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

Project Title: **ENRTF ID: 082-B**

Evaluating Long-Term Success of Wetland Hydrology Restoration

Category: B. Water Resources

Sub-Category:

Total Project Budget: $ 294,662

Proposed Project Time Period for the Funding Requested: June 30, 2023 (4 yrs)

Summary:

An evaluation of the long-term sustainability of twenty wetlands restored through RIM and wetland banking in Southern Minnesota by assessing the current hydrologic condition against a planned and reference condition.

Name: Tim Smith

Sponsoring Organization: Board of Water and Soil Resources

Title:

Department: Wetlands Section

Address: 520 Lafayette Road North

St. Paul MN 55155

Telephone Number: (612) 600-7554

Email tim.j.smith@state.mn.us

Web Address

Location

Region: Southwest

County Name: Big Stone, Blue Earth, Brown, Carver, Chippewa, Chisago, Cottonwood, Dakota, Dodge, Faribault, Fillmore, Freeborn, Goodhue, Hennepin, Isanti, Jackson, Kandiyohi, Lac qui Parle, Le Sueur, Lincoln, Lyon, Martin, McLeod, Meeker, Mower, Murray, Nicollet, Nobl

City / Township:

Alternate Text for Visual:

Assessment area map and photographs illustrating shallow monitoring wells and restored wetlands.

_____ 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: Evaluating Long-term Success of Wetland Hydrology Restoration

I. PROJECT STATEMENT

The Board of Water and Soil Resources (BWSR) has overseen or been responsible for wetland restorations at over 5,500 sites covering approximately 260,000 acres under its wetland banking and Reinvest in Minnesota (RIM) programs. While many of these sites are monitored for up to five years after construction, little is known about the long-term (5-15 years post construction) sustainability of these efforts. We propose to address this information gap by assessing the long-term hydrologic condition of wetlands restored through RIM and wetland banking in the mixed woods plains and temperate prairie ecoregions. This study will complement a current BWSR study funded by the U.S. Environmental Protection Agency (EPA) to assess the vegetative condition of restored wetlands in the same ecoregion of Minnesota.

Our primary goal is to determine if the restoration resulted in long-term sustainable hydrology consistent with the planned condition. The assessment will consist of three activities:

1) Identification of 20 sites (10 RIM and 10 wetland banking) and analysis of existing data,
2) inspection of each site and collection of three years of additional hydrology data, and;
3) comparative analysis of planned condition versus long-term condition and assessment of sustainability

The information obtained through this assessment will be beneficial for refining design practices for wetland restorations and, combined with the EPA funded vegetation study, will provide a comprehensive assessment of the effectiveness of these programs in achieving high quality sustainable sites.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1*: Selection of 20 Restored Wetlands, Background Hydrologic and Design Data Compilation, and Monitoring Well Installation*

Description: This activity will identify 10 RIM sites, 10 wetland banking sites, and reference wetlands where hydrology will be monitored. Restored wetlands will be identified and selected based on their location within the study area, geomorphic position, and availability of planning documents and short-term hydrology monitoring data. Reference wetlands are sustainable with respect to the functions they provide and will be selected to represent the same wetland type and geomorphic position as the restored wetlands. If possible, sites assessed as part of a related BWSR study of the vegetative quality of restored wetlands funded by USEPA will be selected for this assessment. The outcome of this activity will include: a list of restored and reference sites, site-specific monitoring plans, and installation of monitoring wells.

ENRTF BUDGET: $106,892

Outcome	Completion Date
1. Selection of 20 Restored Wetlands (10 RIM and 10 Banking) and Reference Wetlands	*September 2019*
2. Plant Community Mapping and Geomorphic Position Determinations at Study Sites	*October 2019*
3. Monitoring Plan Completion and Monitoring Well Installation	*April 2020*

Activity 2: *Hydrology Monitoring for Three Years at 20 Previously Restored Wetlands and Reference Wetlands*

