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

Project Title: **ENRTF ID: 020-A**

Enhancing Understanding of the Minnesota River Ecosystem

Category: A. Foundational Natural Resource Data and Information

Total Project Budget: $ 573,447

Proposed Project Time Period for the Funding Requested: 3 years, July 2016 to June 2019

Summary:

This project will accelerate collection of baseline data to enhance understanding of the Minnesota River ecosystem, measure future impacts of an ever-changing climate and landscape, and guide future management efforts.

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Sponsoring Organization: MN DNR

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Location

Region: Central, Metro, SW, SE

County Name: Big Stone, Blue Earth, Brown, Carver, Chippewa, Dakota, Hennepin, Lac qui Parle, Le Sueur, Nicollet, Redwood, Renville, Scott, Sibley, Swift, Yellow Medicine

City / Township: Multiple

Alternate Text for Visual:

How will land management, climate change, invasive species, and conservation efforts impact vital elements of the Minnesota River ecosystem? We will never know, unless we accelerate efforts to collect baseline data now!

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

PROJECT TITLE: Enhancing understanding of the Minnesota River ecosystem

I. PROJECT STATEMENT

The ecological health of the Minnesota River (MNR) is threatened by land conversion, population growth, climate change, and the establishment of aquatic invasive species. These factors likely have consequential impacts on lower trophic organisms (i.e., phytoplankton, zooplankton), physical habitat (e.g., channel dimensions, floodplain connectivity), backwater ecosystems, and sensitive fish species (e.g., Shovelnose Sturgeon, Paddlefish) among many other elements of the MNR system. Additionally, conservation efforts within the MNR watershed may have positive impacts on these elements and overall ecosystem health. Due to limited resources, current data on these elements are insufficient and diminishes the ability to measure change, understand important ecosystem functions, and monitor the ecological health of the MNR. This project will accelerate collection of robust baseline data across all 320 miles of the MNR to A) enhance fundamental understanding of the MNR ecosystem; B) measure future impacts of land conversion, climate change, aquatic invasive species, and conservation efforts; C) inform monitoring of MNR ecological health; and D) guide future management, restoration, and protection efforts. The Minnesota Department of Natural Resources (DNR) will use project funds to hire personnel and contract services necessary for collecting robust baseline MNR data.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: Accelerate collection of baseline Minnesota River lower trophic data **Budget: $232,742**

Personnel funded by this project will collect monthly and bi-weekly phytoplankton, zooplankton, and water chemistry samples from 8 locations on the MNR during 07/2016–10/2016, 05/2017–10/2017, and 05/2018–10/2018. Analyses of samples will be conducted by contracted laboratories. Outcomes of this activity will be used by the DNR to develop long-term monitoring strategies and allow the ability to measure future changes to MNR lower trophic organisms and water chemistry.

Outcome	Completion Date
1. Quantify spatial and temporal variability of MNR phytoplankton (8 sites, 16 months)	06-30-2019
2. Quantify spatial and temporal variability of MNR zooplankton (8 sites, 16 months)	06-30-2019
3. Identify relationships between MNR plankton and water chemistry parameters	06-30-2019

Activity 2: Quantify physical habitat characteristics of the Minnesota River **Budget: $90,232**

Personnel funded by this project will quantify MNR channel dimensions (depth profile, width, etc.) at ≥16 sites during July 2016–October 2018. Additionally, physical habitat characteristics (substrate, woody cover, riparian vegetation, bathymetry, etc.) will be quantified for ≥16 corresponding 1km river reaches. Outcomes of this activity will provide the ability to quantify future physical changes to the MNR.

Outcome	Completion Date
1. Quantify channel dimensions at ≥16 locations along the MNR	06-30-2019
2. Quantify habitat characteristics for ≥16 1km reaches along the MNR	06-30-2019

Activity 3: Inventory Minnesota River backwater fish communities **Budget: $89,732**

Personnel funded by this project will develop survey protocols and perform extensive fish community assessments (e.g., gill net, fyke net, boat electrofish, seine) in ≥16 MNR backwaters. Outcomes of this activity will provide the DNR and other agencies with protocols for monitoring backwater fish communities and the ability to measure future changes to MNR backwater fish communities. Additionally, outcomes of this activity will help prioritize floodplain habitats for conservation, restoration, and protection efforts.

