

**The Friends of Nachusa Grasslands
2017 Scientific Research Project Grant Report
Due June 30, 2018**

1. Please save this form to your desktop with a unique file name that includes “Friends 2017 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, 2018.
5. The subject of the e-mail should be “2017 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: Sean Griffin

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2017 grant amount: \$5267.00

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

Research Project Topic: To study the effects of ecological restoration on native bee population genetics, I am comparing the population connectivity and genetic diversity of bees in the Nachusa Grasslands to those in isolated habitat fragments located outside the prairie preserve.

Research Project Purpose: Small, isolated populations of organisms often show reduced connectivity and genetic diversity, which can have serious detrimental effects on the health and longevity of these populations. My study examines whether prairie restoration at Nachusa increases genetic connectivity and enables populations to persist.

Research Project Outcomes to date: During summer 2017, I collected 840 bee specimens from 17 prairie sites at Nachusa and isolated prairie remnants in the surrounding landscape. I extracted and prepared DNA from all collected *Andrena rudbeckiae* individuals and sent the samples out for genomic sequencing, but have not yet started analysis on the sequences.

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 generous funds from the Friends of Nachusa Grasslands paid for my travel and expenses during fieldwork. I also used the funds to pay for lab equipment and

materials to extract and prepare DNA samples, as well as all expenses for DNA sequencing. I would not have been able to complete this project without funding from the Friends.

Describe how your project has benefited the work and goals of Nachusa Grasslands: My work will provide significant insight into how restoration affects prairie organisms at the population level. Because gene flow and high genetic diversity increases the health and long-term viability of populations, these population level processes are integral to the goals of the Nachusa Grasslands to protect and preserve prairie organisms.

Describe how your findings can be applied to challenges in management practices for restoration effectiveness and species of concern: Due to the high mobility of bees, it is currently unknown whether habitat restoration has any effect on bee population genetics. My findings will indicate whether restoration methods should be prioritized as a conservation method for endangered, threatened, and declining species of bees such as the Rusty Patch bumble bee (an endangered bee found in Illinois).

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

I have been invited to give a talk about this project at the Entomological Society of America Annual Meeting 2018 in Vancouver, Canada. The talk citation will be:

Griffin, S.R., N. Amon, N. Haddad, and M. Lopez-Urbe. Effects of ecological restoration on native bee population structure and genetic diversity. Entomological Society of America Annual Meeting. Vancouver, CA. Nov. 2018.

Previous talks about work at Nachusa:

Griffin, S.R., B. Bruninga-Socolar, and J. Gibbs. How does restoration affect flower and bee communities at the Nachusa Grasslands? Nachusa Grasslands Science Symposium. Franklin Grove, IL. Oct. 2017.

Griffin, S.R., B. Bruninga-Socolar, and J. Gibbs. Direct and indirect effects of restoration management on wild bee communities of a tallgrass prairie. Ecological Society of America Annual Meeting. Portland, OR. Aug. 2017.

Griffin, S.R., B. Bruninga-Socolar, M. Kerr, J. Gibbs, R. Winfree. Conservation of native pollinators: effects of restoration on bee communities of a tallgrass prairie. Entomological Society of America Annual Meeting. Minneapolis, MN. Nov. 2015.

Griffin, S.R., B. Bruninga-Socolar, M. Kerr, J. Gibbs, R. Winfree. Conservation of native pollinators: effects of restoration on bee communities of a tallgrass prairie. Nachusa Grasslands Science Symposium. Franklin Grove, IL. Oct. 2015.

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 yet

submitted my findings from this project to a scientific journal, but hope to submit a manuscript to Molecular Ecology by summer 2019.

Previous papers about work at Nachusa:

Griffin, S.R., B. Bruninga-Socular, M. Kerr, J. Gibbs, and R. Winfree (2016) Wild bee community change over a 26 year chronosequence of restored tallgrass prairie. Restoration Ecology.

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