Project Year-End Summary Report

Title of Project: Mechanisms of shrub encroachment: The role of seed dispersal in grassland restoration

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. Alejandra Martínez Blancas (The University of Texas at El Paso)

2. Amount of Grant: $ 3000

4. Was additional outside funding obtained? (check box that applies) Yes ☐ No ☐
Other funding source(s) if you checked "yes." Yes, funding from my startup as well as from the NSF ROADS-RAMP program was used.

5. Briefly, how was the grant money from the Carter Conservation Fund used?
We used the grant money from the Carter Conservation Fund to buy equipment and set up a field study stite at the Jornada Experimental Range to investigate the role of seed dispersal on shrub encroachment.

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.)
Shrub encroachment, a decline in grass cover followed by the proliferation of shrubs, threatens Chihuahuan Desert grasslands. Understanding seed dispersal under shrub encroachment can inform restoration. Are grassland species arriving but failing to establish, or not arriving at all? By understanding this we can assess if seed addition is required or if other measures like shrub removal must be taken to ensure native species establishment. At the beginning of the monsoon season of 2026 we set up two parallel sites at the Jornada Experimental Range. One was in an encroached area and one was in an non-eccroached are. At both sites we deployed seed traps and collected soil cores to quantify species dispersal through space and time respectively. We set out soil from the soil cores in the green house to analyze what species were present in the seed bank. We also collected data on standing vegetations at both sites, this included vegetation cover to the species level and vegetation biomass. If species are present in the seed rain or in the seed banks this means that they are able to arrive to a site but not establish.

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 contribution to the mission of the Native Plant Society is two-fold. First, towards eduaction, specifially of ecology and plant conservation. Second, towards the generation of knowledge that can aid us in conserving the native plants of New Mexico and their habitat.

Regarding education, throught this project I have mentored seven undergraduate students and one postbaccalaurete researcher in ecology and basic plant identification. Specifically, all of these studens have learned about the Chihuahuan Desert and hands-on field ecology. One of these studens was from an NSF research experience for undergraduates program. She is from

Michigan and was very new to arid environments. The desert amazed her! Additionally she learned to preform a preliminary statistical anlaysis, and to communicate her research findings. You can find a detailed description of her experience the she wrote as an outreach activity for her university: https://www.gvsu.edu/experiencematters/experience-view.htm?submissionId=0DB46365-0E1C-0650-C4B4EFB9ABF3F277 . Through this project I am also training a postbaccalaurete research, also from an NSF program (ROADS-RAMP), he is currently processing the data that we collected for this project and will lead the data analysis and manuscript to come out of this project.

Regarding new knowledge for conservation, preliminary data from this project suggests that seeds from imperilled native grassland species are present in the seedbank in the encroached areas. However, the conditions present in the area may not be allowing them to germinate and become part of the standing plant community. This prevents these species from further expanding either through continued seed productions or vegetative growth. Through this project, we also collected data on seed rain, or in other words, the seeds that are able to disperse through space and arrive at our study area. This data will further allow is to understand if the seed bank and standing vegetation are being replinished with new individuals from seeds. We are currently in the process of analyzing these samples. This data will contribute towards forming a more complete picture of the role that seed dispersal has on replenishing native grassland seeds or in shrub encroachment. So far our data seems to suggest that native seeds are still in the seed bank of the community but might not be able to replenish our natural communities but they are not encountering the necessary conditions to germinate. An example of such species present in the seedbank but not in standin vegetations is *Bouteloua eriopoda* (Black Grama), a key native arid grassland species. Management measures like, shrub removal, herbivore removal or irrigation may be good avenues towards restoring our aridlands by setting appropriate environmental conditions for seeds to germinate and establish.

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

We have added most of the species encountered at our site to the inaturalis platform where anyone from the general public can access this information.

Final Instructions

Please send your completed form as a PDF email attachment to cartergrantapps@gmail.com by November 1, 2026.

** 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? We will write a 250 word article and include a photo for the newsletter.

This year end report is submitted by (Type your name) Alejandra Martínez Blancas

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 amartinezblan@utep.edu

Date 10/27/2026

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