Request for Funding

Lessard-Sams Outdoor Heritage Council Fiscal Year 2016 / ML 2015

Program or Project Title: Lake Nokomis Integrated Habitat Enhancements

Funds Requested: \$744,300

Manager's Name: Adam Arvidson

Title: Project Manager

Organization: Minneapolis Parks and Recreation Board

Street Address: 2117 West River Road N

City: Minneapolis, MN 55411 Telephone: 612-230-6470

E-Mail: aarvidson@minneapolisparks.org

Organization Web Site:

County Locations: Hennepin

Ecological Planning Regions:

· Metro / Urban

Activity Type:

Enhance

Priority Resources Addressed by Activity:

Habitat

Abstract:

MPRB requests \$744,300 to improve aquatic habitat in Lake Nokomis through integrated lake management. This project will enhance 4800 linear feet of shoreline, implement three acres of in-lake plant propagation, and rebalance the fish community through stocking of predator fish.

Design and Scope of Work:

The three complementary enhancement activities included in this project will improve habitat for fish, birds, reptiles, amphibians, and aquatic invertebrates in the entirety of Lake Nokomis. The lake measures 200 acres; approximately half is less than 15 feet deep. The lake is owned entirely by MPRB. Its shoreline consists of a combination of Works Progress Administration stone wall in varying condition along with stretches of turfgrass with poor quality native shoreline buffer and little emergent vegetation along the eroding lake edge. It is an important stop-over for migratory waterfowl, songbirds, and shorebirds that use the Mississippi River Flyway, such as wood ducks, loons, grebes, coots, warblers, vireos, grosbeaks, herons, rails, and sandpipers.

Lake Nokomis is limited in its habitat potential due primarily to its lack of clarity and lack of aquatic vegetation. The poor water clarity is attributable to a negative feedback cycle centered on an imbalance in the fish population. Periodic fish surveys have found that small black bullheads and small panfish are overabundant in the lake. There is not enough aquatic vegetation in the lake for these species' shelter and food needs (plants would serve as habitat to prey insects), so these species root in the substrate in search of food. Sediment re-suspension increases turbidity in the lake and also instigates algae blooms by releasing nutrients back into the water column. Sediment- and algae-based turbidity then further suppresses plant growth by preventing light penetration to the lakebed.

Aquatic vegetation is critical to overall lake clarity and habitat. A study by Canfield and Hoyer (1992) has shown

that lakes with at least 40% vegetative coverage function as high quality habitat lakes with good water clarity. Lake Nokomis currently has 11% vegetative coverage. Plants grow only to lake depths up to 8 feet and not in the entire littoral (15-foot maximum depth) zone—which constitutes about half the lake.

The most cost effective means of stopping the negative feedback cycle in Lake Nokomis is to rebalance the fish population through the introduction of predator species that will consume the small panfish and black bullhead. For three years, the Minnehaha Creek Watershed District (MCWD) has been stocking walleye in Lake Nokomis as part of a Biomanipulation Study. Early data analysis is encouraging. Aquatic plant coverage in the lake increased 80% (from 12 to 22 acres) and aquatic plant diversity increased from a mere two species to eight. As a result, phosphorous concentrations in the lake are lower, a fact that will likely lead to reduced algae blooms. In fish surveys, the bluegill population has dropped from 400 per net to 20 per net, and those caught are generally larger in size. This all suggests that the program to stock predatory fish is working.

In other Midwestern lakes, biomanipulation projects have seen similar early results, but then ended too early. Fishing pressure eventually removed the predator fish and these lakes returned to their pre-biomanipulated state. In addition, complementary efforts to bolster vegetation coverage are rare.

MPRB is therefore partnering with MCWD to extend predator fish stocking for an additional five years. This would be one leg of a three-legged stool that also includes two complementary activities focused on restoration of native plant communities. The second leg is the installation of three acres of plant propagation areas within the littoral zone of the lake. These zones will exclude all fish for several years, to give a head start to new plants and also to the native species that already exist in the lakebed seedbank. They will help ensure effective germination and growth of native submergent and emergent vegetation. The third leg is the enhancement of 4800 linear feet of shoreline by regrading banks to stabilize erosion, removing invasive plants in the shoreline buffer, and installing appropriate native emergent and shoreline plants.

