This summer I was fortunate enough to be awarded a SEF grant to research the tallgrass prairies of Nachusa Grasslands. After years of being inside classrooms and labs, I finally got the opportunity to go outside and experience fieldwork. During my research, I was able to participate in a few other projects with fellow NIU scientists. I learned about the small mammal population and how they aide in seed dispersal of prairie vegetation. I spent a few days with Sheryl Hosler working in the field and in the lab on her dung beetle research. In the isotope lab, I prep samples to be analyzed. Most importantly I conducted my own experiment taking soil samples to determine bulk density and texture.

Small mammal trapping:

Over the course of two weeks, I assisted with the small mammal trapping sessions. In the early mornings, we processed seven test sites to check the traps which had been set the evening before. Row by row we checked each trap to ensure they were empty or had a live guest waiting to be released. The traps were all closed during the day to avoid any animals suffocating in the hot temperatures. In the evening we returned to the same sites to reset traps and replace the peanut butter and oats.

Measuring the traits of these small mammals over time will hopefully allow us to see how they respond to changes in the prairie ecosystem. By microchipping captured mice we can avoid processing the same specimen multiple times in one season. It also allows us to see if any captures survived the winter which can be very harsh on the prairie. Working on the small
mammal project I learned how a small mammal can greatly impact the survival of many plant species. This was the first time I worked with living animals and it opened up my interest to smaller trophic levels. I have gained skills in trapping and processing small mammals. I have a better understanding of how to design an experiment to track and monitor small species to better understand their role in the ecosystem.

Beetle pitfall traps and measuring:

On two occasions over the summer, I helped graduate student Sherly Hosler collect beetles from her traps at Nachusa. Talking to Sherly about her work I learned that studying beetles can allow land managers to use them as an indicator species of the overall health of the prairie. I learned how she designed and set up her experiment to bait and trap beetles using bison dung.

In addition to helping with fieldwork, I also assisted in the lab measuring functional traits of the dung beetles collected in 2017. The image to the right shows what a dung beetle looks like under the microscope when measuring their femurs. Assisting in this portion of Sheryl’s research allowed me the opportunity to work with preserved arthropods. I was trusted in handling delicate specimens and working autonomously. I will be able to use this experience to show future employers that I have worked with other researchers, have dealt with cataloging specimens, and accurately collecting data.

Isotope lab:

During the spring semester, my undergraduate research consisted of prepping over 600 samples of ground plant leaves for isotopic analysis. In my downtime I helped Christy Wails and
the Jones lab by prepping their samples. The process of creating a good sample can be tedious and arduous work which requires a lot of patience. Working with mouse hair and feathers added to the level of difficulty as the strands are difficult to place in the foil capsules. Honing in my lab skills and working with new equipment was a goal I set for myself this summer. Being comfortable using balances, knowing procedures for prepping samples, using microscopes, and knowing how to handle chemicals are all skills I will be able to use in my professional career.

Soil bulk density:

For my experiment, I chose to determine the soil bulk density of 21 sites and compare how the presence of bison and the use of prescribed fire change it over time. Having no previous
experience or knowledge of how to determine soil bulk density I first had to do read up on
methods. Nachusa scientist Elizabeth Bach was a tremendous help and a key contributor to my
research. She was kind enough to allow me to use their Giddings corer to extract soil samples
and walked me through the process of weighing and calculating bulk density.

In the field, the tools I used were a 2in. diameter Giddings corer, a wooden dowel rod, a
piece of gutter, a putty knife, a paintbrush, and plastic bags. Once a core was made the metal
core portion was placed in the piece of gutter and the wooden dowel was used to push the soil
core out. The putty knife was used to cut the soil core into a 10cm piece and pushed into a plastic
bag that was placed at the end of the gutter piece. The paintbrush ensured that any soil crumbs
also made it into the plastic bag by brushing the gutter piece clean. Once the samples made it to
the lab they were weighed, dried in the oven, reweighed, and crushed to extract any rocks or pebbles.

I love to learn new skills and be able to teach those skills to someone else to continue the cycle of lifelong learning. Nachusa has a herd of wild bison and as a safety precaution, one should not be out in the prairie alone. Sara Naughton, a fellow Jones Lab student, helped me take samples in the two bison units. I taught Sarah how to use the Giddings corer, collect and process a soil core, and practice driving the UTV in the prairie. Thankfully that day we did not encounter any bison.

Conducting this research has taught me how to design and implement an experiment. From conceptualizing the question I wanted to answer, to collecting the necessary tools to complete the work, converting samples into usable data, and working with others in the scientific community to complete my goal. My summer research allowed me to work with multiple departments at NIU as well as scientists from other universities through the work done at Nachusa. I feel more confident in my ability to conduct research on my own and this experience will greatly improve my eligibility for graduate school. This type of work has encouraged my desire for more independent research in my academic career. I will have another opportunity this fall with a second SEF grant and hope to continue expanding on my skills in the lab. I have become more interested in conservation and science education and hope to pursue a career where I can influence future scientists.