or explosion hazard, resulting in
property damage, personal injury, or death.

1. The water heater has a relief valve...
2. The water heater has a relief valve...
3. The water heater has a relief valve...
4. The water heater has a relief valve...
5. The water heater has a relief valve...
6. The water heater has a relief valve...
7. The water heater has a relief valve...
8. The water heater has a relief valve...
9. The water heater has a relief valve...
10. The water heater has a relief valve...

Rodent Identification

- *Rattus rattus*

Aka: Black Rat, Roof Rat, Ship Rat



Roof rat. Photo from USDA Forest Service: *Photo from: [Discover Life](#), Information compiled by Alan Mowbray, Interpretive Media Writer, EYNF/LEF*

- Description: black to tawny-brown upper body with a paler, lighter-brown or slate-colored underbody. It has a scaly, almost hairless tail that is slightly longer (7 to 9 inches/18.5 to 24 centimeters) than its head and body, for a total length of over 14 inches (35.5 centimeters). It has 5 digits on each foot and 16 very sharp teeth. Black Rats are thought to live for up to 4 years.
- Habits: omnivorous, eating seeds, nuts, vegetables, fruits, insects and invertebrates. It will also eat other materials such as soap and paper. It has been observed to carry food back to the nest for storage. Under normal conditions the female will have between 3 and 7 litters per year, producing between 6 and 22 young per litter. Black Rats actively hunt at dusk and during the night. They are social and territorial, sometimes forming clans of up to 60 animals, dominated by a single male and two or three subordinate females. Feeding territory is defended aggressively by the females, but immature animals are allowed to feed at will.

Rodent Identification

- *Rattus norvegicus*

Aka: Norway Rat, brown rat

- *Description:* Similar to the roof rat but larger and chunkier; tail shorter than length of head and body. External measurements average: total length, 440 mm; tail, 205 mm; hind foot, 46 mm. Weight, 400-500 g.
- *Habits:* The Norway, or brown, rat lives both as a commensal in close association with man and in the feral state, chiefly where vegetation is tall and rank and affords adequate protection. As a commensal this rat lives principally in basements, on the ground floor, or in burrows under sidewalks or outbuildings. They appear to be most common about feed stores, chicken houses, and garbage dumps. Although more at home on the ground, these rats are adept at climbing and have been observed traveling along telephone wires from one building to another. In places they become exceedingly numerous and destructive. These rats are prolific breeders. The gestation period varies from 21 to 23 days and the number of young from two to 14, averaging seven or eight. At birth they are blind, naked, and helpless. They grow rapidly; their eyes open in 14-17 days and they are weaned when 3 or 4 weeks old. There is no delimited breeding season, but there is a tendency for a slow-up in reproduction during fall and winter. The life span is reported to be 2-3 years.