In this three-part scheme, the predatory fish become an in-situ treatment at the exact point of impact. The inlake propagation areas and shoreline restoration will have a greater chance of success with reduced numbers of juvenile panfish and black bullheads. The predatory fish are a mechanism of habitat enhancement—just like vegetative restoration. They are the most cost effective alternative for removing small panfish and black bullheads and ensuring a sustaining balance in the fish population over the long term.

This unique combination of activities is proposed based on extensive scientific study of the lake. This project goes beyond mere shoreline restoration and instead looks at the lake environment holistically. Shoreline restoration would not alone accomplish habitat enhancement goals in Lake Nokomis. This thinking has driven a variety of other previous efforts that have improved the lake's habitat (in addition to the MCWD's biomanipulation study and walleye stocking). In 2001 MCWD and MPRB installed a weir between Lake Nokomis and Minnehaha Creek to reduce nutrient inflow to the lake from the creek, then modified that weir in 2012 to protect against zebra mussels. Also in in 2001, MPRB, MCWD, and the City of Minneapolis installed several native species-planted storm water treatment ponds near the lake to pre-treat urban runoff and provide habitat for various animal species. Nearby residents and groups such as Friends of Lake Nokomis, Blue Water Commission, the Nokomis East Neighborhood Association, and the Hale Page Diamond Lake Neighborhood Association have historically supported efforts to improve lake water quality and habitat through participation in planning and with volunteer efforts.

Lake Nokomis has excellent habitat potential. MPRB and MCWD have been studying this generally shallow lake for years and have implemented some critical habitat improvements already. LSOHC funding would leverage MPRB and MCWD's efforts through each agency's general operations and maintenance funding. It would allow the next phase of habitat enhancement to occur. The MPRB's proposed three complementary enhancement activities will address the lake habitat holistically. This integrated and diversified project constitutes the best chance to make a significant positive impact on all 200 acres of the lake's aquatic habitat.

How the request addresses MN habitats:

According to the original land survey map of Hennepin County prior to the development of the city, Lake Nokomis was originally a shallow lake. It was likely full of emergent vegetation and was an effective spawning ground for fish. Dredging in the early 1900's disturbed Nokomis's littoral habitat. The concurrent construction of the storm sewer conveyance system added nutrients and sediment to the lake system. These two actions combined created a feedback loop that caused Lake Nokomis to switch to an algae dominated low-habitat-value system. Through projects completed by the Blue Water Partnership in the 2000's along with later nutrient reduction projects in the southern portion of the watershed, much of the external sediment and phosphorus load to the lake has been addressed. However, the lake remains locked in an algae-dominated state. The intent of the current

project is to push the lake back into a clear-water habitat-rich state, through three integrated management techniques. This will restore the historic function of the lake as an interconnected habitat system that benefits aquatic vegetation, aquatic invertebrates, fish, birds, reptiles, amphibians, and small mammals.

Please explain the nature of urgency:

Most biomanipulation projects end too early. The balance then tips back toward algae dominance and vegetation gains are destroyed. At Lake Nokomis we have the opportunity to ensure habitat quality tips in the right direction, but even a short hiatus in biomanipulation and plant restoration will unravel years of work.

Planning

MN State-wide Conservation Plan Priorities:

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

Plans Addressed:

- Minnesota DNR Strategic Conservation Agenda
- National Fish Habitat Action Plan

Please describe the science based planning and evaluation model used:

MPRB will continue to regularly monitor phosphorous, nitrogen, chlorophyll-a, zooplankton, and phytoplankton and compare levels to historic data and MPCA standards. MPRB and MCWD will also perform aquatic plant and fish surveys within the propagation areas and the lake in general. Plans and fish management will be adjusted based on findings.