Description: Activity 2 will focus on the collection of shallow water table hydrology data at the restored and reference wetlands. Hydrology will be monitored throughout the growing season (April through October) using submersible pressure transducer data loggers programmed to collect daily water level measurements. Each site will be inspected at the beginning and end of the growing season to identify any factors or conditions that could be affecting hydrology at the site. After each growing season a quality control review will be performed to validate the data collected and/or identify and correct any quality issues. Outcomes

include: restored and reference well monitoring data, regional precipitation analysis, an annual monitoring report identifying periods of above or below normal precipitation, monitoring equipment failures, changes in site conditions, and recommendations for changes to future monitoring efforts.
ENRTF BUDGET: $139,228

Outcome	Completion Date
1. 2020 Growing Season Hydrology Measurements and Precipitation Analysis	*December 2020*
2. 2021 Growing Season Hydrology Measurements and Precipitation Analysis	*December 2021*
3. 2022 Growing Season Hydrology Measurements and Precipitation Analysis	*December 2022*

Activity 3: *Analysis of Long-term Hydrologic Sustainability of Restored Wetlands Restored Through RIM and Wetland Banking and Recommendations for Improving Design and Management*
Description: Activity 3 is the analysis of the hydrology data collected at the 20 restored wetlands over the three growing seasons and comparisons with the planned condition and the reference wetland. BWSR will prepare a report summarizing the information collected during the monitoring period and assess the sustainability of wetland hydrology at the restoration sites. The report shall also contain specific recommendations for improving the design of wetland restorations, measuring success, identifying changes in shallow groundwater hydrology, and defining long-term management strategies. The findings would be shared locally, regionally, and nationally with wetland professionals and resource management agencies.
ENRTF BUDGET: $48,542

Outcome	Completion Date
1. Wetland Hydrology Data Analysis and Evaluation Against Planned Conditions	*April 2023*
2. Recommendations for Improving Hydrologic Sustainability of Restored Wetlands	*June 2023*

III. PROJECT PARTNERS:

A. Partners receiving ENRTF funding. None

B. Partners NOT receiving ENRTF funding. BWSR will be consulting/coordinating with Soil and Water Conservation Districts, local government units, and the Minnesota Department of Natural Resources thoughout this effort. In addition, coordination with the U.S. Army Corps of Engineers and the EPA will occur throughout this effort given the synergies between this and the federally funded vegetation study BWSR is conducting.

IV. LONG-TERM- IMPLEMENTATION AND FUNDING:

At the end of the grant period BWSR intends to continue collecting data at these sites as part of our easement compliance and assessment activities. On an annual basis, BWSR will receive funds from a recently established wetland bank easement stewardship account that can be used for management of easements, including monitoring. We also intend to combine these efforts with other wetland hydrology monitoring programs being pursued by the Minnesota DNR to gather reference wetland data on a statewide basis.

V. TIME LINE REQUIREMENTS:

The project will be completed over a four year period beginning in July 2019. Four years are requested in order to obtain three complete growing seasons of data which, in BWSR's opinion, is the minimum amount for conducting an analysis of this type. Site identification, record review, and well installation will begin in the summer of 2019. Wetland hydrology will be monitored in 2020, 2021, and 2022. Final data analysis and report preparation will begin in the fall of 2022 and conclude with a final report in June of 2023.

