

Symptom and Perceived Problem:

Sightings of ‘rats’ over the past two summers has created concern among various members of the public to the extent that the Town has received numerous complaints; many of them with the service demand for the Town to “do something”. (Example at **Atch A**)

Investigation Points of Contact:

Joshua Cumbee , Brunswick County Environmental Health Supervisor
David Stanley, Current Brunswick County Health Director
Don Yousey, Retired Brunswick County Health Director
Jim Ericson, R.E.H.S., Environmental Health Supervisor, Public Health Pest Management & Environmental Services, Mecklenburg County
Jordan Miller, United States Department of Agriculture Wildlife Specialist
Tom Padgett, NC Wildlife Resources Southeast Region Coordinator
Susan Brown, NC State University Assistant Extension Agent, Agriculture
Bridget Lussier Applied Technology and Management Wildlife Biologist
Gerald Kirby, Local pest control company owner
Mac Tyson, Attorney, Town of Holden Beach

Actions taken, chronology:

1. Mid to late summer last year Town requested assistance from the Brunswick County Health Department to assess whether or not the rats being reported on Holden Beach were a problem, concern to public health and safety and to recommend any solutions if appropriate.. The then Health Director Don Yousey along with the then Environmental Health Director David Stanley performed 2 site visits to the island. Several selected areas where complaints had been registered to the town staff were reviewed by the County personnel and informal verbal feedback subsequently rendered recommended localized habitat reduction on a lot by lot basis by virtue of controlling vegetative growth as a potential solution. To date this has been the prime supporting justification used to issue notice of violations regarding compliance with the overgrown lot ordinance on a case by case complaint driven basis. Information subsequently discovered supports that this is probably not a correct application of code enforcement authority.

2. Based on continued sightings and increased frequency of complaints by various individuals again this summer, town personnel reengaged with the Brunswick County Health Department once again who requested assistance from Jim Ericson Environmental Health Supervisor of the Mecklenburg County Health Department (largest program in NC). Based on the information thusly relayed to the Town from Mr. Ericson which indicated that the prerequisite to determining if there was a bona fide threat to public safety was the identification of the specific species of concern. Subsequent to Mr. Ericson's direction; the town contacted the NC Wildlife Resources Southeast Region coordinator Tom Padgett who provided specific guidance on how go about identifying what rodent species existed at Holden Beach. Throughout the ongoing dialogue with the Brunswick County Health Department and the wildlife specialists to this point the common theme expressed by them all was that any solution would be determined by what species existed and the extent that its existence endangered the public health. Additional consultation with the town attorney was accomplished to verify the ability of the town to affect any programs that invoked the public health as justification for their creation and implementation (GS 160-193 etc).
3. The protocol dictated by the NC Division of Wildlife Resources to identify the rodent species required kill trapping. The authorized taking of the rodents was performed in multiple public locations town wide both day and night by town staff using snap traps to terminate samples in sufficient numbers so that the Wildlife Biologist could perform species identification. Once the samples were taken they were frozen and held until a visit by Mr. Padgett could be arranged. Mr. Padgett performed his species identification the week of 9 August. Primary techniques used were visual inspection, denticular measurement and head/body ratio calculations. DNA analysis was deemed unnecessary.
4. Interview and Findings of Tom Padgett: All of the samples reviewed by Mr. Padgett were identified as "*Sigmodon Hibidus*" or in layman's terms the Cotton Rat (**Atch 1**); a species native to the New World . Even though several of the samples differed in size and specific appearance no other species of rat was identified from the samples provided by Town staff. This difference in appearance is attributed to *Sigmodon's* dimorphism (male larger by approximately a third than the female). **Atch 2** provides in depth information regarding *Sigmodon* but the short facts version of the interview and attachment are summarized here:
 - a. Wild animal; NC native species found throughout the SE US

- b. Don't live with people; reside solely outside, don't get into houses
- c. Raccoons more of a threat
- d. Early secessional grassy areas, open fields,
- e. Not an inside threat, Not a threat to public health
- f. Mostly grazing vegetarians eating greens/grass/seeds; sometimes ground nesting bird's eggs
- g. Normally 10-12 per acre, one year life cycle, high reproductive rate
- h. Significant food source for multiple predators; primary prey of bobcat
- i. Habitat elimination is only way to eliminate them
- j. Very different from Old World rats: *Rateus Rateus* (Roof rat) and *Rateus norvegicus* (Norway rat); the urban species most people identify with
- k. Relatively clean animals; no greater parasitic load (fleas, ticks) than opossums, raccoons or squirrels
- l. Rodenticide not recommended outside
- m. Any type of town sponsored mass extermination effort targeting *Sigmodon* would require a depredation permit from the Wildlife Resources Commission which won't be issued based on existing information

