

**Milwaukee County Department of Parks, Recreation and Culture (DPRC)
Aquatic Invasive Species Grant: Education, Prevention, & Planning 2013-2014**

Final Report
December 8, 2014

A total of four changes were made to the original grant proposal and methods used in this project, submitted by The Milwaukee County Department of Parks, Recreation and Culture (DPRC). The first change was an error with the number of total ponds and total mileage of Lake Michigan shoreline to be surveyed by DPRC staff within Milwaukee County Park boundaries. Presently, the grant reads that DPRC staff will have surveyed “26 of the 51 ponds/lagoons” but should instead read “25 of the 50 ponds/lagoons.” The Arc GIS data had mislabeled an area, accounting for the extra pond, which does not exist (**Appendix A1**). Additionally, the total mileage of Lake Michigan shoreline to be surveyed by DPRC staff should be amended from “10.6 miles” to “9.9 miles.” There was an error in utilizing Arc GIS to estimate shoreline length, which accounted for the discrepancy between the mileage proposed for surveying and the mileage that was actually surveyed in 2013.

The second change was suggested after the DPRC staff training session with Christina Wolbers and Anna Moyer with The Wisconsin Department of Natural Resources (WDNR). The grant states, “surveys...will be done three times at each location per year,” and was changed to “surveys...will be done two times at each location per year.” The change was made due to time and logistical constraints, and was proposed on May 22, 2013 and approved on June 2, 2013 by Heidi Bunk (WDNR) in an email correspondence (**Appendix A2**).

The third change was to the pond survey protocol. The number of rake tows to be taken at medium visibility was changed from 5 to 3, to make surveys in small ponds more efficient. In addition, if more than 6 rings were needed in any pond sampling would stop after the 6th ring. The change was submitted June 24, 2013 and approved June 24, 2013 by Kelly Wagner (WDNR) (**Appendix A3**).

The final change was requested to use excess staffing funds to purchase extra equipment, due to the theft of two aquatic funnel traps while in the field. The change was proposal September 4, 2013 and approved on September 5, 2013 by Walter Ebersohl (WDNR) (**Appendix A4**).

In May of 2013, Lea Cutsforth was hired as the Milwaukee County DPRC’s Natural Areas AIS Coordinator. On May 20th, Anna Moyer and Christina Wolbers, DNR Aquatic Invasive Species Specialists, provided training on aquatic invasive species monitoring methods and identification for Milwaukee County DPRC’s Natural Areas staff.

Methods and Activities

Four separate methods were used depending on the location surveyed:

1. Lake Michigan shoreline meandering surveys
2. Boat landing searches
3. Aquatic invasive species detection pond surveys
4. Aquatic funnel trapping

During 2013 Lea Cutsforth and a Natural Areas staff member, or intern/ volunteer, conducted two surveys at each pond, including one round of aquatic funnel trapping when applicable; and two surveys at each shoreline segment, including boat-landing searches when applicable. After each survey decontamination protocols were followed and utilized for all equipment used during surveys. Again in 2014 Lea Cutsforth and a Natural Areas staff member, or intern/volunteer, conducted two surveys at each pond, including one round of aquatic funnel trapping when applicable. No shoreline meandering surveys were conducted in 2014 because they all were completed in 2013.

WDNR's *Aquatic Invasive Species Early Detection Monitoring Standard Operating Procedures* (SOP), was adapted by Anna Moyer and Christina Wolbers for the Lake Michigan shoreline surveys, due to the segmented nature of shoreline owned by Milwaukee County DPRC (**Appendix B1**). A summary of those changes is as follows:

1. Lake Michigan Shoreline, Meandering Surveys

In 2013, 9.9 miles of Lake Michigan shoreline were surveyed by walking the entire length of the shoreline segments located within Milwaukee County DPRC boundaries. Two surveys were performed in 2013 at each location. One surveyor walked onshore, checking the banks for shoreline plants while also searching the shore for washed up snails, mussels, or aquatic plant debris. The other surveyor waded in the water, lifting up rocks and checking other hard surfaces for attached organisms while also investigating any submerged plants. When visibility was poor, surveyors performed random dip net sweeps and rake tows.

2. Boat Landing Searches

Each public boat landing was searched for 30 minutes total (15 minutes if two people, 30 minutes if one person). Surveyors looked for snails, mussels and aquatic plants in the water and snails on any emergent macrophytes. When visibility was poor, surveyors performed random dip net sweeps and rake tows.

