Lauderdale Lakes Aquatic Plant Management Plan Update

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Lauderdale Lake Management District

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1.0 INTRODUCTION / SUMMARY

Lauderdale Lakes is a chain of three lakes – Green, Middle, and Mill – that compromise 841 total surface acres in Walworth County. These waterbodies are locally important to many year-round residents and, with their proximity to larger metropolitan areas of Milwaukee, Madison, Chicago and northern Illinois, they support a wide array of heavy recreational use year round. Increasing lakeshore development, introduction of aquatic invasive species (AIS), and high recreational use have been cause for concern to protect the lakes for continued use while also maintaining existing quality.

To achieve this, multiple interest groups led by the Lauderdale Lake Management District (LLMD) have collaborated to manage the resources to ensure their use for future generations. Lake management activities have been focused on aquatic plant control as outlined under the current aquatic plant management plan (APMP) completed by the Southeastern Wisconsin Regional Planning Commission (SEWRPC). Currently, the plan was created and approved in 2010 with recommendations for aquatic plant management to focus on mechanical harvesting. Harvesting has replaced herbicide use within the chain, having been in place since 2002 and permitted for 200 acres across all three lakes.

Harvesting permits are issued for 5-year periods and the current permit expired after the 2014 season and was based on data collected in 2008 as part of the 2010 APMP. Continuation of harvesting to alleviate aquatic plant navigation issues is desired by the LLMD. In order to obtain a new permit, updated aquatic plant surveys were requested by WDNR to form an updated harvesting amendment to the current APMP to reflect current conditions. This document will serve as an update of the aforementioned plan.

1.1 LAUDERDALE LAKES MORPHOLOGY

The Lauderdale Lakes are located in the Towns of LaGrange and Sugar Creek, Walworth County, Wisconsin. A small impoundment at the outlet of Mill Lake on Honey Creek connects three, naturally occurring basins, allowing for unassisted navigation between all three lakes. All three lakes feature relatively deep basins with depths over 40', the deepest being Green Lake at 55 feet. Steep dropping shorelines limit habitat suitable for aquatic plant growth in many portions of the lakes. However, both Middle and Mill Lake have extensive areas under 10 feet deep. Much of this area in Middle Lake is protected under a WDNR designated environmentally sensitive areas due to its aquatic ecosystem diversity, limiting management to common navigational channels. Morphological characteristics of all lakes are found in Table 1 below. For further information relating to water quality, watershed and fisheries, please see: An Aquatic Plant Management Plan for the Lauderdale Lakes, SEWRPC, 2010.

Table 1: Lauderdale Lakes Morphology, Walworth County, Wisconsin

	Entire System	Green Lake	Middle Lake	Mill Lake
Surface Area (ac)	841	311	259	271
Lakes Volume	12591	---	---	---
Shoreline Length (mi)	14.7	---	---	---
Maximum Depth (ft)	55	55	42	44
Mean Depth (ft)	14.3	---	---	---

1.2 AQUATIC PLANTS

Aquatic plants are vital to the health of a water body. Unfortunately, they are often negatively referred to as "weeds". The misconceptions this type of attitude brings must be overcome in order to properly manage a lake ecosystem. Rooted aquatic plants are extremely important for the well-being of a lake community and possess many positive attributes. Despite their importance, they sometimes grow to nuisance levels that hamper recreational activities and are common in degraded ecosystems. The introduction of AIS, such as EWM, often can increase nuisance conditions, particularly when they successfully out-compete native vegetation and occupy large portions of a lake.

To assess the state of the current plant communities, full point-intercept surveys were completed by Stantec, Inc. (Stantec) on July 29-30 for Green and Mill Lakes and by WDNR on Middle Lake from August 11 - 13. All surveys followed WDNR survey protocol and included sampling pre-determined locations to document the following at each site:

- Individual species present and their density
- Water depth
- Bottom substrate

Each location was assigned coordinates and loaded into a GPS unit, which was used to navigate to each point. Data collected at each point was then entered into a DNR spreadsheet, which outputs various aquatic plant community indexes and data, allowing for a comparison to past data to monitor changes over time. Information on methods and all referenced tables, figures or charts is included in Appendices A-D.

Past management plans for Lauderdale Lakes also included aquatic plant surveys, providing historical background to document potential changes in the communities over time. Surveys were completed in 1969, 1999, and most recently in 2008 for the current APMP. The 1969 survey was a presence/absence inventory that did not generate statistics. Both the 1999 and 2008 sets of surveys were completed as line-transects surveys. These surveys focused on near-shore areas in limited locations throughout the lake.

To better document aquatic communities, the WDNR adopted the point-intercept survey method above. This method allows for repetition of past surveys by reusing pre-established sample locations. Because of the difference in techniques between the 2014 surveys and those used prior, direct comparison is difficult, limiting it to presence/absence between surveys only, including use of Floristic Quality Index (FQI).

To compare changes in the plant community over time within Lauderdale Lakes and to similar lakes in Wisconsin, the FQI can be used. FQI provides the ability to compare aquatic plant communities based on species presence. This value varies throughout Wisconsin, ranging from 3.0 to 44.6 with a statewide average of 22.2. To achieve this, each plant species, except for AIS, is assigned a coefficient of conservatism value (C values). A plant's C value relates to a plant species' ability to tolerate disturbance. Low C values (0-3) indicate that a species is very tolerant of disturbance, while high C values (7-10) indicate species with a low tolerance of disturbance. Intermediate C values (4-6) indicate plant species that can tolerate moderate disturbance.

Not only does this track changes over time within the Lauderdale Lakes, but allows for comparison of the Lakes to lakes with similar environmental conditions within a delineated area, called an eco-region, to be compared.

Lauderdale Lakes are located in the southern portion of the Southeastern Till Plains eco-region. Lake within the Southeastern Till Plains are typically natural lakes that, due to higher population density in this area of the State, have developed shoreline. Increased development around the lake and overall use of these lakes leads to more disturbance form an undisturbed, natural condition, which leads to lower plant community metrics like FQI and coefficient of conservatism.

1.3 2014 POINT-INTERCEPT SURVEYS

In 2014, the aquatic plant surveys identified a moderately diverse community in Green and Mill Lakes with a very diverse community in Middle Lake. Total species identified within the lakes ranged from 13 (Green) to 28 (Middle) with two AIS – Eurasian water-milfoil (Myriophyllum spicatum- EWM) and curly-leaf pondweed (Potamogeton crispus - CLP), found in Middle and Mill Lakes and only EWM found in Green Lake (Table 2).

Species sampled in the Lakes were present in three categories: emergent, near shore species which are rooted below the water's surface, but their growth extends above the water (bur-reed - Sparganium sp.), submersed species which root on the lake bottom and remain below the water's surface (coontail – Ceratophyllum demersum), and floating-leaf species which root on the lake bottom with vegetation growing to and floating on the surface (white water lily – Nymphaea odorata). Raw data for all surveys is included in Appendix D.

The photic zone, depth to which sunlight reaches the bottom, allowing plants to grow, was similar for all lakes, with plant growth noted to 11.5-12 feet across the Chain. However, amount of photic zone vegetated varied between the lakes, with the lowest amount (62.5%) in Green Lake, limited to many areas of steep dropping shoreline that, though shallow enough for light to penetrate to the bottom, did not provide ideal growing conditions. Native species richness exhibited good diversity per sample point and remained nearly stable throughout the chain with a moderately good spread throughout the system, as exhibited by a Simpson Diversity Index (SDI) varying only slightly from 0.80 – 0.84 throughout. A SDI value closer to 1.0 indicates a healthier, more evenly spread plant community (Table 3).

1.3.1 Green Lake

The aquatic plant community of Green Lake was sampled on July 29, 2014 by Stantec. A full point-intercept survey was completed and included sampling at 695 locations. Because of the steep-dropping bottom in many areas, vegetation within Green Lake was limited to a sand hard-bottom flat that, though within the photic zone, does not provide ideal growing conditions due to nutrient limitation with sandy sediments.

The aquatic macrophyte community of the Lake included 13 floating-leaf, emergent, and submerged aquatic plant species during 2014 (Table 4). Figures 1.1 – 1.4 illustrate the locations of each AIS found and any species identified with a relative frequency of occurrence of 5% or greater.

Plants were found growing to a maximum depth of 12 feet, with only 317 of the 695 locations shallower than this and 62.5% of locations within the photic zone vegetated. Muskgrass (Chara sp.), a macro-algae, was the most dominant species sampled in 2014, found at 25.9% of photic-zone locations. This species prefers sandy areas, often times creating a carpet in shallow locations. Much of the Lauderdale Lakes provide excellent habitat for muskgrass, making it the most prevalent species within all three lakes. Wild celery (Vallisneria americana) and sago pondweed (Stuckenia pectinata), both native plants valuable for near-shore sediment stabilization and important food sources for waterfowl, were the next most common species sampled (Table 4).

Only one AIS was found; Eurasian water-milfoil. This species can grow rapidly and dense, reaching the surface and forming a canopy that shades out native species and hampers recreational use and spreads through fragmentation. Mechanical harvesting cuts growing plants. If all cut portions are not removed from the water it can provide an ideal mechanism for EWM to spread throughout a system. Even with an intensive harvesting program in place on Lauderdale Lakes, EWM growth does not appear to increase by harvesting. Though spread throughout many portions of Green Lake, there were no locations of dense EWM growth noted.

Past surveys on Green Lake are comparable to the current one with both identifying more species than found in 2014 – 18 in 1999 and 20 in 2008. Three species identified in 2014 were new compared to historical records; common bladderwort, arum-leaved arrowhead, and alpine pondweed, though all were likely present during past surveys. Bladderwort was present, but not identified to species level in 2008 (Table 5).

Conversely, three species sampled in both 1999 and 2008 were not sampled in 2014; northern-water-milfoil, Illinois pondweed, and flat-stem pondweed. Northern water-milfoil can readily hybridize with its invasive cousin EWM, creating a plant that has characteristics of both species, but most often resembles EWM. With EWM first identified in 1990 in Lauderdale Lakes, It is likely the EWM within Green Lake and the entire chain is actually a hybrid. However, genetic analysis in required to determine hybridity. The local WDNR lake manager can assist with genetic analyses, which is highly recommended.

Though individual members of the aquatic plant community have changed over time, the FQI has remained stable with average coefficient increasing over all three surveys. FQI across all surveys averaged 20.64, most recently being calculated at 20.2 in 2014. Though lower than that found in 2008, the average coefficient rose considerably to 6.09, over one full point higher than 1999. This shows an increasingly stable plant community compromised of plants less tolerant of disturbance and higher quality. This is especially notable in the presence of active mechanical harvesting, invasive species, and high recreational use, all three which contribute to disturbance, further showing a stable and healthy plant community in Green Lake (Table 6).

1.3.2 Middle Lake

The aquatic plant community of Middle Lake was sampled on August 11 - 13, 2014 by WDNR staff. A full point-intercept survey was completed and included sampling at 588 locations. Middle Lake has a deep basin, but also a large, shallow soft-sediment area that creates ideal growing conditions for aquatic vegetation. This area is a high-value habitat area and, as such, is designated as an environmentally sensitive area by the WDNR to protect it from management and use on the Lake. Because of this, the community within Middle Lake is typically the most diverse of the entire Lauderdale Lakes system.

The aquatic macrophyte community of the Lake included 28 floating-leaf, emergent, and submerged aquatic plant species during 2014 (Table 7). Figures 2.1 – 2.4 illustrate the locations of each AIS found and any species identified with a relative frequency of occurrence of 5% or greater.

In Middle Lake, the photic zone extended to a maximum depth of 12 feet, with 401 of the 588 locations shallower than this. Much of the photic zone was vegetated, due to better habitat, with 85.9% of locations within the photic zone vegetated. Muskgrass was the most dominant species, sampled in at 68.3% of photic-zone locations. Spiny naiad (Najas mariana) was the next most common species at 25.9% of photic locations. Though not native to Wisconsin, this species is not considered invasive and does not become a nuisance, simply blending in with the lake's ecosystem. Spiny naiad provides good food and habitat for fish and can be an important food source for ducks. Similar to Green Lake, sago pondweed was the next most common species sampled (Table 7).

Both EWM and CLP were found within Middle Lake, though neither of them was reported as dense. The life cycle of curly-leaf pondweed is different from all other aquatic plants in Wisconsin such that it dies back during mid to late summer, typically in July. Because of this, early-season surveys typically completed in May are required to accurately document distribution of CLP within a lake. It is likely that CLP is under represented by all surveys completed on Lauderdale Lakes due to this.

Middle Lake has historically contained the most diverse plant community of the Lauderdale Chain. Past surveys are comparable to the current one, though diversity increased greatly from 2008 to 2014 by 8 species. Diversity in Middle Lake is greatly enhanced by the protection provided by the large, WDNR sensitive area. This designation limits management within it, creating a near-natural condition. Many high quality species are present only in this location on the whole Chain. Bladderwort species are unique family of aquatic plants with the ability to be "carnivorous" to obtain some of their nutrients, often being successful in low-nutrient conditions where other species struggle. They get their name from small bladders located on the plant that trap tiny zooplankton, which the plant feeds on. Many of the species are high quality and uncommon in Wisconsin and three are present in Middle Lake: common bladderwort (Utricularia vulgaris), twin-stemmed bladderwort (Utricularia geminiscapa), and creeping bladderwort (Utricularia gibba).

Three individual species identified in 2014 were new compared to historical records; whorled water-milfoil – a high-quality native milfoil rarely found in southern Wisconsin, and both twin-stem and creeping bladderwort. Though new, both bladderworts were possibly present in past surveys as only bladderwort species were recorded. No species present in both 1999 and 2008 surveys were absent in 2014 (Table 8).

With a high diversity, FQI is exceptionally high in Middle Lake. It has increased from past surveys after remaining stable from 1999 to 2008. Average coefficient, though down slightly from 2008, is also still high and relatively stable at 5.74. The large WDNR sensitive area provides valuable protection for many of these species, creating a high-quality and stable plant community by protecting them from disturbance in Middle Lake (Table 9).

1.3.3 Mill Lake

The aquatic plant community of Mill Lake was sampled on July 30, 2014 by Stantec. A full point-intercept survey was completed and included sampling at 457 locations. Much of Mill Lake is shallow, especially the southern half, and as such is conducive to aquatic vegetation. Because of this, Mill Lake can see the densest plant growth out of all three lakes and requires the most harvesting management. Mill Lake also has the largest infestation of EWM.

The aquatic macrophyte community of Mill Lake included 17 floating-leaf, emergent, and submerged aquatic plant species during 2014 (Table 10). Figures 3.1 – 3.4 illustrate the locations of each AIS found and any species identified with a relative frequency of occurrence of 5% or greater.

Similar to the other lakes, plants were found growing to a maximum depth of 11.5 feet, with 296 of the 457 locations shallower than this and 77.9% of these vegetated. Also like the remainder of the system, muskgrass was the most dominant species sampled found at 37.1% of photic-zone locations. Wild celery was the next most common species sampled (Table 11).

Unlike the Green and Middle Lake, Mill Lake has a sizable infestation of EWM as the third-most abundant species sampled in 2014. EWM was spread throughout much of the lake at 28.7% of the photic zone and especially common in the southern portion and the small, boat landing bay. Though abundant, populations of EWM were not dense, with no density over 1.00 recorded, likely due to active harvesting keeping it from becoming a nuisance. Curly-leaf pondweed was also sampled, but at only two locations and is likely under represented due to its life cycle.

Even with the most intensive levels of harvesting and largest spread of AIS within the system, the community of Mill Lake remained diverse. Twenty-one species were found in both previous surveys and dipped slightly to 17 found in 2014. Vegetated sites within Mill Lake had the highest average number of species per location (2.01) on the whole system and highest presence of wild celery, which is important for near-shore stabilization of lake sediments, even more so on heavily recreated lakes that have high amounts of boat wake. Three species found in both previous surveys were not present in 2014; northern water-milfoil, large-leaf pondweed, and leafy pondweed (Table 11).

As a continued theme for Mill Lake, even with high mechanical management and AIS presence, FQI and coefficients within were reasonably high and stable. Though FQI dropped, average coefficient remained stable from 2008, which increased from 1999. Increased management regime in Mill Lake is evident through its average C, which is the lowest of the lakes and is dominated mainly by plants moderately tolerant of disturbance, fewer with a C of 7 or above (Table 12).

1.3.4 All Lakes – 2014 Comparison

Though each lake is its own somewhat unique ecosystem, being a connected chain of waterbodies creates a stable system throughout. All Lauderdale Lakes are subject to the same atmospheric, use, and management conditions. Across each lake, the most common species present by lake, though varying slightly, was compromised of largely the same species. Muskgrass was the most common in all lakes while sago pondweed and spiny naiad were within

the five most common in each lake with EWM and wild celery the most prevalent in two out of three (Table 13).

Use of FQI and average C can also be extrapolated out to lakes in similar eco-regions of Wisconsin to compare communities. The Lauderdale Lakes lie within the Southeastern Till Plains eco-region and are typically more developed with higher recreational use. This impacts the plant communities and is shown by lakes in this eco-region typically having FQI and average C values below those found throughout the State. However, the lakes of the Lauderdale Chain have elevated C values, due to their diverse communities, and are near or exceed the upper quartile for all lakes in the eco-region while also comparing favorably to the mean C for the entire State. In conjunction, the FQI found on all lakes meet and exceed the mean FQI for the Southeastern Till Plains. Middle Lake's FQI surpasses even the upper quartile of eco-region and Wisconsin lakes, indicating a very healthy community comparative that to an undisturbed, natural condition (Table 14).

2.0 MANAGEMENT RECOMMENDATIONS

Management of aquatic plants can take many facets, depending on each lakes unique condition and desire by the community. To be successful, a management option must be accepted by its users. Though herbicide use has been done in the past within Lauderdale Lakes, its use has declined significantly since 2002. Herbicides for aquatic plant management can have negative connotations and be misunderstood by some users, making it potentially controversial. However, the combinations of periodic large scale whole lake type treatments for AIS have shown to reduce the need and frequency of harvesting for several years after treatment. These include periodic triggers based on frequency of occurrence of the AIS, which may be a hybrid, and is a management option that should be further explored by the District.

Currently, mechanical harvesting is practiced on all Lauderdale Lakes and is an accepted approach by riparian owners and lake users. Typically, this entails a high up-front cost to start with the purchase of harvesting equipment. Once started, however, cost can be minimized for upkeep and operation, though plant disposal can be an issue. With the general acceptance of this practice and overall minimal effect on the plant communities of Lauderdale Lakes, continuation of mechanical harvesting is recommended for all lakes. The following guidance for harvester operation and mechanical harvesting recommendations are based on historical aquatic plant management approaches and incorporate needs by lake users (Section 3.0).