LSOHC Metro Urban Section Priorities:

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

Accelerates or Supplements Current Efforts:

Since 2001 MPRB and MCWD have been working to improve the quality of habitat and the fishery in Lake Nokomis through a variety of efforts. A weir between the lake and Minnehaha Creek installed in 2001 and modified in 2012 eliminates creek inflow, thereby reducing nutrients in the lake and protecting it from zebra mussels. Native-planted stormwater ponds installed in 2001 also mitigate urban runoff. The MCWD's Biomanipulation Study is addressing the prevalence of stunted bluegill sunfish and bullheads through stocking of predator walleye. LSOHC funding will allow for continuation of the successful predator fish stocking program as one portion of a full-lake habitat enhancement project. It will supplement the general operations and maintenance funding provided for the lake by MPRB and MCWD. It will allow for rapid implementation of the vegetation restoration portions of the project, to ensure the stocking and restoration take place together for optimum habitat benefit.

Non-OHF Money Spent in the Past:

Appropriation Year	Source	Amount
2000	Minnehaha Creek Watershed District	300,000
2010	Minnehaha Creek Watershed District	41,800
2013	Minnehaha Creek Watershed District	72,598
2014	Minnehaha Creek Watershed District	9,200

Sustainability and Maintenance:

The stewardship plan for enhanced habitat at Lake Nokomis will be led by MPRB environmental stewardship staff. Their primary focus will be to continue to remove invasive tree and herbaceous species from the shoreline, monitor and repair any recurring erosion, and monitor and repair shoreline restoration areas and in-lake propagation areas as needed. MPRB may contract with Conservation Corps Minnesota and will also utilize its youth employment program, Teen Teamworks, to help with invasives removals. Teen Teamworks is a youth employment program that helps teens and young adults develop job skills focused on maintenance and natural resource management. Water resources staff will also conduct aquatic plant surveys. Volunteers from the Nokomis East Neighborhood Association and the Friends of Lake Nokomis will help sustain the enhanced habitat. After conclusion of the five-year grant, MPRB and MCWD will continue to maintain and improve lake habitat. MCWD will likely continue the predator stocking program for an additional five years.

Maintain Project Outcomes:

Year	Source of Funds	Step 1	Step 2	Step 3
2021 and thereafter	MPRB General Operating	continued maintenance of shoreline restoration areas	continued water sampling	
2021 - 2025	MCWD General Operating	continued biomanipulation through stocking of predator fish (planned)	continued fish surveys	continued squatic plant line-intercept surveys

Applicable Criteria:

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

Best Management Practice:

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

Permanent Protection:

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 (County/Municipal, Public Waters, no)

Accomplishment Timeline

Activity	Approximate Date Completed
Restore and enhance 4800 linear feet of riparian habitat (2016 - 2020)	2020
Restore and enhance three acres of littoral habitat through fish exclusion areas (2016 - 2020)	2020
Annual walleye stocking as habitat augmentation to manage aquatic vertebrates	2020
Monitor and evaluate results annually through fish and plant surveys	2020

Outcomes

Programs in metropolitan urbanizing region:

• Improved aquatic habitat indicators Increased diversity and quantity of native aquatic plants will be assessed through annual point-intercept plant surveys. Ongoing fish surveys will determine effectiveness of and guide alterations to the predator fish stocking program. Regular water sampling will provide nutrient loading information.

Relationship to Other Funds:

• No Relationships Listed

The MCWD has been a past recipient of Clean Water Fund dollars, which it has used throughout the watershed on a variety of water quality improvement projects. Lake Nokomis is within the MCWD jurisdiction

Budget Spreadsheet

Total Amount of Request: \$744,300

Budget and Cash Leverage

Budget Name	LSOHC Request	Anticipated Leverage	Leverage Source	Total
Personnel	\$0	\$135,600	MPRB General Operating; Teen Teamworks	\$135,600
Contracts	\$212,700	\$0		\$212,700
Fee Acquisition w/ PILT	\$0	\$0		\$0
Fee Acquisition w/o PILT	\$0	\$0		\$0
Easement Acquisition	\$0	\$0		\$0
Easement Stewardship	\$0	\$0		\$0
Travel	\$0	\$0		\$0
Professional Services	\$187,600	\$0		\$187,600
Direct Support Services	\$0	\$21,000	MPRB General Operating	\$21,000
DNR Land Acquisition Costs	\$0	\$0		\$0
Capital Equipment	\$0	\$0		\$0
Other Equipment/Tools	\$0	\$0		\$0
Supplies/Materials	\$344,000	\$0		\$344,000
DNR IDP	\$0	\$0		\$0
Total	\$744,300	\$156,600		- \$900,900

