

WIU CENTENNIAL HONORS COLLEGE
Thomas E. Helm Undergraduate Research Day 2023

Abstract

Poster

Major: Biology

Faculty Mentor(s): Shawn Meagher

Does Fire Affect Parasitism in White-Footed Mice?

Sarah Kreiling

Parasites can have important negative effects on host individuals and populations, so it is important to understand what causes parasite infections. Due to climate change, fires are becoming more common, but there is little research on how fire affects parasitism rates. I examined the effects of forest fires on parasitism, specifically tick infestations on white-footed mice (*Peromyscus leucopus*). In 2022, I collected mice from 15 long-term burned and unburned plots at WIU's Kibbe Life Science Station. Mice were dissected and the number of ticks on them counted. My data were combined with 8 years' worth of previously collected data. As measures of infection, I calculated prevalence (fraction of hosts infested) and intensity (mean number of ticks on infested hosts) for each plot in each year. I performed multiple regressions to examine effects of sample size (mice caught on a plot), burn, year, and plot on tick infestation rates. Sample size varied significantly with burn, year, and plot. Year and plot had significant effects on prevalence, but sample size and burn did not. Prevalence steadily increased over the course of this study. Year and burn had significant effects on intensity, but sample size and plot did not. Annual mean intensity varied over time, but mice on burn plots consistently had fewer ticks. Overall, I found that microhabitat (plot effects) and weather (year effects) may affect tick infestation rates. My data also suggests that prescribed burns may reduce tick intensities, so could be a means to reduce human exposure to tick-borne diseases.