Since harvesting can spread infestations of EWM by not removing all fragments cut, a multi-faceted approach should be considered. For Green and Mill Lakes, if EWM populations exceed 30% frequency of occurrence during a full point-intercept aquatic plant survey, whole-lake herbicide management should considered to reduce infestation, opening up habitat for native species. This will reduce presence and spread of AIS and reduce harvesting cost and need after a large infestation becomes present. However, due to the large WDNR Sensitive Area on Middle Lake, this approach should NOT be used, only applied to Green and Mill Lakes. If any herbicide management is desired, pre and post-treatment aquatic plant surveys should be completed to document results.

All actions should follow Table 15 below based on strain of EWM present. Waiting to apply after formation of a thermocline has shown to reduce cost and amount of herbicide required to achieve target rates. Herbicide applied does not mix below an established thermocline. Currently, neither Green Lake (8.8%) nor Mill Lake (28.7%) exceeds the 30% frequency of occurrence threshold.

Table 15: EWM Management for Green and Mill Lakes, Walworth County, WI

EWM Littoral Zone Frequency	Management Action(s)		
	Task	Action	Timing
< 30.0%	1	Follow harvesting guidance	As needed throughout the year
>30.0%	1	Pre-treatment aquatic plant survey	Mid-late April
	2	**Whole-lake Herbicide Application**	May, prior to 65 degree water temperature
		Green Lake - 8055 ac/feet or 3353 ac/ft with 15' thermocline**	
		Mill Lake - 2705 ac/feet or 1700 ac/ft with 15' thermocline**	
	3	Post-treatment aquatic plant survey	July/August
	4	Follow harvesting guidance	Beginning 30 days after herbicide application and continuing as needed throughout the year
Whole-lake Herbicide Application Information by EWM Strain		Pure-strain Eurasian water-milfoil	2,4-D whole-lake at 0.25-0.350 PPM
		Hyrbrid Eurasian water-milfoil	2,4-D / endothall mixture at 0.3 / 0.6 PPM
			Fluriodone at 4-6 PPB maintaind for 90+ days

** - Whole-lake and 15' thermocline volumes based on 2014 aquatic plant survey data

3.0 GENERAL GUIDANCE FOR HARVESTER OPERATION

- EXCEPT FOR NAVIGATIONAL ACCESS LANES, ONLY CUT IN DEPTHS MORE THAN THREE FEET
- PRIORITIZE HARVESTING AREAS TO FOCUS ON GREATEST NEED – Highest priority should be on maintaining navigation access lanes to/from boat landings and common navigational lanes. In these areas, you must leave 12 inches of plant on the lake bottom. Individual areas by priority are included in the table below.
- TOP CUT IN AREAS FOR EWM MANAGEMENT – These areas are of moderate priority. Restrict cutting up to a depth of 4', leaving a minimum of 12 inches of plant growth on the lake bottom in areas shallower than 5 feet.
- RECREATIONAL HARVESTING AREAS – These areas of low priority and are to alleviate nuisance, surface-matting growth for riparian owners. Restrict harvesting from the end of pier heads to open water. Harvesting from pier-heads to shore should be done manually only.
- WILD CELERY – Removal of water celery shall be limited to areas that reach "nuisance" conditions – when water celery is closer than 2 feet from the water's surface
- Harvesting of native pondweeds and/or muskgrass is prohibited.
- MINIMIZE IMPACTS TO WDNR ENVIRONMENTALLY SENSITIVE AREAS – Restrict harvesting to navigation channels only within these areas and to a depth of 2 feet, leaving 12 inches of plant growth on the lake bottom. Harvesting to occur after June 30th only.
- SURFACE SKIMMING ALLOWED IN ALL LOCATIONS EXCEPT FOR WDNR SENSITIVE AREAS – Outside of mapped areas, harvester may surface skim free-floating vegetation that has been previously cut or uprooted, but not collected, to a depth of 1 ft. **Use of the cutter head is not permitted for this action.**
- ALL CUT MATERIAL SHOULD BE INSPECTED FOR FISH AND ANIMALS. ANY ORGANISMS FOUND SHOULD BE IMMEDIATELY RETURNED TO THE WATER.
- ALL CUT MATERIALS SHOULD BE COLLECTED AND DEPSITED AT THE DESIGNATED DISPOSAL SITE – Mr. Donald West's property at W5865.
- Maps of all harvesting location and disposal site are included in Appendix E.

Area	Description	Instructions
HIGH PRIORITY AREAS		
A_1	Common access navigation lane	Cut a lane 50' wide to the 5' contour - must leave 12" of plant growth on the bottom*
A_2	Boating access lane	Cut a lane 15' wide to the 5' contour - must leave 12" of plant growth on the bottom*
MODERATE PRIORITY AREAS		
B_1	EWM management areas	EWM Management Areas: Top cut to a depth of 4' to control surface matting of EWM growth and promote native species growth. Must leave 12" of plant growth on the bottom.
B_2	Riparian access	Top cut 2' from pier heads to open water for riparian access
LOW PRIORITY AREAS		
C	Recreational areas	Surface cut only from pier heads to open water (variable widths). Manual harvest ONLY from shore to pier heads

*** - In Middle Lake, cutting depth limited to 2 feet, beginning after June 30th ONLY**

APPENDICES

Appendix A

Supporting Aquatic Plant Survey Methods and Documentation

The point intercept method was used to evaluate the existing emergent, submergent, floating-leaf, and free-floating aquatic plants. If a species was not collected at a specific point, the space on the datasheet was left blank. For the survey, the data for each sample point was entered into the WDNR "Worksheets" (i.e., a data-processing spreadsheet) to calculate the following statistics:

Taxonomic richness (the total number of taxa detected)

- **Maximum depth of plant growth**
- **Community frequency of occurrence** (number of intercept points where aquatic plants were detected divided by the number of intercept points shallower than the maximum depth of plant growth)
- **Mean intercept point taxonomic richness** (the average number of taxa per intercept point)
- **Mean intercept point native taxonomic richness** (the average number of native taxa per intercept point)
- **Taxonomic frequency of occurrence within vegetated areas** (the number of intercept points where a particular taxon (e.g., genus, species, etc.) was detected divided by the total number of intercept points where vegetation was present)
- **Taxonomic frequency of occurrence at sites within the photic zone** (the number of intercept points where a particular taxon (e.g., genus, species, etc.) was detected divided by the total number of intercept points which are equal to or shallower than the maximum depth of plant growth)
- **Relative taxonomic frequency of occurrence** (the number of intercept points where a particular taxon (e.g., genus, species, etc.) was detected divided by the sum of all species' occurrences)
- **Mean density** (the sum of the density values for a particular species divided by the number of sampling sites)
- **Simpson Diversity Index (SDI**) is an indicator of aquatic plant community diversity. SDI is calculated by taking one minus the sum of the relative frequencies squared for each species present. Based upon the index of community diversity, the closer the SDI is to one, the greater the diversity within the population.

Floristic Quality Index (FQI) (This method uses a predetermined Coefficient of Conservatism (C), that has been assigned to each native plant species in Wisconsin, based on that species' tolerance for disturbance. Non-native plants are not assigned conservatism coefficients. The aggregate conservatism of all the plants inhabiting a site determines its floristic quality. The mean C value for a given lake is the arithmetic mean of the coefficients of all native vascular plant species occurring on the entire site, without regard to dominance or frequency. The FQI value is the mean C times the square root of the total number of native species. This formula combines the conservatism of the species present with a measure of the species richness of the site.

Appendix B

Tables

Table 2: Taxa Detected During 2014 Aquatic Plant Surveys, Lauderdale Lakes, Walworth County, WI

Genus	Species	Common Name	Category	Present in Lake		
				Green Lake	Middle Lake	Mill Lake
Myriophyllum	***spicatum***	**Eurasian water-milfoil**	**Invasive**	X	X	X
Potamogeton	***crispus***	**Curly-leaf pondweed**	**Invasive**		X	X
Ceratophyllum	*demersum*	Coontail	Submersed		X	X
Chara	*sp.*	Muskgrass	Submersed	X	X	X
Elodea	*canadensis*	Common waterweed	Submersed	X	X	X
Heteranthera	*dubia*	Water stargrass	Submersed	X	X	X
Myriophyllum	*verticillatum*	Whorled water-milfoil	Submersed		X	
Najas	*flexilis*	Slender naiad	Submersed	X	X	X
Najas	*mariana*	Spiny naiad	Submersed	X	X	X
Nuphar	*variegata*	Spatterdock	Floating-leaf	X	X	
Nymphaea	*odorata*	White water lily	Floating-leaf		X	X
Potamogeton	*alpinus*	Alpine pondweed	Submersed	X		X
Potamogeton	*foliosus*	Leafy pondweed	Submersed		X	
Potamogeton	*gramineus*	Variable pondweed	Submersed	X	X	
Potamogeton	*illinoensis*	Illinois pondweed	Submersed		X	
Potamogeton	*natans*	Floating-leaf pondweed	Submersed		X	X
Potamogeton	*richardsonii*	Clasping-leaf pondweed	Submersed		X	
Potamogeton	*zosteriformis*	Flat-stem pondweed	Submersed		X	X
Sagittaria	*cuneata*	Arum-leaved arrowhead	Emergent	X		X
Sagittaria	*latifolia*	Common arrowhead	Emergent		X	
Sagittaria	*sp.*	Arrowhead species	Emergent		X	
Schoenoplectus	*acutus*	Hardstem bulrush	Emergent		X	
Sparganium	*sp.*	Bur-reed species	Emergent		X	
Stuckenia	*pectinata*	Sago pondweed	Submersed	X	X	X
Typha	*sp.*	Cattail	Emergent		X	
Utricularia	*geminiscapa*	Twin-stemmed bladderwort	Submersed		X	
Utricularia	*gibba*	Creeping bladderwort	Submersed		X	
Utricularia	*vulgaris*	Common bladderwort	Submersed	X	X	X
Vallisneria	*americana*	Wild celery	Submersed	X	X	X
Zizania	*aquatica*	Southern wild rice	Submersed		X	

Table 3: 2014 Aquatic Plant Community Statistics, Lauderdale Lakes, Walworth County, WI.

	Green Lake	Middle Lake*	Mill Lake
Date Sampled	7/29/2014	08/11-13/2014	7/3/2014
Points Sampled	695	588	457
Points with vegetation	198	401	296
Points shallower than maximum depth of plants	317	467	380
Frequency of occurrence	62.46%	85.87%	77.89%
Simpson Diversity Index	0.82	0.8	0.84
Maximum depth of plants (ft)	12	12	11.5
Average number of species per site (shallower than max depth)	1.04	1.71	1.56
Average number of species per site (veg. sites only)	1.66	1.99	2.01
Average number of native species per sire (shallower than max depth)	0.82	1.37	1.11
Average number of native species per site (veg. sites only)	1.53	1.66	1.64
Species Richness	13	28	17

* - survey completed by WDNR staff

Table 4: 2014 Aquatic Plant Taxa-Specific Statistics, Green Lake, Walworth County, WI

Common Name	Percent Frequency of Occurrence within vegetated areas	Percent Frequency of Occurrence at sites shallower than max depth of plants	Percent Relative Frequency of Occurrence	Number of Intercept Points Where Detected	Average Density
Eurasian water-milfoil	**14.14**	**8.83**	**8.5**	**28**	**1.00**
Muskgrass	41.41	25.87	24.9	82	1.18
Common waterweed	1.01	0.63	0.6	2	1.00
Water stargrass	2.02	1.26	1.2	4	1.25
Slender naiad	8.08	5.05	4.9	16	1.06
Spiny naiad	21.21	13.25	12.8	42	1.00
Spatterdock	0.51	0.32	0.3	1	1.00
Alpine pondweed	1.01	0.32	0.3	2	1.00
Variable pondweed	0.51	0.32	0.3	1	1.00
Arum-leaved arrowhead	1.01	0.32	0.3	2	1.00
Sago pondweed	33.33	20.82	20.1	66	1.00
Common bladderwort	3.54	2.21	2.1	7	1.00
Wild celery	38.38	23.97	23.1	76	1.01

* - Species recorded visually only, not data calculated

Table 5: Taxa Detected During Aquatic Plant Surveys, Green Lake, Walworth County, WI

Genus	Species	Common Name	Category	Present in Lake		
				1999	2008	2014
Myriophyllum	***spicatum***	**Eurasian water-milfoil**	**Invasive**	**X**	**X**	**X**
Potamogeton	***crispus***	**Curly-leaf pondweed**	**Invasive**	**X**	**X**	
Ceratophyllum	*demersum*	Coontail	Submersed	X	X	
Chara	*sp.*	Muskgrass	Submersed	X	X	X
Elodea	*canadensis*	Common waterweed	Submersed	X		X
Heteranthera	*dubia*	Water stargrass	Submersed	X	X	X
Myriophyllum	*sibiricum*	Northern water-milfoil	Submersed	X	X	
Najas	*flexilis*	Slender naiad	Submersed	X	X	X
Najas	*mariana*	Spiny naiad	Submersed	X	X	X
Nuphar	*variegata*	Spatterdock	Floating-leaf	X	X	X
Nymphaea	*odorata*	White water lily	Floating-leaf	X	X	
Potamogeton	*alpinus*	Alpine pondweed	Submersed			X
Potamogeton	*foliosus*	Leafy pondweed	Submersed	X	X	
Potamogeton	*gramineus*	Variable pondweed	Submersed		X	X
Potamogeton	*illinoensis*	Illinois pondweed	Submersed	X	X	
Potamogeton	*natans*	Floating-leaf pondweed	Submersed		X	
Potamogeton	*pusillus*	Small pondweed	Submersed		X	
Potamogeton	*richardsonii*	Clasping-leaf pondweed	Submersed		X	
Potamogeton	*sp.*	Pondweed species	Submersed	X		
Potamogeton	*zosteriformis*	Flat-stem pondweed	Submersed	X	X	
Sagittaria	*cuneata*	Arum-leaved arrowhead	Emergent			X
Stuckenia	*pectinata*	Sago pondweed	Submersed	X	X	X
Typha	*sp.*	Cattail	Emergent	X		
Utricularia	*sp.*	Bladderwort species	Submersed		X	
Utricularia	*vulgaris*	Common bladderwort	Submersed			X
Vallisneria	*americana*	Wild celery	Submersed	X	X	X

Table 6 2014 Floristic Quality Indicies, Green Lake, Walworth County, WI

Common Name	1999	2008	2014
Coontail	3	3	---
Muskgrass	7	7	7
Common waterweed	3	---	3
Water stargrass	6	6	6
Northern water-milfoil	6	6	---
Slender naiad	6	6	6
Spatterdock	6	6	6
White water lily	6	6	---
Alpine pondweed	---	---	9
Leafy pondweed	6	6	---
Variable pondweed	---	7	7
Illinois pondweed	6	6	---
Floating-leaf pondweed	---	5	----
Small pondweed	---	7	---
Clasping-leaf pondweed	---	5	---
Flat-stem pondweed	6	6	---
Arum-leaved arrowhead	---	---	7
Sago pondweed	3	3	3
Cattail	1	---	---
Common bladderwort	---	---	7
Wild celery	6	6	6
Total Species	14	16	11
Mean C	5.07	5.69	6.09
Floristic Quality Index (FQI)	**18.98**	**22.75**	**20.20**

Please note: There is no Coefficient of Conservatism for exotic species such as Eurasian Water-Milfoil or plants not identified to the species level (*Sagittaria sp.*).

Coefficient of Conservatism C

0-3 taxa found in wide variety of plant communities and very tolerant of disturbance.
4-6 taxa associated with specific plant communities and tolerates moderate disturbance.
7-8 taxa found in narrow range of plant communities and tolerate minor disturbance.
9-10 taxa restricted to a narrow range of conditions with low tolerance of disturbance.

Table 7: 2014 Aquatic Plant Taxa-Specific Statistics, Middle Lake, Walworth County, WI					
Common Name	Percent Frequency of Occurrence within vegetated areas	Percent Frequency of Occurrence at sites shallower than max depth of plants	Percent Relative Frequency of Occurrence	Number of Intercept Points Where Detected	Average Density
Eurasian water-milfoil	**8.48**	**7.28**	**4.3**	**34**	**1.00**
Curly-leaf pondweed	**0.25**	**0.21**	**0.1**	**1**	**1.00**
Coontail	0.75	0.61	0.4	3	1.00
Muskgrass	79.55	68.31	40	319	1.21
Common waterweed	1	0.86	0.5	4	1.00
Water stargrass	0.25	0.21	0.1	1	1.00
Whorled water-milfoil	5.49	4.71	2.8	22	1.00
Slender naiad	7.73	6.64	3.9	31	1.03
Spiny naiad	30.17	25.91	15.2	121	1.02
Spatterdock	3.24	2.78	1.6	13	1.00
White water lily	5.74	4.93	2.9	23	1.00
Leafy pondweed*	---	---	---	1	---
Variable pondweed	1.75	1.5	0.9	7	1.00
Illinois pondweed	0.25	0.21	0.1	1	1.00
Floating-leaf pondweed	0.75	0.64	0.4	3	1.00
Clasping-leaf pondweed*	---	---	---	1	---
Flat-stem pondweed	1	0.86	0.5	4	1.00
Common arrowhead*	---	---	---	1	---
Arrowhead species	12.47	10.71	6.3	50	1.02
Hardstem bulrush	2	1.71	1	8	1.13
Bur-reed species	2	1.71	1	8	1.00
Sago pondweed	17.46	14.99	8.8	70	1.00
Cattail*	---	---	---	2	---
Twin-stemmed bladderwort	1	0.86	0.5	4	1.00
Creeping bladderwort	2.99	2.57	1.5	12	1.00
Common bladderwort	6.73	5.78	3.4	27	1.00
Wild celery	7.73	6.64	3.9	31	1.00
Southern wild rice	0.25	0.21	0.1	1	1.00
* - Species recorded visually only, not data calculated					

Table 8: Taxa Detected During Aquatic Plant Surveys, Middle Lake, Walworth County, WI

