

**The Friends of Nachusa Grasslands  
2024 Scientific Research Project Grant Report  
Due June 30, 2025**

Please answer the following questions with clearly written summaries to give Nachusa Friends' science committee members, officers, and board members a good idea of what you accomplished using your grant money. Unless you object to the Friends doing so, your report will be uploaded into the science section of the Friends' website: [nachusagrasslands.org](http://nachusagrasslands.org).

1. Please save this form to your desktop with a unique file name that includes "Friends 2023 Science Grant Report" and your last name.
2. Complete the form using the headings in **bold** as your guide.
3. Save the file as a Word document or a PDF.
4. Attach the file to an e-mail, and send it to: [nachusafriendsscience@gmail.com](mailto:nachusafriendsscience@gmail.com) no later than June 30, 2025.
5. The subject of the e-mail should be "2024 Scientific Research Grant Report" and your last name.
6. If you have not completed your work, please submit this form anyway by the June 30 deadline and plan to contact Friends after your project is complete so that we may learn from and publicize the outcomes as appropriate.

**Name:** Lizzy Small

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**2024 grant amount:** \$5,455

**Research Project Topic:** Small mammal trophic niche dynamics in response to prescribed fire and bison grazing in tallgrass prairie

**Research Project Purpose:**

This study investigates the interactions between management strategies and small mammals, building on over a decade of small mammal and plant research at Nachusa Grasslands led by Dr. Holly Jones' Evidence-based Restoration Lab. Specifically, it aims to understand how prescribed fire and bison grazing influence small mammal communities through changes in their trophic niches. Small mammals occupy a central role in restored tallgrass prairie food webs, facilitating significant energy flow through the ecosystem. This project assesses how these management practices affect trophic niche dynamics, providing valuable insights into how the food web responds to restoration efforts.

**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:**

The funds from the Friends of Nachusa Grasslands enabled me to facilitate three successful sessions of data collection in 2024. These funds supported coordinating and scheduling volunteers, arranging transportation between the NIU campus and field sites, and providing essential field gear such as boots, rain pants, and personal protective equipment (including small mammal handling gloves, face masks, water, sunscreen, insect repellent, and first aid supplies) for student volunteers. Additionally, the grant covered cleaning supplies and critical data collection materials including clipboards, waterproof data sheets, pencils, permanent markers, plastic bags (two sizes), envelopes, scales, PIT tags, and Sherman live traps.

Providing transportation and reliable field gear was vital for recruiting and retaining volunteers, many of whom shared that they enjoyed the hands-on field experience. This support directly enabled the safe, efficient, and high-quality collection of data to advance understanding of small mammal trophic niches in restored prairie ecosystems.

**Describe how your project has benefited the work and goals of Nachusa Grasslands:**

This project contributes to a deeper understanding of energy flow and food web dynamics within tallgrass prairie ecosystems by focusing on three common small mammal species that occupy central roles in the food web. By analyzing how management practices such as prescribed fire and bison grazing influence small mammal diets and trophic niches, the findings help inform and improve restoration strategies across multiple sites at Nachusa Grasslands.

Building on a decade-long dataset, this research provides critical long-term insights into the effects of management on both specialist and generalist small mammal species. These insights are essential for evidence-based restoration and adaptive management efforts, supporting Nachusa Grasslands' mission to maintain and restore native biodiversity and prairie ecosystem health.

**Describe how your findings can be applied to challenges in management practices for restoration effectiveness and species of concern:**

Small mammals are essential components of prairie ecosystems, serving both as consumers of plants and arthropods and as prey for numerous predators. Understanding the factors that influence their trophic niches enhances our ability to predict species interactions and resource use within the community.

By assessing how prescribed fire and bison grazing affect small mammal niche positions, we can better anticipate changes in prairie food web structure and function.

This knowledge supports the refinement of restoration techniques aimed at maintaining balanced, resilient ecosystems. Ultimately, it helps ensure that small mammals continue to fulfill their critical roles as seed predators and prey, which is vital for ecosystem stability and the conservation of species of concern.

**Please list presentations/posters you have given on your research:**

- Lizzy Small, “*Small mammal trophic niche dynamics in response to prescribed fire and bison grazing in tallgrass prairie*,” Nachusa Grasslands Science Symposium, Franklin Grove, IL, April 2025
- Lizzy Small, *Master’s Thesis Defense: Small mammal trophic niche dynamics in response to prescribed fire and bison grazing in tallgrass prairie*, Northern Illinois University, DeKalb, IL, October 2024
- Amber Platt, Poster, NIU CURE Conference, DeKalb, IL, April 2025

**Have you submitted manuscripts to scientific journals? If so, which ones? If not, do you anticipate doing so?** (Please send digital copies of published articles to the Friends so that we can learn from your work.)

My manuscript is in progress. I anticipate submitting it to *Restoration Ecology*.

**What follow-up research work related to this project do you anticipate (if any)?**

This is an ongoing, long-term research project that will continue to build on Nachusa’s small mammal dataset. While my project focused on small mammal diet and trophic niche, future students will expand on these questions and explore other aspects of small mammal ecology as part of Dr. Holly Jones’ Evidence-based Restoration Lab and Dr. Pete Guiden’s lab. The undergraduate student I mentored has already built on my work by investigating new diet-related questions and presented her findings at the NIU CURE Conference in spring 2025. Additional data will continue to be collected in future years, and the results will be used in further analyses to better understand small mammal communities and inform prairie management at Nachusa. This ongoing work will also provide meaningful field research and mentorship opportunities for NIU students for years to come.

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

No suggestions, the application and reporting process went very smoothly, and I enjoyed presenting at the research symposium. I really appreciate how organized and supportive the Friends of Nachusa Grasslands are for student researchers. Thank you for your continued investment in conservation science and education!