Lessard-Sams Outdoor Heritage Council
Fiscal Year 2019 / ML 2018 Request for Funding

Date: May 31, 2017

Program or Project Title: Six Mile Creek-Halsted Bay Habitat Restoration Phase I

Funds Requested: $795,000

Manager's Name: Anna Brown
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County Locations: Not Listed

Regions in which work will take place:

- Metro / Urban

Activity types:

- Restore

Priority resources addressed by activity:

- Habitat

Abstract:

Over the next ten years, the Minnehaha Creek Watershed District (MCWD) and its Partners will engage in one of the Metro's largest habitat restoration and water quality enhancement projects, restoring 2,488 acres of in-lake habitat across 14 connected deep and shallow lakes and creating contiguous corridors of restored wetland and uplands in the Six Mile-Halsted Bay Subwatershed (SMCHB), one of the largest tributaries to Lake Minnetonka. Through one of the most ambitious Common Carp management efforts in the state, the program will improve fisheries and benefit waterfowl and non-game bird communities, improving recreation for fisherman, hunters and bird-watchers.

Design and scope of work:

The Six Mile Creek-Halsted Bay (SMCHB) subwatershed is a 27 square mile geography in the western metro spanning Carver and Hennepin Counties. The subwatershed includes 14 deep and shallow lakes, totaling 2,488 acres, and over 2,900 acres of wetlands. Carver Park Reserve is situated entirely within this subwatershed, providing 5,700 acres of permanently protected open water, wetland, forest, and prairie habitat. Much of the subwatershed is designated as DNR Regionally Significant Ecological Area. The complex of deep and shallow lakes and wetlands are connected through a 12 mile stream system that drains to Halsted Bay, the most impaired water body on Lake Minnetonka - the most heavily used recreation lake in the State.

Habitat for fish, birds and waterfowl has been degraded through much of this system, the results of overabundant common carp and historic agricultural land use, with users reporting decreased fishing success in Halsted Bay. Restoring this system is a priority for the District and its partners within the region (Cities of Victoria, St. Bonifacius, Minnetrista, and Waconia, Laketown Township, Carver and Hennepin Counties, and Three Rivers Park District). Together, this group is committed to aligning priorities and investments across agencies to accomplish large scale habitat, corridor, and water resource restoration objectives over the next 10-15 years.

Habitat improvements throughout this system will principally involve restoration of lake and marsh habitats through management of common carp,and the restoration of wetland and contiguous uplands to enhance and connect natural resource corridors.

The Common Carp management approach for SMCHB was developed based on a three-year, half-million dollar District investment with

the University of Minnesota AIS Research Center from 2014-2017, which provided a cutting-edge scientific assessment of common carp populations, reproduction and migratory patterns in the geography. This assessment revealed some of the largest carp population densities ever observed by the center. Proposed Common Carp management includes:
- Aerating 6 shallow marsh areas known to winterkill, to promote bluegill sunfish survivability and prevent carp recruitment.
- Physical barriers at 4 locations to block carp from accessing spawning areas. The barrier between Mud and Halsted will also trap carp for removal.
- Install a water control structure and barrier between two shallow lake systems to have the ability to block carp passage and manipulate water levels to eliminate carp recruitment and maintain healthy shallow lake systems.
- Remove adult carp through winter or open water seining, box-net trapping, and removing carp in stream channels.

This carp management approach will results in 2,488 acres of restored deep and shallow lakes, of which 66% is littoral habitat. Carp control will allow for the restoration of invertebrate and aquatic plant communities to the benefit of gamefish such as Bass, panfish and northern pike communities, as well as non-game fish and waterfowl, providing hunters and fisherman better opportunities to enjoy the region's outdoor heritage.

Which sections of the Minnesota Statewide Conservation and Preservation Plan are applicable to this project:

- H4 Restore and protect shallow lakes
- H6 Protect and restore critical in-water habitat of lakes and streams

Which other plans are addressed in this proposal:

- Long Range Plan for Fisheries Management
- Managing Minnesota's Shallow Lakes for Waterfowl and Wildlife

Describe how your program will advance the indicators identified in the plans selected:

Managing Minnesota's Lakes for Waterfowl and Wildlife
This program increases waterfowl and wildlife habitat in shallow lakes with public access that do not have tracts of shoreline specifically managed for wildlife. Carp management meets the strategy of managing invasive species that are impacting wildlife habitat. Longer term the SMCHB restoration program will further meet the objective through acquisition and restoration of wetlands and prairie that will further enhance waterfowl habitat across the subwatershed.

Long Range Plan for Fisheries Management
This program conserves and restores fish populations and aquatic habitat. It improves habitats so they sustain healthy aquatic systems and fish populations for recreational and commercial uses. Removing abundant carp will restore aquatic vegetation, which is valuable fish habitat. Aerating winterkill prone lakes eliminates carp recruitment and will sustain bigger, and more abundant bluegills, which frequently migrate from shallow lakes to lakes that are publicly accessible and fished by anglers.

Which LSOHC section priorities are addressed in this proposal:

Metro / Urban:

- Protect, enhance, and restore riparian and littoral habitats on lakes to benefit game and nongame fish species

Describe how your program will produce and demonstrate a significant and permanent conservation legacy and/or outcomes for fish, game, and wildlife as indicated in the LSOHC priorities:

The SMCHB program will improve the hunting and fishing legacy in the metro area by utilizing targeted carp control to restore vegetation and invertebrate populations in shallow lakes and littoral habitats, providing better refuge, spawning structure and improved food source for fish and wildlife. MN DNR fisheries find that moderately abundant aquatic plant communities promote high fish species richness and are optimal for growth and survival of fishes. Restoration of plant communities through this program will benefit gamefish including Bass, panfish and northern pike communities, as well as non-game fish and waterfowl, providing hunters and fisherman better recreation opportunities.

8 of the 14 lakes being addressed by this program are DNR managed fisheries. Most of the lakes have natural shorelines, providing optimum conditions for fishery improvements with in-lake habitat restoration. The state record largemouth bass was taken from one of these lakes in 2005, underscoring the potential for this system to become a tremendous metro bass fisheries – connected to Halsted Bay on Lake Minnetonka, a world class fishery known for its bass, walleye and muskellunge populations, and one of the state's most heavily used recreation lakes.

The restoration of these 14 lakes will further benefit the over 75 species of birds present in the area, including over 20 species of migratory waterfowl that either breed in or migrate through the area.

To ensure the permanence of these improvements, the MCWD will operate and maintain the physical infrastructure, while monitoring the system to inform ongoing adaptive management.

Describe how the proposal uses science-based targeting that leverages or expands corridors and complexes, reduces fragmentation or protects areas identified in the MN County Biological Survey:

This program to manage common carp in SMCHB would be the largest, most robust carp management efforts ever conducted in the state. The foundation for this program is a three-year assessment conducted in partnership with the University of Minnesota AIS Research Center which evaluated carp abundance, recruitment patterns, and seasonal movement patterns in SMCHB. This pioneering work and the resulting data, completed in 2017, has allowed the District to develop a well-timed, and targeted management approach with quantifiable goals.