3. Aquatic Invasive Species Detection, Pond Surveys

The *Plant Pond Survey Method*, created by Kelly Wagner (WDNR) was adapted into the *Invasive Species Detection Survey Method for Ponds*, by Anna Moyer (WDNR). Two more adjustments were made following approvals on July 18th, 2013 (**Appendix B2**). Surveys were conducted following the *Invasive Species Detection Method for Ponds*, two times at each location, to look for invasive invertebrates and plants. When conditions were appropriate, aquatic funnel trapping was used to augment collected crayfish data.

Note: Historically Milwaukee County Parks had recreational boating on many of the pond/lagoons. Current Milwaukee County ordinances prohibit boating and watercraft use of any kind on the ponds/lagoons (excluding Veterans Park pond). All “historic boat launches” were not treated differently than the rest of the pond shoreline (i.e. no boat launch search was conducted unless the boat launch was active).

4. *Aquatic Funnel Trapping*

In addition to visual pond surveying and dip net sampling, the presence of crayfish was also determined using aquatic funnel traps, or minnow traps. Protocols were adapted from The Citizen Lake Monitoring Network (CLMN) *Rusty Crayfish Monitoring 2013* (**Appendix C1**), River Alliance of Wisconsin *Project Red Manual 2012* (**C2**), and 2007 *Wisconsin Crayfish Sampling Manual* (**C3**).

Due to the urban surroundings and high visibility of shoreline around most ponds, the perimeter of the pond was assessed for safe locations for the traps, in appropriate crayfish habitat (e.g. rocky/cobble bottoms, vegetative cover). The number of traps was then determined based on how safe it was to lay them out without detection/tampering. Terrestrial and aquatic plant cover, fishing hotspots and islands were all considered when making these choices.

Animal liver, bologna, or hot dog pieces were used as bait. Traps were labeled and tagged; floats and markers were less than 5 inches in diameter, and neither orange nor fluorescent. Labels and tags had the appropriate DPRC contact information. Traps were set out, making sure they were not visible and camouflaged when necessary. Traps were set 30 feet apart, and checked and emptied every 24 hours.

Only one trapping attempt was needed per location per season. After several days of sampling effort if no crayfish are found, staff stopped sampling at that site.

All pond locations were surveyed for crayfish using a dip net; aquatic funnel trapping was additional, not all ponds could be trapped due to surrounding vegetation, low water levels or high risk of detection potentially resulting in equipment theft and tampering. The ponds that were not trapped in were surveyed with a dip net for invertebrates including crayfish.

Internship Program

The purpose of an internship with the Natural Areas Division of the Milwaukee County Parks is to benefit current college students or recent graduates in their future natural resource management career fields. The Natural Areas Program provides interns with the opportunity to gain necessary skill sets for many of the standard entry-level jobs within the natural resource management fields.

During the 2013-2014 AIS field season, five interns spent time working on this project with the Natural Areas AIS Coordinator. Interns learned the techniques for surveying ponds, fieldwork planning and logistics, voucher specimen preparation, use of monitoring equipment and how to record/enter data into the Surface Water Integrated Monitoring System (SWIMS). Training was conducted through direct observation, data recording,

species identification, and assisting with sample collection all under the direct supervision of the Natural Areas AIS Coordinator

Overall Findings

In the 50 ponds and 9.9 miles of Lake Michigan shoreline surveyed throughout 2013 - 2014 the following AIS were looked for (**Appendix D1**):

- **Shoreline plants:** Purple loosestrife (*Lythrum salicaria*), Japanese knotweed (*Polygonum cuspidatum*), Japanese hops (*Humulus japonicus*), flowering rush (*Butomus umbellatus*), Common reed (*Phragmites australis*), reed canary grass (*Phalaris arundinacea*);
- **Floating, emergent and submerged plants:** Water lettuce (*Pistia stratiotes*), water hyacinth (*Eichhorcia crassipes*), curly-leaf pondweed (*Potamogeton crispus*), Eurasian water-milfoil (*Myriophyllum spicatum*), water chestnut (*Trapa natans*), yellow floating heart (*Nymphoides peltata*), brittle water nymph (*Najas minor*), parrot feather (*Myriophyllum aquaticum*), European frog-bit (*Hydrocharis morus-ranae*), African elodea (*Lagarosiphon major*), hydrilla (*Hydrilla verticillata*), Brazilian waterweed (*Egeria densa*), Australian swamp stonecrop (*Crassula helmsii*);
- **Aquatic invertebrates:** Red swamp crayfish (*Procambarus clarkia*), rusty crayfish (*Orconectes rusticus*), zebra mussels (*Dreissena polymorpha*), quagga mussels (*Dreissena bugensis*), banded mystery snail (*Viviparus georgianus*), Chinese mystery snail (*Clipangopaludina chinensis*), faucet snail (*Bithynia tentaculata*), New Zealand mud snail (*Potamopyrgus antipodarum*), Asian clam (*Corbicula fluminea*).

