

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

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**Project Title:**

**ENRTF ID: 088-E1**

State Spring Inventory for Resource Management and Protection

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**Topic Area:** E1. NR Info Collection /Analysis - Statewide

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**Total Project Budget:** \$ 828,000

**Proposed Project Time Period for the Funding Requested:** 2 yrs, July 2013 - June 2015

**Other Non-State Funds:** \$ 0

**Summary:**

Springs are natural groundwater discharge points and are vital cold-water sources for Minnesota's streams. A statewide inventory is the crucial first step in spring management, monitoring, and preservation.

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**Location**

**Region:** Statewide

**County Name:** Statewide

**City / Township:**

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<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 Readiness	<input type="checkbox"/> Leverage	<input type="checkbox"/> Employment	<input type="checkbox"/> TOTAL _____%



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

**PROJECT TITLE: State Spring Inventory**

### **I. PROJECT STATEMENT**

Springs are critical resources in Minnesota and occur all across the state. They create coldwater (trout streams) and cool water fisheries, sustain base flow in streams, and create unique habitats (see attached map). In order to maintain spring flows and protect the resources that depend on springs, it is vital to inventory, assess, and monitor springs on a comprehensive, statewide basis. This need was recognized in the December 2008 document, *"Managing for Water Sustainability: Report of the EQB Water Availability Project"* from the Minnesota Environmental Quality Board which specifically recommends an inventory of the state's springs. Due to a lack of a comprehensive inventory of springs, resource managers are making decisions about water use without knowing of the presence or nature of these groundwater dependent resources. Intact springs help to maintain the integrity of aquatic systems against invasive species; knowing their locations is the first step in keeping them intact. Spring location information is also an important part of developing comprehensive watershed management strategies at the local level. In southeastern Minnesota's Root River watershed, the existing spring inventory and springshed mapping information is being used by local government and NGO staff to target landowners for land conservation assistance to improve groundwater quality and preserve groundwater flow.

This proposal details the initial phase of a four-year statewide inventory of Minnesota's springs. The inventory process will first focus on collecting and consolidating data from existing sources such as topographic maps, DNR records, local governments, public land survey records, universities, state and federal agencies and local interest groups. These data will be entered into the Minnesota Karst Features Database (KFDB). The KFDB, although known to be incomplete, is heavily used for project planning by private industry, local governments and state agencies. Spring location is important site information for a variety of projects and is one of the questions asked in the EAW/EIS process. As springs are preliminarily identified, project staff will begin the process of field-verification. In this process, staff will field-verify their presence and record information describing the spring's geology and hydrology.

DNR staff experience in southeast Minnesota has demonstrated that a comprehensive field inventory of all the springs along any given stream is a time-consuming and labor-intensive process. Colleagues from other states have also found this to be true. This project would also include time to evaluate methods for more efficient and cost-effective field spring inventory. Of particular interest is the use of airborne thermal scanners for spring detection. These scanners detect the temperature difference between springs and the surface water into which they discharge. During the second phase of this project, staff will investigate and evaluate the feasibility of using this technique to map springs in priority areas of the state. That evaluation will serve as the basis for future project planning and funding requests.

The data acquired during this project will be made web-accessible for use by the MPCA, LGU's, DNR, industry and citizen groups as they identify impaired waters, evaluate TMDL requirements, and target lands for protection, restoration and enhancement. The located springs, as groundwater system discharge points, can also be reviewed for potential inclusion in state and local groundwater quantity and quality monitoring efforts.

## II. DESCRIPTION OF PROJECT ACTIVITIES

### Activity 1: Spring Location Data Compilation & Management

**Budget: \$475,000**

Compile existing spring location information from Department of Natural Resources-Fisheries records, topographic maps, and other federal, state and local sources. These data will be entered into the web-accessible GIS database (MN Karst Features Data Base).

Outcome	Completion Date
1. Compile available spring location information	30 June 2015
2. Enter data into Karst Features Data Base or equivalent	30 June 2015

### Activity 2: Field Spring Survey

**Budget: \$353,000**

Verify compiled spring locations in the field and begin field surveys to locate additional springs. Target areas will be northeast and southeast Minnesota and other locations across the state as the need arises.