Genus	Species	Common Name	Category	Present in Lake		
				1999	2008	2014
Myriophyllum	***spicatum***	**Eurasian water-milfoil**	**Invasive**	**X**	**X**	**X**
Potamogeton	***crispus***	**Curly-leaf pondweed**	**Invasive**	**X**	**X**	**X**
Ceratophyllum	*demersum*	Coontail	Submersed	X	X	X
Chara	*sp.*	Muskgrass	Submersed	X	X	X
Decodon	*verticillatus*	Swamp loosestrife	Emergent	X		
Elodea	*canadensis*	Common waterweed	Submersed	X	X	X
Heteranthera	*dubia*	Water stargrass	Submersed	X		X
Lemna	*minor*	Small duckweed	Free-floating	X		
Myriophyllum	*sibiricum*	Northern water-milfoil	Submersed	X	X	
Myriophyllum	*verticillatum*	Whorled water-milfoil	Submersed			X
Najas	*flexilis*	Slender naiad	Submersed	X	X	X
Najas	*mariana*	Spiny naiad	Submersed	X	X	X
Nuphar	*variegata*	Spatterdock	Floating-leaf	X	X	X
Nymphaea	*odorata*	White water lily	Floating-leaf	X	X	X
Potamogeton	*foliosus*	Leafy pondweed	Submersed		X	X
Potamogeton	*gramineus*	Variable pondweed	Submersed		X	X
Potamogeton	*illinoensis*	Illinois pondweed	Submersed	X	X	X
Potamogeton	*natans*	Floating-leaf pondweed	Submersed	X		X
Potamogeton	*nodosus*	Long-leaf pondweed	Submersed		X	
Potamogeton	*richardsonii*	Clasping-leaf pondweed	Submersed			X
Potamogeton	*sp.*	Pondweed species	Submersed	X		
Potamogeton	*zosteriformis*	Flat-stem pondweed	Submersed	X	X	X
Sagittaria	*latifolia*	Common arrowhead	Emergent	X		X
Sagittaria	*sp.*	Arrowhead species	Emergent			X
Schoenoplectus	*acutus*	Hardstem bulrush	Emergent	X	X	X
Schoenoplectus	*subterminalis*	Water bulrush	Submersed	X		
Sparganium	*natans*	Small bur-reed	Emergent		X	
Sparganium	*sp.*	Bur-reed species	Emergent			X
Stuckenia	*pectinata*	Sago pondweed	Submersed	X	X	X
Typha	*sp.*	Cattail	Emergent	X		X
Utricularia	*geminiscapa*	Twin-stemmed bladderwort	Submersed			
Utricularia	*gibba*	Creeping bladderwort	Submersed			X
Utricularia	*sp.*	Bladderwort species	Submersed	X	X	
Utricularia	*vulgaris*	Common bladderwort	Submersed			X
Vallisneria	*americana*	Wild celery	Submersed	X	X	X
Zizania	*aquatica*	Southern wild rice	Submersed	X		X

Table 9: Floristic Quality Indicies, Middle Lake, Walworth County, WI

Common Name	1999	2008	2014
Coontail	3	3	3
Muskgrass	7	7	7
Swamp loosestrife	7	---	---
Common waterweed	3	3	3
Water stargrass	6	---	6
Small duckweed	4	---	---
Northern water-milfoil	6	6	---
Whorled water-milfoil	---	---	8
Slender naiad	6	6	6
Spatterdock	6	6	6
White water lily	6	6	6
Leafy pondweed	---	6	6
Variable pondweed	---	7	7
Illinois pondweed	6	6	6
Floating-leaf pondweed	5	---	5
Long-leaf pondweed	---	7	---
Clasping-leaf pondweed	--	---	5
Flat-stem pondweed	6	6	6
Common arrowhead	3	---	3
Hardstem bulrush	6	6	6
Water bulrush	9	---	---
Small bur-reed	---	9	---
Sago pondweed	3	3	3
Cattail	1	---	1
Twin-stemmed bladderwort	---	---	9
Creeping bladderwort	---	---	9
Common bladderwort	---	---	7
Wild celery	6	6	6
Southern wild rice	8	---	8
Total Species	20	16	23
Mean C	5.35	5.81	5.74
Floristic Quality Index (FQI)	**23.93**	**23.25**	**27.52**

Please note: There is no Coefficient of Conservatism for exotic species such as Eurasian Water-Milfoil or plants not identified to the species level (*Sagittaria sp.*).

Coefficient of Conservatism C

0-3 taxa found in wide variety of plant communities and very tolerant of disturbance.
4-6 taxa associated with specific plant communities and tolerates moderate disturbance.
7-8 taxa found in narrow range of plant communities and tolerate minor disturbance.
9-10 taxa restricted to a narrow range of conditions with low tolerance of disturbance.

Table 10: 2014 Aquatic Plant Taxa-Specific Statistics, Mill Lake, Walworth County, WI

Common Name	Percent Frequency of Occurrence within vegetated areas	Percent Frequency of Occurrence at sites shallower than max depth of plants	Percent Relative Frequency of Occurrence	Number of Intercept Points Where Detected	Average Density
Eurasian water-milfoil	**36.82**	**28.67**	**18.4**	**109**	**1**
Curly-leaf pondweed	**0.68**	**0.53**	**0.3**	**2**	**1**
Coontail	5.07	3.95	2.5	15	1.07
Muskgrass	47.64	37.11	23.7	141	1.14
Common waterweed	4.39	3.42	2.2	13	1
Water stargrass	1.01	0.79	5	3	1
Slender naiad	6.76	5.26	3.4	20	1
Spiny naiad	20.27	15.79	10.1	60	1.03
Spatterdock	0.68	0.53	0.3	2	1
White water lily	1.01	0.79	0.5	3	1
Alpine pondweed	6.08	4.47	3	18	1
Floating-leaf pondweed	1.01	0.79	0.5	3	1
Flat-stem pondweed	0.34	0.26	0.2	1	1
Arum-leaved arrowhead	1.35	1.05	0.7	4	1
Sago pondweed	10.47	8.16	5.2	31	1
Common bladderwort	10.47	8.16	5.2	31	1
Wild celery	46.62	36.32	23.2	138	1.01

* - Species recorded visually only, not data calculated

Table 11: Taxa Detected During Aquatic Plant Surveys, Mill Lake, Walworth County, WI

Genus	Species	Common Name	Category	Present in Lake		
				1999	2008	2014
Myriophyllum	***spicatum***	**Eurasian water-milfoil**	**Invasive**	**X**	**X**	**X**
Potamogeton	***crispus***	**Curly-leaf pondweed**	**Invasive**	**X**	**X**	**X**
Ceratophyllum	*demersum*	Coontail	Submersed	X	X	X
Chara	*sp.*	Muskgrass	Submersed	X	X	X
Decodon	*verticillatus*	Swamp loosestrife	Emergent	X		
Elodea	*canadensis*	Common waterweed	Submersed	X	X	X
Heteranthera	*dubia*	Water stargrass	Submersed	X	X	X
Lemna	*sp.*	Duckweed species	Free-floating		X	
Myriophyllum	*sibiricum*	Northern water-milfoil	Submersed	X	X	
Najas	*flexilis*	Slender naiad	Submersed	X	X	X
Najas	*mariana*	Spiny naiad	Submersed	X	X	X
Nuphar	*variegata*	Spatterdock	Floating-leaf	X	X	X
Nymphaea	*odorata*	White water lily	Floating-leaf	X	X	X
Potamogeton	*alpinus*	Alpine pondweed	Submersed			X
Potamogeton	*amplifolius*	Large-leaf pondweed	Submersed	X	X	
Potamogeton	*foliosus*	Leafy pondweed	Submersed	X	X	
Potamogeton	*gramineus*	Variable pondweed	Submersed		X	
Potamogeton	*illinoensis*	Illinois pondweed	Submersed	X		
Potamogeton	*natans*	Floating-leaf pondweed	Submersed	X		X
Potamogeton	*nodosus*	Long-leaf pondweed	Submersed		X	
Potamogeton	*pusillus*	Small pondweed	Submersed		X	
Potamogeton	*sp.*	Pondweed species	Submersed	X		
Potamogeton	*zosteriformis*	Flat-stem pondweed	Submersed	X	X	X
Sagittaria	*cuneata*	Arum-leaved arrowhead	Emergent			X
Stuckenia	*pectinata*	Sago pondweed	Submersed	X	X	X
Typha	*sp.*	Cattail	Emergent	X		
Utricularia	*sp.*	Bladderwort species	Submersed	X	X	
Utricularia	*vulgaris*	Common bladderwort	Submersed			X
Vallisneria	*americana*	Wild celery	Submersed		X	X

Table 12: Floristic Quality Indicies, Mill Lake, Walworth County, WI			
Common Name	**1999**	**2008**	**2014**
Coontail	3	3	3
Muskgrass	7	7	7
Swamp loosestrife	7	---	---
Common waterweed	3	3	3
Water stargrass	6	6	6
Northern water-milfoil	6	6	---
Slender naiad	6	6	6
Spatterdock	6	6	6
White water lily	6	6	6
Alpine pondweed	---	---	9
Large-leaf pondweed	7	7	---
Leafy pondweed	6	6	---
Variable pondweed	---	7	---
Illinois pondweed	6	---	---
Floating-leaf pondweed	5	---	5
Long-leaf pondweed	---	7	---
Small pondweed	---	7	---
Flat-stem pondweed	6	6	6
Arum-leaved arrowhead	---	---	7
Sago pondweed	3	3	3
Cattail	1	---	---
Common bladderwort	---	---	7
Wild celery	---	6	6
Total Species	16	16	14
Mean C	5.25	5.75	5.71
Floristic Quality Index (FQI)	**21.00**	**23.00**	**21.38**

Please note: There is no Coefficient of Conservatism for exotic species such as Eurasian Water-Milfoil or plants not identified to the species level (*Sagittaria sp.*).

Coefficient of Conservatism C

0-3 taxa found in wide variety of plant communities and very tolerant of disturbance.
4-6 taxa associated with specific plant communities and tolerates moderate disturbance.
7-8 taxa found in narrow range of plant communities and tolerate minor disturbance.
9-10 taxa restricted to a narrow range of conditions with low tolerance of disturbance.

Table 13: Aquatic Plant Community Statistics, Lauderdale Lakes, Walworth County, WI			
	Green Lake	**Middle Lake**	**Mill Lake**
F.o.o. at sites shallower than maximum depth of plants	62.46%	85.87%	77.89%
Simpson Diversity Index	0.82	0.8	0.84
Most Dominant Species	Muskgrass	Muskgrass	Muskgrass
	Wild celery	Spiny naiad	Wild celery
	Sago pondweed	Sago pondweed	Eurasian water-milfoil
	Spiny naiad	Arrowhead sp.	Spiny naiad
	Eurasian water-milfoil	Eurasian water-milfoil	Sago pondweed / Common bladderworth
Species Richness	13	28	17
Community FQI	20.2	27.52	21.38
Average Coeffecient of Conservatism	6.09	5.74	5.71

Table 14: FQI and Average Coefficient of Lauderdale Lakes Compared to Wisconsin and Southeastern Till Plain lakes.

	Average Coefficient of Conservatism			**Floristic Quality**		
Quartile*	Lower	Mean	Upper	Lower	Mean	Upper
Wisconsin Lakes	5.5	6	6.9	16.9	22.2	27.5
Southeastern Till Plains	5.2	5.6	5.8	17	20.9	24.4
Green Lake - 2014	6.09			20.2		
Middle Lake - 2014	5.74			27.52		
Mill Lake - 2014	5.71			21.38		

* - Values indicate highest value of the lowest quartile, mean, and lowest value of the upper quartile

Appendix C

Figures

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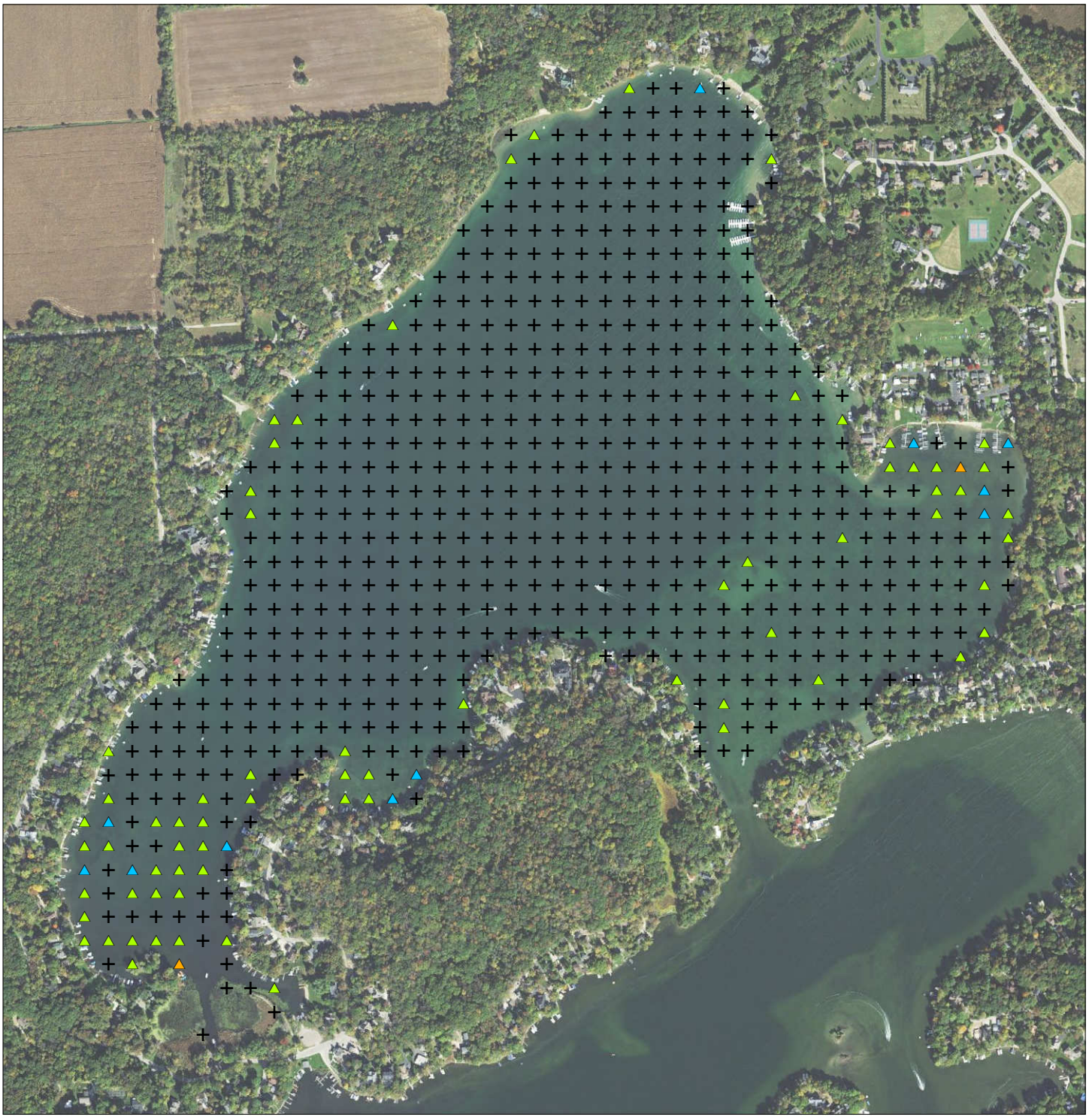
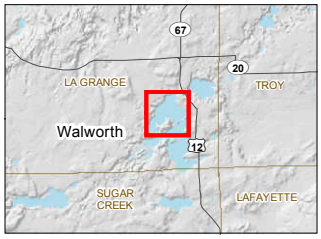




Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec
3. Orthophotography: 2015 NAIP

Legend

- GPS Sample Points*
- Fullness Rating 1
- Fullness Rating 2
- Fullness Rating 3

Fullness Rating	Coverage	Description
1		Few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2		There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover tines.
3		The rake is completely covered and tines are not visible.

*Survey Completed 2014/07/29 by James Scharl & Tom Lamppa

Figure No.
1.1

Title
2014 PI Survey - Green Lake Muskgrass *(Chara sp.)*

Client/Project
Lauderdale Lakes Management District

Project Location
T. of Elkhorn, Walworth Co., WI

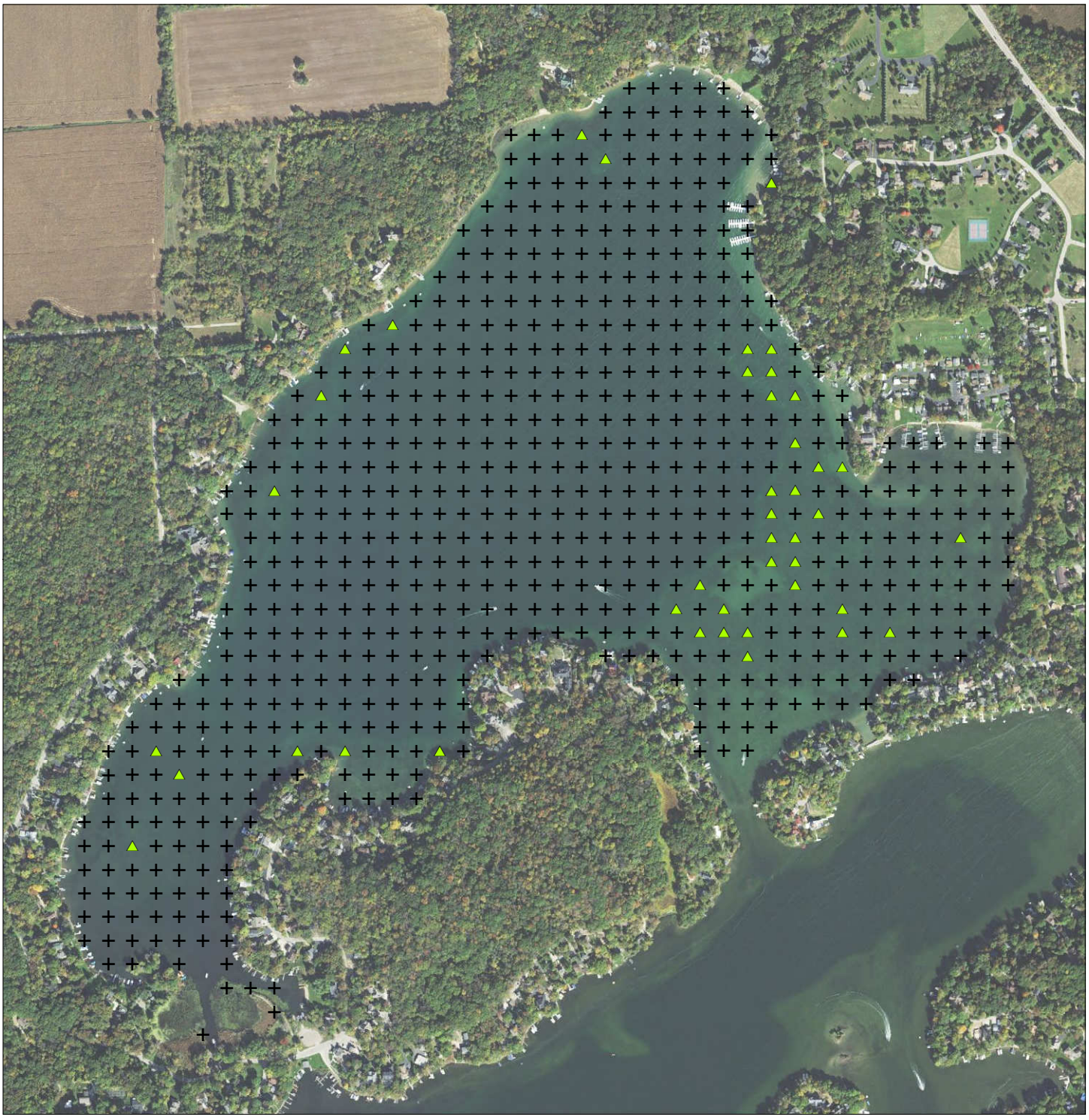
193703101
Prepared by KAS on 2014-09-25
Technical Review by AB on 2014-09-25
Independent Review by JS on 2015-02-05

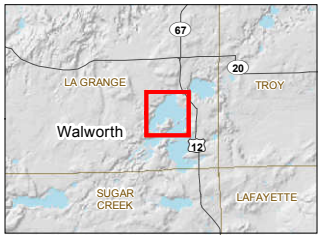
0 400 800 Feet
1:9,600 (at original document size of 8.5x11)

N

Stantec

R:\gis\other PCs\193703101 AIS Lauderdale Lakes\07 gis\mxds\Green Posffred PI Naiad Spiny 8.5x11.mxd Revised: 2015-12-16 By: Ksollau





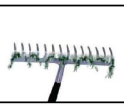
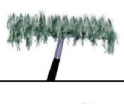
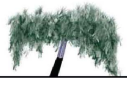
Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec
3. Orthophotography: 2015 NAIP

Legend

+ GPS Sample Points*

▲ Fullness Rating 1

Fullness Rating	Coverage	Description
1		Few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2		There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover tines.
3		The rake is completely covered and tines are not visible.

