

**Environment and Natural Resources Trust Fund  
2016 Request for Proposals (RFP)**

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**Project Title:**

**ENRTF ID: 077-B**

Prioritizing Threats and Actions in the Mississippi Headwaters

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**Category:** B. Water Resources

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**Total Project Budget:** \$ 396,000

**Proposed Project Time Period for the Funding Requested:** 2 years, July 2016 to June 2018

**Summary:**

This project will guide the use of private and public resources necessary to implement conservation activities that are cost effective and represent positive return on investment to the public, private industry and local communities.

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**Name:** Richard Biske

**Sponsoring Organization:** The Nature Conservancy

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Minneapolis MN 55415

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**Email** rbiske@tnc.org

**Web Address** nature.org

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**Location**

**Region:** Central

**County Name:** Aitkin, Anoka, Cass, Crow Wing, Isanti, Itasca, Mille Lacs, Sherburne, Stearns, Todd, Wadena

**City / Township:**

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**Alternate Text for Visual:**

Description of area impacted.

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



## I. PROJECT STATEMENT

This project will identify environmental and economic impacts from changing weather and land use on ecological capacities for providing public water supplies, assimilation of treated wastewater, energy production and recreation within the Upper Mississippi River Basin from Lake Itasca to the Twin Cities. The project will assess the relative risk to watersheds within the basin to evaluate the public and private benefits of alternative conservation investment scenarios building on existing plans, models, monitoring, and tools while leveraging new data from MPCA.

Climate and land use change, water use needs, and precipitation patterns threaten to significantly alter freshwater ecosystems, functions, and services in the Upper Mississippi River Basin, an area which is economically dependent on its natural resource base. The risk and extent of these changes are even more pronounced when coupled with these land use changes and other human activities that impact natural systems. Climate and land use changes have the potential to negatively impact water quality by increasing runoff of sediment and nutrients to surface water and nitrates in groundwater. The extent and potential economic impact of these risks is unknown. Current planning processes and the models developed to support them have not yet been designed explicitly to assess or address these impacts.

All of these impacts will affect the Mississippi River's water quality and availability which could have a major impact on downstream users who are economically dependent on this resource. For example, cities along the Mississippi River are subject to water quality and stormwater discharge limits based on the river's capacity to assimilate those loads without exceeding clean water standards. Major water users, such as power producers and other industrial users, are subject to water use restrictions under conditions of drought, and these restrictions result in operational and revenue implications.

This project will guide the use of private and public resources necessary to implement conservation activities that are cost effective, consider long-term changes in land use and climate conditions, and represent positive return on investment to the public, private industry and local communities.

## II. PROJECT ACTIVITIES AND OUTCOMES

### Activity 1: Basin and Watershed Scenario Modeling

**Budget: 220,000**

The Nature Conservancy will convene basin and watershed stakeholders to gather data and input on past watershed changes, anticipated future changes, and resulting impact on water resources. The project will employ the watershed models supported by MPCA developed to characterize:

- Observed changes in forests and weather and corresponding variation of flooding/low flows and quality from the most recent 30 years of data
- Projected demographic changes
- Changes to Mississippi River peak flows (flood/drought) predicted from future conversion of forest areas and changing weather.

Using the MPCA supported watershed model this project will also explore the future response and impact to lakes and rivers from potential changes. We will use these results to assess public and private economic impacts illustrated through one or more case studies.

| Outcome   | Completion Date |
|---|-----------------|
| 1. Description of past and future seasonal and annual flow dynamics and pollutant loads by river reach, tributary and lakes.  | 4/30/2017       |
| 2. Projected future ranges of water quality by UMR river reach and within key water bodies, including: seasonal average river water quality (total phosphorous, algal blooms, total suspended solids, nitrate). | 6/30/2017       |
| 3. Implications of projected future flooding and drought upon downstream water supplies,  | 9/30/2017       |



## Environment and Natural Resources Trust Fund (ENRTF)

### 2016 Main Proposal

#### Project Title: Prioritizing Threats and Actions in the Mississippi Headwaters

|   |           |
|---|-----------|
| assimilation of treated wastewater and recreation.  |           |
| 4. Sensitivity analysis to identify key drivers and stressors. Lake Response times for trend detection using a lake model and sentinel lakes to establish trends. | 9/30/2017 |

#### **Activity 2:** Prioritize watersheds for protection and restoration activity.

**Budget: \$176,000**

Once baseline or natural background model outputs are complete, The Conservancy will convene a group of basin and major watershed stakeholders to gather model input to define stabilizing measures required to:

- Maintain the natural support system necessary to maintain basin water quality, surface water supply and wastewater treatment, recreation and hydropower.
- Prioritize investment options based on a cost benefit basis.
- Inform watershed planning efforts, Direct the investment of watershed restoration and protection funds to reduce impacts from these changes, including protection of groundwater recharge zones, floodplain restoration and reforestation.