2013 AIS Survey Results:

Bay View Park

Shoreline (0.8 mi):

- Common reed (*P. australis*)
- Eurasian water milfoil (*M. spicatum*)

Bender Park

Shoreline (1.2 mi):

- Common reed (*P. australis*)

Big Bay Park

Shoreline (0.3mi):

- ◇ No AIS Detected

Cupertino Park

Shoreline (0.3mi):

- ◇ No AIS Detected

Doctor's Park

Shoreline (0.4mi):

- ◇ No AIS Detected

Grant Park

Shoreline (1.8 mi):

- Purple loosestrife (*L. salicaria*)
- Common reed (*P. australis*)

Grant Park pond 1 (0.7 acres):

- Purple loosestrife (*L. salicaria*)

Grant Park pond 2 (1 acre):

- ◇ No AIS detected

Grant Park pond 3 (0.2 acres):

- ◇ No AIS detected

Grobschmidt Park

Mud Lake (19.1 acres):

- Common reed (*P. australis*)

Holler Park

Holler Park pond (0.3 acres):

- Chinese mystery snail (*C. chinensis*)

Humboldt Park

Humboldt Park pond 1(4 acres):

- Chinese mystery snail (*C. chinensis*)
- Curly-leaf pondweed (*P. crispus*)
- Eurasian water milfoil (*M. spicatum*)
- Purple loosestrife (*L. salicaria*)

Humboldt Park pond 2 (0.4 acres):

- Chinese mystery snail (*C. chinensis*)

Lake Park

Shoreline (0.5 miles):

- ◇ No AIS detected

Jackson Park

Jackson Park pond (8.7 acres):

- Chinese mystery snails (*C. chinensis*)

Oak Creek Parkway

The Millpond (4.8 acres): Previously documented with having rusty crayfish (*O. rusticus*) by WDNR excel spreadsheet record for 2012 (**Appendix C4**), but no specimens were found in 2013.

- Purple loosestrife (*L. salicaria*)
- Chinese mystery snail (*C. chinensis*)
- Curly-leaf pondweed (*P. crispus*)

- Eurasian water milfoil (*M. spicatum*)

Oakwood Park

Oakwood Park pond 1 (1.8 acres):

- Curly-leaf pondweed (*P. crispus*)
- Eurasian water milfoil (*M. spicatum*)

Oakwood Park pond 2 (1.7 acres):

- Eurasian water milfoil (*M. spicatum*)

Oakwood Park pond 3 (1.3 acres):

- Curly-leaf pondweed (*P. crispus*)
- Eurasian water milfoil (*M. spicatum*)

Root River Parkway

Root River Parkway pond 1 (1.1 acres):

- ◇ No AIS Detected

Root River Parkway pond 2 (1.3 acres):

- Chinese mystery snail (*C. chinensis*)
- Common reed (*P. australis*)
- Flowering rush (*B. umbellatus*)

Root River Parkway Anderson Lake (8.2 acres):

- Purple loosestrife (*L. salicaria*)
- Curly-leaf pondweed (*P. crispus*)
- Eurasian water milfoil (*M. spicatum*)

Root River Parkway pond 3 (Milwaukee Sports Complex; 3 acres):

- ◇ No AIS Detected

Root River Parkway pond 4 (0.6 acres):

- Rusty crayfish (*O. rusticus*)

Saveland Park

Saveland Park pond (0.4 acres):

- Banded mystery snails (*V. georgianus*)

Scout Lake Park

Scout Lake (8 acres):

- Chinese mystery snail (*C. chinensis*)
- Curly-leaf pondweed (*P. crispus*)
- Eurasian water milfoil (*M. spicatum*)

Sheridan Park

Shoreline (1.8 mi):

- ◇ No AIS detected

Sheridan Park pond (1.8 acres):

- Chinese mystery snail (*C. chinensis*)
- Rusty crayfish (*O. rusticus*)

South Shore Park

Shoreline (0.9 mi):

- Purple loosestrife (*L. salicaria*)
- Common reed (*P. australis*)
- Curly-leaf pondweed (*P. crispus*)

Warnimont Park

Shoreline (1.4 mi):

- Common reed (*P. australis*)

Warnimont Golf Course pond (0.8 acres):

- Curly-leaf pondweed (*P. crispus*)

Whitnall Park

Whitnall Park pond 1 (0.5 acres):

- Common reed (*P. australis*)
- Purple loosestrife (*L. salicaria*)

