Environment and Natural Resources Trust Fund
2019 Request for Proposals (RFP)

Project Title: **ENRTF ID: 236-FH**

Integrated Research and Restoration in Prairie and Forest

Category: H. Proposals seeking $200,000 or less in funding

Sub-Category: F. Methods to Protect, Restore, and Enhance Land, Water, and Habitat

Total Project Budget: $ 150,583

Proposed Project Time Period for the Funding Requested: June 30, 2022 (3 yrs)

Summary:

Comparisons of two methods of restoration both in forest and prairie habitat to provide land managers with evidence-based choices for ecological and cost effective restoration solutions.

Name: Betsy Daub

Sponsoring Organization: Friends of the Mississippi River

Title: Conservation Director

Department: Land Conservation

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St. Paul MN 55101

Telephone Number: (651) 222-2193

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Location

Region: Metro

County Name: Dakota, Sherburne

City / Township: Hampton, Elk River

Alternate Text for Visual:

Map showing location of sites for prairie and forest integrated research and restoration in Dakota and Sherburne Counties. Photos show buckthorn control methods and prairie seeding experiment.

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity Readiness	_____ Leverage	_____ TOTAL	_____%
____ If under $200,000, waive presentation?			

PROJECT TITLE: Integrated Research and Restoration in Prairie and Forest Habitats

I. PROJECT STATEMENT

Friends of the Mississippi River (FMR) proposes to compare ecological restoration techniques in both forest and prairie habitats to investigate the effectiveness of different methods that have, surprisingly, not been well studied. In a forested site, we will investigate the outcomes of two mechanical methods for invasive buckthorn control and compare them to methods that use the application of herbicides which may be costlier and negatively impact native plants. At a prairie restoration site, we will evaluate three different seed diversity mixes and two different seeding methods to assess how project managers can achieve the greatest native diversity and cover for the cost.

The restoration community spends millions of dollars each year to restore habitat and reverse decades of environmental degradation. Surprisingly, little research has been conducted to assess current and new restoration methodologies and their ecological and cost effectiveness. Restoration practitioners are not often rigorously testing different methods and tend to use familiar approaches. Conversely, academic inquiry is not always driven by the needs of practitioners. While there are applied researchers investigating restoration questions, the field is still relatively young, and a large gap remains in the existing body of research that should inform habitat management practices. This project seeks to bridge that gap by gathering information to better inform restoration practices and how restoration dollars are spent to achieve the best possible habitat outcomes. Since 1999, FMR's staff ecologists have directed restoration on more than 2,500 acres at 62 sites within the Twin Cities metro area. Coupled with advanced degrees and experience conducting research, FMR has the skills to examine these important restoration questions and knows that our work, and that of many restoration professionals, will benefit from these inquiries.

The forest restoration study will occur at the 191-acre Hampton Woods Wildlife Management Area. One of the largest contiguous oak forests remaining in Dakota County, it provides critical habitat for rare plants and SGCN species in a largely agricultural landscape. The site is owned and managed by the Minnesota DNR. The prairie seeding study will take place at the William H. Houlton Conservation Area, a 347-acre property located at the confluence of the Mississippi and Elk rivers in Sherburne County and owned by the City of Elk River. FMR will compile and write up the results from both sites for dissemination to Minnesota's restoration community and in scientific and other publications.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: Comparison of two methods of forest restoration as part of 90-acre restoration – Hampton Woods WMA

1). Buckthorn seedlings and native plants – Mechanical vs herbicidal control: Large buckthorn will be removed to promote a flush of seedlings which will be cut when stems are about 6 inches high, then re-cut when regrowth occurs. Buckthorn stems will be counted in study plots before and after each cutting. Native vegetation will also be surveyed before the treatment and in subsequent seasons. This treatment will be compared with plots where herbicide alone is applied to regrowth, as conventionally done. Results will be analyzed and disseminated to restoration professionals.

2). Mature buckthorn and native plants - Mechanical vs herbicidal control: Three treatments will be completed with separate funding: forestry mow, stump-treat, follow-up foliar; forestry mow, no stump-treat, follow-up foliar; forestry mow twice. While these methods are currently used in the field, a direct comparison of the effectiveness and cost has never been undertaken. LCCMR funding will be used to complete additional vegetation survey work in the years after treatment to compare results of each method on native plants. Results will be disseminated to restoration professionals.

