

**The Friends of Nachusa Grasslands  
2021 Scientific Research Project Grant Report  
Due June 30, 2022**

1. Please save this form to your desktop with a unique file name that includes “Friends 2021 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, 2022.
5. The subject of the e-mail should be “2021 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.

**Name:**

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**2021 grant amount: \$2,710**

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

**Research Project Topic:**

Assessment of Enteric Parasites in Wild Bison at Nachusa Grasslands

**Research Project Purpose:**

Parasite infections are major threats to bison, particularly in herds contained within smaller, more concentrated environments. Intestinal parasite infections have the potential to cause weight-loss, anemia, diarrhea and disrupt the gut microbiome which can strain an animal's immune system. Therefore, my study aims are to assess the gastrointestinal parasite infections of the Nachusa bison through various analyses of fecal samples and identify factors that may be affecting infection prevalence and severity.

**Research Project Outcomes to date:**

Microscopic analysis of bison fecal samples (collected in 2021) revealed 9 different types of intestinal parasites (at the Genus level). Based on these results, primer sets (specific to these types of parasites) have been purchased for molecular parasite detection using PCR. The PCR analysis can allow for parasite analysis of our older fecal samples in frozen storage. The primers have been received in lab and are undergoing quality control testing prior to widespread use on all our samples. Bison fecal DNA samples have been prepared for microbiome next-generation sequencing at Rush University (specifically, I performed the “library preparation” of these samples in our lab) and the samples have been shipped to Rush University for completion of the sequencing.

**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:**

These grant funds have been utilized to purchase laboratory supplies for the microscopic and molecular analysis of intestinal parasites and bacterial microbiome composition of Nachusa bison. These supplies include: DNA isolation kits, primers and reagents necessary for PCR identification of parasites as well as “library preparation” of DNA samples (a first step necessary prior to DNA sequencing), and staining kits for fecal smear slides for microscopic identification of parasites.

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

Wild American bison (*Bison bison*) were reintroduced to Nachusa beginning in 2014 as part of the Nature Conservancy’s mission to restore native tallgrass prairie. Ensuring the health of these bison is paramount to the sustainability of these ecosystem restoration efforts.

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

Results from this study can be used by the Nachusa Grasslands management team to better understand the health of the herd. These data may be applied to veterinary health interventions (e.g., anti-parasitic medications provided during annual round-ups) or management strategies (e.g., preference to certain areas of the preserve for grazing).

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

1. Phi Sigma Symposium at NIU: Poster (April 2022)
2. Nachusa Science Symposium: Talk (April 2022)
3. American Society of Microbiology Conference: Poster (June 2022)

**Have you submitted manuscripts to scientific journals? If so, which ones? If not, do you anticipate doing so?** (Please send digital copies of published articles to the Friends so that we can learn from your work.)

Not yet, however, I'm drafting my first manuscript for this project specific to the results obtained from the bison gut microbiome DNA sequencing analysis. Upon receipt of the sequencing results data, I will complete this manuscript and submit it to a relevant peer-reviewed scientific journal for publishing.

**What follow-up research work related to this project do you anticipate (if any)?**

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

Future research on this subject will include an expansion of herds from other locations for comparison of results. In addition to testing other conservation herds, analysis of bison from commercial farms would allow for better understanding of factors that may influence these animals' gut microbiome composition and parasite transmission dynamics.