SMCHB is an incredibly rich ecological system that has seen declining conditions due to over-abundant carp, and land use patterns that have substantially altered the hydrology, nutrient cycling, and ecology of the 2,900 acres of wetland, and its 14 lakes.

SMCHB subwatershed has 5,165 acres of nearly contiguous DNR-designated Regionally Significant Ecological Area that spans the watershed and 15 Minnesota Biological Survey Sites of Biodiversity significance. The 5,700 acre Carver Park Preserve provides habitat for over 75 species of birds and seven species of waterfowl nest in the area that would benefit from enhanced foraging activities once the carp population declines. The Subwatershed lies within the Mississippi flyway, a critical corridor for migratory waterfowl. SMCHB provides all this ecological benefit and value within 25 miles of downtown Minneapolis, making its restoration of preservation that much more critical to support the overall ecological value with the metro region and provide habitat for species negatively impacted by urbanization.

The carp management program leverages restoration work completed by the District and additional restoration to come in subsequent phases of the SMCHB habitat restoration. In 2013 MCWD restored 209 acres of prairie adjacent to Six Mile Marsh within a regionally significant ecological corridor. MCWD is currently restoring a 20 acre wetland complex situated between two MBS sites of biodiversity significance that will enhance the vegetative diversity of the site, providing improved habitat in an area of rapid urbanization. MCWD will continue to strategically implement targeted restorations like these to enhance the impact of the in-lake management approach.

How does the proposal address habitats that have significant value for wildlife species of greatest conservation need, and/or threatened or endangered species, and list targeted species:

This habitat restoration project will have benefits across the entire trophic chain. As carp populations are reduced, we will see restoration of aquatic vegetation, macroinvertebrates, and water quality, restoring food and habitat for numerous species of fish and wildlife, and in turn, restoring populations of these species.

In particular, carp management will allow shallow lakes to shift to a new, healthier alternative stable state. Much of the subwatershed's littoral area is currently turbid and algae-dominated. However, with fewer carp uprooting vegetation and suspending nutrients, littoral waters can return to clear-water states dominated by submerged aquatic vegetation. Evidence suggests that this alternative stable state positively impacts the food web on many levels. Higher abundance and diversity of aquatic vegetation is related to higher abundance, diversity and growth rates of fish and waterfowl, because vegetation provides better refuge and spawning habitat. These factors, combined with reduced competition for macroinvertebrates and other food, explain why carp management can have indirect effects on many species.

Over 20 species of waterfowl that either breed or migrate through the area will benefit from this restoration. The area contains over 75 species of birds, has over 15 MCBS Sites of Biodiversity significance, and the lakes support over 20 species of fish. These restoration benefits are endorsed by the Minnesota Waterfowl Association and the US Fish and Wildlife Service. Specific species that will benefit include:

Harvested waterfowl: Mallards, Wood ducks, Ring-necked ducks, Blue-winged teals, Canada Goose, Trumpeter Swan, Tundra Swan, American Black Duck, Northern Shoveler, Ring-necked duck, Bufflehead, Common Goldeneye, Hooded Merganser, Common Merganser, Common Loon, Pied-billed Grebe, Pelicans, Great Blue Heron, Great Egret, Green Heron, and Lesser scaup.

Game and non-game fish: Largemouth bass, northern pike, walleye, muskellunge, yellow perch, bluegill, pumpkinseed, shiners, Iowa darter, brook silverside, johnny darter, minnows, white sucker, and black and white crappie.

Water-birds listed on the Minnesota DNR Species in Greatest Conservation Need: Northern pintail, American black duck, Lesser scaup,

Trumpeter swan, Common loon, Western grebe, Horned grebe, Red-necked grebe, Eared grebe, Night heron, Franklin's gull, American white pelican, Upland sandpiper, White-rumped sandpiper, Semipalmated sandpiper, and Buff-breasted sandpiper.

Identify indicator species and associated quantities this habitat will typically support:

Aquatic Vegetation: Key habitat for waterfowl, fish and birds. Current communities are degraded, with invasive plants such as Eurasian Watermilfoil and Curlyleaf Pondweed dominating the system. Restoration will improve aquatic plant biodiversity and habitat diversity, with expected recovery of native narrow-leaf pondweeds, broad-leaf pondweeds and other native emergent and submerged plants. Aquatic vegetation in deep lakes should occupy 30 to 40% of the lake to optimize fish growth and abundance. In shallow lakes, vegetation should occupy near 100% of the area, providing key habitat and food source for waterfowl.

Waterfowl: Waterfowl pair density is high when compared to surrounding areas due to an abundance of existing and restorable wetland habitat. Restoration of these wetland areas will benefit these species, with Mallards being a key indicator species. There is the potential for over 30 duck/pairs/mile.

Invertebrates: Invertebrates are a key food source for waterfowl and several fish species. Common carp compete for this food sources, so removal of carp will restore the food sources in these waterbodies for waterfowl and fish. Key invertebrate species include snails, crustaceans and insects.

Fish: As habitat is improved, it is expected that populations and diversity of near-shore fish species will be improved, and include species such as darters, brook silverside and multiple species of shiners and minnows. These improvements will have cascading effects throughout the trophic change, and provide additional benefit to panfish, bass and other game fish. Changes in the fish community will be assessed in the future by the MN DNR.

Outcomes:

Programs in metropolitan urbanizing region:

- Improved aquatic habitat indicators *2,488 acres of habitat for fish and wildlife will be restored across 14 connected lakes. Aquatic vegetation will be restored, providing improved conditions that will benefit fish and waterfowl. The macroinvertebrate community will rebound, restoring the food source for waterfowl and many fish species. Evaluating changes in the aquatic plant community will occur by using the DNR's FQI, among other metrics. Fish and macroinvertebrate communities are predicted to improve based on increases in aquatic vegetation. The DNR's Fish IBI will be completed after carp management goals have been met, and can be compared to previously collected data.*

How will you sustain and/or maintain this work after the Outdoor Heritage Funds are expended:

The Minnehaha Creek Watershed District (MCWD) is a permanent governmental entity created by state statute and operates under a series of 10-year plans that are approved by MNBWSR. SMCHB is an established priority of the next 10-year plan, which will include an extensive investment strategy to implement carp management and subsequent phases of the habitat restoration program.

The MCWD relies on multiple funding sources including a local levy as well as public and private partnerships, including LSOHC. The District has the commitment and funding sources necessary to maintain existing and future natural resource enhancement projects.

MCWD is committed to utilizing its staff and expertise to maintain the results of this aggressive management approach into perpetuity. The District operates an Aquatic Invasive Species Program, whose top priority is to manage high impact AIS, such as common carp, in prioritized geographies of the District. MCWD will monitor the system post-project to identify and respond to any unanticipated recruitment events.

