Environment and Natural Resources Trust Fund

2027 Request for Proposal

General Information

Proposal ID: 2027-301

Proposal Title: Sustaining Prairie Investments: Disturbance Guidance for Restored Grasslands

Project Manager Information

Name: Brittany Smith

Organization: Monarch Joint Venture

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Project Basic Information

Project Summary: Minnesota's restored prairies need active disturbance management to sustain habitat value, yet managers lack guidance. This project delivers evidence-based recommendations protecting monarchs, pollinators, grassland wildlife, and prior public investments.

ENRTF Funds Requested: $525,000

Proposed Project Completion: June 30, 2030

LCCMR Funding Category: Fish and Wildlife (D)

Project Location

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

Region(s): Central

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

Statewide

When will the work impact occur?

In the Future

Narrative

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

Minnesota has made substantial public investments through ENRTF, OHF, and other state and federal programs to restore prairie habitat across public and private lands. These reconstructed prairies are intended to provide long-term habitat for monarchs, pollinators, grassland birds, and other wildlife. However, funding has emphasized site acquisition and establishment, with far less attention directed toward long-term management required to sustain ecological function.

Prairie restorations are not self-sustaining. Without periodic disturbance such as fire, grazing, or mechanical treatment, plant diversity, milkweed abundance, nectar resources, and vegetation structure decline, reducing habitat value. After establishment, reconstructed prairies face decline without active management, yet decision-makers lack Minnesota-specific evidence to determine when intervention is needed and which disturbance strategies are most effective.

While disturbance ecology is well studied in remnant prairies, far less is known about how reconstructed prairies respond to disturbance history across a regional portfolio of publicly funded projects. This gap limits the ability of agencies and partners to prioritize management actions, allocate scarce stewardship resources, and justify ongoing investment in restoration maintenance.

Without evidence-based guidance linking disturbance management to ecological outcomes, Minnesota risks the gradual degradation of its restored prairies and the wildlife habitat value they were designed to deliver.

What is your proposed solution to the problem or opportunity discussed above? Introduce us to the work you are seeking funding to do. You will be asked to expand on this proposed solution in Activities & Milestones.

In collaboration with the U.S. Fish and Wildlife Service, Ducks Unlimited, and the Minnesota Land Trust, this project will evaluate 70–80 reconstructed prairie sites in central Minnesota. Sites will be selected using a stratified design representing dominant disturbance types (fire, grazing, and mechanical) across a gradient of time since disturbance.

Standardized vegetation surveys, pollinator resource monitoring, and drone-derived structural metrics will quantify key habitat indicators including floristic quality, milkweed abundance, nectar resources, invasive species pressure, and vegetation structure. These data will be paired with site disturbance histories to evaluate how habitat condition responds to disturbance type and timing.

Statistical analyses will identify disturbance intervals and thresholds associated with declines or sustained habitat function, producing the first Minnesota-specific, multi-site evaluation of long-term prairie restoration performance.

Results will be translated into a disturbance management guide providing clear, evidence-based recommendations on disturbance type and frequency. This guidance will enable agencies and partners to prioritize management actions, allocate scarce stewardship resources more effectively, and protect the substantial public investments already made in Minnesota's prairie restorations.

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 produce actionable science linking disturbance management to ecological outcomes in reconstructed prairies.
Specific outcomes include:
(1) quantitative models describing how key habitat indicators respond to disturbance type and time since disturbance;
(2) identification of disturbance intervals and thresholds indicating when management is needed to prevent decline;
(3) a Prairie Restoration Disturbance Management Guide with evidence-based recommendations on disturbance type,

frequency, and prioritization;
(4) a technical report and manuscript drafted for peer review evaluating restoration performance across a regional portfolio; and
(5) dissemination to agencies, conservation partners, and policymakers to support more effective stewardship of Minnesota's prairie restoration

Activities and Milestones

Activity 1: Site Selection, Management History Compilation, and Finalization of Monitoring Protocol Selection

