

**The Friends of Nachusa Grasslands
2018 Scientific Research Project Grant Report
Due June 30, 2019**

1. Please save this form to your desktop with a unique file name that includes “Friends 2018 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 no later than June 30, 2019.
5. The subject of the e-mail should be “2018 Scientific Research Grant Report” and your last name.
6. After your research project is complete, please contact Friends so that we may learn from and publicize the outcomes as appropriate.

Name: Nicholas Steijn

Address: 310 N Main St, Apt 16, Galena, IL 61036

Phone: 860-978-3575

E-mail: nicholassteijn@gmail.com

2018 grant amount: \$1500

Please answer the following questions with 1- to 2- sentence summaries:

Research Project Topic: Small mammal community response to herbicide use in a restored prairie

Research Project Purpose: To determine if small mammal diversity is affected after the use of herbicide to control invasive plants in prairie ecosystems. I also conducted a brief greenhouse experiment to determine if certain herbicides are able to prevent invasive birdsfoot trefoil (*Lotus corniculatus*) seeds from germinating.

Research Project Outcomes to date: The difference in small mammal diversity between herbicide-treated and untreated test plots was small, probably biologically insignificant, and weakly statistically significant. Spraying birdsfoot trefoil seeds with Transline did not reduce germination rate, while spraying with Milestone, Crossbow, and Garlon 3 did reduce germination rate.

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 largest expense was gas money for traveling back and forth to Nachusa. During trapping sessions (which lasted 12 days, 4 times per year) I had to be there in both the morning and afternoon, sometimes transporting volunteers 4 times per day. I tried to mitigate this by having volunteers drive themselves and others whenever possible, and staying at Nachusa’s housing overnight. The next largest expense was PIT (passive integrated transponders) tags for the mammals we caught; although they are inexpensive,

we use several hundred per year. I also used the money for miscellaneous supplies such as hand sanitizer, nitrile gloves, and bait for the traps.

Describe how your project has benefited the work and goals of Nachusa Grasslands: This project has helped the Nachusa stewards understand how small mammal populations fluctuate over time and how herbicide regimes may (not) affect them. This will hopefully help the stewards and managers make more informed decisions about future restoration activities. This project also introduced nearly 100 volunteers to Nachusa Grasslands for the first time, and many of them have subsequently helped on Saturday work days or even pursued a career in prairie restoration.

Describe how your findings can be applied to challenges in management practices for restoration effectiveness and species of concern: In a small way, this project will help remove some of the uncertainty and speculation about unintended consequences when implementing herbicide regimes at Nachusa and other restored prairies. Understanding more about small mammals' population fluctuations may also explain patterns in seed dispersal and plant community assembly, which sometimes pose challenges to successful prairie restoration. My experiment with birdsfoot trefoil seed may also help improve the control of this invasive plant.

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

Posters: Nachusa Science Symposium (2017)

Presentations: Midwest Ecology and Evolution Conference (2018), Ecological Society of America Conference (2018), Nachusa Science Symposium (2018)

Have you submitted manuscripts to scientific journals? If so, which ones? If not, do you anticipate doing so? (Please keep us informed on publications.)

I have not submitted manuscripts to scientific journals, but I do anticipate doing so.

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