Monitoring the success rates of prairie violet transplants at Glacier Creek Nature Preserve

PROJECT DESCRIPTION

The regal fritillary butterfly *(Argynnis idalia*) has been proposed as a threatened species under the Endangered Species Act (USFWS 2024). Prairie violets (*Viola pedatifida)* are the obligate host plant for regal fritillary caterpillars, which makes these plants crucial in conservation efforts for this butterfly (Debinski & Kelly 1998, McCullough et al. 2017, Sims 2017, McCullough et al. 2019).

UNO's Glacier Creek Preserve (GCP) contains prairie violets, but they are unevenly distributed, with several areas lacking them entirely. I sampled GCP in June 2025 to examine prairie violet distribution and found that most regions of the Preserve had very few prairie violets (Fig. 1). The regions that do not contain prairie violets are where prairie violets have not been transplanted, and **my goals with this project are to increase the number of prairie violets at GCP, learn how much watering after transplanting increases prairie violet survival, and establish a colony of prairie violets in the UNO Biology greenhouse for transplanting in future years**.

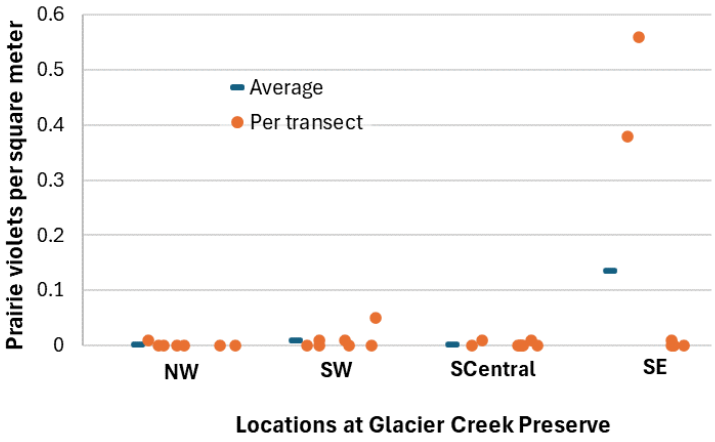

Figure 1. The number of prairie violets observed in different regions of GCP in June 2025.

More prairie violets could promote regal fritillary populations at GCP. Prairie violets do not grow well from seed, and transplanting seedlings grown from roots is a more effective method for establishing a secure population (Henderson et al. 2018, Steinauer 2024,). I propose to cultivate prairie violets at UNO's greenhouse and transplant them to GCP, with the goal of increasing the amount of suitable habitat for regal fritillaries.

METHODOLOGY

I will work with Sarah Bailey, the greenhouse director at Prairie Plains Resource Institute, to learn how to separate prairie violet roots from the plant and how to cultivate them in the greenhouse. I will transplant 100 seedlings to GCP in May of 2026 and will water half of the transplants in the field for four weeks to compare their survival with the transplants that aren't watered. All transplants will be watered when first planted, and the 50 that will be watered throughout the duration of the study will not be watered whenever 0.5cm of rainfall has not occurred within 72 hours of the last watering or rainfall. The transplant locations will be marked via GPS and flagging, and the survival of each transplant will be monitored weekly.

I will keep a population of prairie violets grown in the greenhouse that will not be transplanted to GCP, which will provide an opportunity for others to increase the greenhouse population to allow more transplanting in the future. This project will provide valuable information on prairie violet survival under different watering conditions, and it will provide proof of concept on how to grow prairie violets in the UNO greenhouse.

PROJECT TIMELINE

I am requesting a Summer 2026 funding timeline.

Fall 2025	Work with Prairie Plains Resource Institute to gather necessary materials to begin growing prairie violet seedlings in UNO Biology greenhouse.
Spring 2026	Grow and split prairie violet seedlings.
Summer 2026	Transplant all but 20 seedlings to GCP in May and continue growing and splitting prairie violet seedlings in the greenhouse. For seedlings that are transplanted to GCP, I will water half the transplants for 4 weeks and then analyze the percentage of transplants that have survived to mid-August.

STUDENT/FACULTY MENTOR ROLES

I will grow seedlings in the UNO greenhouse and transplant them to GCP, as well as watering and monitoring them in the field after transplanting. I will lead the analysis to determine how much transplant survival is increased by watering.

Dr. Timothy Dickson will assist with troubleshooting issues in growing seedlings in the greenhouse and transplanting them into the field. Dr. Dickson will help to analyze whether transplants survive differently when they are watered or not watered, and he will help make graphs and the poster that is presented at the Research and Creative Activity Fair.

PREVIOUS INTERNAL FUNDING

No previous internal funding received.

BUDGET

Budget item	Description	Cost
Prairie violet transplant starts	I will purchase 40 initial seedlings from Prairie Plains Resource Institute at $5 per seedling. I will then grow and split these seedlings to produce transplants for the field.	$200
Stipend	I will spend at least 120 hours growing prairie violet seedlings in the UNO Biology greenhouse and transplanting them into the field. I am budgeting this time at $15 per hour.	$1,800
Total		$2,000

January 5, 2026

To the Reviewers of Mose Kolobara's FUSE proposal,

I am writing a reference in full support of Mose Kolobara's project description for the UNO Fund for Undergraduate Scholarly Experience (FUSE). I first met Mose when she contacted me in September 2024 to inquire about volunteering on research projects with me. I asked her to work on entering data from a long-term survey of butterflies from UNO's Glacier Creek Preserve completed by Dr. Ted Burk, and she also expressed interest in going on a butterfly survey transect walk with Dr. Ted Burk and learning more about the conservation of butterflies. We discussed the project Mose has submitted and are now looking for funding to allow the completion of the project. Mose has a keen mind and a passion for conservation, and she will see this project through.

While I work primarily on plants, I have spent more and more time researching the interactions between plants and butterflies. For example, I have published on how grazing management affects milkweeds and monarch butterflies in the central USA (see publication list on website in signature), and I have been collaborating with Dr. Ted Burk from Creighton University to enter in his 25 years of data on butterfly abundance from nature preserves in the region. Dr. Burk is the preeminent expert on Lepidoptera in the Omaha region and will consult on the project. I am quite interested in the project that Mose is submitting, and I have a strong background in plant identification, experimental design, and statistics. I will help Mose through all steps of the project to make sure she collects good data and completes good analyses. Her project would also help the natural infrastructure of Glacier Creek Preserve and would be part of future teaching labs (e.g. Restoration Ecology – BIOL 4420 / 8426) and student research projects.

Mose is smart, motivated, and has good time management skills. She is in the top 5% of students I have interacted with, in terms of her intelligence combined with her motivation. I feel confident that she will complete a good project with the support around her, and I hope her project is given a close look.

Sincerely,

Timothy L. Dickson, Ph.D.

Associate Professor

REFERENCES

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USFWS. (2024). *USFWS Proposes ESA Protections for Both Subspecies of the Regal Fritillary Butterfly | U.S. Fish & Wildlife Service*. https://www.fws.gov/press-release/2024-08/usfws-proposes-esa-protections-both-subspecies-regal-fritillary-butterfly