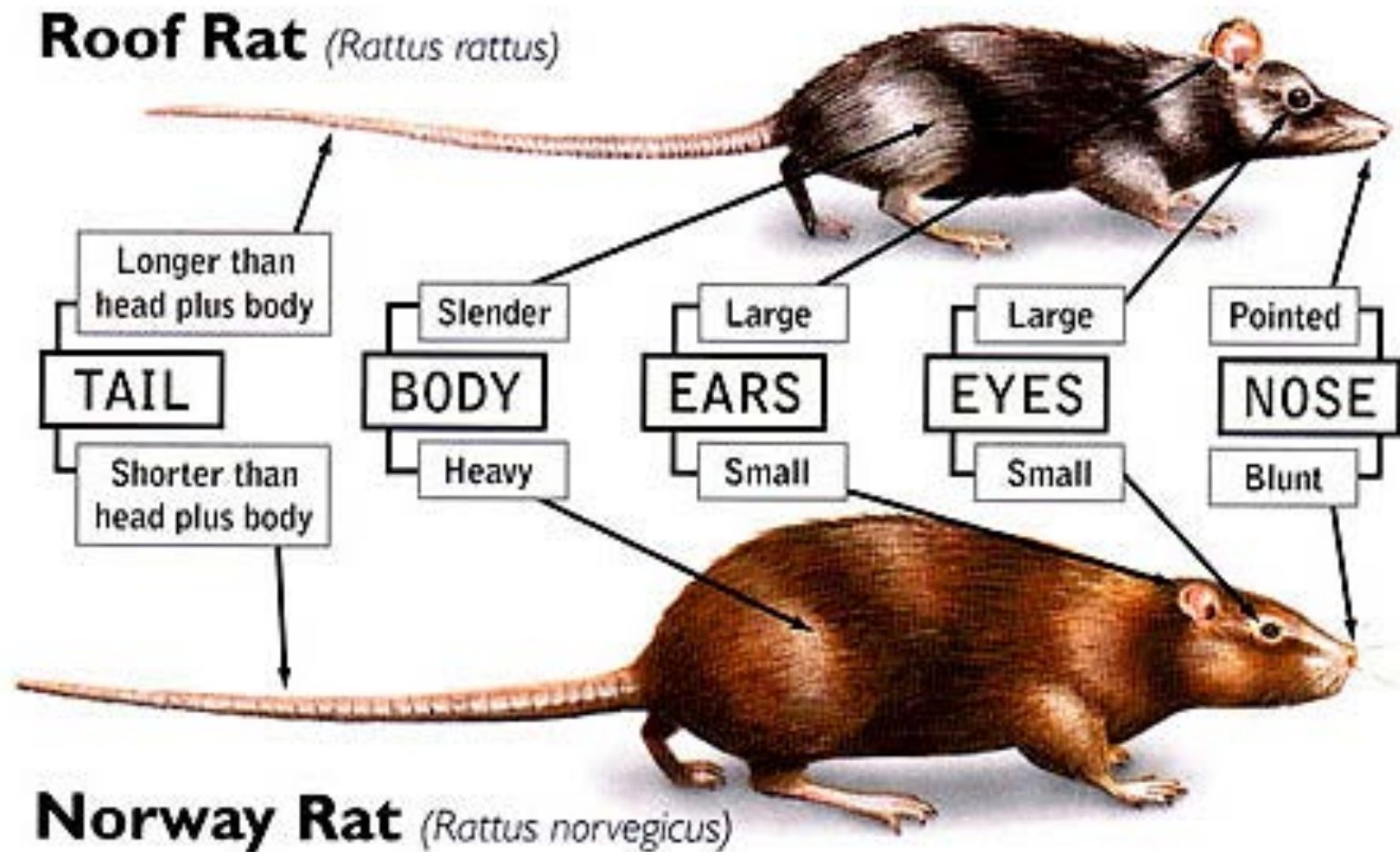
Norway rat. Photo from Maine.gov Got Pests: Rats.

Rodent Identification

