

## Project Year-End Summary Report

Title of Project: Survey of soil microbiome associated to plant species in different ecological changes in NM

*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: Dr. Kelly Ramirez and Parikrama Sapkota, University of Texas at El Paso

2. Amount of Grant: \$5000

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

Other funding source(s) if you checked "yes."

Dodson Grant -UTEP (\$3000);

Jornada Graduate Student Fellowship -JRN LTER (\$12000);

Joint Genome Institute (JGI) - funding for metagenomic analysis for the study (all the cost related to metagenomic analysis will be covered);

Sunflower scholarship received for poster presentation about the research for Native Plant Society of New Mexico (\$150)

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

The grant was used for the research material.

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.)

All the soil collection from field was achieved during early spring 2022. During summer time, all the DNA extraction, polymerase chain reactions (PCR) was completed. During the fall 2022, all the samples are sent for analysis both for metagenomic as well as amplicon based sequencing. We are expecting results and analysis early spring 2023 and paper publication once the analysis is completed.

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.*

My research educates public (students or general) about types of soil microbes found on the rhizosphere soil of native plants found in New Mexico. Additionally, it also provides information on how specific microbial taxa or genome interact with different dryland plant species found around New Mexico. Due to desertification, ecological state changes can be found in New Mexico and this research will help ecologists (more specifically microbial ecologists) learn more on difference on soil microbiome found in these state changes if any. For the purpose of restoration, one can use such information. This research will provide valuable information for efforts to restore historical perennial grasslands to minimize invasive grass introduction using

knowledge of dryland soil microbial communities for restoration efforts. Additionally, restored grasslands will not only increase fodder for cattle but also provide habitat for small as well as large mammals and animals, support soil health (structure, nutrients cycling, carbon sequestration), restore desired vegetative cover to protect soils, control erosion, reduce sediment, improve water quality and quantity, and enhance stream flow and build invasion-resistant plant communities

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

I learned collecting soil sample for DNA analysis. Additionally, I honed my molecular biology skills like DNA extraction from soil samples, PCR (polymerase chain reactions), analysis of the gel electrophoresis data. I got to present about the research at the international platform ESA-Montreal, Canada during summer 2022 as well as nationally at Native Plant Society's annual conference at Albuquerque. This research was one of the critical chapter of dissertation which I am hoping to publish once I get my analysis of sequencing back. I am looking forward to share my sequencing data and analysis to community around me (El Paso and New Mexico), to NPSNM and to soil lovers.

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#### **Final Instructions**

**Please send your completed form in MS Word (not converted to pdf) as an email attachment to [cartergrantapps@gmail.com](mailto: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 (500-1000 words, illustrations welcome) for our newsletter, **ora** 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](http://www.npsnm.org) under the Chapters tab.*

*What are your intentions in this regard?* I am looking forward to do a visual presentation or write an article. I can do presentation anytime. I can also write article, but I think it would be better for me to wait till I get my analysis back so I can write about findings from this research, if not then I can also write article before I get my results/analysis.

This year end report is submitted by (name) Parikrama Sapkota

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Date Dec 1, 2022

*Please contact us again at [cartergrantapps@gmail.com](mailto:cartergrantapps@gmail.com) if you have any questions or alternate suggestions.*