*Survey Completed 2014/07/29 by James Scharl & Tom Lamppa

Figure No.

1.2

Title

2014 PI Survey - Green Lake
Spiny Naiad *(Najas marina)*

Client/Project

Lauderdale Lakes
Management District

Project Location

T. of Elkhorn,
Walworth Co., WI

193703101

Prepared by KAS on 2014-09-25
Technical Review by AB on 2014-09-25
Independent Review by JS on 2015-02-05

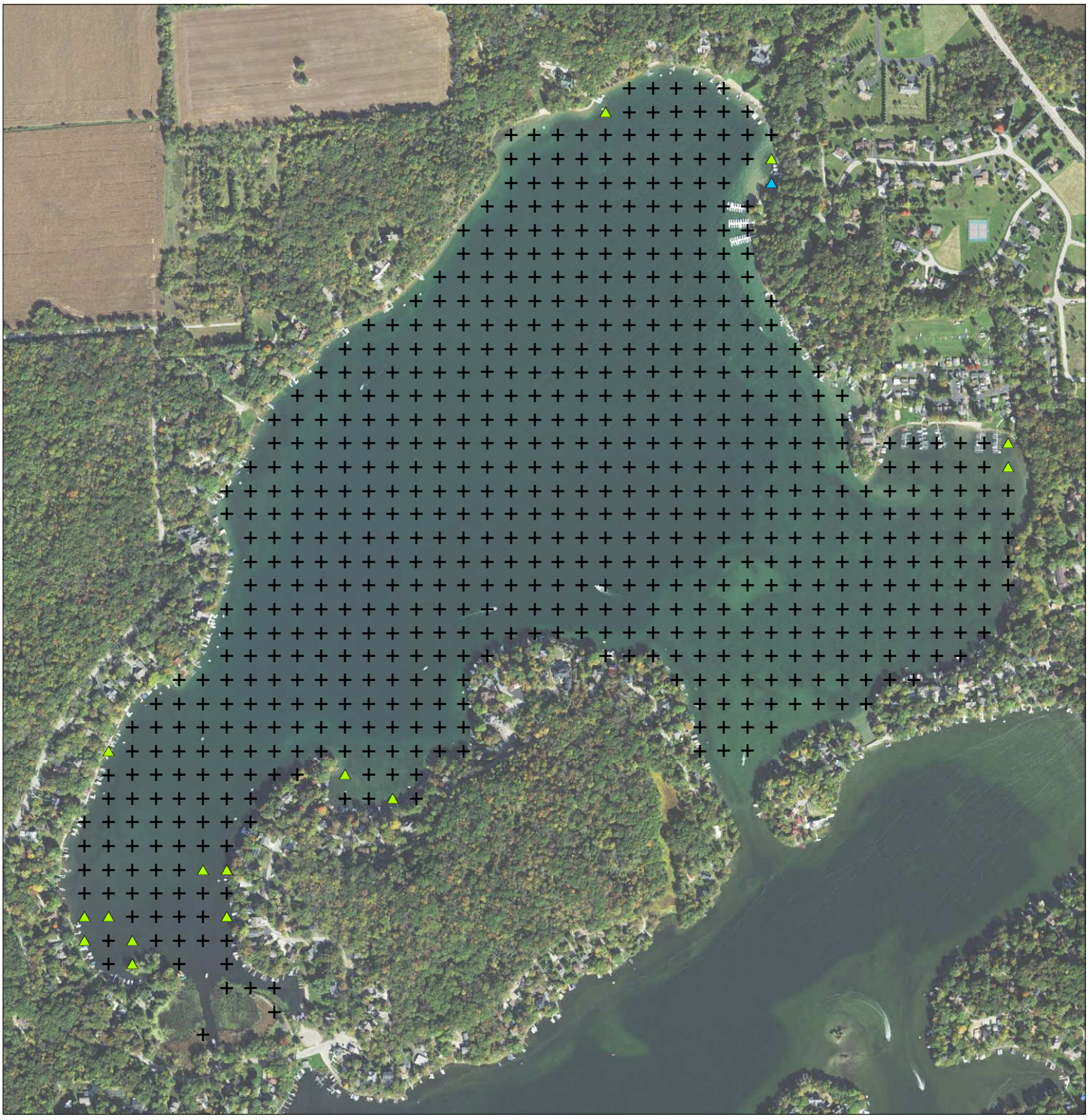
0 400 800 Feet

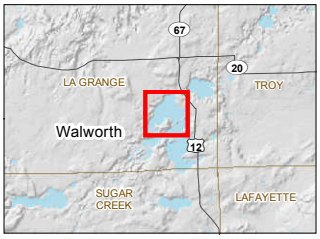
1:9,600 (at original document size of 8.5x11)

N

Stantec

R:\gis\other PCs\193703101 AIS Lauderdale Lakes\07 gis\mxds\Green Postfreat PI Naiad Slender 8.5x11.mxd Revised: 2015-12-16 By: Ksoltau



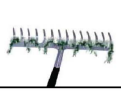
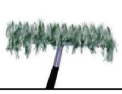


Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec
3. Orthophotography: 2015 NAIP

Legend

- GPS Sample Points*
- Fullness Rating 1
- Fullness Rating 2

Fullness Rating	Coverage	Description
1		Few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2		There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover tines.
3		The rake is completely covered and tines are not visible.

*Survey Completed 2014/07/29 by James Scharl & Tom Lamppa

Figure No.
1.3

Title
2014 PI Survey - Green Lake
Slender Naiad *(Najas flexilis)*

Client/Project
Lauderdale Lakes
Management District

Project Location
T. of Elkhorn,
Walworth Co., WI

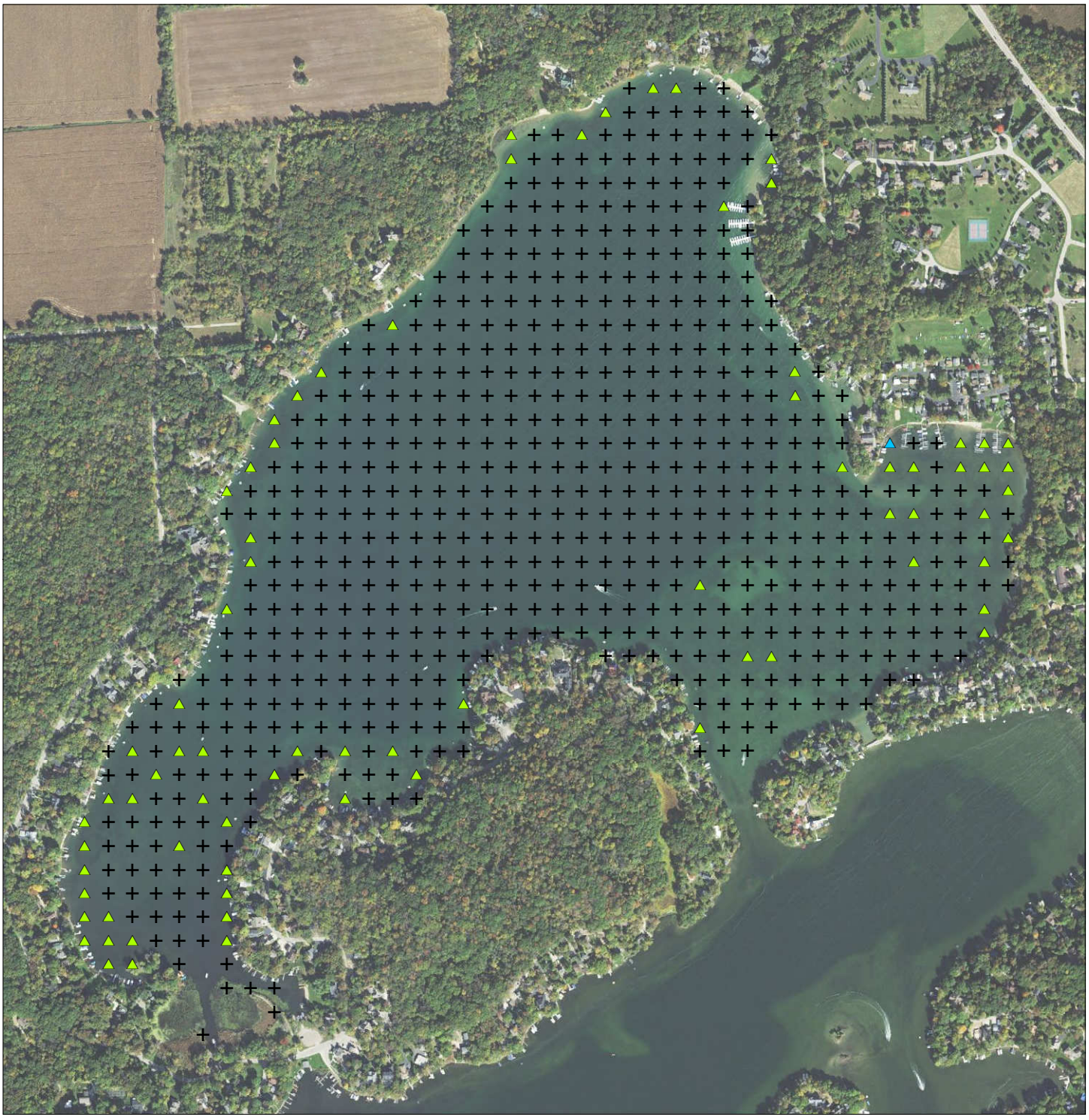
193703101
Prepared by KAS on 2014-09-25
Technical Review by AB on 2014-09-25
Independent Review by JS on 2015-02-05

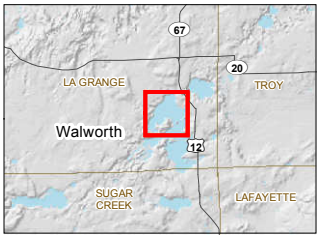
0 400 800 Feet
1:9,600 (at original document size of 8.5x11)

N

Stantec

R:\gis\other PCs\193703101 AIS Lauderdale Lakes\07 gis\mxds\Green Postfire at PI Naiad Celery 8.5x11.mxd Revised: 2015-12-16 By: Ksoltau



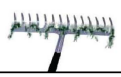
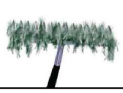


Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec
3. Orthophotography: 2015 NAIP

Legend

- GPS Sample Points*
- Fullness Rating 1
- Fullness Rating 2

Fullness Rating	Coverage	Description
1		Few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2		There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover tines.
3		The rake is completely covered and tines are not visible.

*Survey Completed 2014/07/29 by James Scharl & Tom Lamppa

Figure No.

1.4

Title

2014 PI Survey - Green Lake Wild Celery *(Vallisneria americana)*

Client/Project

Lauderdale Lakes Management District

Project Location

T. of Elkhorn, Walworth Co., WI

193703101

Prepared by KAS on 2014-09-25
Technical Review by AB on 2014-09-25
Independent Review by JS on 2015-02-05

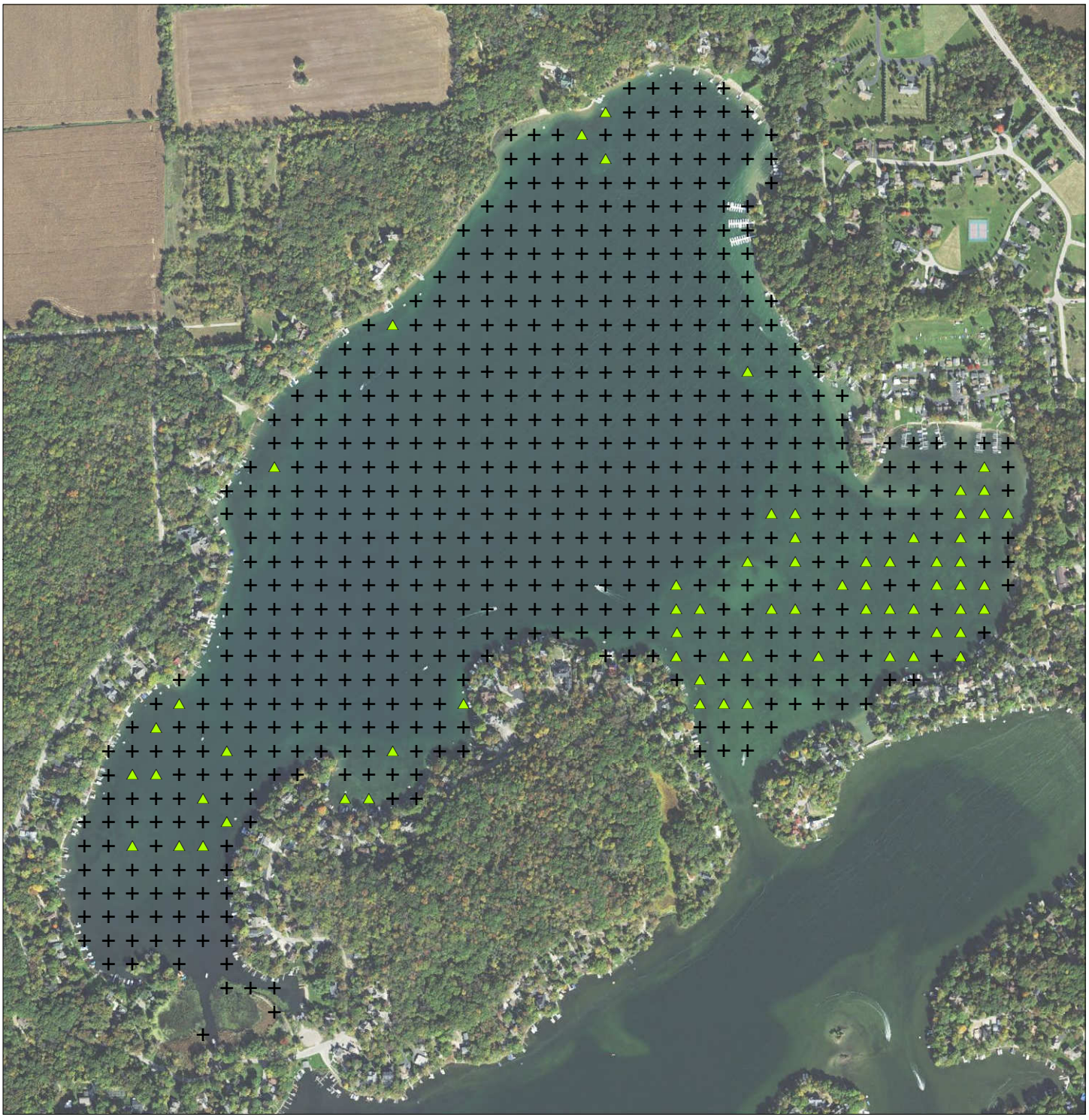
0 400 800 Feet

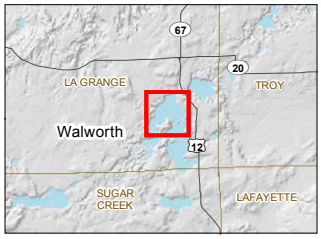
1:9,600 (at original document size of 8.5x11)

N

Stantec

R:\gis\other PCs\193703101 AIS Lauderdale Lakes\07 gis\mxds\Green Postfreat PI Sago 8.5x11.mxd Revised: 2015-12-16 By: ksollau



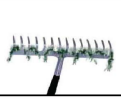
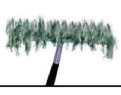


Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec
3. Orthophotography: 2015 NAIP

Legend

- GPS Sample Points
- Fullness Rating 1

Fullness Rating	Coverage	Description
1		Few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2		There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover tines.
3		The rake is completely covered and tines are not visible.

