

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

Project Title:

ENRTF ID: 169-DH

Suppressing Reed Canary Grass with Native Plants

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

Sub-Category: D. Aquatic and Terrestrial Invasive Species

Total Project Budget: \$ 191,000

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

Summary:

Build on current ENRTF project by testing whether cover crops of native plants suppress recolonizing reed canary grass and foster floodplain forest tree regeneration while creating pollinator habitat

Name: Rebecca Montgomery

Sponsoring Organization: U of MN

Title: Associate professor

Department: Forest Resources

Address: 1530 Cleveland Avenue North

St. Paul MN 55108

Telephone Number: (612) 624-7249

Email rebeccam@umn.edu

Web Address

Location

Region: Southeast

County Name: Goodhue, Houston, Wabasha, Wright

City / Township:

Alternate Text for Visual:

Images of floodplain forest, reed canary grass, diverse native plant community, and diverse plant community with young trees. Map of study sites; images of partners MN Audubon, UMN Bee Lab.

<input type="checkbox"/>	Funding Priorities	<input type="checkbox"/>	Multiple Benefits	<input type="checkbox"/>	Outcomes	<input type="checkbox"/>	Knowledge Base
<input type="checkbox"/>	Extent of Impact	<input type="checkbox"/>	Innovation	<input type="checkbox"/>	Scientific/Tech Basis	<input type="checkbox"/>	Urgency
<input type="checkbox"/>	Capacity	<input type="checkbox"/>	Readiness	<input type="checkbox"/>	Leverage	<input type="checkbox"/>	TOTAL <input type="checkbox"/> %
<input type="checkbox"/> If under \$200,000, waive presentation?							



PROJECT TITLE: Suppressing reed canary grass with native plants

I. PROJECT STATEMENT

This project will help ensure the future of Mississippi River floodplain forests by developing the most effective methods for regenerating native trees in areas threatened by invasive reed canary grass. In our current project, we have found reed canary grass slowly reinvades post herbicide treatment. The latter is a problem for success of tree planting as recolonizing reed canary grass can outcompete juvenile trees. At one of our sites, native herbaceous plants are abundance and reed canary grass colonization is low. In this request, **we propose to build on our current project by adding native plant seed mixes to our existing treatment plots, testing whether they suppress recolonizing reed canary grass, foster tree regeneration and increase biodiversity, including abundance and diversity of native pollinators.**

Floodplain forests protect water quality and provide critical habitat for wildlife. The Upper Mississippi River (Minneapolis to St. Louis) contains some of the most significant tracts of floodplain forest in the nation. However, the long-term existence of these forests is under threat from invasive reed canary grass, which aggressively out-competes tree seedlings. As floodplain forest stands die off, current knowledge suggests they will be replaced by reed canary grass-dominated wet meadows. Without active restoration, Minnesota will likely lose much of its floodplain forests, along with the many species of birds and other wildlife that depend upon these habitats for survival.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: Test two native plant seed mixes for long-term control of reed canary grass at three sites spanning 100 miles of the Mississippi River

Competition from reed canary grass (RCG) is one of the primary factors limiting forest regeneration in the floodplain. RCG tends to reseed after herbicide treatment, creating challenges for long-term restoration. We will test the efficacy of native plant seed mixes to inhibit reed canary grass. We will plant two native plant seed mixes within three of our four 10-acre sites (the fourth site has adequate natural colonization by native species). One mix has been developed by Minnesota Board of Water and Soil Resources for floodplain restoration but lacks field tests. The other is designed by William Kiser from the Fish and Wildlife Service (trained as part of our first ENRTF grant) and consists of species that have characteristics that would foster competition with young RCG but not with juvenile trees planted on site.