5. Additional Facts:

- a. No nighttime sightings or complaints thereof
- b. Daytime takes were only ones verified
- c. No verified reports of injuries (bites) etc to humans; health department did receive a complaint about a garbage can at pier (**Atch 3**); report also indicated bird consumption of rodenticide
- d. No reports of any illnesses or instance of diseases
- e. Excerpts from the CAMA Land Use Plan -
 - i. Goal: Maintain and where possible improve the natural environment and water quality within and adjacent to Holden Beach.
 - ii. Objective: Protect the Natural Environment: The Town shall take actions designed to protect and where possible enhance and restore the sensitive natural resources located in and adjacent to the Town of Holden Beach.
- f. *Sigmodon* populations are boom or bust: known to be cyclic and experience drastic ups and downs.
- g. 17 known locations where exterminator is being contracted with for rodent removal
- h. Numerous locations throughout town with deer and bird feeders
- i. Over two thirds of the island is heavily vegetated

Conclusions:

- a. *Sigmodon Hispidus* is not a threat to Public Health.
- b. Vast majority of people have a paradigm of fear and bias towards all rat species; harmful or not.

Recommendations:

Per the Division of Wildlife Resources; The Town will not be allowed to undertake any type of widespread eradication efforts of *Sigmodon*.

Therefore it is recommended that efforts to increase the public's knowledge of *Sigmodon* be undertaken to mitigate innate bias and reduce any unnecessary anxiety people may experience.

This can be accomplished through various means but initially it is proposed to begin by developing and publishing information for public consumption regarding the many and varied species of animal life here at Holden Beach. Various outlets and articles on wildlife are readily available and can be assembled fairly easily/placed on Town's website accordingly. Specific information regarding *Sigmodon* can be expanded and included accordingly.

Education notwithstanding and if people still feel compelled to take some type of action; it is recommended that on an individual property owner's basis they keep their yards mowed, eliminate wildlife feeders and contact an exterminator for professional elimination of *Sigmodon*.

File:Sigmodon hispidus1.jpg

From Wikipedia, the free encyclopedia



No higher resolution available.

Sigmodon_hispidus1.jpg (800 × 527 pixels, file size: 137 KB, MIME type: image/jpeg)



This is a file from the Wikimedia Commons. Information from its **description page** there is shown below.

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- **Description:** This photograph depicts a Cotton Rat (*Sigmodon hispidus*), whose habitat includes the southeastern United States, and way down into Central and South America. Its body is larger than the deer mouse, *Peromyscus maniculatus*, and measures about 5–7 inches, which includes the head and body; the tail measures an additional 3–4 inches. Its hair is longer and coarser than *P. maniculatus*, and is a grayish-brown color, sometimes grayish-black. The cotton rat prefers overgrown areas with shrubs and tall grasses.
- **Creator:** CDC/ James Gathany, 2005
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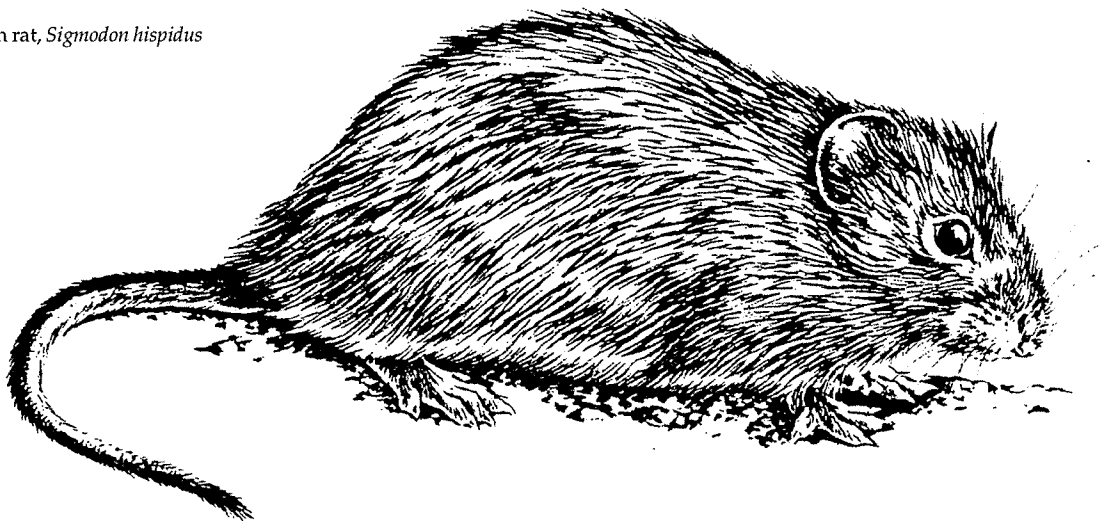
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COTTON RATS

