LIPHATECH®

September 7, 2011

Mr. Harden Blackwell
234 Beach Road North
Wilimington NC

Dear Mr. Blackwell:

First, thank-you again for all of the kindness and hospitality you extended to me during my visit to Figure Eight Island. It was a very enjoyable experience.

Attached is the final version of the proposed Rat Control Program for figure Eight Island. I have incorporated the input I received from you and your associates. I trust it will meet your needs.

As you are aware, rules regarding the use of rodenticides are currently in a "state of flux". As it stands right now, it will be illegal to apply rodenticides more than fifty (50) feet from a "building". However, discussions are underway between the National Pest Management Association, the pest control industry, rodenticide manufacturers and the EPA to modify this position. There is no way to predict the outcome, but I am hopeful the rules will be relaxed enough to allow effective and efficient rodent control on the island.

As you move forward, please feel free to contact me if there is any way in which I can be of service.

Sincerely,

Ted A. Bruesch

Ted A. Bruesch
Technical Support Manager

# Figure Eight Island - Rat Control Program

## Introduction

There are two species of rats with public health significance in the United States, the Norway rat and the roof rat. Both of them appear to be present on Figure Eight Island. Given the nature of these animals, the varying levels of concern by residents and the dense foliage covering much of the island, effective control will be challenging but not impossible. The following is a starting point program. It will need frequent re-evaluation and modification as new information about the situation becomes available and conditions change.

## Rat Biology and Behavior

Before a pest rodent can be controlled it is important to know how to differentiate the species and to understand at least a little about their behavior.

Norway Rat (aka. brown rat, sewer rat):

- Prefers to live in burrows dug into the earth, but will live in higher places such as walls and attics if suitable earthen burrowing sites are in short supply.
- Tail is shorter than head and body combined. Ears barely protrude above the top of the head.

Roof Rat (aka. black rat, ship rat):

- Prefers to live in trees, especially palm crowns and high places such as attics, but will live in lower places such as burrows dug into the earth especially if high places are in short supply.
- Tail is noticeably longer than the head and body combined. Ears protrude significantly above the top of the head.
- Refer to the Liphatech Technical Bulletin “Effective Control of the Roof Rat” for more information.

Both Rat Species:

- Will eat a wide variety of foods. See the list of potential food sources below. They do tend to stick with foods with which they have become familiar. An adult rat will eat about one ounce of food per day. *Laboratory tests conducted recently by Liphatech, Inc. have demonstrated rats will readily eat the fruiting bodies from pindo palm trees and pittosporum bushes.*
- Need about one ounce of water per day but can get it from high moisture foods such as fruits. See the list below for other potential water sources.
- Are very afraid of new objects such as traps and rodent bait stations placed in an established territory.
- Will explore objects such as traps and rodent bait stations in a new territory as they first enter it.
- Have incredibly sensitive senses of smell, taste and touch. However, they have poor eyesight.
- Prefer to be active at night.

- Will travel several hundred yards between their nest site and food but prefer the two to be as close together as possible.
- Have a strong social hierarchy, with the dominant (alpha) animals getting the preferred nest sites and food sources. Weaker (subordinate) rats occupy less desirable places.
- Breed so rapidly they often outbreed monthly efforts to eliminate an existing infestation.
- Are not very intelligent but have evolved certain behaviors which help them survive efforts to eliminate them.
    - Fearful of new objects.
    - Reluctant to try new foods.
    - Secretive activity patterns.

For more information about their biology, refer to Liphatech's "Commensal Rodent Facts" brochure.

Rat Habitat:
Rats need three things to survive: food, water and shelter. While eliminating all of their resources is not possible, any efforts to minimize them will help "stress" the rat population. Stressed rats breed less and are more likely to take rodenticides. Here are *examples* of each which are present on the island.

