

**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: \$7,832**

**Research Project Topic:**

Hitching a ride? Bison as potential co-dispersers of seeds and symbiotic mycorrhizal fungi

**Research Project Purpose:**

The purpose of this project was to examine the potential role of bison in the co-dispersal of native prairie plant seeds and symbiotic arbuscular mycorrhizal (AM) fungi. We addressed the following specific research questions:

- 1) How does AM fungal community structure differ across bison grazed, ungrazed, and wallowed plots?
- 2) Are AM fungi present in bison dung or fur? If so, how similar are AM fungal communities on/in bison to the AM fungal communities found in soil?
- 3) Could bison wallowing potentially co-disperse seeds and AM fungi?

**Research Project Outcomes to date:**

- We have complete all field and lab work associated with this project, including soil/dung/fur sampling, field assessments of plant diversity, lab processing of soil

samples, DNA sequencing of soil samples, bison fur greenhouse bioassay experiments, and root colonization assessment from greenhouse bioassays.

- We have completed DNA sequence bioinformatics analysis, and statistical analysis of all data.
- We have presented the results of this research through multiple poster and oral presentations (see below).
- The results of this work are summarized in the Honors Thesis of Tristan Wells, which he successfully defended in May 2025.
- We have drafted a manuscript and are currently revising it for submission to the journal, *Ecology*.

**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:**

Grant funds supported undergraduate student Tristan Wells to travel to Nachusa to conduct field work and spend time learning about prairie restoration from TNC experts. Funds were also used to supplement Tristan's scholarship and pay him to conduct lab and greenhouse work. Funds were used to pay for DNA sequencing, lab and greenhouse experiment supplies. Remaining travel funds will be used to present results of this work at the 2025 Ecological Society of America annual conference in Baltimore, MD.

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

It is estimated that roughly 59% of Earth's biodiversity is found belowground. As such, research exploring soil biodiversity is key to understanding how to protect and manage for the majority of species. Our research uncovered two major findings. First, Bison wallowing more than grazing significantly alters AM fungal communities contributing to belowground mosaics of soil biodiversity. Second, Bison carry both viable seeds and AM fungal propagules in their fur, enabling co-dispersal of this plant-fungal symbiosis that is important for prairie conservation and restoration.

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

Most prairie plants rely on AM fungi and many late-successional or rare prairie plants cannot grow without these fungal symbionts. Bison have long been studied as a tool for prairie restoration and now we know they impact belowground communities as well through their grazing and wallowing behavior. Bison can be incorporated into efforts aimed at managing soil biodiversity.

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

Wells, TE, VB Chaudhary (2025) Bison shape AM fungal communities through behavior and plant-fungal co-dispersal. Ecological Society of America Annual Meeting, Baltimore, MD.

Wells, TE (2025) Bison shape AM fungal communities through behavior and plant-fungal co-dispersal. Nachusa Grasslands Annual Meeting. Virtual.

Wells, TE (2025) Bison shape AM fungal communities through behavior and plant-fungal co-dispersal. Dartmouth College Undergraduate Honors Thesis Presentation, Hanover, NH.

VB Chaudhary (2024) Continent-scale aerial dispersal of arbuscular mycorrhizal fungi. Plenary, International Conference on Mycorrhizas, Manchester, UK.

Wells, TE, VB Chaudhary (2024) Hitching a ride: Bison dispersal of arbuscular mycorrhizal fungi. Karen E. Wetterhahn Science Symposium, Dartmouth College Hanover, NH, USA.

**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 drafted a manuscript and are revising it for submission to *Ecology*.

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

We don't anticipate any follow-up research at this time.

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

Thank you for your support!! This project was truly transformational for Tristan!!