Whitnall Park pond 2 (2.2 acres):

- Chinese mystery snail (*C. chinensis*)
- Curly-leaf pondweed (*P. crispus*)

Whitnall Park pond 3 (Mallard Lake; 17.7 acres):

- Purple loosestrife (*L. salicaria*)
- Flowering rush (*B. umbellatus*)
- Curly-leaf pondweed (*P. crispus*)
- Eurasian water milfoil (*M. spicatum*)

Wilson Park

Wilson Park pond (8.8 acres):

- Purple loosestrife (*L. salicaria*)
- Curly-leaf pondweed (*P. crispus*)
- Rusty Crayfish (*O. rusticus*)

Of the 28 AIS looked for in 2013, 8 AIS were found. Of all 35 locations surveyed, Curly-leaf pondweed (*P. crispus*) was found in 11 locations, Chinese mystery snail (*C. chinensis*) was found in 9 locations, Purple loosestrife (*L. salicaria*) was found in 9 locations, Eurasian water milfoil (*M. spicatum*) was found in 9 locations and Common reed (*P. australis*) was found in 8 locations. Rusty crayfish (*O. rusticus*) were found in 3 locations, flowering rush (*B. umbellatus*) was found in 2 locations, banded mystery snail (*V. georgianus*) was found in 1 location. (**Appendix D2**).

2014 AIS Survey Results:

Brown Deer Park (A stream that flows into the Milwaukee River connects

Brown Deer park pond 2 and pond 3.)

Brown Deer Park pond 1 (6.9 acres):

- Chinese mystery snail (*C. chinensis*)

- Eurasian water milfoil (*M. spicatum*)
- Purple loosestrife (*L. salicaria*)

Brown Deer Park pond 2 (0.4 acres):

- Chinese mystery snail (*C. chinensis*)

Brown Deer Park pond 3 (0.4 acres):

- Chinese mystery snail (*C. chinensis*)
- Reed canary grass (*P. arundinacea*)

Brown Deer Park pond 4 (0.7 acres):

- ◇ No AIS detected

Dineen Park

Dineen Park pond (2 acres):

- Chinese mystery snail (*C. chinensis*)
- Curly-leaf pondweed (*P. crispus*)
- Reed canary grass (*P. arundinacea*)

Dretzka Park has three ponds, connected by a stream that flows into the Menomonee River.

Dretzka Park pond 1 (1 acre):

- Eurasian water milfoil (*M. spicatum*)*
- Curly-leaf pondweed (*P. crispus*)*

Dretzka Park pond 2 (2.9 acres):

- Reed canary grass (*P. arundinacea*)

Dretzka Park pond 3 (1.1 acres):

- ◇ No AIS detected

Estabrook Park

Estabrook Park pond (1.1 acres):

- Chinese mystery snail (*C. chinensis*)
- Eurasian water milfoil (*M. spicatum*)

Greenfield Park

Greenfield Golf Course pond 1 (0.5 acres):

- Purple loosestrife (*L. salicaria*)*

Greenfield Park pond 2 (1.2 acres):

- Chinese mystery snail (*C. chinensis*)
- Purple loosestrife (*L. salicaria*)
- Reed canary grass (*P. arundinacea*)

Greenfield Park pond 3 (9.2 acres):

- Curly-leaf pondweed (*P. crispus*)*
- Chinese mystery snail (*C. chinensis*)
- Eurasian water milfoil (*M. spicatum*)
- Common reed (*P. australis*)**

- Purple loosestrife (*L. salicaria*)

Greenfield Park pond 4 (0.7 acres):

- Banded mystery snail (*V. georgianus*)*
- Chinese mystery snail (*C. chinensis*)
- Eurasian water milfoil (*M. spicatum*)
- Common reed (*P. australis*)**
- Purple loosestrife (*L. salicaria*)
- Reed canary grass (*P. arundinacea*)

Greenfield Park pond 5(0.3 acres):

- Common reed (*P. australis*)**

Hansen Park

Hansen Golf Course pond (0.3 acres):

- ◇ No AIS detected

Jacobus Park

Jacobus Park pond (0.5 acres):

- Chinese mystery snail (*C. chinensis*)
- Curly-leaf pondweed (*P. crispus*)*
- Purple loosestrife (*L. salicaria*)

Kosciuszko Park

Kosciuszko Park pond (2.3 acres):

- ◇ No AIS detected

McCarty Park

McCarty Park pond (4.4 acres):

- Chinese mystery snail (*C. chinensis*)
- Purple loosestrife (*L. salicaria*)

McGovern Park

McGovern Park pond (4.9 acres):

