

Friends of Nachusa Grasslands

2022 Scientific Research Project Grant Policy and Instructions

The goals of Friends of Nachusa Grasslands (Friends) are to build endowments for long-term protection, conduct and encourage volunteerism, protect land, and encourage science and education at Nachusa Grasslands near Franklin Grove, Illinois.

To support scientific endeavors, the Friends organization awards monetary grants to qualified candidates conducting scientific research significant to Nachusa Grasslands. Research projects should focus primarily on prairie, savanna, wetland, woodland, and stream habitat management such as prescribed fire, seed collection, weed control, general or specific flora or faunal populations, and natural areas restoration. Special consideration may be given to proposals investigating the specific questions noted on the addendum to this set of guidelines entitled "Potential Research Topics at Nachusa Grasslands" but these research questions should not be considered limiting for grant applications.

Qualifications for Scientific Research Project Grants:

- The expected outcomes of the scientific research project should be pertinent and practical to the specific work and goals of Nachusa Grasslands.
- Research must be conducted at Nachusa Grasslands – additional sites may be included, but the majority of the study should take place at Nachusa Grasslands.
- Proposals will be evaluated in regard to each project's direct applicability to challenges in management practices for restoration effectiveness and species of concern.
- Research that lends itself to being published in peer reviewed journals may be favored over that which does not.
- For suggestions on appropriate research topics and to determine how their proposed work relates to that of previous grantees on the same or similar topics, applicants should consult with Dr. Elizabeth Bach, Nachusa Grasslands Ecosystem Restoration Scientist (elizabeth.bach@tnc.org).

Scientific Research Project Applicant Criteria:

- University researchers or college graduate students; or
- Members of pertinent organizations; or
- Individuals who have previously demonstrated valuable results in pertinent research.
- Applicants will be evaluated in regard to their standing and experiences as well as their project proposals.
- Members of Friends may apply for grants but may not simultaneously serve on the Selection Committee.

Permission to Conduct Research at Nachusa Grasslands:

- Applicants must obtain permission to conduct research at Nachusa Grasslands by contacting Elizabeth Bach (elizabeth.bach@tnc.org). Before submitting an application, applicants should submit a completed "Research Permit Application and Liability Waiver" form of the Illinois Chapter of The Nature Conservancy. This form is available in the Science section of the Friends website (nachusagrasslands.org). No grant will be awarded without TNC approval. The permit application must be submitted before the

grant application will be considered, but full TNC approval typically happens after grant submission.

- Researchers may also need a permit from the Illinois Nature Preserves Commission since a large portion of Nachusa Grasslands has been designated an Illinois Nature Preserve. Elizabeth Bach will coordinate INPC permitting with researchers for whom this applies.
- Finally, research involving endangered species may require an additional permit from the Illinois Department of Natural Resources. Please be in contact with Elizabeth Bach and refer to the following website for information and the permit form itself:
<http://www.dnr.illinois.gov/conservation/NaturalHeritage/Pages/EndangeredSpeciesPermits.aspx>

Scientific Research Project Grant Amounts and Timeline:

- Friends solely determines the awarding of grants.
- The total amount budgeted for all 2022 grants combined is \$66,000. (Please see the Friends website for grant award history.)
- Grants should generally be used between February 1, 2022, and June 30, 2023. Friends retains the option of requiring a refund of the grant money if terms of the grant agreement as set forth in these guidelines are not met within this timeline. To avoid the refunding of grant money, researchers should clearly and honestly communicate with Friends as soon as any issue arises.
- Multi-year proposals can be submitted for up to three years' work at Nachusa Grasslands. Compelling reasons for a multi-year commitment from the Friends should be made in the application, and the proposed annual budget requests should be listed and justified. Friends reserves the right to award only one year of funding if the case for multi-year funding has not been justified in the application.
- Grantees who have already been awarded a multi-year grant do not need to submit a new application for the 2022 grant cycle unless the research design has changed significantly. However, they do need to submit a status report about one page in length describing 1) the progress that has been made toward accomplishing the research goals, 2) the likelihood the original scope of the research will be achieved, and 3) any variations/revisions that have been made to the original scope of study. The report is due no later than 5 pm on November 30, 2021 (the same date new grant applications are due.) Friends retains the right to not fund the remaining years of the research grant if the status report does not demonstrate sufficient progress and the grantee cannot present a plan for getting back on schedule.
- Recipients may be supported by other organizations for the same research project.
- Up to 10% of the total grant from Friends of Nachusa Grasslands can be applied to institutional "indirect costs."

Ownership, Reporting, and Sharing of Research Findings:

- Grant recipients own their research and are encouraged to publish their findings. Digital or hard copies of published work must be provided to the Friends when they are available.
- Recipients must formally (in print and online) acknowledge the support provided by the Friends in all presentations, posters, publications, and reports.