| Outcome  | Completion Date |
|--|-----------------|
| 1. Alternative development zoning and performance options.   | 10/31/2017      |
| 2. Performance results for common conservation scenarios used in Watershed Restoration and Protection Strategies (WRAPS) and Local Water Plans.                  | 12/31/2017      |
| 3. Analysis of alternative watershed conservation return on investment scenarios based on ecological, social and economic benefits.                              | 2/28/2018       |
| 4. Categorize watersheds based on ecosystem services provided and quantify the amount of protection and restoration activities required for priority watersheds. | 6/30/2018       |

### **III. PROJECT STRATEGY**

#### **A. Project Team/Partners**

Partners receiving funds: The Nature Conservancy's Freshwater Ecologist and Mississippi Headwaters Program Director will convene stakeholders for input to the model scenarios and engage partners to incorporate results into watershed plans. A contractor will perform model development, calibration and execution along with project guidance. Partners: Watershed planners and agency representatives responsible for implementing conservation activities will participate in land use and conservation scenario modeling.

#### **B. Project Impact and Long-Term Strategy**

The project will guide the future allocation of public and private resources to conservation activities that yield the greatest return on investment and avoid long-term environmental costs. TNC is seeking \$500,000 from the USDA, NRCS Conservation Innovation Grant program and the National Fish and Wildlife Foundation and other private funds to implement conservation projects based on the results of this project. The results are also intended to inform local land use planning and infrastructure investment by water treatment and supply facilities.

#### **C. Timeline Requirements**

Within the first 12 months, the baseline watershed model application-calibrated for historical land use and climate-- will be validated; the model will be adapted to explore alternative scenarios under likely future land use and climate projections; and the resulting water quality and quantity predictions for key river reaches and water bodies will be assessed and compared against the baseline, including cost and management implications. In the subsequent 12 months, stakeholders will be convened to review these model predictions to develop restoration and protection scenarios. The last year of the project will focus on integrating the information gained from the scenario modeling into watershed plans, informing land use planning and engaging water user groups for infrastructure investment and implementing conservation projects in the basin.

## 2016 Detailed Project Budget

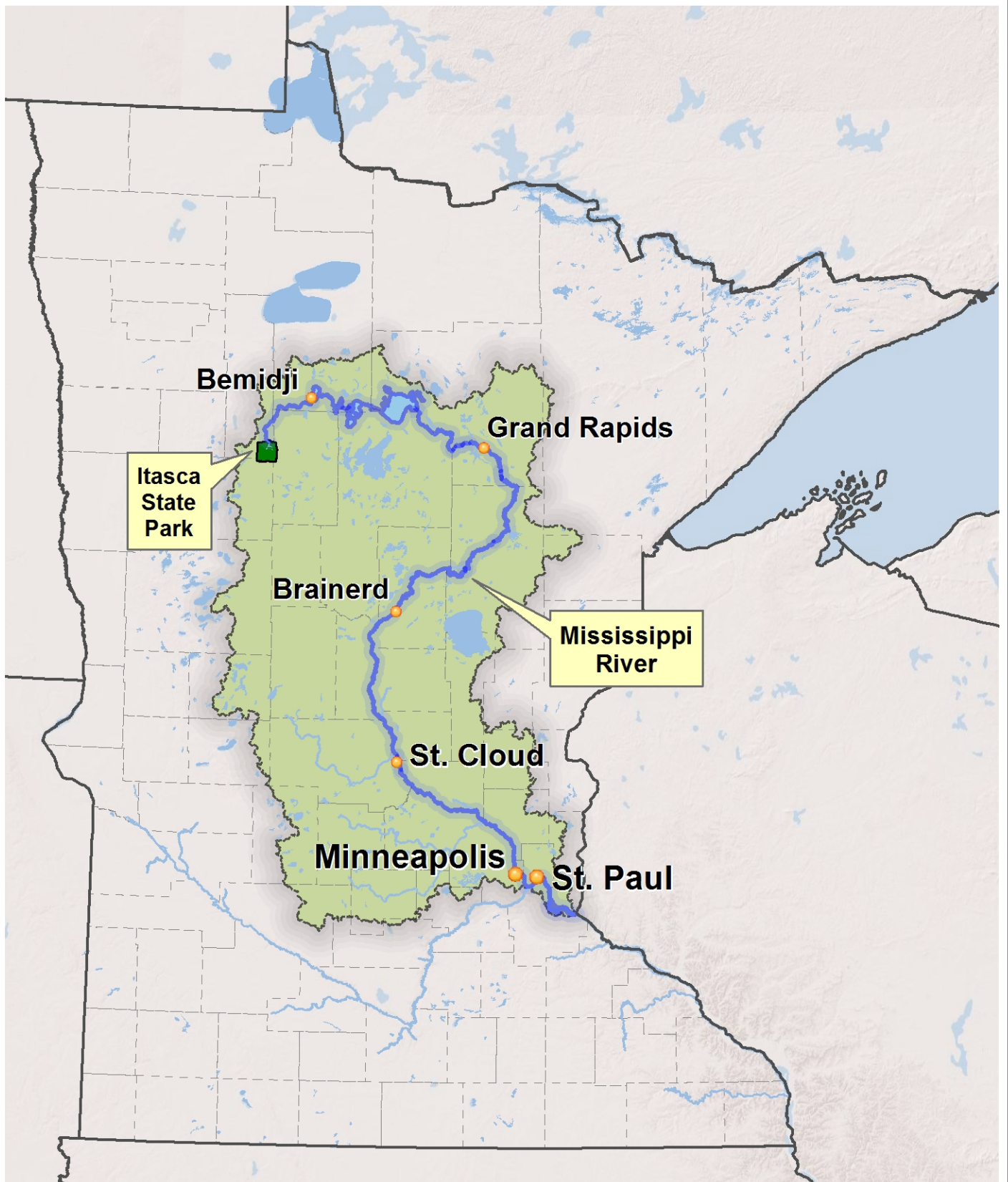
**Project Title:** *Prioritizing Threats and Actions in the Mississippi Headwaters*

