Environment and Natural Resources Trust Fund
2011-2012 Request for Proposals (RFP)

Subd: 05i

Project Title: Determination of Phosphorus Reduction from Perpetual Easements

Category: B. Water Resources

Total Project Budget: $ $125,000

Proposed Project Time Period for the Funding Requested: 3 yrs, July 2011 - June 2014

Other Non-State Funds (secured): $ 0

Summary:

Most studies are not long enough to evaluate reductions in phosphorus. This study will examine limited-duration and perpetual easements and their effectiveness at reducing phosphorus transport to streams.

Name: Eric Mohring

Sponsoring Organization: Board of Water and Soil Resources

Address: 520 Lafayette Rd N

Saint Paul MN 55155

Telephone Number: 651-297-7360

Email eric.mohring@state.mn.us

Web Ad

Location:

Region: Central

Ecological Section: North Central Glaciated Plains (251B)

County Name: Renville

City / Township:

2011-2012 MAIN PROPOSAL

PROJECT TITLE: Potential Benefits of Perpetual Easements on Phosphorus Reduction

I. PROJECT STATEMENT

Most studies of management practices are not long enough to evaluate reductions in phosphorus. Failure to show phosphorus reductions may cause reluctance from landowners to participate in land retirement programs. It is up to scientists and resource managers to demonstrate that immediate reductions in phosphorus are not always expected. Recent ENRTF projects (ML 2005 Subd. 7(c) and ML 2007 Subd. 5(c)) studied the impacts of agricultural land retirement programs on stream water quality and biotic integrity at sites in the Minnesota River Basin. The projects demonstrated that land retirement programs are a positive influence on stream quality, resulting in lower nitrogen concentrations and better fish quality. However, these studies did not demonstrate a relationship between **phosphorus** and **amount** of land retirement.

West Fork Beaver Creek is an important local resource and has a high profile among recreational users, especially kayakers. The high resource quality, visibility to Minnesota recreationists, and on-going data collection at this site make it ideal for this investigation and takes advantages of cost-sharing. The Hawk Creek Watershed Project has noted that phosphorus concentrations have decreased in West Fork Beaver Creek over the past 10 years, coinciding with the increase in land retirement through the Reinvest in Minnesota (RIM) program and Conservation Reserve Enhancement Program (CREP). Renville County, which includes most of the West Fork Beaver Basin, has the greatest number of acres enrolled in the RIM program in the State of Minnesota, for the longest duration. This leads us to the hypothesis that reductions in stream phosphorus concentrations are related to the **length of time** that the surrounding land has been in retirement.

Confirming this hypothesis would be important to the Minnesota Board of Water and Soil Resources (BWSR) management decisions and policy of prioritizing perpetual easements over limited duration easements and may encourage more participation. This also will be useful to BWSR management for setting priorities and providing for responsible use of taxpayer dollars.

The Minnesota BWSR, the U.S. Geological Survey, and Hawk Creek Watershed Project will cooperate in this study using primarily existing phosphorus data. Some quality-assurance samples will be collected to ensure that current phosphorus samples are comparable to historic values. The phosphorus data will be compared to existing RIM and CREP contract data to determine length of time acres have been enrolled in the program. A geographic information system (GIS) coverage will be used to complete statistical analyses and to relate length of time to potential phosphorus reduction.

II. DESCRIPTION OF PROJECT ACTIVITIES

The BWSR and USGS, with cooperation from Hawk Creek Watershed Project, propose to analyze existing and new data to determine land retirement history and compare to existing USGS and Hawk Creek Watershed Project phosphorus data from West Fork Beaver Creek. The objective would be to determine if phosphorus concentrations have decreased in relation to the length of time land has been in retirement through the RIM program. This project takes

advantage of data that have already been collected. In order to compare the Hawk Creek Watershed Project and USGS data, quality assurance samples will be collected during 2011 and 2012. Minnesota Valley Testing Lab will be used and be evaluated in order to verify performance standards. The samples will offer continued assurance that the two data sets are comparable. In addition statistical analyses will be performed to control for other factors (such as distance of land retirement from the stream or streamflow) that may have an effect on total phosphorus concentration. A report will document phosphorus reduction in the West Fork Beaver Creek and the history of land retirement in the RIM programs in the basin. The report will be the basis for outreach activities including presentations to BWSR and local governments, fact sheets, and workshops in order to explain results of participation the RIM program.

Activity 1: Collect water samples to evaluate existing data from multiple sources and time periods **Budget:** $ 10,326

The Hawk Creek Watershed Project, with the help of USGS personnel, will collect and analyze 12 samples over 2 years for quality assurance purposes.

Outcome	Completion Date
1. Evaluate Minnesota Valley Testing Lab performance standards	*9-30-2011*
2. Collect samples and analyze for phosphorus and other nutrients	*9-30-2012*

Activity 2: Perform geographic spatial analysis of historical RIM participation, summarize documentation and statistical analysis of landscape patterns of RIM participation, and write a final report **Budget:** $ 114,674

A student will be hired by the USGS to complete a geographic analysis of the RIM. The USGS will complete statistical analyses. A peer-reviewed report documenting results benefits of easements will be completed. Outreach activities to communicate the results will include presentations to BWSR and local governments, fact sheets, and workshops, in order to put the results to use in management decisions and policy.