3). Restoration on 53 adjacent acres; Orchid and bird surveys: 53 acres adjacent to the research units will be managed for invasive species that would otherwise reinvade the research sites. Invasive woody removal will be done on 31 new acres and follow-up management on 22 acres, including a prescribed burn. Garlic mustard, which is still sparse, will be controlled. Orchid surveys and breeding bird surveys will be conducted throughout the WMA to evaluate overall restoration results. Results will be disseminated to other restoration professionals.

ENRTF BUDGET: $140,673.10

Outcome	Completion Date
1. Conduct and evaluate results of buckthorn seedling experiment	*June 2022*
2. Conduct and evaluate results of forestry mowing experiment at mature buckthorn stand	*June 2022*
3. Complete ecological restoration and enhancement on 90 acres	*June 2022*
4. Conduct and evaluate breeding bird and native orchid surveys	*June 2022*
5. Publish and disseminate research results	*June 2022*

Activity 2: Prairie restoration assessment on previously seeded habitat – W.H. Houlton Conservation Area, Elk River
In fall 2017, each half of the 106-acre prairie was seeded using one of two methods: drill or broadcast seeding. Within each half, three seed mixes were used (30, 50 and 70 species), creating a factorial experimental set-up with six separate treatments. LCCMR funds will enable FMR ecologists to establish replicate 1m x 1m vegetation monitoring plots in the prairie to survey for cover and diversity of native and non-native plant species and assess the overall best results and cost-effectiveness of these treatment combinations. Plots will be distributed throughout six treatments and be surveyed three times each growing season. Data will be recorded and compiled in a database and stored on a shared server. Data will be analyzed each year to identify trends in species diversity and cover and summarized in yearly progress reports. The experiment will be written up for dissemination and publication.

ENRTF BUDGET: $9,910.35

Outcome	Completion Date
1. Conduct and evaluate results of drill vs broadcast seeding	*June 2022*
2. Conduct and evaluate results of seed diversity mixes	*June 2022*
3. Publish and disseminate research results	*June 2022*

III. PROJECT PARTNERS:

A. Partners receiving ENRTF funding

Name	Title	Affiliation	Role
Betsy Daub	Conservation Director	FMR	Grant management
Karen Schik	Senior Ecologist	FMR	Project management
Alex Roth	Ecologist	FMR	Project management
Barb Heintz	Bookkeeper	FMR	Accounting

B. Partners NOT receiving ENRTF funding

Name	Title	Affiliation	Role
Bob Fashingbauer	Area Wildlife Manager	Mn DNR	Landowner
Michael Hecker	Parks & Rec Director	City of Elk River	Landowner

IV. LONG-TERM- IMPLEMENTATION AND FUNDING: Friends of the Mississippi River has a history of long-term engagement at the sites where we have initiated ecological work. Our goal is to improve the ecological health and stability of native plant communities at each site to a stage of low-level on-going maintenance. Until they reach that point, we are committed to working with the landowner to seek and obtain the funding.