Activity Budget: $167,000

Activity Description:
Objective: Generate a standardized ecological dataset across reconstructed prairie restorations spanning a gradient of time since disturbance.
Tasks: Identify 70-80 reconstructed prairie sites within central MN; Confirm access and coordinate site selection with conservation partners; Compile and standardize management histories including fire, grazing, and mechanical treatments; Classify sites by dominant disturbance type and time-since-disturbance interval; Begin developing analytical database and site metadata structure.
Approach: Management records will be compiled from partner datasets and standardized within a spatial database to support consistent integration of ecological monitoring data and management histories across restoration sites. Disturbance histories will be standardized into a consistent dataset describing disturbance type, timing, and frequency. Sites will then be classified by their primary disturbance category and selected to ensure representation across restoration ages and disturbance intervals.
Outputs: Georeferenced site database (70-80 prairie restorations); Standardized disturbance history dataset
Impact and Use: These datasets establish the analytical foundation for evaluating relationships between disturbance history and habitat condition across reconstructed prairie restorations.
Evaluation: Completion will be assessed by finalizing the site list, achieving ≥90% completeness of disturbance history records, and producing a QA/QC-reviewed disturbance history database ready for field sampling in Year 2.

Activity Milestones:

Description	Approximate Completion Date
Candidate site list created in coordination with partners	October 31, 2027
Site screening criteria applied and disturbance history review completed	December 31, 2027
Final list of sites selected and access confirmed	January 31, 2028
Standardized disturbance history database completed for all selected sites	March 31, 2028
Field season preparation completed (site logistics, sampling protocols finalized)	April 30, 2028

Activity 2: Field Evaluation of Prairie Restorations Across Disturbance Type and Timing

Activity Budget: $260,000

Activity Description:
Objective: Collect standardized ecological data across 70-80 reconstructed prairie sites and integrate these data with disturbance histories to evaluate relationships between disturbance type, timing, and habitat condition.
Tasks: Conduct vegetation surveys using LCCMR's timed-meander protocol; implement IMMP monitoring for milkweed density and nectar resources; conduct pollinator observational transects; collect drone imagery for vegetation structure; and integrate ecological datasets with disturbance histories.
Approach: Year 2 includes the primary field sampling season and development of the analytical dataset. All sites will be sampled during Summer 2028 in a single coordinated field season to minimize inter-annual weather and phenological variability. Field sampling will occur over 14 weeks by two crews of two seasonal technicians. The project PI and two Fergus Falls–based field biologists will coordinate field logistics, provide additional sampling capacity, and oversee data quality.
Outputs: Standardized ecological dataset describing vegetation composition, pollinator resources, and vegetation

structure across 70-80 sites; Integrated ecological and disturbance history database supporting spatial analysis of prairie restoration performance
Impact and Use: Results will support statistical modeling and development of disturbance-specific maintenance guidance for prairie restoration stewardship.
Evaluation: Completion will be assessed by sampling 70-80 sites and producing a QA/QC-reviewed integrated dataset ready for analysis.

Activity Milestones:

Description	Approximate Completion Date
Field crews hired, trained, and deployed; field season initiated	May 31, 2028
35-40 sites (~50%) sampled and data entered	July 31, 2028
All sites sampled and data entered; field season completed	September 30, 2028
Field datasets QA/QC reviewed and finalized	November 30, 2028
Integrated ecological–disturbance dataset completed and ready for analysis	December 31, 2028

Activity 3: Statistical Analysis and Development of Prairie Restoration Disturbance Maintenance Guidance

