Environment and Natural Resources Trust Fund
2019 Request for Proposals (RFP)

Project Title: **ENRTF ID: 008-A**

Phase-II: Enhancing Understanding of the Minnesota River Ecosystem

Category: A. Foundational Natural Resource Data and Information

Sub-Category:

Total Project Budget: $ 598,241

Proposed Project Time Period for the Funding Requested: June 30, 2022 (3 yrs)

Summary:

Phase-II will build upon and expand efforts of phase-I to enhance understanding of plankton, Paddlefish, spawning success, backwater habitats, and more in the Minnesota River.

Name: Tony Sindt

Sponsoring Organization: MN DNR

Title: Minnesota River Specialist

Department: Fish and Wildlife Division

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Location

Region: Central, Metro, Southwest, Southeast

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

City / Township:

Alternate Text for Visual:

Phase-II will expand upon phase-I to enhance understanding of Paddlefish, spawning success, plankton, and more in the Minnesota River.

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity Readiness	_____ Leverage	_____ TOTAL	_____%
____ If under $200,000, waive presentation?			

PROJECT TITLE: Phase-II: Enhancing understanding of the Minnesota River ecosystem

I. PROJECT STATEMENT

The Minnesota River (MNR) flows more than 320 miles across our state, providing tremendous fishing and recreation opportunities, and is home to a diversity of aquatic organisms including over 80 species of fish. Landscape alterations, population growth, climate change, invasive species, and conservation efforts continually affect this important resource. Fortunately, Phase-I of this proposed project (M.L. 2006, Chp. 186, Sec. 2, Subd. 03i, Enhancing Understanding of the Minnesota River Ecosystem, FY2016–2019) allowed us to begin learning about relatively unknown components of the MNR ecosystem.

Ongoing **PHASE-I** outcomes include:

- Collecting the first comprehensive plankton dataset: collecting spatially and temporally comprehensive phytoplankton and zooplankton data from over 240 miles of the MNR.
- Discovering a significant population of Paddlefish: project staff captured 66 Paddlefish from the MNR during the last 2 years, compared to one previously.
- Evaluating a healthy Shovelnose Sturgeon population: capturing > 300 sturgeon, tracking movements of transmitter tagged fish along 240 miles of river, and quantifying population characteristics.
- Establishing benchmarks for measuring changes to habitat features and backwater fish communities.

Unfortunately, there are still many data gaps that limit our ability to measure change over time and make informed management, conservation, and restoration decisions. For Phase-II, we propose building upon outcomes of Phase-I, and addressing new questions that will further inform future monitoring, management, and protection of this important aquatic resource and fishery.

PHASE-II objectives include:

- **PLANKTON:** expand evaluation of phytoplankton and zooplankton—the base of the aquatic food web.
- **PADDLEFISH:** expand evaluation of the newly discovered Paddlefish population inhabiting the MNR.
- **SPAWNING SUCCESS:** evaluate spawning success of migratory fishes (Lake Sturgeon, Paddlefish, etc.).
- **BACKWATERS:** investigate the ecological function of floodplain backwater habitats.
- **UNIQUE ELEMENT CONCENTRATIONS:** identify unique element concentrations of water samples that can determine where individual fish were born and where they have lived.

The ultimate goal is to A) protect and enhance populations of important fishes along with their critical habitats; B) provide the ability to measure ecosystem changes resulting from landscape alterations, climate change, invasive species, and critical habitats; and C) inform efforts to monitor, protect, and enhance this unique and important resource for all Minnesotans to enjoy and utilize. The MN DNR will use project funds to accelerate data collection, hire unclassified personnel, purchase equipment, and contract laboratory services necessary for enhancing fundamental understanding of the MNR ecosystem.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: Expand evaluation of **PLANKTON** communities and identify **UNIQUE ELEMENT CONCENTRATIONS** of water samples along 270 miles of the MNR.

