

**Environment and Natural Resources Trust Fund
2014 Request for Proposals (RFP)**

Project Title:

ENRTF ID: 009-A

State Spring Inventory for Resource Management and Protection

Category: A. Foundational Natural Resource Data and Information

Total Project Budget: \$ 875,746

Proposed Project Time Period for the Funding Requested: 3 Years, July 2014 - June 2017

Summary:

Springs are natural points of groundwater discharge. This project will systematically inventory springs statewide to provide the fundamental data needed to maintain spring flows and protect groundwater-dependent resources.

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Sponsoring Organization: MN DNR

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Location

Region: Statewide

County Name: Statewide

City / Township:

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



PROJECT TITLE: State Spring Inventory for Resource Management and Protection

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, create unique ecological habitats, and help to maintain the integrity of aquatic systems against invasive species. 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. A partial inventory exists for southeastern Minnesota that is maintained in the Minnesota Karst Features Database (MN KFDB) at the Minnesota Geological Survey. The MN KFDB, although known to be incomplete, is heavily used for project planning by private industry, local governments and state agencies.

This proposal is the initial phase of a four-year statewide inventory of Minnesota's springs. The initial phase will 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 MN KFDB, or an equivalent, related database for the spring inventory. Work will begin to field-verify selected spring data and collect site-specific information such as location, geology, aquifer source, flow, temperature, and the springflow source area (springshed).

The field inventory and verification of springs is a time-consuming and labor-intensive process. This project will also evaluate methods for more efficient and cost-effective field inventory of springs. 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. If testing during this project shows use thermal imagery is cost effective, this technique would be used in a continuation project to map springs in priority areas and across larger, less accessible areas of the state.

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, will 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 and Management

Budget: \$394,373

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) or an equivalent, related database for long-term management and web access.

Outcome	Completion Date
1. Compile available spring location information	30 June 2017
2. Enter data into the MN Karst Features Data Base or equivalent and make available on-line	30 June 2017



Activity 2: Field Survey and Verification of Springs

Budget: \$481,373

Field verify compiled spring locations, collect site-specific information such as geologic setting, aquifer source, flow, temperature, and the springflow source area (springshed). This is a statewide project in scope but project design recognizes that initial emphasis will be in southeast and northeast Minnesota, along major rivers, and other areas with designated trout streams. This activity will also evaluate and test alternative methodologies, such as air-borne thermal scanners, to identify efficient and cost-effective procedures to identify and survey springs.

Outcome	Completion Date
1. Field verification of compiled spring locations	30 June 2017
2. Initial field survey to locate springs in priority areas	30 June 2017
3. Evaluate and test alternative methodologies for efficient spring location and field surveys.	30 June 2017

TOTAL BUDGET \$ 875,746

III. PROJECT STRATEGY

A. Project Team/Partners

The project team will include DNR specialists in springs, karst, and hydrogeologic systems mapping. The Minnesota Geological Survey will partner with the DNR to provide geologic interpretations and maintain the existing MN Karst Features Database as the repository for karst features and associated spring information.

B. Timeline Requirements

This is the first phase of a four-year project. Given the statewide scope of the project, it is projected that a continuation project for a total of four years of project work will be needed to bring the major inventory, site verification, and database work to closure. If spring mapping by thermal imaging methodology is determined feasible in this Phase 1 project, the continuation project will utilize the methodology for more thorough mapping of large or difficult to access areas. It is expected that some level of spring identification and site verification work will continue after the four-year project period as a result of on-going resource protection work by DNR or other agencies. On-going support of the spring inventory database will be needed by DNR or MGS to assure the assembled data are current and remain accessible to users.

C. Long-Term Strategy and Future Funding Needs

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. The state spring inventory is part of a long-term continuing need to identify, assess, and monitor all parts of the hydrologic cycle so that observed or projected hydrologic system response to change, whether climatic or anthropogenic, can be accurately interpreted.