Personnel

Position	FTE	Over # of years	LSOHC Request	Anticipated Leverage	Leverage Source	Total
Water Quality Staff	0.04	5.00	\$0	\$20,000	MPRB General Operating	\$20,000
Landscape Architect/Project Manager	0.08	5.00	\$0	\$60,000	MPRB General Operating	\$60,000
Youth Crew Supervisor	0.05	5.00	\$0	\$8,800	MPRB General Operating & Teen Teamworks	\$8,800
Youth Worker(s)	0.50	5.00	\$0	\$46,800	MPRB General Operating & Teen Teamworks	\$46,800
Total	0.67	20.00	\$0	\$135,600	-	\$135,600

Amount of Request: \$744,300

Amount of Leverage: \$156,600

Leverage as a percent of the Request: 21.04%

Output Tables

Table 1a. Acres by Resource Type

Туре	Wetlands	Prairies	Forest	Habitats	Total
Restore	0	0	0	0	0
Protect in Fee with State PILT Liability	0	0	0	0	0
Protect in Fee W/O State PILT Liability	0	0	0	0	0
Protect in Easement	0	0	0	0	0
Enhance	0	0	0	200	200
Total	0	0	0	200	200

Table 2. Total Requested Funding by Resource Type

Туре	Wetlands	Prairies	Forest	Habitats	Total
Restore	\$0	\$0	\$0	\$0	\$0
Protect in Fee with State PILT Liability	\$0	\$0	\$0	\$0	\$0
Protect in Fee W/O State PILT Liability	\$0	\$0	\$0	\$0	\$0
Protect in Easement	\$0	\$0	\$0	\$0	\$0
Enhance	\$0	\$0	\$0	\$744,300	\$744,300
Total	\$0	\$0	\$0	\$744,300	\$744,300

Table 3. Acres within each Ecological Section

Туре	Metro/Urban	Forest/Prairie	SE Forest	Prairie	Northern Forest	Total
Restore	0	0	0	0	0	0
Protect in Fee with State PILT Liability	0	0	0	0	0	0
Protect in Fee W/O State PILT Liability	0	0	0	0	0	0
Protect in Easement	0	0	0	0	0	0
Enhance	200	0	0	0	0	200
Total	200	0	0	0	0	200

Table 4. Total Requested Funding within each Ecological Section

Туре	Metro/Urban	Forest/Prairie	SE Forest	Prairie	Northern Forest	Total
Restore	\$0	\$0	\$0	\$0	\$0	\$0
Protect in Fee with State PILT Liability	\$0	\$0	\$0	\$0	\$0	\$0
Protect in Fee W/O State PILT Liability	\$0	\$0	\$0	\$0	\$0	\$0
Protect in Easement	\$0	\$0	\$0	\$0	\$0	\$0
Enhance	\$744,300	\$0	\$0	\$0	\$0	\$744,300
Total	\$744,300	\$0	\$0	\$0	\$0	\$744,300

Table 5. Average Cost per Acre by Resource Type

Туре	Wetlands	Prairies	Forest	Habitats
Restore	\$0	\$0	\$0	\$0
Protect in Fee with State PILT Liability	\$0	\$0	\$0	\$0
Protect in Fee W/O State PILT Liability	\$0	\$0	\$0	\$0
Protect in Easement	\$0	\$0	\$0	\$0
Enhance	\$0	\$0	\$0	\$3,722

Table 6. Average Cost per Acre by Ecological Section

Туре	Metro/Urban	Forest/Prairie	SE Forest	Prairie	Northern Forest
Restore	\$0	\$0	\$0	\$0	\$0
Protect in Fee with State PILT Liability	\$0	\$0	\$0	\$0	\$0
Protect in Fee W/O State PILT Liability	\$0	\$0	\$0	\$0	\$0
Protect in Easement	\$0	\$0	\$0	\$0	\$0
Enhance	\$3,722	\$0	\$0	\$0	\$0

