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

Project Title: **ENRTF ID: 134-D**

Invasive Carp Applied Research in Lake Nokomis Subwatershed

Category: D. Aquatic and Terrestrial Invasive Species

Total Project Budget: $ 189,936

Proposed Project Time Period for the Funding Requested: 3.5 years, July 2016 to September 201

Summary:

Application of current invasive carp research to management of an entire subwatershed, to improve water quality, increase aquatic vegetation, and provide additional guidance for large-scale carp management.

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Location

Region: Metro

County Name: Hennepin

City / Township: Minneapolis and Richfield

Alternate Text for Visual:

Map of Lake Nokomis Subwatershed showing public lands and managed lakes

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

PROJECT TITLE: Invasive Carp Applied Research in Lake Nokomis Subwatershed

I. PROJECT STATEMENT

Using the same methods pioneered by Dr. Peter Sorensen (judas fish technique, telemetry monitoring, biomass estimates) of the University of Minnesota's Sorensen Lab and successful projects implemented on Clam Lake (Burnet County, WI) and Silver Lake (Ramsey County, MN), this project will track, assess, and manage common carp in the Lake Nokomis subwatershed. Applying the latest research to an entire subwatershed will increase statewide understanding of common carp in interconnected lake and wetland systems. It will also improve water quality in Lake Nokomis, Taft Lake, Mother Lake, Legion Lake, and several wetlands within the subwatershed. Significantly reducing carp biomass can increase aquatic vegetation, reduce re-suspension of phosphorous-laden sediments, and decrease turbidity, all of which improve water quality and clarity.

The Invasive Carp Applied Research and Management project includes the entire Lake Nokomis subwatershed because carp are most likely migrating through storm sewers from Lake Nokomis to other lakes and wetlands that experience winter kill, so they can spawn without competition. With this comprehensive approach comes greater opportunity for success in water quality improvement, aquatic vegetation increase, and carp management, as well as valuable additional research that can help managers of other interconnected lake and wetland systems statewide. Water quality and invasive species management goals will be accomplished through radio tracking of carp to discover migration routes and patterns, ongoing assessment of carp and aquatic vegetation, strategic and targeted carp removal, and creation of a long-term carp management plan based on previous research and this new research in the subwatershed.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: Migration Tracking and the Judas Fish Technique **Budget: $83,589**

Carp will be captured and surgically implanted with radio transmitters. Carp movement will be tracked for several years to determine seasonal movement throughout the subwatershed and spawning activities.

Outcome	Completion Date
1. Map carp migration routes	6/1/2019
2. Identify winter aggregation sites for removal	2/28/2019
3. Identify potential sites for migration barriers	6/1/2019

Activity 2: Biomass Assessment **Budget: $52,370**

Ongoing quantification of carp biomass and aquatic vegetation extents and diversity will be performed. Carp will be assessed through mark and recapture activities, as well as fin ray or otolith study to determine age structure of carp fishery. Annual point intercept vegetation surveys and ongoing water quality and clarity monitoring will determine response to management activities.

Outcome	Completion Date
1. Determine carp population, age structure, recruitment	7/1/2017
2. Document reduction in carp population and provide guidance for changes in methodology	3/31/2019
3. Document response of aquatic vegetation and water quality to carp management	8/1/2019

Activity 3: Carp Removal and Management **Budget: $53,977**

Telemetry-guided carp removal will ensure efficiency. A research-based management plan will consider how to prevent reintroduction with techniques employed throughout the subwatershed. This activity will improve water quality and clarity through carp removal, and will determine ongoing management strategies.

Outcome	Completion Date
1. Reduction in carp biomass	3/31/2019
2. Complete long-term management plan to improve water quality through carp management	6/1/2019

III. PROJECT STRATEGY

A. Project Team/Partners

The project will be led by the Minneapolis Park and Recreation Board (MPRB), the primary ENRTF funding recipient, and will involve the Minnehaha Creek Watershed District (MCWD), other public agencies, and two project consultants.

Project Partners Receiving Funds:

- Minneapolis Park and Recreation Board [$27,214]: project management, planning, and oversight
- Minnehaha Creek Watershed District [$10,813]: technical resources, management planning
- WSB Engineers (Tony Havranek) [$89,959]: project execution
- Blue Water Science (Steve McComas) [26,000]: project execution
- Contract anglers to be determined [$31,000]: targeted carp removal

Project Partners Not Receiving Funds: City of Richfield, City of Minneapolis, Metropolitan Airports Commission

B. Project Impact and Long-Term Strategy

This project is a critical piece of an overall water quality improvement strategy that has been in progress for more than a decade, led by MCWD, MPRB, and the City of Minneapolis. Previous and ongoing activities include the installation of stormwater treatment wetlands within the watershed, construction of a weir to prevent flow of Minnehaha Creek into Lake Nokomis, regular stocking of predatory fish to manage panfish and bullhead populations, and shoreline restoration. These complementary activities have been funded directly by the agencies involved. A major restoration project (one-half of the shoreline of Lake Nokomis) has received funding approval from the Lessard-Sams Outdoor Heritage Council and is pending final legislative approval.