### IV. TOTAL ENRTF REQUEST BUDGET 2 years

| <b>BUDGET ITEM</b>   | <b>AMOUNT</b>    |
|--|------------------|
| <b>Personnel:</b> The Nature Conservancy's (TNC) Watershed Lead will administer the overall project as well as coordinate stakeholder engagement for input on model development and application of model outputs. .35 FTE/year, 71% salary 29% benefits, 2 person in this position type  | \$ 50,000        |
| TNC's Aquatic Ecologist will perform InVEST (Integrated Valuation of Ecosystem Services and Tradeoffs) modeling to prioritize watersheds within the basin and inform Return on Investment for various conservation strategies. .3 FTE/year 71% salary and 29% benefits, 1 person in position type  | \$ 45,000        |
| <b>Professional/Technical/Service Contracts:</b> The Nature Conservancy will contract to calibrate HSPF models with data up to 2014 to establish land use change and develop baseline conditions, calibrate model for climate change scenarios, run model at multiple scales for alternative conservation scenarios and potential return on investment for different services. | \$ 175,000       |
| 5 to 10 Stakeholder meetings, conversion to watershed and site level model scenarios, cost/benefit calculations, summary tables.   | \$ 125,000       |
| <b>Additional Budget Items:</b> <i>Summary document and map portfolio printing for stakeholders.</i>   | \$ 1,000         |
| <b>TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST =</b>   | <b>\$396,000</b> |

### V. OTHER FUNDS

| <b>SOURCE OF FUNDS</b>   | <b>AMOUNT</b> | <b>Status</b>  |
|--|---------------|----------------|
| <b>Other Non-State \$ To Be Applied To Project During Project Period:</b> Conservation practice implementation based on results from the analysis and partner input resulting from project. Practices may include: wetland restoration, grassland establishment, reforestation, forest management and land protection using conservation easements and fee title acquisition. Applications pending from U.S. Dept. of Agriculture Natural Resources Conservation Service Conservation Innovation Grants and the National Fish and Wildlife Foundation. | \$ 500,000    | <i>Pending</i> |
| <b>Funding History:</b> Conservancy staff have current funding to develop initial InVEST modeling for the Mississippi Headwaters Basin for which all funds will have been spent prior to July 2015.  | \$ 50,000     | Secured        |
| <b>Remaining \$ From Current ENRTF Appropriation:</b> <i>\$200,000 Minn Laws 2014 ENRTF appropriation for program entitled Southeast Minnesota Watershed Protection Plan managed by Rich Biske, The Nature Conservancy. The current appropriation project and this proposed project are not directly related as they are different geographic scopes.</i>  | \$ 200,000    | <i>Unspent</i> |



# Mississippi River Headwaters

## Legend

- Mississippi River Headwaters
- Mississippi Headwaters Basin

25 12.5 0 25  
Miles

The Nature Conservancy  
Protecting nature. Preserving life.

M:\mod\Superior Mixed Forest - Great Lakes\Upper Mississippi River (SMF)  
Special Project\Mississippi River - Marketing - 201402 - LP.mxd

#### Project Manager Qualifications:

Project Manager: Richard Biske, Freshwater Conservation Program Director, The Nature Conservancy

#### Responsibilities Pertaining to the Proposal:

- 1) Supervise key employees working on project.
- 2) Administer contracts associated with the project.
- 3) Prepare reports.

Rich has led the Conservancy's Freshwater Program in Minnesota, North Dakota and South Dakota since 2014. Prior to his new role, Biske was the Conservancy's watershed lead in Southeast Minnesota. He helped lead several teams of resource professionals to develop watershed protection analysis and plans. He has developed and implemented conservation plans from the 8 digit HUC water watershed scale to the site level. Rich has applied many innovative conservation practices to protect fresh water from run-off and pollution. He has also protected thousands of acres of habitat in watersheds key to the health of the Mississippi River through acquisitions and conservation easements. Rich has more than 14 years of professional experience in conservation. He received his BS from the University of Minnesota, majoring in Natural Resources and Environmental Studies with a minor in Forest Resources Management.

#### **The Nature Conservancy**

The mission of The Nature Conservancy is to conserve the lands and waters on which all life depends. Since 1958, The Nature Conservancy has helped protect more than 650,000 acres of forests, prairies, rivers, lakes and wetlands in Minnesota.