Target Lake/Stream/River Feet or Miles

4,800

Parcel List

Section 1 - Restore / Enhance Parcel List

Hennepin

Name	TRDS	Acres	Est Cost	Existing Protection?
Nokomis Lake	02824213	192	\$785,600	Yes

Section 2 - Protect Parcel List

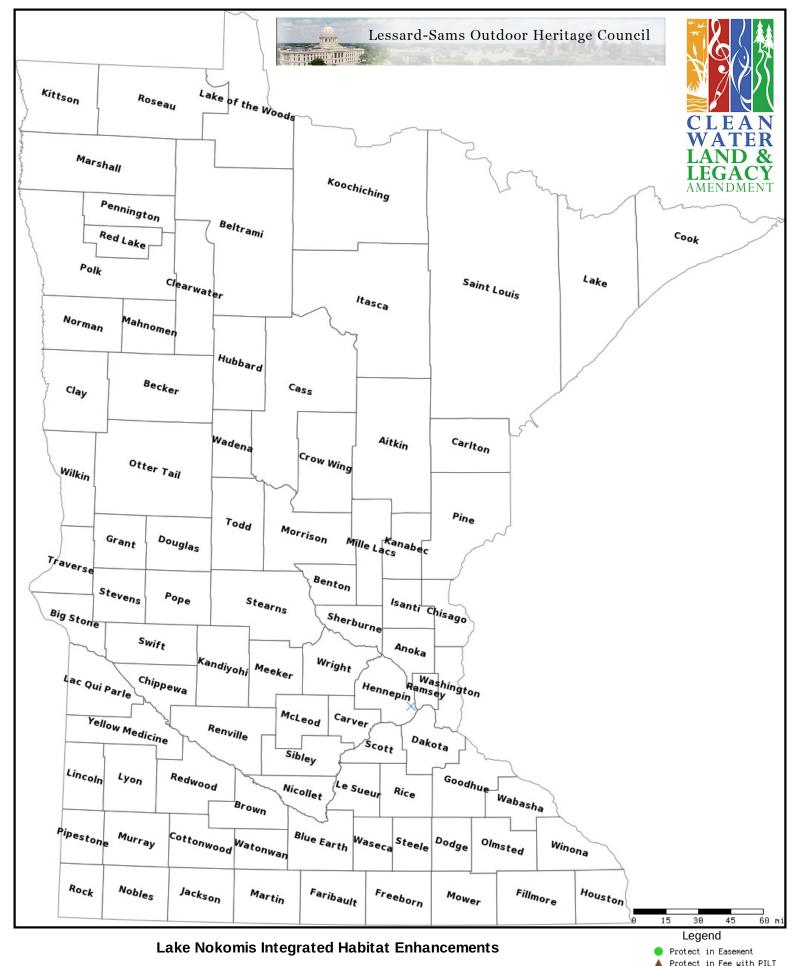
No parcels with an activity type protect.

Section 2a - Protect Parcel with Bldgs

No parcels with an activity type protect and has buildings.