LCCMR funding would allow for three years of the Invasive Carp Applied Research and Management project, after which, management activities would continue and would most likely be funded by MPRB and MCWD. Findings from this watershed-scale research would be made available to other lake and watershed managers throughout the state. This project will demonstrate how current University of Minnesota research can be applied to entire interconnected watersheds (even those connected through storm sewer rather than overland flows). It will also demonstrate how that research can be applied to ongoing management of carp.

C. Timeline Requirements

If funded, the project will initiate in the fall of 2016 with capture surveys and biomass assessment. Research, monitoring, biomass removal and management activities will continue through the spring of 2019, with reporting and management planning being completed in the fall of 2019, 36 months after initiation.

2016 Detailed Project Budget

Project Title: Invasive Carp Applied Research in Lake Nokomis Subwatershed

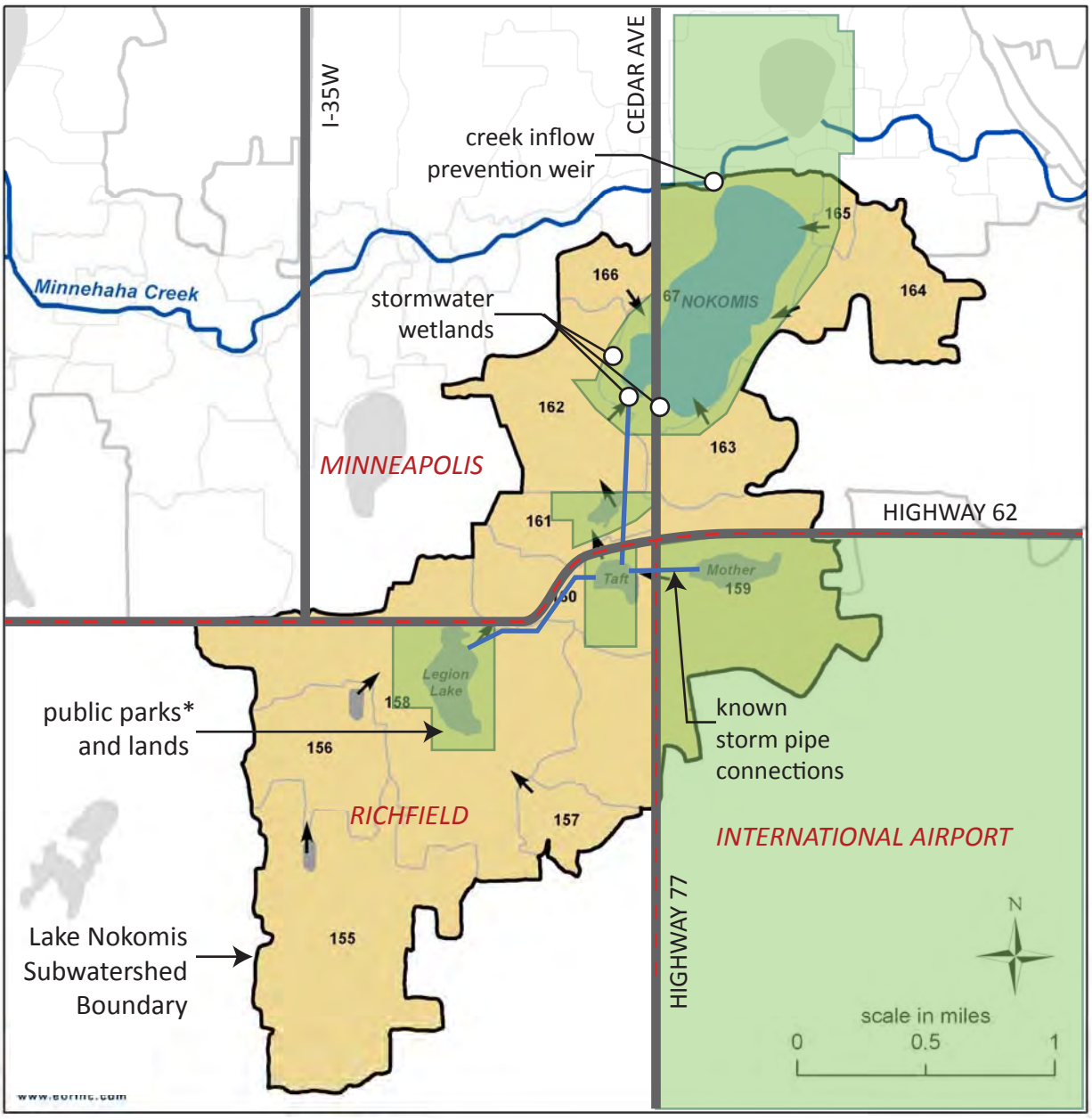
IV. TOTAL ENRTF REQUEST BUDGET *ten months project duration*