Outcome	Completion Date
1. Field verification of compiled spring locations	30 June 2015
2. Initial field survey to locate springs	30 June 2015

**Total Budget      \$828,000**

## III. PROJECT STRATEGY

### A. Project Team/Partners

**Jeffrey A. Green, P.G.**, will be the Project Manager. Jeff is the Springshed Mapping Hydrologist for the Minnesota Department of Natural Resources. He has extensive experience managing ENRTF projects and is the lead worker for the *“ENRTF- Innovative Trout Stream Springshed Mapping in Southeast Minnesota”* project. The Minnesota Geological Survey will partner with the DNR to provide geologic interpretations and maintain the existing Karst Features Database as the repository for spring information.

### B. Timeline Requirements

This is the first phase of an initial four-year project. The work will need to continue after the four-year period due to the statewide focus and the complexity of springs and their hydrologic systems.

### C. Long-Term Strategy

Springs are natural features that return groundwater to surface waters. The groundwater that discharges from springs is critical for maintaining surface stream flow in Minnesota’s streams and rivers. The quantity and quality of that water has a direct impact on surface water ecosystems and human use of those rivers and streams. This information is critical for Total Maximum Daily Load (TMDL) implementation strategies, impaired waters remediation, trout stream management, ground water protection and allocation issues, and local land and water management decisions. A long-term commitment to locating springs & identifying their springsheds is necessary for the future success of these efforts.

## Project Budget

### IV. TOTAL PROJECT REQUEST BUDGET

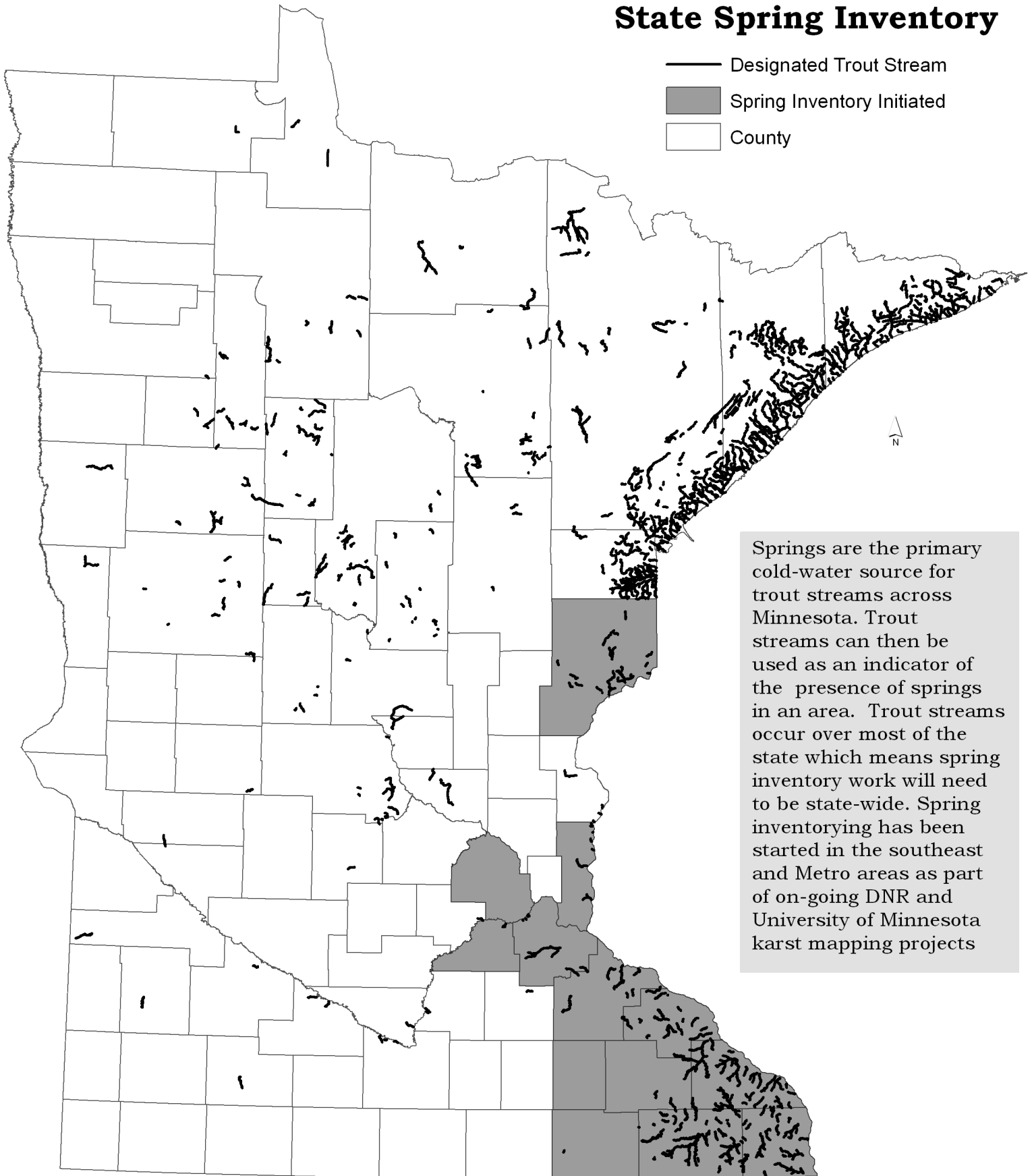
<u>BUDGET ITEM</u>	<u>AMOUNT</u>
<b>Personnel:</b>	
(2) Hydrologist 1 100% time (75% salary, 25% benefits )	\$ 240,000
(1) Hydrologist 3 100% time (75% salary, 25% benefits )	\$ 184,000
Information Technology Specialist 2 % 100 time (75% salary, 25% benefits ) (1)	\$ 145,000
<b>Contracts:</b> Geologic interpretations & field geolgy assistance Minnesota Geological Survey	\$ 30,000
<b>Equipment/Tools/Supplies:</b> Field equipment such as current meters, data loggers, field laptop computers, waders, hip boots, GIS software, GPS units.	\$ 40,000
<b>Acquisition (Fee Title or Permanent Easements): None</b>	
<b>Travel:</b>	
In-state vehicles for state-wide travel	\$ 93,000
In-state meals & lodging	\$ 45,000
<b>Additional Budget Items:</b> Direct Support Sevices- DNR used a rate of 6.5% to calculate costs for direct support services, which are DNR's direct and necessary business services required to support this proposal.	\$ 51,000
<b>TOTAL PROJECT BUDGET REQUEST TO LCCMR</b>	<b>\$ 828,000</b>