We will evaluate relationships between plankton communities, river flow, floodplain influence, and microhabitat types by collecting > 100 phytoplankton and zooplankton samples from strategically selected locations during a broad range of flow conditions. We will also collect water samples from the MNR and connected rivers (e.g., Mississippi River, large tributaries) to identify unique element concentrations with mass spectrometry analyses—such as the ratio of Strontium to Calcium. Element concentrations in water correlate with element concentrations in fish otoliths (ear bones) and fin rays, and can help determine waterbodies where individual

fish were born and where they have lived.

ENRTF BUDGET: $222,067

Outcome	Completion Date
1. Quantify relationships between plankton communities, river flow, and floodplain influence along 270 miles of the MNR (≥ 100 phyto and ≥ 150 zooplankton samples).	*06-30-2022*
2. Identify element concentrations of water from the MNR and connected rivers.	*06-30-2022*

Activity 2: Continue evaluating the population and movement patterns of MNR **PADDLEFISH** and evaluate **SPAWNING SUCCESS** of important large river fishes.

Unfortunately, knowledge about many upper Mississippi River basin migratory fish species (Lake Sturgeon, Paddlefish, etc.) is inadequate for effective management and conservation efforts. We will capture, tag, release, and track movements of Paddlefish in the MNR. Additionally, we will identify spawning habitats and spawning success of important migratory large river fishes through field reconnaissance, aerial imagery, fish telemetry, and sampling for larval fishes and eggs.

ENRTF BUDGET: $295,950

Outcome	Completion Date
1. Quantify relative abundance, growth, habitat use, and movement of Paddlefish.	*06-30-2022*
2. Identify potentially important spawning habitats within the MNR.	*06-30-2022*
3. Identify presence of juveniles, larvae, & eggs of important migratory large river fishes.	*06-30-2022*

Activity 3: Continue evaluating the ecological role and function of MNR floodplain **BACKWATER** habitats.

Following protocols developed during phase-I, we will conduct fish surveys in ≥ 12 backwaters to evaluate changes over time and relationships between fish communities, river connectivity, and habitat characteristics.

ENRTF BUDGET: $80,224

Outcome	Completion Date
1. Characterize fish communities in ≥ 12 MNR backwaters	*06-30-2022*

III. PROJECT PARTNERS:

A. Partners receiving ENRTF funding NA

B. Partners NOT receiving ENRTF funding NA

IV. LONG-TERM- IMPLEMENTATION AND FUNDING:

Although the MN DNR conducts annual MNR fish surveys, game and fish funded efforts focus on monitoring populations of game species (Flathead Catfish, Walleye, etc.) and general fish community health. Unfortunately, resources are insufficient for robust evaluation of important non-game fishes and evaluating other important components of the MNR ecosystem, such as plankton communities and floodplain habitats. In addition, other agencies and institutions lack the capacity or programs for collecting the base-line data this study seeks. Accelerating and supplementing efforts to enhance understanding of the MNR ecosystem will exponentially increase the value of current and future DNR efforts. Outcomes of this project will A) inform restoration, conservation, and management of large river fishes and critical habitats; B) enhance our ability to quantify future ecosystem changes; and C) guide long-term monitoring and management of the MNR ecosystem. The DNR will continue to seek external funds to increase capacity for building upon the outcomes of past, present, and future projects.

V. TIME LINE REQUIREMENTS:

This proposed project will last 36 months with all final reports completed by June 30, 2022.

2019 Proposal Budget Spreadsheet

Project Title: Phase-II: Enhancing understanding of the Minnesota River ecosystem