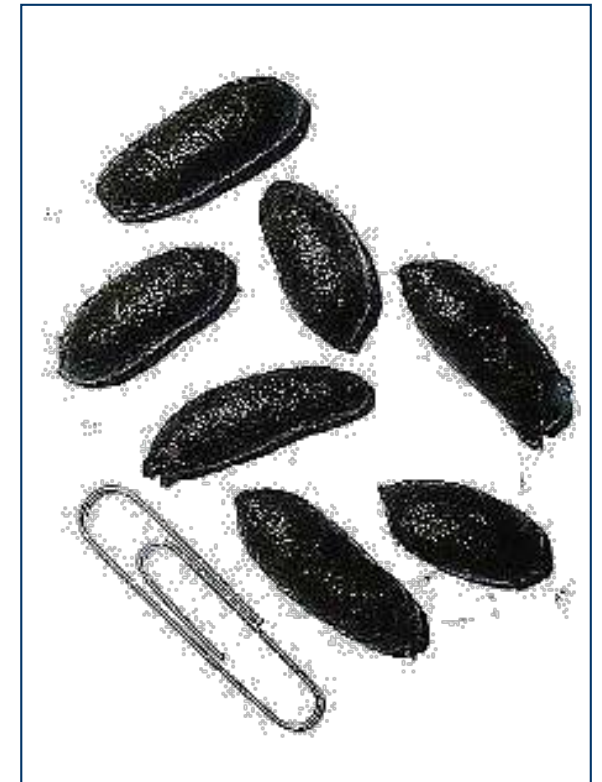
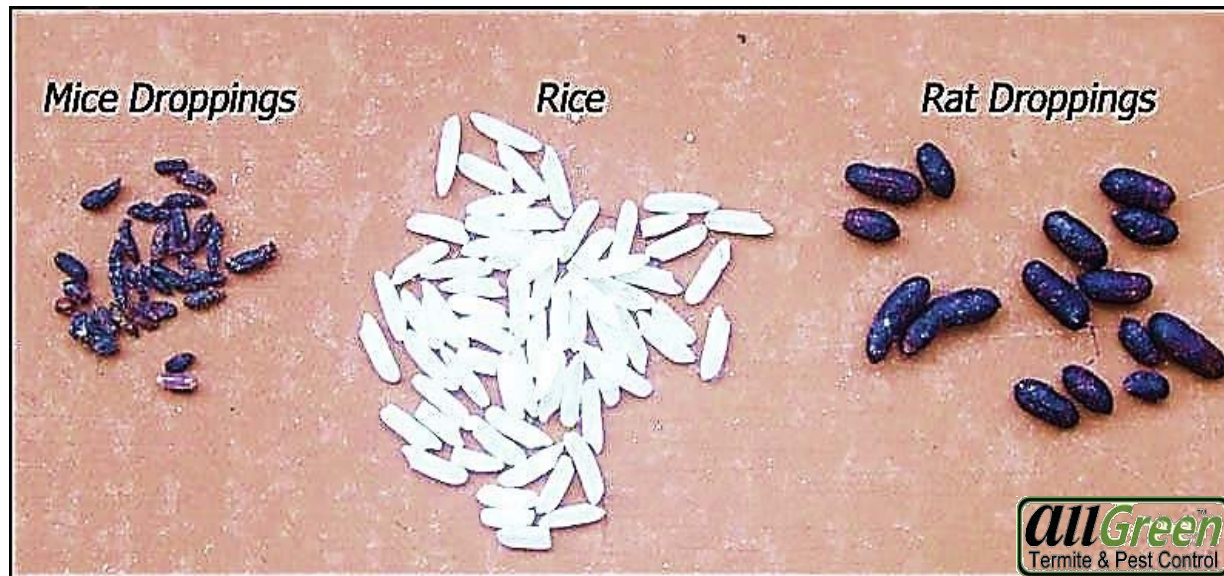
Telling Norway rats and roof rats apart