*Survey Completed 2014/07/29 by James Scharl & Tom Lamppa

Figure No.
1.5

Title
2014 PI Survey - Green Lake
Sago Pondweed *(Stuckenia pectinata)*

Client/Project
Lauderdale Lakes
Management District

Project Location
T. of Elkhorn,
Walworth Co., WI

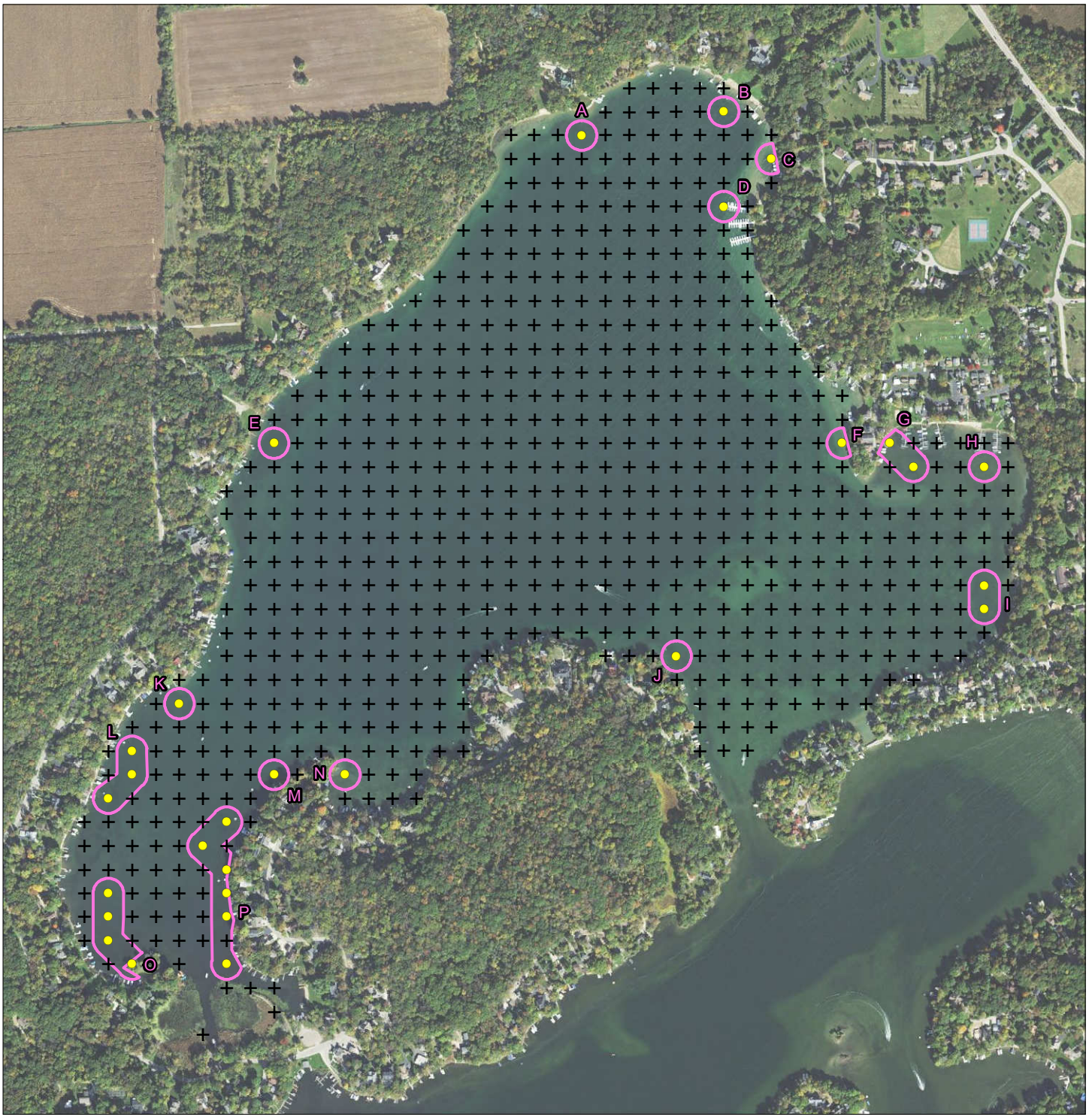
193703101
Prepared by KAS on 2014-09-25
Technical Review by AB on 2014-09-25
Independent Review by JS on 2015-02-05

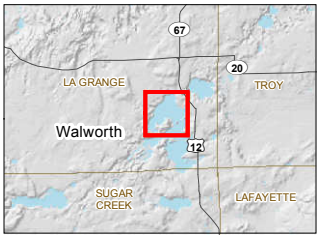
0 400 800 Feet
1:9,600 (at original document size of 8.5x11)

N

Stantec

R:\gis\other PCs\193703101 AIS Lauderdale Lakes\07 gis\mxds\Green Posttreat PI EWM 8.5x11.mxd Revised: 2015-12-16 By: ksoltau





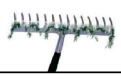
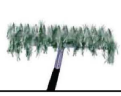
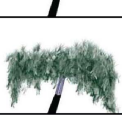
Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec
3. Orthophotography: 2015 NAIP

Legend

- GPS Sample Points*
- Fullness Rating 1
- Aquatic Invasive Plant Area

Eurasian Water-Milfoil (acreage)			
A	0.50	I	1.00
B	0.50	J	0.50
C	0.35	K	0.50
D	0.50	L	1.67
E	0.50	M	0.50
F	0.35	N	0.50
G	1.06	O	1.98
H	0.50	P	3.03
Total = 13.95			

Fullness Rating	Coverage	Description
1		Few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2		There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover tines.
3		The rake is completely covered and tines are not visible.

*Survey Completed 2014/07/29 by James Scharl & Tom Lamppa

Figure No.
1.6

Title
2014 PI Survey - Green Lake Eurasian Water-Milfoil

Client/Project
Lauderdale Lakes Management District

Project Location
T. of Elkhorn, Walworth Co., WI

193703101
Prepared by KAS on 2014-09-25
Technical Review by AB on 2014-09-25
Independent Review by JS on 2015-02-05

0 400 800 Feet
1:9,600 (at original document size of 8.5x11)

N

Stantec

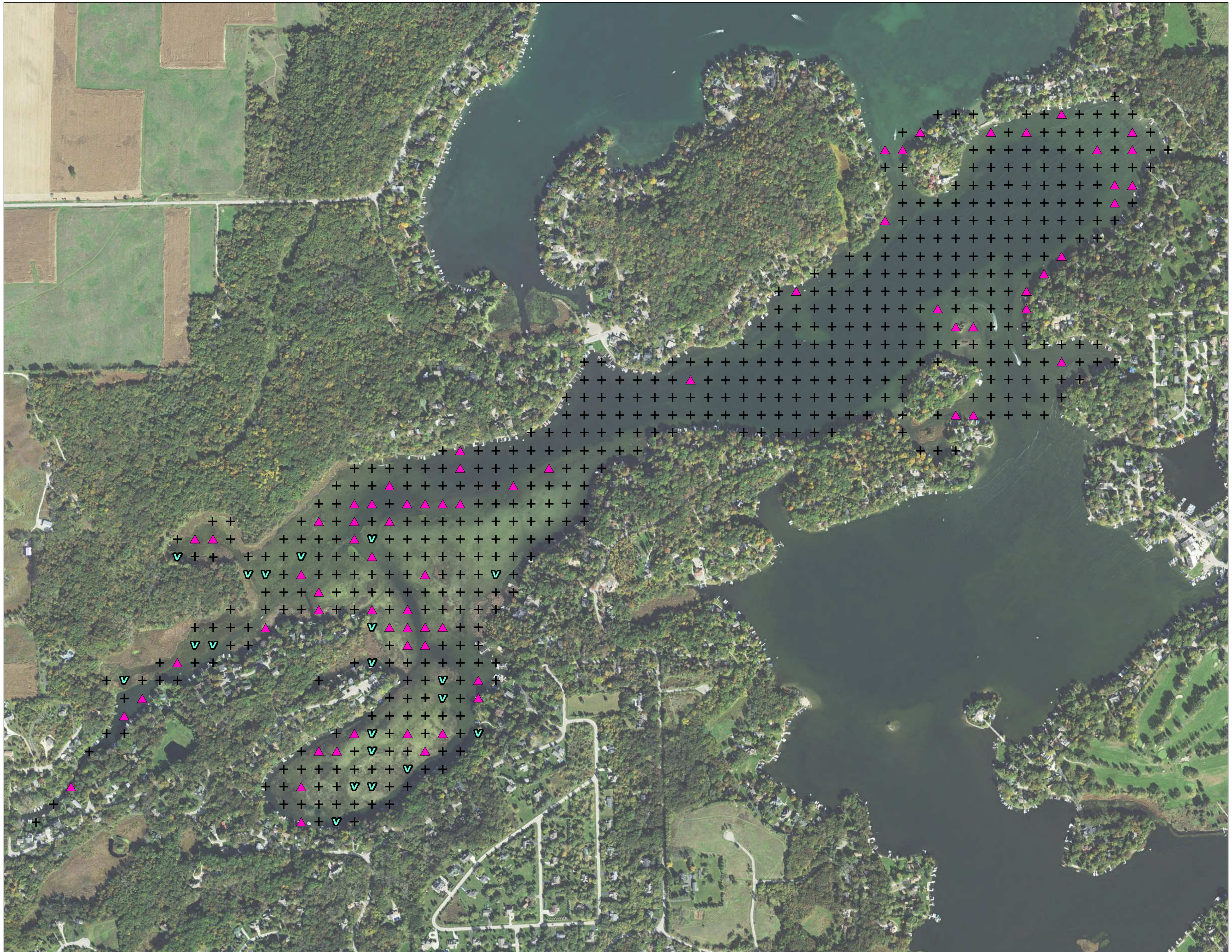


Figure No.

2.1

Title

2014 PI Survey - Middle Lake
Sago Pondweed *(Stuckenia pectinata)*

Client/Project

Lauderdale Lakes
Management District

Project Location

T. of Elkhorn,
Walworth Co., WI

193703101
Prepared by KAS on 2015-01-13
Technical Review by JD on 2015-01-13
Independent Review by JS on 2015-02-03

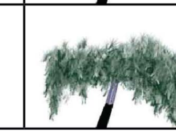
0 400 800 Feet

1:9,600 (At original document size of 11x17)

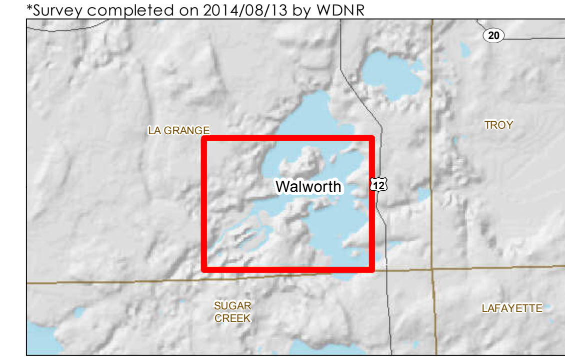
N

Legend

- + GPS Sample Points
- ▲ Fullness Rating 1
- V Visual Only

Fullness Rating	Coverage	Description
1		Few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2		There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover tines.
3		The rake is completely covered and tines are not visible.

*Survey completed on 2014/08/13 by WDNR



Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec
3. Orthophotography: 2015 NAIP

Stantec

R:\gis\other PCs\193703101_AIS_Lauderdale Lakes\07_gis\mxds\Middle PI Sago.mxd Revised: 2015-12-16 By: Ksoltau

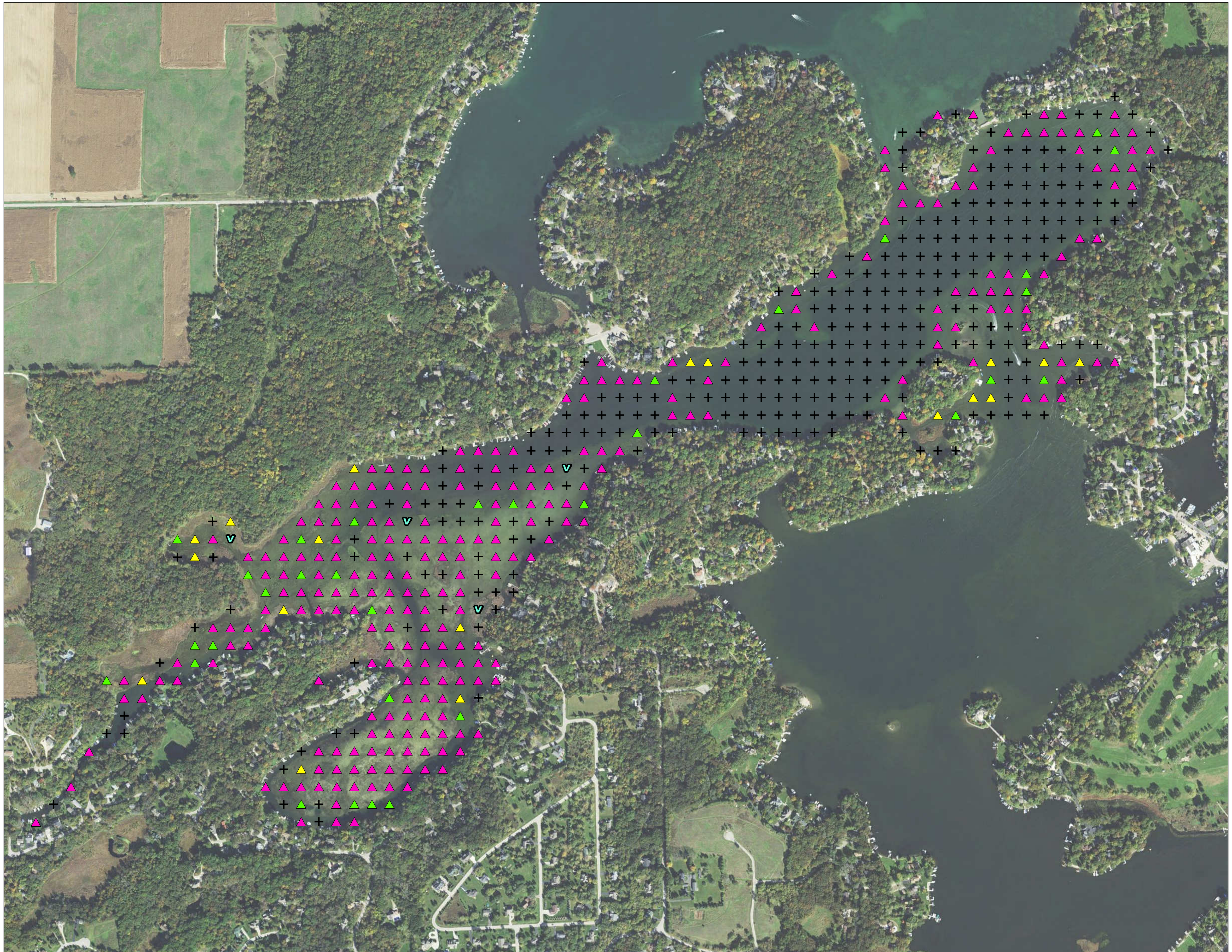


Figure No.
2.2

Title

2014 PI Survey - Middle Lake Muskgrass *(Chara sp.)*

Client/Project
Lauderdale Lakes Management District

Project Location
T. of Elkhorn,
Walworth Co., WI

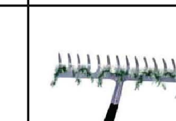
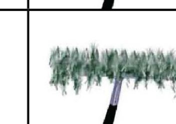
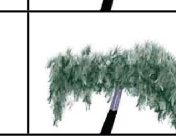
193703101
Prepared by KAS on 2015-01-13
Technical Review by JD on 2015-01-13
Independent Review by JS on 2015-02-03

0 400 800 Feet
1:9,600 (At original document size of 11x17)

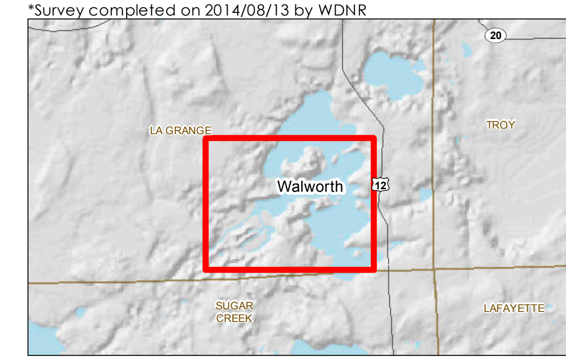
N

Legend

- + GPS Sample Points*
- Fullness Rating 1
- Fullness Rating 2
- Fullness Rating 3
- V Visual Only

Fullness Rating	Coverage	Description
1		Few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2		There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover tines.
3		The rake is completely covered and tines are not visible.

*Survey completed on 2014/08/13 by WDNR



Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec
3. Orthophotography: 2015 NAIP

Stantec

R:\gis\other PCs\193703101 AIS Lauderdale Lakes\07 gis\mxds\Middle PI Chara.mxd Revised: 2015-12-16 By: Ksoltau

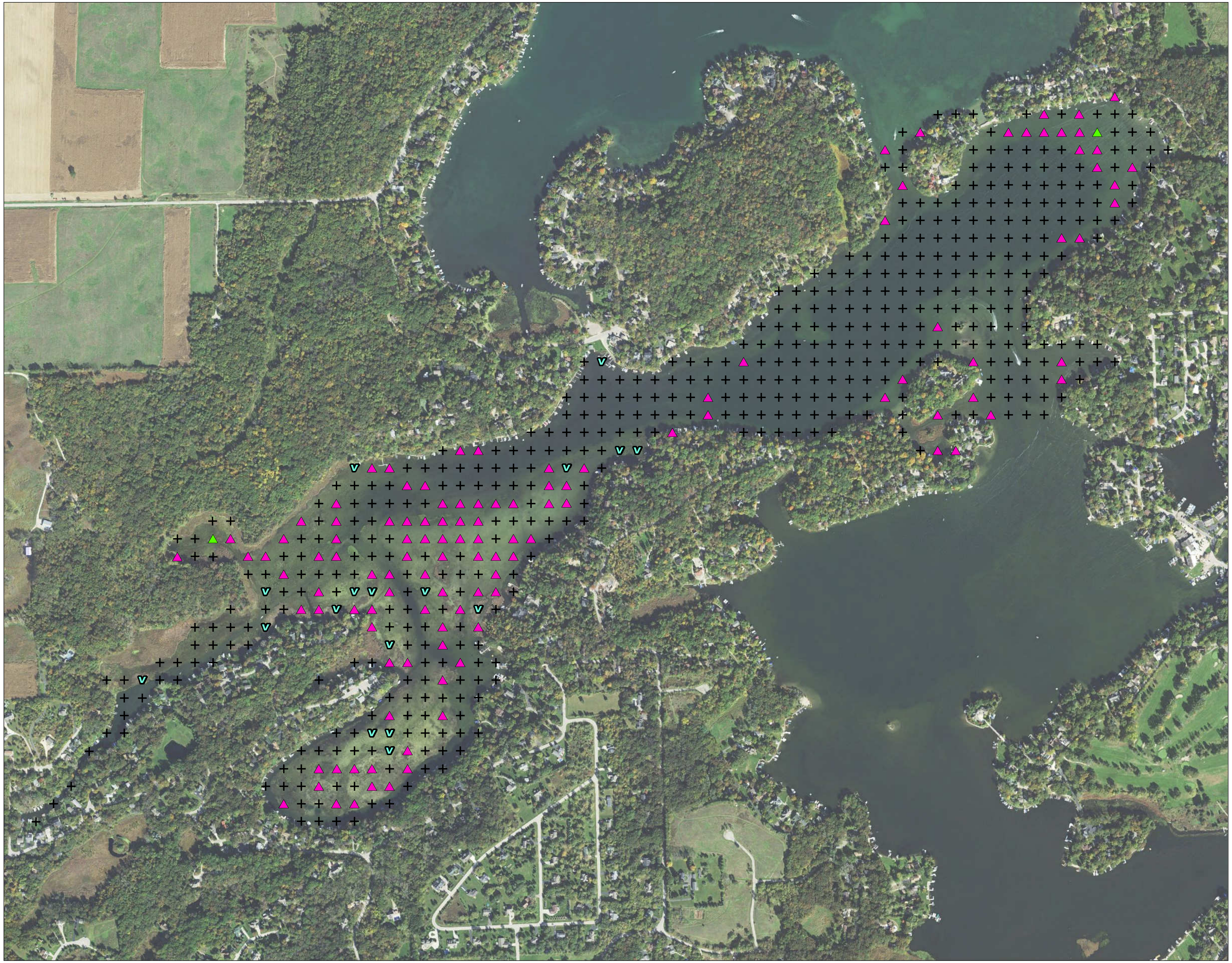


Figure No.
2.3

Title

2014 PI Survey - Middle Lake Spiny Naiad *(Najas marina)*

Client/Project

Lauderdale Lakes Management District

Project Location

T. of Elkhorn, Walworth Co., WI

193703101
Prepared by KAS on 2015-01-13
Technical Review by JD on 2015-01-13
Independent Review by JS on 2015-02-03

0 400 800 Feet
1:9,600 (At original document size of 11x17)

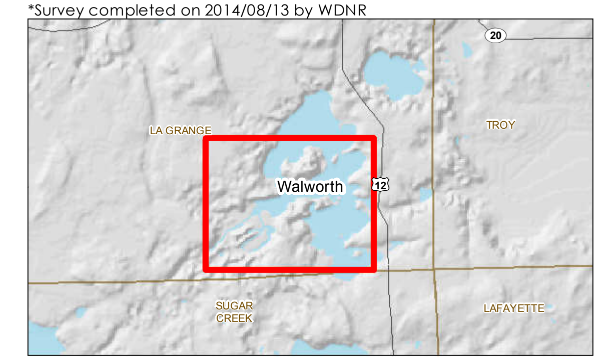
N

Legend

- GPS Sample Points*
- Fullness Rating 1
- Fullness Rating 2
- Visual Only

Fullness Rating	Coverage	Description
1		Few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2		There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover the tines.
3		The rake is completely covered and tines are not visible.