IV. TOTAL ENRTF REQUEST BUDGET 3 **years**

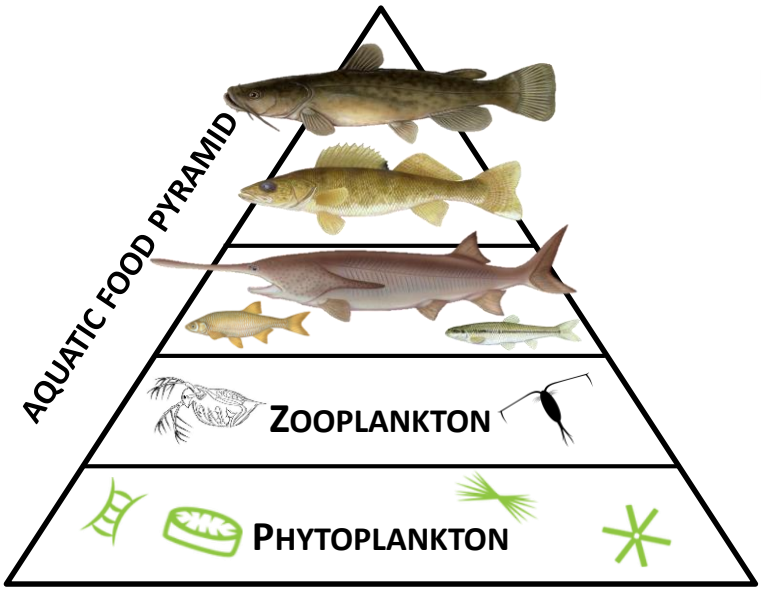
BUDGET ITEM	AMOUNT
Personnel:	**$ 426,500**
NR Fisheries Specialist: 100% FTE for 36 months (65% salary, 35% fringe) = $236,000	
NR Fisheries Technician: 100% FTE for 30 months (65% salary, 35% fringe) = $171,000	
Summer Intern: 100% FTE for 8 months (100% salary) = $19,500	
Professional/Technical/Service Contracts:	**$ 35,000**
Contract Service: Water chemistry analyses by Minnesota Department of Agriculture = $5,000	
Contract Service: Phytoplankton enumeration TBD through RFP and competative bid = $15,000	
Contract Service: Water microchemistry/mass spectrometry TBD through RFP and competative bid = $10,000	
Contracted Service: Fish structure microchemistry/laser ablation & mass spectrometry TBD through RFP and competative bid = $5,000	
Equipment/Tools/Supplies:	**$ 55,750**
Paddlefish sampling, tagging, and telemetry equipment = $38,000; Larval fish & egg sampling equipment = $3,750; Plankton and water sampling supplies = $3,000; Water and fish structure microchemistry supplies = $5,000; Backwater sampling equipment = $3,000; Personal protective equipment = $3,000	
Acquisition (Fee Title or Permanent Easements):	**NA**
Travel:	**$ 40,000**
Fleet transportation (vehicle milage to and from the Minnesota River ≈ $0.75/mile) = $37,000	
In-state travel expenses: meals and loding for distant and overnight status = $3,000	
Additional Budget Items: Direct and necessary costs: HR Support ($9,101), Safety Support ($1,885), Financial Support ($7,082), Communication Support ($1,251), IT Support ($20,613), and Planning Support ($1,059).	**$ 40,991**
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =	$ 598,241

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:	**$ 120,000**	Secured
DNR facilities & services: office space, office overhead, lab space, technical and field support	$10,000	Secured
DNR equipment: boats, outboard motors, sampling equipment (fyke nets, gill nets, trawls, etc.), microscopes, lab supplies, etc.	$30,000	Secured
DNR fisheries staff (65% salary, 35% fringe): Tony Sindt (Project Manager) - 25% FTE for 36 months,	$80,000	Secured
Past and Current ENRTF Appropriation: M.L. 2006, Chp. 186, Sec. 2, Subd. 03i, Enhancing understanding of the Minnesota River ecosystem (Phase I) was allocated $500,000 for FY2016-2019.	**$ 193,337**	Unspent (as of 04/2018)
Other Funding History:	**NA**	

ENHANCE UNDERSTANDING OF

PADDLEFISH



PLANKTON

SPAWNING SUCCES

IN THE MINNESOTA RIVER

Project Manager Qualifications and Organization Description

Project Manager:
Tony Sindt, M.S., is the Minnesota River Specialist, Sr. for the MN DNR Fish and Wildlife Division. 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 MN 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 four peer reviewed articles, presented original research at numerous professional conferences, has acted as the project leader for multiple fisheries research projects, and serves as the project manager for phase-I of the proposed project (M.L. 2016, Chp. 186, Sec. 2, Subd. 03i Enhancing understanding of the Minnesota River). Tony's extensive experience working on large river systems, knowledge about aquatic ecosystems, and experience as a project manager makes him an ideal candidate for leading 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.
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MN DNR, Fish and Wildlife Division
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