Fig. 1. Hispid cotton rat, *Sigmodon hispidus*



Damage Prevention and Control Methods

Exclusion

Usually not practical.

Cultural Methods

Remove dense vegetation.

Repellents

Not effective.

Toxicants

2% zinc phosphide on dry bait.

Fumigants

Not practical.

Trapping

Snap traps (rat traps).

Live traps.

Shooting

Not practical.

Identification

The hispid cotton rat (*Sigmodon hispidus*) is a moderately large, robust rodent with a scaly, sparsely haired tail that is shorter than the combined head and body.

Cotton rats have relatively large eyes. The ears are large but almost hidden in the fur. They have four toes and a small thumb on their front feet and five toes on each hind foot. The cotton rat has very small internal cheek pouches. Distinguishing characteristics are the rough grizzled appearance of the blackish or grayish fur and the rather stiff black guard hairs.



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

This rodent has a high “Roman” nose and color similar to that of a javelina, resulting in the name “javelina rat” in many areas.

The total length averages 10 inches (25 cm) including the tail length of 4 inches (10 cm). The cotton rat may be distinguished from the Norway rat by its smaller size, shorter tail, and longer grizzled fur. Evidence of cotton rat presence are stem and grass cuttings 2 or 3 inches (5 or 8 cm) in length piled at various locations along runways, which are 3 to 5 inches (8 to 13 cm) wide. Pale greenish or yellow droppings, about 3/8 inch (9 mm) in length and 3/16 inch (5 mm) in diameter, may also be present along the runways.



Fig. 2. Range of the hispid cotton rat in North America.

Range

The hispid cotton rat occurs over most of the southern United States, from the southeastern tip of California, southern Arizona and New Mexico, north to eastern Colorado, eastward through the southern portions of Kansas and Missouri, through Tennessee and North Carolina, and southward along the Atlantic coast through Florida, the Gulf states, and up the Rio Grande Valley (Fig. 2).

Two other species of cotton rat, the least cotton rat (*S. minimus*) and the yellownose cotton rat (*S. ochrognathus*), occur only in small areas of southeastern Arizona and southwestern

New Mexico. They are very similar to the hispid cotton rat.

Habitat

Cotton rats prefer dense cover such as grassy fields, overgrown roadsides, or fencerow vegetation adjacent to cultivated fields. They also occupy meadows, marshy areas, cactus patches, and weedy ditch banks. Under the protective cover, the cotton rat will have well-defined runways radiating in all directions from the nest site.

Food Habits

Cotton rats are normally herbivores, eating the roots, stems, leaves, and seeds of a wide variety of plants. They also feed on sugarcane, fruits, berries, and nuts. Cotton rats will cut tall plants off at the base and continue to cut them into shorter sections. They also eat insects, the eggs and young of ground-nesting birds (particularly quail), and the carcasses of dead animals.

General Biology, Reproduction, and Behavior

Cotton rats are basically nocturnal but will venture out in the daytime and are active year-round. The home range is small — from 1/4 to 3/4 acre (0.1 to 0.3 ha) for females and 1 to 1 1/4 acres (0.4 to 0.5 ha) for males. Cotton rats do not store food or hibernate. They can swim and do not hesitate to do so. This species is excitable, pugnacious, and aggressive toward mice living in the same fields. Their nests are a crude mass of dry grass fibers stripped from larger plant stems, placed in shallow surface depressions, among clumps of coarse grasses, underground in shallow tunnels, or under rocks or logs.

