

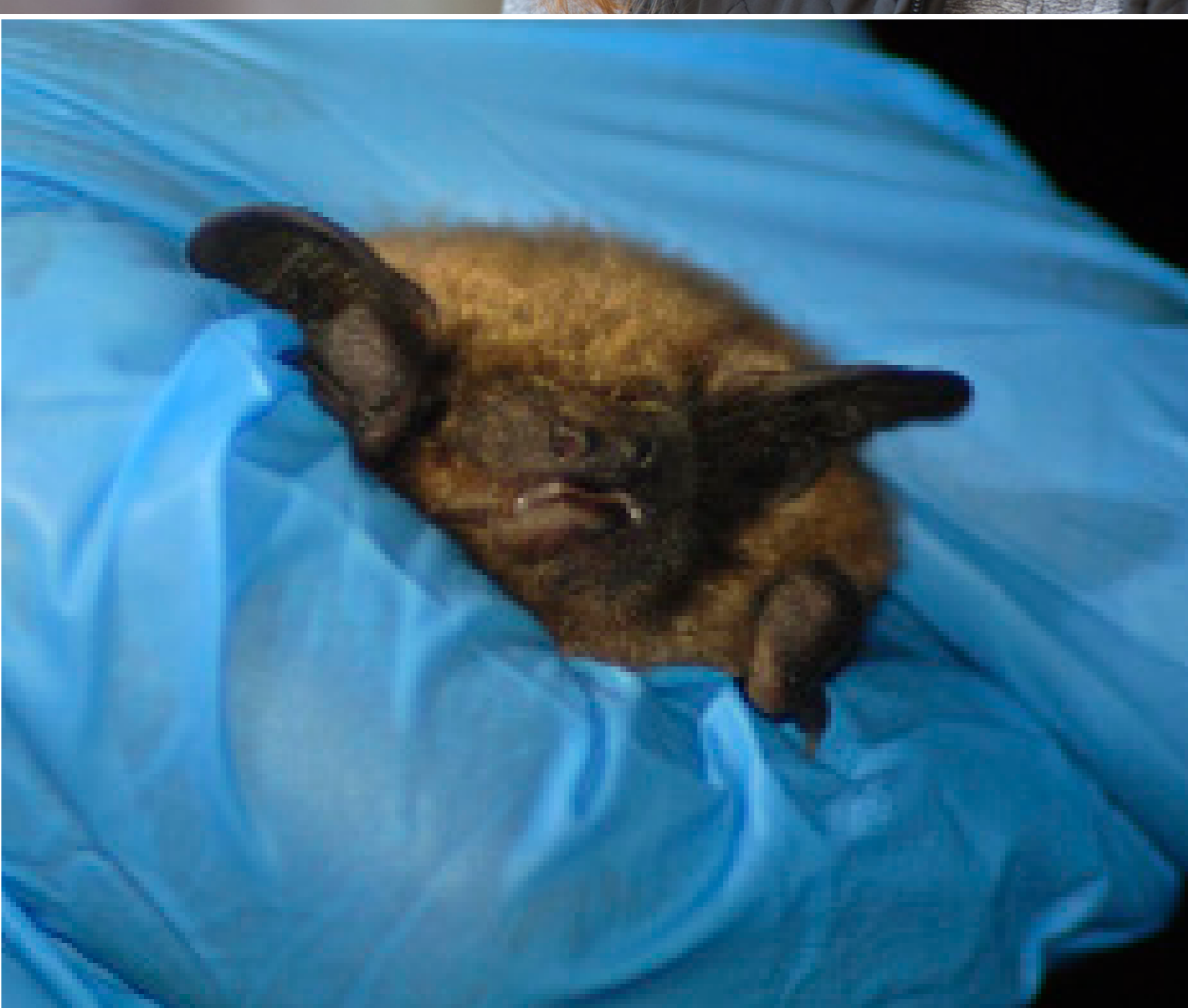


Undergraduate Program

Ecological Technology Design
Ecosystem Health
Soil and Watershed Science
Natural Resources Management

Graduate Program

Soil and Watershed Sciences
Ecological Technology Design
Wetland Science
Ecosystem Health & Natural Resource Management



Bats and the City

*Bats in North America provide many valuable ecosystem services such as consuming insect populations, which wreak havoc on agricultural crops and spread disease. Unfortunately, cave bats in most of the United States and Canada are threatened by disease. White-Nose Syndrome (WNS), caused by the fungus *Pseudogymnoascus destructans*, decimated cave bat populations in New York starting in 2006 and has radiated across the United States and Canada. A Certified Wildlife Biologist® and Lecturer, Shannon P. Browne has been working in the lab studying urbanization's impacts on bats in the WNS positive states of Virginia, Maryland, and Delaware.*

How Does Urbanization Affect Bats?

This cold-loving fungus, which thrives strictly in consistently cold and humid environments, such as winter bat hibernacula, is transmitted by direct contact with spores from infected bats or their substrate. The fungus physically irritates the bats during hibernation, resulting in abnormal behavioral changes, premature usage of stored energy, dehydration, and finally death. WNS' devastating effects have been well documented at cold and humid winter bat hibernacula throughout most of its range. Interestingly, the role of urbanization, which would create warmer climates due to the heat island effect, in WNS positive areas has not been investigated. The nature of urban areas consists of impervious surfaces, man-made structures, planted trees, artificial light, and additional water sources. We hypothesized that with the appropriate combination of landscape features, highly and moderately urban areas within a WNS positive region could serve as habitat for cave bats.

Determining Which Variables Are Important

To test this overarching hypothesis, we deployed bat acoustic detectors and insect traps every week from spring through fall for three years, among a gradient of urbanization levels, within two geographic regions where WNS has persisted for several years. We also collected habitat variables such as climate conditions, potential roost sites, drinking sources, flight space openness, light and sound pollution in the field and remotely for each site. Our team has been analyzing data to identify species-specific activity level changes among multiple seasons, years, and urbanization levels from northern Virginia, through Washington, D.C., to the coast of Maryland and Delaware.

Research Questions

- Do cave bats utilize highly urban areas?
- Will certain cave bat species exhibit differences in activity and composition in differing levels of urbanization?
- Can we predict which, if any, landscape features or combination of features are important to cave bat species along an urban-rural gradient?

Our lab's study is the first to look at cave bat activity, diversity, and associated landscape features among multiple years along the urban-rural gradient in a WNS positive region.