



Environment and Natural Resources Trust Fund (ENRTF) M.L. 2016 Work Plan

Date of Report: May 29, 2016
Date of Next Status Update Report: February 1, 2017
Date of Work Plan Approval: June 7, 2016
Project Completion Date: December 31, 2019
Does this submission include an amendment request? NO

PROJECT TITLE: Invasive Carp Management Research in Lake Nokomis Subwatershed

Project Manager: Adam Arvidson
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Location: Lake Nokomis Subwatershed, Hennepin County, Minneapolis and Richfield, MN

Total ENRTF Project Budget:	ENRTF Appropriation:	\$189,000
	Amount Spent:	\$0
	Balance:	\$189,000

Legal Citation: M.L. 2016, Chp. 186, Sec. 2, Subd. 06g

Appropriation Language:

\$189,000 the second year is from the trust fund to the commissioner of natural resources for an agreement with the Minneapolis Park and Recreation Board to apply current invasive carp management research to the entire Lake Nokomis subwatershed and provide demonstration guidance for large-scale carp management. This appropriation is available until June 30, 2020, by which time the project must be completed and final products delivered.

I. PROJECT TITLE: Invasive Carp Management Research in Lake Nokomis Subwatershed

II. 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, which is 6,004 acres in size and includes portions of the cities of Minneapolis and Richfield and lands belonging to the Metropolitan Airports Commission. The subwatershed includes four lakes (Nokomis in Minneapolis, Taft and Legion in Richfield, and Mother within the International Airport) and several associated wetlands. The lakes constitute a total of 235 acres of open water and nearly five miles of shoreline.

It is important to consider the entire 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.

III. OVERALL PROJECT STATUS UPDATES:

Project Status as of February 1, 2017:

Project Status as of August 1, 2017:

Project Status as of February 1, 2018:

Project Status as of August 1, 2018:

Project Status as of February 1, 2019:

Overall Project Outcomes and Results:

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Ecological Data Collection and Assessment

Description:

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.

Summary Budget Information for Activity 1:

ENRTF Budget: \$ 52,000
Amount Spent: \$ 0
Balance: \$ 52,000

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

Activity Status as of February 1, 2017:

Activity Status as of August 1, 2017:

Activity Status as of February 1, 2018:

Activity Status as of August 1, 2018:

Activity Status as of February 1, 2019:

Final Report Summary:

ACTIVITY 2: Spatial Monitoring of Common Carp

Description:

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. The project area includes 4 separate lake basins (Lake Nokomis, Taft Lake, Mother Lake, Legion Lake) and one major stream (Minnehaha Creek).

Summary Budget Information for Activity 2:

ENRTF Budget: \$ 83,000
Amount Spent: \$ 0
Balance: \$ 83,000

Outcome	Completion Date
<i>1. Determine whether carp populations within the four basins are distinct or one interconnected population.</i>	6/1/2018
<i>2. Identify winter aggregation sites within each of the four basins.</i>	2/28/2019
<i>3. Evaluate the necessity and viability of carp barrier installations between the major basins and Minnehaha Creek, should telemetry show migration between these water bodies.</i>	6/1/2019

Activity Status as of February 1, 2017:

Activity Status as of August 1, 2017:

Activity Status as of February 1, 2018:

Activity Status as of August 1, 2018:

Activity Status as of February 1, 2019:

Final Report Summary:

ACTIVITY 3: Carp Removal and Management Planning

Description:

Carp will be removed from Lake Nokomis and other basin lakes during the winter using telemetry implemented in Activity 2. This “judas-fish” technique ensures efficiency of removal by helping commercial anglers exactly locate winter aggregations of carp. Carp biomass in each lake will be reduced using a combination of open water and under ice netting in each lake to achieve a biomass level well under 88 lbs/acre. This biomass threshold will also be based on observed ecological responses of water quality, aquatic vegetation, and each lake’s respective fishery, as assessed in Activity 1.

