Environment and Natural Resources Trust Fund
2012-2013 Request for Proposals (RFP)

Project Title: **ENRTF ID:** **046-C1**

Curly Leaf Pondweed Treatment and Removal Effectiveness

Topic Area: C1. Invasive Species - Aquatic

Total Project Budget: $ 285,000

Proposed Project Time Period for the Funding Requested: 3 yrs, July 2013 - June 2016

Other Non-State Funds: $ 0

Summary:

Several Minnesota lakes are impaired by Curly leaf pondweed. This project would measure effectiveness of harvest of this invasive species, and review the benefit of the harvested material as fertilizer.

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Sponsoring Organization: Mankato State University - Water Resources Ctr

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Location

Region: SE

County Name: Blue Earth, Faribault

City / Township:

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity Readiness	_____ Leverage	_____ Employment	_____ TOTAL _____%

Environment and Natural Resources Trust Fund (ENRTF)
2012-2013 Main Proposal

PROJECT TITLE: Curly Leaf Pondweed treatment and removal effectiveness

I. PROJECT STATEMENT *(3/4 page or less)*

Curly Leaf pondweed (CLP) has been identified in over 700 lakes within the state of Minnesota. The natural life cycle of this aquatic invasive species results in its complete senescence (death of the plant) by midsummer. The dead plant material forms floating mats of decaying vegetation that dramatically limit recreational opportunities, produce unpleasant odors, lower dissolved oxygen levels, and potentially lead to fish kills. This annual die off is also suspected of causing large releases of nutrients back into the water column, contributing to water quality impairments. This nutrient release is suspected of being a major contributor to potential algal blooms. Given the widespread distribution of CLP, it is important to identify the treatment options that not only control CLP abundance, but also reduce internal nutrient loading resulting from CLP senescence.

Lura Lake is located in southern Blue Earth County and northern Faribault County within the Le Sueur River watershed of south central Minnesota. The Minnesota Pollution Control Agency (MPCA) listed Lura Lake as impaired for aquatic recreation due to excess nutrients under section 303(d) of the Clean Waters Act. Lura Lake has a nearly 1:1 watershed to lake ratio (1457 acre watershed/1,294 lake area), making it an ideal candidate to examine lake management, monitor implementation effectiveness, and improve water quality within the system. Modeling completed through the Lura Lake TMDL indicated that internal nutrient cycling, largely from the CLP, was likely a large cause of the water quality impairment, making it a priority for implementation activity.

The Water Resources Center would like to implement and evaluate the effectiveness of mechanical harvest. Mechanical harvesting a portion the Curly Leaf in the lake will allow the WRC to determine the amount of nutrient removed from the system, and how this effects the nutrient cycling within the lake system. Furthermore, all CLP harvested will be evaluated and tested for use as a source of fertilizer on agricultural fields. This project will allow an investigation of the cost effectiveness and potential to use these methods to improving water quality, fish habitat, and recreational opportunities on other Minnesota lake systems, as well the feasibility as a treatment option with multiple benefits to the natural and human uses of the landscape.

II. DESCRIPTION OF PROJECT ACTIVITIES

Activity 1: (Pre implementation planning) **Budget:** $18,000.00

Outcome	Completion Date
1. Bids from aquatic vegetation harvesters received, with a harvester selected	September1 st, 2013
2. Find spreading acres, and test soils before application	November 1 st, 2013
3. Complete all DNR permits required to harvest the allowable percentage	November 1 st, 2013
4. Landowner outreach and education	December 30th 2013

Activity 2: (Implementation) **Budget:** $155,000

Outcome	Completion Date
1. Hire contractor to mechanically harvest 15% of the littoral zone in Lura Lake	May 30th, 2015
2. Compare to unharvested areas (control)	May 30th, 2015
3. Transport harvested materials to testing area	June 1st, 2015

Activity 3: (Pre/Post Implementation Point-Intercept Survey) **Budget:** $15,000.00

Outcome	Completion Date
1. Initial Point-Intercept Survey of Macrophytes in Lura Lake	May 1st, 2015
2. 2nd Point-Intercept Survey of Macrophytes immediately before implementation	May 15th, 2015
3. 3rd Point-Intercept Survey immediately after implementation	May 30th, 2015

Activity 4: (Pre/Post Implementation Water Quality Data Collection) **Budget:** $50,000.00

Outcome	Completion Date
1. Water quality sampling protocol developed	September1 st, 2013
2. Weekly water quality data collection at three sites within Lura Lake	August 15th, 2015

Activity 5: (ARC GIS Map Creation/Statistical Comparison) **Budget:** $15,000

Outcome	Completion Date
1. Creation of ARC GIS Maps that display the locations and densities of each species pre/post implementation	July 15th, 2015
2. Statistical comparisons of macrophyte density, species richness, species evenness, pre/post implementation water quality and Lura Lake TMDL data	November 30th, 2015

Activity 6: (Final report/Community Outreach) **Budget:** $32,000.00

Outcome	Completion Date
1. Develop final report highlighting findings	July 1, 2016
2. Present findings at no less than three conferences; post final report on MRBDC website	July 1, 2016

III. PROJECT STRATEGY

A. Project Team/Partners

The Water Resources Center (WRC) at Minnesota State University, Mankato (MSU, M) will be the organization that is receiving funds from the Environment and Natural Resources Trust fund to complete the objectives previously described. The Minnesota Department of Natural Resources (MNDNR) Invasive Species Program and Division of Fish and Wildlife have expressed an interest in the results of the research. Similarly, the University of Minnesota – Extension Southern Minnesota Outreach Center has also expressed interest in the project. The data collected will also be valuable to the MPCA and DNR when reviewing lake water quality data, impairments and treatment options.