*Survey completed on 2014/08/13 by WDNR



Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec
3. Orthophotography: 2015 NAIP

Stantec

R:\gis\other_PCs\193703101_AIS_Lauderdale_Lakes\07_gis\mxds\Middle_PI_Spiny.mxd Revised: 2015-12-16 By: Ksoltau

Figure No.

2.4

Title

2014 PI Survey - Middle Lake Arrowhead *(Sagittaria sp.)*

Client/Project

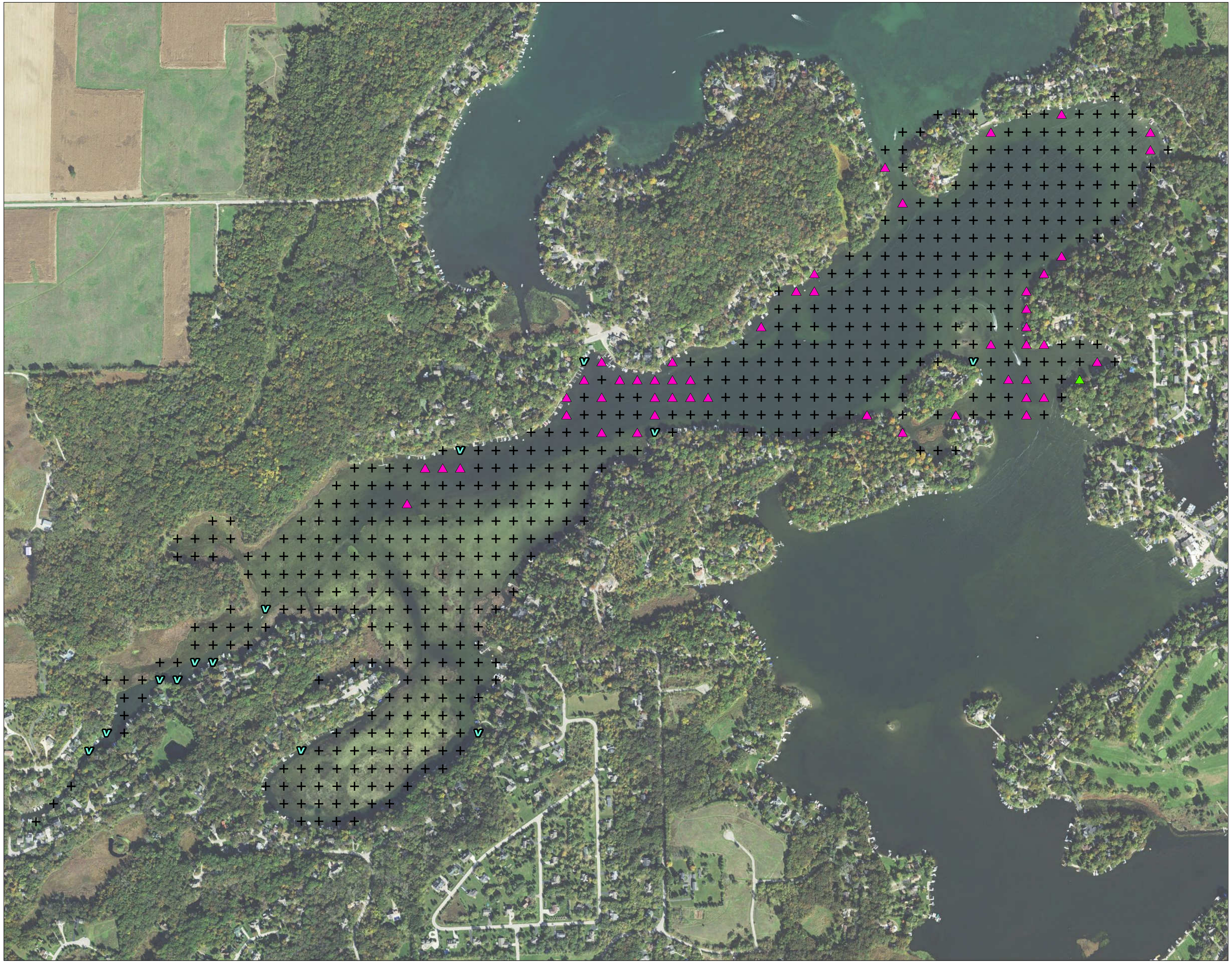
Lauderdale Lakes Management District

Project Location

T. of Elkhorn, Walworth Co., WI

193703101

Prepared by KAS on 2015-01-13
Technical Review by JD on 2015-01-13
Independent Review by JS on 2015-02-03



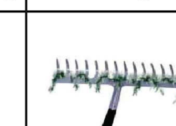
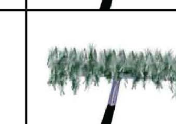
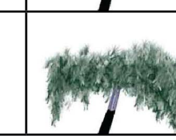
0 400 800 Feet

1:9,600 (At original document size of 11x17)

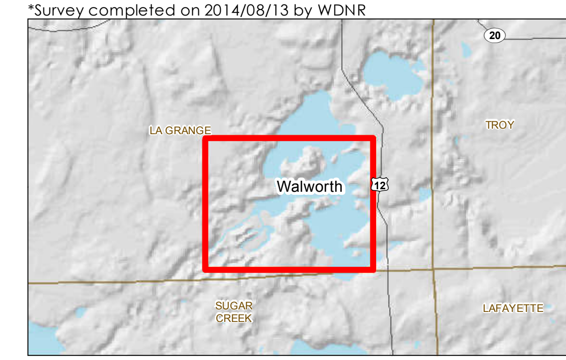
N

Legend

- + GPS Sample Points*
- ▲ Fullness Rating 1
- ▲ Fullness Rating 2
- V Visual Only

Fullness Rating	Coverage	Description
1		Few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2		There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover tines.
3		The rake is completely covered and tines are not visible.

*Survey completed on 2014/08/13 by WDNR



Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec
3. Orthophotography: 2015 NAIP

Stantec

R:\gis\other_PCs\193703101_AIS_Lauderdale_Lakes\07_gis\mxds\Middle_PI_Arrow.mxd Revised: 2015-12-16 By: Ksoltau

Figure No.
2.5

Title
2014 PI Survey - Middle Lake Eurasian Water-Milfoil

Client/Project
Lauderdale Lakes Management District

Project Location
T. of Elkhorn,
Walworth Co., WI

193703101
Prepared by KAS on 2015-01-13
Technical Review by JD on 2015-01-13
Independent Review by JS on 2015-02-03

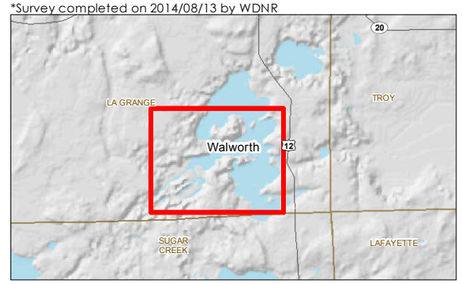
0 400 800 Feet
1:9,600 (At original document size of 11x17)

N

Legend
- GPS Sample Points*
- Fullness Rating 1
- Visual Only
- Aquatic Invasive Plant Area

Fullness Rating	Coverage	Description
1		Few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2		There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover tines.
3		The rake is completely covered and tines are not visible.

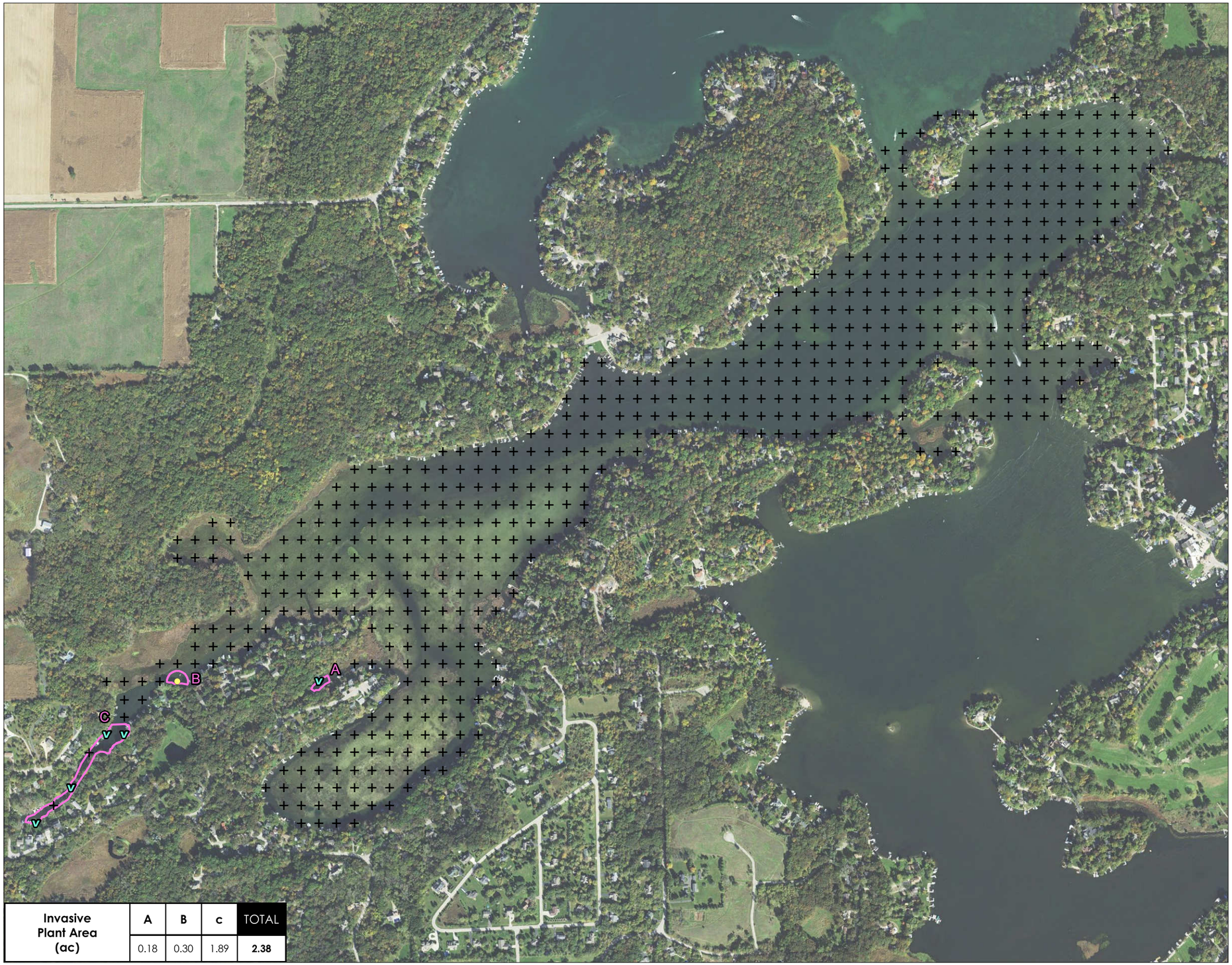
*Survey completed on 2014/08/13 by WDNR



Invasive Plant Area (ac)	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	TOTAL
	0.27	0.30	0.50	0.50	0.50	2.51	2.29	0.39	4.82	1.70	2.22	0.50	4.47	0.27	0.50	3.08	1.74	**26.58**

Notes
1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec
3. Orthophotography: 2015 NAIP

Stantec



Invasive Plant Area (ac)	A	B	c	TOTAL
	0.18	0.30	1.89	**2.38**

Figure No.

2.6

Title

2014 PI Survey - Middle Lake Curly-leaf Pondweed

Client/Project

Lauderdale Lakes Management District

Project Location

T. of Elkhorn, Walworth Co., WI

193703101

Prepared by KAS on 2015-01-13
Technical Review by JD on 2015-01-13
Independent Review by JS on 2015-02-03

0 400 800 Feet

1:9,600 (At original document size of 11x17)

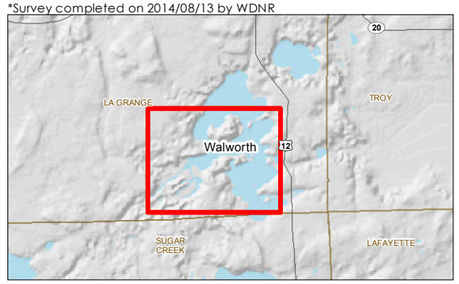
N

Legend

- GPS Sample Points*
- Fullness Rating 1
- Visual Only
- Aquatic Invasive Plant Area

Fullness Rating	Coverage	Description
1		Few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2		There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover tines.
3		The rake is completely covered and tines are not visible.

*Survey completed on 2014/08/13 by WDNR

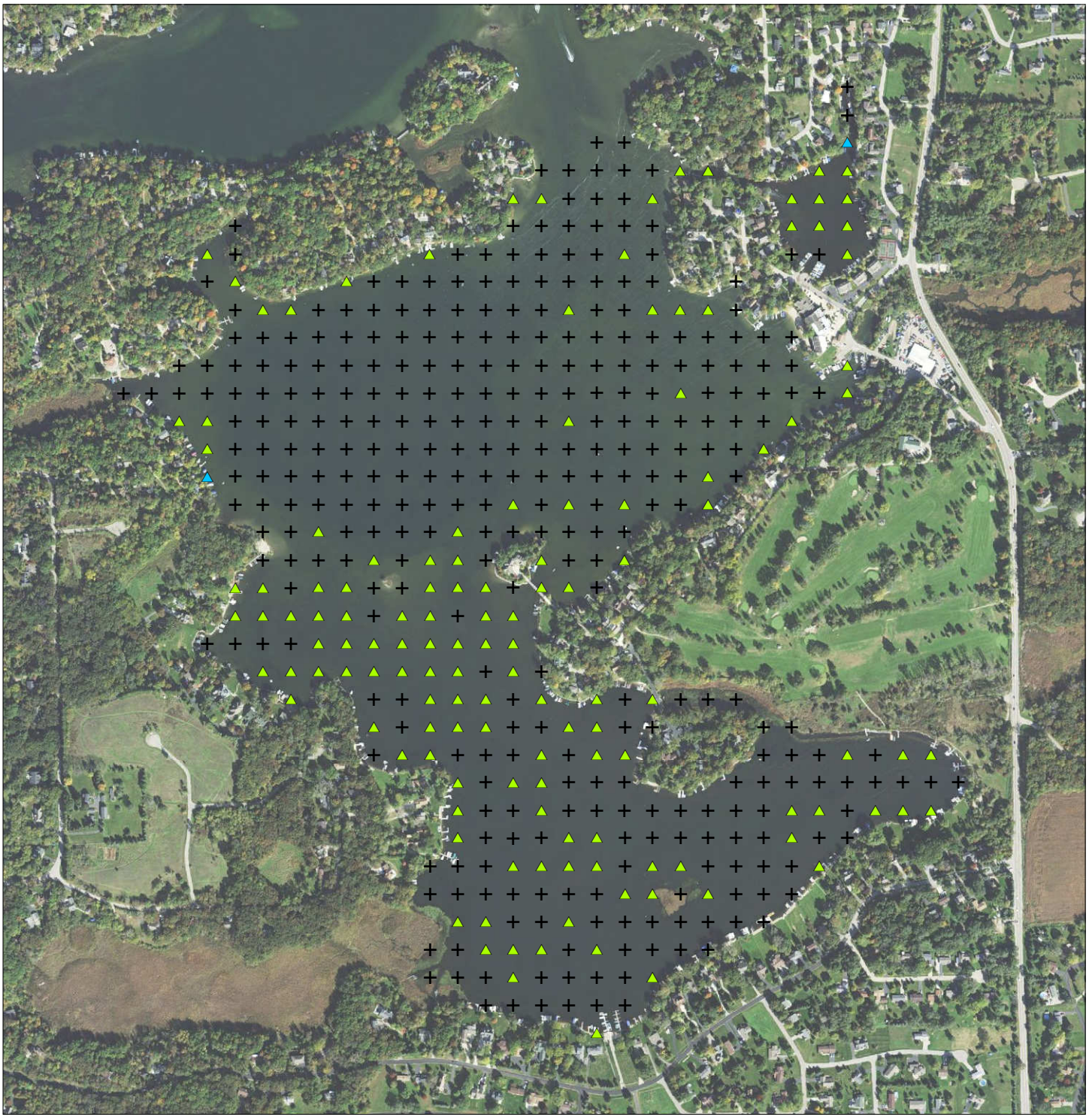


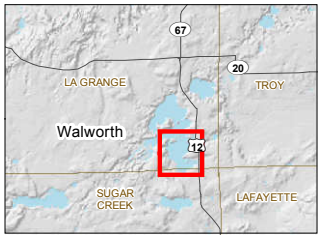
Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec
3. Orthophotography: 2015 NAIP

Stantec

R:\gis\other PCs\193703101 AIS Lauderdale Lakes\07 gis\mxds\Mill PostTreat PI Celery 8.5x11.mxd Revised: 2015-12-16 By: Ksoltau



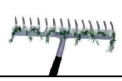


Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec
3. Orthophotography: 2015 NAIP

Legend

- GPS Sample Points*
- Fullness Rating 1
- Fullness Rating 2

Fullness Rating	Coverage	Description
1		Few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2		There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover tines.
3		The rake is completely covered and tines are not visible.

*Survey Completed 2014/07/29 by James Scharl & Tom Lamppa

Figure No.