An adaptive management plan will be developed using data collected under Activity 1. This plan will also rely on existing literature and published articles to develop a dynamic plan that is responsive to data collected during the project period and beyond.

Summary Budget Information for Activity 3:

ENRTF Budget: \$ 54,000
Amount Spent: \$ 0
Balance: \$ 54,000

Outcome	Completion Date
<i>1. Remove carp from subwatershed lakes, using telemetry to locate winter aggregations of fish.</i>	3/31/2019
<i>2. Complete long-term management plan to improve water quality through ongoing carp management</i>	6/1/2019

Activity Status as of February 1, 2017:

Activity Status as of August 1, 2017:

Activity Status as of February 1, 2018:

Activity Status as of August 1, 2018:

Activity Status as of February 1, 2019:

Final Report Summary:

V. DISSEMINATION:

Description:

Project data, status, and general public information will be shared on the websites of the Minneapolis Park and Recreation Board (www.minneapolisparcs.org) and the Minnehaha Creek Watershed District (www.minnehahacreek.org). In addition, information will be disseminated at the Lake Nokomis boat inspection booth. MPRB and MCWD will work with other project partners to post information on those organizations’ websites. Final research data will be made available to the public and researchers upon request.

Status as of February 1, 2017:

Status as of August 1, 2017:

Status as of February 1, 2018:

Status as of August 1, 2018:

Status as of February 1, 2019:

Final Report Summary:

VI. PROJECT BUDGET SUMMARY:

A. ENRTF Budget Overview:

Budget Category	\$ Amount	Overview Explanation
Personnel:	\$ 1,806	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
Professional/Technical/Service Contracts:	\$ 161,023	Tony Havranek, WSB Engineers (Telemetry, population estimates, aging, coordination of removals, management planning) = \$89,023 Steve McComas, Blue Water Science (Fisheries assessment, plant surveys) = \$26,000 Targeted carp netting and removal (contractor to be determined) = \$31,000
Equipment/Tools/Supplies:	\$ 4,950	Radio tags, surgical supplies, radio receiver
Other	\$ 21,221	Unallocated at this Time. Likely to be used for unforeseen expenses and additional consulting needs driven by project realities.
TOTAL ENRTF BUDGET: \$ 189,000		

Explanation of Use of Classified Staff: The MPRB Director of Strategic Planning is funded through project-specific expenses, all of which are tracked hourly and can be justified. Other MPRB and MCWD staff are salaried and do not appear here as budgeted expenditures in this request. See "Other Funds" below for use of salaried position costs as matching funds.

Explanation of Capital Expenditures Greater Than \$5,000: N/A

Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation: 0.05

Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation: 0.3

B. Other Funds:

Source of Funds	\$ Amount Proposed	\$ Amount Spent	Use of Other Funds
Non-state			
Minneapolis Park and Recreation Board	\$ 25,408	\$	Water resources specialist time: 5% salary and benefits through 36-month

			project duration; Technical water resources staff for sampling and analysis: 5% salary and benefits through 36-month project duration
Minnehaha Creek Watershed District	\$ 10,813	\$	Water quality manager time: 5% salary and benefits through 36-month duration of project
State			
Clean Water, Land, and Legacy Amendment via Lessard-Sams Outdoor Heritage Council	\$ 444,000	\$	Restoration of more than 4,000 linear feet of lake Nokomis shoreline for aquatic and terrestrial habitat enhancement
TOTAL OTHER FUNDS:	\$ 480,221	\$	

VII. PROJECT STRATEGY:

A. Project 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 [\$1,806]: project management, planning, and oversight
- 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: Minnehaha Creek Watershed District, 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) received funding approval from the Lessard-Sams Outdoor Heritage Council and was approved by the State Legislature. This project will begin in 2016. MPRB and MCWD provide funds for Lake Nokomis annually through staff time, aquatic invasive species inspections, water sampling and analysis, and invasive vegetation removal.