ENRTF BUDGET: \$ 93,184

Outcome	Completion Date
1. Three floodplain sites that span 100 miles of the Mississippi River treated with native plant seed mixes	January 2022
2. Efficacy of reed canary grass control documented on 40 acres of floodplain	January 2022

Activity 2: Assess annual survival and growth of 3750 tree saplings and abundance and diversity of native pollinators at three sites spanning 100 miles of the Mississippi River

We will continue monitor natural and artificial regeneration of four species (silver maple, cottonwood, hackberry, swamp white oak) established in our first ENRTF project. Further, we will assess cover and species diversity of plants established from our seed mixes. We will assess pollinator abundance and diversity with a specific focus on bees. This effort will include annual surveys yielding ~10,000 bee collections. This will further contribute to knowledge of native pollinators in Minnesota.



**Environment and Natural Resources Trust Fund (ENRTF)
2019 Main Proposal**

ENRTF BUDGET: \$ 101,816

Outcome	Completion Date
<i>1. Four tree species and 3750 trees measured annually for survival and growth</i>	<i>January 2022</i>
<i>2. Assessment of native pollinator abundance and diversity including collection of ~10,000 bees</i>	<i>January 2022</i>
<i>3. Assessment natural tree regeneration and plant biodiversity of three floodplain sites that span 100 miles of the Mississippi River</i>	<i>January 2022</i>
<i>4. Updated decision support tool that documents the most effective methods for controlling reed canary grass and regenerating floodplain forests</i>	<i>June 2022</i>

III. PROJECT PARTNERS:

A. Partners receiving ENRTF funding

Name	Title	Affiliation	Role
Rebecca Montgomery	Associate professor	University of Minnesota	Project manager
Andy Beebe	Forest ecologist	MN Audubon	Application of seed mixes
Elaine Evans	Extension educator	University of Minnesota	Lead pollinator surveys
Meredith Thomsen*	Professor	University of Wisconsin-La Crosse	Research and monitoring

*Dr. Thomsen is a leader in reed canary grass control and effects on regeneration along the Upper Mississippi River. Dr. Thomsen's expertise in reed canary grass research is the reason a small amount of funding would go out of state. Approximately half of money going out of state is matched by University of Wisconsin-La Crosse. All research will be conducted in Minnesota.

B. Partners NOT receiving ENRTF funding

Name	Title	Affiliation	Role
William Kiser	Private lands biologist	USFWS	Design seed mix
Dan Shaw	Native vegetation specialist	BWSR	Provide seed mix

IV. LONG-TERM- IMPLEMENTATION AND FUNDING:

This effort supports a UMN partnership with MN Audubon built in our current ENRTF project. The long-term strategy of MN Audubon is to sustain and restore floodplain forest for birds and other wildlife along the Upper Mississippi River. Results of the proposal work will provide the information and decision support tools for river managers to most effectively implement forest restoration projects using funding from other sources into the future. University partners and Audubon's forest ecologist will continue to assess longer-term responses (5-10 yrs) by occasional monitoring beyond the timeline of this proposal.

V. TIMELINE REQUIREMENTS

In year 1, we will apply seed mixes to existing sites. In year 2 and 3 we will evaluate response of reed canary grass, native plants, pollinator abundance and diversity and tree regeneration. In year 3, we will update the decision support tool and present a final report to foresters, wildlife managers, and other interested partners.

2019 Detailed Project Budget

Project Title: Suppressing reed canary grass with native plants

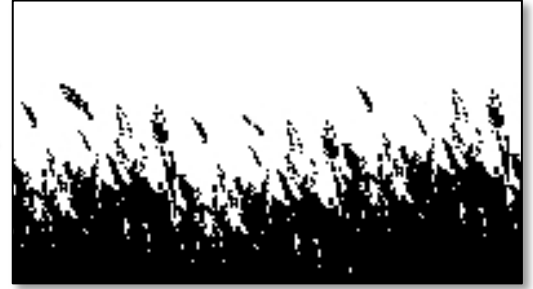
IV. TOTAL ENRTF REQUEST BUDGET - 3 years

