Movement and dynamics of Norway rats in an urban landscape

Rosalyn Rael
*Tulane University of Louisiana, rrael@tulane.edu*

Caz Taylor
*Tulane University, caz@tulane.edu*

Follow this and additional works at: [http://scholarscompass.vcu.edu/bamm](http://scholarscompass.vcu.edu/bamm)

Part of the [Ordinary Differential Equations and Applied Dynamics Commons](http://scholarscompass.vcu.edu/bamm/OrdinaryDifferentialEquationsAndAppliedDynamics), and the [Population Biology Commons](http://scholarscompass.vcu.edu/bamm/PopulationBiology)

http://scholarscompass.vcu.edu/bamm/2016/May20/4

This Event is brought to you for free and open access by the Dept. of Mathematics and Applied Mathematics at VCU Scholars Compass. It has been accepted for inclusion in Biology and Medicine Through Mathematics Conference by an authorized administrator of VCU Scholars Compass. For more information, please contact [libcompass@vcu.edu](mailto:libcompass@vcu.edu).
MOVEMENT AND DYNAMICS OF NORWAY RATS IN AN URBAN LANDSCAPE

Rosalyn Rael¹, Caz Taylor²

¹Tulane/Xavier Center for Bioenvironmental Research, Tulane University, 627 Lindy Boggs, 6823 St. Charles Ave., New Orleans, LA 70118
²Department of Ecology and Evolutionary Biology, Tulane University, 400 Lindy Boggs, 6823 St. Charles Avenue, New Orleans, LA 70118
¹rrael@tulane.edu

Abstract

Norway rats are common urban pests that can carry and transmit several zoonotic pathogens, posing a potential health risk to humans and domestic animals. Though globally widespread, little is known about how natural and human-related changes in urban landscapes affect the population dynamics and movement of this species. As part of an interdisciplinary project investigating recovery of human and natural systems in New Orleans, Louisiana after Hurricane Katrina, we are designing a framework for modeling movement and dynamics of Norway rat populations. I will present this spatial network-flow model of movement across a landscape and describe how network structure relates to the likelihood and speed of network occupancy, and how population densities relate to network neighborhood properties. I will describe how the model can be used to explore the efficacy of rodent population control measures such as increasing sanitation and targeting populations through direct removal. I will also describe how we will use extensive data being gathered on rat demographics and genetics through a trapping census study, ground cover vegetation data, and GIS data to parameterize movement and life history features in the model, and will discuss further applications including modeling the spread of rodent-borne diseases.