- Rats can eat just about anything which is not poisonous to them. Potential food sources on the island include:
    - Pindo palm fruits
    - Pittosporum pods
    - Nuts
    - Wild birds and especially their eggs
    - Pet food in outdoor dishes, including feral cat feeding stations (Note: Feral cats are ineffective at killing rats, especially adult rats.)
    - Crustaceans such as crabs
    - Insects
    - Pet droppings
    - Wild bird food
    - Bagged garbage not in cans or garbage in uncovered cans (Note: Metal garbage cans are best – otherwise watch plastic cans for holes gnawed by rats)
    - Restaurant dumpster (Note: Lately dumpsters are being constructed of plastic. Rats gnaw at the drain hole in the bottom until it is large enough to serve as an entry point.)
- Potential water sources include:
    - Leaky faucets, sprinkler heads and irrigation boxes
    - Fountains and bird baths
    - Condensation on A/C lines
    - Storm drains
    - Puddles from rain or irrigation
    - Outdoor pet water dishes
    - Cambium layer under the bark of shrubs

    - They can also gnaw through plastic water pipes.
- Potential shelter sites include:
    - Clutter, debris and brush piles – especially in out of the way places
    - Under thick foliage such as ground cover plants and pittosporum or elaegenus shrubs
    - Under concrete slabs or ground level wooden decks and walkways
    - Under concrete pads for beach side garbage cans, household garbage can enclosures and dumpster pads

**Control Program Elements**

Partners:
Effective rat control on Figure Eight Island will depend on the cooperation of the following groups of people.

- Homeowners Association
    - Provide leadership in sharing with all the residents including the Yacht Club this "Rat Control Program".
    - Train employees to watch for signs of rats in common areas such as the boat launch and around the beach path trash cans.
- Homeowners
    - Take action to reduce conditions which attract rats and help them survive.
    - Work closely with their pest control professional to assure compliance with "Minimum Requirements for Professional Rodent Control Services Performed for Residents of Figure Eight Island" (Listed below)
- Rodent Control Professionals
    - Be proficient in their understanding of rat biology and behavior.
    - Take timely and effective action against any rats inhabiting their customers' property
    - Comply with the "Minimum Requirements for Professional Rodent Control Services Performed for Residents of Figure Eight Island" (Listed below)
- Landscape Professionals (contractors and association employees)
    - Advise homeowners of any rodent activity they see in their routine activities on the homeowners property

Reducing Rat Attractants:
Here are some things homeowners should do to make their property less attractive to rats.

- Clean up windfall fruit such as that from pindo palms and pittosporum shrubs.
- Do not leave pet food outside in dishes overnight.
- Mount wild bird feeders at least 5 feet off the ground and fit them with effective rat deterrents such as squirrel guards. They should not be mounted on the house.
- Avoid the use of ground cover foliage.
- Eliminate clutter and debris.
- Firewood should be stacked neatly, on a rack at least one foot above the ground and well away from the house.
- Repair leaky faucets, sprinkler heads and irrigation boxes.

- Trim pittosporum or elaegenus to make the ground under them less concealed and easier to inspect/treat.

Reducing Rat Entry Potential:
Here are some things homeowners should do to keep rats from gaining entry to houses:

- Trim foliage at least two feet away from structures.
- Do not use climbing foliage such as ivy on houses.
- Trim trees such as palms so they do not touch the house or overhang the roof.
- Keep doors and windows in good repair and closed.
- Maintain effective weather-stripping at the bottom of doors, especially garage doors.
- Plug the following types of gaps with wire mesh followed by caulk or mortar:
    - Around dryer and bathroom vents
    - Around electrical, plumbing and HVAC entry points
    - Under the bottom course of siding
- Maintain dryer and bathroom vents so the louvers operate properly. Metal vents are more rat resistant than plastic.
- Screen attic vents with ¼ inch hardware cloth.
- Have appropriate fireplace caps installed.

**Minimum Requirements for Professional Rodent Control Services Performed for Residents of Figure Eight Island**

Rodent control services should be contracted with a North Carolina "licensed" pest control contractor. Service should be performed at least monthly by a "registered" or "certified" technician.