2014 Detailed Project Budget

Project Title: State Spring Inventory for Resource Management and Protection

IV. TOTAL ENRTF REQUEST BUDGET 3 years (two year work plan with additional 1 year to complete work)

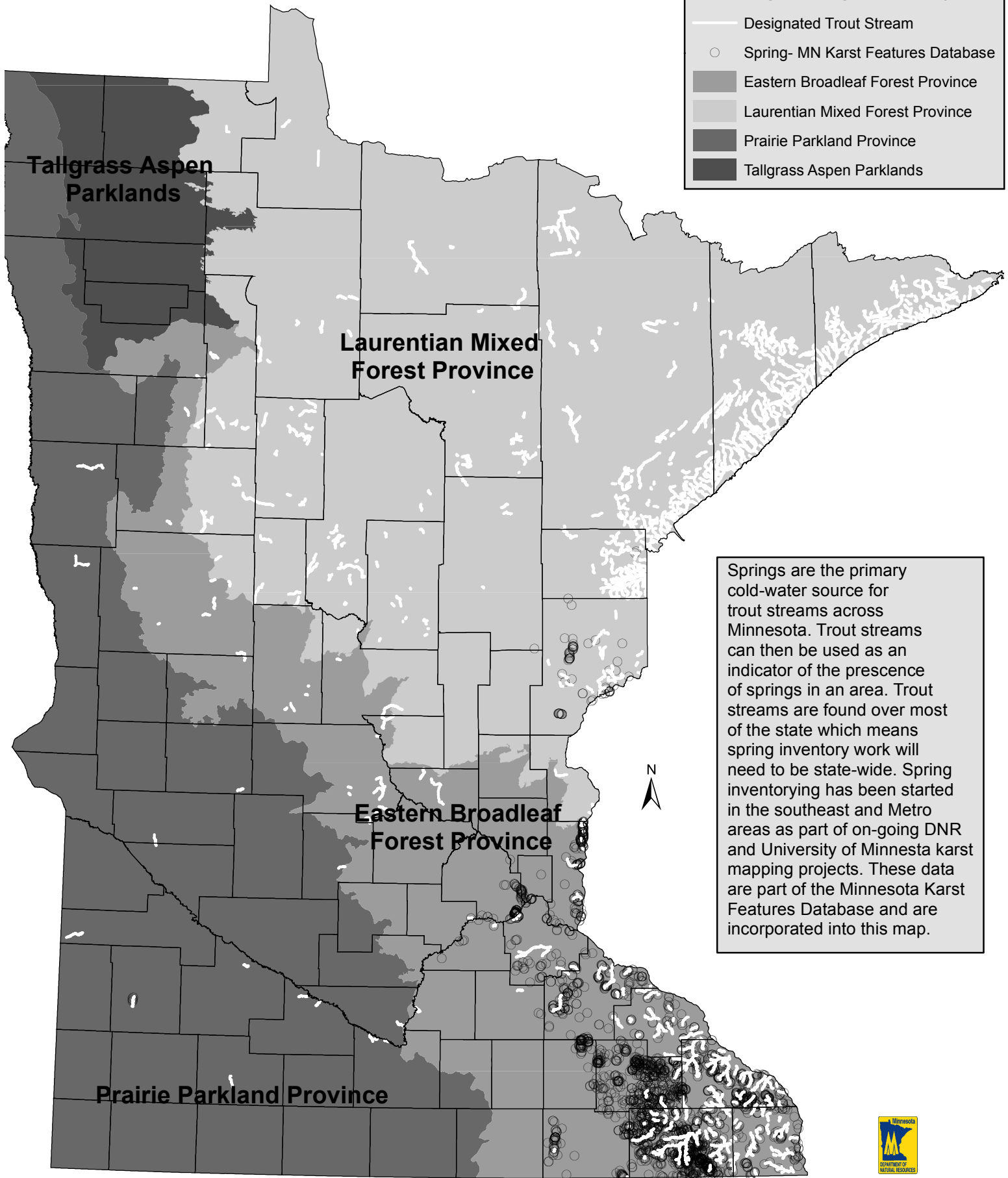
BUDGET ITEM	AMOUNT
Personnel: four positions, total 4 FTE for direct project activities	\$ 515,945
Hydrologist 3: est. \$150,963 (1 classified @ 1 FTE for two years), 75% salary, 25% benefits	
Hydrologist 1: est. \$262,045 (2 unclassified @ 1 FTE each for two years, 75% salary, 25% benefits	
Research Analyst: est. \$102,937 (1 unclassified @ 1 FTE for two years), 75% salary, 25% benefits	
Professional/Technical/Service Contracts:	
Geologic interpretations, field geology assistance, and database. Minnesota Geological Survey	\$ 30,000
Technical assistance and equipment rental for testing or applying thermal imaging or other field data collection technology. Exact types of services required and contractor/vendor to be determined.	\$ 45,000
Database and specialty programming services; web design and user support. MN.IT service level agreement	\$ 40,000
Direct and Necessary Services for the Appropriation	\$ 66,801
Equipment/Tools/Supplies:	
Field equipment such as current meters, data loggers, ruggedized field laptop computers or specialized field data tablets, waders, hip boots, GPS equipment, GIS or specialty software, misc. tools and supplies for field data collection and equipment maintenance.	\$ 40,000
Travel expenses in Minnesota:	
Fleet charges for cars, trucks, minivans, est. \$93,000; lodging, meals, mileage as per state contracts, est. \$45,000	\$ 138,000
Additional Budget Items: none	\$ -
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST =	\$ 875,746

