



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



Using Spatial Wildlife Ecology to Solve Applied Problems

Dr. Jennifer M. Mullinax is a wildlife ecologist that studies animal habitat use, preferences, and movements across landscapes. She has over 20 years of experience modeling different species' movements and habitat use, including such projects as black bear habitat across the southeast, box turtle movements in D.C., waterfowl movements as they relate to avian influenza, and white-tailed deer and mouse ecology as they relate to tick-borne zoonotic diseases.

Spatial Ecology of White-tailed Deer, White-Footed Mice, and Other Mammals

Like many other states, Maryland has seen a dramatic increase in the urban and suburban populations of white-tailed deer, especially in suburban and urban landscapes. As the climate warms and the human population increases, many agricultural, suburban, and urban communities will likely continue experiencing increases in deer-human conflicts and well as tick-borne disease issues. Currently, Dr. Mullinax is cooperating with USDA-ARS, Howard County, and Montgomery County to investigate wildlife communities and tick densities in green spaces and county parks in several Maryland locations. In those spaces, her lab is investigating the urban spatial ecology of white-footed mice, white-tailed deer, other small to medium mammals, wild turkeys, and tick densities in Maryland.

Spatial Ecology of Avian Influenza at the Intersection of Wild Waterfowl and Poultry

Avian influenza viruses pose risks to agricultural production and human health. Of particular interest is the risk of outbreaks at poultry farms from viruses introduced from wild waterfowl. The Mullinax lab is helping to characterize the temporal and spatial variation across wild species using spatiotemporal prevalence models. Given the 2022-2023 high pathogenic avian influenza outbreak, the distribution of waterfowl is important to the current transmission models and necessary for understanding the disease risk they pose. This is particularly true for waterfowl such as blue-winged teal, which have been implicated in the annual northern movement of H7 viruses that pose a particular threat to the agricultural industry. Recent quantitative methods in integrative species distribution models (ISDM) are allowing the Mullinax Lab, in cooperation with USGS and USDA-APHIS, to use joint-modeling approaches to combine disparate datasets to gain a better overall understanding of avian influenza.

Spatial Ecology of Black Bears Across the State of Florida

Florida is a highly human-modified landscape with patches of natural habitats throughout the state, many of which are high quality black bear habitat. The Florida black bear has experienced significant habitat and genetic fragmentation caused by human land use changes. Today the population is distributed in seven distinct and relatively isolated subpopulations. Increased connectivity among these subpopulations is critical for the long-term persistence and for the facilitation of dispersal in an increasingly human-modified landscape. Dr. Mullinax and her lab are investigating habitat use and wildlife corridors across the entire state of Florida. This project is creating robust statewide dispersal corridors for a growing and expanding black bear population and will be contributing to the sparse research on robust corridor validation methods.