MCWD has a robust operations and maintenance program for its physical infrastructure and the maintenance of the aeration and barrier facilities will be rolled into that program, except where another agency has agreed to maintain infrastructure within their jurisdiction.

Explain the things you will do in the future to maintain project outcomes:

Year	Source of Funds	Step 1	Step 2	Step 3
2021 and beyond	MCWD Tax Levy	Maintain aeration units and barriers	Monitor for carp recruitment and gather carp population estimates	engage in carp removal if carp recruitment occurs or if populations exceed 100 kg/ha

What is the degree of timing/opportunistic urgency and why it is necessary to spend public money for this work as soon as possible:

It is critical to manage these powerful invaders before populations grow and migrate into new waters. The District just completed a

half-million dollar, 3-year carp assessment with the University of Minnesota in this geography. Waiting to implement carp management will make that data out-of-date, requiring new population estimates to be gathered. Carp management is phase 1 of habitat restoration in this area, but additional phases cannot be implemented until carp management is underway. Additional phases may include wetland restoration, as well as protection and restoration of upland areas by easement or possible land purchases. The sooner carp management can be implemented, the sooner other strategies can begin and restoration of this geography can occur.

How does this proposal include leverage in funds or other effort to supplement any OHF appropriation:

MCWD just completed a half-million dollar investment with the University of Minnesota to provide a scientific assessment of common carp in this geography. Those funds were all provided by the District's local levy. Additionally, the District will invest in the necessary monitoring equipment to implement this project, and maintain the project long-term. District will provide in-kind staff time during the duration of the project to complete most tasks, reducing funds needed from OHF .

Carp management is part of a larger strategy to restore aquatic and terrestrial habitat, create protected and enhanced wetland and upland corridors, and address historic legacy of development and farming practices on SMCHB water resources. The District has conducted several strategic implementation activities to meet these goals including a 209 acre prairie restoration adjacent to Six Mile Creek and a 20 acre wetland restoration between two MCBS designates sites of biodiversity significance.

Several of the longer term restoration strategies including subsequent phases of in-lake restoration and management of flow-throw wetlands are dependent upon carp management being complete, at which time the district will seek to leverage additional State and Regional funding sources as well as continue to implement using levy and local match.

Relationship to other funds:

- Environmental and Natural Resource Trust Fund
- Clean Water Fund

Describe the relationship of the funds:

MCWD has historically been successful leveraging Clean Water Funds for the implementation of water quality implementation projects. However, the targeted benefits of the broader SMCHB restoration strategy are not limited to only to water quality improvement. While Clean Water Funds can be leveraged for implementation elements that will enhance the overall restoration impact, this management program specifically targets habitat restoration that would not typically be funded by the Clean Water Fund.

MCWD intends to seek funding from the Environmental and Natural Resource Trust Fund for future phases of this restoration strategy, potentially including the wetland restoration program phase.

Describe the source and amount of non-OHF money spent for this work in the past:

Appropriation Year	Source	Amount
2014-2015	MCWD Tax Levy	181,386
2015-2016	MCWD Tax Levy	165,649
2016-2017	MCWD Tax Levy	186,355

Activity Details

Requirements:

If funded, this proposal will meet all applicable criteria set forth in MS 97A.056 - **Yes**

Will restoration and enhancement work follow best management practices including MS 84.973 Pollinator Habitat Program - **Yes**

Is the activity on permanently protected land per 97A.056, subd 13(f), tribal lands, and/or public waters per MS 103G.005, Subd. 15 - **Yes (Public Waters)**

Do you anticipate federal funds as a match for this program - **No**

Land Use:

Will there be planting of corn or any crop on OHF land purchased or restored in this program - **No**

Accomplishment Timeline

Activity	Approximate Date Completed
Run electric for aeration units	September 2018
Install aeration units	November 2018
Install permeable berm at outlet of Crown College Pond	September 2018
Install weir and stilling well between North and South Lundsten	September 2019
Replace barrier at Zumbra outlet	September 2018
Install barrier/fish-trap between Mud Lake and Halsted Bay	September 2018
Install barrier at Wassermann outlet	September 2018
Box-net trapping	June 2021
Winter/open-water seining	March 2021
Carp trapping in stream channels	June 2021
Evaluation and effectiveness monitoring	Ongoing - MCWD

Budget Spreadsheet

Total Amount of Request: $795,000

Budget and Cash Leverage

Budget Name	LSOHC Request	Anticipated Leverage	Leverage Source	Total
Personnel	$0	$269,400	MCWD Tax Levy, MCWD Tax Levy, MCWD Tax Levy, USFWS Match	$269,400
Contracts	$568,000	$0		$568,000
Fee Acquisition w/ PILT	$0	$0		$0
Fee Acquisition w/o PILT	$0	$0		$0
Easement Acquisition	$0	$0		$0
Easement Stewardship	$0	$0		$0
Travel	$0	$0		$0
Professional Services	$0	$0		$0
Direct Support Services	$0	$0		$0
DNR Land Acquisition Costs	$0	$0		$0
Capital Equipment	$167,000	$0		$167,000
Other Equipment/Tools	$0	$91,300	MCWD Tax Levy	$91,300
Supplies/Materials	$60,000	$0		$60,000
DNR IDP	$0	$0		$0
Total	$795,000	$360,700	-	$1,155,700

Personnel

Position	FTE	Over # of years	LSOHC Request	Anticipated Leverage	Leverage Source	Total
Position 1	0.60	3.00	$0	$151,900	MCWD Tax Levy	$151,900
Position 2	0.50	3.00	$0	$72,200	MCWD Tax Levy	$72,200
Position 3	0.30	3.00	$0	$43,300	MCWD Tax Levy	$43,300
USFWS technical assistance	0.02	1.00	$0	$2,000	USFWS Match	$2,000
Total	1.42	10.00	$0	$269,400	-	$269,400

Capital Equipment

Item Name	LSOHC Request	Anticipated Leverage	Leverage Source	Total
Aeration units	$22,000	$0		$22,000
Permeable berm (barrier)	$20,000	$0		$20,000
Weir, barrier and stilling well	$30,000	$0		$30,000
Physical barriers	$20,000	$0		$20,000
Barrier/fish-trap	$75,000	$0		$75,000
Total	$167,000	$0	-	$167,000

Amount of Request:	$795,000
Amount of Leverage:	$360,700
Leverage as a percent of the Request:	45.37%
DSS + Personnel:	$0
As a % of the total request:	0.00%
Easement Stewardship:	$0
As a % of the Easement Acquisition:	-%

Does the amount in the contract line include R/E work?

The full amount of the contract line is for R/E work, principally in the form of carp removal and capital construction. In Minnesota, commercial fisherman hold license for carp removal on individual lakes, so the District is obligated to work with the licensed fisherman for all seining activities.