	Roof rat (<i>Rattus rattus</i>), also called black rat, ship rat	Norway rat (<i>Rattus norvegicus</i>), also called brown rat
Overall appearance	Medium-sized, slender rodent with large ears and a long, thin scaly tail (generally longer than body).	Medium-sized chunky rodent with a scaly tail that is shorter than the body.
Color	Black, gray, or brown	Brown or gray
Weight	up to 200 g	400-500 g
Ears	Large, creased, flimsy	Small, sturdy
Tail	Tail longer than body, uniform in width. Tail is slender and prehensile. Charcoal grey.	Tail shorter than body, fatter at base. Tail is fat and not prehensile. Pink or tan.
Muzzle	Narrow, sharp and long	Blunt, broad, and short. Heavy cheeks.
Locomotion	Agile climber, doesn't like swimming.	Not as good a climber as roof rat, but good swimmer.
Habitat	World-wide in warm climates. Human buildings, generally <i>high up</i> : attics, rafters, crossbeams of buildings. Form runways along pipes and wires	World-wide. Human buildings, generally <i>low down</i> : in basements, on the ground floor, in sewers and subways, in burrows under buildings. May also live in a feral state where cover is available.

Rodent Identification



Rodent Identification

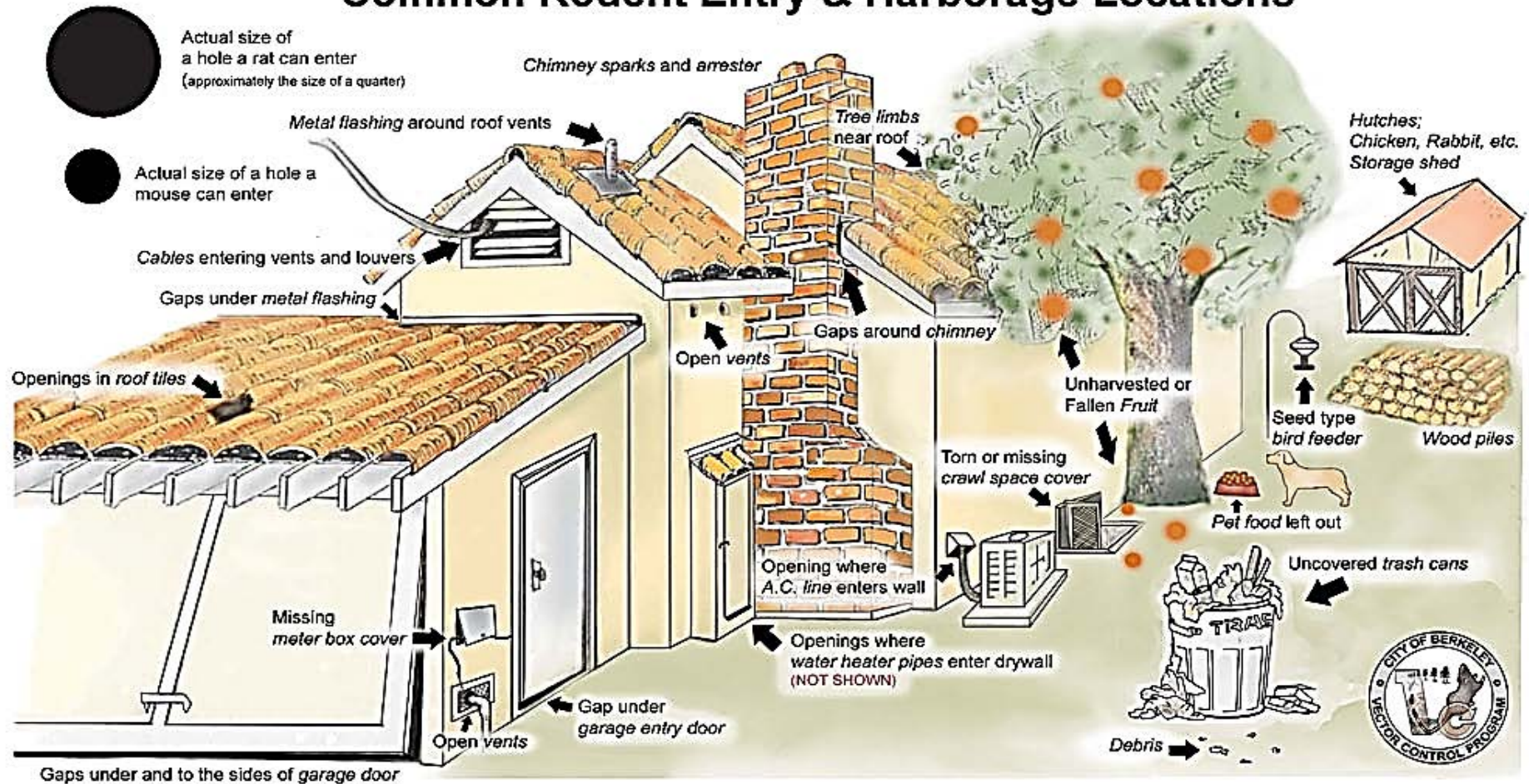


Rodent Proofing

- Seal cracks and openings in building foundations and any openings for water pipes, electric wires, sewer pipes, drain spouts, and vents. No hole larger than 1/4 inch should be left unsealed, in order to exclude both rats and house mice. Make sure doors, windows, and screens fit tightly. Their edges can be covered with sheet metal if gnawing is a problem. Coarse steel wool, wire screen, and lightweight sheet metal are excellent materials for plugging gaps and holes. Norway and roof rats are likely to gnaw away plastic sheeting, wood, caulking, and other less sturdy materials.
- Because rats and house mice are excellent climbers, openings above ground level must also be plugged. Rodent proofing against roof rats, because of their greater climbing ability, usually requires more time to find entry points than for Norway rats. Roof rats often enter buildings at the roofline, so be sure that all access points in the roof are sealed. If roof rats are traveling on overhead utility wires, contact a pest control professional or the utility company for information and assistance with measures that can be taken to prevent this.

Rodent Exclusion

Common Rodent Entry & Harborage Locations



Trapping & Baiting

- After inspection, rodent potential identification, exclusion
 - Always follow product label
 - No toxic bait within the house
 - Snap traps & Glue Boards (no small pets)
 - Location
 - Observed entry points, food & water sources, rub marking points

Trapping & Baiting

- Multiple Feed Bait

- Contrac Blox

- Highly palatable, yet weatherable, CONTRAC works well in wet and dry conditions.
 - Multiple edges that appeal to a rodent's desire to gnaw.
 - Bait shyness is not a problem with CONTRAC because it remains effective for several days after bait is consumed



- Single Feed Bait

- FASTRAC All-Weather Blox

- An acute bait, FASTRAC gets exceptional rodent acceptance and control, and can kill rats and mice in about two days, after consuming a toxic dose



Photo is not representative of a label placement

Helpful Sites

- <http://wwwnc.cdc.gov/travel/yellowbook/2016/infectious-diseases-related-to-travel/rickettsial-spotted-typhus-fevers-related-infections-anaplasmosis-ehrlichiosis>
- <http://citybugs.tamu.edu/2016/01/05/rodents-in-attics/>
- <http://www.belllabs.com/downloads/specimen-labels>
- <http://ipm.ucanr.edu/PMG/PESTNOTES/pn74106.html>
- <http://agrifecdn.tamu.edu/txwildlifeservices/files/2016/08/RatsMice.pdf>
- <http://www.cdc.gov/rodents/>
- <https://www.epa.gov/rodenticides/identify-and-prevent-rodent-infestations>



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