



# Environment and Natural Resources Trust Fund

## 2022 Request for Proposal

### General Information

**Proposal ID:** 2022-061

**Proposal Title:** Seed collection of early-blooming plants for pollinators

### Project Manager Information

**Name:** Alan Ritchie

**Organization:** MN DNR - Ecological and Water Resources Division

**Office Telephone:** (651) 259-5074

**Email:** Alan.Ritchie@state.mn.us

### Project Basic Information

**Project Summary:** We will establish new populations of early-season flowers by hand harvesting and planting species that are currently lacking in prairie restorations and are essential to pollinator health.

**Funds Requested:** \$200,000

**Proposed Project Completion:** October 31 2025

**LCCMR Funding Category:** Small Projects (H)

**Secondary Category:** Methods to Protect, Restore, and Enhance Land, Water, and Habitat (F)

### Project Location

**What is the best scale for describing where your work will take place?**

Region(s): SW

**What is the best scale to describe the area impacted by your work?**

Region(s): SW

**When will the work impact occur?**

During the Project and In the Future

## Narrative

### **Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.**

Habitats need flowers blooming from spring through fall to effectively support pollinators. However, reaching this standard is a complex challenge for land managers, who must contend with plant availability and the propagation needs of dozens of plant species. Spring blooming, early-season flowers are among the hardest to restore, limiting their presence in restorations across the state.

Early-season flowers are expensive and have limited availability from native plant vendors due to their particular growing requirements and short harvest windows. Many also have specialized storage and germination needs that may limit seed viability and establishment success if improperly processed or if planted using traditional broadcast seeding methods. These issues make incorporation of early-season flowers into restorations a cost-ineffective and often unsuccessful endeavor for many land managers, to the detriment of pollinators, game, and non-game wildlife throughout Minnesota.

Identifying best restoration practices for early-season flowers in prairies would benefit some of Minnesota's most at-risk pollinator species: those that emerge in the early spring to harsh, variable weather and limited floral availability. Filling this early-season gap would also benefit overall prairie reconstruction effectiveness and resiliency by enhancing plant diversity.

### **What is your proposed solution to the problem or opportunity discussed above? i.e. What are you seeking funding to do? You will be asked to expand on this in Activities and Milestones.**

Early-season flowers essential for pollinators exist on DNR land, but occur in small, isolated patches. With support for harvesting seed, storage, and planting, these flowers will be strategically restored to maximize cost-effectiveness and create new sources of seed for DNR beyond the life of this project.

We propose a pilot project to hand-collect seed from 6-10 early-season flowers essential to early-emerging pollinators from DNR properties, focusing on species with known propagation success. We will germinate and grow out plants in greenhouses, and then install mature plants into priority prairie reconstructions for pollinators within DNR region 4. These plantings will then be harvested over subsequent years, increasing the availability of early-season flowers for other DNR restoration projects as appropriate.

Throughout this initial pilot we will record data on our harvest, germination, and planting methods and begin compiling existing scientific literature and expert knowledge on these topics. This information will help inform best practices and serve as the basis for a future early-season flower propagation guide and workshops for land managers working throughout Minnesota's prairie region.

### **What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?**

This project will have 3 major outcomes:

1. Enhances habitat for at-risk pollinators and other wildlife in a region of significant conservation need, including bumble bee queens, regal fritillaries, solitary bees, and other moths and butterflies.
2. Creates new seed sources of early-season flowers on DNR lands, providing additional capacity to test different planting approaches and identify best practices for restoring early-season flowers for pollinators to the landscape.
3. Begin identifying best practices for harvest, grow-out, and planting for future early-season planting guide and workshops for both DNR programs and prairie restoration community of practice.

## Activities and Milestones

### Activity 1: Early-season pollinator plant hand-harvest

**Activity Budget:** \$85,855

**Activity Description:**

A contractor will hand-harvest seed from ~ 8-12 species of early-season, pollinator supporting prairie plants across southwest Minnesota. Spring 2023 we will prioritize collection from easy to locate species known to produce large quantities of seed as well as several harder to collect species, either due to short stature or a narrow/early-season harvest window. For each species we will collect from as many source populations as possible. Spring 2024 and 2025 we will add to our effort by collecting seed from additional or rarer species, or new sources for those previously collected. Early-season plant seed often must be stored at cold temperatures to maintain viability. To address this a seed refrigerator will be purchased and kept at a regional WMA facility to provide proper storage for this and future projects region-wide.

We will create collection maps to aid in locating populations of plants, and will record seed availability post-harvest for planning future collections. When possible we will photograph harvestable plants, collect reference specimens, and compile harvest field notes and observations for a future early-season plant guide. We will coordinate with other managers to target recently burned areas with high seed harvest potential.

**Activity Milestones:**

Description	Completion Date
Collect from 5 species of early-season plant that produce large quantities of seed.	July 31 2023
Collect from 3 species with harder to collect seed or fewer known populations.	July 31 2023
Collect from 3 new species or new populations from previously collected species each subsequent year.	July 31 2025

### Activity 2: Plant grow out and installation to enhance early-season pollinator habitat

**Activity Budget:** \$64,854

**Activity Description:**

We will contract a native seed vendor to grow out ~6,000 plants from the seed hand-harvested in Activity 1. Collected early-season plant species that are critical to the life cycles of specific at-risk, threatened, or endangered pollinators, and with the greatest likelihood of germination and propagation success will be given highest priority; for example, prairie violets for regal fritillaries. Plants that are harder to germinate and propagate will be given secondary priority. For all species the contractor will collect detailed germination and propagation data to guide development and identification of best growing methods for a future early-season plant propagation reference manual.

After completion of grow out the contractor will install plants as dormant bare root stock into existing SW MN prairie reconstructions. Planting will occur once plants have entered winter dormancy to maximize establishment success, approximately October 2024 and 2025. Seed not used for propagation and plant installation will be stored by DNR staff and broadcast seeded onto future reconstructions where appropriate, or shared with prairie local technical teams. The October 2024 planting will be monitored the following spring to ensure adequate establishment.

**Activity Milestones:**

Description	Completion Date
Germinate, grow, and install 6,000 bare-root, plug plants from at least 6 early-season plant.	October 31 2024
Monitor establishment success of 2024 installations and adjust planting methods as necessary.	April 30 2025
Install 6,000 bare-root plants from 5 additional species and/or install in additional locations.	October 31 2025

### Activity 3: Early-season pollinator plant harvest coordination, field days, and outreach

**Activity Budget:** \$49,291

**Activity Description:**

Over the duration of this project we will share early-season plant harvest, propagation, and planting information and techniques identified in this project as well as through review of existing literature and consultation with subject matter experts. First, we will communicate our work plans and initial harvest results from year 1 to DNR prairie managers and partners within prairie local technical teams (LTTs) to receive feedback and coordinate on seed harvest and sharing opportunities across the work area. Final outcomes will also be reported to DNR managers and LTTs to identify next steps with this work and areas for expansion. Second, we will hold several workshops and/or field days to train DNR staff, private land managers, conservation organizations, university students, and other professionals on early-season pollinator plant identification, harvesting, and planting techniques to increase the community-of-practice's capacity for this work. Additional public outreach field days with both hands-on pollinator education and seed harvest may be hosted as well. Feedback from these coordination and outreach events will inform further development of an early-season plant propagation reference manual and other training materials.

**Activity Milestones:**

Description	Completion Date
Present preliminary harvest results to prairie plan local tech teams (prairie LTTs) for feedback.	January 31 2024
Present first year grow out and installation outcomes to prairie LTTs for feedback.	January 31 2025
Host early-season plant ID, harvest, and planting technique field day/workshop for practitioners	May 31 2025
Host early-season pollinator and plant seed harvest field day for public	June 30 2025
Project coordinator reviews collected data with managers to identify remaining knowledge gaps, next steps.	October 31 2025

## Long-Term Implementation and Funding

**Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this be funded?**

Results and data from this pilot project will identify how to efficiently and effectively incorporate more early-season flowers into DNR prairie restorations across its regions and programs. Our findings will be shared with our conservation partners and contractors to help alleviate some of the seed cost and availability issues we currently face, and inform future partnerships and projects to enhance our prairies for pollinators and other game and non-game wildlife. Additionally, the plantings and equipment purchased will increase our capacity to restore early-season plants by creating new, easier to access harvest populations and proper seed storage for DNR managers.

## Project Manager and Organization Qualifications

**Project Manager Name:** Alan Ritchie

**Job Title:** DNR Pollinator Conservation Coordinator

**Provide description of the project manager's qualifications to manage the proposed project.**

Alan Ritchie will lead the project coordination including assisting and directing the botanist and seed collection crew, communication and coordination with wildlife managers and greenhouse staff, and generating plant collection maps, species identification guides, and compiling germination, grow out, and survivorship data from plantings for early season planting guides for DNR managers. The project manager will be responsible for developing and implementing a work plan including achievable outcomes and tracking and reporting on project progress.

Alan has studied pollinators and their interactions with plants in prairie ecosystems for almost a decade. He holds an MSc in Entomology from U of MN, where he studied pollinators, native forbs, and pollination in tallgrass prairies on MN public and private lands. He has training and experience in bee community ecology, pollination, and prairie ecology. Throughout his research Alan has managed and coordinated field crews in projects involving native plant identification and seed collection, as well as bee and other pollinator collection. During his Master's Alan helped to implement and manage a successful LCCMR project involving bee conservation: "Data-Driven Pollinator Conservation Strategies". As the DNR's new pollinator conservation coordinator, Alan is using these experiences and his knowledge of pollinator ecology to identify and address challenges DNR managers face in conserving and restoring habitat for Minnesota's native pollinators on state administered lands.

Experience:

- B.S., Ecology, Evolution, and Behavior – University of Texas, 2013
- M.S., Entomology – University of Minnesota, Twin Cities 2016-2019

**Organization:** MN DNR - Ecological and Water Resources Division

**Organization Description:**

In addition to directly enhancing DNR habitat restoration efforts, the proposed project directly supports the following MNDNR goals and operational orders:

- Minnesota Prairie Conservation Plan: restores habitat within the prairie core and Wildlife Action Network.
- Goal 1 of DNR 10-Year Strategic Plan: restoration of prairies and grasslands
- The EWR 2018-2028 strategic plan: restoration and enhancement of DNR lands
- Goal 1, objective 1.1 of the MN wildlife action plan 2015-2025: restore nectar and pollen resources in Wildlife Action Network for SGCNs, e.g. prairie violet for regal fritillary (*Speyeria idalia*)
- Operational order 130 and DNR pollinator BMPs: restorations must include at least 3 flowering species within

each of the 3 blooming periods per year.

Additionally, this proposal supports Goal 1 of Governor Walz's 2019 pollinator executive order and the recommendations of the inter-agency pollinator protection team state pollinator report by seeking to increase native forb species richness on state managed lands.

## Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
<b>Personnel</b>								
Pollinator Conservation Coordinator		Project coordination including assisting and directing seed collection, work plan development and implementation, grant progress reporting, data management.			30%	1.5		\$82,500
							<b>Sub Total</b>	<b>\$82,500</b>
<b>Contracts and Services</b>								
Seed to Site LLC	Professional or Technical Service Contract	Seed harvest, voucher specimen collection for harvest guide, data collection on seed sources. Potentially plant propagation and related data collection depending on number of seeds collected.		X		1.5		\$36,000
TBD	Professional or Technical Service Contract	Two years of seed grow out in greenhouse, plug plant installation. Final cost dependent on seed amount and number plants successfully grown.				-		\$33,000
							<b>Sub Total</b>	<b>\$69,000</b>
<b>Equipment, Tools, and Supplies</b>								
	Tools and Supplies	Activity 1: Materials and equipment for seed harvest, cleaning, and drying, including a seed mill, seed drying rack, seed collection bags, and seed storage bags. Harvest data collection materials, including notebooks, plant presses, etc. Activity 2: supplies and materials for protecting maintaining plantings post-installation, including posts and signs, herbicide, etc. Activity 3: Outreach and field day materials and supplies, including signage, handouts, porta-potty rental, etc.	Project implementation					\$17,601
							<b>Sub Total</b>	<b>\$17,601</b>
<b>Capital Expenditures</b>								