Describe and explain leverage source and confirmation of funds:

The leverage will be primarily met through the District's ad valorem tax levy. All equipment costs will be leverage in Year 1 and be

available in 2018. The personnel costs will use existing full time staff positions, so additional board approvals are not required.

Does this proposal have the ability to be scalable? - Yes

Tell us how this project would be scaled and how administrative costs are affected, describe the "economy of scale" and how outputs would change with reduced funding, if applicable:

The program and budget has been developed to optimize carp removal to get populations below 100 kg/ha. However, with less funding, the District would likely prioritize the barriers and aeration as the most critical for long term carp control and reduce the aggressiveness of removal.

Output Tables

Table 1a. Acres by Resource Type

Type	Wetlands	Prairies	Forest	Habitats	Total
Restore	0	0	0	2,488	2,488
Protect in Fee with State PILT Liability	0	0	0	0	0
Protect in Fee W/O State PILT Liability	0	0	0	0	0
Protect in Easement	0	0	0	0	0
Enhance	0	0	0	0	0
Total	0	0	0	2,488	2,488

Table 2. Total Requested Funding by Resource Type

Type	Wetlands	Prairies	Forest	Habitats	Total
Restore	$0	$0	$0	$795,000	$795,000
Protect in Fee with State PILT Liability	$0	$0	$0	$0	$0
Protect in Fee W/O State PILT Liability	$0	$0	$0	$0	$0
Protect in Easement	$0	$0	$0	$0	$0
Enhance	$0	$0	$0	$0	$0
Total	$0	$0	$0	$795,000	$795,000

Table 3. Acres within each Ecological Section

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	Northern Forest	Total
Restore	2,488	0	0	0	0	2,488
Protect in Fee with State PILT Liability	0	0	0	0	0	0
Protect in Fee W/O State PILT Liability	0	0	0	0	0	0
Protect in Easement	0	0	0	0	0	0
Enhance	0	0	0	0	0	0
Total	2,488	0	0	0	0	2,488

Table 4. Total Requested Funding within each Ecological Section

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	Northern Forest	Total
Restore	$795,000	$0	$0	$0	$0	$795,000
Protect in Fee with State PILT Liability	$0	$0	$0	$0	$0	$0
Protect in Fee W/O State PILT Liability	$0	$0	$0	$0	$0	$0
Protect in Easement	$0	$0	$0	$0	$0	$0
Enhance	$0	$0	$0	$0	$0	$0
Total	$795,000	$0	$0	$0	$0	$795,000

Table 5. Average Cost per Acre by Resource Type

Type	Wetlands	Prairies	Forest	Habitats
Restore	$0	$0	$0	$320
Protect in Fee with State PILT Liability	$0	$0	$0	$0
Protect in Fee W/O State PILT Liability	$0	$0	$0	$0
Protect in Easement	$0	$0	$0	$0
Enhance	$0	$0	$0	$0

Table 6. Average Cost per Acre by Ecological Section

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	Northern Forest
Restore	$320	$0	$0	$0	$0
Protect in Fee with State PILT Liability	$0	$0	$0	$0	$0
Protect in Fee W/O State PILT Liability	$0	$0	$0	$0	$0
Protect in Easement	$0	$0	$0	$0	$0
Enhance	$0	$0	$0	$0	$0

Target Lake/Stream/River Feet or Miles

3.89 square miles of lake targeted

I have read and understand Section 15 of the Constitution of the State of Minnesota, Minnesota Statute 97A.056, and the Call for Funding Request. I certify I am authorized to submit this proposal and to the best of my knowledge the information provided is true and accurate.

Parcel List

Explain the process used to select, rank and prioritize the parcels:

N/A

Section 1 - Restore / Enhance Parcel List

No parcels with an activity type restore or enhance.

Section 2 - Protect Parcel List

No parcels with an activity type protect.

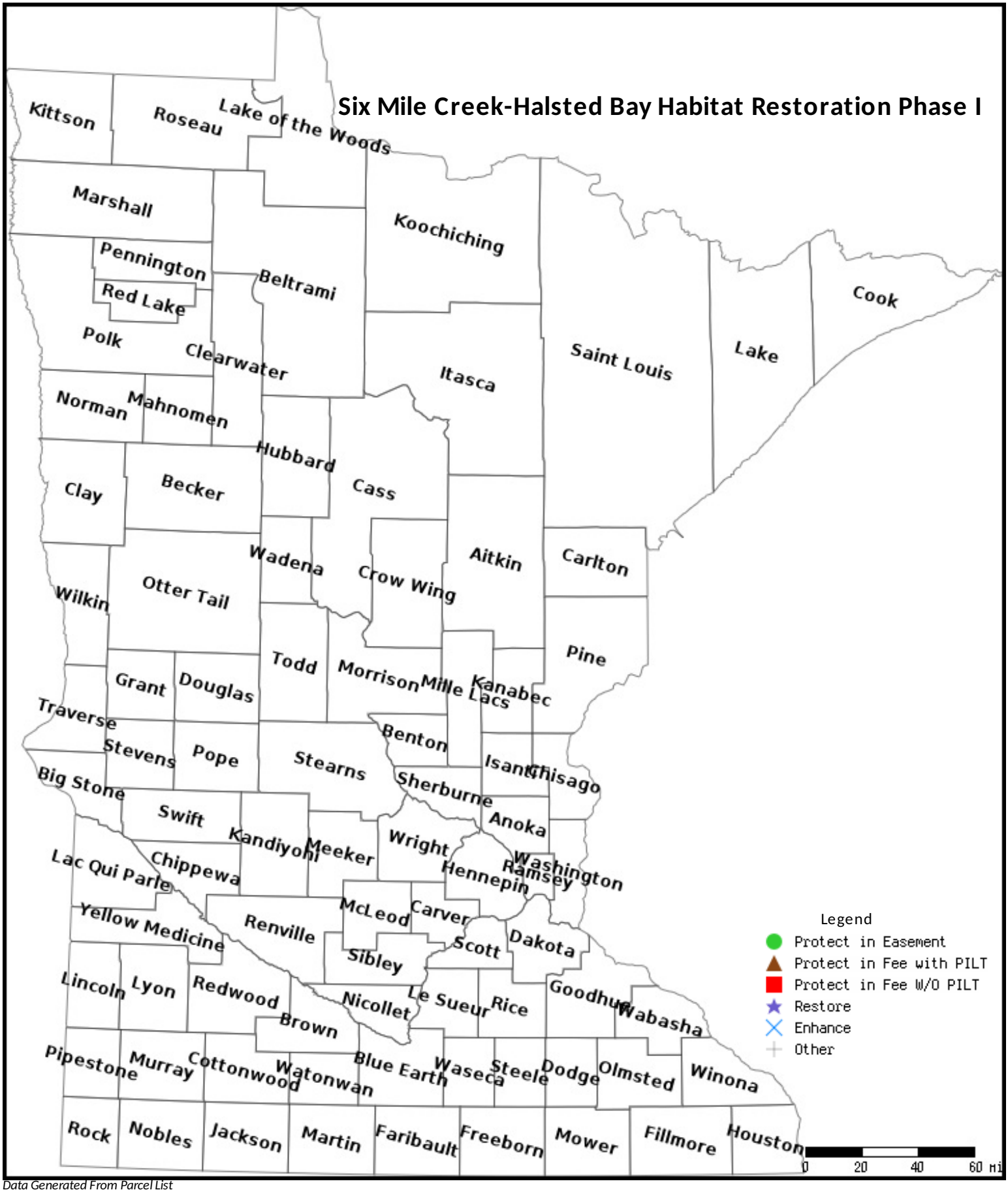
Section 2a - Protect Parcel with Bldgs

No parcels with an activity type protect and has buildings.

