



Environment and Natural Resources Trust Fund (ENRTF) M.L. 2011 Work Plan

Date of Status Update:

Date of Next Status Update: 1/1/2012

Date of Work Plan Approval: 8/11/2011

Project Completion Date: 6/30/2014

Is this an amendment request? _____

Project Title: Trout Stream Springshed Mapping in Southeast Minnesota - Phase III

Project Manager: Calvin Alexander, Jr.

Affiliation: U of MN

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Location:

Counties Impacted: Dakota, Dodge, Fillmore, Goodhue, Houston, Mower, Olmsted, Rice, Wabasha, Washington, Winona

Ecological Section Impacted: Paleozoic Plateau (222L)

Total ENRTF Project Budget:	ENRTF Appropriation \$:	280,000
	Amount Spent \$:	<u>0</u>
	Balance \$:	280,000

Legal Citation: M.L. 2011, First Special Session, Chp. 2, Art.3, Sec. 2, Subd. 05b2

Appropriation Language:

\$250,000 the first year and \$250,000 the second year are from the trust fund to continue to identify and delineate water supply areas and springsheds for springs serving as cold water sources for trout streams and to assess the impacts from development and water appropriations. Of this appropriation, \$140,000 each year is to the Board of Regents of the University of Minnesota and \$110,000 each year is to the commissioner of natural resources.

I. PROJECT TITLE: Innovative Springshed Mapping for Trout Stream Management-Continuation (U of MN)

II. PROJECT SUMMARY: Trout streams depend on a steady supply of clean, cold water to exist. Minnesota’s karst lands contain 173 designated trout streams each of which is sourced from springs. Those trout springs are under increasing pressure from changing land use. Additional large groundwater withdrawals for energy production and other development loom in the future. Delineation of the recharge areas or springsheds of the trout springs is a crucial first step in the protection of the trout fisheries and the restoration of those that have been degraded. This project is to develop innovative identification and delineation tools to determine the supply areas (springsheds) for springs serving as coldwater sources for modern and historic trout streams and assessing impacts on them from land and water development.

III. PROJECT STATUS UPDATES:

Project Status as of 15 January 2012

Project Status as of 15 July 2012

Project Status as of 15 January 2013

Project Status as of 15 August 2013

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Innovative Trout Springshed Maps and Reports

Description: Springsheds that feed source springs of trout streams will be delineated in the Galena, Prairie du Chien, and St. Lawrence karst lands. Maps of the springsheds will be transferred to the U of M for web posting and will be linked to the DNR web site. The existing temperature-monitoring network will be maintained and expanded as equipment and sites are available. The results of our dye tracing, spring monitoring, and hydrostratigraphy investigations will be used to develop spring assessment protocols.

Summary Budget Information for Activity 1:

ENRTF Budget: \$ 280,000
Amount Spent: \$ 0
Balance: \$ 280,000

Activity Completion Date:

Outcome	Completion Date	Budget
1. Innovative Trout Springshed Maps and Reports (Conduct dye traces and field investigations for springshed map production, maps and reports of completed traces and spring parameter monitoring including spring assessment protocol development).	30 June 2013	\$280,000

(See also the companion U of M project work program Activity 1)

Activity Status as of 15 January 2012

Activity Status as of 15 July 2012

Activity Status as of 15 January 2013

Activity Status as of 1 August 2013

Final Report Summary: 1 August 2013

V. DISSEMINATION:

Description: GIS-based maps and written reports of the springsheds will be prepared and disseminated to the LCCMR, interested residents and to local, regional and state resource managers and regulators interested in specific targeted areas. Interim dye trace results will be available as GIS shape files and derived products on a dye trace by dye trace basis. Data tables of discharge and chemistry will be available as developed. Spring assessment protocols will be published and made available to local and state agency staff.

Status as of 15 January 2012

Status as of 15 July 2012

Status as of 15 January 2013

Status as of 1 August 2013

Final Report Summary: 1 August 2013

VI. PROJECT BUDGET SUMMARY:

A. ENRTF Budget:

Budget Category	\$ Amount	Explanation
Personnel:	\$ 193,059	1 Research Assistant (50%), 1 Research Specialist (90%), P.I. (8%), Research Scientist (12%), Under graduate lab assistant.
Equipment/Tools/Supplies/Analytical:	\$ 35,900	Field equipment, dye, sampling supplies
Travel Expenses in MN:	\$ 20,041	Mileage and expenses
Contract with MGS	\$ 31,000	1 month/year of Tony Runkel and Bob Tipping
TOTAL ENRTF BUDGET:	\$ 280,000	