- Chinese mystery snail (*C. chinensis*)
- Eurasian water milfoil (*M. spicatum*)
- Common reed (*P. australis*)**

Menomonee River Parkway

Menomonee River Parkway pond (2 acres):

- Purple loosestrife (*L. salicaria*)

Mitchell Park

Mitchell Park pond (2.9 acres):

- Chinese mystery snail (*C. chinensis*)

- Purple loosestrife (*L. salicaria*)

Noyes Park

Noyes Park pond (0.5 acres):

- Purple loosestrife (*L. salicaria*)
- Reed canary grass (*P. arundinacea*)

Veterans Park

Veterans Park pond (15.7 acres):

- Curly-leaf pondweed (*P. crispus*)
- Purple loosestrife (*L. salicaria*)
- Reed canary grass (*P. arundinacea*)

Washington Park

Washington Park pond (11.2 acres):

- Chinese mystery snail (*C. chinensis*)
- Curly-leaf pondweed (*P. crispus*)*

Uihlein Soccer Park

Uihlein Soccer Park pond (1 acre):

- ◇ No AIS detected

In 2014, of the 28 aquatic invasive species looked for 7 were found. Of the 25 locations surveyed Chinese mystery snail (*C. chinensis*) was found in 13 locations, Purple loosestrife (*L. salicaria*) was found in 11 locations, Common reed (*P. australis*)** was found in 4 locations, Reed canary grass (*P. arundinacea*) was found in 7 locations, Curly-leaf pondweed (*P. crispus*) was found in 6 locations, Eurasian water milfoil (*M. spicatum*)** was found in 6 locations, banded mystery snail (*V. georgianus*) was found in 1 location*.

**Specimen vouchers waiting verification from state herbarium.

*No specimen available for voucher (see “*Problems/issues encountered*” section of this document).

Project Summary

Of the 28 AIS surveyed for over the 2013 and 2014 seasons, 8 were discovered within the Park System. Of all 60 locations surveyed, Chinese mystery snail (*C. chinensis*) was found in 22 locations, Purple loosestrife (*L. salicaria*) was found in 20 locations. Curly-leaf pondweed (*P. crispus*) was found in 17 locations, Eurasian water milfoil (*M. spicatum*) was found in 15 locations, common reed (*P. australis*) was found in 11 locations, rusty crayfish (*O. rusticus*) were found in 3 locations, flowering rush (*B. umbellatus*) was found in 2 locations, and a banded mystery snail (*V. georgianus*) was found in 1 location.

All data was entered into SWIMS per survey date (each location has two survey dates) regardless of whether AIS was detected or not. If no AIS was detected “No AIS Found” will appear in the data field. If AIS was detected, a list of specific species will appear in the data field.

Problems/issues encountered

Despite the many challenges of conducting ecological surveys in urban settings, the overall flow of this project went as planned. Some of the protocols were suited for large lakes and rural streams, as previously stated, adjustments were made. Some specific issues encountered are listed below:

1. In 2014, Greenfield Park Golf Course pond 1 and the Menomonee River Parkway pond were under construction preventing access to the pond and shoreline after the second set of surveys. Menomonee River Parkway pond is being converted into a wetland and will be no longer considered a pond/lagoon.
2. For reasons unknown, in 2014 there were issues with the quality of some submerged aquatic plant specimens. Populations were dying back early, or consisted of a small number of individuals making viable samples difficult.
 - a. Only one banded mystery snail shell that was found at Greenfield Park pond 4, and was collected but was inadvertently destroyed in the field.
 - b. Only one purple loosestrife plant was found at Greenfield Park pond 1, when discovered (in bloom) construction had begun and the shoreline was fenced off, preventing specimen and photo voucher collection.
 - c. Washington Park pond, Jacobus Park pond and Dretzka Park pond 1 had unusual phenomena where invasive submerged aquatic vegetation (i.e. curly-leaf pondweed and Eurasian water milfoil) began decaying very early in the season (June). No samples were distinguishable when prepared for the herbarium.
 - d. Greenfield Park pond 3, on July 8th, 2014 had an aquatic herbicide application performed that interfered with the first pond survey and may have had an effect on the samples collected. No curly-leaf pondweed specimen distinguishable when prepared for the herbarium.
 - e. Appendix D2 distinguishes all these locations.
3. During aquatic funnel trapping in 2013, one trap was tampered with at Anderson Lake, where an unknown person raised and presumably emptied the trap. In both years (2013 and 2014) aquatic funnel traps were stolen. One trap was stolen from Scout Lake park pond, in 2013; and one trap from Brown Deer Park pond 1, in 2014.