

**The Friends of Nachusa Grasslands
2016 Scientific Research Project Grant Report
Due June 30, 2017**

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2016 grant amount: \$1500.00

**Research Project Topic: MICROBIAL COMMUNITY DYNAMICS IN TALLGRASS
PRAIRIE SOIL AFFECTED BY NATIVE GRAZER FECES (*BISON BISON*)**

Research Project Purpose: The purpose of this project was to determine if/how the reintroduced bison feces will affect the microorganisms in the prairie soil over time.

Research Project Outcomes to date: When looking at C:N, moisture content and pH had no relative difference throughout the three ages of prairie sampled (6yr, 15yr and Remnant) or between samples of fecal incubation. Samples were sequenced bacteria and archaea and we discovered a large change after 6 months of bison presence when compared to pre-bison sampling performed on the entire chronosequence of prairie. The chronosequence indicates clear differences in microorganisms between the younger/old and remnant prairies. With bison presence, the three prairies sampled indicated convergence toward a homogenized prairie in 2015. 2016 was even more exciting when compared to 2015 sequences. 2016 illustrated nearly no difference between the three prairies sampled. Additional samples have been recently sequenced for further analysis to understand how the bison exclosures differ from bison exposed soil within the three sites.

Describe how the grant funds you have received from the Friends of Nachusa Grasslands have been used in regard to the above topic, purpose, and/or outcomes: Funds from Friends of Nachusa have assisted in geochemical analyses and rRNA gene sequence analysis to better understand how the microorganisms within the prairie soil are affected by the reintroduction of bison. Without this funding, we would not have been able to discover the rapid change bison microbes have.

Describe how your project has benefited the work and goals of Nachusa Grasslands: Describe how your findings can be applied to challenges in management practices for restoration effectiveness and species of concern:

This project has changed the microbial performance throughout the chronosequence of prairie in the north bison unit. This project will help Nachusa Grasslands staff, volunteers, and scientists better understand how these megafauna affect the prairie. If the goal is for the prairies to restore faster into a native prairie ecosystem, I do not think the bison are

assisting in this process, but instead changing the ecosystem as a whole into a homogenized prairie.

Please list presentations/posters you have given on your research: NIU PhiSigma Symposium -- Poster Presentation 2015-17, Midwest GeoBiology Conference – Poster Presentation 2015-16, Midwest Ecology and Evolution Conference – Oral Presentation 2016, Goldschmidt – Oral Presentation 2016

Have you submitted manuscripts to scientific journals? No If so, which ones? If not, do you anticipate doing so? Yes, hopefully. (Please keep us informed on publications.)

Optional: Offer suggestions for improving the application and award process for future Friends of Nachusa Grasslands Scientific Research Grants: