

**The Friends of Nachusa Grasslands  
2023 Scientific Research Project Grant Report  
Due June 30, 2024**

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 2022 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, 2024.
5. The subject of the e-mail should be "2023 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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**2023 grant amount:** \$4,872.60

**Research Project Topic:** Fire frequency drives tradeoffs among conservation priorities in tallgrass prairie

**Research Project Purpose:** Typically, fire research focuses on a narrow set of ecosystem outcomes; yet land managers often need varied and numerous ecosystem outcomes such as a diverse plant community or insect or small mammal abundance to make decisions for the entire ecosystem in order to achieve long-term management goals. This research explored how often to prescribe fires to sustain one of the most endangered ecosystems on earth: the tallgrass prairie ecosystem.

**Research Project Outcomes to date:**

- One Publication (In preparation for submission in July 2024):
  - Bloodworth, K.J., Koerner, S.E., Kazanski, C.E., Ahlering, M., Boyle, W.A., Gora, S.L., Guiden, R., Hamilton, R., Helzer, C., Obermeyer, B., Twidwall, D., Welti, E.A.R., Bach, E.M. Fire frequency drives tradeoffs among conservation priorities in tallgrass prairie.

- Two Oral Presentations:
  - Bloodworth, K.J., Bach, E., Kazanski, C., Ahlering, M., Boyle, A., Gora, S.L., Guiden, P., Hamilton, B., Helzer, C., Obermeyer, B., Twidwell, D., Welti, E., Koerner, S.E. *Ecological Society of America* (August 2024). Fire frequency drives tradeoffs among conservation priorities in tallgrass prairie.
  - Bloodworth, K.J., Bach, E., Kazanski, C., Ahlering, M., Boyle, A., Gora, S.L., Guiden, P., Hamilton, B., Helzer, C., Obermeyer, B., Twidwell, D., Welti, E., Koerner, S.E. *Ecological Society of America* (April 2024). Fire frequency drives tradeoffs among conservation priorities in tallgrass prairie.
- Three Poster Presentations:
  - Bloodworth, K.J., Bach, E., Kazanski, C., Ahlering, M., Boyle, A., Gora, S.L., Guiden, P., Hamilton, B., Helzer, C., Obermeyer, B., Twidwell, D., Welti, E., Koerner, S.E. *Nachusa Science Symposium* (April 2023). Effects of fire frequency on shaping multiple ecosystem outcomes in tallgrass prairie: a meta-analysis approach.
  - Bloodworth, K.J., Bach, E., Kazanski, C., Ahlering, M., Boyle, A., Guiden, P., Hamilton, B., Helzer, C., Obermeyer, B., Twidwell, D., Welti, E., Koerner, S.E. *Nachusa Science Symposium* (April 2022). The effect of fire frequency on shaping multiple ecosystem outcomes in tallgrass prairie.
  - Bloodworth, K.J., Bach, E., Kazanski, C., Koerner, S.E. *University of North Carolina Graduate School's Graduate Research and Creativity Showcase* (April 2022). The effect of fire frequency on shaping multiple conservation outcomes in tallgrass prairie.

**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 funding that I received for this project has been used as stipend for my work on this project for 1 to 3 months out of the year from 2021-2024. Using this funding, I was able to dedicate my time to this project: I met with co-authors, found peer review articles relevant to this topic, extracted and compiled data from these peer-reviewed articles, analyzed data, wrote and edited the finished manuscript, and presented this work at many conferences and symposiums. In addition to a stipend. I also used the funding from the Friends of Nachusa Grasslands to travel to and from Nachusa Grasslands three times (2022, 2023, and 2024). During these three visits I worked directly with Elizabeth Bach to make a concerted effort to make progress on various parts of the project and in 2024, I presented my work at the Nachusa Science Symposium. In addition to working closely with Elizabeth and presenting my work during my visits, I also was able to meet and create connections with colleagues who work at Nachusa Grasslands.

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

This work has used published data from across the tallgrass prairie range to create a guide for land managers. Using this work, land managers can decide on the appropriate frequency of fire for their land management outcomes of interest. For Nachusa researchers and managers in particular, this work will help with directing land management but will also help in directing scientific goals, as we learned in this project that there are many gaps in data. Therefore, scientists working at Nachusa Grasslands may decide to focus study efforts on small mammals, for example, who were majorly understudied in the research articles in our study. Importantly, this work follows Nachusa Grasslands goals of increasing restoration and conservation efforts of tallgrass prairie and will add to the successful outcomes of restoration across the tallgrass prairie range.

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

The findings of my research are directly applicable to many management challenges for restoration in tallgrass prairie. In particular, land managers often have diverse land management goals, for example they may be interested in increasing plant and bird diversity while decreasing plant biomass. This study can assist in answering those questions and assisting with managing land for diverse outcomes by acting as a guide for land managers to use when deciding how often to burn their land.

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

Bloodworth, K.J., Bach, E., Kazanski, C., Ahlering, M., Boyle, A., Gora, S.L., Guiden, P., Hamilton, B., Helzer, C., Obermeyer, B., Twidwell, D., Welti, E., Koerner, S.E. *Ecological Society of America* (August 2024). Fire frequency drives tradeoffs among conservation priorities in tallgrass prairie. Oral Presentation

Bloodworth, K.J., Bach, E., Kazanski, C., Ahlering, M., Boyle, A., Gora, S.L., Guiden, P., Hamilton, B., Helzer, C., Obermeyer, B., Twidwell, D., Welti, E., Koerner, S.E. *Ecological Society of America* (April 2024). Fire frequency drives tradeoffs among conservation priorities in tallgrass prairie. Oral Presentation.

Bloodworth, K.J., Bach, E., Kazanski, C., Ahlering, M., Boyle, A., Gora, S.L., Guiden, P., Hamilton, B., Helzer, C., Obermeyer, B., Twidwell, D., Welti, E., Koerner, S.E. *Nachusa Science Symposium* (April 2023). Effects of fire frequency on shaping multiple ecosystem outcomes in tallgrass prairie: a meta-analysis approach. Poster Presentation.

Bloodworth, K.J., Bach, E., Kazanski, C., Ahlering, M., Boyle, A., Guiden, P., Hamilton, B., Helzer, C., Obermeyer, B., Twidwell, D., Welti, E., Koerner, S.E. *Nachusa Science Symposium* (April 2022). The effect of fire frequency on shaping multiple ecosystem outcomes in tallgrass prairie. Poster Presentation.

Bloodworth, K.J., Bach, E., Kazanski, C., Koerner, S.E. *University of North Carolina Graduate School's Graduate Research and Creativity Showcase* (April 2022). The effect

of fire frequency on shaping multiple conservation outcomes in tallgrass prairie. Poster Presentation.

**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.)

The manuscript has been previously submitted and rejected from two journals but is in the process of being submitted to another journal. This submission will occur in July and I will send a digital copy to Friends of Nachusa once the article is published.

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

While I hope that there is follow up work done on this project by other researchers, I do not currently have plans for any follow up research. I would especially like my work to serve as a guide on where to focus resources for future work, for example in further study of small mammal communities as stated above.

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