- Grant recipients must use the format provided by Friends to submit a written report of their research findings to Friends, including an accounting of how the grant was spent. These reports may be published on the Friends website.
- The specific timing of the report may be mutually determined by the individual and Friends, but generally the completed report will be expected no later than June 30, 2023.
- With the collaboration of the recipients, Friends may further publicize the research grants or outcomes.
- Recipients should share their data with other Friends grantees and Nachusa researchers as appropriate.
- Recipients will be expected to present a brief overview of their projects or a poster presentation at the annual **Nachusa Science Symposium** on the fourth Saturday in April, **April 22, 2023**. If they are not available on that date, grant recipients will be expected to submit a report for distribution at the meeting.

Scientific Research Project Subsequent Awards:

- Previous years' researchers are invited to apply for a 2022 grant to continue the research they have previously conducted at Nachusa Grasslands. There is no limit on the number of grants an individual may receive as long as all prior awards are noted on the application and previous grant requirements have been met.

Friends of Nachusa Grasslands Liability Waiver:

- Friends of Nachusa Grasslands makes no warranties or representations, express or implied, and Researcher shall engage in activities at Nachusa Grasslands at their own risk.
- There are possible dangers that might be involved in the type of activities the Researcher will be participating in. The Researcher must not be aware of any problem or condition that could endanger others or themselves if the Researcher participates in activities at Nachusa Grasslands.
- Researcher, for themselves and their heirs, shall waive, release, indemnify, and hold harmless Friends of Nachusa Grasslands and its officers, board members, and general members from any and all claims, liabilities, losses, damages, and expenses incurred in connection with the activities of the Researcher and circumstances resulting from any injury to Researcher, or damage to the Researcher's property at Nachusa Grasslands.

COVID-19 Safety Protocols:

- The Nature Conservancy Nachusa Grasslands has established COVID-19 safety protocols that must be followed by all staff, volunteers, and researchers until further notice.
- In addition, a daily self-certification regarding COVID-19 symptoms must be completed before conducting any group work (with 2 or more individuals) in order to conduct contact tracing should the need arise.
- Updated guidelines will be provided to all researchers receiving awards from Friends.

Application Process Instructions: *Please follow these instructions carefully.*

1. Download the Friends of Nachusa Grasslands 2022 Scientific Research Grant Application form from the Friends of Nachusa Grasslands web page (<https://www.nachusagrasslands.org/science-grants-2022.html>).
2. Save the form to your desktop with the filename "Your Last Name, Friends of Nachusa Grasslands 2022 Scientific Research Grant".
3. Complete the application, tabbing between form fields.
4. Save the file as a Word document or a PDF.
5. Attach the file and your résumé or curriculum vitae to an e-mail, and send it to: nachusafriendsscience@gmail.com.
6. The subject of the email should be "2022 Scientific Research Grant" and your last name.
7. Please direct questions about the application process to nachusafriendsscience@gmail.com.
8. Incomplete applications will not be considered. However, a member of the Selection Committee may contact you or your references for clarification of a submission. Failure to respond to a request for information will result in rejection of your application.

Dates to Remember:

- Deadline for applications: November 30, 2021, by 5:00 p.m. CST. Applications received after this deadline will **not** be considered.
- Announcement of grant recipients: by February 1, 2022
- Grants must be used between February 1, 2022, and June 30, 2023 (unless a detailed multi-year proposal has been submitted and approved.)
- Written report of research findings during 2022 are due June 30, 2023.

Potential Research Topics at Nachusa Grasslands

The following is an evolving compilation of research questions pondered by stewards and staff at Nachusa Grasslands. Friends of Nachusa Grasslands would like to support scientific research that provides insight into the answers to these questions, but will not restrict its science grant awards to research endeavors that address only these specific questions. This list is meant to encourage researchers who are thinking of doing work at Nachusa to consider these and related research topics in their planning.

Resistance and resilience of the restored tallgrass prairie community to disturbance management (e.g. fire and/or grazing): For example,

1. How does fire frequency and grazing affect specific insect populations? Do unburned sites leave sufficient refuge for these insect species? We have inventories of a few groups of insects at Nachusa (dragonflies, bees, moths, butterflies, specialized orthopterans, mosquitoes, ground and dung beetles, ticks), but we need to know more about all of the insect populations present. What species are present, and how does management affect their populations? Regal fritillary

butterflies, for example, are abundant at Nachusa. How do prescribed burns impact this species? Are the eggs and/or larva surviving fires, or are larva only surviving in unburned units? How can we better manage, restore, and reconstruct prairie to promote diverse insect populations and a large abundance of these species?