BUDGET ITEM	AMOUNT	
Personnel:	\$ 134,484	
Research Scientist, project coordinator (75% salary, 25% benefits); 10% FTE for each of years 1-2		\$ 12,632
Research Scientist, curation of bee samples (75% salary, 25% benefits); 10% FTE for each of years 1-2		\$ 12,632
Graduate Research Assistant located at the University of Minnesota to conduct data collection and analysis (54% salary, 46% fringe benefits (includes health and tuition), 50% FTE for 2.5 years		\$ 97,700
Undergraduate summer research technician; .23 FTE (93% salary, 7% fringe) for 2 years, 40h/week, 12 weeks/year		\$ 11,520
Professional/Technical/Service Contracts:	\$ 24,516	
Andy Beebe, MN Audubon, Forest Ecologist (66.5% salary, 33.5% benefits); 8% FTE for each of year 1		\$ 3,000
Graduate Research Assistant located at the University of Wisconsin-La Crosse to conduct research at Minnesota field sites in collaboration with UMN graduate student, 2 summers @ 360h/y * 22.94/h (16,516) + partial tuition support (5,000)		\$ 21,516
Equipment/Tools/Supplies: Field supplies such as flagging (750), rite-in-the rain paper (250) and curation supplies for bee surveys (5000), rental of ATV and wagon for seed application(1000), seed mixes(5000)	\$ 12,000	
Travel: In State Travel -Mileage (approximately 20,000 miles) at current mileage rate of \$0.545/mile) and expenses for lodging (\$84 per night, approximately 65 days) and per deims (\$56 per day, approximately 65 days) for graduate student travel to and between data gathering and restoration sites. Travel reimbursement will follow guidelines in DNR Commissioners Plan.	\$ 20,000	
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST =	\$	191,000

V. OTHER FUNDS

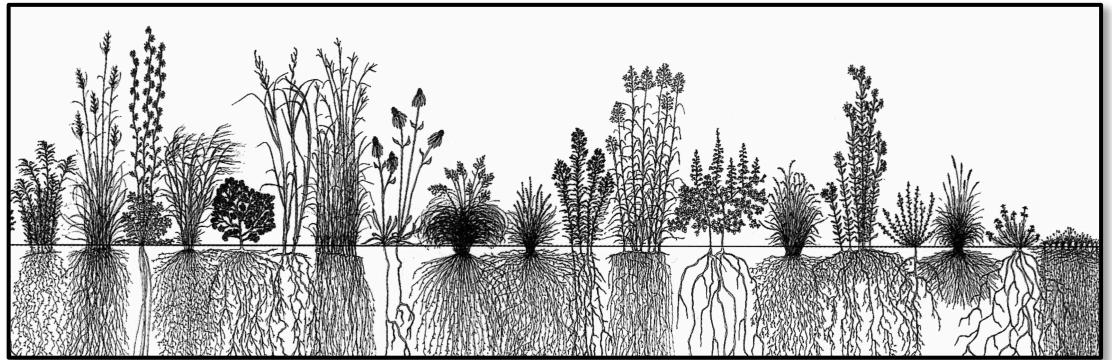
SOURCE OF FUNDS	AMOUNT	Status
Other Non-State \$ To Be Applied To Project During Project Period:	N/A	N/A
Other State \$ To Be Applied To Project During Project Period:	N/A	
In-kind Services To Be Applied To Project During Project Period: University of Minnesota unrecovered facilities and administration costs (54% of UMN costs; federal on-campus rate) (71,771); Rebecca Montgomery 1% for 3 Years, Project overview (3,671); University of Wisconsin La Crosse salary and fringe from University of Wisconsin La Crosse faculty (8,000); University of Wisconsin La Crosse funds for waiving overhead charges (20% of student + faculty salary costs only, as tuition support is exempt from overhead charges (4903)	\$ 88,345	secured
Funding History: LSOHC funding to implement bottomland forest restoration projects including site preparation and tree planting. \$300,000 secured from July 2014-June 2017, of which \$150,000 spent during current LCCMR ML 2016 159-F 8e	\$ 150,000	secured
Remaining \$ From Current ENRTF Appropriation: Current LCCMR ML 2016 159-F 8e will end June 30, 2019	\$ 58,000	secured
Total	\$ 296,345	

ENTRF 2019: Suppressing reed canary grass with native plants



Reed canary grass replaces floodplain forests.

