

Kaylee Ebner

M.P.H. Candidate, Epidemiology Track

kaylee.m.ebner@vanderbilt.edu

Practicum Site: Tennessee Department of Health

Practicum Site Supervisor: Abelardo Moncayo, Ph.D.

Tick Mitigation in TN: Southeastern Center of Excellence in Vector-Borne Diseases Public Land Tick-Bot Released Permethrin



Introduction: Tick-borne diseases are a growing concern in Tennessee. During the summer, Tennesseans flock outdoors and utilize the state's many trails and parks, putting people in direct contact with ticks and thus direct risk of acquiring a tick-borne disease. The objective of this project is to not only gain a better understanding of the prevalence of ticks in these high-use areas but also to provide proof-of-concept for reactive immediate, short term vector control. This study was done in collaboration with the Southeastern Center of Excellence in Vector-Borne Diseases (SECVBD).

Methods: This study was conducted at Long Hunter State Park in Hermitage, TN. Four 100-meter-long trail segments were chosen, two selected for treatment and two for control. Daily dragging and tick collection was done for four weeks on each trail. If a treatment trial triggered the collection of three adults, five nymphs, or two or more life stages of the same species, The Tick-Bot was run. The Tick-Bot is a small, remote-controlled vehicle with a permethrin-treated drag, that treats the vegetation it passes.

Results: In total, 1,009 ticks were collected. A decrease in the number of ticks collected from the beginning to the end of the study was observed. Additionally, a higher number of ticks were collected from the control trials, however, there was no statistically significant difference found.

Conclusions: The ticks collected have been preserved in 95% molecular-grade ethanol and stored in a -80°F freezer and will be tested for pathogens in fall 2024. The Tick-Bot is an innovative solution to mitigating the risk ticks pose to humans, but it will need further research and testing before being implemented on a larger scale.