

Project Year-End Summary Report

Title of Project: Sampling the Alpine Flora of the Southern Rocky Mountains

Begin answering in the shaded box right beside or below each question and it will expand to accommodate as you type. Use up to a total of two and a half pages for questions 1-8. More detailed presentations, a final report, articles or posters are welcome separately (See final instructions at the end of this form.)*

1. Organization name or Individual who received the grant: Joseph Kleinkopf

2. Amount of Grant: \$ 1500

4. Was additional outside funding obtained? (check box that applies) Yes No

Other funding source(s) if you checked "yes." Lewis and Clark Fund for Exploration and Field Research

5. Briefly, how was the grant money from the Carter Conservation Fund used?

Grant money was used to fund travel and equipment costs for alpine plant collection field work.

6. Write an abstract or summary of the activities performed and the progress that was made this year on your project. (Save any conclusions, lessons learned, and benefits achieved for the final sections, 7&8.)

In the summer of 2023, I surveyed nine (9) alpine plant communities from across the Southern Rocky Mountains, including six alpine plant communities from New Mexico and three from Colorado. In total, I now have community-level data for 17 alpine plant communities across the Southern Rocky Mountains (10 from NM, 7 from CO). Funds from this grant were used to pay for travel (gas) to and from field sites and equipment for plant collecting. In total, we collected 599 vouchered specimens which will be identified to species level and deposited in the UNM Herbarium. Duplicates will be sent to partnering institutions. Following this work, I now have enough data to ask and answer questions about 1) baseline biodiversity in alpine plant communities, 2) how alpine plant communities differ, and what drives those those differences, and 3) compare alpine plant communities of the Southern Rocky Mountains with those of other mountain ranges in North America, South America, Europe, and Asia. I have preliminary data that suggests that differences between alpine plant communities are driven by neutral processes (random dispersal, speciation, and extinction), as opposed to climatic variables like temperature and/or precipitation.

7. How does your project further a Native Plant Society mission area, namely: *plant or ecological education; conservation/restoration of native plants and/or their habitats; adds to botanical research; promotes appropriate use of native plants to conserve water, land and/or wildlife.*

This project furthers missions of conservation of native plants and their habitats, as well as adds to botanical research. My project starts with community-level sampling of the highly imperiled alpine habitat, and provides much needed data to ask questions about the ecology, evolution, and conservation status of alpine floras. We now have an understanding of what species make up alpine plant communities, and thus the capacity to ask questions about the processes that lead to the assembly of alpine floras. A better understanding of these

processes will allow us to predict how alpine plant communities are responding (and will respond) to continued climate change.

8. Any other conclusions., lessons learned, benefits to you, the community or the environment hopefully result from your work as assisted by this grant.

As a result of collecting plants across alpine floras, we have refined the protocols and equipment required to efficiently and thoroughly survey alpine plant communities in the Southern Rockies. Prior to our efforts, we knew about gamma diversity of the alpine flora (what exists in the alpine) but not about alpha or beta diversity (community diversity and differences between communities, respectively), most likely because the alpine is difficult to access and even harder to survey thoroughly, especially since terrain is rocky and thunderstorms prevent collecting after noon. Our efforts provide a blueprint for how to conduct alpine plant surveys in New Mexico. Additionally, our efforts have produced thousands of photos of alpine plants that have already been used to create excitement and interest in the alpine flora. My hope is that this excitement will translate to an understanding of how imperiled this habitat is, and a desire to conserve these habitats. Finally, these data will contribute much needed data to an understanding of how alpine floras assemble. Studies in Europe and Asia already provide some context, but this question has not been thoroughly explored in North America. We aim to be the first to explore this question in North America and provide new insights into how alpine floras assemble worldwide.

Final Instructions

Please send your completed form as pdf as an email attachment to cartergrantapps@gmail.com by December 1.

** To remain in good standing for any future funding from the Native Plant Society of New Mexico, we ask that you educate our membership more fully in some way. This could be an article (250 words minimum, at least 1 high resolution illustration or photo) for our newsletter, **or** a paper or electronic copy or link to a published article connected with the past year's work, **or** by making an educational and visual presentation to one of our chapters. Contact information for our 7 area chapters is found on our website at www.npsnm.org under the Chapters tab.*

What are your intentions in this regard? I will be presenting at the Albuquerque chapter meeting on February 7th, 2024

This year end report is submitted by (Type your name) Joseph Kleinkopf

My typed name is equal to my handwritten signature in testifying to the accuracy and truth of this report to the best of my knowledge today.

eMail address jkleinkopf@unm.edu

Date 01 December 2023

Please contact us again at cartergrantapps@gmail.com if you have any questions or alternate suggestions.