Minnehaha Creek Watershed District *REQUEST FOR BOARD ACTION*

MEETING DATE: May 11, 2017

TITLE: Authorization to Request Funding from Lessard Sams Outdoor Heritage Council

RESOLUTION NUMBER: 17-036

PREPARED BY: Anna Brown

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REVIEWED BY: ☐Administrator ☒ Counsel ☒ Program Mgr. (Name): James Wisker
☐ Board Committee ☐ Engineer ☐ Other

WORKSHOP ACTION:

☐ Advance to Board mtg. Consent Agenda. ☐ Advance to Board meeting for discussion prior to action.

☒ Refer to a future workshop (date): **May 25, 2017** ☐ Refer to taskforce or committee
☐ Return to staff for additional work. ☐ No further action requested.

☐ Other (specify):

PURPOSE or ACTION REQUESTED:
Authorization to submit an application to Lessard Sams Outdoor Heritage Council (LSOHC) requesting funding for Carp Management in the Six Mile-Halsted Bay Subwatershed

PROJECT/PROGRAM LOCATION:
Six Mile-Halsted Bay subwatershed

PROJECT TIMELINE:
May 31, 2017: Application deadline
August 22-24, 2017: Proposal hearings to Lessard Sams Outdoor Heritage Council
September 28, 2017: Allocation selections made
July 1, 2018: Project period begins
June 30, 2021: Project completion and reporting deadline

PROJECT/PROGRAM COST:
No match is required for Lessard-Sams Outdoor Heritage Funds, however staff may advise that the District assume certain costs in order to increase competitiveness.

PAST BOARD ACTIONS:
N/A

SUMMARY:

Over the last two years, the Minnehaha Creek Watershed District has undergone an assessment of its organizational strategy. This strategic planning process has established the development of high impact capital projects, integrated with non-water initiatives through multi-jurisdictional partnerships, as the District's highest organizational priority. At the same time, the District board has identified the limits of the District's tax levy in funding implementation at a larger scale.

The Six Mile-Halsted Bay subwatershed was identified in 2014 as a focal priority for planning and implementation activities due to its scale, natural resource complexity, existing impairments, planned land use change, existing partnerships, and connection to Halsted Bay, which requires the largest phosphorus load reduction of any waterbody in the District. The District has led a cross-jurisdictional partnership within this geography which has identified strategies to protect and restore the system while integrating natural resource work with that of other public and private partners to maximize the return on the public's investment.

Subwatershed Partners have executed a Resolution of Support formally establishing the Subwatershed Partnership, and memorializing support for an implementation plan and investment framework that leverages outside funds to support the scale of implementation needed.

One of the principal restoration strategies for the Six Mile-Halsted Bay system is the management of common carp in the shallow lake system. The District recently completed a study in coordination with the University of Minnesota of carp recruitment and population density that verified the need to control the carp population in order to advance water and natural resource goals. District staff have developed a management strategy based on the recently gathered carp field data that will suppress recruitment, and bring populations below the damage threshold, to address the Partnership's clean water goals for the system.

In 2016, recognizing limitations of the MCWD levy to support the scale of watershed implementation being planned, the MCWD Board of Managers appointed an Investment Task Force. This Task Force developed a preliminary strategy to pursue and obtain ongoing supplemental funding, larger than one-time grants, to implement objectives identified within priority focal subwatershed plans, such as the Six Mile-Halsted Bay Subwatershed. The task force recommended the following strategies be employed:

- Group individual projects into implementation categories that can be effectively marketed as larger scale programmatic initiatives to specific funding sources.
- Focus strategically on a select grouping of funds that 'fit' the capital implementation program
- Develop strategic partnerships with third parties that increase eligibility for programmatic funding described above.

In seeking to diversify the financing strategy for the Six Mile-Halsted Bay implementation, staff have identified that the objectives of the carp management program align with those of the Lessard-Sams Outdoor Heritage Fund (OHF).

OHF funds projects and programs that restore, project, and enhance wetlands, prairies, forests and habitat for fish, game and wildlife. It is estimated that the State Legislature will make available approximately 100 million in appropriation recommendations for fiscal year 2019, which begins July 1, 2018. Funds have to be spent within 3 years, or 5 years with an extension. The application deadline is May 31, 2017.

At the May 11, 2017 Board meeting, staff will seek preliminary authorization to prepare a funding request to Lessard-Sams for carp management in the Six Mile-Halsted Bay Subwatershed. Staff will coordinate the

preparation of the application with members of the Six Mile-Halsted Bay Subwatershed Partners, the US Fish and Wildlife Service, the MN Department of Natural Resources, and other public and private partners.

A draft application is attached. The application will be updated and modified based on Board and Partner input. A final application will be provided at the May 25 Board Meeting.Between May 11 and May 25, staff will:

- Network with addition partners to gain application support
- Obtain written support from the Six Mile-Halsted Bay Subwatershed Partnership
- Work the the US Fish and Wildlife Service to refine the application
- Determine the balance of in kind and/or direct match to increase application competitiveness
- Determine if certain overhead costs should be left in the application or funded through District levy to increase application competitiveness
- Determine existing staff capacity for implementation of 3-year management program

RESOLUTION

RESOLUTION NUMBER: 17-036

TITLE: Authorization to apply for grant funds through Lessard Sams Outdoor Heritage Council

WHEREAS, on February 9, 2017, the Board of Managers approved the District's strategic direction and alignment report, stating its principal organizational strategy of:

- Developing high impact capital projects integrated with non-water initiatives through multijurisdictional partnership;
- Changing the land-use water policy environment to increase early value added partnership with private development, public infrastructure, and public policy and planning; and

WHEREAS, pursuant to Resolution 14-047 the MCWD Board of Managers has identified the Six Mile Creek subwatershed as a priority area for focusing District planning activities and coordination efforts with subwatershed partners; and

WHEREAS, on October 10, 2013, the MCWD Board of Managers authorized the execution of a contract with Dr. Peter Sorenson and the University of Minnesota to conduct a three-year carp assessment of the Six Mile-Halsted Bay subwatershed to identify recruitment, carp census, and management strategies, the results of which serve as the basis for the funding request; and

WHEREAS, the MCWD Board of Managers has identified the need to diversify its external funding resources and develop a programmatic implementation strategy in priority geographies in order to meet the need for implementation of high impact capital projects; and

WHEREAS, Lessard-Sams Outdoor Heritage Fund makes annual recommendations to the Minnesota Legislature for appropriations to restore, protect, and enhance wetlands, prairies, forests, and habitat for fish, game and wildlife for projects greater than $400,000; and

WHEREAS, staff have identified that the goals of carp management in the Six Mile-Halsted Bay Subwatershed are consistent with those of the Lessard-Sams Outdoor Heritage Fund; and

WHEREAS, the District [WILL SECURE] the support of its partners including the Six Mile-Halsted Bay Subwatershed Partnership, US Fish and Wildlife Service, the University of Minnesota, Minnesota Waterfowl Association [PENDING], and Duck's Unlimited [PENDING]; and

NOW, THEREFORE, BE IT RESOLVED that the Minnehaha Creek Watershed District Board of Managers authorizes staff to apply for FY 2019 funds through the Lessard-Sams Outdoor Heritage Council.

Resolution Number 17-036 was moved by Manager _____, seconded by Manager _____. Motion to adopt the resolution ___ ayes, ___ nays, ___abstentions. Date: _____.

_____ Date:_____
Secretary

MINNEHAHA CREEK WATERSHED DISTRICT

QUALITY OF WATER QUALITY OF LIFE

Six Mile – Halsted Bay Subwatershed

Carp Management Implementation Plan

April 26, 2017

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Executive Summary

The Six Mile – Halsted Bay Subwatershed is located in the western portion of the Minnehaha Creek Watershed District, in Carver County. It's composed of several deep and shallow lakes, has numerous wetlands, and eventually flows into Halsted Bay of Lake Minnetonka. Several lakes in this subwatershed are impaired for excess nutrients, and can be characterized as generally turbid with poor water clarity and damaged aquatic plant communities that provide poor habitat for fish and waterfowl. Common carp are abundant in the Six Mile – Halsted Bay Subwatershed, and are a known driver of poor water quality and ecological conditions. Managing carp is a top priority for management and restoration of this subwatershed, and is part of a broader plan in the District's 2017 Comprehensive Plan to improve water quality and ecological conditions across that entire system.

In 2014, the Minnehaha Creek Watershed District (MCWD) partnered with the University of Minnesota (U of M) to complete a 3-year assessment of common carp in the Six Mile – Halsted Bay Subwatershed. Its purpose was to determine the abundance, recruitment patterns, and seasonal movement of carp to enable the development of carp control strategies for restoration of the Six Mile – Halsted Bay Subwatershed. Adult carp biomass in 12 of the 15 lakes was found to exceed 100 kg/ha (89 lbs/acre), a threshold where ecological damage can occur. Several carp nurseries were identified, with South Lundsten Lake being a top management priority. South Lundsten was found to be an active carp nursery, contributing high abundances of juvenile common carp to several lakes in the subwatershed, including downstream to Parley Lake, and as far upstream as Wassermann Lake. Other carp nurseries were identified, although some have not produced juvenile carp in many years; and likely provide successful carp recruitment in harsh winter conditions, or drought years, that allow winterkill of bluegill sunfish. Movement data of common carp identified four distinct populations in the subwatershed, which can be managed separately with some use of barriers. For management purposes, one of these management units will be separated to facilitate adult carp removal by adding a barrier between Mud Lake and Halsted Bay. The following are the carp management units for this system: 1) Pierson-Marsh-Wassermann, 2) Auburn-Lundsten-Turbid, 3) Parley-Mud, 4) Carver Park Reserve Lakes and 5) Halsted Bay.

There are two approaches to managing carp in this subwatershed. The first approach would be an aggressive, short-term approach that could provide management over a 3-year time period across the entire subwatershed concurrently. Alternatively, management could be implemented in a more phased approach over 7 to 8 years, first addressing carp recruitment system-wide in priority areas, and then removing adult carp biomass one management unit at a time. The first approach is preferred, as an aggressive, short-term timeframe for carp management can lead to earlier implementation of additional restoration strategies, and earlier restoration of the subwatershed; however, the approach chosen will be directed mainly by funding and resources available. It is expected that even with an aggressive, short-term approach, continued management may be needed to meet all management goals beyond the 3-year time-frame, and long-term monitoring and maintenance will be needed indefinitely regardless of the approach chosen. Management will need to be adaptive, as the results of each action taken can inform and possibly change future actions. With either approach, there will be three main objectives: 1) Suppress carp recruitment system wide, 2) Install a barrier/trapping system between Mud and

Halsted bay, and 3) Adult carp biomass removal. Within each objective, there are certain priority waterbodies to focus on if resources are limited (*Figure 1*). These priorities are based off of carp abundance and frequency of carp recruitment in individual carp nurseries. Suppressing carp recruitment is a top priority to prevent new carp from being produced into the system. This will be accomplished by using winter aeration in some waterbodies to prevent winterkill of bluegill sunfish, which feed very effectively on carp eggs. In other waterbodies, physical barriers will prevent access from adult carp in nearby lakes.

Concurrently, a barrier/trapping system between Mud and Halsted Bay should be installed, and adult biomass removal can begin in waterbodies that exceed the damaging carp biomass threshold. A carp barrier/trap between Mud and Halsted Bay will separate carp populations in the Six-Mile Creek Lakes from Lake Minnetonka, containing the populations and improving removal strategies for Halsted Bay and Parley and Mud Lakes. This corridor is frequently used as a carp migration route, and including a trapping system in the design will facilitate removal of carp from both management units.

Adult carp removal will involve three main strategies: winter or open-water seining, box-net trapping and trapping migratory carp in stream channels. Strategies will vary by waterbody and management unit. Based on carp population data from the U of M assessment, target numbers of carp for removal have been set for each waterbody to bring the carp population to a maximum biomass level of 100 kg/ha (89 lbs/acre).

As carp removal occurs, ongoing monitoring is necessary to track carp removal progress and monitor for carp recruitment. Monitoring will also occur to document changes in water quality and ecological conditions. Metrics that will be tracked include: total phosphorus, chlorophyll-a, water clarity, total suspended solids and several aquatic plant community metrics.