Native plants could hold back reed canary grass, protecting young trees.



We will promote survival of 1000s of young trees while also creating pollinator habitat

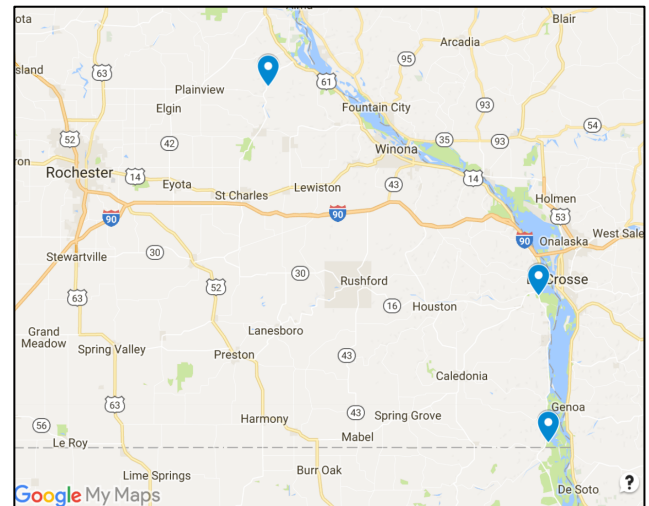
We will work with these partners:

Audubon Minnesota

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[Upper Mississippi River Program](#)

Restoring Floodplain Forests



Sites span 100 miles of Mississippi River in MN



Project Manager Qualifications and Organization Description

Project Manager: Rebecca A. Montgomery

Associate Professor, Dept. of Forest Resources, University of Minnesota, St. Paul, MN 55108.

Professional Appointments and Preparation

Associate Professor, Forest Resources, University of Minnesota, 2011-present

Assistant Professor, Forest Resources, University of Minnesota, 2004-2011

Research Associate, Forest Resources, University of Minnesota, 2003-2004

Instructor, Forest Resources, University of Minnesota, 2003-2004

Ph.D., Ecology and Evolutionary Biology, University Connecticut, 1999.

B.A., Biology, *magna cu laude*, Occidental College, 1994.

Honors, Professional Recognition and Service (Selected)

Invited speaker at regional, national and international symposia, seminars, and workshops, e.g. MN Sustainable Forest Education Cooperative, Michigan State, UW-Madison, University of Toronto, US-Japan Workshop on Photosynthetic Plasticity and Global Change. Received Richard C. Newman Art of Teaching award (2010) and College of Food, Agricultural and Natural Resources Sciences Distinguished Teaching Award (2010). I serve as chair of the Physiology Working Group of the Society of American Foresters and subject editor of *Plant Ecology*. I served on the Science Team for the Minnesota Climate Change Vulnerability Assessment and on the Falcon Heights Environment Commission.

Areas of Expertise

Plant ecophysiology, forest ecology, forest regeneration and dynamics, shrub ecology, herbivory, competition, invasive species, rare and endangered species biology. Research spans temperate and tropical forests, managed and unmanaged ecosystems.

Project Management Experience and Responsibilities for this Project

More than ten years of research experience in prairies, oak savanna, deciduous and boreal forest of Minnesota. Principal investigator or co-principal investigator on >20 research grants from National Science Foundation, Minnesota Department of Natural Resources, US Department of Energy, US National Park Service and USDA Forest Service projects. Montgomery will provide scientific leadership, supervise funded staff, mentor the graduate student and both oversee and participate in all project activities.

Peer-reviewed publications

Forty-nine publications, including articles, book chapters, and reports. Forty-four publications in the peer-reviewed literature.

Organization Description

The University of Minnesota has a strong tradition of education and public service through its role as both the state land-grant university, and the state's primary research university. The Department of Forest Resources is the leading research and educational institution on forest related issues in Minnesota. For over 100 years the department has played a key role in discovering and fostering sustainable forest resource management activities in Minnesota.