Activity Budget: $98,000

Activity Description:
Objective: Evaluate relationships between disturbance history and habitat condition and develop science-based disturbance management guidance for prairie restoration stewardship.
Tasks: Conduct statistical analyses of ecological and disturbance datasets; Evaluate relationships between disturbance type, timing, and habitat condition; Identify disturbance intervals associated with sustained habitat function; Develop Prairie Restoration Disturbance Management Guide for land managers; Prepare technical report and peer-reviewed manuscript; Disseminate findings to agency partners and policymakers
Approach: Statistical models will evaluate how habitat indicators respond to disturbance type and time since disturbance. Results will be synthesized into management-relevant disturbance interval recommendations and incorporated into guidance developed with agency partners to ensure applicability to restoration portfolios across Minnesota.
Outputs: Statistical models linking disturbance history to habitat condition; Prairie Restoration Disturbance Management Guide document; Technical report and peer-reviewed manuscript; Partner presentations and legislative summary
Impact and Use: Guidance will inform stewardship planning for prairie restorations, helping land managers prioritize disturbance actions that sustain habitat condition and protect the ecological value of public restoration investments.
Evaluation: Completion will be assessed through finalized statistical models, publication of the guidance document, submission of a peer-reviewed manuscript, and documented dissemination to agency partners.

Activity Milestones:

Description	Approximate Completion Date
Integrated ecological–disturbance dataset prepared and initial statistical modeling initiated	March 31, 2029
Preliminary models evaluating disturbance type and interval effects completed	September 30, 2029
Disturbance regime relationships synthesized and management implications identified	December 31, 2029
Draft Prairie Restoration Disturbance Management Guide completed and circulated to partners for review	March 31, 2030
Final Prairie Restoration Disturbance Management Guide published; manuscript prepared for submission; final report complete	June 30, 2030

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Neil Powers	USFWS	Fergus Falls WMD Project Leader	No
Emmy Kenow	Minnesota Land Trust	Restoration Program Manager	No
John Lindstrom	Ducks Unlimited	Manager of Conservation Programs	No
Ryan Diener	Ducks Unlimited	Grazing and Grasslands Program Coordinator	No

Dissemination

Describe your plans for dissemination, presentation, documentation, or sharing of data, results, samples, physical collections, and other products and how they will follow ENRTF Acknowledgement Requirements and Guidelines.
Project results will be disseminated to ensure direct application to prairie restoration and management in Minnesota. Engagement with partners including the U.S. Fish and Wildlife Service, Ducks Unlimited, Minnesota Land Trust, and other conservation practitioners will occur throughout the project to support awareness and use of results.

Primary outputs will include a Prairie Restoration Disturbance Management Guide and technical report summarizing relationships between disturbance type, timing, and habitat condition. These materials will be distributed to state and federal agencies, conservation organizations, and private land managers to inform stewardship planning and prioritization of management actions.

Findings will be presented through partner briefings, practitioner-focused webinars, and conference presentations to promote adoption of disturbance-based management approaches. A peer-reviewed manuscript will ensure broader scientific dissemination.

Project datasets and associated documentation will be maintained in standardized formats to support future use and integration with ongoing monitoring efforts, including compatibility with existing programs such as the Integrated Monarch Monitoring Program (IMMP). IMMP data are freely provided to researchers upon request, resulting in ~12 requests and 2-3 publications annually.

Results will be communicated to the public through accessible summaries and outreach materials highlighting the value of prairie restoration and stewardship supported by the Environment and Natural Resources Trust Fund. All project communications will acknowledge ENRTF support in accordance with program guidelines.

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 work be funded?
Project findings will be implemented through development and dissemination of a Prairie Restoration Disturbance Management Guide for state and federal agencies, conservation organizations, and private land managers. Results will support adaptive stewardship and prioritization of disturbance-based management within existing restoration programs. The project will also establish a standardized framework linking ecological monitoring with restoration management histories to support future spatial decision-support tools. MJV will integrate this framework into the national Integrated

Monarch Monitoring Program workflows to improve GIS-based management tracking and integration with the IMMP database. No additional ENRTF funding will be required.

Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Remote Sensing for Pollinator Habitat	M.L. 2024, , Chp. 83, Art. , Sec. 2, Subd. 03x	$180,000

Project Manager and Organization Qualifications

Project Manager Name: Brittany Smith

Job Title: Senior Habitat Program Manager

Provide description of the project manager's qualifications to manage the proposed project.
The Project Manager serves as Senior Habitat Program Manager with the Monarch Joint Venture (MJV), where she leads the organization's Habitat Program and works with partners to improve habitat outcomes for monarchs, pollinators, and grassland wildlife. Her work focuses on applying science to real-world management challenges and ensuring that conservation efforts translate into measurable improvements on the ground.

She has extensive experience working directly with federal and state agencies, conservation organizations, and private land managers to design and implement habitat projects across the Midwest, including in Minnesota. This includes coordinating multi-partner efforts, supporting restoration and management planning, and integrating monitoring data to inform adaptive stewardship.

Her background includes field-based conservation and restoration work with USDA–NRCS and Pheasants Forever and Quail Forever, providing a strong foundation in prairie and working lands management. She has led and supported habitat monitoring efforts, including vegetation and pollinator surveys, and regularly works with partners to interpret results and translate them into practical management decisions.

As a program manager, she oversees staff, project implementation, budgets, and timelines, and has experience delivering complex, multi-year projects in collaboration with diverse partners. Her work emphasizes producing usable information and getting it into the hands of practitioners to improve management outcomes.

This applied experience and focus on implementation position her to successfully lead this project and deliver guidance that supports effective, on-the-ground prairie restoration management in Minnesota.

Organization: Monarch Joint Venture

Organization Description:
The Monarch Joint Venture (MJV) is a national conservation nonprofit dedicated to protecting monarch butterflies and their migration through habitat conservation, applied science, education, and partnership. Founded in 2008 and operating as an independent 501(c)(3) since 2018, MJV coordinates more than 135 federal and state agencies, non-governmental organizations, and academic programs working across the monarch's migratory range.

MJV's science program advances conservation through applied research, habitat monitoring, and technological innovation, including remote sensing and drone-based assessments, and coordinates the Integrated Monarch Monitoring Program — a continent-wide standardized framework for evaluating habitat condition and pollinator use across restoration and management contexts. MJV's habitat program provides technical assistance to land managers

and conservation practitioners to establish and maintain high-quality pollinator habitat across a range of land ownership types.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	$ Amount
Personnel								
Sr. Habitat Program Manager		Project Manager; Leads overall project implementation, including partner coordination, site selection, and oversight of field sampling and analysis. Responsible for ensuring integration across project components and for translating results into management guidance and final deliverables.			26%	0.45		$45,000
Habitat Restoration Specialists (Fergus Falls)		Habitat Restoration Specialists (Fergus Falls-based, 2 existing staff. 0.3FTE/year total) Provide local project support including site selection, access coordination, and field sampling across prairie restoration sites. Lead implementation of field protocols, technician training, and data quality control to ensure consistent and accurate data collection. Contribute applied expertise in restoration management and disturbance history to support interpretation of results and development of practical, management-relevant guidance.			26%	0.9		$68,000
Geospatial Data and Modeling Analyst		Leads development of the project's integrated analytical framework by compiling, standardizing, and linking multi-source disturbance histories with ecological monitoring and drone-derived datasets across 70–80 prairie sites. Designs and manages the geospatial database and QA/QC workflows required to ensure consistent, defensible cross-site comparisons. This position is responsible for integrating field, spatial, and management datasets into a single analysis-ready structure and supporting statistical modeling of relationships between disturbance type, timing, and habitat condition. The analyst will develop reproducible workflows and spatial analysis tools that enable identification of disturbance thresholds and translation of results into management guidance. This role is essential to producing the project's core deliverables, including the integrated ecological–			26%	1.5		$144,000