Number of Full-time Equivalent (FTE) funded with this ENRTF appropriation: 1.75

B. Other Funds:

Source of Funds	\$ Amount Proposed	\$ Amount Spent	Use of Other Funds
U of Mn (1 m/yr for Alexander)	\$20,848		P.I salary

TOTAL OTHER FUNDS:	\$ 20,848	\$	
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VII. PROJECT STRATEGY:

A. Project Partners: Minnesota Department of Natural Resources, total from appropriation \$220,000

B. Project Impact and Long-term Strategy: By delineating springsheds and making web-based maps available, this project will provide critical information for the protection and management of the springs that form the coldwater streams of southeast Minnesota. This information is critical for Total Maximum Daily Load (TMDL) implementation strategies, impaired waters remediation, ground water protection and allocation issues, and local land and water management decisions.

Karst ground water flow is the most complex hydrogeologic environment in Minnesota. Springs are the natural features that return groundwater to surface waters. Karst springs respond much faster to surface recharge than is expected from conventional hydrology theory. Karst springs exhibit a wide range of rapid responses to recharge events. Springs integrate all of the natural and anthropogenic processes that occur in their recharge areas – in their individual springsheds. Springshed mapping is critical component of karst aquifer characterization. Long-term resources are needed to gather and maintain the parameters necessary to realistically, effectively manage karst springs in Minnesota and to train staff and resource managers in the use of the available karst data. LCMR and LCCMR have played a leading role in the effort to understand and manage Minnesota’s karst springs

The availability of high-resolution LiDAR maps, scheduled for July 2009, will produce a flood of new information showing the locations of karst features. We anticipate that new information will have a major impact on the springshed mapping project.

C. Spending History:

Funding Source	M.L. 2005 or FY 2006-07	M.L. 2007 or FY 2008	M.L. 2008 or FY 2009	M.L. 2009 or FY 2010	M.L. 2010 or FY 2011
ENRTF appropriation to U M		250,000			
ENRTF appropriation to UM				250,000	

VIII. ACQUISITION/RESTORATION LIST:

IX. MAP(S):

X. RESEARCH ADDENDUM:

XI. REPORTING REQUIREMENTS:

Periodic work plan status update reports will be submitted not later than 15 January 2012, 15 July 2012, 15 January 2013, and 1 August 2013. A final report and associated products will be submitted between June 30 and August 1, 2013 as requested by the LCCMR.

Attachment A: Budget Detail for M.L. 2011 (FY 2012-13) Environment and Natural Resources Trust Fund Projects

Project Title: <i>Innovative Springshed ampping for Trout Stream Management</i>			
Legal Citation: <i>ML 2011 ...</i>			
Project Manager: <i>E. Calvin Alexander, Jr.</i>			
M.L. 2011 (FY 2012-13) ENRTF Appropriation: \$ 280,000			
Project Length and Completion Date: 30 June 2013			
Date of Update: 27 June 2011			

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 1 Budget	Amount Spent	Balance
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	Innovative Trout Springshed maps and Reports		
Personnel: Research Assistant: 2 years (50% 12 months per year) = \$77,781 Research Specialist: 2 year (90% 12 months per year) = \$56,716 Dr. E. Calvin Alexander, Jr.: 1 month per year salary & benefits for 2 years = \$20,848 Scott Alexander: 1.5 months per year salary & benefits for 2 years = \$16,805 undergraduate lab assistant: 2 years = \$20,909	\$ 193,059	0	\$ 193,059
Equipment/Tools /Supplies : Equipment: nitrate data loggers; temperature, conductivity, stage data loggers = \$20,000 Supplies: dye, charcoal, bottles, lab and field chemicals, lab and field expendable supplies = \$7,500	\$ 27,500	0	\$ 27,500
Analytical Expenses: Cation/anion analyses - Geology Lab at U of M approximately \$40 per sample, ~162 samples - \$6,500 Isotope analyses - Texas State, San Marcos, TX, approximately \$15 per sample, ~100 samples - \$1,500 (The Texas State lab has been used for previous phase of the proejct and continues to have the best capability available for this work at a reasonable price.	\$ 8,000	0	\$ 8,000
Travel & Subsistence In-state: mileage and expenses = \$20,041 (per amounts in University plan for employee expenses reimbursement)	\$ 20,441	0	\$ 20,441
Contracts: MGS Tony Runkel: 1 month per year and benefits for 2 years (8% time, 1 month per year) = \$16,000 Bob Tipping: 1 month per year and benefits for 2 years (8% time, 1 month/year) = \$15,000	\$ 31,000	0	\$ 31,000
COLUMN TOTAL	\$280,000	\$0	\$280,000