3.1

Title

2014 PI Survey - Mill Lake
Wild Celery *(Vallisneria americana)*

Client/Project

Lauderdale Lakes
Management District

Project Location

T. of Elkhorn,
Walworth Co., WI

193703101
Prepared by KAS on 2014-09-25
Technical Review by AB on 2014-09-25
Independent Review by JS on 2015-02-05

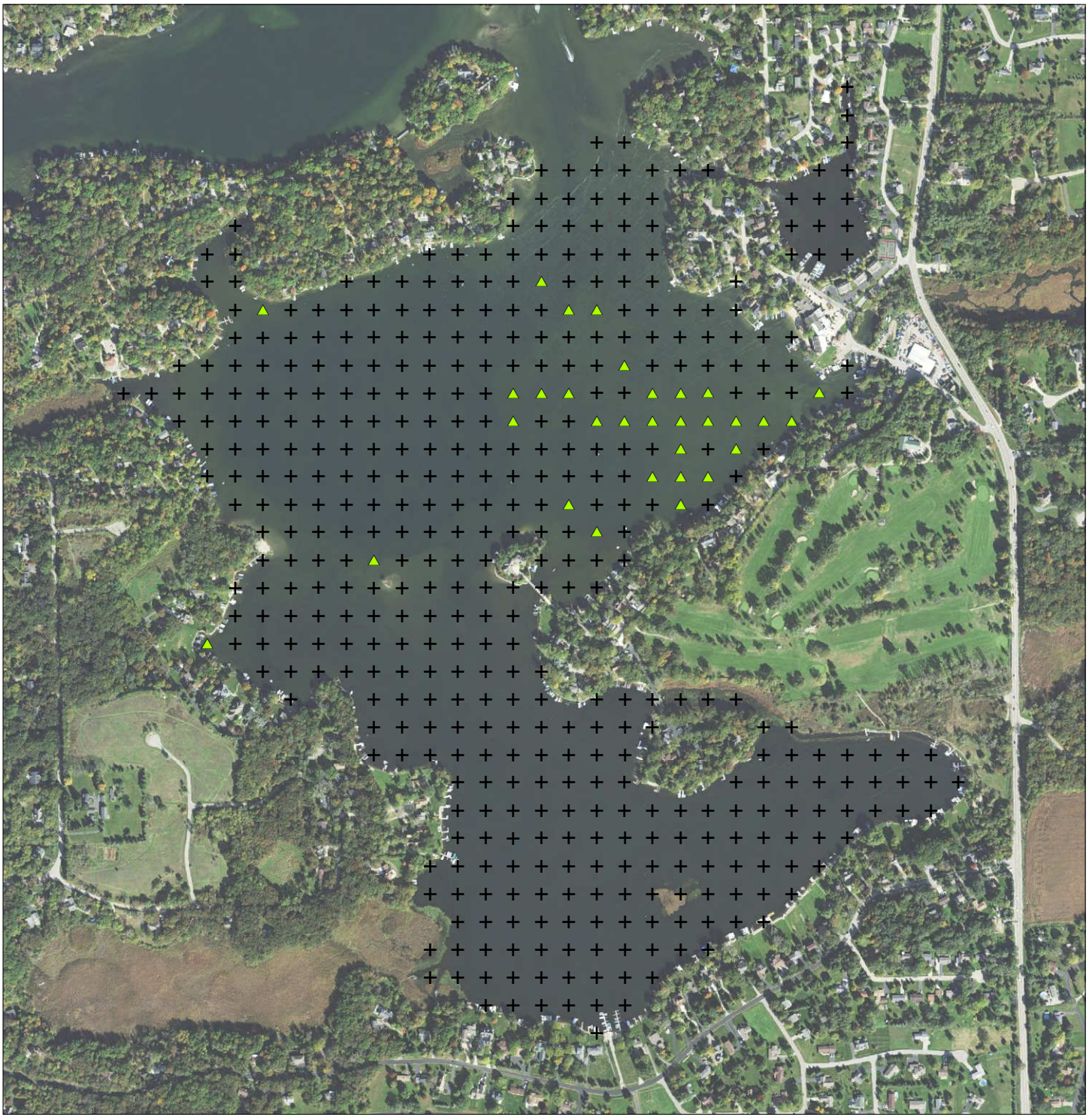
0 400 800 Feet

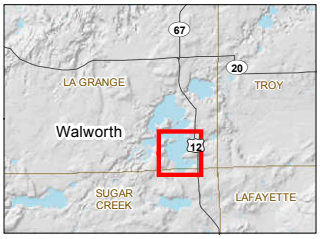
1:9,600 (at original document size of 8.5x11)

N

Stantec

R:\gis\other PCs\193703101 AIS Lauderdale Lakes\07_gis\mxds\Mill PostTreat PI Celery.mxd Revised: 2015-12-16 By: Ksoltau





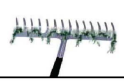
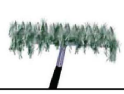
Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec
3. Orthophotography: 2015 NAIP

Legend

+ GPS Sample Points*

▲ Fullness Rating 1

Fullness Rating	Coverage	Description
1		Few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2		There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover tines.
3		The rake is completely covered and tines are not visible.

*Survey Completed 2014/07/29 by James Scharl & Tom Lamppa

Figure No.

3.2

Title

2014 PI Survey - Mill Lake

Sago Pondweed *(Stuckenia pectinata)*

Client/Project

Lauderdale Lakes Management District

Project Location

T. of Elkhorn, Walworth Co., WI

193703101

Prepared by KAS on 2014-09-25

Technical Review by AB on 2014-09-25

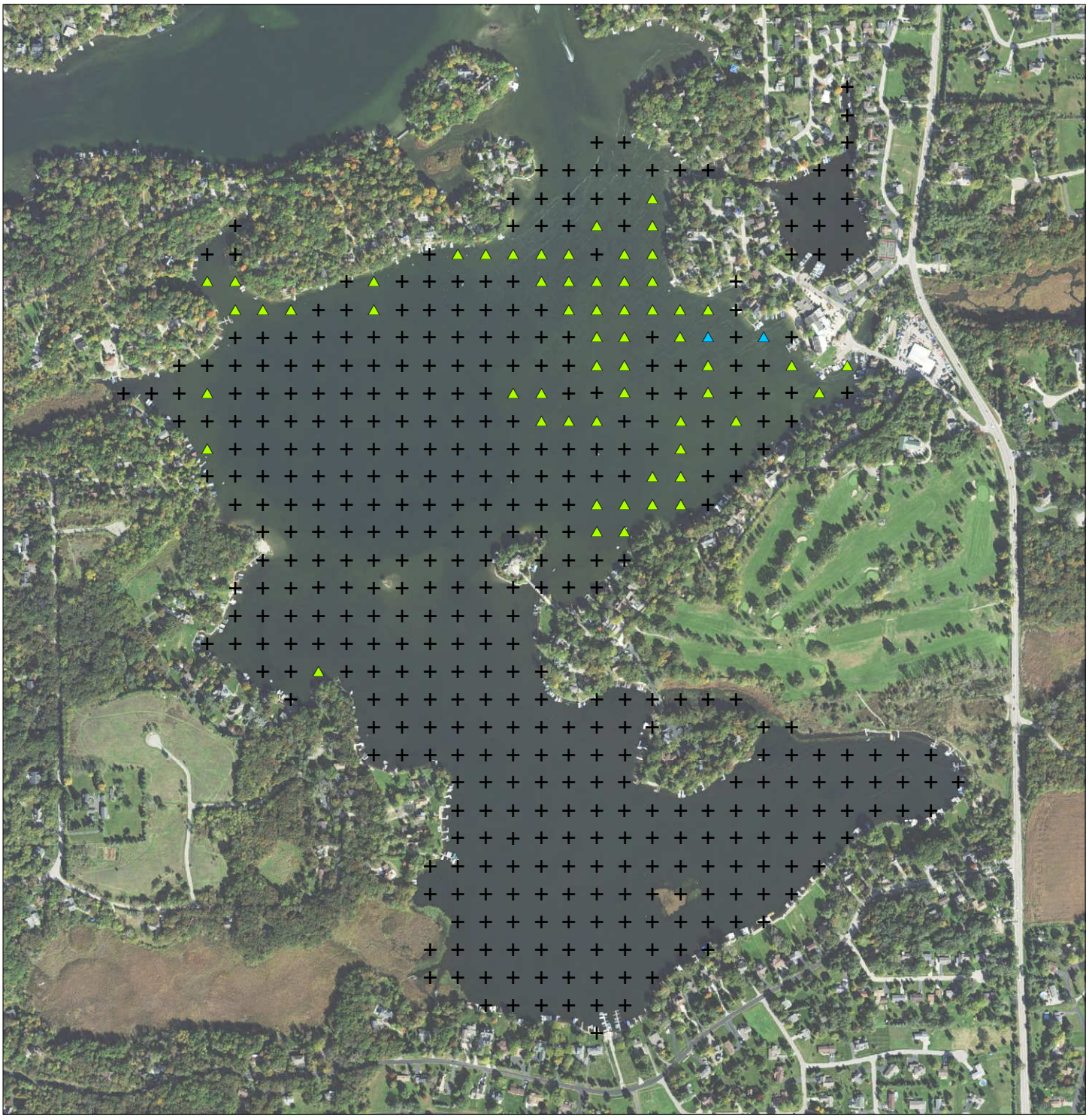
Independent Review by JS on 2015-02-05

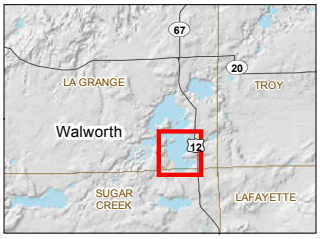
0 400 800 Feet

1:9,600 (at original document size of 8.5x11)

N

Stantec





Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec
3. Orthophotography: 2015 NAIP

Legend

- GPS Sample Points*
- Fullness Rating 1
- Fullness Rating 2

Fullness Rating	Coverage	Description
1		Few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2		There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover tines.
3		The rake is completely covered and tines are not visible.

*Survey Completed 2014/07/29 by James Scharl & Tom Lamppa

Figure No.
3.3

Title
2014 PI Survey - Mill Lake
Spiny Naiad *(Najas marina)*

Client/Project
Lauderdale Lakes
Management District

Project Location
T. of Elkhorn,
Walworth Co., WI

193703101
Prepared by KAS on 2014-09-25
Technical Review by AB on 2014-09-25
Independent Review by JS on 2015-02-05

0 400 800 Feet
1:9,600 (at original document size of 8.5x11)

N

Stantec

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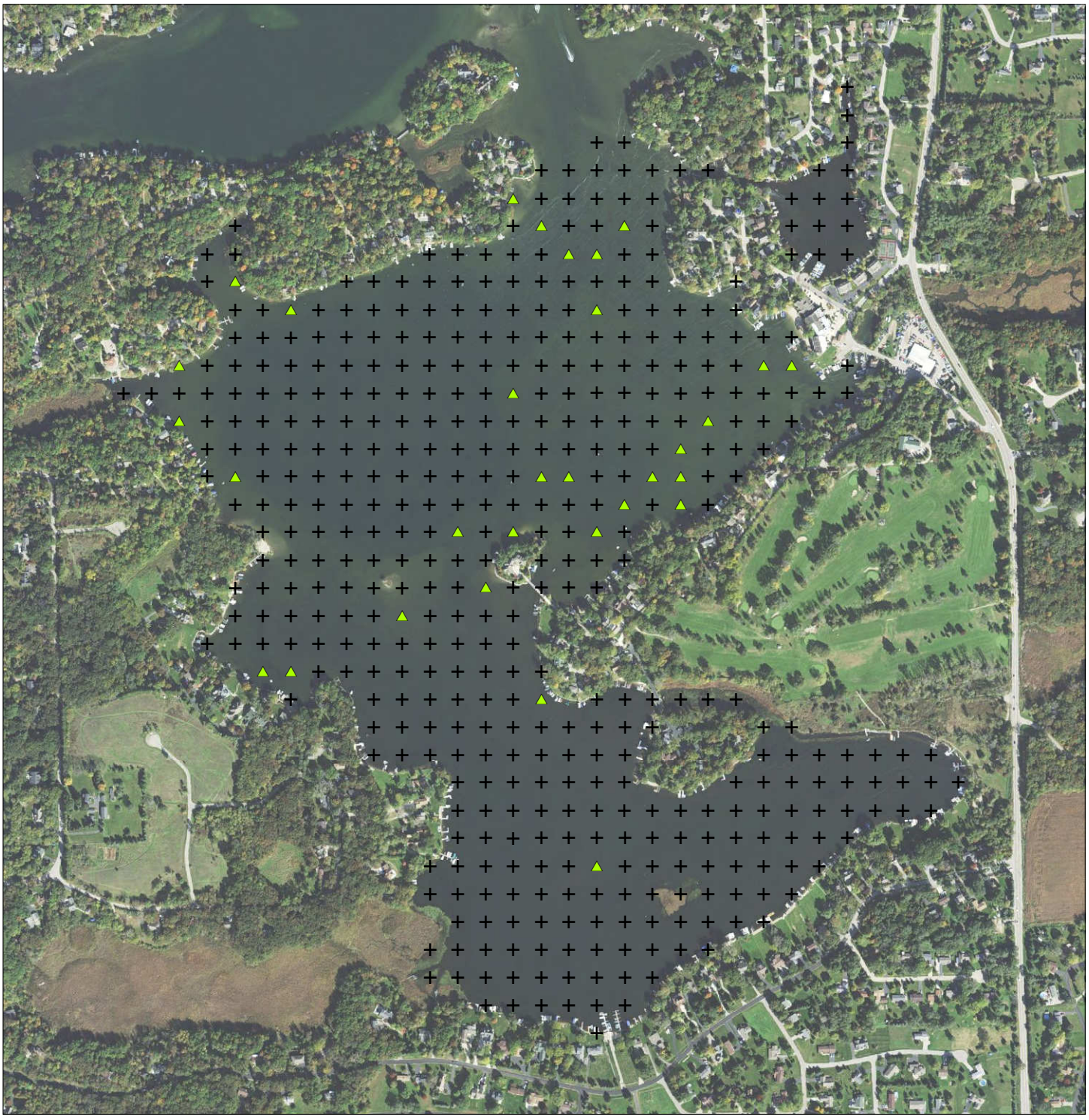
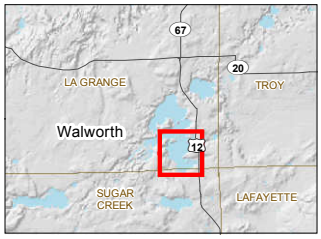




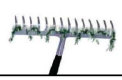
Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec
3. Orthophotography: 2015 NAIP

Legend

+ GPS Sample Points*

▲ Fullness Rating 1

Fullness Rating	Coverage	Description
1		Few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2		There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover tines.
3		The rake is completely covered and tines are not visible.

*Survey Completed 2014/07/29 by James Scharl & Tom Lamppa

Figure No.

3.4

Title

2014 PI Survey - Mill Lake

Bladderwort *(Utricularia vulgaris)*

Client/Project

Lauderdale Lakes Management District

Project Location

T. of Elkhorn, Walworth Co., WI

193703101

Prepared by KAS on 2014-09-25

Technical Review by AB on 2014-09-25

Independent Review by JS on 2015-02-05

0 400 800 Feet

1:9,600 (at original document size of 8.5x11)

N

Stantec

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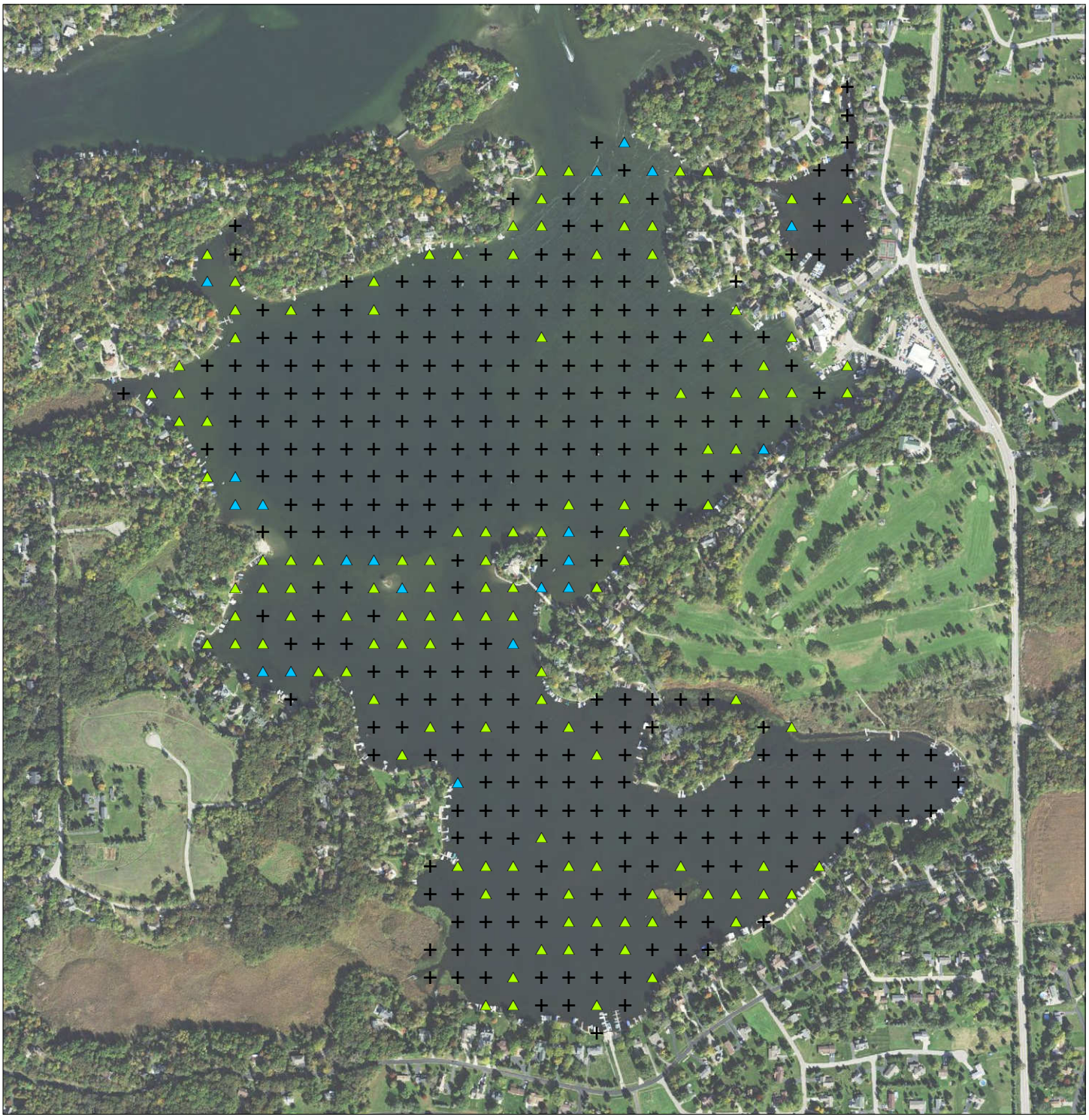
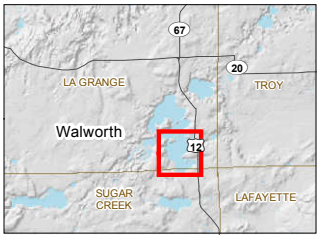


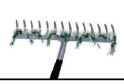
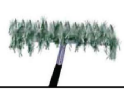


Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec
3. Orthophotography: 2015 NAIP

Legend

- \+ GPS Sample Points*
- ▲ Fullness Rating 1
- ▲ Fullness Rating 2

Fullness Rating	Coverage	Description
1		Few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2		There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover tines.
3		The rake is completely covered and tines are not visible.