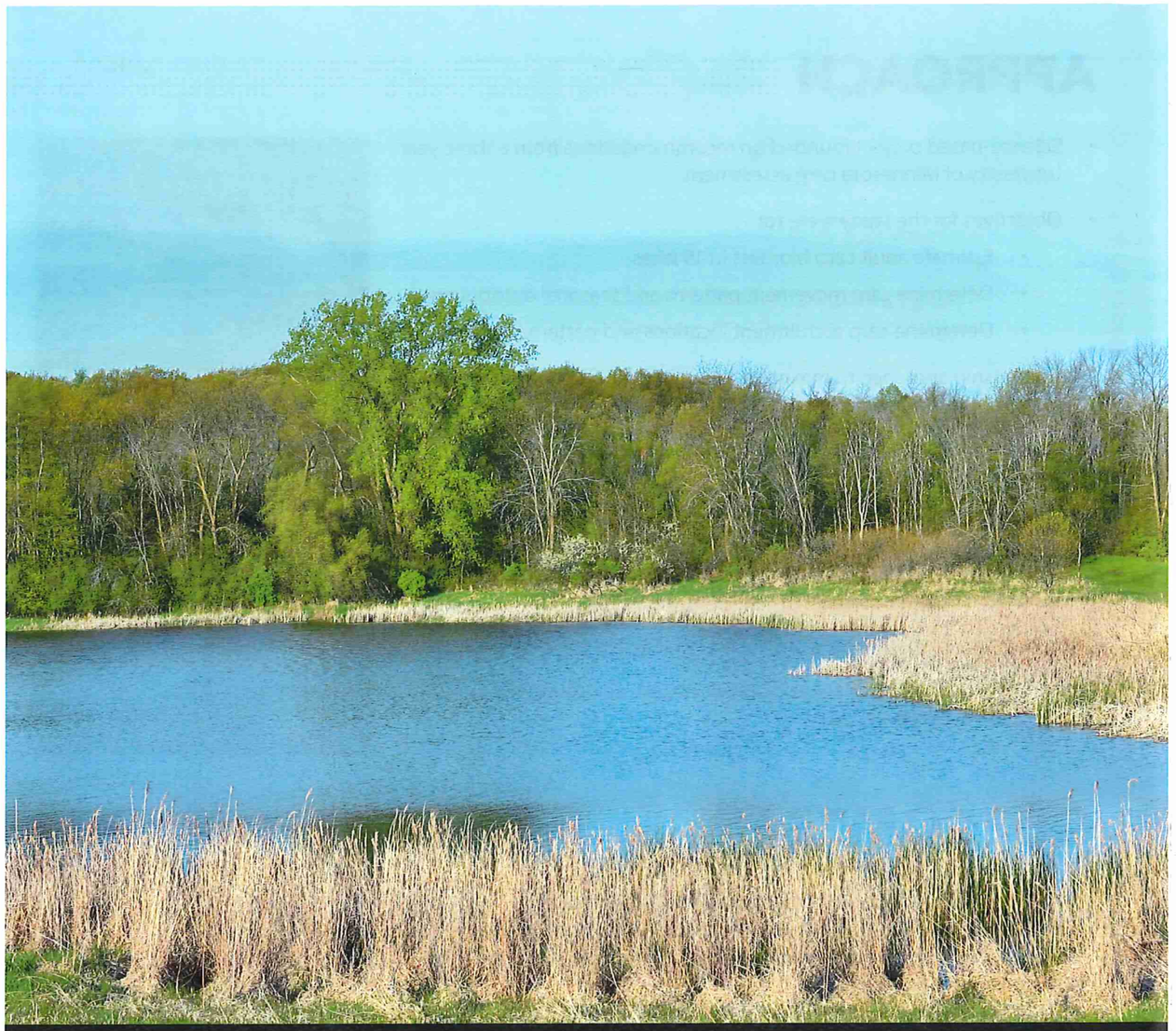
Section 3 - Other Parcel Activity

No parcels with an other activity type.

Parcel Map



Data Generated From Parcel List



SIX MILE - HALSTED BAY HABITAT RESTORATION

A focused and coordinated approach to improving habitat and ecological integrity

Carver County • Carver County Soil and Water Conservation District • Hennepin County • Laketown Township • Minnetrista • St. Bonifacius • Three Rivers Park District • Victoria • Waconia

QUALITY OF WATER *** QUALITY OF LIFE
50TH ANNIVERSARY
Est. 1967
MINNEHAHA CREEK WATERSHED DISTRICT

INTRODUCTION

The Six Mile-Halsted Bay Subwatershed (SMHB) is a 27 square mile area at the headwaters of Lake Minnetonka containing 17 lakes and hundreds of acres of wetlands woven together by Six Mile Creek. Since 2014, the Minnehaha Creek Watershed District has prioritized this geography for natural resource protection and enhancement. Based on sound science, we identified the following key issues:

- Degraded habitat for fish and waterfowl
- Elevated phosphorus levels
- Fragmented habitat corridors
- Degraded wetland systems

