

**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:** \$5,500

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

**Research Project Topic:**

Arbuscular mycorrhizal fungi association and population genetics of *Comandra umbellata*

**Research Project Purpose:**

The purpose of this project is to investigate a possible correlation between the presence of *C. umbellata* and the arbuscular mycorrhizal fungi community in order to better understand how to use both as restoration tools successfully to their fullest effect, particularly in regards to establishment conditions for *C. umbellata*. The second purpose, regarding population genetics of *C. umbellata* is to identify what genetic diversity exists in this plant across Nachusa Grasslands to identify spatial trends that can inform best management practices, particularly with transplanting.

**Research Project Outcomes to date:**

To date, identifiable regions of arbuscular mycorrhizal fungi DNA has been amplified from all soil samples and is nearing preparation for next generation sequencing. For the population genetics portion, all *C. umbellata* samples have been scored with 1 primer. Subsequent primers are currently being screened for variation and a Hyb-Seq method is being tested.

**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 grant funds received from the Friends of Nachusa Grasslands have enabled all the field and lab work to collect samples and then extract, amplify, and analyze DNA of arbuscular mycorrhizal fungi and *C. umbellata*. A small portion of the funds were used for transportation and supplies for work in the field. A majority of the funding went toward lab tools and reagents for extracting, amplifying, indexing, and sequencing of arbuscular mycorrhizal fungi DNA.

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

This project has furthered questions stemming directly from Nachusa stewards' concerns and observations regarding establishment of *C. umbellata*. With relatively little known about such a desirable prairie plant, this project will provide both a foundation for further research questions and results with practical applications in the field.

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

The results of my project will have two important implications for management of *C. umbellata*. The results of my study of the arbuscular mycorrhizal fungi community will provide a foundation for understanding whether there is a correlation between this hemiparasite and the soil community. This will inform whether the two may contribute to the success of one another or if they have a negligible or even negative impact on establishment and persistence of one another. The population genetics portion of my project will inform whether transplanting *C. umbellata* from remnants is a viable management practice for establishing a genetically diverse population in restorations and if so, at what proportion and spatial scale transplant selection is necessary.

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

Poster – Friends of Nachusa Grasslands Science Symposium, October 2018

**Have you submitted manuscripts to scientific journals? If so, which ones? If not, do you anticipate doing so?**

I do intend to submit manuscripts regarding both portions of this project to scientific journals and will inform Friends of Nachusa Grasslands when that happens.

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

I do not have specific suggestions for improving the application and award process but I do want to highlight that throughout the process, stewards were especially helpful and open to talking through their observations and concerns in the field. That support strengthened the project immensely.