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. Funding History:

Funding Source and Use of Funds	Funding Timeframe	\$ Amount
Minnehaha Creek Watershed District / City of Minneapolis: implementation of stormwater pre-treatment basins to improve lake water quality	2000	\$ 300,000
Minnehaha Creek Watershed District: lake biomanipulation project	2010 – 2016	\$ 41,800
Minnehaha Creek Watershed District: Lake Nokomis / Minnehaha Creek barrier weir to prevent invasive species introduction to Lake Nokomis and reduce nutrients via creek inflow	2012-2013	\$ 72,598
Minnehaha Creek Watershed District: stocking of predatory fish to reduce panfish populations	2012 - 2016	\$ 9,200
Minneapolis Park and Recreation Board: ongoing lake management and monitoring, including full-time staffed aquatic invasive species inspections checkpoint at boat launch, aquatic vegetation removal, water quality sampling and analysis	Pre-2000 – 2016	Approx. \$30,000 annually

VIII. FEE TITLE ACQUISITION/CONSERVATION EASEMENT/RESTORATION REQUIREMENTS:

A. Parcel List:

B. Acquisition/Restoration Information: N/A

IX. VISUAL COMPONENT or MAP(S): See Attached Subwatershed Map

X. RESEARCH ADDENDUM: N/A

XI. REPORTING REQUIREMENTS:

Periodic work plan status update reports will be submitted no later than February 1, 2017, August 1, 2017, February 1, 2018, August 1, 2018, and February 1, 2019. A final report and associated products will be submitted between June 30 and December 31, 2019.

**Environment and Natural Resources Trust Fund
M.L. 2016 Project Budget**



Project Title: Invasive Carp Management Research in Lake Nokomis Subwatershed

Legal Citation: M.L. 2016, Chp. 186, Sec. 2, Subd. 06g

Project Manager: Adam Arvidson

Organization: Minneapolis Park and Recreation Board

M.L. 2016 ENRTF Appropriation: \$ 189,000

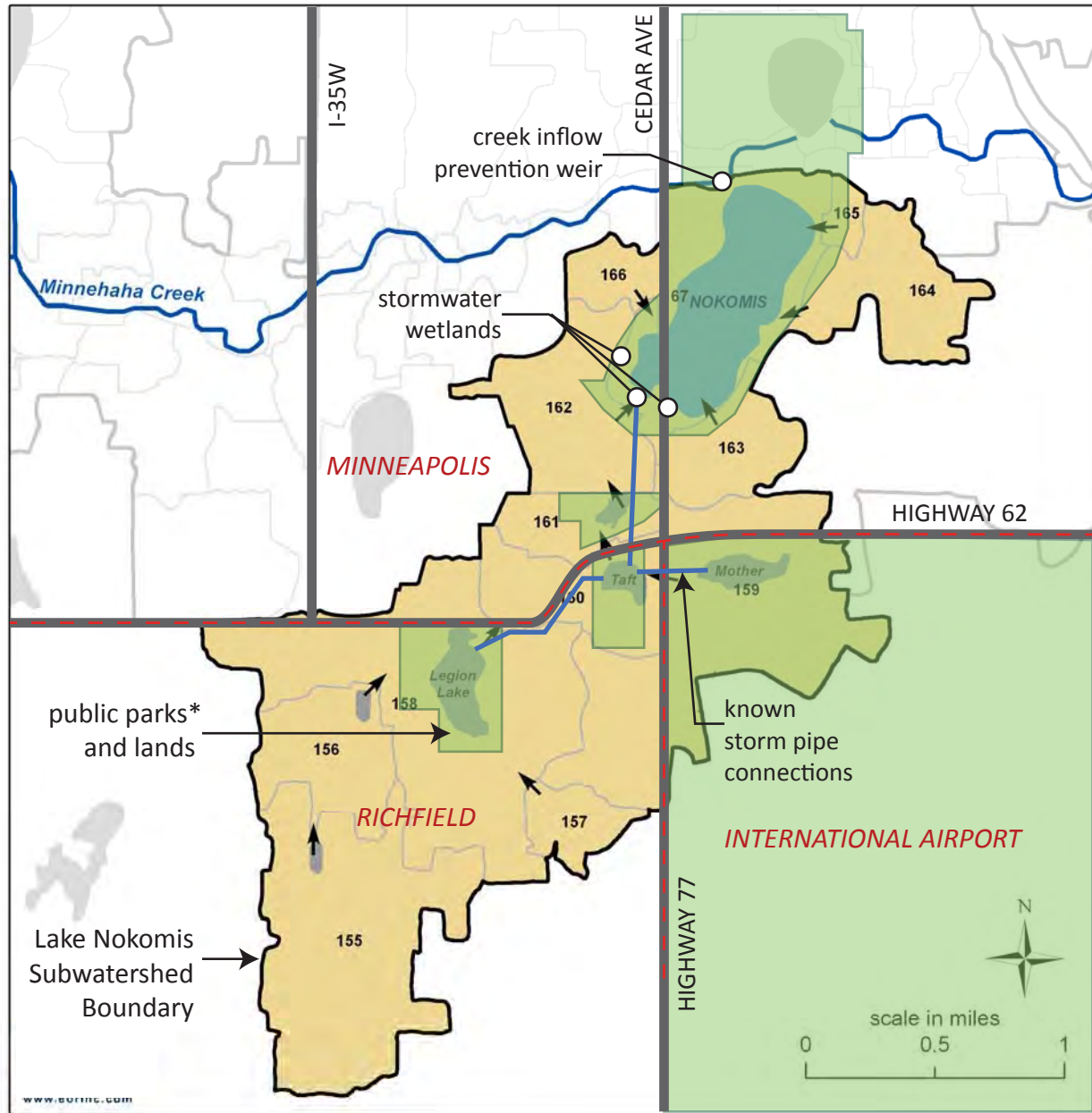
Project Length and Completion Date: 3 Years, June 30, 2019

