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.

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2018 grant amount: $2918

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

Research Project Topic: This year, I had two separate projects at the Nachusa Grasslands. For the first, I used funding to continue an ongoing study of how bee population genetics are affected by large-scale habitat restoration.

My second project involved collaborating with Laura Rericha-Anchor of the Forest Preserve of Cook County, IL to find and identify uncommon bees at Nachusa.

Research Project Purpose: The goal of my bee genetics research is to determine the effects of restoration on bee population connectivity and genetic diversity across fragmented landscapes.

The goal of my second project is to more completely catalog uncommon and specialized bee species at Nachusa, to give us a better understanding of the bee diversity supported by the preserve.

Research Project Outcomes to date: All genetic analysis has been completed for my genetics project, and I am currently waiting on a collaborator (Dr. Margarita Lopez-Uribe, Assistant Professor at Penn State University) to process the data using bioinformatics.

For the 2nd project, I collected over 500 bees from target plant species during summer 2018 and sent them to Laura Rericha-Anchor for identification. From these specimens, we have identified many exciting new species records for Nachusa, including one species

that has not been recorded since 1909. To date, we have collectively found 221 species of bees at Nachusa.

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 from the Friends of Nachusa Grasslands have fully funded my genetics project at Nachusa, including costs of travel, fieldwork, and genetics lab work. I would not have been able to do this ambitious project without support from Friends of the Nachusa Grasslands. In addition, grant funds supported my travel and all equipment purchasing for my bee collecting trips to Nachusa in 2018.

Describe how your project has benefited the work and goals of Nachusa Grasslands: Results from my bee genetics project will give new insight into how large-scale restorations like Nachusa affect wild bees and other groups of conservation concern at the population level. This work will contribute to the greater understanding of population-level processes in restoration ecology.

My second project, cataloging uncommon bee species, gives us a better idea of species diversity protected by the Nachusa Grasslands.

Describe how your findings can be applied to challenges in management practices for restoration effectiveness and species of concern: My genetics work will help us determine whether habitat connectivity should be prioritized in restoration and conservation efforts focused on wild bees.

Our finding of 221 bee species at Nachusa identifies Nachusa as a diversity hot-spot for bees in the region and highlights the importance of prairie restoration efforts for conserving pollinator communities.

Please list presentations/posters you have given on your research: Because I do not yet have usable results from my genetics project, I have not given any talks/posters on this topic. However, I have given the following presentations on other projects 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 any manuscripts resulting from this work, but hope to submit a manuscript to Molecular Ecology before summer 2020. My previous work at Nachusa has resulted in 1 published paper and 2 papers in prep (see below).

Griffin, S.R., B. Bruninga-Socolar, M. Kerr, J. Gibbs, and R. Winfree. 2017. Wild bee community change over a 26-year chronosequence of restored tallgrass prairie. *Restoration ecology.* 25(4): 650-660.

Griffin, S.R., B. Bruninga-Socolar, and J. Gibbs. *In prep.* Wild bee communities of restored tallgrass prairies respond to landscape context rather than local management.

Bruninga-Socolar, B., **S.R. Griffin**, J. Gibbs, and R. Winfree. *In prep.* Bee traits predict species diversity and abundance in restored tallgrass prairie.

<u>**Optional**</u>**: Offer suggestions for improving the application and award process for future Friends of Nachusa Grasslands Scientific Research Grants:**