The species is very prolific and will breed throughout the year. Several litters may be produced annually, averaging 2 to 15 young per litter. The gestation period is 27 days, and the young are weaned in 10 to 15 days.

Most young breed for the first time at 2 to 3 months of age. Therefore, several generations may live in the same nest at one time. The average life span is 6 months.

Damage

Cotton rat populations fluctuate greatly, ranging from 11 to 149 per acre (28 to 373/ha), and cause the most serious damage during population peaks. They may damage a variety of crops, including alfalfa, grains, grasses, vegetables, peanuts, fruit crops, sweet potatoes, and sugar beets. Cotton rats are especially troublesome in sugarcane and melons. Since these animals will eat quail eggs, a high cotton rat population may have a detrimental impact on quail nesting success. Cotton rats also compete with quail for the same foods.

Legal Status

Cotton rats are not protected in most states; some states classify them as nongame mammals. They may be taken if causing damage. Check local and state laws before beginning control measures.

Damage Prevention and Control Methods

Exclusion

If the area is small or the crop to be protected is of high value, a sheet-metal barrier 18 inches (46 cm) tall may be used to exclude cotton rats. Bury the barrier about 6 inches (15 cm) to prevent cotton rats from burrowing under it.

Cultural Methods

Remove dense cover by burning, mowing, plowing, or the use of herbicides to reduce habitat and prevent large population increases. Habitat modification is best as a preventive measure, since this control method will have little effect on the ensuing damage once a population reaches its peak.

Repellents

None are registered for repelling cotton rats.

Toxicants

Only zinc phosphide (2% active ingredient) is currently registered and being marketed for cotton rat control, and its use is limited to sugarcane fields.

When applying toxic bait, lightly scatter teaspoon quantities in the rats' runways at 12- to 30-foot (3.6- to 9-m) intervals according to label instructions.

Fumigants

Fumigants are not very practical because cotton rats use their burrows and tunnels infrequently. Since state pesticide registrations vary, check with the local extension office or state wildlife agency for information on repellents, toxicants, and fumigants in your area.

Trapping

Small rodent live traps or rat-sized snap traps are effective for catching a small number of animals. The traps should be baited with a mixture of peanut butter and oatmeal or a piece of fresh carrot or sweet potato. The trap should be set in the runway at a right angle to the direction of travel.

Economics of Damage and Control

The amount and extent of damage is directly related to the relative density of the cotton rat population. The cost of control must be weighed against the value of the crop to be protected, such as sugarcane or melons.

Acknowledgments

Figures 1 and 2 from Schwartz and Schwartz (1981), adapted by Jill Sack Johnson.

For Additional Information

- Camedon, G. N., and S. R. Spencer. 1981. *Sigmodon hispidus*. Mammal. Sp. 158:1-9.
- Clark, D. O. 1972. The extending of cotton rat range in California — their life history and control. Proc. Vertebr. Pest Conf. 5:7-14.
- Clark, J. P. 1986. Vertebrate pest control handbook. California Dept. Food Agric. Sacramento. 615 pp.

Editors

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BCHD Complaint # 2506

BRUNSWICK COUNTY HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH COMPLAINT INVESTIGATION REQUEST

Date: 7/25/11 Time: 10:45 Received By: Ninei BCHD File # _____
Requested by: Kate Arrendale Phone: 910-512 3079

Complaint Detail:
 Wastewater Well Pool Food & Lodging Animal Services Other:
An old woman was bite by rat. Someone putting rat poison down & birds are eating it.
Camp ground at pier has garbage piled at dumpster and may be a cause of rats. Smells really bad.

Subdivision/Business: _____ Parcel # _____
Lot: _____ Block: _____ Section: _____ GIS Property Address/Location: _____
Directions: _____

Property Owner: _____ Phone #: _____

BCHD Investigative Officer: Joshua Coodee Date Investigated: 7/25/11

Investigation Notes / Comments: I tried contacting Kate on 7/25/11, however, she did not pick up the phone, so I left a message for her to return my call

Complaint Justified: Yes No Undetermined
NOV Issued: Yes No
Date for re-inspection: _____
Date of Compliance: _____

Lab Reports Attached: Yes No
Compliance Notes: _____

Referred for investigation to: _____
Date: _____ By: _____

Follow up visit necessary: Yes No Date of follow up if needed: _____