V. TIME LINE REQUIREMENTS: FMR will complete the activities presented in this proposal by June 30, 2022.

2019 Proposal Budget Spreadsheet

Project Title: Research and Restoration in Prairie and Forest Habitats

IV. TOTAL ENRTF REQUEST BUDGET $150,583.45; *3* years

BUDGET ITEM (See "Guidance on Allowable Expenses")	**AMOUNT**
Personnel:	$ 28,302
Conservation Director (1): ($1,871.44) Overall project management, assist with evaluation of restoration; .020 FTE. 88% salary, 12% benefits	
Ecologists (2): Plan/organize restoration activities, develop and put out RFPs, hire and oversee vendors, guide restoration activities, plan and conduct surveys, evaluate restoration actitivities. ($22,066.18) .17 FTE each year for the three-year project. 88% Salary, 12% Benefits.	
Bookkeeper (1): Pay invoices received. Assist in developing report & reimbursement documentation, track and document staff expenses. ($354.96) .005 FTE each year for the three-year project. 88% Salary, 12% Benefits.	
Professional/Technical/Service Contracts: Vendors to provide restoration activities such as woody and exotic plant removal, herbicide application, seeding (Vendor contracts will be awarded on a competitive and performance basis.)	$ 120,625
Equipment/Tools/Supplies: (plot set-up supplies and survey materials)	$500.00
Acquisition (Fee Title or Permanent Easements):	$ -
Travel: Mileage to and from project sites: Prairie Site: 78.8 miles RT x $0.545 x 12 trips = $515.35; Forest site: 56 miles RT x $0.545 x 21 trips = $640.92	$ 1,156
Additional Budget Items:	$ -
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =	$ 150,583

V. OTHER FUNDS *(This entire section must be filled out. Do not delete rows. Indicate "N/A" if row is not applicable.)*

SOURCE OF FUNDS	**AMOUNT**	**Status**
Other Non-State $ To Be Applied To Project During Project Period: City of Elk River	$ 10,000	*Secured*
Other State $ To Be Applied To Project During Project Period: LSOHC - Metro Big Rivers Habitat Phase 7: 2016 appropriation - $430,000 for prairie restoration on the W.H. Houlton Conservation Area	$ 430,000	*Secured*
In-kind Services To Be Applied To Project During Project Period: Friends of Houlton Conservation Area ($4,828); Friends of the Mississippi River volunteers ($4,345.20)	$ 9,173	*Pending*
Past and Current ENRTF Appropriation: Metro Conservation Corridors Phase 8 - Prairie, Forest, and Savannna Restoration in Greater Metropolitan Area: 2015 appropriation - $115,000	$ 115,000	Secured - will be completed by June 2018
Other Funding History: Dakota County Farmland an Natural Areas Program	$ 50,000	*Secured - will be completed by June 2019*

Attachment C:
Environment and Natural Resources Trust Fund
M.L. 2019 Acquisition/Restoration Parcel List Spreadsheet
Project Title: Research and Restoration in Prairie and Forest Habitats
Legal Citation:
Project Manager: Betsy Daub
Organization: Friends of the Mississippi River
College/Department/Division:
M.L. 2019 ENRTF Appropriation: $150,583.45
Project Length and Completion Date: 3 years, June 30, 2022
Todays's Date: 3/30/18