		disturbance dataset, statistical models, and Prairie Restoration Disturbance Management Guide.						
Sr. Science Program Manager		Provides scientific oversight of study design, analytical approach, and interpretation to ensure results are rigorous, defensible, and appropriate for informing management decisions. Advises on model structure and evaluation in coordination with the Data and Modeling Analyst and supports synthesis of results into the management guide and manuscript.			26%	0.3		$29,300
Field Technicians (Seasonal)		Four seasonal technicians will conduct vegetation and habitat sampling as two-person crews to ensure safety and efficient data collection across sites. Technicians will implement standardized monitoring protocols and operate semi-independently following training and established field procedures. Project staff will provide coordination, training, and ongoing data quality review to ensure consistency across sites.			26%	1.44		$84,000
Science Coordinator		Drone-based monitoring support; training support; data interpretation; reporting; manuscript support. This effort may be distributed across the Science Coordinator and supporting MJV science technical staff, providing additional capacity for specialized tasks such as drone-based monitoring and training.			26%	0.75		$56,700
							Sub Total	**$427,000**
Contracts and Services								
Intertidalist	Service Contract	Service contract to support integration of project data with the Integrated Monarch Monitoring Program (IMMP) database, including data formatting, database alignment, and transfer. This work ensures compatibility with established monitoring standards and complements, but does not duplicate, internal data management and analysis conducted by project staff.				0.15		$34,000
Simple Business Automations	Service Contract	Contract with Simple Business Automations (Polli) for drone image processing, producing orthomosaics and spatial datasets to support habitat analysis.				0		$19,100
							Sub Total	**$53,100**

Equipment, Tools, and Supplies								
	Equipment	Field equipment including quadrat frames, measuring tapes, hand lenses, compasses, clipboards, hand tally counters, stopwatches, field identification guides, and related gear for vegetation and habitat sampling	Supports standardized vegetation and habitat monitoring across sites, enabling consistent measurement of plant composition, structure, and ecological condition.					$800
	Tools and Supplies	Field safety supplies - first aid kits, personal protective equipment, and field safety materials	Ensures safe field operations across remote and geographically dispersed sites during multi-season data collection.					$500
	Tools and Supplies	Field sampling supplies - Consumable field materials including flagging, stakes, waterproof notebooks, sample bags, labels, and related items	Supports repeated site visits and standardized data collection by providing materials needed to mark plots, record observations, and manage field samples.					$400
	Equipment	Data storage and drone replacement parts (propellers) - replacement propellers, charging support, SD cards, and external hard drives for UAV operation and data storage	Supports continued UAV operation and secure storage and backup of imagery and derived data products collected during field sampling.					$500
	Tools and Supplies	Field data processing and statistical analysis software and storage resources	Software and storage resources for processing and managing ecological and spatial datasets.					$4,300
							Sub Total	**$6,500**
Capital Equipment								
		Unmanned Aerial Vehicle (UAV) system and accessories (1 unit), including batteries, charging equipment, and transport case	Supports standardized collection of high-resolution vegetation structure data across sites, enabling consistent measurement of habitat characteristics related to disturbance, pollinator resources, and grassland wildlife habitat.	X				$15,500
							Sub Total	**$15,500**
Acquisitions and Stewardship								
							Sub Total	**-**

Travel In Minnesota								
	Miles/ Meals/ Lodging	Field travel for two 2-person crews sampling ~80 sites across west-central Minnesota; estimated ~12,000 miles at current IRS mileage rate and lodging for 2 crews for ~40 nights at reasonable state rates. Per diem costs will be covered by MJV as in-kind match.	Supports field data collection across geographically distributed prairie restoration sites, enabling completion of standardized vegetation, pollinator, and drone-based monitoring.					$18,400
	Conference Registration Miles/ Meals/ Lodging	In-state travel for 2 project staff to attend 3–4 Minnesota-based conferences/meetings (e.g., ecological or natural resource management conferences); includes mileage (~300 miles/trip at IRS rate), lodging (2 nights per event at reasonable state rates), and meals for 2 staff for ~3 days per event in accordance with State of Minnesota reimbursement limits	Supports dissemination of project findings, coordination with agency and conservation partners, and integration of project results into ongoing prairie restoration and management programs.					$3,000
							Sub Total	**$21,400**
Travel Outside Minnesota								
							Sub Total	**-**
Printing and Publication								
	Printing	Printing of Prairie Restoration Disturbance Management Guide; ~100 copies; ~15–20 pages; field-ready format	Production of concise, field-usable management guidance summarizing project findings for application by agencies and land managers					$1,340
	Printing	Printing of field datasheets for vegetation and habitat monitoring; double-sided, ~400 pages total; $0.40/page	Backup data collection materials to ensure continuity of field data collection when electronic systems are unavailable					$160
							Sub Total	**$1,500**
Other Expenses								
							Sub Total	**-**
							Grand Total	**$525,000**

