The Friends of Nachusa Grasslands
2020 Scientific Research Project Grant Report
Due June 30, 2021

1. Please save this form to your desktop with a unique file name that includes "Friends 2020 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, 2021.
5. The subject of the e-mail should be "2020 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: Pete Guiden
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2020 grant amount: $1302

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

Research Project Topic: Bison wallows are a common feature in Nachusa Grasslands, and they may indirectly help seed establishment by creating a "landscape of fear" where granivores are more exposed to their predators. However, little is known about how other animals use wallows, including small mammals and birds that consume seeds.

Research Project Purpose: By determining how many bison wallows exist in Nachusa, where those bison wallows are located, and how environmental context (e.g., burn history) affects how granivores use bison wallows, we might inform efforts to seed abandoned wallows with rare annual plants, increasing plant community diversity.

Research Project Outcomes to date: In May 2021, we recorded the location and size of 169 bison wallows and noted whether they were abandoned or in use. We also conducted a seed removal experiment in a subset of 22 wallows, and will analyze these data this fall.

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: Funds were used to purchase camera traps that allowed us to monitor animal use of bison wallows, and to pay for mileage to study sites.

Describe how your project has benefited the work and goals of Nachusa Grasslands: Understanding how bison impact the entire prairie ecosystem is an important management goal at Nachusa. We will help understand the indirect effects of

bison by providing a map of wallows (including estimated area and whether they are abandoned) to Nachusa staff and stewards.

Describe how your findings can be applied to challenges in management practices for restoration effectiveness and species of concern: If small mammals avoid foraging in bison wallows, this may provide a refuge for seeds that suffer high levels of seed predation. Bison wallows may therefore provide an opportunity to over-seed plant species that are difficult to establish in undisturbed grassland.

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

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.**)**
These data will be analyzed by Alex Halouchanka (Hamilton College undergraduate student) this fall for his senior thesis research, and we hope to also publish this study in a peer-reviewed ecology journal. A copy of all written publications will be provided to Friends of Nachusa.

What follow-up research work related to this project do you anticipate (if any)?
Ideally, we would replicate the seed removal study across multiple months to capture how seasonal changes in the prairie affect the importance of wallows to plants and animals.

<u>Optional</u>: Suggestions for improving the application and award process for future Friends of Nachusa Grasslands Scientific Research Grants: