Environment and Natural Resources Trust Fund

2021 Request for Proposal

General Information

Proposal ID: 2021-407

Proposal Title: Tools for Supporting Healthy Ecosystems and Pollinators

Project Manager Information

Name: Jessica Petersen

Organization: MN DNR - Ecological and Water Resources Division

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Project Basic Information

Project Summary: Create a pollination companion guide to MNDNR's Field Guides to Native Plant Communities for conservation practitioners to better integrate plant-pollinator interactions into natural resource planning and decision-making.

Funds Requested: $198,000

Proposed Project Completion: 2024-06-30

LCCMR Funding Category: Small Projects (H)

Secondary Category: Foundational Natural Resource Data and Information (A)

Project Location

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

Statewide

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

Statewide

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.

In light of recent concern over pollinator declines, Minnesotans are eager to support pollinators. There is no off-the-shelf reference in Minnesota that provides information on the interdependent relationships between native plant species and pollinator communities.

Just like the Monarch butterfly needs milkweed to survive, many other pollinators need specific plants to complete their lifecycle. Similarly, many plants need specific pollinators to survive because without them the plants cannot reproduce. The details of the relationships between plants and pollinators are known only by a few subject matter experts, or the information is buried in the scientific literature and biological collections. Providing resources for Minnesotans about what plant species pollinators need to complete their lifecycle, and what plants need from pollinators to reproduce will allow conservation practitioners to make more informed decisions about how to protect pollinators and plant communities.

Existing efforts to protect, enhance, and restore pollinator habitat rely on ad hoc review of the literature and consulting experts. Information gaps in plant-pollinator interdependence result in challenges with decision-making across a variety of sectors including sourcing diverse seed for prairie restorations, understanding plant community fragility in the face of pollinator declines, and the ability of plant communities.

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.

The Field Guides to Native Plant Communities were established by the MNDNR and used widely in the conservation community as a standard for describing plant communities. These guides will form the foundation upon which we will build informational tools to support pollinators. The tools will provide insight into the degree to which plant communities may become fragile in the face of pollinator declines. Data will be compiled from the literature, plant specimens housed at the Bell Museum and other collections, and experts.

Through this project, the conservation community can better support both rare and declining pollinators and plant communities in Minnesota. By highlighting the plant and pollinator communities that may be vulnerable to loss of ecosystem function, we can focus conservation efforts of these fragile relationships more efficiently.

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?

The compiled data will be translated into two user-friendly tools:

1. A companion pollination handbook for the native plant community field guides (Pollination Field Guide). This resource is targeted at better understanding the plant community reliance on pollinators for reproduction.
2. A plant selection tool for building and enhancing more resilient restorations and native plant communities that support pollinators. This resource will allow practitioners to more efficiently conserve rare pollinator species by providing the plant resources they depend on to complete their lifecycle.

Activities and Milestones

Activity 1: Pollinator and plant community tools and outreach

Activity Budget: $198,000

Activity Description:

We propose to add pollinator and pollination related attributes to an existing Minnesota Department of Natural Resources plant database. These data will then be compiled into products that will help Minnesotans make more informed decisions about how best to support pollinators and build healthy plant communities. The pollination handbook and plant selection tool for restorations and enhancements will be rolled out via outreach events for practitioners.

Activity Milestones:

Description	Completion Date
Enhance the DNR's plant database to include with attributes related to pollinators and pollination	2022-06-30
Develop and deploy outreach events to roll out the pollinator resources for end users.	2023-06-30
Produce the two tools described above for Minnesotans to better support pollinators and plant communities.	2023-06-30

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Dr. Dan Cariveau	University of Minnesota	Advisory capacity to help guide the creation of the pollination database.	No

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?
This timeframe will produce a product that will stand alone. Ongoing improvements to the products and ongoing dissemination of the products will be achieved through standard DNR operating budgets and staffing.

Project Manager and Organization Qualifications

Project Manager Name: Jessica Petersen

Job Title: Invertebrate Ecologist - Research Scientist 2

Provide description of the project manager's qualifications to manage the proposed project.
Jessica Petersen will lead the project coordination including assisting the ecologist, data manager, and information officer in designing plant attributes related to pollinators, developing products, and delivering content to conservation practitioners. The project manager will be responsible for developing and implementing a work plan including achievable outcomes and tracking and reporting on project progress.

Dr. Petersen has been employed by the DNR for almost 4 years, and with the Minnesota Biological Survey for the past 2 years. During this time she has managed teams of scientists, delivered scientific content to practitioners by hosting webinars, podcasts, and written content. Jessica has helped to manage several successful LCCMR projects involving bee and butterfly conservation. She has training and experience conducting scientific research in such topics as bee and butterfly community ecology, plant-insect interaction, pollination, and prairie ecology that have resulted in 14 co-authored scientific publications, 12 invited presentations, and 14 extension and outreach publications. Dr. Petersen has taught 6 undergraduate biology courses including topics such as Geographic Information Systems (GIS), entomology, and critical thinking.
Experience:

- B.S. – University of Iowa, 2002
- M.S., Ecology and Evolutionary Biology – Iowa State University, Iowa 2003-2005
- Ph.D, Entomology, Minor – Statistics – Iowa State University, Iowa 2005-2010
- Post-doctoral Research – Cornell University, New York 2010-2014
- Adjunct Professor – Roanoke College, Virginia 2014-2016

Organization: MN DNR - Ecological and Water Resources Division

Organization Description:
The proposed project directly supports the following goals outlined by the MNDNR:

- 10-year Strategic Conservation Agenda, Goal 1, Minnesota's waters, natural lands, and diverse fish and wildlife habitats are conserved and enhanced.
- Goal 1 of Minnesota's Wildlife Action Plan: Ensure the long-term health and viability of Minnesota's wildlife, with a focus on species that are rare, declining, or vulnerable to decline.

Additionally, this work will support the numerous habitat restoration efforts by the MNDNR across all divisions in supporting pollinators.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	$ Amount
Personnel								
Ecologist		Specialist dedicated to compiling data from multiple sources into a database and translating the results into pollinator products.			32%	1.5		$104,842
Data manager		Assists with data management and incorporating new data into existing database structure			32%	0.1		$10,000
Information outreach specialist		Assists with delivering outreach materials and updating website content			32%	0.1		$14,000
Research Scientist 2 - Invertebrate Ecologist		Project lead devoted to maintaining ecological integrity of pollinator-related information. Responsible for developing and implementing a work plan including achievable outcomes and tracking and reporting on project progress.			32%	0.4		$48,000
							Sub Total	**$176,842**
Contracts and Services								
							Sub Total	**-**
Equipment, Tools, and Supplies								
							Sub Total	**-**
Capital Expenditures								
							Sub Total	**-**
Acquisitions and Stewardship								
							Sub Total	**-**
Travel In Minnesota								

	Miles/ Meals/ Lodging	Travel	Travel in-state to libraries, herbaria, insect collections, meetings with subject matter experts and to deliver content.					$5,000
							Sub Total	**$5,000**
Travel Outside Minnesota								
							Sub Total	**-**
Printing and Publication								
							Sub Total	**-**
Other Expenses								
		Direct and necessary costs	Direct and necessary costs to cover HR support ($3,218), Safety Support ($582), Financial Support ($2,175), Communication Support ($1,388), IT Support ($7,655), and Planning Support ($1,138).					$16,158
							Sub Total	**$16,158**
							Grand Total	**$198,000**

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
In-Kind	Heritage Enhancement	For subject matter expertise	Pending	$12,000
In-Kind	General Fund	For project supervision, subject matter expertise	Pending	$12,000
			State Sub Total	**$24,000**
Non-State				
			Non State Sub Total	**-**
			Funds Total	**$24,000**

Attachments

Required Attachments

Visual Component

File: cc7428fc-eb8.pdf

Alternate Text for Visual Component

Example of a table listing plants and attributes related to pollinators. Outcomes include a pie chart showing plant community dependence on pollinators and pollinators benefiting
from host plants.

Administrative Use

Does your project include restoration or acquisition of land rights?

No

Does your project have patent, royalties, or revenue potential?

No

Does your project include research?

No

Does the organization have a fiscal agent for this project?

No

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND

Tools for Supporting Healthy Ecosystems and Pollinators

Building and enhancing more resilient native plant communities by supplying guides for plant-and-pollinator selection.

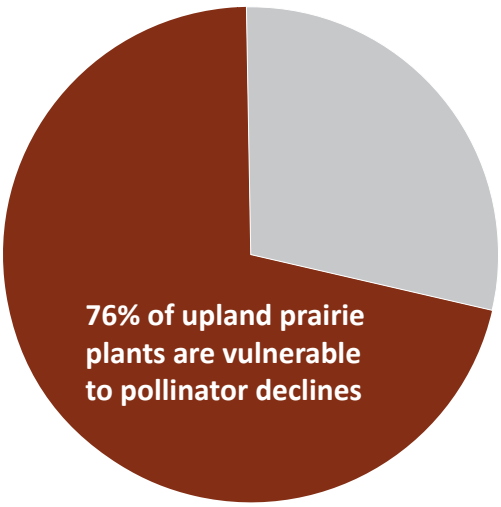
Need: Better resources for conservation practitioners to support declining pollinator populations and improve their habitat.

Solution: Pollination companion guide to the MNDNR Field Guides to Native Plant Communities detailing exactly what plants pollinators need and how much plants benefit from pollinators

Forbs	species frequency in NPC (%)	species cover (when present)	animal pollination?	pollinator nest value	blooming period	Pollinator Host	breeding system	plant lifespan	flower structure	clonality	nectar production
Purple prairie clover (*Dalea purpurea*)	78	•	✔		Mid		self-compatible	perennial	spike	non-clonal	yes
Harebell (*Campanula rotundifolia*)	78	•	✔		Mid						
Alumroot (*Heuchera richardsonii*)	76	•	✔		Mid-Late						
Prairie loosestrife (*Lysimachia quadriflora*)	74	•	✔		Mid						
Violets (*Viola* spp)	69	••	✔		Mid-Late						

This project will supply information for these areas

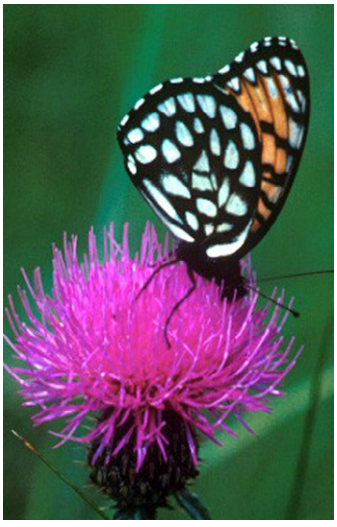
Assessment of the native plant community dependence on pollinators for survival.



DEPARTMENT OF NATURAL RESOURCES

Conservation of pollinators through targeted restoration and enhancements that provide the exact plants pollinators need.

A male *Tetraloniella albata* (a species of long-horned bee) visits a purple prairie clover (*Dalea purpurea*) flower.



A regal fritillary (*Speyeria idalia*). The larvae of this rare prairie butterfly feed solely on violets (*Viola* species).