

**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.

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**2024 grant amount:** \$8400

**Research Project Topic:** Rodent diversity and seed predation

**Research Project Purpose:** We studied the effects of tallgrass prairie rodent biodiversity (which is indirectly shaped by management decisions like prescribed fire and grazing) on food webs. Specifically, we wanted to know whether seeds of invasive plants are more likely to be consumed by high-diversity rodent communities, providing a new "natural" tool for managers to prevent the spread of invasive plant species.

**Research Project Outcomes to date:** Our seed removal study successfully identified several ways by which prairie management shapes seed removal by rodent communities. Notably, four times as many seeds were removed in unburned prairies compared to burned prairies, and 2.5 times more seeds were removed where bison were absent compared to prairies in the bison unit. Evidence suggests these changes are due to rodents, rather than invertebrates. Moreover, we found that the most common rodent species at Nachusa, the deer mouse, was a key player in removing invasive seeds. Where deer mice are absent, twice as many native seeds were

consumed compared to invasive seeds. Where deer mice dominated the rodent community, invasive seeds were six times more likely to be consumed than native seeds. We have written a manuscript describing our findings, currently in review at the *Journal of Applied Ecology*, and also presented these results at the Nachusa Science Symposium. We are continuing to analyze additional data we collected on rodent behavior (see below), with the hope of producing a second peer-reviewed manuscript.

**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 were used for two things in this study: 1) salary support for myself (0.5 month salary, \$4000) to travel to Nachusa, collect data, and analyze and communicate this work. 2) A new tag reader allowing us to identify which individual rodents entered our seed buckets to consume seeds, allowing us to collect data to be used in our second publication.

**Describe how your project has benefited the work and goals of Nachusa Grasslands:** Restoring the entire ecosystem is the goal of habitat restoration. While we have known for many years that fire and grazing at Nachusa shape rodent communities, people often ask “So what? Why care about the rodents?” Our work on this project helps address this, by demonstrating that land managers and stewards at Nachusa not only affect the abundance or diversity of animals, but the broader food web they support.

**Describe how your findings can be applied to challenges in management practices for restoration effectiveness and species of concern:** Controlling invasive plant species is a top priority for the management of Nachusa Grasslands, as well as many other tallgrass prairie restorations. By highlighting the importance of deer mice in controlling seeds of invasive species, we show that management approaches that promote deer mice (e.g., frequent fire, relaxed megaherbivore grazing) might be useful in plantings that are facing pressure from invasive plants.

**Please list presentations/posters you have given on your research:** 2025 Nachusa Science Symposium

**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.) We have an article in review at the *Journal of Applied Ecology*, and will be happy to share the manuscript if/when it is accepted.

**What follow-up research work related to this project do you anticipate (if any)?** We hope to write at least one more paper addressing the behavioral component of our data (identifying specific individual rodents in seed buckets). We also may connect our data to other datasets (e.g., plant community biodiversity) to see what other factors explain seed removal.

**Optional: Suggestions for improving the application and award process for future Friends of Nachusa Grasslands Scientific Research Grants:** I want to say thank you for all you do to support scientific research at Nachusa! Your work, along with the tireless efforts of the Nachusa staff, truly makes this a world-class place to work. It has been incredible to watch the growth of science at Nachusa, and your support for graduate students and postdocs is so valuable.

One small suggestion: could we have a more flexible document format to submit our proposals? It would be great to be able to embed a small image, for example, to illustrate our ideas.