#	Acquisition or Restoration Parcel Name	Geographic Coordinates (preferably from the center of the parcel) Format: [Deg.]° [Min.]' [Sec.]" [Hemis.] Latitude	Longitude	Estimated Cost	Estimated Annual PILT Liabilities	County	Site Significance (please include what ecosystem (e.g., prairie, forest, wetland, savanna) is represented as well as the ecological significance, site importance, conservation value, and public benefits)	Activity Description (e.g. fee title acquisition, conservation easement acquisition, site preparation, restoration)	# of Acres	# of Shoreline Miles	Type of Landowner (private individual or trust, non-profit organization, for-profit entity)	Proposed Fee Title or Easement Holder (if applicable)	Status of work (e.g. engaged in landowner negotiations, no longer in consideration, restoration activities underway)
1	Hampton Woods WMA	44°37'20.45"N	93° 1'55.09"W	$140,673	N/A	Dakota	Outstanding diversity oak forest. Only forest for miles in agriculture-dominated landscape. Includes rare species and SGCNs. Site recently brought into public ownership and is valued for hunting and recreation.	Exotic brush control and two comparative studies to evaluate mechanical vs herbicide methods on mature and seedling plants.	90	0	Public. DNR	N/A	FMR has conducted invasive plant species control on adjacent acres
2	Wm H Houlton Conservation Area	45°17'50.30"N	93°34'57.72"W	$9,910	N/A	Sherburne	335-acre conservation area at the confluence of the Mississippi and Elk Rivers - high biodiversity location. Close proximity to SNAs. Creating new prairie/pollinator habitat on location of former farm field. Site newly brought into public ownership and is valued for hunting and wildlife viewing.	Research data collection - evaluating 6 different prairie seeding treatments for their effects on biodiversity and native species establishment success.	180	2.8	Public, City of Elk River	N/A	FMR began prairie restoration with fall 2017 seeding.
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4													
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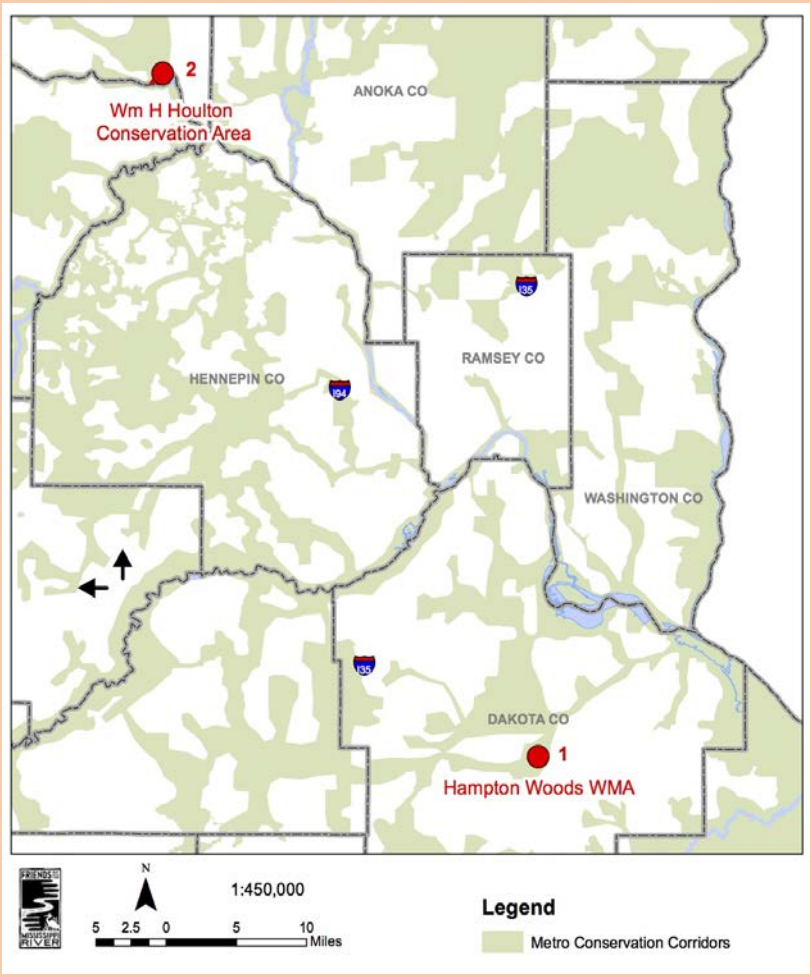
NOTES:

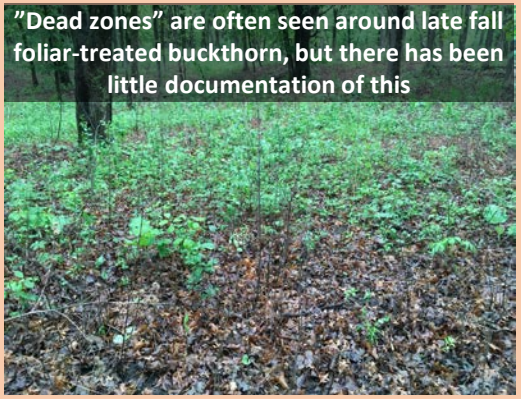


ACTIVITY 1.

Compares mechanical control of mature and seedling buckthorn and its long-term effectiveness, its impacts on native plants, and its cost…