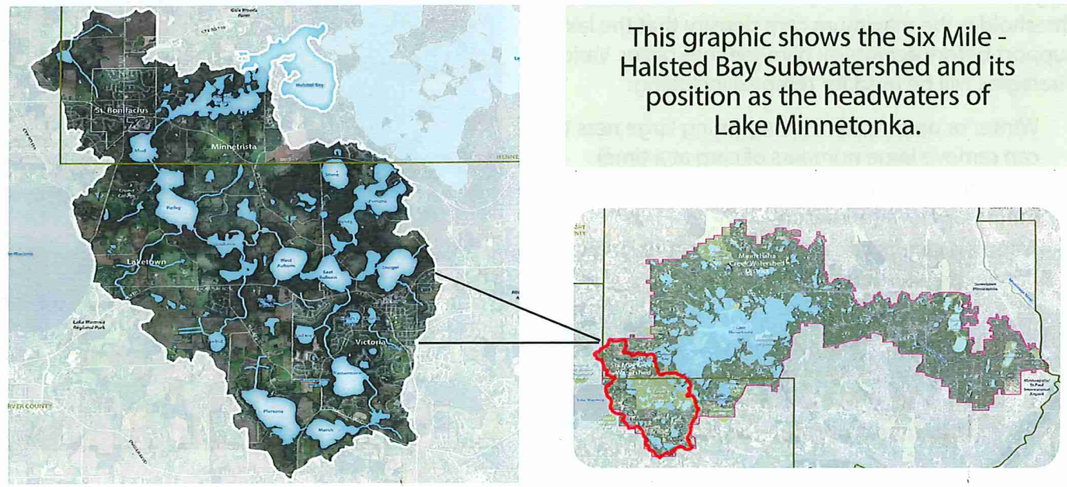
In 2016, we formed the SMHB Partnership, bringing together representatives from the cities of Minnetrista, St. Bonifacius, Victoria, and Waconia; Carver and Hennepin Counties; Laketown Township; Three Rivers Park District; and Carver County Soil and Water Conservation District. The partnership helps guide implementation in a way that is coordinated, integrated with local plans and priorities, and leverages public investment across agencies. By coordinating with other agencies we can maximize our ability to create a SMHB that supports robust game fish populations, where wetlands perform critical ecosystem services for humans and waterfowl, and where corridors connect people and animals through protected, high value natural resources.

To achieve this vision, we developed a 3-pronged strategy:

- **Carp management** for habitat restoration
- **Landscape restoration** through wetland and corridor acquisition and enhancement
- **Alum treatment** to manage internal phosphorus release

As we develop an implementation plan, we are seeking to build on our previous success at obtaining grants for individual projects by diversifying our funding approach. By targeting multi-year, programmatic funds instead of single-project grants, we aim to increase our effectiveness. This also means bringing new partners to the table who can help extend our work into new areas, affirming our commitment to extend the clean water ethos to support a broader array of ecosystem services.

We are preparing a funding request for fiscal year 2019 to Lessard Sams Outdoor Heritage Council for the SMHB carp management program. In this brochure, you will find information about the common carp population in the SMHB, why carp management is a crucial first step in the overall strategy, and how we intend to reduce carp below the ecological damage threshold system-wide.



This graphic shows the Six Mile - Halsted Bay Subwatershed and its position as the headwaters of Lake Minnetonka.

PHASE I: CARP MANAGEMENT

Common carp are long-lived, highly productive invasive fish that can have severe impacts to the ecology of lakes and wetlands. They are bottom feeders, uprooting aquatic vegetation, digging up nutrient-rich sediment and eating the microorganisms that serve as food for fish and waterfowl. Waterbodies with abundant common carp can often be described as turbid, algae-dominated and lacking aquatic vegetation that is valued habitat for many aquatic organisms. Managing common carp populations can improve the aquatic vegetation community, thus improving habitat and water quality for waterfowl and gamefish and restoring the ecological health in these once degraded lakes.

The scientific data from the three year assessment we conducted in partnership with the University of Minnesota will inform carp management for years to come in this subwatershed. Carp management coupled with other restoration strategies will restore valuable habitat once occupied by abundant waterfowl and gamefish and improve water quality across the system. We propose a carp management plan with three main objectives:

1. SUPPRESSING CARP RECRUITMENT

Aeration units will be installed in six of the shallow lakes and will operate from November to April. These six lakes were identified as carp nurseries during the three year assessment. Aerating these lakes will prevent winterkill of bluegill sunfish, which are predators of carp eggs. Several physical barriers will also be installed to prevent adult carp from spawning in affected lakes.

2. INSTALLING BARRIER/TRAP BETWEEN MUD LAKE AND HALSTED BAY

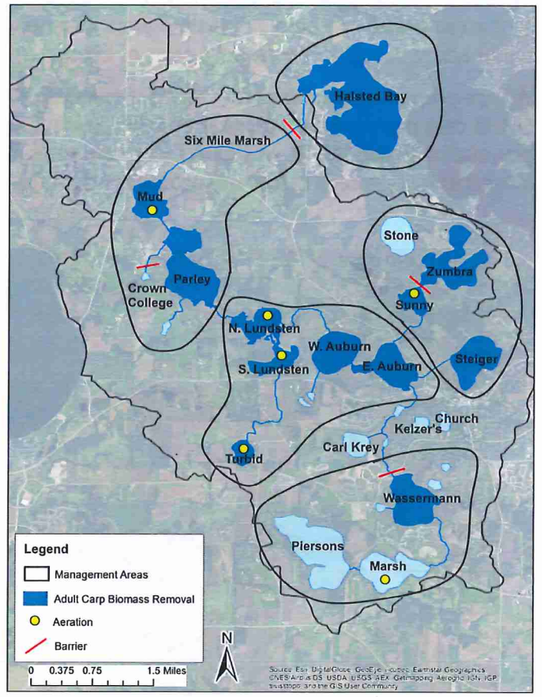
The barrier installed between Mud Lake and Halsted Bay will be instrumental to prevent carp migration from Halsted Bay and the greater Lake Minnetonka to Mud and Parley Lakes. This will contain the carp populations and help with removal efforts. A trap will also be used in this location to capture additional carp and remove them from the lakes.

3. ADULT CARP BIOMASS REMOVAL

Carp will be removed from individual lakes to achieve a target of 89 lbs/acre of carp biomass in each lake. This threshold is the maximum carp density that the lakes support before ecological damage may occur. Various strategies will be used for removal including:

- Winter or open water seining (using large nets that can remove large numbers of carp at a time)
- Box-net trapping (rectangular nets used with bait during open water season)
- Trapping carp in stream channels as they migrate between waterbodies

Long-term monitoring will track progress of carp removal, potential carp recruitment, and the ecological response from carp removal.



Six Mile - Halsted Bay Carp Management Area

APPROACH

- Science-based project founded on recommendations from a three year University of Minnesota carp assessment
- Objectives for the study were to:
  - Estimate adult carp biomass in 15 lakes
  - Determine carp movement patterns and seasonal distribution
  - Determine carp recruitment locations and patterns
- Partnership approach to maximize the public return on investment and achieve stacked benefits across sectors
- Phase I of a sustainable and long-term commitment to maintain habitat restoration

Meets objectives for the Metro Urbanizing Area:

- Protect and restore riparian and littoral habitats on lakes to benefit game and non-game fish species
- Protect from long term or permanent endangerment from invasive species

OUTCOMES

- Restore littoral habitat in 14 lakes, totaling 2,488 acres of habitat for game and non-game fish by increasing aquatic vegetation, improving the invertebrate communities, and increasing water clarity
- Improve habitat and forage for over 75 species of birds, including over 20 species of waterfowl that breed in or migrate through the subwatershed
- Provide long-term protection from invasive common carp across the system of lakes and wetlands in the subwatershed

CONTACT

Learn more and stay up to date at www.minnehahacreek.org/six-mile or contact Anna Brown, (952) 641-4522, abrown@minnehahacreek.org.