Outcome	Completion Date
1. Database of RIM acres and analysis of years in program	*6-30-2012*
2. Statistical interpretation of RIM and phosphorus concentrations	*12-30-2012*
3. Draft report provided to the LCCMR quantifying benefits of easements	*3-30-2013*

III. PROJECT STRATEGY

A. Project Team/Partners

Eric Mohring (BWSR) will coordinate project research (in kind). The majority of the funding ($125,000) will be for a contract with the U.S. Geological Survey (USGS). Victoria Christensen (USGS) will guide quality-assurance protocol, perform statistical analysis, write report, and supervise graduate GIS student. Funding ($1000) will go to the Hawk Creek Watershed Project for sample analysis. Cory Netland (HCWP) will coordinate collection of water-quality samples.

B. Timeline Requirements

The proposed project will be completed in 3 years.

C. Long-Term Strategy and Future Funding Needs

The proposed research fits into BWSRs larger task to prioritize perpetual and limited duration easements. The proposed research also fits with the USGS strategic plan of providing water information to the nation. This project proposal resulted from information gathered from previous ENRTF projects. It will be completed in the 3 years with the requested funds. However, data

collected during 2011-2012 and the analysis of historical data, will complement any future research in this area.

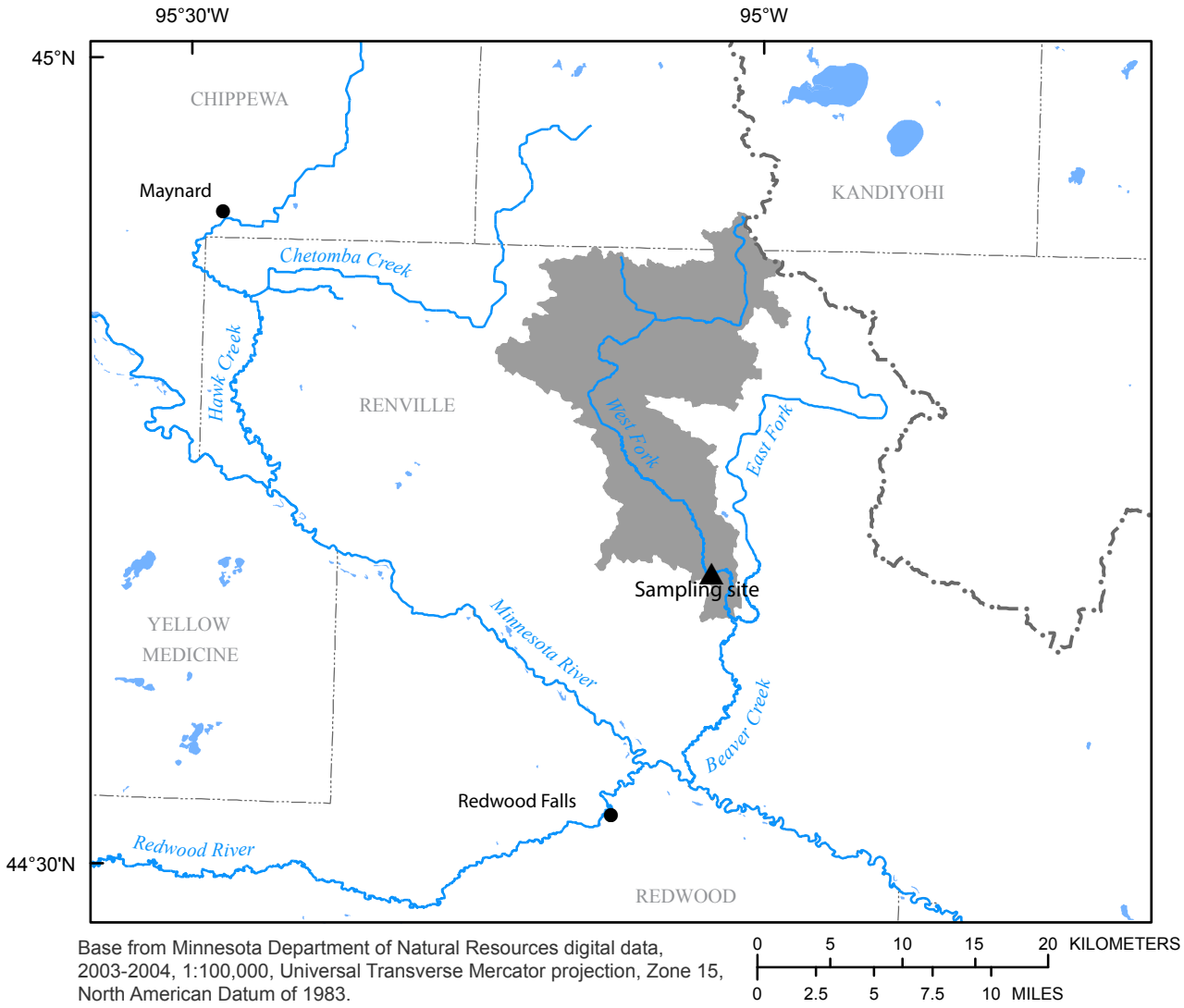
2011-2012 Detailed Project Budget

IV. TOTAL TRUST FUND REQUEST BUDGET 3 years

BUDGET ITEM	AMOUNT
Contracts: USGS - Hydrologist, 20%FTE, 30% fringe, 3 years	$ 64,896
USGS - GIS Student, 30%FTE, 30% fringe, 3 years	$ 39,424
USGS - Hydrologic Technician, 5%FTE, 30% fringe, 2 years	$ 8,112
USGS - GIS specialist & water-quality specialist, 5%FTE, 30% fringe, 1 year	$ 6,354
Contracts: Minnesota Valley Testing, Nutrient analysis and sample shipping costs (contract through Hawk Creek Watershed Project)	$ 1,000
Contracts: USGS National Water-Quality Lab	$ 494
Contracts: USGS publishing network, editing, printing, illustrations	$ 4,000
Equipment/Tools/Supplies: Sample bottles, analytical blank water, filters, preservatives, ice	$ 400
Travel: Travel to sampling site. $0.55 per mile, no per diem	$ 220
Additional Budget Items: Fedex of samples to National Water Quality Laboratory	$ 100
TOTAL ENVIRONMENT & NATURAL RESOURCES TRUST FUND $ REQUEST	$ 125,000

V. OTHER FUNDS

SOURCE OF FUNDS	AMOUNT	Status
Other Non-State $ USGS 40/60 matching funds	$ 84,000	Pending
Other State $ Being Applied to Project During Project Period:	0.00	
In-kind Services During Project Period: BWSR hydrologist, project oversight, communications, presentations, report writing	$ 20,000	
Remaining $ from previous ENRTF Appropriation	0.00	
Funding history: ML 2005, First Special Session, [Chap.1], Art. 2, Sec. [10], Subd. 7(c) and ML 2007, [Chap. HF 293], Sec.[2]. Subd. 5(c).	$ 575,000	



EXPLANATION

- West Fork Beaver Creek drainage subbasin
- Boundary of Minnesota River Basin
- Sampling site

Project Manager Qualifications and Organization Description

Eric Mohring, Hydrologist, Minnesota Board of Water and Soil Resources

Experience:

Eric Mohring has a BS in geology from Princeton University and an MS in hydrogeology from the University of Minnesota. He is a Licensed Professional Geologist in Minnesota and has 23 years experience with state government including the Minnesota Board of Water and Soil Resources (BWSR) and the Department of Natural Resources (DNR). Duties have included: assisting local governments with hydrology and water management, data base management, conducting hydrology training, evaluating pollution reduction benefits, hydrogeologic investigations and regional studies, technical assistance to state agencies, local units of government, and the public. He has 2 years experience in private consulting. Responsibilities for this proposal will include project over-sight, technical assistance, report review, and outreach.

Organization Description:

The Minnesota Board of Water and Soil Resources (BWSR) is a state government agency. The mission of BWSR is to improve and protect Minnesota's water and soil resources by working in partnership with local organizations and landowners.

Victoria Christensen, Hydrologist, United States Geological Survey

Experience:

Victoria Christensen has a BA in management from Hamline University and a BS in geology and MS in water resources from the University of Kansas. She is currently a project chief for the U.S. Geological Survey, Minnesota Water Science Center. She has 18 years of work experience in the fields of ground water and water quality. Her experience includes managing several research projects monitoring agricultural basins. She has served as project chief on studies of nutrient and pesticide occurrence and distribution, statistical modeling, and ammonia assimilative capacity. Her research history includes studies of water quality, sediment quality and ground-water recharge. Responsibilities for this proposal will include sampling design, statistical analysis, data review and compilation, report preparation, and outreach.

Organization Description:

The United States Geological Survey is a federal government agency in the Department of Interior. The mission of the USGS is to provide reliable scientific information and enhance and protect our quality of life.

Cory H. Netland, Coordinator, Hawk Creek Watershed Project

Experience:

Cory Netland has a BS in biology from the University of Minnesota-Duluth and is currently the Coordinator of the Hawk Creek Watershed Project. He has 7 years of work experience in the field of surface water-quality improvement. His experience includes enrollment and maintenance of Conservation Reserve Program (CRP) and Reinvest in Minnesota (RIM) lands while working for two Soil and Water Conservation Districts. Current duties include the management of 10 grants that the Watershed Project currently has open. Also, all grant reporting, reimbursement requests, modifications, and applications are performed by Mr. Netland. Responsibilities for this proposal will include physical collection of water samples, assistance with data collection, and outreach.

Organization Description:

The Hawk Creek Watershed Project is a local unit of government that includes a governing Executive Committee consisting of one County Commissioner from each of the three counties in the watershed: Renville, Chippewa, and Kandiyohi Counties. The motto of the Project is "helping put conservation on the landscape."