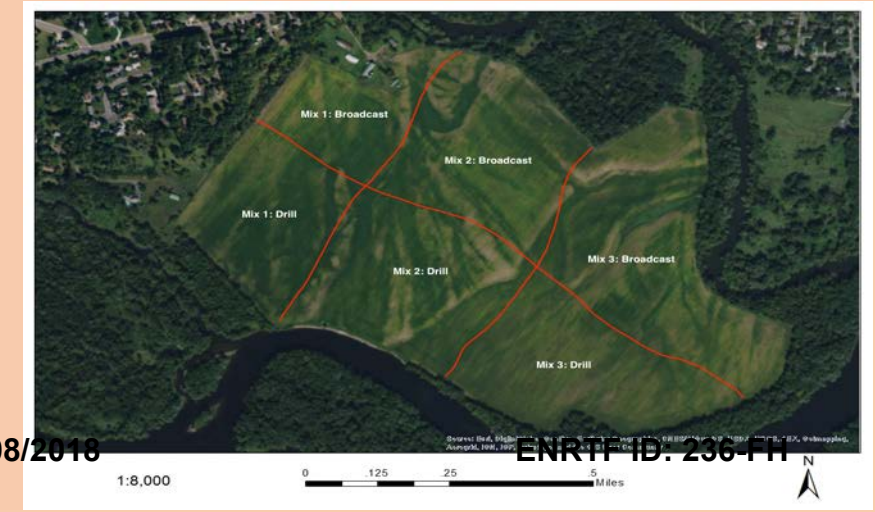
with

Foliar herbicide treatment – which can be costly and can kill native plants



ACTIVITY 2.

Investigates whether adding more species to a seed mix results in more diverse restoration. We compare 3 prairie seed diversity mixes and 2 seeding methods to assess how to achieve the greatest native diversity and cover for the cost.



FRIENDS OF THE MISSISSIPPI RIVER
FMR.ORG

2019 ENRTF
Funding Proposal

Attachment D. Additional Work Plan Information for Acquisition, Easements, and Restoration

Acquisition/Restoration Information:

The information to be included in this section is to help fulfill specific requirements pertaining to fee title acquisition, conservation easement acquisition, and restoration efforts completed using Environment and Natural Resources Trust Fund dollars. More detailed information explaining these requirements is available in separate documents that are available on the "Project Manager Info" page of the LCCMR website under "Requirements for ENRTF Land Acquisitions and Restorations": http://www.lccmr.leg.mn/pm_info/manager_info_index.html. Please fill out the relevant portions below. Please delete any sections that do not apply to your project. For example, if your project only involves fee title acquisition, answer all five items under fee title acquisition and then delete all of the text for the portions relating to conservation easement acquisition and restoration.

Restoration

1. Provide a statement confirming that all restoration activities completed with these funds will occur on land permanently protected by a conservation easement or public ownership.

Friends of the Mississippi River's (FMR) work for this project will take place on two sites that are permanently protected and in public ownership. The W.H. Houlton Conservation Area is owned by the City of Elk River, MN and is open to the public for hunting and wildlife-viewing activities. Hampton Woods Wildlife Management Area is public land owned by the Minnesota Department of Natural Resources. It is used by the public for hunting and wildlife-watching activities.

2. Summarize the components and expected outcomes of restoration and management plans for the parcels to be restored by your organization, how these plans are kept on file by your organization, and overall strategies for long-term plan implementation.

FMR proposes to conduct research on targeted prairie and forest restoration methodologies as part of a larger restoration project. At one site we look at two mechanical methods for buckthorn control and compare them to methods that use foliar application of herbicides. At a second site we evaluate three different levels of diversity of prairie seed mixes and two different seeding methods to assess how project managers can gain the most impact for their seeding costs.

The project sites have resource management plans already written for them. These plans are stored on a shared server by our organization.

FMR has been strategically focused on specific areas within designated conservation corridors for over a decade. This has allowed us to stay engaged with projects, landowners, partners and communities, helping to ensure the continuous improvement and expansion of the habitat values at these sites, while protecting the public investment that has been made in them. FMR is committed to ongoing restoration and enhancement activities required at these sites over time.

3. Describe how restoration efforts will utilize and follow the Board of Soil and Water Resources "Native Vegetation Establishment and Enhancement Guidelines" in order to ensure ecological integrity and pollinator enhancement.