2. How and why does the beaver population shift on the preserve, and what is their impact on Nachusa ecosystems over time?
3. How do the substrates of our wetlands and streams change over time as a function of beaver impact, flooding, and management decisions (tree and drain tile removal, fire, grazing)? What impact do these substrate changes have on aquatic flora and fauna populations? For example, increased silt levels in Clear Creek in recent years may have impacted damselfly populations. How can silt levels be reduced over time?
4. What effect is repeated fire and/or grazing having on the shrub and tree layers of Nachusa's savannas and woodlands?
5. How do biological, physical, and chemical soil characteristics change over time as a result of various management regimens in different habitats? Can these changes inform future management decisions?
6. Should bison wallows be over-seeded? Is there enough of a seed bank in wallows to recover? If not, what is the appropriate seed composition and weight for over-seeding? Or are wallows generally used over multiple years and should not be expected to revegetate during that time?
7. How does fire and grazing impact multiple plant and animal populations? Can we make better or more nuanced management decisions if we understand how plants and animals are interacting in response to disturbance? How do we approach management for whole ecosystem diversity and resilience?

Restoring habitat for rare and declining prairie, savanna, and aquatic species (including plants, animals, fungi, etc. For example,

1. What is the role of meso-predators on our turtle populations? Can we learn from DNA analysis of predator scat what their prey are?
2. Are there techniques other than DNA analysis of predator scat that can be used to study predator diet?
3. Is predator control of any kind warranted and/or productive in the effort to support endangered species populations?
4. We need better and more consistently acquired data on the health of our aquatic habitats (both streams and wetlands). What physical, chemical, and biological changes occur over time, and can these changes be correlated with restoration efforts?
5. Where do bison spend their time on the preserve? Does it vary seasonally? Does it vary by sex of the individuals? How closely related are their movements to vegetation and weather conditions?
6. Improving germination of *Comandra umbellata* is a goal of unit stewards. A recent study at Nachusa examined correlations between genetic diversity, stand characteristics, mycorrhizal communities, and soil characteristics. It found that genetic diversity across the preserve was isolated, and diversity within stands varied by phosphorus availability. Possible questions for research include: How does phosphorus availability impact flower and seed production? Could facilitated pollen transfer between identified genetic groups of *C. umbellata* produce greater numbers of seed and/or more consistently viable seed? Does seed recruitment depend on soil characteristics and/or density of *C. umbellata* stems?
7. We have ongoing random block studies looking at how and whether over-seeding a low diverse prairie can increase its diversity. Would someone like to adopt this ongoing study?
8. What's the best way to turn an old pasture full of brome grass and weeds into a biologically diverse native prairie? We have several pastures we are thinking about seeding. What's the best way to proceed? Round them up first? Use grass herbicide first? Seed directly into the brome?

9. We know some populations of native bees are using restorations. Are other remnant-dependent or endangered insect species using the restorations? How can we encourage persistence of these species in restorations?
10. Sandhill cranes are now nesting at Nachusa. What management strategies would attract and maintain a breeding population of bobolinks or prairie chickens? Or other less common faunal species? What needs to be done to increase the abundance of these species?
11. Flies can transmit disease in bison. What fly species do we have and are they vectors for these common diseases? How could we manage to break disease cycles with minimal impact on other native species?
12. Further studies to “find out what we have” at Nachusa may provide valuable management insight. For example, previously completed inventory studies on turtles have provided valuable information for timing prescribed fire in turtle habitat before turtles come out of their hibernaria. We have limited knowledge of Nachusa’s lichens, mosses, ferns, snails, and many other flora and fauna.

Impacts and management of exotic invasive species (both plant and non-plant). For example,

1. How do non-native invasive species (plant, insect, etc.) compete with native species? Both within and between trophic groups?
2. Specific questions about *Lotus corniculatus* (bird’s foot trefoil): How do available herbicides (eg. Garlon 3A, Transline, Crossbow, a basal bark mix) compare in actually killing the plant? What percentage of an individual plant needs to be treated to kill a plant? Do the roots of treated plants stay alive to overwinter and sprout again in the spring even if the plant is top-killed? What is the killing radius of specific herbicides; that is, what is their impact on nearby non-target species? How much of the root structure needs to be removed to make digging up plants an effective strategy?
3. How can *Trifolium pretense* (red clover), *Phalaris ardinacea* (reed canary grass), and *Melilotus* sp. (sweet clover) and other non-native invasive plants be eradicated or greatly reduced most effectively? Original and creative hypotheses welcome.
4. Does over-seeding lead to increased plant diversity and effectively push out unwanted species (invasive, non-native, and/or weedy natives)? Can species mixes be designed for highly resistant communities? Can fire and/or grazing regimes be modified to reduce non-native competition?
5. In a changing climate, which invasive species are expected to become more competitive with natives? Are there non-native invasive plants that could move into the region or may already be here that could become invasive? Which species should we be on guard for? How can the introduction of these species to the preserve be prevented?
6. What non-native animal species exist on the preserve? What impact do they have on native species populations? Can and should eradication be attempted?