VI. SEE ADDITIONAL PROPOSAL COMPONENTS

2019 Proposal Budget Spreadsheet

Project Title: Evaluating Long-term Success of Wetland Hydrology Restoration

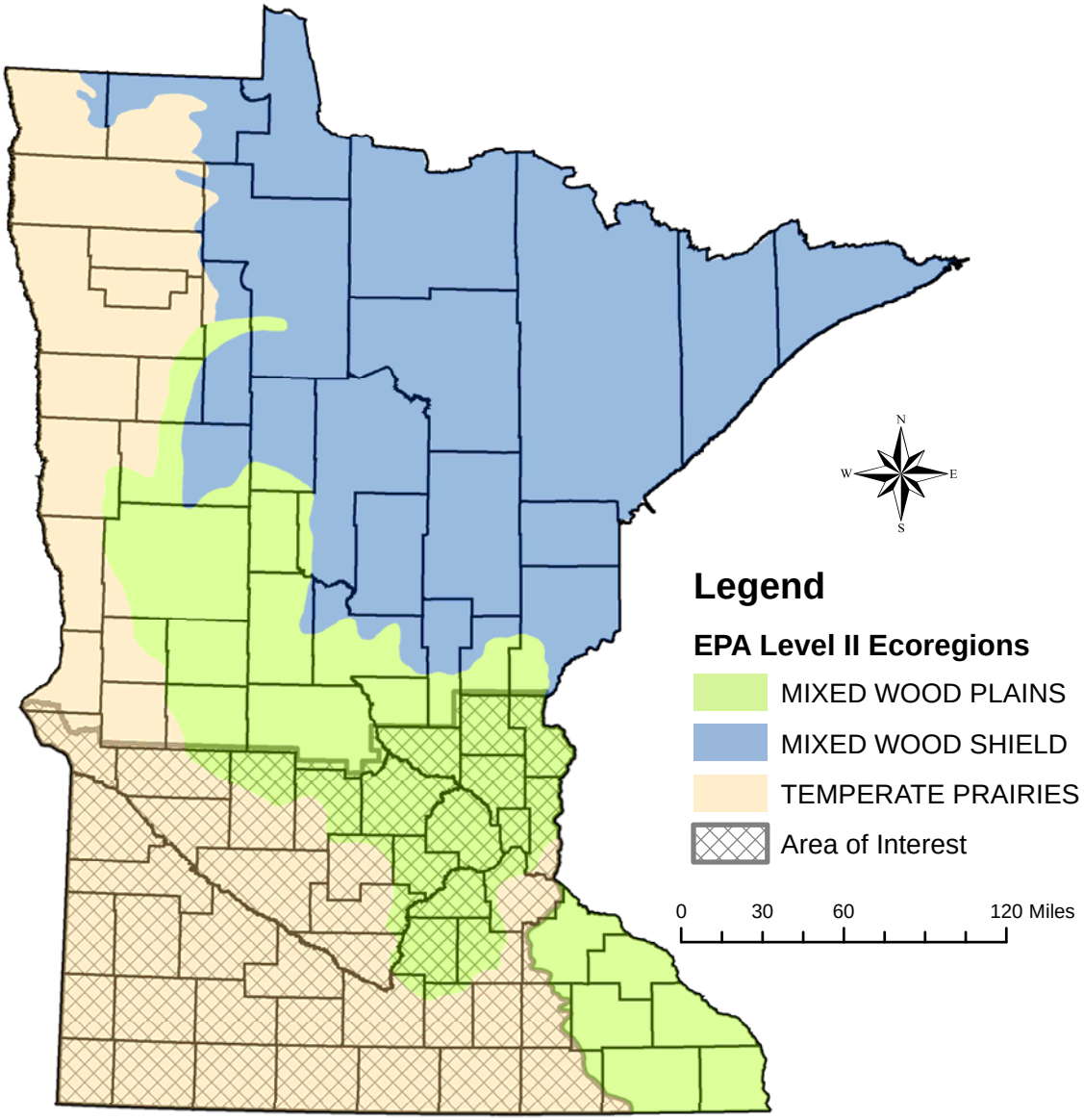
IV. TOTAL ENRTF REQUEST BUDGET 4 years

BUDGET ITEM (See "Guidance on Allowable Expenses")	**AMOUNT**
Personnel: Hydrologist This position is the primary position for field work, data analysis, and report writing. Average 0.5 FTE for 4 years, totaling 2.0 FTE. Of the requested amount, 73% will be salary and 27% will be fringe benefits.	$ 186,184
Personnel: Student Worker This position would support the Hydrologist with fieldwork, data collection, and data management. Average 0.3 FTE for 4 years, totaling 1.2 FTE. Of the requested amount, 100% will be salary and 0% will be fringe benefits.	$ 17,687
Professional/Technical/Service Contracts: None	$ -
Equipment/Tools/Supplies: Shallow monitoring well supplies for 90 wells. This includes Schedule 40 10-micron PVC, locking caps, bottom caps, locks, geo-textile material, packing sand, bentonite and miscellaneous supplies (chain, electrical tape, soil knife, notepads, and flagging).	$ 6,230
Equipment/Tools/Supplies: Data collection equipment including Solinst Data loggers for 90 wells at $600/well, Solinst Baro loggers for 20 sites at $300 site, a water lever monitor, and an optical reader for the data loggers.	$ 60,575
Acquisition (Fee Title or Permanent Easements): None	$ -
Travel: In-state lodging ($100 per night for 68 nights)	$ 6,800
Travel: Consistent with BWSR Policy and State Law - total for 4 year period	$ 5,256
Travel: Truck rental fees ($497.10 a month for 24 months)	$ 11,930
Additional Budget Items: None	$ -
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =	$ 294,662

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:	NA	
Other State $ To Be Applied To Project During Project Period:	NA	
In-kind Services To Be Applied To Project During Project Period: BWSR Staff Time @$9,000 per year for grant management, quality assurance, assistance with field work, and data management	$ 36,000	
Past and Current ENRTF Appropriation:	NA	
Other Funding History:	NA	

Evaluating Long-Term Success of Wetland Hydrology Restoration



The map above shows the EPA Level II Ecoregions of Minnesota and the proposed area for this study, which is also the area where BWSR is assessing the quality of vegetation at restored wetlands under an EPA grant. Below left is a drained and cropped wetland common of the area, below right shows the same wetland two years after restoration. The middle photograph shows installation of a shallow wetland monitoring well similar to what would be used in the assessment.

Project Manager Qualifications and Organization Description