Outcome	Completion Date
1. Develop fish community survey protocols for MNR backwaters	06-30-2018
2. Characterize fish communities in ≥16 MNR backwaters	06-30-2019

Activity 4: Evaluate population dynamics, movement, and habitat use of sensitive fish species (i.e., Shovelnose Sturgeon, Paddlefish) in the Minnesota River **Budget: $160,741**

Personnel funded by this project will conduct boat electrofishing, trammel net, and trawl surveys to capture Shovelnose Sturgeon in the MNR. Captured sturgeon will be tagged with a passive integrated transponder (PIT tag), fin clipped for age estimation, and released. A subset (≈ 50) of captured Shovelnose Sturgeon will also be tagged with an acoustic telemetry tag. Paddlefish (a native planktivore competitor with invasive carps) encountered in fish sampling gears or by commercial fishermen during this project will also be tagged with an acoustic telemetry tag. In addition to existing acoustic receivers, ten acoustic receivers purchased for this project will be deployed throughout the MNR to track movement of tagged fish. Mark-recapture methods, telemetry data, age estimation, and length frequency histograms will be used to characterize population dynamics and movement of Shovelnose Sturgeon in the MNR. Telemetry data will be used to characterize movement and habitat use of any tagged Paddlefish. Outcomes of this project will improve the DNR's ability to monitor Shovelnose Sturgeon and Paddlefish populations in the MNR.

Outcome	Completion Date
1. Estimate population dynamics (abundance, growth, mortality, recruitment) of Shovelnose Sturgeon in the MNR	06-30-2019
2. Quantify movement patterns and habitat use of Shovelnose Sturgeon in the MNR	06-30-2019
3. If Paddlefish are encountered during this project, quantify movement patterns and habitat use of MNR Paddlefish	06-30-2019

III. PROJECT STRATEGY

A. Project Team/Partners

DNR Division of Fish and Wildlife Section of Fisheries will administer the project, hire personnel, provide technical and field support, and utilize project outcomes for the benefit of Minnesota's natural resources. Jack Lauer, DNR Southern Regional Fisheries Manager, is the project sponsor. Tony Sindt, DNR Minnesota River Specialist, will be the designated project manager. Facility space, boats, additional equipment, additional labor, technical support, and field support will be provided in-kind by the DNR.

B. Project Impact and Long-Term Strategy

The Minnesota River is an important geological, biological, and recreation resource for Minnesotan's. The DNR Section of Fisheries has recently dedicated one full-time fisheries specialist to managing MNR fisheries and monitoring long-term biological health. The value and effectiveness of this DNR position will be exponentially increased if this project is funded to accelerate development of monitoring protocols and establish baseline datasets so that future sampling efforts can focus on measuring change and monitoring health rather than collecting initial baseline data. Additionally, outcomes of this project will contribute to fundamental understanding of the MNR ecosystem and identify priority lands within the MNR valley for conservation, restoration, and protection efforts. External funds will be continually sought to increase the DNR's capacity to build upon the outcomes of this project and share data with other entities.

C. Timeline Requirements

The proposed time requirement for this project is 36 months (07/01/16–06/30/2019). Final reports for all project activities will be completed by June 30th 2019.

2016 Detailed Project Budget

Project Title: Enhancing understanding of the Minnesota River ecosystem

IV. TOTAL ENRTF REQUEST BUDGET, 3 years

BUDGET ITEM	AMOUNT
Personnel:	**$ 338,095**
NR Fisheries Specialist: 100% FTE for 36 months (70% salary, 30% fringe)	$ 183,180
NR Fisheries Technician: 100% FTE for 30 months (70% salary, 30% fringe)	$ 136,195
Summer Intern: 100% FTE for 10 months (100% salary)	$ 18,720
Professional/Technical/Service Contracts:	**$ 98,000**
Contracted Service: phytoplankton and zooplankton enumeration	$ 74,000
Contracted Service: water chemistry analyses	$ 24,000
Equipment/Tools/Supplies:	**$ 56,500**
Lower trophic level and water sampling equipment = $9,000, habitat survey supplies = $2,500, Fish sampling equipment = $2,000, Fish tags and telemetry equipment = $35,000, computers = $3,000, personal protective gear = $2,000, miscellaneous and replacement equipment = $3,000	$ 56,500
Acquisition (Fee Title or Permanent Easements):	**NA**
Travel:	**$ 42,000**
Fleet transportation: $0.73/mile	$ 39,000
In-state travel expenses: meals and lodging for distant and overnight status	$ 3,000
Additional Budget Items: Direct and necessary expenses: Human Resources Support ($9,210), IT Support ($17,686), Safety Support ($2,171), Financial Support ($7,485), Communications Support ($1,236), Planning Support ($829), and Procurement Support ($235) necessary to accomplishing funded programs/projects.	**$ 38,852**
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =	**$ 573,447**