FMR will use and follow the Board of Soil and Water Resources "Native Vegetation Establishment and Enhancement Guidelines" to ensure ecological integrity and pollinator enhancement on our project sites. Our project incorporates these guidelines in numerous ways, including:

- *Sites are selected to be strategic in providing ecological benefits for the landscape in which they are a part*
- *Sites are selected within identified conservation corridors in order to make landscape connections to decrease habitat fragmentation and create habitat linkages across the landscape*
- *Restoration efforts will incorporate plant communities appropriate to the sites to provide food and habitat for species in need, particularly pollinators*
- *Restoration efforts will include methods to restore and maintain species diversity, including incorporating prescribed fire and the removal of invasive plants that displace native vegetation*
- *Efforts are designed to restore habitat complexes and natural corridors and buffer natural areas*
- *The restoration of a former farm field to prairie will help retain water on the land, reduce runoff and improve adjacent Mississippi River water quality*
- *Efforts include removal of invasive species*
- *The project practices adaptive management with its focus on monitoring and assessing restoration methods and outcomes*

4. Describe how the long-term maintenance and management needs of the parcel being restored with these funds will be met and financed into the future.

FMR has been strategically focused on specific areas within designated conservation corridors for over a decade. This has allowed us to stay engaged with projects, landowners, partners and communities, helping to ensure the continuous improvement and expansion of the habitat values at these sites, while protecting the public investment that has been made in them. Starting with individual parcels, our project areas have grown by orders of magnitude to protect and restore large tracts of land, ultimately creating contiguous greenway corridors. The protection, restoration and enhancement projects presented in this work program are all part of larger projects both in the sense of time and area. Because of human induced changes in the landscape, natural areas require management. While it is often the case that initial restoration and enhancement require relatively large investments initially, the costs often decrease over time as the goals for a site are met and the project enters a more maintenance level of activity, such as conducting period burns on restored prairie. FMR is committed to conducting fundraising from both public and private sources, for the ongoing restoration and enhancement activities required at these sites over time.

5. Describe how consideration will be given to contracting with Conservation Corps of Minnesota for any restoration activities.

FMR's standard practice when contracting is to always provide the Conservation Corps of Minnesota with our Request for Proposals. We will continue this practice when contracting for restoration work for this project.

6. Provide a statement indicating that evaluations will be completed on parcels where activities were implemented both 1) initially after activity completion and 2) three years later as a follow-up. Evaluations should analyze improvements to the parcel and whether goals have been met, identify

any problems with the implementation, and identify any findings that can be used to improve implementation of future restoration efforts at the site or elsewhere.

This focus of this project is to evaluate diverse restoration methods for their outcomes and effectiveness at achieving habitat improvements, creating desired native plant communities and wildlife habitat, and cost effectiveness. The goal is for this information to inform future restoration efforts at these and other sites. Restoration outcomes will be monitored annually for multiple years.

PROJECT TITLE: Research and Restoration in Prairie and Forest Habitats
Friends of the Mississippi River

Project Manager Qualications:

Betsy Daub, Conservation Director
Betsy holds a Master of Science degree in Resource Ecology and Management from the University of Michigan's School of Natural Resources and Environment. She has over 25 years of experience working in the environmental/conservation field. In her capacity as FMR's Conservation Director, she leads the organization's efforts to protect and restore land in the Mississippi River watershed. Her conservation work in Minnesota includes serving on the Minnesota Forest Resources Council, leading Audubon Minnesota's Important Bird Areas effort, and with the Minnesota DNR as project manager developing the online rare species guide.

Organization Description:

Friends of the Mississippi River (FMR) is a leading citizen organization working to protect and enhance the Mississippi River and its watershed in the Twin Cities area. We believe the tremendous ecological, cultural, scenic and recreational values of the river must be carefully tended to ensure that they continue to be shared equally by all citizens and that they endure for future generations. We accomplish these goals through three inter-related programs.

- Land Conservation: We work with public and private landowners to protect, restore and manage important natural areas along the river and its key tributaries.
- Watershed Protection: Working with citizens and local governments, we strive to draw attention to the health of local rivers, lakes and wetlands and bring citizen opinion to bear on decisions that improve water quality.
- River Corridor Stewardship: The Mississippi River cannot protect itself. We engage citizens in a variety of educational, recreational, and volunteer stewardship activities that give them the desire and the understanding to advocate on behalf of the river's public values at City Hall or the State Capitol.