B. Timeline Requirements

This project will be completed within a 36 month time period. The timeline of this research is in direct relation to the growing season of macrophytes in lakes in Minnesota. At least two years of harvest and data collection would be necessary to monitor the effects of the harvest and removal. Furthermore, the TMDL study conducted on these lakes from 2009-2011 provided a baseline dataset from which important conclusions can be drawn on the effects of these treatment options on water quality.

C. Long-Term Strategy and Future Funding Needs

The data collected within this project will be useful in determining the potential of harvest as strategy as part of a larger, state wide effort to control invasive aquatic species and improve water quality in multiple lake and river systems.

2012-2013 Detailed Project Budget

INSTRUCTIONS AND TEMPLATE (1 PAGE LIMIT)

Attach budget, in MS-EXCEL format, to your "2012-2013 LCCMR Proposal Submit Form".

(1-page limit, single-sided, 10 pt. font minimum. Retain bold text and DELETE all instructions typed in italics. ADD OR DELETE ROWS AS NECESSARY. If a category is not applicable write "N/A" , leave it blank, or delete the row.)

IV. TOTAL ENRTF REQUEST BUDGET *[Insert # of years for project]* **years**

BUDGET ITEM *(See list of Eligible and Non-Eligible Costs, p. 11)*	**AMOUNT**
Personnel: **-**Primary - Reseach analyst Intermediate - $83,624.00 (40% FTE/yr for 3 years) -Secondary -Research Scientist 2 - $3,369.60 (3%FTE/yr for 3 years) -Tertiary - Office administrator - $4,815.00 (3% FTE/yr for 3 years)	$91,810
Contracts: Specific contractors TBD by bid process. -Contract: Macrophyte Harvester - 2 years - $145,000.00 -Contract: Truck/trailer to haul harvested material - 2 years - $5,000.00	$150,000
Equipment/Tools/Supplies: **-**Printing and reports - $410.0 -Lab analysis costs - $36,000.00 (3 sites, 26 samples/year, 2 years) -Mailings and outreach materials - $450.00	$36,860
Acquisition (Fee Title or Permanent Easements):	NA
Travel: -MSU motor pool fees - vehicle, mileage, and watercraft fuel - 2 years - $6,080.00	$6,330
Additional Budget Items:	NA
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =	$285,000

V. OTHER FUNDS

SOURCE OF FUNDS	**AMOUNT**	**Status**
Other Non-State $ Being Applied to Project During Project Period:	NA	
Other State $ Being Applied to Project During Project Period:	NA	
In-kind Services During Project Period:	NA	
Remaining $ from Current ENRTF Appropriation (if applicable):	NA	
Funding History:	NA	

PROJECT TITLE:

Project Manager Qualifications and Organization Description

Shannon Fisher, Project Manager
As the Director of the Water Resources Center, Associate professor, and Executive Director of the Minnesota River Joint Powers Board, Shannon Fisher has coordinated a wide variety of research and technical assistance projects. Though his additional experience working as a Natural Resource Specialist with the Minnesota department of Natural Resources (DNR), Shannon brings over a decade of management experience to this project.

Recent projects related to the proposal managed by Shannon include:

- Upper Cannon Lake Project Excess Nutrients TMDL. 2008-2011.
- Lura Lake Excess Nutrients TMDL. 2008-2011.
- Development of TMDL Plans for the Rush River and High Island Creek Watersheds.
- Minnesota River Monitoring (2008-2010). 2007-2010.
- Lake Crystal Excess Nutrient TMDL. 2008-2010.
- Evaluation of Nutrient and Bacterial Transport for Manure Applied Lands. 2008.
- Blue Earth River Turbidity TMDL Study. 2007-2009.
- Loon Lake and Crystal Lake Clean Water Partnership Project. 2007-2009.
- Minnesota River Basin Non-point Nutrient Trading Partnership. 2006-2009.

Water Resources Center, Minnesota State University, Mankato (WRC)
The Water Resources Center (WRC) of Minnesota State University, Mankato was created in 1987 to serve as a regional center for environmental research and information exchange. The mission of the WRC is to gather, interpret, and distribute data of environmental significance to help citizens enhance the quality of regional lakes, rivers, wetlands, and groundwater. This is accomplished through faculty and student applied research, educational programming, technical assistance, and water resource planning. The WRC is uniquely situated to disseminate the latest information about the Minnesota River due to its involvement with data collection and distribution, policy development, and communication throughout the Minnesota River Basin.

Since its beginning, the WRC has participated in over 100 research, educational, and planning projects involving partnerships with dozens of public and private organizations. These projects range from groundwater, lake assessment, and TMDL studies to water quality workshops to development of watershed-based plans for surface water quality protection. Our stability since 1987 stands as a testament to the objective and quality products we produce. Long-term partnerships with counties, nonprofit organizations, and state agencies have resulted in many important and far-reaching land and water resource initiatives. We have a dedicated staff and look forward to enhancing the public's connection with the Minnesota River.