UNIVERSITY OF MINNESOTA

Twin Cities Campus

Department of Fisheries Wildlife, and Conservation Biology
College of Food, Agricultural and Natural Resource Sciences

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- *Office address is 104 Hodson Hall)*

May 31, 2017

Dear Members of the Lessard Sams Outdoor Heritage Council,

I write to express my strong support for Minnehaha Creek Watershed District's (MCWD) Six Mile-Halsted Bay Habitat Restoration Program which I have read. The Six Mile Creek –Halsted Bay Subwatershed is a truly remarkable chain of shallow lakes located in the heart of the Metro Area that unfortunately has been severely damaged by a heavy infestation of common carp. There is no doubt that at one time it once supported enormous populations of waterfowl and game fish, most of which has now disappeared because of ecological degradation caused by hordes of bottom-feeding carp. Using mark-recapture techniques my research team has measured the highest densities of adult carp yet reported in the US (~800lbs/ acre). Further, we have found that thousands of these carp leave this system each year to enter Lake Minnetonka proper where they inflict other untold damage. However, there is very good news. In our recently three-year half-million dollar scientific study of this Subwatershed, my team concluded that watershed habitat restoration would be possible if this invasive were brought into control and that this is possible. Of key importance, was our surprising discovery that only 2-4 small ponds of the dozen or so that comprise this system are the source of the tens of thousands of carp that live there, and that recruitment (production of young) from these ponds, is not continuous. These ponds only produce young carp because they are very shallow and degraded and thus lack gamefish, and they could be restored. Further, we identified key carp migratory routes using a combination of radio-tracking, DNA markers and microchemistry – and these routes could be blocked. Finally, the population estimates we provided MCWD provide an excellent starting place for removal. In our final report to the MCWD, we provide detailed state-of-the–art scientific recommendations to reduce and then control these carp populations. It would likely be the largest – and most economically and ecologically valuable -- carp control program attempted in the Midwest. It will not easy, will take much patience and support from many parties, but the effort to restore a century of damage to this once exquisite system is clearly warranted.

We look forward to continuing to work with MCWD as they develop this innovative approach to managing common carp across this large interconnected lake and wetland system of great value.

Sincerely,

Dr. Peter Sorensen
Professor, Department of Fisheries, Wildlife & Conservation Biology
University of Minnesota
Soren003@umn.edu

Minnesota Waterfowl Association, INC
907 First Street N. Hopkins, MN 55343 • 952-767-0320 • FAX 952-767-0324

May 22, 2017

To Whom It May Concern,

The Six Mile – Halsted Bay Habitat Restoration project will greatly benefit and improve Minnesota's waterfowl habitat and populations as well as improve the ecological integrity of Minnesota's waters. Minnesota Waterfowl Association expresses full support of this project proposed by Minnehaha Creek Watershed District.

The Six Mile – Halsted Bay Subwatershed is a 27 square mile area with 17 lakes and hundreds of acres of wetlands that provide habitat to dabbler and diving duck populations. Species that have been found on these waters include (but are not limited to): Mallards, Blue wing teal, Wood Ducks, Wigeon, Gadwall, Bufflehead, Ruddy Duck, Redhead, Ring-necked Duck, Common Merganser, Hooded Merganser, American Black Duck, Canvasback, Greater/Lesser Scaup, Long-tailed Duck, Common Goldeneye, and Red-breasted Merganser. Habitat for these species is degrading under rising carp and rough fish populations, loss of critical wetland complexes, and high phosphorus levels in the Subwatershed's waters. Minnehaha Creek Watershed District's proposed project for Habitat Restoration in the Six Mile – Halsted Bay Subwatershed is critical to improving these current conditions and providing better waterfowl habitat, populations, and opportunities for future generations of duck hunters.

Minnesota Waterfowl Association fully supports the efforts of the Minnehaha Creek Watershed District and anticipates collaborating on this project in the years to come.

Sincerely,

Bradley D. Nylin
Executive Director
Minnesota Waterfowl Association

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Minnesota Valley National Wildlife Refuge
and Wetland Management District
3815 American Blvd East
Bloomington, MN 55425

May 31, 2017

Lessard Sams Outdoor Heritage Council
100 Rev. Dr. Martin Luther King Jr. Blvd.
State Office Building, Room 95
St. Paul, MN 55155

Members of the Lessard Sams Outdoor Heritage Council,

The Minnesota Valley National Wildlife Refuge (Refuge) as part of the U.S. Fish & Wildlife Service (USFWS) is pleased to express our support for the Six Mile-Halsted Bay (SMCHB) Habitat Restoration Project, which is one of the largest habitat-corridor improvement projects in the metropolitan area targeting the invasive common carp. The first phase of the project will restore 2,488 acres across 14 deep and shallow lakes by managing and removing common carp, improving the fishery and benefitting waterfowl and non-game bird communities.

The SMCHB watershed is rich in natural resources and biodiversity and provides habitat for 75 species of birds and the lakes support over 20 species of fish. The MN DNR has identified over 15 sites of biodiversity significance. Large areas of undisturbed or minimally disturbed forest and wetlands in the sub watershed have been designated Regionally Significant Ecological Areas, including nearly all of the Carver Park Reserve. At the same time, an overabundance of common carp, degraded wetland complexes, and high nutrient levels threaten critical habitat and for breeding and migration for a host of waterfowl, fish, amphibians, waterbirds, and shorebirds. The Minnehaha Creek Watershed District's (MCWD) proposed restoration is critical in preserving the area's rich natural resources and providing improved conditions for fish, waterfowl, and non-game birds.

The goals of the MCWD's habitat restoration project are consistent with the USFWS's Partners for Fish and Wildlife Program, which aims to work with others to conserve, protect and enhance fish, wildlife, and plants and their habitats. The Refuge values MCWDs commitment to these shared resources, and recognizes the SMCHB Habitat Restoration Project as an innovative, adaptive approach to address complex habitat and water resource challenges. The Refuge is fully supportive of this work, and looks forward to supporting this and future phases of the restoration of the SMCHB system.

Sincerely,

Tim Bodeen
Refuge Manager

ThreeRivers
PARK DISTRICT

May 30, 2017

Dear Members of the Lessard-Sams Outdoor Heritage Council:

As a member of the Six Mile-Halsted Bay Subwatershed Partnership, Three Rivers Park District (TRPD) is pleased to offer support for the Minnehaha Creek Watershed District's (MCWD) habitat restoration program for the Six Mile-Halsted Bay subwatershed, one of the largest habitat-corridor improvement projects in the metropolitan area.