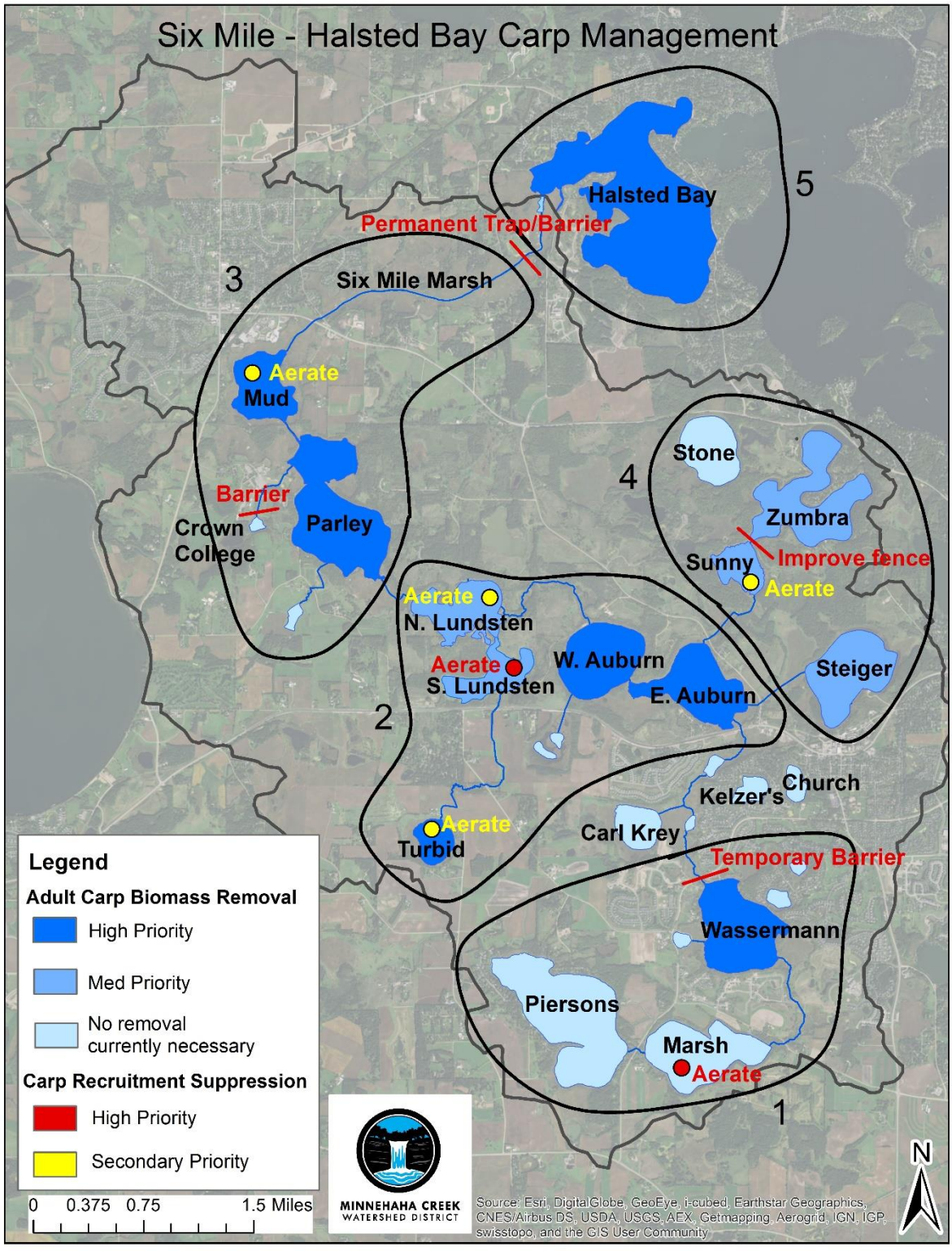

Figure 1. Prioritization Map for Carp Implementation

Overview of Carp in Six Mile – Halsted Bay Subwatershed

Adult carp biomass in 12 of the 15 lakes in the subwatershed were found to exceed the 100 kg/ha (89 lbs/acre) threshold; a threshold known to be ecologically damaging in shallow Midwestern lakes (Bajer et al. 2009). In the remaining sections of this plan, carp biomass will be referenced as pounds per acre (lbs/acre). Lakes with very high biomass ranging from 226 to 1,128 lbs/acre include: Wassermann, Turbid, West Auburn, East Auburn, Parley, Mud, and Halsted Bay. These are priority lakes for management. Halsted Bay had the highest carp biomass ever observed by the Sorensen Lab (U of M), with an estimated biomass of 1,128 lbs/acre, twelve times the threshold. Several lakes had more moderate densities ranging from 139 to 182 lbs/acre and included: North Lundsten, South Lundsten, Steiger, Sunny and Zumbra. Carp removal is warranted in these lakes, but make up a second tier priority for management. Carp biomass was generally low (≤ 88 lbs/acre) in Piersons, Stone and Kelzer's lakes, and requires no current management.

Several carp nurseries were identified in the subwatershed, with South Lundsten being especially important. South Lundsten appears to be the primary source of carp for North Lundsten, West Auburn and East Auburn. It also contributes low numbers of carp to downstream lakes like Parley, and as far upstream as Wassermann Lake. Other nurseries that need to be addressed include North Lundsten, Marsh Lake, Sunny Lake, Turbid Lake, Crown College Pond, Big SOB Lake and Mud Lake. Each will be discussed further in context of their management units.

A number of carp in each waterbody were also radio-tagged and tracked frequently throughout the assessment. Movement patterns of carp were observed over a variety of seasonal conditions, and indicated there were several mostly distinct populations of carp in the subwatershed. These distinct carp populations form separate management units that will require unique goals and strategies to manage. For management purposes, one of these units will be separated by adding a barrier between Mud Lake and Halsted Bay to facilitate adult carp removal. The following will be the carp management units for this system: 1) Pierson-Marsh-Wassermann, 2) Auburn-Lundsten-Turbid, 3) Parley-Mud, 4) Carver Park Reserve Lakes and 5) Halsted Bay.

Management Unit Goals

A target number for carp removal necessary for respective lakes and management units was provided by the U of M assessment based off population estimates in comparison to the aforementioned ecological threshold. Numbers provide goals for carp removal, and updated population surveys will be conducted as management occurs to track population changes and determine progress in achieving management goals. The following are carp management goals for each management unit.

Pierson-Marsh-Wassermann (Management Unit 1)
Suppress carp recruitment in South Lundsten and Marsh Lake, and reduce carp population in Wassermann Lake by at least 4,920 carp to achieve a carp biomass of less than 89 lbs/acre.

Auburn-Lundsten-Turbid (Management Unit 2)
Suppress carp recruitment in South Lundsten, North Lundsten and Turbid Lakes, and reduce carp population in the management unit by at least 12,750 carp to achieve a carp biomass of less than 89 lbs/acre.

Parley – Mud (Management Unit 3)
Install barrier/fish-trap between Mud and Halsted Bay. Suppress carp recruitment in South Lundsten, Big SOB, Crown College Pond and Mud Lake, and reduce carp population in the management unit by at least 17,800 carp to achieve a carp biomass of less than 89 lbs/acre.

Carver Park Reserve Lakes (Management Unit 4)
Suppress carp recruitment in Sunny Lake, and reduce carp population in the management unit by at least 4,400 carp to achieve a carp biomass of less than 89 lbs/acre.

Halsted Bay (Management Unit 5)
Install barrier/trapping system between Mud Lake and Halsted Bay, and reduce carp population in Halsted Bay by at least 59,350 to achieve a carp biomass of less than 89 lbs/acre.

Carp Management Objectives

There are three main objectives to sustainably manage carp in this system.

Objective 1. Suppress carp recruitment system-wide
Objective 2. Install a barrier/trapping system between Mud Lake and Halsted Bay
Objective 3. Removal of adult carp biomass

Suppressing carp recruitment is the top priority for carp management, as it prevents new carp from being produced into the system. Installation of a barrier/trapping system between Mud Lake and Halsted Bay, as well as removal of adult carp biomass, could be conducted concurrently while suppressing carp recruitment, however, without achieving objective 1, long-term sustainability of carp removal cannot occur.

Implementation Plan

Initial management will be focused on suppression of carp recruitment areas across the subwatershed. This will be done by winter aeration of several waterbodies that are prone to winterkill, and installing barriers to block access to others. Preventing winterkill by using winter aeration should help maintain a healthy bluegill population, which feed on carp eggs very effectively. Installation of a barrier/fish-trapping system will be installed to prevent carp passage from Mud Lake to Halsted Bay, which will allow Halsted Bay and Parley-Mud to be separate management units. Halsted Bay will require long-term management due to its connection to greater Lake Minnetonka, and may even require carp management in other areas of Lake Minnetonka and adjoining subwatersheds to achieve carp management goals in Halsted Bay.

Removal of adult carp biomass is also needed. Depending upon the approach used and resources available, concurrent removal across all management units could occur. If a more phased implementation approach is selected, initial carp removal could begin in the headwaters of the subwatershed and continue to other management units once good progress has been made in meeting management goals in the headwaters area.

Monitoring will be necessary to both inform ongoing management decisions, as well as to document water quality and ecological changes following carp management. This adaptive management framework will be a critical component of how this plan is implemented. Each strategy and action will have certain results that will inform, and possibly change subsequent strategies and actions taken. A monitoring section is included with more details.

Six Mile – Halsted Bay Carp Management Timeline

Objective/Task	2018				2019				2020				2021			
Objective 1. Suppress Carp Recruitment	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Task 1. Acquire all necessary permits	x		x		x				x				x			
Task 2. Run electric for aeration units			x													
Task 3. Operation of aeration units				x	x			x	x			x	x			
Task 4. Install permeable berm at outlet of Crown College Pond			x													
Task 5. Install weir and stilling well between North & South Lundsten			x													
Task 6. Replace barrier at Zumbra outlet			x													
Objective 2. Install barrier/fish-trap between Mud Lake and Halsted Bay			x													
Objective 3. Adult carp biomass removal																
Task 1. Install barrier structure at Wassermann outlet			x													
Task 2. Box-Net Trapping			x			x	x			x	x			x		
Task 3. Winter/Open-water Seining				x	x			x	x			x	x			
Task 4. Carp trapping in stream channels			x	x		x	x	x		x	x	x		x		
Task 5. Maintain barriers			x	x		x	x	x		x	x	x		x		
Monitoring																
Task 1. Updated carp population surveys							x	x			x	x				
Task 2. Winter Dissolved Oxygen Monitoring	x				x				x				x			
Task 3. Spring Trap Net Surveys						x				x			x			
Task 4. Fall Trap-Net Surveys			x				x				x					
Task 5. Radio tag tracking			x	x	x	x	x	x	x	x	x	x	x	x		
Task 6. Aquatic Plant Surveys		x	x			x	x			x	x			x	x	
Task 7. Water Quality Monitoring		x	x			x	x			x	x			x	x	
Task 8. Water Quality Monitoring in aerated lakes				x	x			x	x			x	x			
Reporting				x				x				x		x		

Objective 1 - Suppressing Carp Recruitment

The goal of suppressing carp recruitment is to prevent the addition of new carp to the system. This is key to effective carp management, and is typically accomplished by either blocking movement of adult carp to these waterbodies, or preventing winterkill of bluegill sunfish by aerating carp nurseries during the winter.

Winter Aeration

Aeration units will be installed in North Lundsten, South Lundsten, Mud, Sunny, Turbid and Marsh Lake. These units would be operated from November to April (ice-on to ice-off). South Lundsten should be prioritized among these waterbodies, as it currently provides for frequent carp recruitment to several lakes in the subwatershed. The remaining waterbodies are still a priority to address, but would be considered a secondary priority to South Lundsten.

Barriers

A permeable berm will be constructed at the outlet of Crown College Pond, which was found by the U of M assessment to also provide frequent carp recruitment. The pond has a small outlet with intermittent flow, so the simplest measure here is to isolate the pond from the system by installing a permeable berm. The berm will not only prevent fish passage, but it will require less maintenance than physical barrier structures, and will be designed to add additional flood storage to the watershed. Installation of this barrier should be considered a priority management activity.

Between North and South Lundsten, in addition to aerating these waterbodies, a variable crest weir will be installed that will provide the option of installing a temporary barrier when needed. A stilling well will also be installed, that will provide the flexibility to manipulate water levels in both of these shallow lakes. The flexibility to be able to manipulate water levels and add a temporary barrier provides another layer of protection if carp recruitment did occur, which then a drawdown could occur and carp passage could be prevented. Manipulating water levels can also be a useful habitat restoration strategy, and could improve the aquatic plant community in the shallow lakes. The ability to raise water levels in drought years would also provide more protection to the lake from possible winterkill of bluegill sunfish.

At the outlet of Zumbra Lake, which flows to Sunny Lake, a barrier is currently in place that blocks most carp passage from Zumbra to Sunny, and vice versa. However, in high water conditions, this barrier can overtop and subsequently allow carp to pass through. Another priority activity should be to fortify this barrier to provide better effectiveness in high water conditions.

Big SOB Lake, which is a private and man-made lake that flows into Parley Lake, can also serve as a carp nursery. The U of M sampled abundant young-of-year carp in this lake in 2014, but indicated it was likely the result of a rotenone treatment carried out by the property owner in 2013, which likely killed off any bluegill sunfish and was recolonized by carp in spring of 2014 which created for optimum conditions for carp recruitment. The property owner has since installed a barrier at the outlet of the lake and now aerates the lake annually in the winter.

Objective 2 – Install barrier/fish-trap between Mud Lake and Halsted Bay

Preventing fish passage and installing a trapping system between Mud Lake and Halsted Bay will effectively separate the rest of the Six-Mile Creek lakes from Halsted Bay and greater Lake Minnetonka. This will additionally address Objective 3, facilitating adult carp removal in Parley-Mud and Halsted Bay management units, by trapping migrating carp by the barrier. The U of M assessment found that almost 50% of the carp in the Parley-Mud-Halsted original management unit use this passageway. Trapping fish in this location would be very effective in removing adult carp to achieve target population levels.

Objective 3 – Adult carp biomass removal

Removal strategies and goals for removal will be broken out by each management unit and individual lakes. For each unit, there will be a target number of carp to be removed to meet the 89 lbs/acre carp biomass threshold, which is the maximum carp density that the lakes can handle before ecological damage could start occurring. Within each unit, there will be target removal numbers for each lake. Carp populations can mix between different lakes in each unit, so while there are target removal numbers for each lake, the most important number is the total number of carp removed from the management unit. These target numbers are meant to be a guide, and more removal could occur in one lake over another as carp move through the system, and still achieve the goals of each unit. It should also be noted that these target numbers are fluid, carp grow year to year and overall biomass will change. Updated population numbers will be gathered throughout implementation, and target numbers may change accordingly.

Various strategies will be used for removal of adult carp, including winter seining, open-water seining, open-water box-net trapping and trapping in migratory stream channel areas. Strategies used in each management unit will vary.