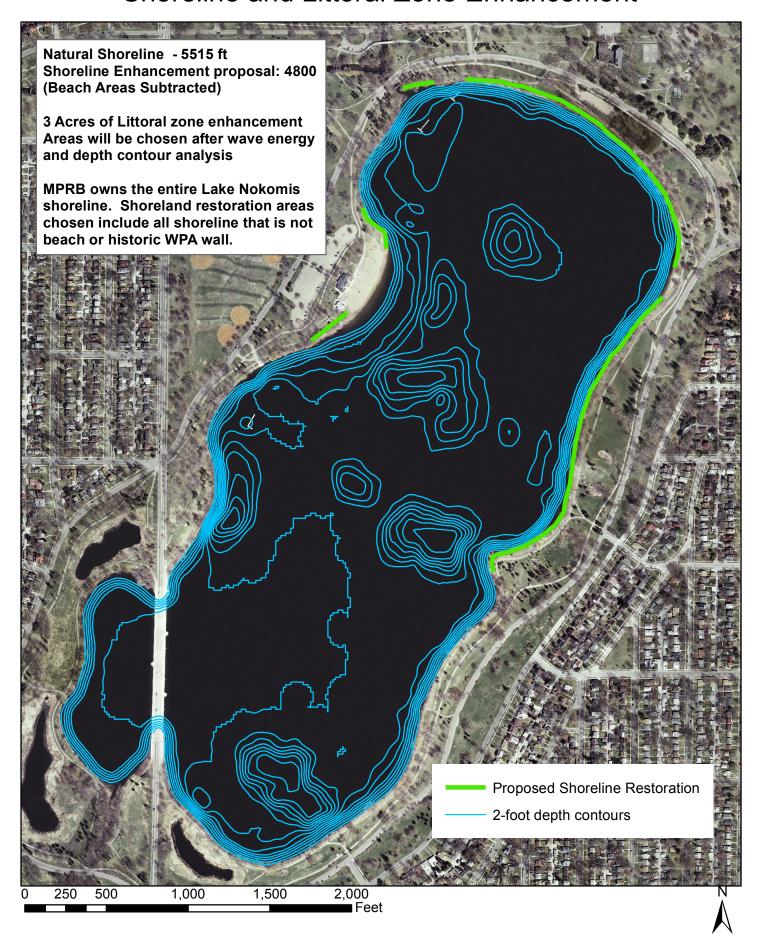
Section 3 - Other Parcel Activity

No parcels with an other activity type.



Protect in Fee with PILT Protect in Fee W/O PILT Restore Enhance Other

Lake Nokomis Shoreline and Littoral Zone Enhancement



Offered by: Anita Tabb

Seconded by: Scott Vreeland

Resolution 2014-204

Resolution Authorizing the Superintendent to Submit a FY 2016 Proposal to the Lessard-Sams Outdoor Heritage Council (LSOHC) for Up to \$750,000 for Lake Nokomis Littoral and Riparian Habitat Restoration

Whereas, The Minneapolis Park and Recreation Board (MPRB) is the steward of Minneapolis parks;

Whereas, The Lessard-Sams Outdoor Heritage Council (LSOHC) has released a Fiscal Year 2016 Request for Proposals;

Whereas, The Minnesota Constitution Art. XI, Sec. 15, dedicates sales tax income to outdoor heritage, clean water, parks and trails, and arts and cultural heritage through a voter approved 2008 ballot measure commonly called the Clean Water, Land, and Legacy Amendment;

Whereas, The MPRB submitted applications for Wirth Park and Lake Nokomis to this grant program for FY 2015;

Whereas, The request in Wirth Park was funded and the request for Lake Nokomis Littoral and Riparian Habitat Restoration was selected for a presentation to the Council, but was not funded;

Whereas, The Lake Nokomis project proposed in FY 2015 is closely aligned with the stated FY 2016 priority actions of the LSOHC, including "protect, enhance, and restore riparian and littoral habitats on lakes to benefit game and non-game fish species" and "protect from long term or permanent endangerment from invasive species;"

Whereas, An ad hoc committee of MPRB staff has considered other projects in the system that could benefit from LSOHC funding and has determined that no other near-term projects closely meet the LSOHC's stated FY 2016 funding priorities for the Metro Urbanizing Area;

Whereas, The Lake Nokomis Littoral and Riparian Habitat Restoration project will use a variety of methods to enhance habitat in the lake, including but not necessarily limited to creation of in-lake plant propagation areas and restoration of native emergent, submergent, and shoreline vegetation;

Whereas, MPRB plans to partner with the Minnehaha Creek Watershed District (MCWD), which has executed a biomanipulation project in Lake Nokomis; and

Whereas, This resolution is supported by the MPRB 2007-2020 Comprehensive Plan, which envisions "Urban forests, natural areas, and waters that endure and captivate;"

RESOLVED, That the Board of Commissioners authorize the Superintendent to Submit a FY 2016 Proposal to the Lessard-Sams Outdoor Heritage Council (LSOHC) for up to \$750,000 for Lake Nokomis Littoral and Riparian Habitat Restoration; and

RESOLVED, That the President of the Board and Secretary to the Board are authorized to take all necessary administrative actions to implement this resolution.