As part of every service visit the Rodent Control Professional should:

- Ask the homeowner about any evidence of rat activity they may have noticed:
    - Live or dead rats
    - Droppings (provide handout with photos)
    - Gnawed wood work, plastic water pipes, electrical wires etc.
    - Holes chewed into the roof soffit especially under tile or shake roofs
    - Dark "smears" on surfaces upon which rats may be travelling
    - Musky or urine like odors coming from walls and attics
    - Holes in the ground which, are about 2 to 6 inches in diameter especially those under shrubs, concrete slabs and on ground decks or walkways
    - Rat nests in trees and shrubs, especially palm crowns
    - Rat nests on sills between deck joists and in voids which open to the outside such as dryer vents or soffit vents
    - Pets in an agitated state towards hidden places such as walls, attics and foliage.
- Inspect the entire property, inside and out looking for signs of rat activity such as those listed in the previous item.
- Abide by rodenticide label directions as well as all local, state and federal pesticide application regulations.

- Maintain anchored tamper resistant bait stations in the following places: (minimum)
    - Under shrubs which have previously been infested.
    - In or beside the garbage can enclosure.
    - Next to the house where foliage offers shelter from view.
    - At the base of palm trees or on the trunk as high as practical.
    - Every 15 to 30 feet apart under property line hedges adjacent to neighboring properties without rodent control programs.
    - In and on high places which may serve as runways or nesting sites for roof rats. (Keep in mind 50% of a roof rat population may never travel to the ground and the entire population is likely to spend 90% of its life more than 4 feet above the ground.) Examples include: board fence top rails and decks or roofs which may have overhanging palm trees.
- Rely on second generation anticoagulant rodenticides for the following reasons:
    - Low active ingredient concentrations (25 or 50 PPM) contribute to faster acceptance of the new "food" source.
    - Rats are likely to consume a lethal dose in a single feeding.
    - Sub-lethal doses do not cause bait shyness so the rat is likely to return for a lethal dose.
    - Mortality is painless.
    - An antidote is readily available – vitamin K1.
- Bait station rodenticide recommendations include, in order of preference:
    - Difethialone Soft Bait (Such as FirstStrike Soft Bait)
    - Difethialone Block Baits (Such as Generation Mini Blocks)
    - Bromadiolone Block Baits (Such as Maki Mini Blocks and Contrac Blox)
- Rats are unlikely to eat stale or spoiled rodenticide. Replace uneaten rodenticide at least monthly.
- If any bait stations are found to be empty it may be an indication the rat population in the area is greater than anticipated. An increased level of service will be necessary. Steps to be taken include:
    - Agreements between homeowners and pest control professionals should be structured to allow compensation for expansion of the rodent control program to meet changing circumstances.
    - Use more bait per station.
    - Add stations in the vicinity of active stations.
    - Check and restock the stations more often. It might take weekly or bi weekly service for some period of time.
- When feeding on one rodenticide ceases, switch to another product to eliminate any rats which did not choose to feed on the first offering.
- Use loose (bulk) pellets such as Maki Paraffinized Pellets to treat burrows in the earth according to label directions.
    - First, make sure it is a rat burrow and not a crab burrow. Look for indications such as rat droppings and foot prints.
    - DO NOT use place packs or block baits as these are likely to be kicked out by rats thereby exposing them to children and non-target animals.

    - Place loose pellets as deep as practical into the burrow.
    - Do not cave in burrows until it appears activity in the burrow has stopped. Then close the burrow, but monitor it as part of future services since rats often return to favorable sites.
- As a preventive measure, maintain several non-toxic monitoring bait (e.g. No-Tox) placements in the attic secured to un-set rat snap traps. Leave the traps un-set initially lest a rat approaching it tentatively sets it off with a paw, thus becoming "trap shy". If during the routine service, the No-Tox block shows signs of feeding, re-bait with a small amount of bait and set the trap. Check it daily, re-bait and re-set as needed until the infestation is eliminated.
- If "snap traps" are used in areas accessible to children and non-target animals they should be placed in a tamper resistant bait station such as the Aegis RP Anchor. Pre-bait as described in the attic trap placements. They must be checked several times each week to make sure they have not been sprung or do not contain a trapped rat. In either case the trap is for the time being, ineffective.
- If "live" traps are used they must be checked every morning so any trapped rats can be removed before they die of exposure in the trap.

T. Bruesch
Liphatech
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