Prioritization for removal should be given to waterbodies with the highest abundances of common carp, and includes the following waterbodies: Wassermann, East Auburn, West Auburn, Turbid, Parley, Mud and Halsted Bay. Of moderate priority, is removal of carp in: Zumbra, Steiger, Sunny, North Lundsten and South Lundsten. No removal is currently required in Piersons, Kelzers or Stone Lakes. This prioritization can be useful if resources are limited.

Costs and management strategies for each unit are estimated over a three-year time period. It is expected that good progress towards meeting management goals in each unit will be made within the first three years, however, the timeline in each unit will vary depending upon success of the actions taken. Some may take longer than three years, such as removal in Halsted Bay, which will require ongoing removal over a longer time period due to its connection to Lake Minnetonka. To achieve management goals in Halsted Bay, removal may even need to occur in other areas of Lake Minnetonka. Once management goals are achieved, there will be a need for ongoing management and occasional removal to maintain those levels.

Piersons-Marsh-Wassermann Management Unit

Management Goal:

Suppress carp recruitment in South Lundsten and Marsh Lake, and reduce carp population in Wassermann Lake by at least 4,920 carp to achieve a carp biomass of less than 89 lbs/acre.

Piersons-Marsh-Wassermann Summary Table

Surface area (acres)	Total Carp Abundance
460	10,411

Individual Lakes Summary Table

Lake	Surface area (acres)	Avg. carp weight (lbs)	Carp Abundance	Carp biomass (lbs/acre)	Total carp abundance to equal 89 lbs/acre	# carp to be removed to achieve 89 lbs/acre
Piersons	297	7.3	3,580	88	3,616	0
Wassermann	163	7.6	6,831	318	1,914	4,917

Management Strategies

Carp removal in Wassermann Lake could involve a combination of winter seining, box-net trapping and trapping of fish in the channel at the outlet of Wassermann Lake. A temporary barrier structure will be installed to contain the populations during removal.

Temporary Barrier at Wassermann Outlet

A temporary barrier will be installed and maintained at the Wassermann outlet during management of the Piersons-Marsh-Wassermann and Auburn-Lundsten-Turbid management units. While the barrier can be temporary, to aid in the maintenance and success of the barrier, a permanent sheetpile weir will be installed with slots built in that will allow a barrier to be dropped in and removed as needed. This will prevent carp from downstream lakes from re-colonizing Wassermann Lake while removal occurs. Once management goals are met in Wassermann Lake and the downstream management unit of Auburn-Lundsten-Turbid, the barrier could be removed. The barrier will be installed prior to water temperatures reaching 7 degrees Celsius (C), as carp are known to spawn around 10 degrees C. Waiting until 7 degrees C also allows Northern Pike to move freely to their spawning grounds, as they spawn earlier than common carp, in water temperatures as low as 4 degrees C. The barrier will be maintained at least twice/week, and more frequently around heavy rain events, to keep the barrier clear of debris. Once the barrier is installed, if Northern Pike are observed trying to re-enter Wassermann Lake, action should be taken to help move the Pike past the barrier and back in to Wassermann Lake.

Carp Movement Tracking

To aid in removal, 15 radio-tagged carp will be tracked at least once/month by MCWD staff, or as needed, in Wassermann Lake. 4 of these tags were implanted in the fall of

2016 by the U of M, and 11 more were implanted on April 17, 2017 with funds remaining from the U of M Assessment.

Winter Seining

Two to three seine attempts per year could be attempted in Wassermann Lake as needed. Winter seining is the best opportunity to remove a larger number of carp all at once, but can have variable success. As more carp are removed from the lake, the costs to get commercial fisherman to seine the lake becomes greater.

Box-Net Trapping

Three box-net trap removals will be scheduled annually during the open water season. This can be a labor intensive process, and typically can remove anywhere from 200 to 1,000 carp per removal.

Trapping in channel at Wassermann outlet

As opportunities arise, there may be a chance to trap fish in the channel area at the Wassermann outlet. Based off of tracking data during the U of M study, carp don't leave Wassermann Lake every year, and when they do, it typically involves only a portion of the population moving to downstream lakes. A temporary barrier will already be installed near the culvert of Wassermann Lake to prevent carp from downstream waterbodies from recolonizing Wassermann Lake. If carp are observed stacking up at the barrier trying to head downstream, another barrier could be installed behind them and carp could be trapped in the channel and removed. Conversely, if carp stack up on the downstream side of the barrier trying to enter Wassermann, its possible the other barrier could be installed upstream, the temporary barrier by the culvert could be opened, and carp could again be trapped and removed. Removal would require MCWD to obtain a DNR permit, as well as means for disposal.

Management Progress

Management progress will be tracked on a separate spreadsheet that will be updated as removals and new population surveys occur. Population surveys will occur annually on Wassermann until management goals are achieved. Winter seining in early 2017 removed 2,450 carp from the lake, which reduces the number of carp left to remove to reach the goal population biomass.

Auburn-Lundsten-Turbid Management Unit

Management Goal:

Suppress carp recruitment in South Lundsten, North Lundsten and Turbid Lakes, and reduce carp population in the management unit by at least 12,750 carp to achieve a carp biomass of less than 89 lbs/acre.

Auburn-Lundsten-Turbid Summary Table

Surface area (acres)	Total Carp Abundance
471	21,802

It is expected that the total carp abundance in this management unit is greater than what's listed here. There are approximately 750 carp from Wassermann Lake that are currently somewhere in this management unit. The 750 carp represents one radio tagged carp that was initially tagged in Wassermann Lake, but last tracked in one of the Auburn Lakes. Additionally, the juvenile carp from the 2015 year class spawned in South Lundsten are now almost 3 years old, and are likely dispersed among lakes in this management unit. Updated population surveys will be needed.

Individual Lakes Summary Table*

Lake	Surface area (acres)	Avg. carp weight (lbs)	Carp Abundance	Carp biomass (lbs/acre)	Total carp abundance to equal 89 lbs/acre	# carp to be removed to achieve 89 lbs/acre
East Auburn	116	4.3	6,121	227	2,418	3,703
West Auburn	133	5.1	7,201	276	2,307	4,894
North Lundsten	108	5.6	2,793	145	1,704	1,089
South Lundsten	74	5.6	2,414	183	1,178	1,236
Turbid	40	8.1	2,273	460	442	1,831
Total			**20,802**		**8,049**	**12,753**

**Carp populations in this management unit mix fairly frequently, especially between East and West Auburn and North and South Lundsten. Management goals for each waterbody are approximate targets, but overall reductions are needed across the management unit as a whole.*

Management Strategies

Management strategies in these lakes could involve a combination of winter seining, open-water seining, box-net trapping and trapping of migratory fish in stream channels. Lakes conducive to winter seining and potentially open-water seining include East Auburn, West Auburn and Turbid Lakes. North and South Lundsten, given their shallow depth and limited accessibility, would be difficult to seine. A more likely carp removal strategy for these lakes would be to either trap the carp as they migrate from North Lundsten to West Auburn, or remove them once they enter West or East Auburn. The installation of a variable crest weir between North and South Lundsten, which would include brackets for a temporary barrier, would allow for the future option to drawdown South Lundsten Lake. Drawdown could be a rapid response tool if aeration fails, and carp recruitment occurs. Temporary barriers may also be needed to aide in trapping and removal between North Lundsten and West Auburn.

Carp Movement Tracking

To aid in removal, 10 carp in each of the 5 lakes will be implanted with radio tags to track movement and inform timing of management strategies. Radio-tagged carp will be tracked at least once/month, or as needed, during management.

Winter Seining/Open-Water Seining

Winter and/or open-water seining is expected to be a strategy for carp removal in East Auburn, West Auburn and Turbid Lake. Turbid Lake, given its small size, may be a good candidate for an open-water seine, however, accessibility and bottom debris may be an issue. Two to three seine attempts per year could be attempted in East Auburn, West Auburn and Turbid Lakes as needed. North and South Lundsten are not good candidates for seining due to depth and accessibility, and will primarily be managed as carp move from these lakes into stream channels or other lakes. Seining provides the best opportunity to remove a larger number of carp all at once, but can have variable success. As more carp are removed from the lake, the costs to get commercial fisherman to seine the lake becomes greater.

Box-Net Trapping

Box-net trapping is an option for West Auburn and Turbid Lake, conditions are likely not suitable in East Auburn or either Lundsten Lakes. Three box-net trap removals will be scheduled annually during the open water season. This can be a labor intensive process, and typically can remove anywhere from 200 to 1,000 carp per removal.

Drawdown

The installation of a variable crest weir and stilling well between North and South Lundsten will provide the flexibility to manipulate water levels. The weir will also include a temporary barrier that can be removed as needed. Water drawdown and the temporary barrier could be a rapid response tool to control the carp if aeration fails. The installation of this weir will require the current trail crossing between the two lakes to be built up to reduce flooding potential and potential fish passage. A drawdown is not planned for in the initial management, but the option will be there if other strategies are not effective.

Trapping carp in the channel between North Lundsten and West Auburn

The stream between North Lundsten and West Auburn is a frequent migratory passageway for carp in this management unit. The U of M Assessment observed around 43% of carp from West Auburn pass through this channel annually, on their way to North Lundsten, and there is likely a similar number that returns to West Auburn. With proper timing, installing a couple temporary barriers in this location could effectively trap carp for removal. Trapping would likely be most effective just downstream of the culvert located between West Auburn and North Lundsten. To catch carp coming to North Lundsten from Auburn Lake, a barrier will be installed downstream of the culvert, and once carp pass the culvert area, a second barrier will be installed in front of the culvert on the downstream side to effectively block carp in. This strategy can be reversed as fish attempt to leave North Lundsten and move upstream. Tracking of radio-tagged fish, in combination with analyzing historical tracking data from the U of M Assessment will

guide the timing of trapping. There could be some costs for equipment and disposal of removed carp.

Management Progress
Management progress will be tracked on a separate spreadsheet that will be updated as removals and new population surveys occur. Population surveys will occur annually on each waterbody until management goals are achieved.

Parley-Mud Management Unit

Management Goal:
Suppress carp recruitment in South Lundsten, Big SOB, Crown College Pond and Mud Lake, and reduce carp population in the management unit by at least 17,800 carp to achieve a carp biomass of less than 89 lbs/acre.

Parley-Mud Summary Table

Surface area (acres)	Total Carp Abundance
351	21,315

Individual Lakes Summary Table

Lake	Surface area (acres)	Avg. carp weight (lbs)	Carp Abundance	Carp biomass (lbs/acre)	Total carp abundance to equal 89 lbs/acre	# carp to be removed to achieve 89 lbs/acre
Parley	258	8.9	16,167	558	2,592	13,575
Mud	93	9.1	5,148	504	912	4,236
Total			**21,315**		**3,504**	**17,811**

Management Strategies
Carp removal in these lakes could involve a combination of winter seining, open-water seining, box-net trapping and trapping of migratory fish in stream channels. Removal in this management unit will be facilitated by the barrier/trapping system to be installed between Mud Lake and Halsted Bay. Carp in Mud Lake often move to Parley Lake by late fall, over-winter in Parley, and move back to Mud early spring. Management strategies will take advantage of that movement pattern, and focus on removing carp from this management unit when all carp are in Parley Lake. Carp also move frequently between Mud and Halsted Bay, and with the presence of a trapping system between these two lakes, additional removal could occur in this location.

Carp Movement Tracking
To aid in removal, 10 carp in each of the two lakes will be implanted with radio tags to track movement and inform timing of each management strategy. Radio-tagged carp will be tracked at least once/month, or as needed, during management.

Winter Seining/Open-Water Seining

Winter and/or open-water seining is expected to be one of the primary strategies for carp removal in Parley Lake. Carp from Mud Lake over-winter in Parley, making winter removal in Parley ideal for removing carp from the whole management unit. Two to three seine attempts per year could be attempted as needed. Winter and open-water seining provide the best opportunity to remove a larger number of carp all at once, but can have variable success. As more carp are removed from the lake, the costs to get commercial fisherman to seine the lake becomes greater.

Box-Net Trapping

Three box-net trap removals will be scheduled annually during the open water season. This can be a labor intensive process, and typically can remove anywhere from 200 to 1,000 carp per removal.

Trapping carp Six-Mile Creek

The U of M Assessment found that 50% of carp in this management unit move annually through the channel between Mud and Halsted Bay. With the installation of barrier/trapping system in this channel, removal could occur throughout the open-water season.

Management Progress

Management progress will be tracked on a separate spreadsheet that will be updated as removals and new population surveys occur. Population surveys will occur annually on Parley and Mud until management goals are achieved.

Carver Park Reserve Management Unit

Management Goal:

Suppress carp recruitment in Sunny Lake, and reduce carp population in the management unit by at least 4,400 carp to achieve a carp biomass of less than 89 lbs/acre.

Carver Park Reserve Lakes Summary Table

Surface area (acres)	Total Carp Abundance
532	10,247

Individual Lakes Summary Table

Lake	Surface area (acres)	Avg. carp weight (lbs)	Carp Abundance	Carp biomass (lbs/acre)	Total carp abundance to equal 89 lbs/acre	# carp to be removed to achieve 89 lbs/acre
Zumbra	221	6.6	5,953	178	2,984	2,969
Sunny	48	7.2	981	147	595	386
Steiger	166	8.0	2,886	139	1,851	1,035
Stone	97	10.5	427	46	821	0
Total			**10,247**		**6,251**	**4,390**

Management Strategies
Carp removal in the Carver Park Reserve Lakes could involve a combination of winter seining and box-net trapping.

Carp Movement Tracking
To aid in removal, 10 carp in Zumbra Lake will be implanted with radio tags to track movement and inform timing of management strategies. Each lake in this management unit is a somewhat contained population with limited to no movement between lakes. Because of management strategies planned for Sunny and Steiger, tracking fish in those lakes will not be critical. Radio-tagged carp will be tracked at least once/month, or as needed, during management. Tags will be implanted in 2019.