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Commissioner	r Aye	Nay	Abstain	Absent	
Bourn	ď				
Erwin	χ				
Forney	ኦ				
Musich	γ.				_
Olson	X				
Tabb	χ				_
Vreeland	7				
Wielinski	7				_
Young	X		1		

Adopted by the Minneapolis Park and Recreation Board In formal meeting assembled on June 4, 2014

Liz Wielinski, President

Approved:

Betsy Hodges, Mayor

"If any ordinance, resolution, or other action of the Board shall not be returned by the "If any ordinance, resolution, or other action of the Board shall not be returned by the came shall have the came force and effect as if annroved by the Mayor," Mayor within five (3) days, Sundays excepted, after it sname presented to the same shall have the same force and effect as if approved by the Mayor".

Resolution No. 2014-204

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The Minnehaha Creek Watershed District is committed to a leadership role in protecting, improving and managing the surface waters and affiliated groundwater resources within the District, including their relationships to the ecosystems of which they are an integral part. We achieve our mission through regulation, capital projects, education, cooperative endeavors, and other programs based on sound science, innovative thinking, an informed and engaged constituency, and the cost effective use of

public funds.

May 30, 2014

Lessard-Sams Outdoor Heritage Council 95 State Office Building St. Paul, MN 55155

To Whom It May Concern:

On behalf of the Minnehaha Creek Watershed District (MCWD), I am pleased to provide this letter in support of Minneapolis Park and Recreation Board's (MPRB) Lake Nokomis Improvement Project grant application to the Lessard-Sams Outdoor Heritage Council. This project will help address water quality goals for Lake Nokomis, consistent with the MCWD's Comprehensive Water Resources Management Plan and the approved Total Maximum Daily Load (TMDL) for Lake Nokomis.

The MPRB's request to the Lessard-Sams Outdoor Heritage Council is proposed to fund shoreline, in-lake habitat restoration, and five years of a ten year walleye stocking program. The MCWD previously partnered with MPRB between 2009 and 2013 to manage fish populations, to improve water quality within Lake Nokomis. That work resulted in water quality improvements that resulted in Lake Nokomis meeting state standards from 2011-2012.

The MCWD supports funding this project as it may serve as a cost-effective demonstration of biomanipulation strategies to improve water quality. Should the MPRB's grant request be approved, the MCWD Board of Managers may consider cost-sharing the last five years of the ten year program the Minneapolis Park and Recreation Board.

Thank you for your consideration of the proposal.

Sincerely,

David Mandt

Interim District Administrator

3000 East 50th Street Minneapolis MN 55417

phone: 612-724-5652 fax: 612-724-2770

nena@nokomiseast.org www.nokomiseast.org

June 6, 2014

Lessard Sams Outdoor Heritage Council 95 State Office Building St Paul MN 55155

Re: Minneapolis Park and Recreation Board Application

Nokomis East Neighborhood Association (NENA) is a nonprofit organization that invests in neighborhood improvement, encourages participation in civic affairs, builds community and advocates for the interests of the neighborhood. We represent a growingly diverse population of 15,000, and base our programs on their priorities.

Water quality and environment are high priorities for Nokomis East residents, and NENA has long supported projects to improve Lake Nokomis. We strongly support the Minneapolis Park and Recreation Board in its efforts to improve shoreline and in-lake habitat of Nokomis. The proposal to implement plant propagation areas within the lake's littoral zone, enhance the shoreline with grading and vegetation, and continue the successful predator fish stocking program will greatly benefit this valuable natural resource.

Please feel free to contact me with any questions, at rulrich@nokomiseast.org or 612-724-5652.

Sincerely,

Rita Ulrich

Executive Director

ZM Well



June 9, 2014

To whom it may Concern,

The Friends of Lake Nokomis continues to wholeheartedly support efforts taken by the Minneapolis Park and Recreation Board to improve habitat surrounding and within Lake Nokomis. The most recent project to continue the successful walleye stocking program, implement native plant propagation within the lake's littoral zone and restoration of the shoreline with native upland and aquatic vegetation is an excellent example of habitat improvement. These actions are in direct alignment of the Friends of Lake Nokomis' mission we fully support them.

Thank you,

MATT MUSICH
Matt Musich

President, Friends of Lake Nokomis