BUDGET ITEM	AMOUNT
Personnel:	
MPRB Water Resources Specialist / Project Manager: one full time salaried position throughout 36-month duration of project; 5% total project period salary =$10,705; 5% total project period benefits = $2,907	$ 13,612
MCWD Water Quality Manager: one full time salaried position throughout 36-month duration of project; 5% total project period salary = $8,320; 5% total project period benefits = $2,493	$ 10,813
MPRB Director of Strategic Planning: one full time salaried position throughout 36-month duration of project; 0.5% total project period salary = $1,308; 0.5% total project period benefits = $498	$ 1,806
MPRB Technical Staff: water sampling and analysis; two full time salaried positions at 50 hours/year each for 36-month duration of project; 2.5% total project period salary = $4,208 each; 2.5% total project period benefits = $1,690 each	$ 11,796
Subtotal	$ 38,027
Contracts:	
Tony Havranek, WSB Engineers (Telemetry, population estimates, aging, coordination of removals, management planning)	$ 89,959
Steve McComas, Blue Water Science (Fisheries assessment, plant surveys)	$ 26,000
Targeted carp netting and removal (contractor to be determined)	$ 31,000
Subtotal	$ 146,959
Equipment/Tools/Supplies:	
Telemetry and Tagging Equipment (radio tags, surgical supplies, radio receiver)	$ 4,950
Acquisition (Fee Title or Permanent Easements): *N/A*	$ -
Travel: *N/A*	$ -
Additional Budget Items: *N/A*	$ -
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =	**$ 189,936**

V. OTHER FUNDS

SOURCE OF FUNDS	AMOUNT	Status
Other Non-State $ Being Applied to Project During Project Period: *whether the funds are secured or pending approval.*	$ -	
Other State $ Being Applied to Project During Project Period: Lessard-Sams Outdoor Heritage Council has approved funding for shoreline restoration on Lake Nokomis, which will take place during the project period	$ 444,000	*final funding approval pending*
In-kind Services During Project Period:	$ -	
Remaining $ from Current ENRTF Appropriation (if applicable):	$ -	
Funding History: Minnehaha Creek Watershed District and Minneapolis Park and Recreation Board have been investing in Lake Nokomis water quality since 2000, including creation of stormwater pre-rtreatment ponds, a weir to prevent Minnehaha Creek water from entering the lake, and ongoing vegetation management and water quality monitoring	$ 423,598	*expended*

Project Location



* public lands shown are those that overlap the subwatershed

targeted winter carp removal

carp with surgically implanted radio telemetry device

Project Title: *Invasive Carp Applied Research in Lake Nokomis Subwatershed*

Project Team Qualifications:

Rachael Crabb, MPRB Water Resources Supervisor
Ms. Crabb has worked with water quality at MPRB for seven years, the last two as Water Resources Supervisor. She has a total of twelve years of experience working on water resources with local governments. She holds Master's and Bachelor's degrees in geology. In her current role, she is responsible for all of MPRB's water quality monitoring and improvement projects, a jurisdiction that spans eight lakes and connected waterways.

Kelly Dooley, MCWD Water Quality Manager
Ms. Dooley has fifteen years of water quality monitoring and management experience, eight years of which have been with the Minnehaha Creek Watershed District. She holds Master's and Bachelor's degrees in biology. She has served since 2011 as MCWD's water quality manager, a role in which she co-manages the lakes, stream and wetland monitoring program, which involves training and supervising technicians and district representatives in daily field work activities. She also has been the manager of the Lake Nokomis biomanipulation project since 2010. The results of this biomanipulation project have revealed that carp play a bigger role in the deterioration of the lakes throughout the Nokomis subwatershed.

Tony Havranek, Senior Environmental Scientist, WSB & Associates
Mr. Havranek has more than fifteen years of experience in fisheries assessment and management. His experience includes population estimates, hatchery management, and development of biological integrity indices. In his work he has employed a wide variety of techniques, including electrofishing, seining, gill-netting, and fyke netting. He has six years of specific experience with carp management utilizing techniques such as radio telemetry, commercial fishing, population modeling, barrier design and installation, and habitat modification. He has managed six successful carp reduction projects in Wisconsin, Minnesota, and Illinois. In 2013 he received the first non-institutional DNR permit to radio-tag carp, making him the only person outside a University setting able to perform the type of successful carp management being pioneered by the Sorensen Lab

Organization Description – Minneapolis Park and Recreation Board
With 197 park properties totaling nearly 6,744 acres of land and water, the Minneapolis Park and Recreation Board (MPRB) provides places and recreation opportunities for all people to gather, celebrate, contemplate, and engage in activities that promote health, well-being, community, and the environment. Each year, approximately 18 million visits are made to the nationally acclaimed Minneapolis park system. Its urban forests, natural areas and waters endure and captivate. Its Grand Rounds National Scenic Byway, neighborhood parks, recreation centers and diversified programming have made the Minneapolis park system an important component of what makes Minneapolis a great place to live, play and work.

MPRB Mission:
The Minneapolis Park and Recreation Board shall permanently preserve, protect, maintain, improve, and enhance its natural resources, parkland, and recreational opportunities for current and future generations. The Minneapolis Park and Recreation Board exists to provide places and recreation opportunities for all people to gather, celebrate, contemplate, and engage in activities that promote health, well-being, community, and the environment.