The Board of Water and Soil Resources (BWSR), an agency of the State of Minnesota, administers programs that prevent sediment and nutrients from entering the State's lakes, rivers, and streams; enhance fish and wildlife habitat; and protect wetlands. The twenty member board, consisting of representatives of local and State government agencies and citizens, sets a policy agenda designed to enhance service delivery though partnerships with local governments. Board members, including the board chair, are appointed by the governor to four-year terms. The board is the State's administrative agency for 90 soil and water conservation districts, 46 watershed districts, 23 metropolitan watershed management organizations, and 80 county water managers. BWSR has specific statutory authority to develop rules for the implementation of the Wetland Conservation Act and the State wetland banking program, and to provide compensatory wetland mitigation for eligible public road projects using funds allocated by the legislature.

The BWSR mission is to: "Improve and protect Minnesota's water and soil resources by working in partnership with local organizations and private landowners." Core functions include implementing the State's soil and water conservation policy and comprehensive local water management, as well as administering the WCA. To carry out these responsibilities, BWSR has hired and retained a pool of highly experienced staff to plan, design, construct, and manage wetland restoration projects. In addition to administrative and management positions, BWSR technical staff positions include: Wetland Specialists, Wetland Banking Specialists, Conservation Engineers and Technicians, Soil Scientists, Vegetation Specialists, and Hydrologists.

The BWSR Project Manager for the proposal will be Tim Smith. Mr. Smith is currently the BWSR Wetland Banking Coordinator responsible for oversight and administration of the Minnesota Wetland Bank, a position he has held since June of 2016. His responsibilities also include supervision of five technical staff and administration of two federal grants totaling in excess of $1.2 million. Prior to being employed at BWSR Mr. Smith spent nineteen years with the U.S. Army Corps of Engineers in California, North Carolina, and Minnesota. His responsibilities with the Corps were diverse and included five years working as a project manager performing planning and project management tasks for federal civil works projects with budgets ranging from several hundred thousand to eight million dollars. He also spent fourteen years as a senior project manager and supervisor in the Corps' regulatory program implementing the Clean Water Act Section 404 permitting program throughout Minnesota and Wisconsin. Mr. Smith received a Bachelor of Science in Environmental Administration from the University of Evansville and a Master's Degree in Environmental Science from Indiana University. His background and professional experiences make him a highly capable and competent Project Manager for the work proposed under this grant.