Winter/Open-Water Seining
Winter seining is expected to be a strategy for carp removal in Zumbra Lake, and possibly Sunny Lake. It is expected that two to three seine attempts per year could be attempted as needed. Seining provides the best opportunity to remove a larger number of carp all at once, but can have variable success. As more carp are removed from the lake, the costs to get commercial fisherman to seine the lake becomes greater.

Box-Net Trapping
Box-net trapping is an option for Zumbra and Steiger Lakes, conditions are likely not suitable in Sunny Lake. Three box-net trap removals will be scheduled annually during the open water season. This can be a labor intensive process, and typically can remove anywhere from 200 to 1,000 carp per removal.

Management Progress
Management progress will be tracked on a separate spreadsheet that will be updated as removals and new population surveys occur. Population surveys are tentatively scheduled to occur annually on each waterbody until management goals are achieved.

Halsteds Bay Management Unit

Management Goal:
Install barrier/trapping system between Mud Lake and Halsted Bay, and reduce carp population in Halsted Bay by at least 59,350 to achieve a carp biomass of less than 89 lbs/acre.

Halsteds Bay Summary Table

Lake	Surface area (acres)	Avg. carp weight (lbs)	Carp Abundance	Carp biomass (lbs/acre)	Total carp abundance to equal 89 lbs/acre	# carp to be removed to achieve 89 lbs/acre
Halsteds Bay	552	9.65	64,441	1128	5,091	59,350

Management Strategies

Management strategies for Halsteds Bay will be complex, and may need to involve removal in other areas of Lake Minnetonka to reach management goals. A barrier/trapping system will be installed between Mud Lake and Halsteds Bay, which will aid in containing the population to Halsted Bay and Lake Minnetonka, and also be a primary removal tool. The U of M assessment observed Six Mile Creek between Mud Lake and Halsted Bay to be a frequent migratory route for carp. Almost 50% of carp in this bay pass through this channel annually. Both open water seining and winter seining will also be management strategies for this lake. Box net trapping could also be successful in this lake, but will not be used until a significant number of carp have already been removed through seining and trapping

Barrier & Trapping System in Six Mile Creek between Mud Lake and Halsted Bay

This system is described in Objective 2 of this carp management plan. The U of M assessment found that almost 50% of carp in Halsted Bay use this passageway to reach Mud Lake and Parley Lake. By cutting that passageway off with a barrier/trapping system, it not only contains the population in this management unit to Halsted Bay and greater Lake Minnetonka, but it also acts as primary carp removal tool by removing carp on an ongoing basis as carp pass through the trap.

Carp Movement Tracking

To aid in removal, 15 carp in the lake will be implanted with radio tags to track movement and inform timing of each management strategy. Radio-tagged carp will be tracked at least once/month, or as needed, during management. A portion of the carp population in Halsted Bay are known to go out into greater Lake Minnetonka, so it is expected that tracking will needed to occur not only in Halsted Bay, but other areas of the lake.

Winter Seining/Open-Water Seining

Winter and open water seining are expected to be a main strategy to remove carp in Halsted Bay. Two open water seining attempts could occur annually, as well as up to three winter seining attempts, all as needed. Seining provides the best opportunity to remove a larger number of carp all at once, but can have variable success. As more carp are removed from the lake, the costs to get commercial fisherman to seine the lake becomes greater.

Box-Net Trapping

Box-net trapping is an option for Halsted Bay as numbers are reduced. Its unlikely box-nets will be required in the first three years of management due to the large number of carp in this bay.

Assessing Carp in greater Lake Minnetonka

Assessing carp in greater Lake Minnetonka is not directly part of the initial carp management plan for Halsted Bay, however, as carp biomass is removed from the lake, it may become necessary to start addressing carp in other bays of Lake Minnetonka, and thus other subwatersheds. For instance, during the U of M assessment, carp tagged in Halsted Bay have been observed moving into nearby Priests Bay and Cooks Bay, and

even as far as Jennings Bay. Jennings Bay is connected to both the Dutch Lake Subwatershed and Painters Creek Subwatershed, both of which carp are suspected of being an issue. Addressing carp in those subwatersheds and Jennings Bay would likely provide positive benefits in achieving management goals in Halsted Bay.

Management Progress

Management progress will be tracked on a separate spreadsheet that will be updated as removals and new population surveys occur. Population surveys will occur annually on Halsted Bay until management goals are achieved.

Additional Information

Equipment & Operational Needs

One-time costs for equipment will include the purchase of trap-nets, electrofishing boat, and supplies in year one of management. The District will use trap-nets to monitor potential carp recruitment areas. If carp recruitment occurs, a rapid response would need to occur to control the new juvenile carp produced. An electrofishing boat will be used to provide updated carp population surveys that will track management progress, as well as monitor populations long-term. Operational needs include supplies and other materials needed for repair and maintenance of equipment and barriers, operating costs of running aeration units, as well as permit fees for winter aeration and thin ice signage as required by the MN DNR. Funds may also be used for clearing submerged debris in lakes that interfere with the success of seining and other management strategies, and equipment rental to aid in removal of carp in stream channels.

Contingency

If an aeration system fails, or barriers are compromised, carp recruitment could occur. If recruitment occurs, a rapid response would need to occur to control the new juvenile carp population. Rapid response could include strategies such as drawdowns, fish poisonings, trapping fish in migratory streams or removal as adults once they move into other waterbodies. Different scenarios need to be developed. Funds will be budgeted for annually for these types of responses.

Monitoring Plan

Monitoring will be necessary to inform management, track progress on achieving management goals, and assessing ecological changes as removal occurs.

Monitoring to Inform Management

Monitoring activities that inform management and track progress on achieving management goals include performing updated carp population surveys, monitoring for carp recruitment, and tracking radio-tagged fish to inform management timing. Monitoring for carp recruitment includes performing winter dissolved oxygen monitoring and trap-net surveys. Updated carp population estimate requires the completion of electrofishing surveys. Tracking radio-tagged carp involves the use of telemetry gear, and implanting radio tags in a subset of carp. A description of those activities is described further in this section.

Updated Carp Population Surveys

Carp population surveys will be conducted annually by performing electrofishing surveys on all accessible waterbodies to monitor management progress. Surveys will occur late summer/early fall, following protocol developed by the University of Minnesota. Two surveys will be conducted, and results will be averaged. If survey results do not fall within 20% of each other, a 3rd survey will be performed. Once management goals are met in each waterbody, the frequency of updated surveys could be decreased to once every five years.

List of lakes to receive annual population surveys

Piersons-Marsh-Wassermann Management Unit	Auburn-Lundsten-Turbid Management Unit	Parley-Mud Management Unit	Carver Park Reserve Lakes Management Unit	Halsted Bay Management Unit
Wassermann	East Auburn	Parley	Zumbra	Halsted Bay
	West Auburn	Mud	Steiger	
	North Lundsten*		Sunny*	
	South Lundsten*			
	Turbid			

**Accessibility may be an issue for these lakes*

Winter Dissolved Oxygen Monitoring

Winter dissolved oxygen is monitored to assess the potential for winterkill of bluegill sunfish. Winterkill could result in optimum conditions for carp recruitment. Winter dissolved oxygen readings below 2 mg/L at the surface will prompt a spring trap-net survey to be conducted to determine status of the sunfish community.

List of lakes to receive annual winter dissolved oxygen monitoring

Lake	Frequency
Marsh	2 to 3 times per winter
North Lundsten	
South Lundsten	
Sunny	
Mud	
Turbid	

Spring Trap-Net Surveys

Trap-Net surveys are used to sample young-of-year carp, as well as panfish like bluegill sunfish. Spring trap-net surveys will be performed on potential carp nursery lakes if the threat of winterkill is possible. Winter dissolved oxygen (DO) will be monitored, and if DO falls below 2 mg/L at the water's surface, it will prompt a spring trap-net survey to assess the status of bluegills. If a winterkill occurred, rapid response planning will begin to address possible juvenile carp in the system. An early fall survey can confirm if carp recruitment actually occurred, and the rapid response can then be implemented.

Potential Spring Trap-Net Lakes	
Marsh	Sunny
North Lundsten	Mud
South Lundsten	Turbid

Fall Trap-Net Surveys

Trap-Net surveys are a way to sample young-of-year carp, as well as panfish like bluegill sunfish. Fall is the optimum time to sample for juvenile carp, as they would be large enough by this time to be trapped in the nets. These surveys will occur annually on the lakes below, and confirm if carp recruitment occurred.

List of lakes that will receive annual fall trap-net surveys

Fall Trap-Net Survey Lakes	
Marsh	Sunny
North Lundsten	Mud
South Lundsten	Turbid

Carp Tracking

Radio-tagged carp will be tracked once per month, or as needed to inform management strategies such as seining or stream trapping.

Monitoring to Assess Ecological Changes

Carp are known to exacerbate internal phosphorus loading, reduce water clarity and uproot aquatic vegetation. Metrics for assessing changes in water quality and ecological conditions will include the following: total phosphorus, chlorophyll-a, water clarity, total suspended solids and aquatic plant community metrics.

Monitoring Activities

A detailed description of the monitoring activities is described in this section. These monitoring activities will be conducted on each lake to assess ecological changes as carp are managed in the system.

Aquatic Plant Surveys

Two aquatic plant surveys will be performed annually on each waterbody during carp removal efforts, as well as annually for at least 3 years once carp management goals are met. Surveys will follow standard point-intercept protocol established by the Minnesota Department of Natural Resources (MN DNR), and occur in both early summer and late summer. Early summer surveys

capture early season plant growth, including the invasive Curlyleaf Pondweed. Late summer plant surveys capture native vegetation when it should be at its peak biomass, as well provides a better representation of invasive Eurasian Watermilfoil. During all surveys, acoustic mapping will occur that will provide further metrics to evaluate the changes in the aquatic plant community. Metrics that will tracked from aquatic plant surveys include: Floristic Quality Index (FQI), percent occurrence of each species, maximum depth of plant growth, percent area of the lake vegetated, and average aquatic vegetation biovolume.

List of lakes receiving annual aquatic plant surveys (both early and late summer)

Halsted Bay	Steiger
Marsh	Sunny
Wassermann	North Lundsten
East Auburn	South Lundsten
West Auburn	Parley
Turbid	Mud
Zumbra	

Water Quality Monitoring

Water quality monitoring will occur annually during removal, and for least 3-years once carp management goals are met. Ongoing water quality monitoring needs will be reassessed after that 3-year post carp management time period.

Water quality monitoring will provide data to assess changes in nutrients, algal abundance and water clarity. Parameters being analyzed will include Total Phosphorus, Chlorophyll-a, Total Suspended Solids and Water Clarity. Sampling will occur monthly May – September in deep lakes, and twice per month May – September in shallow lakes.

List of lakes receiving water quality monitoring (TP, Chl-a, TSS, Clarity) once per month May – September

East Auburn	Zumbra
West Auburn	Steiger
Turbid	Sunny

List of lakes receiving water quality monitoring (TP, Chl-a, TSS, Clarity) twice/month May – September

North Lundsten	Mud
South Lundsten	Halsted Bay
Wassermann	Parley

Other Monitoring

Additional monitoring will occur in several waterbodies that are receiving annual aeration. Aeration in shallow lakes has the potential to impact sediment resuspension and sediment release of phosphorus. Grab samples will be collected to monitor for any water quality impacts from aeration. Samples will be taken three times during the winter while aeration is occurring; once before the aeration unit is turned on (November), once while in operation (Jan./Feb.), and once after the unit is shutdown at ice-off (March/April). Samples will be analyzed for Total

Phosphorus and Total Suspended Solids. Monitoring will occur for three years to assess if aeration is having any detrimental effects on water quality.

Aeration lakes to receive water quality monitoring
Marsh
North Lundsten
South Lundsten
Sunny
Mud
Turbid

Reporting

Annual reports will be generated to update progress on achieving management goals in each waterbody and management units, as well as provide any new updates to the management plan, as it is an adaptive process.

Six Mile - Halsted Bay Subwatershed Budget
3-Year Implementation Plan
Timeline July 1, 2018 - June 30, 2021

	Grant Period			
	2018	**2019**	**2020**	**2021**
Objective 1 - Suppress Carp Recruitment				
Run electric for aeration units	$72,000			
Aeration Units	$22,000			
Permeable berm at outlet of Crown College Pond	$20,000			
Install weir and stilling well between North & South Lundsten	$25,000			
Replace barrier at Zumbra outlet	$2,000			
Subtotal	***$141,000***	***$0***	***$0***	***$0***
Objective 2. Install barrier/fish-trap between Mud Lake and Halsted Bay	$75,000			
Subtotal	***$75,000***	***$0***	***$0***	***$0***
Objective 3. Adult carp biomass removal				
Install barrier structure at Wassermann outlet	$18,000			
Box-Net Trapping	$54,000	$54,000	$54,000	$54,000
Winter/Open-water Seining	$100,000	$100,000	$100,000	$100,000
Carp trapping in stream channels	$5,000	$5,000	$5,000	$5,000
Subtotal	***$177,000***	***$159,000***	***$159,000***	***$159,000***
Equipment & Operations				
Trap-Nets & supplies	$10,000			
Electrofishing boat	$70,000			
Barrier supplies & maintenance	$2,000	$2,000	$2,000	$2,000
Operational costs of aeration units	$5,000	$5,000	$5,000	$5,000
Permits & signage for aeration	$3,000	$3,000	$3,000	$3,000
Debris cleanup to facilitate seining	$2,000	$2,000	$2,000	$2,000
Subtotal	***$92,000***	***$12,000***	***$12,000***	***$12,000***
Contigency Funds (Rapid Response)	$10,000	$10,000	$10,000	$10,000
Subtotal	***$10,000***	***$10,000***	***$10,000***	***$10,000***
Monitoring				
Updated Carp Population Surveys	In-kind MCWD			
Winter Dissolved Oxygen Monitoring	In-kind MCWD			
Spring Trap-Net Surveys	In-kind MCWD			
Fall Trap-Net Surveys	In-kind MCWD			
Implanting Radio Tags	$28,000			
Tracking radio-tagged carp	In-kind MCWD			
Aquatic Plant Surveys	In-kind MCWD			
Water Quality Monitoring	In-kind MCWD			

Subtotal	***$28,000***	***$0***	***$0***	***$0***

Personel

Technician (1 FTE)	$24,000	$48,000	$48,000	$24,000
Manager	in-kind			
Technician	in-kind			
Subtotal	***$24,000***	***$48,000***	***$48,000***	***$24,000***

Total Annual Budget	$547,000	$229,000	$229,000	$205,000
Total Project Budget	$1,210,000			

Lessard-Sams Outdoor Heritage Council

Outdoor Heritage Fund

FY 2019 Call for Funding Request

April 3, 2017

Deadline for Submission: Wednesday, May 31, 2017

Constitutional Amendment - Article XI

Sec. 15. Outdoor heritage……funds……are dedicated, for the benefit of Minnesotans…… ...and may be spent only to restore, protect, and enhance wetlands, prairies, forests, and habitat for fish, game, and wildlife;……The dedicated money under this section must supplement traditional sources of funding for these purposes and may not be used as a substitute. Land acquired by fee with money deposited in the outdoor heritage fund under this section must be open to the public taking of fish and game during the open season unless otherwise provided by law.

