

St. Eustatius: Rat Control Program

Introduced predators such as cats, dogs, and rats can be found all over St. Eustatius and are a primary threat to the island's biodiversity. Rats, which are not limited to urban areas, can be found all the way up to The Quill and have become an especially challenging issue as they not only threaten the survival of native plant and animal species but also potentially pose a serious health risk to the island's inhabitants. Thanks to funding from the Netherlands Ministry of Economic Affairs under their Nature Fund initiative, a two-year rodent control project facilitated through the Caribbean Netherlands Science Institute (CNSI), was launched in early 2016 on St. Eustatius.

The goal is to establish a rat control program in key biodiversity and residential areas that will lead to a decrease in density of rats in those areas. The two project leaders are CNSI's Hannah Madden and Dr. Teresa Leslie from the Eastern Caribbean Public Health Foundation (ECPHF), in close cooperation with St. Eustatius National Parks (STENAPA) and the St. Eustatius Public Health Department. From February 2019, the Public Health Department will continue implementing the program to ensure its long-term success.

St. Eustatius' Black Rat (*Rattus rattus*) population, which most likely arrived in the Americas in the mid-1500s on the ships of early European

explorers (Leslie & Madden, 2015), has firmly established itself on the island and poses a threat to its biodiversity. Rats consume everything from native plants, flowers and fruits to agricultural products, which according to Madden "could very well result in a reduction of the number of different plants and animals found on St. Eustatius, which has been documented on other rat-infested islands" (Saint Martin News Network). Rats eat eggs, and for this reason are one of the most serious threats to island seabird populations worldwide (Sarmiento et al., 2014; Jones et al., 2008). On St. Eustatius camera traps have documented egg predation by rats at Red-billed Tropicbird nesting cavities (Madden & Ellis, 2013; Madden, 2014; Madden, 2015). This is significant as St. Eustatius, along with Saba, is an important breeding area for Red-billed Tropicbirds, with estimates of 100 to 200 tropicbirds breeding and nesting each year in St. Eustatius's coastal areas. Not only are the nests easily accessible to rats, but Tropicbirds are especially vulnerable to egg predation due to its single egg clutch size.

Beyond the impact of rats on biodiversity, there is a real fear that they could carry "potential diseases which pose a direct risk to human and animal health" explains Dr. Leslie. "The bacterial disease leptospirosis¹, which is often associated with rats, poses a serious threat in the Caribbean and is not adequately documented" (Saint Martin News Network).

Ross School of Veterinary Medicine students dissecting rat specimens collected on St. Eustatius.
Photo by: © Hannah Madden



Red-billed Tropicbird chick at Pilot Hill. On St. Eustatius camera traps have documented egg predation by rats at Red-billed Tropicbird nesting cavities.
Photo by: © Hannah Madden



¹Leptospirosis is an infection caused by bacteria called *Leptospira*, a genus of spirochaete bacteria. Symptoms of infection with *Leptospira* may range from none to mild such as headaches and fevers, but can also be severe such as kidney failure and bleeding into the lungs (World Health Organisation, 2003).



Camera trap image showing mouse at tracking tunnel.
Photo by: © Hannah Madden



Rat prints visible on tracking tunnel card from the Quill.
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Data on rat ecology is being collected to ensure that the rat-control program will target the correct areas. Such data includes density and distribution of rats as well as their specific biodiversity impact. Hannah Madden, who is spearheading the project's efforts to protect St. Eustatius's biodiversity from rats, spent time this July 2017 with Elizabeth Bell, senior ecologist from New Zealand's Wildlife Management International Ltd. and a leading expert on invasive species control, to learn more about rat control. Together they installed tracking tunnels in one area of the Quill National Park to assess rodent presence and density, whereby 60% of the tunnels documented rat prints. Dr. Teresa Leslie, who is spearheading the project's investigation into the public health threat of rats, is collaborating with the Ross University School of Veterinary Medicine in St. Kitts to gather data on what pathogens the rats may be carrying. A team of nine scientists, led by Dr. Sree Rajeev, visited St. Eustatius earlier this year and carried out necropsies on caught rats. The collected kidney samples were tested for the presence of the spirochaete bacteria that cause leptospirosis and which can be spread by rat urine. The results provided possible evidence of leptospirosis circulating among the rodent population, but more data is needed to have conclusive results.

While St. Eustatius's inhabitants are aware of the rat infestation issue, there currently is no systematic control system beyond the personal use of rat poison (Leslie & Madden, 2015). On many other Caribbean islands the mongoose (*Herpestes auropunctatus*) was introduced to control the island's rat population. These efforts have been unsuccessful as mongoose are a diurnal species, whereas rats are nocturnal. In many cases this has led to the

decimation of birds and small animal populations. Baited programs have had great success at controlling and eradicating rat populations, and rodenticide baits have been used to eradicate rats on more than 20 other Caribbean islands without harming native wildlife (Dasgupta, 2016). The baiting program on St. Eustatius began this September 2017 in the Pilot Hill area, a known nesting site for red-billed tropicbirds. The public is being warned not to consume land crabs collected from the treatment areas for up to one year due to possible second-hand poisoning. Whilst crabs are not affected by the bait, it can accumulate it in their flesh. Monitoring will then take place to measure the effectiveness of control. Bell Laboratories, Inc, a manufacturer of rodent control products, which supports a number of rat extermination projects on other islands, generously donated supplies of rodenticide and bait stations to the project. The residential baiting program will begin in November 2017 and will be a joint effort between the Eastern Caribbean Public Health Foundation and the St. Eustatius Public Health Department.

An essential component of the rat control program is to consistently involve and cooperate with government departments, community members and local stakeholders (Leslie & Madden 2015). Their involvement will not only help ensure the programs success but also its sustainability. Community members must be involved and feel empowered and clearly understand that they are a key component of solving the island's rat problem. Ongoing outreach activities include lectures and seminars for the public. The key message: rats are a culprit for decreasing biodiversity, and biodiversity is vital for island and population (human) health (Leslie & Madden, 2015).



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