

Prairie burn effects on insect communities  
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Native Michigan prairies are host to a vast variety of plant and insect species. Commonly in nature, these prairies would be burned, usually as a result of lightning strikes. This cycling of vegetation is generally healthy for the prairie, because it reduces leaf and grass litter, and provides better grazing and foraging for herbivorous animals. These burns also reduce the number of invasive plants, clearing space for native plants to grow and promoting more biodiversity. However, what is not as well known is the effect that these prairie burns may have on the insect and arthropod populations residing in this habitat, particularly the species that are too small or flightless to escape the fire, or species that live in or raise offspring on the ground level of the prairie. This question is important to answer, as the arthropod populations and their environment affect each other in many ways; the environment providing habitat and foraging, and the arthropods providing soil enrichment by decomposing dead materials. The purpose of this study is to determine what effect prairie burns have on the arthropod populations. Furthermore, as this year's research is a yearly continuation of the same study from 2013, its purpose is also to analyze whether there is a long-term effect by biennial burns on the prairie.

To test if prairie burns have an impact on arthropod populations, the prairie donated to Calvin for research by Carol and Fritz Rottman was burned on one half during the spring prior to the start of this year's research. I set up four series of pitfall traps in the prairie, two on the burned side, and two on the unburned side. These traps are laid along a north/south-facing transect line, with six traps along each site, totaling 24 traps in total. Over the course of two weeks, June 26-July 10, these traps were set and collected, and each one processed and counted individually to record a representation of the species present on either side of the prairie. These insects and arthropods are identified and counted to create a database of the biodiversity on the prairie. Statistical tests will be run to understand how arthropod communities differ on the burned and unburned sites.

These tests are run to determine if there are any significant changes between the two halves of the prairie. Various tests will be conducted: a Simpson's analysis, a Shannon-Weiner analysis, a diversity index analysis, and a chi-squared test. I also plan to create a bar graph to display the comparison between my research this year, and the findings from the past years' research. These tests and analyses will all be run once I complete the identification of the samples I have collected and recorded.

This research has benefitted me in many ways. This is the first research I have conducted without a partner, and outside of a class setting, which has helped me appreciate the value of doing solo research. I have also gained valuable experience in troubleshooting issues in this type of research, and figuring out ways to improve my testing and processing methods to be more efficient. Finally, I have appreciated the ability to live in a house on-site; by living in the same place and experiencing the same weather, sights, and sounds, it has really allowed me to better understand this prairie and the many aspects that make up its intricate ecosystem.