		Seed refrigerator	Refrigerator will provide storage for hand-collected seed. Early-season plant seed often requires refrigeration to remain viable post-harvest.					\$8,000
							<b>Sub Total</b>	<b>\$8,000</b>
<b>Acquisitions and Stewardship</b>								
							<b>Sub Total</b>	-
<b>Travel In Minnesota</b>								
	Miles/ Meals/ Lodging	1 person, project coordinator; number of trips and mileage will vary dependent on harvest location and support needs, locations of presentations and field days.	Project coordinator will drive from DNR central office to region 4 to assist and direct project work, including hand-harvest, give presentations to regional staff and collaborators, and participate in field days					\$10,000
							<b>Sub Total</b>	<b>\$10,000</b>
<b>Travel Outside Minnesota</b>								
							<b>Sub Total</b>	-
<b>Printing and Publication</b>								
							<b>Sub Total</b>	-
<b>Other Expenses</b>								
		Direct and necessary costs	Direct and necessary costs to cover HR support (\$2,496), Safety Support (\$387), Financial Support (\$1,311), Communication Support (\$1,388), IT Support (\$5,311), and Planning Support (\$1,008).					\$12,899
							<b>Sub Total</b>	<b>\$12,899</b>



							<b>Grand Total</b>	<b>\$200,000</b>
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## Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
<b>Contracts and Services</b> - Seed to Site LLC	Professional or Technical Service Contract	Seed harvest, voucher specimen collection for harvest guide, data collection on seed sources. Potentially plant propagation and related data collection depending on number of seeds collected.	A single-source contract is required for this project because Seed to Site is a registered Targeted Group (TG) small business vendor local 1) geographically located within the proposed work area, and 2) possesses the highly specialized botanical knowledge necessary to carry out the proposed activities. Seed to Site is ensuring a competitive price for the contracted work by offering lower travel rates to and from seed harvest sites relative to metro-based ecological service vendors. <b>This is a single source contract.</b>

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
<b>State</b>				
			<b>State Sub Total</b>	-
<b>Non-State</b>				
			<b>Non State Sub Total</b>	-
			<b>Funds Total</b>	-

## Attachments

### Required Attachments

*Visual Component*

File: [3156b4db-888.pdf](#)

*Alternate Text for Visual Component*

Diagram outlining project problem and proposed solution activities: harvest, grow out, and outreach...

### Administrative Use

**Does your project include restoration or acquisition of land rights?**

No

**Does your project have potential for royalties, copyrights, patents, or sale of products and assets?**

No

**Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?**

N/A

**Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF?**

N/A

**Does your project include original, hypothesis-driven research?**

No

**Does the organization have a fiscal agent for this project?**

No

# Seed collection of early-blooming plants for pollinators



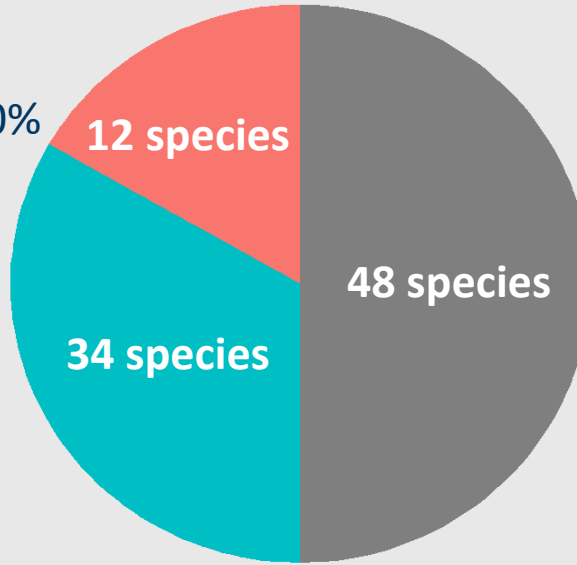
Prairie violet (*Viola pedatifida*), an early plant with poor commercial availability



The at-risk Regal fritillary (*Argynnis idalia*) requires violets to complete its life cycle

## Problem:

Approximately 50% of early-season prairie plants are **not available** commercially for restorations.



Not Available

Available

Limited Availability

## Proposed solution:

### Activity 1: Early Plant Harvest



Hand-harvest early plants for at-risk pollinators

### Activity 2: Plant Grow Out



Grow and install plants into pollinator habitat restorations

### Activity 3: Coordination & Outreach



Use findings from Activities 1 & 2 to coordinate with partners and educate other professionals