### V. OTHER FUNDS

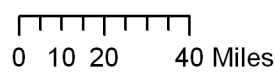
<u>SOURCE OF FUNDS</u>	<u>AMOUNT</u>	<u>Status</u>
<b>Other Non-State \$ Being Applied to Project During Project Period:</b>	\$ -	
<b>Other State \$ Being Applied to Project During Project Period:</b>		
	\$ -	
<b>In-kind Services During Project Period:</b>	\$ -	
<b>Remaining \$ from Current Trust Fund Appropriation (if applicable):</b>		
<b>Funding History:</b>		

# State Spring Inventory

- Designated Trout Stream
- Spring Inventory Initiated
- County



Springs are the primary cold-water source for trout streams across Minnesota. Trout streams can then be used as an indicator of the presence of springs in an area. Trout streams occur over most of the state which means spring inventory work will need to be state-wide. Spring inventorying has been started in the southeast and Metro areas as part of on-going DNR and University of Minnesota karst mapping projects



## **Environment Trust Fund 2013 Project Proposal**

**Title of proposal: State Spring Inventory**

### **Project Manager Qualifications**

Jeffrey A. Green

Jeff Green is a Hydrologist 3 and is the Springshed Mapping Hydrologist for the Minnesota Department of Natural Resources-Division of Ecological and Water Resources in Rochester. His primary areas of emphasis are karst hydrology, karst mapping, and carbonate hydrogeology. He has a M.S. in Water Resources Management and a B.S. with Distinction in Soil Science from the University of Wisconsin-Madison and is licensed as a Professional Geologist by the State of Minnesota. He currently is managing the ENRTF-Innovative Springshed Mapping-continuation project and serves as its staff. He has been involved in a variety of ENRTF- funded projects since 1993. He was the Project Manager on the ENRTF-Hydraulic Impacts of Quarries and Pits project from 2001 to 2004, is co-managing the current ENRTF-Springsheds project and is familiar with the process.

### **Organizational Description**

The mission of the Minnesota Department of Natural Resources (DNR) is to work with citizens to conserve and manage the state's natural resources, to provide outdoor recreation opportunities, and to provide for commercial uses of natural resources in a way that creates a sustainable quality of life.