Available Funding

The Lessard-Sams Outdoor Heritage Council (LSOHC) is charged with making annual recommendations to the Minnesota Legislature for appropriations from the Outdoor Heritage Fund (OHF). The council currently **estimates approximately $100 million will be available for appropriation recommendations** from the OHF in fiscal year 2019 (July 1, 2018 - June 30, 2019). This estimate may be revised after November, 2017. The Call for Funding Request is open to all who want to apply.

Successful applicants must:

1. Complete the electronic application form found at **www.lsohc.leg.mn/FY2019/index_call.html** by **4:00 p.m., Central Standard Time, Wednesday, May 31, 2017**. A confirmation e-mail will be sent to the applicant upon successful completion of application;
2. Request a minimum of $400,000. Proposals less than $400,000 should be submitted to the Conservation Partners Legacy Program (http://www.dnr.state.mn.us/grants/habitat/cpl/index.html);
3. Be consistent with the Minnesota Constitution, statute, and state law, and laws on tribal self-governing harvest regulations; including MN Statutes 97A.056, and MN Statutes 84.973 (Pollinator Habitat Program)
4. Be current with all reporting requirements for past Outdoor Heritage Fund appropriations;

5. Be available to make a formal presentation, testify at meetings, answer questions as necessary and be queried by LSOHC members and staff based on accurate completion of the details provided;
6. Be recommended for funding by the LSOHC; and
7. Be appropriated funds in the 2018 Minnesota Legislative Session beginning fiscal year 2019 (July 1, 2018 – June 30, 2019).

Proposal Requirements

Through this Call for Funding Request, the Council is seeking habitat program or project proposals to recommend for funding that:

1. Are consistent with the Minnesota Constitution, statute, and state law, and laws on tribal self-governing harvest regulations; including MN Statutes 97A.056, and MN Statutes 84.973 (Pollinator Habitat Program)
2. Are of primary benefit to fish, game, and wildlife;
3. Address the LSOHC Ecological Section Vision and Priorities (attached) in this Call for Funding Request;
4. Demonstrate a capability to successfully manage and implement the project/program(s) being requested;
5. Demonstrate the ability to identify and establish the financial and managerial controls needed to successfully and fully implement the proposed project/program;
6. Provide an up-to-date external financial audit or its equivalent of your organization with no serious adverse findings;
7. Are transparent, understandable, and accessible by the public for input and review;
8. Protect and advance the public interest;
9. Are grounded in science and reflect "best practices" for natural resource management;
10. Take into account existing conservation delivery systems;
11. Encourage efficient and effective conservation solutions;
12. Request a realistic monetary amount given the stated scope and timeframe (shorter time frames are viewed positively by the Council).

Note: Individual applicants cannot submit multiple requests for funding on the same project. If this is done, the Council reserves the right to reject those proposals.

Terms of the Funding

Payment

The expenses must be direct to and necessary for the program or project, as determined by the state's fiscal agent, and must protect, enhance or restore prairies, wetlands, forests or habitat for fish, game and wildlife. The funds may not be used for general organization support or overhead. Funds may not be used for fundraising from other sources. Funds may be used for planning and evaluating habitat programs or projects paid for with the OHF; however, the evaluation and planning expenses must be direct to and necessary for the program or project, as presented to the Council. For non-state entities, payment is reimbursement for expenses incurred.

Timing

Recommendations that come forth from this Call for Funding Request will go before the 2018 Legislature. Reimbursable expenses may be incurred on or after July 1, 2018, or the date on which the LSOHC approves the accomplishment plan, whichever is later. Unless otherwise provided by the legislature during the appropriations process, the funds are available until June 30, 2021 when projects must be completed and final accomplishments reported. Funds for restoration or enhancement are available until June 30, 2023, or five years after an acquisition, whichever is later, in order to complete the restoration and enhancement work.

Schedule

April 3, 2017	Call for Funding Issued
May 31, 2017	Deadline: Call for funding proposals due
July 20, 2017	Deadline: LSOHC members submit selections for proposal presentations
August 3, 2017*	Council Meeting: Review proposals and select proposals for hearings
August 22-24, 2017*	Council Meeting and Proposal Hearings
September 8, 2017	Deadline: LSOHC members submit individual allocation selections
September 28, 2017*	Council Meeting: Initial allocation selection
October 16, 2017	Deadline: Draft accomplishment plans submitted that reflect allocation recommendations
November 16, 2017*	Council Meeting: LSOHC members review draft accomplishment plans
December 12, 2017	Council Meeting: Final bill adopted for recommendation to legislature
June, 2018	Council Meeting: Final accomplishment plans approved
July 1, 2018	First day of project period

* Project managers are asked to attend to provide information.

Note: Dates are subject to change. Always check the LSOHC website for the current schedule.

For information and assistance:

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Hearing Criteria

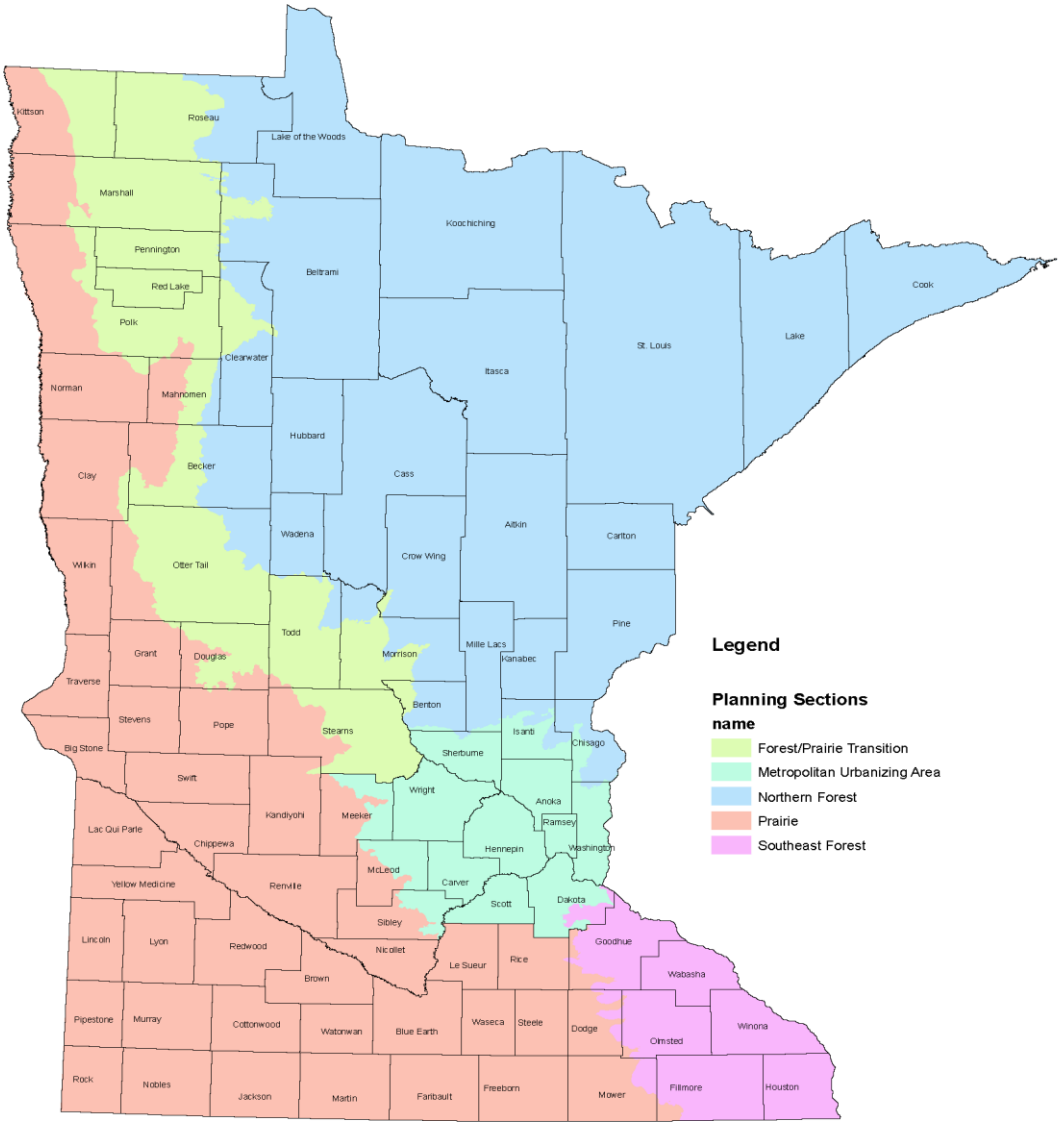
Proposals will be reviewed and scored by LSOHC members based on the following criteria. The scoring process will be used to help evaluate proposals and aid in the recommendation process. High scorers are not guaranteed funding and low scorers are not necessarily excluded from receiving funding.

HEARING CRITERIA	Max Points
1. Proposal abstract provides a clear and succinct overview of the proposal activity, outputs, and outcomes. Proposal is clearly written and adequately addresses: Who, What, Where, When, Why, and How.	10
2. Proposal addresses priority actions and outcomes of one or more of the ecological sections and is likely to produce and demonstrate significant and permanent conservation legacy and/or habitat outcomes for fish, game and wildlife.	15
3. Proposal uses science-based targeting that leverages or expands corridors and complexes, reduces fragmentation or protects areas identified in the MN County Biological Survey.	10
4. Proposal addresses habitats that have significant value for wildlife species of greatest conservation need, and/or threatened or endangered species, and lists targeted species.	15
5. Proposal identifies indicator species and associated quantities this habitat will typically support.	10
6. Performance measures are clearly identified, and have a specific plan for measuring and evaluating outcomes.	10
7. Proposal outcomes will be maintained over time.	10
8. Degree of timing/opportunistic urgency.	5
9. Proposal includes leverage in funds or other effort to supplement any OHF appropriation.	10
10. Proposed budget is appropriate to accomplish the outcomes described in the scope of work.	5
Maximum Points Possible	**100**

LSOHC Ecological Sections

Minnesota Law specifies, “The council shall use the regions of the state based upon the ecological regions and sub-regions developed by the Department of Natural Resources and establish objectives for each region and sub-region to achieve the purposes of the fund outlined in the state constitution.”

For purposes of developing the framework that will be used to guide expenditures from the OHF over the next 25 years, the Council has identified five Lessard-Sams Outdoor Heritage Council Sections (L-SOHC Sections). These are an aggregation of the state’s ten Ecological Sections.



Northern Forest Section Vision

The Council's vision for the Northern Forest Section contains clear view of the desired future condition for the section's forest lands, lakes and wetlands, and wildlife habitat.

Forestland should be universally accessible for forest management purposes as well as protected from development and fragmentation. Private in-holdings in public forests and key properties for habitat and stand management, adjacent to existing ownership should be acquired, with an eye toward ensuring no net loss of forestland. Of special concern is the condition of brushlands within the forestlands. These lands, along with early successional forest habitat are crucial for game species and non-game species and need restoration and enhancement work so as to ensure ample availability of this habitat type.

Lakes and wetlands supporting healthy fish populations are fundamental to the future of the Northern Forest Section. Lakes and streams with protected shoreland and restored watersheds will produce quality warm and cold-water aquatic systems. Those resources will provide the aquatic habitat required to support excellent fish populations and other aquatic organisms.

The Northern Forest Section is home to both cherished and unique Minnesota wildlife populations. It is imperative that the wildlife habitat of this Section support those populations. Healthy wild rice wetlands and shallow lakes that provide important habitat for a wide range of game and non-game wildlife which are clearly front and center in the Council's vision. These and other key habitats are envisioned to protect habitat for endangered, threatened and species of special concern and more common.

Priority Actions for the Northern Forest Section with Examples of Outcome Measures
Priorities actions are not in order of preference or importance.