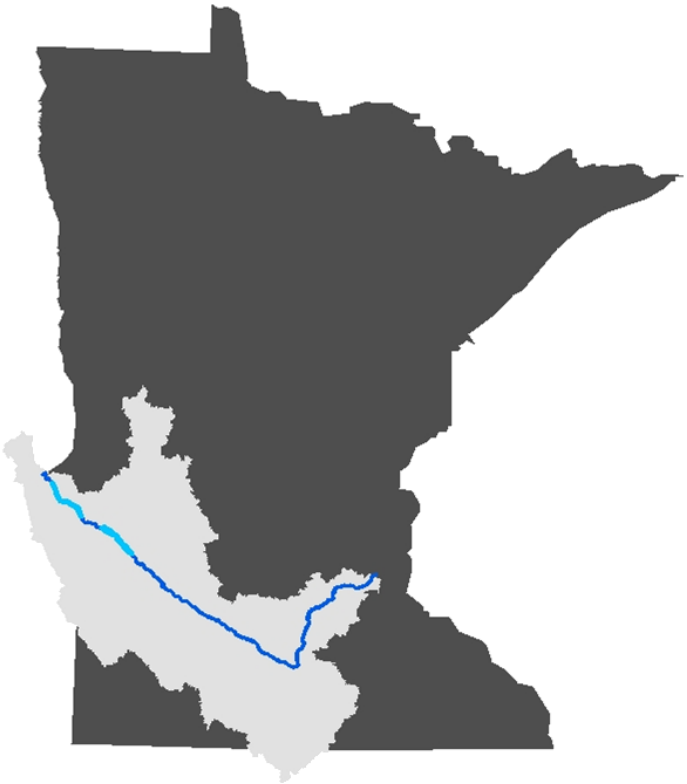
V. OTHER FUNDS

SOURCE OF FUNDS	AMOUNT	Status
Other Non-State $ To Be Applied To Project During Project Period:	NA	
Other State $ To Be Applied To Project During Project Period:	NA	
In-kind Services To Be Applied To Project During Project Period:	**$ 83,000**	
DNR facilities & services: office space, office overhead, technical & field support	$ 9,000	Secured
Existing DNR equipment: boats, sampling equipment (fyke nets, gill nets, trawls, seines), microscopes, lab supplies, etc.	$ 14,000	Secured
DNR fisheries staff (70% salary, 30% fringe): Tony Sindt (Project Manager) - 25% FTE for 36 months & Brian Schultz (Project Supervisor) – 5% FTE for 36 months	$ 60,000	Secured
Funding History:	NA	
Remaining $ From Current ENRTF Appropriation:	NA	

How will these factors

impact these vital elements

of the Minnesota River ecosystem?



We will never know, unless we accelerate efforts to collect baseline data now!

Project Manager:
Tony Sindt, M.S., is the Minnesota River Specialist for the MN DNR Division of Fish and Wildlife, Section of Fisheries. Tony received his B.S. in Ecology from Minnesota State University, Mankato in 2008 and his M.S. in Fisheries Biology from Iowa State University in 2011. His thesis was titled "fish species of greatest conservation need in wadeable Iowa streams: status, habitat associations, and effectiveness of species distribution models". Prior to becoming the Minnesota River Specialist for the DNR in 2014, Tony spent three years working as a fisheries biologist for the Ohio Division of Wildlife's Inland Fisheries Research Unit where he functioned as the Ohio River research biologist. Tony has authored three peer reviewed articles, presented original research at numerous professional conferences, and has acted as the project leader for multiple fisheries research projects. Tony has extensive knowledge and experience with large river ecosystems and is an ideal candidate for managing this project.

Organization Description:
The mission of the Minnesota Department of Natural Resources 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. Within the DNR, the Division of Fish and Wildlife bears primary responsibility for managing, protecting, and regulating the State's fisheries and wildlife resources. As part of the Divisions mission, it will promote habitat protection and development of private and public lands. The DNR has extensive experience administering and coordinating projects funded by the ENRTF.

Tony Sindt, M.S.
Minnesota River Specialist
MN DNR, Section of Fisheries
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