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Undergraduate Research in Biology: Field Studies

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2:00-3:00 PM (Room 1310)

Undergraduate Research in Biology: Field Studies
Chair: Dr. Eric Walters, Department of Biological Sciences

Reducing the risk of ehrlichiosis at Hoffer Creek Wildlife Preserve

By Yong Suk Ko and John Warfle (Mentor: Dr. Holly Gaff)

The purpose of this research was to reduce the incidence of human monocytic ehrlichiosis (*Ehrlichia chaffeensis*) transmission from *Amblyomma americanum*, Lone star tick, to humans at Hoffer Creek Wildlife Preserve; an urban park. The project was part of an active tick surveillance project that had been flagging for ticks weekly at a variety of locations in the Hampton Roads area since 2009. The first phase of this project used a motion-activated, infrared camera to identify the abundance of known preferred host species such as white-tailed deer (*Odocoileus virginianus*), raccoons (*Procyon lotor*), etc., and the areas most frequently used by these hosts. Using this information and a map of the preserve, a simulation model was created based on a published agent-based model for ehrlichiosis. Using this simulation, locations for control measures were determined. In the second phase we built host-targeted acaricide applicator systems to target species indicated as the likely host of the infected ticks. These systems were deployed at the locations identified by our model. Surveillance continued in the reserve in order to assess the impact of these systems and compare with predicted model results.

An inventory of vegetation in a successional, forested wetland, southeastern Virginia

By Caitlin Sciulli and Jana Eggleston (Mentor: Dr. Holly Gaff)

The Stephens tract is site that is a part of The Nature Conservancy Stewardship of lands adjacent to the Great Dismal Swamp National Wildlife Refuge, a part of a greater wetland habitat restoration plan as a solution to habitat fragmentation. In 2003, TNC began the vegetative restoration of Stephens by planting *Taxodium distichum* (bald cypress) and *Platanus occidentalis* (American sycamore) trees, altering drainage, and allowing both mammalian and vegetative succession to progress. In 2005, a 1ha research grid was established to monitor the herbivorous small mammal community. The objectives of this study were to inventory the vegetation, map the dominant herbaceous species and begin determining the woodiness of the established grid. We collected, identified and prepared voucher specimens from the 1ha site, creating a master inventory. Our results show that the dominant species required by mammalian herbivores, such as *Aster* spp. (*Symphotrichium* spp.), *Juncus* spp., *Solidago* spp., *Rubus*, and assorted trees, are widespread on the site. Future work will include the completion of the measuring of all tree diameters and the determination of percent woodiness by species for correlation with the occurrence of small mammals on the site.

Vegetation and Tick Populations in Hampton Roads

By David Cutherell (Mentor: Dr. Holly Gaff)

While the distribution of ticks in a given geographic area tends to be very patchy and related to host populations, soil moisture, vegetation type, weather conditions, and other factors, the relationship between tick species and abundance, and habitat, is not well understood. A tick surveillance project has been running in the Hampton Roads area since 2009 with weekly data collection at set transect areas. In order to better understand the relationship between habitat and tick populations, these areas in will be mapped and the dominant vegetation type assessed. A relationship between vegetation type and tick species and numbers could help identify areas where ticks are most likely to be found, as well as where particular species are likely to move in the future.

Enrichment of Captive Squirrel Monkeys at the Virginia Zoo

By LaCheryl Ball (Mentor: Dr. Eric Walters)

Food enrichment is a technique used by the zoo industry to promote overall wellness of animals in captivity. I measured responses of captive squirrel monkeys to food enrichment at the Virginia Zoo. The research involved determining pre-treatment activity levels in order to test the effect of food enrichment on post-treatment activity levels. I hypothesized that feeding and active behaviors would increase as a result of food enrichment. Introduction of food enrichment resulted in a 15% increase in feeding behaviors, an 11% decrease in sedentary behaviors, and a 4% increase in active behaviors. In conclusion, food enrichment was a successful method of increasing activity in captive squirrel monkeys and has important implications for increased health and well-being of captive primates.