- Protect shoreland and watersheds to restore or enhance critical habitat on wild rice lakes, shallow lakes, cold water lakes, streams and rivers, and spawning areas.
  - Forestlands are protected from development and fragmentation *(acres protected from development and fragmentation; average size protected complex; acres of forestlands with high connectivity to other forestlands protected)*
  - Healthy populations of endangered, threatened, or special concern species, species in greatest conservation need, and more common species – emphasis on unique species *(Population levels of focal forest game species, focal species in greatest conservation need; number and acreage of native plant communities with high biodiversity significance)*
- Provide access to manage habitat on landlocked public properties or protect forest land from parcelization and fragmentation through fee acquisition, conservation or access easement.
  - Greater public access for wildlife and outdoors-related recreation *(# of access points, % population with access within distance)*
  - Landlocked public properties are accessible with increased access for land managers *(# of landlocked properties accessed, % decrease in landlocked properties)*
- Restore and enhance habitat on existing protected properties, with preference to habitat for rare, endangered or threatened species identified by the Minnesota County Biological Survey.

- Increased availability and improved condition of riparian forests and other habitat corridors *(acres, habitat connectivity)*

- Restore forest-based wildlife habitat that has experienced substantial decline in aerial extent in recent decades.
  - Improved aquatic habitat indicators *(index of biotic integrity and other aquatic habitat indicators)*
  - Increased availability and improved condition of habitats that have experienced substantial decline *(e.g., acres of pine and brushland)*
- Protect from long term or permanent endangerment from invasive species.

Forest/Prairie Transition Section Vision

The Council's future for the Forest/Prairie Transition Section envisions diverse and productive remnant tracts of native prairie, forests grasslands, wetlands, lakes and rivers, and their associated fish and wildlife habitat.

The Council sees a future when ample grasses and other vegetation on shorelands and higher in the watershed keeps water on the land. This will yield clean lakes and streams, steady lake and stream levels, and improved aquatic vegetation, providing a plentiful supply of habitat for fish, game and wildlife in the Section, especially habitat for waterfowl and upland birds.

These rivers and streams and their surrounding vegetation will provide corridors of habitat including intact areas of forest cover in the eastern reaches of the Section, and large wetland/upland complexes in the more westerly areas. These wetland/upland complexes will consist of native prairies, restored prairies, quality grasslands and restored shallow lakes and wetlands.

Priority Actions for Forest/Prairie Transition Section with Examples of Outcome Measures
Priorities actions are not in order of preference or importance.

- Protect, enhance and restore wild rice wetlands, shallow lakes, wetland/grassland complexes, aspen parklands, and shoreland that provide critical habitat for game and non-game wildlife.
  - Protected, restored, and enhanced aspen parklands and riparian areas *(evidence of successful projects, connectivity of protected habitats, connectivity of forest habitats via corridors)*
  - Wetland/upland complexes will consist of native prairies, restored prairies, quality grasslands, and restored shallow lakes and wetlands *(# and type grassland bird conservation areas protected and restored; average size of complex, grassland and wetland acres; ratio grassland/upland; Increased grass cover %; # protected sites connected via corridor)*
- Protect, enhance and restore rare native remnant prairie.
  - Wetland/upland complexes will consist of native prairies, restored prairies, quality grasslands, and restored shallow lakes and wetlands
    (# and type grassland bird conservation areas protected and restored; average size of complex, grassland and wetland acres; ratio grassland/upland; increased grass cover %; # protected sites connected via corridor)
  - Remnant native prairies are part of large complexes of restored prairies, grasslands, and large and small wetlands *(Acres/percent of priority prairie wetland complexes protected under*

conservation management; # and type grassland bird conservation areas protected and restored; average size of complex, grassland and wetland acre (minimum of 40% grass and 20% water in prairie core areas); % and # protected sites connected via corridor)

- Protect, enhance and restore migratory habitat for waterfowl and related species, so as to increase migratory and breeding success.
  - Water is kept on the land *(due to abundant grasses and other vegetation on shorelands and higher in the watershed); (#/miles protected floodplain, saturated, and fen wetlands; # protected high gradient stream reaches*; *evidence of restored natural hydrology*)
  - Improved aquatic vegetation*(Evidence of healthy aquatic vegetation, low turbidity)*
  - Rivers and streams (and surrounding vegetation) provide corridors of habitat including intact areas of forest cover in the east and large wetland/upland complexes in the west *(Evidence of use in migration, connectivity of protected lands, # and extent of complexes; acres restored riparian vegetation)*
  - Increased waterfowl and upland bird migratory and breeding success *(Population levels of focal game species and species in greatest conservation need, # small basins and permanent wetlands, wetlands in high density nesting areas, wetlands with adjacent grassland)*
- Protected, restored, and enhanced habitat for waterfowl, upland birds, and species of greatest conservation need *(evidence of successful projects, connectivity of protected habitats, # MCBS sites)*
- Protect from long term or permanent endangerment from invasive species.

Metro Urbanizing Vision

The Council's vision for the Metropolitan Urbanizing Section is the protection of a network of natural lands in the Section providing wildlife habitat, birding sites, quality fisheries, especially cold-water fisheries and a forest land base that contributes to the habitat picture.

These natural lands in the Metropolitan Urbanizing Section include complexes of restored and perpetually protected wetlands, prairies, and forests, providing habitat benefits and access. These will have core areas spaced proportionally throughout the section with protected highly biologically diverse wetlands and plant communities including native prairies. Where possible, the habitats will connect, making corridors for wildlife and species in greatest need of conservation, and hold wetlands and shallow lakes open to public recreation and hunting. The Section's game lakes will be significant contributors of waterfowl production, due to efforts to protect uplands adjacent to game lakes. In the corridors, the streams, rivers and lakes will be protected by vegetative buffers and bank stabilization along riparian areas. Remnant oak savanna will be protected and its health restored, as will forests contributing to quality fisheries. As a result cold-water streams and lakes will provide high quality fisheries within an hour's drive of the majority of the state's population. Where possible, invasive species will have been permanently eradicated.

Priority Action for Metropolitan Urbanizing Area with Example of Outcome Measures
Priorities actions are not in order of preference or importance.

- Protect, enhance and restore remnant native prairie, Big Woods forests and oak savanna with an emphasis on areas with high biological diversity.

- Core areas protected with highly biologically diverse wetlands and plant communities including native prairies. *(% of 2010 remaining prairie and oak savanna protected, % protected sites that are MCBS sites, % adequately buffered/connected, average size of core complexes, evidence of successful R/E projects)*
- A forest land base that contributes to the habitat picture *(High quality forests, including oak savanna and Big Woods complexes are restored/protected, evidence of use by species dependent on these habitats, particularly SGCN, evidence of successful watershed approaches…e.g., reduced erosion)*

- Protect habitat corridors, with emphasis on the Minnesota, Mississippi and St. Croix rivers (bluff to floodplain.)
  - A network of natural land habitats will connect, making corridors for wildlife and species in greatest need of conservation *(Corridors connecting protected areas, evidence of SGCN and other wildlife using corridors, acres of "green infrastructure" corridors protected)*
  - Protected habitats will hold wetlands and shallow lakes open to public recreation and hunting. *(# access points, user satisfaction)*
- Enhance and restore coldwater fisheries systems.
  - High quality aquatic habitat *(streams, rivers and lakes protected by vegetative buffers along riparian areas, aquatic indicators…mussels, fish populations, increased* w*ater quality and water on a site)*
- Protect, enhance and restore riparian and littoral habitats on lakes to benefit game and non-game fish species.
  - Game lakes are significant contributors of waterfowl population, due to efforts to protect uplands adjacent to game lakes *(# impaired lakes, evidence of lake use/success….nesting success, etc.)*
- Protect from long term or permanent endangerment from invasive species.

Southeast Forest Section Vision

The Council recognizes the Southeast Forest Section of Minnesota is a unique place, largely untouched by recent glaciers that covered most of Minnesota. The underlying karst geology and overlying remnants of the Big Woods are not found elsewhere in Minnesota. The ages have left a legacy of warm and cold water streams and rivers, floodplains, hardwood forests, remnant bluffland prairies, and striking topographic relief that provides diverse habitat worthy of protection.

In the forested parts of the Southeast Forest Section the Council sees a future of restored and protected oak savanna and mixed deciduous forest lands making up large blocks of protected property, accessible for resource management purposes.

The cold and warm water streams of the region will be protected and enhanced by work in and along streams as well as work streamside to the top of the watershed to slow runoff and keep aquatic habitat clean and productive, with prolific fish, game and wildlife populations.

Southeast Forest Section wildlife habitat will be established in large corridors and complexes of restored and protected, biologically diverse habitat typical of the un-glaciated region. As a result the Section's endangered or threatened species will find habitat, such as goat prairies, in which to survive, alongside more common species of interest to Minnesotans. The Mississippi River and associated floodplain and bluffs, as well as the feeder streams will be an important part of this network of corridors and complexes.

Priority Actions for Southeast Forest Section with Examples of Outcome Measures
Priorities actions are not in order of preference or importance.

- Protect forest habitat though acquisition in fee or easement, to prevent parcelization and fragmentation and to provide the ability to access and manage landlocked public properties.
  - Forestlands and savannas are protected from parcelization and fragmentation and accessible for resource management purposes *(acres protected from development and fragmentation, acres of forestlands with high connectivity to other forestlands protected, # landlocked properties accessed, % decrease in landlocked properties)*
- Protect, enhance and restore habitat for fish, game and non-game wildlife in rivers, cold water streams and associated upland habitat.
  - High priority riparian lands are protected from parcelization and fragmentation *(acres protected)*
  - Stream to bluff habitat restoration and enhancement will keep water on the land to slow runoff and degradation of aquatic habitat *(index of biotic integrity and other aquatic and shoreline habitat indicators, acres of riparian forest, increased water infiltration)*
  - Rivers, streams and surrounding vegetation provide corridors of habitat *(Evidence of use in migration, connectivity of protected lands, # and extent of complexes)*
- Protect, enhance and restore remnant goat prairies.
  - Remnant goat prairies are perpetually protected *(% of remnant goat prairies protected, evidence of increased goat prairie habitat quality)*
- Restore forest-based wildlife habitat that has experienced substantial decline in aerial extent in recent decades.
  - Large corridors and complexes of biologically diverse wildlife habitat typical of the unglaciated region are restored and protected *(Connectivity of wildlife habitat, average size protected complex, # and acreage of native plant communities with high biodiversity significance, evidence of migratory success)*
  - Healthy populations of endangered, threatened, and special concern species as well as more common species *(population levels of focal game species, focal species in greatest conservation need)*
- Protect from long term or permanent endangerment from invasive species.

Prairie Section Vision

The Council sees the future of the Prairie Region as vital to the future of waterfowl, grassland birds and other wildlife dependent on native and restored prairies, shallow lakes, wetlands, and grasslands. The prairie region of Minnesota was once home to some of the largest herds of grazing animals the world has

ever known. It also contains within its borders, a portion of the Prairie Pothole Region the birthplace of 70 percent of North America's waterfowl. Unique components of this section are the prairie rivers, large and small, from the Red and Minnesota Rivers to their tributaries in adjacent watersheds. This section also contains some of the largest freshwater marshes in North America.

The Prairie Section of Minnesota is now one of the most altered rural landscapes in the world, with 90 percent of its native prairie and wetlands now under plow. The native prairie and wetlands that remain should be perpetually protected. Where possible these remnant native prairies should be part of large complexes with a goal of nine square mile parcels. These parcels should include restored prairies, grasslands, large and small wetlands that will create buffers to the native prairie and provide the density of habitat needed by fish, game and wildlife. Key core parcels should be set aside as areas managed for game species as well as refuges for fish, game or wildlife, and endangered or threatened species. Special emphasis should be put on extremely uncommon Minnesota species with unique or specific habitat requirements.

The Prairie Section waters, affected by agricultural practices which increase run off over natural levels, will have benefitted from revitalized and expanded shoreland buffers and work to enhance shallow lake productivity for a variety of shorebirds and waterfowl. As a result of concentrated work of this type, combined with restored and enhanced upland habitat, historically significant resources for migratory waterfowl, such as the Heron Lake and Swan Lake Watersheds will once again be important landscapes for many species of migrating birds. Likewise the Red River Valley will provide abundant wildlife habitat while simultaneously keeping water on the land to reduce flood potential.

The Prairie Section is the home to a critical portion of the state's wildlife-related lands. The Council sees these being increasingly productive in the future, as the result of restoration and enhancement of native prairie, grassland and associated watershed, including the shallow lakes of this section. In the southeastern part of the Section there are precious remnants of the Big Woods and oak savanna they will also be targeted for protection.

Priority Actions for the Prairie Section and Examples of Outcome Measures
Priorities actions are not in order of preference or importance.