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
Capital Equipment		Unmanned Aerial Vehicle (UAV) system and accessories (1 unit), including batteries, charging equipment, and transport case	The UAV equipment is necessary to support standardized collection of vegetation structure data across approximately 80 prairie restoration sites. These data are required to quantify habitat condition and evaluate relationships between disturbance and ecological outcomes. The equipment will be used specifically for project field sampling and data collection and is not a general-purpose purchase. No existing equipment is available that meets project needs for consistent, repeatable data collection across the full set of sites. **Additional Explanation :** Equipment purchased through this project will be used to support ongoing prairie monitoring and evaluation efforts conducted by MJV and partner agencies beyond the project period. UAV equipment will enable continued collection of standardized vegetation structure data to assess habitat condition and inform adaptive management across prairie restoration portfolios. The equipment will remain in use for conservation monitoring, supporting future projects and expanding application of project methods statewide. This continued use will maximize the long-term value of the investment and support sustained evaluation of publicly funded prairie restorations.

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
			State Sub Total	**-**
Non-State				
In-Kind	MJV Unrestricted Contributions	Per diem coverage for 4 field techs for duration of survey work (~50 days each, 200 total)	Secured	$8,600
			Non State Sub Total	**$8,600**
			Funds Total	**$8,600**

Total Project Cost: $533,600

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component

File: 86a32550-f25.pdf

Alternate Text for Visual Component

Visual showing prairie condition declining over time without disturbance, illustrated by photos and a graph. Text highlights that without fire, grazing, or mechanical treatment, plant diversity decreases and woody species increase. The proposed project evaluates disturbance timing and type to guide effective prairie management....

Financial Capacity

Title	File
MJV 2024 - 990	18dc53b1-55a.pdf
MJV Cert. of Good Standing	28efddac-5e5.pdf

Board Resolution or Letter

Title	File
MJV Board Letter	314ba2bf-19f.pdf

Administrative Use

Does your project include restoration or acquisition of land rights?

No

Do you understand that travel expenses are only approved if they follow the "Commissioner's Plan" promulgated by the Commissioner of Management of Budget or, for University of Minnesota projects, the University of Minnesota plan?

Yes, I understand the Commissioner's Plan applies.

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

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?

Yes

Does the organization have a fiscal agent for this project?

No

Does your project include the pre-design, design, construction, or renovation of a building, trail, campground, or other fixed capital asset costing $10,000 or more or large-scale stream or wetland restoration?

No

Do you propose using an appropriation from the Environment and Natural Resources Trust Fund to conduct a project that provides children's services (as defined in Minnesota Statutes section 299C.61 Subd.7 as "the provision of care, treatment, education, training, instruction, or recreation to children")?

No

Provide the name(s) and organization(s) of additional individuals assisting in the completion of this proposal:

Wendy Caldwell, Monarch Joint Venture; Jen Thieme, Monarch Joint Venture

Do you understand that a named service contract does not constitute a funder-designated subrecipient or approval of a sole-source contract? In other words, a service contract entity is only approved if it has been selected according to the contracting rules identified in state law and policy for organizations that receive ENRTF funds through direct appropriations, or in the DNR's reimbursement manual for non-state organizations. These rules may include competitive bidding and prevailing wage requirements

Yes, I understand