Within the Six Mile-Halsted Bay subwatershed, TRPD owns Carver Park Reserve, almost 6,000 acres of permanently protected lakes, marshes, forest, and prairie habitat. Carver Park contains five lakes and hundreds of acres of restorable wetlands and marshes, comprising a significant portion of the restorable Six Mile-Halsted Bay corridor, in close proximity to Lake Minnetonka and Minnetonka Regional Park. In addition to facilitating the restoration of public lands, Carver Park Reserve provides access by the public to enjoy the benefits of those restoration lands, with hundreds of thousands of visitors every year. Promoting environmental stewardship is at the center of TRPD's mission, making the MCWD and TRPD natural partners.

Over the last year, TRPD has participated as the District has led an effort to bring together stakeholders from across the subwatershed to develop a science-based strategy to protect and restore the abundant natural resources contained within this geography. The Partnership has established shared goals that will not only strengthen the ecological integrity of the subwatershed, but will do so in a way that is integrated across public agencies to maximize the return on the public's investment in natural resources.

Through the District's leadership in identifying principal drivers of declining aquatic habitat in the system, we understand that addressing high concentrations of common carp is the first prong of a strategy to restore the integrity of the 14 lakes and hundreds of acres of wetland in the Six Mile-Halsted Bay subwatershed. Significant portions of the aquatic habitat in this area have been degraded due to the presence of common carp, and the District's efforts to control common carp within the system will restore critical habitat for game fish and waterfowl species. The goals of this management program – to control carp reproduction, remove adult biomass, and install barriers to reduce the ease of movement through the system – will allow aquatic vegetation to re-establish, creating critical habitat for fish and waterfowl populations. While further implementation will be needed to fully realize the vision of a restored Six Mile system, we recognize the District's commitment and leadership to carry the vision through.

Administrative Center, 3000 Xenium Lane North, Plymouth, MN 55441-1299
Information 763.559.9000 • TTY 763.559.6719 • Fax 763.559.3287 • www.ThreeRiversParks.org

Three Rivers Park District is a committed and active participant in the Six Mile-Halsted Bay restoration strategy. We appreciate your consideration of this strategy which will greatly enhance this unique metro resource.

Sincerely,

Boe R. Carlson

Boe R. Carlson, Superintendent
Three Rivers Park District

BRC/jjs

City of Victoria
1670 Stieger Lake Lane
P.O. Box 36
Victoria, MN 55386
952.443.4210

May 30, 2017

Members of the Lessard-Sams Outdoor Heritage Council,

As a member of the Six Mile-Halsted Bay Subwatershed Partnership, The City of Victoria is pleased to offer support for the Minnehaha Creek Watershed District's (MCWD or District) habitat restoration program for the Six Mile-Halsted Bay subwatershed, one of the largest habitat-corridor improvement projects in the metropolitan area.

The City of Victoria is known as the City of Lakes and Parks, and as such we place high value on our ecological resources. The City contains three of the Six Mile Subwatershed lakes and several smaller lakes, as well as many wetland complexes, including several that are listed as regionally significant ecological areas. Our residents value the opportunity to fish our local lakes and access Carver Park Reserve for its wildlife viewing opportunities. Our residents also notice the negative impact that high concentrations of carp have had on our water resources over the years, impacting their ability to recreate within the cities many natural assets.

The City and District have worked in partnership for years both through the Six Mile Halsted Bay Subwatershed Partnership and through coordination on specific water quality and ecological restoration projects. The District's approach to project develop supports the City's development goals while enhancing the ecological integrity of the wetland and water resources within City limits.

Most recently, the City and District signed an agreement in mid-May that will restore a 23 acre wetland adjacent to Lake Wassermann, a lake whose ecological integrity has been severely impact by both Carp and elevated phosphorus levels. The restoration will preserve 1,500 feet of shoreline from private develop and the two parties will coordinate to construct a fishing pier to improve recreational access to the Lake. This project will be directly enhanced by the carp management program as it makes Wassermann an increasingly attractive fishing destination.

Through the District's leadership in identifying principal drivers of declining aquatic habitat in the system, we understand that addressing high concentrations of common carp is the first prong of a strategy to restore the integrity of the 14 lakes and hundreds of acres in the Six Mile-Halsted Bay subwatershed. The City and its residents value the District's work in developing an implementation approach to management of the system and convene all agencies to commit to restoration of the Six Mile-Halsted Bay Subwatershed. The scale of implementation is greater than any one agency could do along, and we value the District's commitment and leadership to carry the vision through.

The City of Victoria is a committed and active participant in the Six Mile-Halsted Bay restoration strategy. We appreciate your consideration of this program which will greatly enhance this unique metro resource.

Sincerely,

Laurie Hokkanen

Laurie Hokkanen
City Manager

Municipal Offices
7701 County Road 110 West
Minnetrista, MN 55364-9552
Email: minnetrista@ci.minnetrista.mn.us

May 25, 2017

Members of the Lessard-Sams Outdoor Heritage Council,

As a member of the Six Mile-Halsted Bay Subwatershed Partnership, The City of Minnetrista is pleased to offer support for the Minnehaha Creek Watershed District's (MCWD or District) habitat restoration program for the Six Mile-Halsted Bay subwatershed, one of the largest habitat-corridor improvement projects in the metropolitan area.

The City of Minnetrista is a rural residential and lakeshore community situated on the western edge of Lake Minnetonka. The City includes Halsted Bay and its tributary wetland complex, Six Mile Marsh. Over the years, the City has seen the active fisheries of Halsted Bay give way to high carp populations that have degraded the shoreline and impacted our residents' ability to enjoy this resource. The issues in Halsted Bay are made worse by a degraded upstream system, parts of which also fall in the City's jurisdiction, including wetland that have altered hydrology and limited vegetative diversity.

The scale of restoration in Halsted Bay, Six Mile Marsh, and the upland lake complex is greater than the City can implement, and we value the District's leadership in creating a programmatic solution to enhance the ecology of the whole system, providing benefit to our human and non-human residents. We understand that carp are a principal driver of the declining ecological condition within Halsted Bay and its upstream lakes, and are encouraged by this opportunity to aggressively manage carp to make way for other in lake and watershed restoration strategies and increase their effectiveness.

The District has proven its leadership in identify and implementing solutions to enhance the ecological integrity within this area. In 2013, the District purchased 209 acres in the City of Minnetrista to restore it from tiled agriculture to a mixture of native prairie and savanna and oak woodland. The City and District also partnered on a to provide technical and regulatory assistance on a wetland banking project on a private farm just outside of the Six Mile-Halsted bay Subwatershed, protecting and restoring 42 acres of wetland and buffer. This effort to manage carp system wide will be complementary to these and upcoming wetland and upland restoration strategies.

The City of Minnetrista is a committed and active participant in the Six Mile-Halsted Bay restoration strategy. We appreciate your consideration of this program which will greatly enhance this unique metro resource.

Sincerely,

David Abel,
Community Development Director