- Protect, enhance, or restore existing wetland/upland complexes, or convert agricultural lands to new wetland/upland habitat complexes.
  - Key core parcels are protected for fish, game and other wildlife *(acres/percent of priority key parcels protected in fee or permanent easement)*
  - Increased participation of private landowners in habitat projects *(acres habitat P/R/E in private adjacent/near projects)*
  - Improved condition of habitat on public lands *(evidence of successful R/E projects)*
  - Restored and enhanced upland habitat *(evidence of successful restoration/enhancement projects)*
  - Agricultural lands are converted to grasslands to sustain functioning prairie systems. (*Acres/percent of priority key parcels are converted)*
  - Improved access to public lands *(# access points, acres of protected lands open for public access, % population with access within distance)*

- Water is kept on the land to reduce flood potential and degradation of aquatic habitat *(Watershed yield (indic. in dev.); evidence of restored natural hydrology; #/area/miles of protected floodplain, saturated, and fen wetlands)*

- Protect, enhance and restore remnant native prairie, Big Woods forests and oak savanna.
  - Protected, enhanced and restored remnants of big woods and oak savanna *(% of large remnants (>500 acres) of big woods and oak savanna protected)*
  - Remnant native prairie and wetlands are perpetually protected and adequately buffered *(Percent of remnant native prairie and wetlands protected, acres of remnant prairies with adequate buffers)*
  - Remnant native prairies are part of large complexes of restored prairies, grasslands, and large and small wetlands *(Acres/percent of priority prairie wetland complexes protected under conservation management; # and type grassland bird conservation areas protected and restored; average size of complex, grassland and wetland acre (minimum of 40% grass and 20% water in prairie core areas); % and # protected sites connected via corridor)*
- Restore or enhance habitat on public lands.
  - Increased wildlife productivity (evidence of increased productivity on specific lands; populations levels of focal game and Species in Greatest Conservation need)
- Protect, restore and enhance shallow lakes.
  - Protected, restored and enhanced shallow lakes (% of priority shallow lakes protected, evidence of successful restoration/ enhancement projects)
  - Improved aquatic vegetation (Evidence healthy aquatic vegetation, low turbidity)
  - Enhanced shallow lake productivity (degree of use by shorebirds and waterfowl)
- Protect expiring Conservations Reserve Program (CRP) lands.
  - Key core parcels are protected for fish, game and other wildlife *(Acres/percent of priority key parcels protected in fee or permanent easement)*
- Protect, enhance and restore migratory habitat for waterfowl and related species, so as to increase migratory and breeding success.
  - Protected, restored, and enhanced habitat for migratory and unique Minnesota species
  - *(degree of fall use of significant resources by migratory waterfowl; evidence of successful projects, connectivity of protected areas via riparian corridors)*
- Protect from long term or permanent endangerment from invasive species.

Lessard-Sams Outdoor Heritage Council – SAMPLE/PROGRAM WORKSHEET
Fiscal Year 2019 / ML 2018 Request for Funding

Date: May 05, 2017

Program or Project Title: Managing Carp in the Six Mile Creek-- Halsted Bay Subwatershed

Funds Requested: $1,210,000

Manager's Name: Anna Brown
Title: Planner – Project Manager
Organization: Minnehaha Creek Watershed District
Address: 15320 Minnetonka Blvd
City: Minnetonka, MN 55345
Mobile Number: 952-641-4522
Email: abrown@minnehahacreek.org

County Locations: Hennepin and Carver Counties

Regions in which work will take place: (Check all that apply)

- Northern Forest
- Forest / Prairie Transition
- Southeast Forest
- Prairie
- **Metro / Urban**

Activity types: (Check all that apply)

- Protect in Easement
- **Restore**
- **Enhance**
- Protect in Fee
- Enter other Activity Here update

Priority resources addressed by activity: (Check all that apply)

- **Wetlands**
- Forest
- Prairie
- **Habitat**

Abstract (100 words):

Provide a clear, concise summary of the proposed program's activities and outcomes. This should include the Who, What, When, Where, Why and How. This is the most visible description of your program. The abstract will provide readers with an overview of program objectives and will be publicly visible on the LSOHC website and summary reports.

Common carp are overly abundant in Minnehaha Creek Watershed District's 27 square mile Six Mile-Halsted Bay Subwatershed, and are primary drivers of degraded water quality and ecological conditions. The Minnehaha Creek Watershed District's Phase 1 of Habitat Restoration in the 27-square mile Six Mile – Halsted Bay Subwatershed will restore and enhance 1,262 acres of degraded in-lake habitat across 10 lakes, and protect another 382 acres in four lakes

from further degradation by reducing and maintaining carp populations below their ecological damaging threshold of 100 kg/ha.

Design and scope of work (500 words):

This section describes the problem to be addressed, the scope of work, how priorities were set, and the urgency and opportunity of the proposed project/program. Be sure that the narrative answers what specific habitat will be affected and how the actions will directly restore, enhance, and/or protect prairies, wetlands, forests, or habitat for fish, game, and wildlife. Your narrative should also address the level of stakeholder involvement and partnership.

The Six Mile-Halsted Bay Subwatershed spans 27 square miles on the western edge of Minnehaha Creek Watershed District in Hennepin and Carver Counties and is one of the restoration focus geographies for MCWD. The area contains approximately 15 lakes and hundreds of acres of wetlands, all connected by Six Mile Creek, which ultimately drains into Halsted Bay of Lake Minnetonka. Despite this subwatershed's potential to provide an extensive corridor of high quality habitat for fish, waterfowl and other wildlife, ecological conditions are degraded and in need of restoration. Six of the subwatershed's lakes are listed as impaired for nutrients because of excess phosphorus, four lakes have fish communities with poor Index for Biotic Integrity scores, and almost all lakes have poor or degraded Floristic Quality Index scores.

In 2013, MCWD completed the Six Mile Creek Diagnostic study that identified watershed and internal phosphorus loading, degraded wetlands and carp as the primary drivers of poor water quality and ecological degradation. Common carp are abundant in the Six Mile-Halsted Bay Subwatershed, and are primary drivers of degraded water quality and ecological conditions. Carp cause these negative impacts through their bottom feeding behavior, which is known to resuspend bottom sediments and release nutrients into the water column. Due in large part to this behavior, six of the subwatershed's lakes are listed as impaired for nutrients because of excess phosphorus, and many more exhibit elevated phosphorus levels without being listed as impaired, leading to algae blooms that inhibit recreational activities and harm fish habitat. To understand the extent of carp in the watershed, the MCWD commissioned the University of Minnesota to conduct a three-year assessment of common carp in this expansive geography that documented carp population levels, tracked their movement, and identified carp spawning locations. This scientific assessment, which concluded spring of 2017, will be the basis of implementing carp management. Twelve lakes had carp biomass levels above 100 kg/ha; a threshold known to be ecologically damaging in shallow Midwestern lakes (Bajer et al. 2009). Carp biomass ranged from 156 to 1,264 kg/ha, which is 12 times the ecological damaging threshold. Controlling carp populations is a top priority for restoration of this subwatershed.

We will use an adaptive, science-based approach to inform carp management strategies. First, to develop management strategies and priority water bodies, we will use data from the recent three-year carp assessment, which was conducted in partnership with University of Minnesota researchers and assessed carp abundance, recruitment patterns and seasonal movement. Second, to ensure management strategies are effective, we will monitor carp abundance and carp recruitment, and changes to water quality and ecological conditions.

We propose to reduce carp populations below the 100 kg/ha threshold through two objectives:

1. Suppress carp recruitment
2. Remove adult carp biomass

We will accomplish the first objective with a) winter aeration, which prevents winterkill of bluegill sunfish, a species that preys on carp eggs, and b) physical barriers, which block carp from accessing spawning areas. We will accomplish the second objective with a) winter or open-water seining, b) box-net trapping, and c) trapping migratory carp in stream channels. After this aggressive short-term approach, we will continue long-term maintenance indefinitely. Members of the Six Mile – Halsted Bay Partnership and other partners will support maintenance efforts.

Carp are powerful invaders that threaten Minnesota's native aquatic ecosystems and recreational activities. It is critical to manage these invaders before populations grow and migrate into new waters. Management of carp in the Six Mile-Halsted Bay Subwatershed will prevent population growth and migration of this invasive species, restoring water quality, habitat, ecological diversity and recreational benefits to the subwatershed and to downstream waters.

Which sections of the Minnesota Statewide Conservation and Preservation Plan are applicable to this project: Check the top TWO that apply

- **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: Check the top TWO that apply

- **Long Range Plan for Fisheries Management**
- **Managing Minnesota's Shallow Lakes for Waterfowl and Wildlife**
- Other plan gets entered here

Describe how your program will advance the indicators identified in the plans selected (150 words):

The Long Range Plan for Fisheries Management calls for conserving and managing Minnesota's aquatic resources and associated fish communities for their intrinsic values and long term ecological, commercial, and recreational benefits to the people of Minnesota. By managing invasive carp populations, this project will conserve and restore native fish communities and fish habitat, so that these native communities can provide such benefits.

The goal of Minnesota's Shallow Lakes for Waterfowl and Wildlife program is to protect shallow lakes for their ecological, recreational, and economic importance, with particular emphasis on wildlife and wildlife based recreation. This project will support the Shallow Lakes goal by directly protecting several shallow lakes in the Six Mile-Halsted Bay Subwatershed from the many detrimental impacts of carp. In particular, this project will enhance waterfowl, fish and other wildlife populations that have had to compete with carp for food and habitat.

Which LSOHC section priorities are addressed in this proposal: Check the top ONE applicable outcome per region with text box to explain

Metro / Urban:

- Protect, enhance, and restore remnant native prairie, Big Woods forests, and oak savanna with an emphasis on areas with high biological diversity
- Protect habitat corridors, with emphasis on the Minnesota, Mississippi, and St. Croix rivers (bluff to floodplain)
- Enhance and restore coldwater fisheries systems
- Protect, enhance, and restore riparian and littoral habitats on lakes to benefit game and nongame fish species
- **Protect from long-term or permanent endangerment from invasive 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 (250 words):

This project will protect the Six Mile-Halsted Bay ecosystem and its species from invasive carp, restoring 1,644 acres of littoral habitat. Carp threaten native fish communities and several species of game and non-game wildlife, especially waterfowl. Carp populations are growing and dispersing, and if not managed, their negative impacts on water quality and ecological conditions could be permanent. By providing short- and long-term management of carp populations, this project will restore and enhance food and habitat for both game and non-game fish and wildlife for generations.

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 (350 words):

We have used intensive science-based targeting to select priority water bodies and management strategies for carp population control in the Six Mile-Halsted Bay Subwatershed. We partnered with University of Minnesota researchers to conduct a three-year study assessing carp abundance, recruitment patterns, and seasonal movement in the subwatershed, which allowed identification of target management areas and quantifiable goals for each area. We will continue to use science-based targeting as management occurs by monitoring carp abundance, carp recruitment, water quality and ecological conditions. In addition to documenting management progress, the results of monitoring will allow for an adaptive management framework by informing ongoing management decisions.

This science-based targeting and adaptive management framework will restore critical habitat and food sources to the Minnesota portion of the Mississippi Flyway, the most heavily used migration corridor for waterfowl and other birds. Historically, lakes and wetlands across Minnesota contained abundant macroinvertebrates and aquatic vegetation to support waterfowl during migration and breeding. However, in the last century, much of this landscape has been drained or filled, fragmenting critical habitat and limiting the number of stopover locations for birds to rest and refuel during spring and fall migration. These factors, combined with infestations of carp in the Six Mile-Halsted Bay Subwatershed, have limited the utility of the subwatershed's lakes to birds traveling the Mississippi Flyway. Once restored, lakes and wetlands in the Six Mile-Halsted Bay Subwatershed can again serve as exceptional habitat for waterfowl and other birds, expanding the corridor that links southern wintering grounds and northern breeding grounds.

This project's science-based targeting will also restore food and habitat for many species of fish. Although Six Mile Creek connects almost all the lakes and wetlands in the subwatershed, connectivity in the subwatershed is degraded due to poor habitat in many of the water bodies. This project will improve aquatic connectivity in the Six Mile Creek corridor by restoring and enhancing spawning areas and aquatic habitat for game and non-game fish.

How does the proposal address habitats that have significant value for wildlife species of greatest conservation need, and/or threatened or endangered species, and lists targeted species (350 words):

By controlling carp populations, we will restore and enhance 1,644 acres of littoral habitat for many species of waterfowl, fish and other wildlife. Littoral ecosystems in the Six Mile – Halsted Bay Subwatershed have been degraded by carp, which uproot aquatic vegetation, compete with waterfowl for macroinvertebrates and other food, and create turbid, phosphorus-rich water that impairs the water quality of fish habitat. As these carp populations are reduced, we will see recovery 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 resuspending 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, likely 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.

Species that may benefit include:

Harvested waterfowl: Mallards, Wood ducks, Ring-necked ducks, Blue-winged teals and Lesser scaups.

Harvested fish: bass, pike panfish.

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 (250 words):

CRITERIA #5 - Explain here game and non-game indicator species that will benefit from the work outlined in this request.

Example 1: Mallards – Utilizing USFWS's thunderstorm models, we estimate the fee-title acquisition of 1,000 acres as outlined within the proposal can produce an additional 2,000 nesting pairs of mallards.

Example 2: Pheasants – The removal of trees and prescribed fire within the existing 20,000 acres of Wildlife Management Areas within the farmland zone of Minnesota as outlined in this proposal is estimated to produce an additional 10,000 pheasants annually.

Example 3: Monarch Butterfly – The conversion of 100 acres of cropland to restored native prairie (planting seed mix BWSR U3) as outlined within this proposal is estimated to grow an additional 500 new stems of milkweed which in turn is estimated to produce an additional 250 monarch butterflies.

Example 4: Brown Trout – The protection of 1,000 ft along the Outdoor Heritage Stream via conservation easement that protects the existing high quality stream habitat will protect an estimated 500 brown trout.

ANOTHER EXAMPLE that Sarah found: The various trout species are the key indicator species for our project. Our activities restore and/or enhance habitat that typically supports a biomass of 100 to 130 pounds per acre of brook or brown trout in southeast MN trout streams, and 40 pounds per acre of trout in northern MN trout streams.

The benefits of carp management are more easily evaluated on an ecosystem level rather than on any species level. As explained above, reducing carp populations allows recovery of aquatic vegetation, macroinvertebrates, and water quality. This restores food and habitat for numerous species of fish and wildlife, and in turn, restores populations of these species. Therefore, we will use several indices of ecosystem health as indicators of carp management success. To evaluate the health of macrophyte communities we will use the Floristic Quality Index and the "Score the Shore" index. We will also use the Index for Biotic Integrity to measure fish and macroinvertebrate health. Our goals are to increase these scores by….