Date of Report: May 29, 2016

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 1 Budget	Amount Spent	Activity 1 Balance	Activity 2 Budget	Amount Spent	Activity 2 Balance	Activity 3 Budget	Amount Spent	Activity 3 Balance	TOTAL BUDGET	TOTAL BALANCE
BUDGET ITEM	<i>Vegetation and Fisheries Assessment</i>			<i>Carp Movement Tracking</i>			<i>Carp Removal and Management Planning</i>				
Personnel (Wages and Benefits)											
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	\$602			\$602			\$602			\$1,806	
Professional/Technical/Service Contracts											
Tony Havranek, WSB Engineers (Telemetry, population estimates, aging, coordination of removals, management planning) = \$89,023	\$20,398			\$68,625			\$15,000			\$104,023	
Steve McComas, Blue Water Science (Fisheries assessment, plant surveys) = \$26,000	\$21,000			\$0			\$5,000			\$26,000	
Targeted carp netting and removal (contractor to be determined) = \$31,000							\$31,000			\$31,000	
Equipment/Tools/Supplies											
Radio tags, surgical supplies, radio receiver				\$4,950						\$4,950	
Capital Expenditures Over \$5,000											
<i>List specific items - one row per item. Add rows as needed.</i>											
Printing											
<i>List types of printing costs anticipated.</i>											
Travel expenses in Minnesota											
<i>Specify purpose for and types of travel expenses and indicate estimated allocations toward each type of expense, e.g., mileage, lodging, meals. Per diems are not allowed.</i>											
Other											
Unallocated at this time	\$10,000			\$8,823			\$2,398			\$21,221	
COLUMN TOTAL	\$52,000			\$83,000			\$54,000			\$189,000	

Environment and Natural Resources Trust Fund (ENRTF)
2016 Proposal
Invasive Carp Applied Research in Lake Nokomis Subwatershed

Project Location



* public lands shown are those that overlap the subwatershed



targeted winter carp removal



carp with surgically implanted radio telemetry device