V. OTHER FUNDS

SOURCE OF FUNDS	AMOUNT	Status
Other Non-State \$ Being Applied to Project During Project Period: none	\$ -	
Other State \$ Being Applied to Project During Project Period: none	\$ -	
In-kind Services During Project Period: none	\$ -	
Remaining \$ from Current ENRTF Appropriation (if applicable): none	\$ -	
Funding History: None	\$ -	

State Spring Inventory- Coldwater Streams & Existing Spring Inventory

- Designated Trout Stream
- Spring- MN Karst Features Database
- Eastern Broadleaf Forest Province
- Laurentian Mixed Forest Province
- Prairie Parkland Province
- Tallgrass Aspen Parklands



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 are found 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. These data are part of the Minnesota Karst Features Database and are incorporated into this map.



2014 RFP Project Proposal: State Spring Inventory

Project Manager Qualifications and Organization Description

Project Manager: Jan D. Falteisek

Degrees and Professional Certificates:

M.A. Geology, University of Missouri, Columbia, Missouri	1984
B.A. Mathematics, Southwest State University, Marshall, Minnesota	1974
Minnesota Professional Geologist, License #30114	

Qualifications:

1992 to present DNR Waters Hydrogeologist Supervisor
Provided technical and program direction for the completion of 17 Part B county geologic atlases or regional hydrogeologic assessments. Authored or co-authored several individual plates in reports. Directed the development of project databases, directed the editing and publication of part B atlases and documents, assured web access of project data, supported staff development of improved mapping tools and techniques, and assisted others in use of and access to project results and data. Most recently, also provided project oversight and staff supervision for the ongoing springshed mapping work in southeast Minnesota.

Previous employment:

1990 to 1991	DNR Waters Hydrogeologist , coordinating several LCMR projects and completed guidelines for pollution sensitivity.
1984 to 1989	MN Pollution Control Agency, Hydrogeologist, hazardous waste regulations and Superfund site investigations.
1980 to 1983	Missouri Dept. of Natural Resources, Hydrologist, coal mine permitting and regulations.

Project Responsibilities: The project manager will be responsible for: providing overall project management and technical direction for the project; directing project staff; contracting for professional services in support of the project; contracting for other services; coordinating with project partners; directing the development of project reports; and preparing and submitting project work plans, updates and final reports.

Organization Description: The Minnesota Department of Natural Resources (DNR)'s mission 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.