In addition, while carp are not technically an indicator species, they will serve as indicators of our management progress. Our goal is to reduce carp biomass to 100 kg/ha, the threshold indicating the density at which carp begin to appreciably impact a system's water quality and ecological integrity. We divided the subwatershed into management areas, and even further into individual lakes, and we have used three-years of carp abundance data to determine exactly how much biomass must be removed from each lake to cross the 100 kg/ha threshold. Monitoring for carp abundance as management occurs will indicate if we are meeting biomass reduction goals in each lake and if we are on track to cross the threshold.

Other indicator species of ecosystem quality include mallards and several species of vegetation such as wild rice, wild celery….

While there is limited data available on the effect of carp removal on fish communities, [insert fish species] may also serve as indicator…

Outcomes:

Programs in metropolitan urbanizing region:

- A network of natural land and riparian habitats will connect corridors for wildlife and species in greatest conservation need. *Management of carp will restore and enhance large areas of shallow-water fish and wildlife habitat. Outcomes in carp management will be measured by carp abundance and carp recruitment patterns. Outcomes in fish and wildlife*

habitat will be measured in concentrations of total phosphorus, chlorophyll-a and total suspended solids, as well as water clarity and several aquatic plant community metrics.

How will you sustain and/or maintain this work after the Outdoor Heritage Funds are expended (200 words):

Even with an aggressive initial approach to carp management, long-term monitoring and maintenance will almost certainly be necessary. We plan to continue operation and maintenance of aeration units and barriers, carp population and recruitment monitoring, and annual carp removal. We understand that these practices will have associated costs. The Minnehaha Creek Watershed District, with its local partners, will assume all management costs and responsibilities. The Minnehaha Creek Watershed District has funds for a much larger Six Mile- Halsted Bay Subwatershed management plan, so once the capital-intensive phase of this project has been completed, the project's costs can be absorbed by the larger subwatershed plan. Members of the Six Mile – Halsted Bay Partnership may also assume responsibility for certain management practices, such as operation and maintenance of aeration units. The Six Mile – Halsted Bay Partnership includes the Cities of Victoria, Minnetrista, Laketown, and St. Bonifacius, Carver and Hennepin Counties, the Carver Soil and Water Conservation District, and Three Rivers Park District. Other partners, such as the Minnesota Department of Natural Resources and Ducks Unlimited, may help with fish and waterfowl monitoring. Further, the District can apply for supplemental funds through other granting organizations and/or obtain volunteer labor.

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

Year	Source of Funds	Step 1	Step 2	Step 3
2015	Fund A	step 1 to maintain outcome - CRITERIA # 7	step 2 to maintain outcome	step 3 to maintain outcome
2016	Fund B	step 1 to maintain outcome	step 2 to maintain outcome	step 3 to maintain outcome
2017	Fund C	step 1 to maintain outcome	step 2 to maintain outcome	step 3 to maintain outcome

What is the degree of timing/opportunistic urgency and why it is necessary to spend public money for this work as soon as possible (150 words):

Carp are competitive invasive fish that threaten Minnesota's native aquatic ecosystems and recreational water activities. It is critical to manage these powerful invaders before populations grow and migrate into new waters. Management of carp in the Six Mile-Halsted Bay Subwatershed will prevent population growth and migration of this invasive species, causing restoration of degraded water quality and ecological conditions. These conditions must be restored if the area is to provide the recreational, economic, and ecological benefits to Minnesotans that it once did.

How does this proposal include leverage in funds or other effort to supplement any OHF appropriation (200 words):

The Minnehaha Creek Watershed District is providing an anticipated $_____ in leverage, which is detailed in the budget section. The District is also committed to long-term monitoring and maintenance of the project.

Relationship to other funds:

- Arts and Cultural Heritage Fund
- Environmental and Natural Resource Trust Fund
- Clean Water Fund
- Parks and Trails Fund
- Enter Other Funds Here

Describe the relationship in the text box provided here

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

Appropriation Year	Source	Amount
2015	ENRTF	3,500,000
2016	Federal Dollars	4,000,000
2017	Local Tax Levy	1,800,000

Activity Details

Requirements:

If funded, this proposal will meet all applicable criteria set forth in MS 97A.056 – **Yes/No** **All proposals will answer**

We have reviewed MS 97A.056 and all the criteria set forth therein. Because this project does not involve acquiring land, many criteria are not applicable, but we plan to follow all applicable criteria.

Subd. 11.**Recipient requirements.**

Will local government approval be sought prior to acquisition - **Yes/No** **Fee proposal will answer**

EXPLAIN HERE

Is the land you plan to acquire free of any other permanent protection - **Yes/No** **Fee proposal will answer**

EXPLAIN HERE

Is the land you plan to acquire free of any other permanent protection - **Yes/No** **Easement proposal will answer**

EXPLAIN HERE

Will restoration and enhancement work follow best management practices including MS 84.973 Pollinator Habitat Program - **Yes/No** **Restore/Enhance proposal will answer**

The project will follow best management practices. The project does not include any planting of vegetation, but by restoring and enhancing littoral areas, we will promote macrophyte growth and perhaps create some pollinator habitat.

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/No** **Restore/Enhance proposal will answer**

EXPLAIN HERE

Do you anticipate federal funds as a match for this program - **Yes/No** **All proposals will answer**

Are the funds confirmed - **Yes/No**

Documentation

What are the types of funds?
Other - EXPLAIN HERE

Land Use:

Will there be planting of corn or any crop on OHF land purchased or restored in this program - **Yes/No** **All proposals will answer**

EXPLAIN HERE There will be no planting of corn or any crop.

Are any of the crop types planted GMO treated - **Yes/No**

Is this land currently open for hunting and fishing - **Yes/No** **Fee proposal will answer**

EXPLAIN HERE

Will the land be open for hunting and fishing after completion - **Yes/No** **Fee proposal will answer**

EXPLAIN HERE

Will the eased land be open for public use - **Yes/No** **Easement proposal will answer**

EXPLAIN HERE

Are there currently trails or roads on any of the acquisitions on the parcel list - **Yes/No** **Fee/Easement proposal will answer**

Describe the types of trails or roads and the allowable uses:

EXPLAIN HERE

Will the trails or roads remain and uses continue to be allowed after OHF acquisition – **Yes/No**

How will maintenance and monitoring be accomplished:

EXPLAIN HERE

Will new trails or roads be developed as a result of the OHF acquisition – **Yes/No**

Describe the types of trails or roads and the allowable uses:

EXPLAIN HERE

How will maintenance and monitoring be accomplished:

EXPLAIN HERE

Accomplishment Timeline

Activity	Approximate Date Completed
Objectives	
Run electric for aeration units	Month, 2018
Install aeration units	Month, 2018
Install permeable berm at outlet of Crown College Pond	Month, 2018
Install weir and stilling well between North & South Lundsten	Month, 2018
Replace barrier at Zumbra outlet	Month, 2018
Install barrier/fish-trap between Mud Lake and Halsted Bay	Month, 2018
Install barrier at Wasserman outlet	Month, 2018
Box-Net Trapping	2018-2021 (and potentially beyond)
Winter/open-water seining	2018-2021 (and potentially beyond)
Carp trapping in stream channels	2018-2021 (and potentially beyond)
Monitoring	2018-2021 (and potentially beyond)
Carp population surveys	2018-2021 (and potentially beyond)
Winter dissolved oxygen monitoring	2018-2021 (and potentially beyond)
Spring trap-net surveys	2018-2021 (and potentially beyond)
Fall trap-net surveys	2018-2021 (and potentially beyond)
Implanting radio tags	2018-2021 (and potentially beyond)
Tracking radio-tagged carp	2018-2021 (and potentially beyond)
Aquatic plant surveys	2018-2021 (and potentially beyond)
Water quality monitoring	2018-2021 (and potentially beyond)

Budget Spreadsheet

Total Amount of Request: $1,210,000

Budget and Cash Leverage

Budget Name	LSOHC Request	Anticipated Leverage	Leverage Source	Total
Personnel	$144,000	$224,000	MCWD	$368,000
Contracts	$764,000			$784,000
Fee Acquisition w/ PILT				
Fee Acquisition w/o PILT				
Easement Acquisition				
Easement Stewardship				
Travel				
Professional Services				
Direct Support Services				
DNR Land Acquisition Costs				

Capital Equipment	$242,000			
Other Equipment/Tools				
Supplies/Materials	$60,000			
DNR IDP				
Total	$1,210,000	$224,000		

Personnel

Position	FTE	Over # of years	LSOHC Request	Anticipated Leverage	Leverage Source	Total
Position 1	1.00	3.00	$10,000	$10,000	Private sources	$20,000
Total	1.00	3.00	$10,000	$10,000	-	$20,000

Capital Equipment

Item Name	LSOHC Request	Anticipated Leverage	Leverage Source	Total
truck	$500	$500		$1,000
Total	$500	$500	-	$1,000

Amount of Request:	$11,700
Amount of Leverage:	$10,500
Leverage as a percent of the Request:	89.74%
DSS + Personal:	$10,100
As a % of the total request:	86.32%
Easement Stewardship:	$100
As a % of the Easement Acquisition:	100.00%

How did you determine which portions of the Direct Support Services of your shared support services is direct to this program: EXPLAIN HERE
Does the amount in the contract line include R/E work? EXPLAIN HERE

Does the amount in the travel line include equipment/vehicle rental? – Yes/No

Explain the amount in the travel line outside of traditional travel costs of mileage, food, and lodging: EXPLAIN HERE
Describe and explain leverage source and confirmation of funds: EXPLAIN HERE

Does this proposal have the ability to be scalable? – Yes/No

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: EXPLAIN HERE

Output Tables

Table 1a. Acres by Resource Type

Type	Wetlands	Prairies	Forest	Habitats	Total
Restore	1,644				
Protect in Fee with State PILT Liability					
Protect in Fee W/O State PILT Liability					

Protect in Easement					
Enhance					
Total	1,644				1,644

Table 1b. How many of these Prairie acres are Native Prairie?

Type	Native Prairie
Restore	0
Protect in Fee with State PILT Liability	0
Protect in Fee W/O State PILT Liability	0
Protect in Easement	0
Enhance	0
Total	0

Table 2. Total Requested Funding by Resource Type

Type	Wetlands	Prairies	Forest	Habitats	Total
Restore	$100	$100	$100	$100	$400
Protect in Fee with State PILT Liability	$100	$100	$100	$100	$400
Protect in Fee W/O State PILT Liability	$100	$100	$100	$100	$400
Protect in Easement	$100	$100	$100	$100	$400
Enhance	$100	$100	$100	$9,800	$10,100
Total	$500	$500	$500	$10,200	$11,700

Table 3. Acres within each Ecological Section

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	Northern Forest	Total
Restore	1,644					
Protect in Fee with State PILT Liability						
Protect in Fee W/O State PILT Liability						
Protect in Easement						
Enhance						
Total	1,644					1,644

Table 4. Total Requested Funding within each Ecological Section

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	Northern Forest	Total
Restore	$100	$100	$100	$100	$100	$500
Protect in Fee with State PILT Liability	$100	$100	$100	$100	$100	$500
Protect in Fee W/O State PILT Liability	$100	$100	$100	$100	$100	$500
Protect in Easement	$100	$100	$100	$100	$100	$500
Enhance	$100	$100	$100	$100	$9,300	$9,700
Total	$500	$500	$500	$500	$9,700	$11,700

Tables 5 and 6 will be auto populated from the information provided above, applicants do not need to calculate or complete

Table 5. Average Cost per Acre by Resource Type

Type	Wetlands	Prairies	Forest	Habitats
Restore	$10	$10	$10	$10

Protect in Fee with State PILT Liability	$10	$10	$10	$10
Protect in Fee W/O State PILT Liability	$10	$10	$10	$10
Protect in Easement	$10	$10	$10	$10
Enhance	$10	$10	$10	$980

Table 6. Average Cost per Acre by Ecological Section

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	Northern Forest
Restore	$10	$10	$10	$10	$0
Protect in Fee with State PILT Liability	$10	$10	$10	$10	$0
Protect in Fee W/O State PILT Liability	$10	$10	$10	$10	$0
Protect in Easement	$10	$10	$10	$10	$0
Enhance	$10	$10	$10	$10	$0

Target Lake/Stream/River Feet or Miles

15

Parcel List

Complete the parcel tab as accurately as possible. The system will automatically generate a "dot" map from the TRDS provided. Inaccurate completion of this data will not represent all of the activity location in your proposal.

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

EXPLAIN HERE update

Section 1 - Restore / Enhance Parcel List

Hennepin

Name	TRDS	Acres	Est Cost	Existing Protection?

Tract 5		0	$0	

Scott

Name	TRDS	Acres	Est Cost	Existing Protection?
Tract 4		0	$0	

Section 2 - Protect Parcel List

Carlson

Name	TRDS	Acres	Est Cost	Existing Protection?	Hunting?	Fishing?
Tract 3		0	$0			

Ramsey

Name	TRDS	Acres	Est Cost	Existing Protection?	Hunting?	Fishing?
Tract 2		0	$0			

Washington

Name	TRDS	Acres	Est Cost	Existing Protection?	Hunting?	Fishing?
Tract 1		0	$0			

Section 2a - Protect Parcel with Bldgs

No parcels with an activity type protect and has buildings.

Section 3 - Other Parcel Activity

Grant

Name	TRDS	Acres	Est Cost	Existing Protection?	Hunting?	Fishing?
Tract 7	2	0	$0			

Kandiyohi

Name	TRDS	Acres	Est Cost	Existing Protection?	Hunting?	Fishing?
Tract 6	2	0	$0			

Attachments:

1. **The Online Program Management System will generate a map based on the parcel list that will be attached here**

2. **Other attachments submitted will appear after the system map, for example, the required Proposal Illustration, photos, letters of support, etc.**