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The Effects of Native and Domestic Grazers on the Health of Bumble Bee (*Bombus* spp.) Populations in a Historical Tallgrass Prairie Ecosystem

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Cover Page Footnote

This research was performed under the supervision of Dr. Derek Rosenberger of Olivet Nazarene University. Dr. Rosenberger provided great assistance and support throughout the entire process: from the formation of this study and the writing of proposals and permit requests to compiling and analyzing data, writing reports, and opening doors to present at multiple scientific conferences. Dr. Rosenberger, as well as co-student researcher Anne Hughes-Wagner, spent hours in the field assisting in data collection by performing transect surveys in multiple locations. Funding for this research was provided by the Hippenhammer research grant. Midewin National Tallgrass Prairie made this research possible by providing permits to perform surveys on their property, as well as by generously providing escorts in the bison pasture so we could safely perform surveys there. Finally, I cannot thank the Olivet Honors Program enough for providing this opportunity and for support throughout the process both by faculty and other students.



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Presented as Abstract only

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ABSTRACT

Bumble bees (*Bombus* spp.) play an important role in the pollination of ecologically and economically significant plants worldwide. In recent years, bumble bee populations have suffered decline throughout North America, particularly in the Midwest. Many factors likely contribute to this decline, including the use of pesticides, disease, and habitat loss. Although cattle grazing space is a common use for Midwestern grassland, a comparison had not been made between the capacity of cattle pasture to support bumble bee communities with the capacity of tallgrass prairie, a habitat thought to be optimal for requisite floral resources. Additionally, the reintroduction of bison is becoming increasingly prevalent in the Midwest, both as a restoration tool and as a farmed meat, but it is not known if there is an effect of bison grazing on bumble bee communities. In this study, we sought to determine what effects grassland management for restored prairie, cattle pasture, and bison pasture have on the community composition of bumble bees at Midewin National Tallgrass Prairie in northeastern Illinois. Abundance, species richness, and diversity were recorded across transects in each habitat type using standard sweep net protocol. We found that restored prairie supports significantly higher abundance and species richness of bumble bees than either cattle or bison pasture. This study can be used to inform grassland managers of conservation implications when making land use decisions in the face of habitat loss and decline of bumble bees across the Midwest.

Keywords: bumble bee, conservation, prairie, grassland, pollinator, bison, cattle, grazing