*Survey Completed 2014/07/29 by James Scharl & Tom Lamppa

Figure No.
3.5

Title
2014 PI Survey - Mill Lake
Muskgrass *(Chara sp.)*

Client/Project
Lauderdale Lakes
Management District

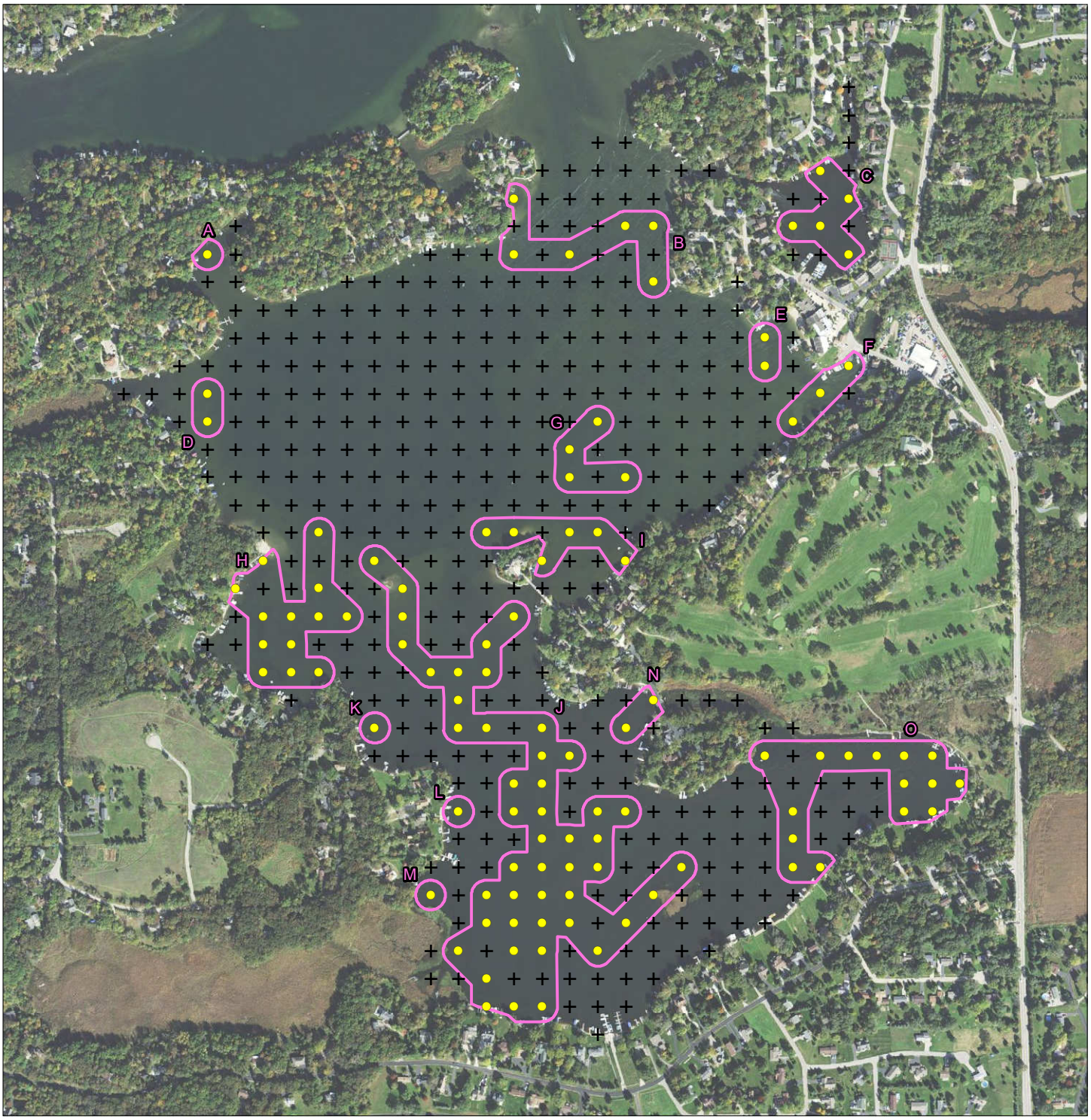
Project Location
T. of Elkhorn,
Walworth Co., WI

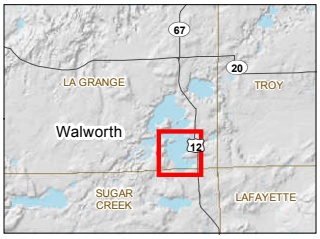
193703101
Prepared by KAS on 2014-09-25
Technical Review by AB on 2014-09-25
Independent Review by JS on 2015-02-05

0 400 800 Feet
1:9,600 (at original document size of 8.5x11)

N

Stantec





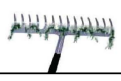
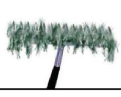
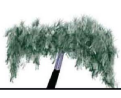
Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec
3. Orthophotography: 2015 NAIP

Legend

- GPS Sample Points*
- Fullness Rating 1
- Aquatic Invasive Plant Area

Eurasian Water-Milfoil (acreage)			
A	0.45	I	3.68
B	5.44	J	30.41
C	3.26	K	0.50
D	1.09	L	0.50
E	1.09	M	0.50
F	2.04	N	1.14
G	3.00	0	9.61
H	8.28		
Total = 70.99			

Fullness Rating	Coverage	Description
1		Few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2		There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover tines.
3		The rake is completely covered and tines are not visible.

*Survey Completed 2014/07/29 by James Scharl & Tom Lamppa

Figure No.
3.6

Title
2014 PI Survey - Mill Lake
Eurasian Water-Milfoil

Client/Project
Lauderdale Lakes
Management District

Project Location
T. of Elkhorn,
Walworth Co., WI

193703101
Prepared by KAS on 2014-09-25
Technical Review by AB on 2014-09-25
Independent Review by JS on 2015-02-05

0 400 800 Feet
1:9,600 (at original document size of 8.5x11)

N

Stantec

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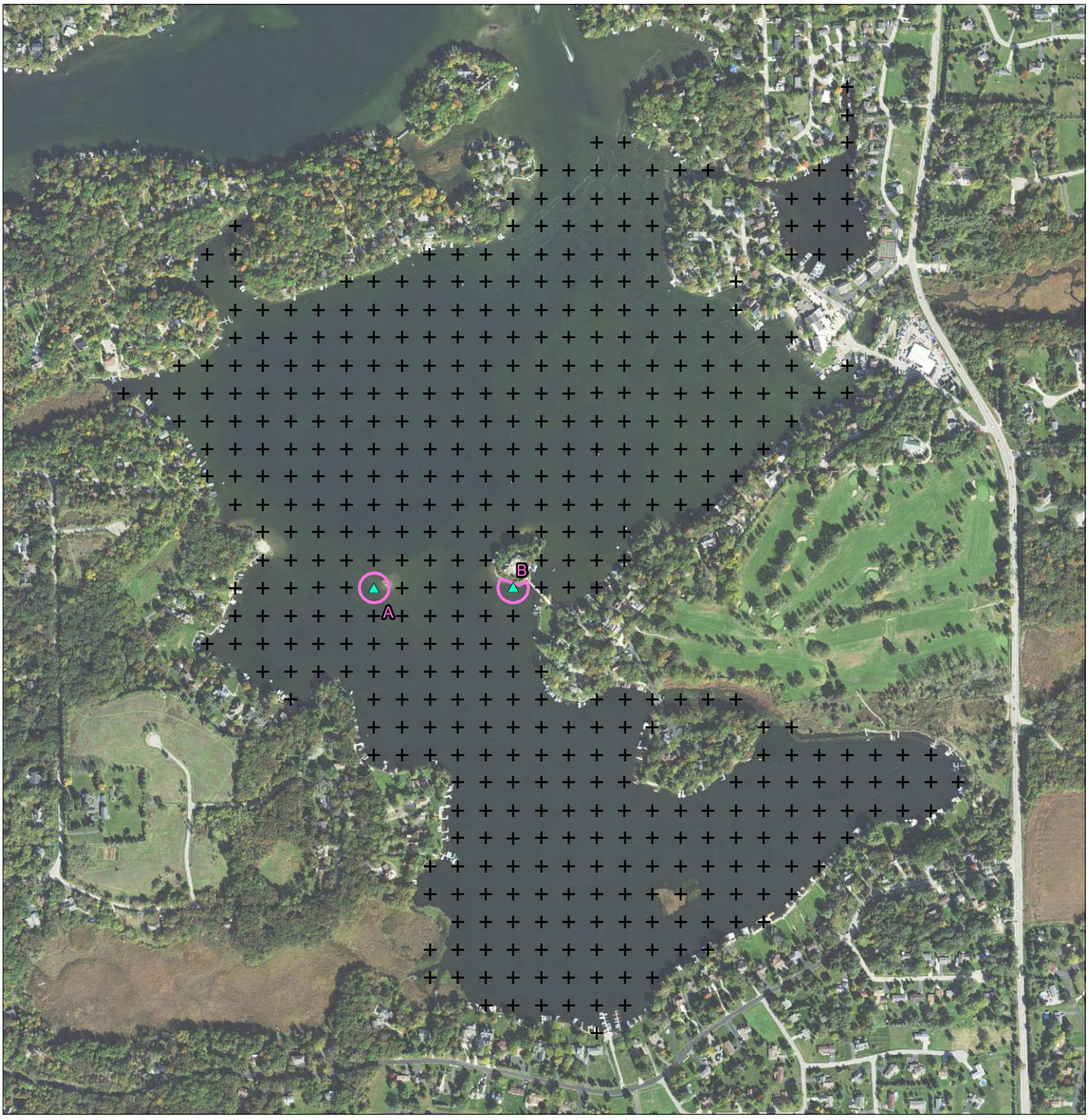
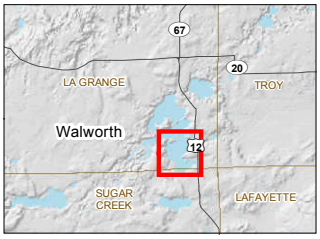




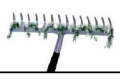
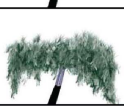
Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec
3. Orthophotography: 2015 NAIP

Legend

- GPS Sample Points*
- Fullness Rating 1
- Aquatic Invasive Plant Area

Curly-leaf Pondweed (acreage)	
A	0.45
B	0.36
Total = 0.81	

Fullness Rating	Coverage	Description
1		Few plants. There are not enough plants to entirely cover the length of the rake head in a single layer.
2		There are enough plants to cover the length of the rake head in a single layer, but not enough to fully cover tines.
3		The rake is completely covered and tines are not visible.

*Survey Completed 2014/07/29 by James Scharl & Tom Lamppa

Figure No.
3.7

Title
2014 PI Survey - Mill Lake
Curly-leaf Pondweed

Client/Project
Lauderdale Lakes
Management District

Project Location
T. of Elkhorn,
Walworth Co., WI

193703101
Prepared by KAS on 2014-09-25
Technical Review by AB on 2014-09-25
Independent Review by JS on 2015-02-05

0 400 800 Feet
1:9,600 (at original document size of 8.5x11)

N

Stantec

Appendix D

Raw Plant Survey Data

	A	I	J	M	N	O	P	Q	R	AG	AQ	AW	BR	BU	CA	CH	CP	DL	EF	ER	ES	FN	FO	FP	FQ
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P), rake rope (R), camera (C)	comments	Total Rake Fullness	*Myriophyllum spicatum*, Eurasian water-milfoil or Hybrid water-milfoil	*Chara* sp., Muskgrasses	*Elodea canadensis*, Common waterweed	*Heteranthera dubia*, Water star-grass	*Najas flexilis*, Slender naiad	*Najas marina*, Spiny naiad	*Nuphar variegata*, Spatterdock	*Potamogeton alpinus*, Alpine pondweed	*Potamogeton gramineus*, Variable pondweed	*Sagittaria cuneata*, Arum-leaved arrowhead	*Stuckenia pectinata*, Sago pondweed	*Utricularia vulgaris*, Common bladderwort	*Vallisneria americana*, Wild celery				
2	**Lake**	Green Lake	1				DENSE/CATTAILS																		
3	**County**	Walworth	2				DENSE/CATTAILS																		
4	**WBIC**		3				DENSE/WWL																		
5	**Date**	07/29/14	4				DENSE/WWL																		
6	**Field Crew**	James Scharl	5	2	m	p		1		1										1					
7		Thomas Lamppa	6	2	m	p		1														1			
8			7	0.5	r	p		1	1	1			1		1			1				1			
9			8	1.5	m	p		3		3															
10			9	2	m	p		1	1																
11			10	1	m	p		1		1			1									1			
12			11	2	m	p		1	1	1												1			
13			12	2	m	p		1		1			1									1			
14			13	2.5	s	p		1		1															
15			14	3.5	s	p		1		1															
16			15	4	s	p																			
17			16	1.5	m	p		1		1	1	1										1			
18			17	2.5	m	p		1		1			1									1			
19			18	3	m	p		1	1				1									1			
20			19	4.5	m	p																			
21			20	5	m	p																			
22			21	5	s	p																			
23			22	5	m	p																			
24			23	2.5	m	p		1	1		1		1									1			
25			24	2	m	p		1		1								1				1			
26			25	3.5	m	p		1	1																
27			26	5	m	p		1		1															
28			27	4.5	m	p		1		1															
29			28	4.5	s	p		1		1															
30			29	5	s	p		1													1				
31			30	2.5	m	p		1	1													1			
32			31	2.5	m	p		2		2												1			
33			32	4	m	p																			
34			33	5	m	p		2		2															
35			34	5	m	p		1		1															
36			35	5	m	p		1		1															
37			36	5	m	p		1		1			1												
38			37	3	m	p		1	1				1									1			
39			38	3.5	m	p		1		1												1			
40			39	5	m	p		1		1															
41			40	5.5	m	p		1						1						1					
42			41	5.5	m	p																			
43			42	6	m	p		1		1										1		1			
44			43	5.5	m	p		1	1	1										1					
45			44	3.5	m	p		2		2															
46			45	3.5	m	p		1		1												1			
47			46	5	m	p		2		2															
48			47	6	m	p																			
49			48	6.5	m	p		1		1															
50			49	7	m	p		1		1															
51			50	6.5	m	p		1		1															
52			51	5	m	p		1	1											1	1	1			
53			52	2.5	r	p																			
54			53	4	m	p		1	1	1												1			
55			54	6	m	p		1														1			
56			55	6.5	m	p																			
57			56	8	m	p																			
58			57	8	m	p		1		1										1	1	1			
59			58	7	m	p																			
60			59	4.5	m	p		1		1															
61			60	2.5	m	p		1		1										1		1			
62			61	3	m	p		1		1										1					
63			62	2.5	m	p		2		2			1												
64			63	2	s	p																			
65			64	5	m	p																			
66			65	6	m	p		1	1											1					
67			66	7	m	p		1												1		1			
68			67	8	m	p		1						1											
69			68	8	m	p																			
70			69	8.5	m	p																			
71			70	7	m	p		1		1															
72			71	6	m	p		1	1													1			
73			72	0.5	r	p																			
74			73	3	m	p		1	1	1			1		v										
75			74	5	m	p		1		1															
76			75	5	m	p																			
77			76	3	m	p		2		2												1			
78			77	4	s	p		1		1			1												
79			78	5	m	p		1	1													1			
80			79	7.5	m	p		1						1											
81			80	8.5	m	p		1														1			

	A	I	J	M	N	O	P	Q	R	AG	AQ	AW	BR	BU	CA	CH	CP	DL	EF	ER	ES	FN	FO	FP	FQ
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P), rake rope (R), camera (C)	comments	Total Rake Fullness	*Myriophyllum spicatum*, Eurasian water-milfoil or Hybrid water-milfoil	*Chara* sp., Muskgrasses	*Elodea canadensis*, Common waterweed	*Heteranthera dubia*, Water star-grass	*Najas flexilis*, Slender naiad	*Najas marina*, Spiny naiad	*Nuphar variegata*, Spatterdock	*Potamogeton alpinus*, Alpine pondweed	*Potamogeton gramineus*, Variable pondweed	*Sagittaria cuneata*, Arum-leaved arrowhead	*Stuckenia pectinata*, Sago pondweed	*Utricularia vulgaris*, Common bladderwort	*Vallisneria americana*, Wild celery
82			81	9	m	p		1													1				
83			82	10	s	p		1											1						
84			83	15	m	r																			
85			84	12	s	p		1								1									
86			85	6.5	s	p		1						1							1				
87			86	6	s	p																			
88			87	6	s	p		1		1				1							1				
89			88	7	s	p																			
90			89	7	s	p		1											1		1				
91			90	5	s	p																			
92			91	5.5	s	p		1						1											
93			92	4	s	p																			
94			93	3.5	s	p																			
95			94	6	m	p																			
96			95	6.5	m	p																			
97			96	4	m	p																			
98			97	5	m	p		1											1						
99			98	8.5	m	p																			
100			99	10.5	m	p																			
101			100	16	m	r																			
102			101	19	m	r																			
103			102	22	m	r																			
104			103	17.5	s	r																			
105			104	10	s	p																			
106			105	21	s	r																			
107			106	26.5																					
108			107	30																					
109			108	24	s	r																			
110			109	25																					
111			110				FISHERMAN																		
112			111	4	m	p		1													1				
113			112	6	m	p		1		1															
114			113	6	m	p																			
115			114	6	m	p																			
116			115	5	m	p																			
117			116	6	m	p		1	1										1		1				
118			117	15	s	r																			
119			118	22	m	r																			
120			119	22.5	m	r																			
121			120	26																					
122			121	28																					
123			122	28.5																					
124			123	34																					
125			124	38																					
126			125	39.5																					
127			126	38.5																					
128			127	28.5																					
129			128	6.5	s	p		1		1							1		1		1				
130			129	5	m	p		1											1						
131			130	5	m	p		1		1									1						
132			131	6	m	p		1											1	1					
133			132	6.5	m	p																			
134			133	6	m	p																			
135			134	6	m	p																			
136			135	6	m	p																			
137			136	2	r	p																			
138			137				LAND																		
139			138	11.5	s	p																			
140			139				SWIMMERS																		
141			140	28																					
142			141	29.5																					
143			142	33																					
144			143	37																					
145			144	37.5																					
146			145	40																					
147			146	42																					
148			147	42																					
149			148	32																					
150			149	8	s	p																			
151			150	1	r	p		1		1															
152			151	6	m	p		1											1						
153			152	7	m	p																			
154			153	7	m	p																			
155			154	7	m	p																			
156			155	7	m	p																			
157			156	7	m	p		1		1															
158			157	7	m	p																			
159			158	6.5	m	p																			
160			159	5	m	p																			
161			160	0.5	r	p																			

	A	I	J	M	N	O	P	Q	R	AG	AQ	AW	BR	BU	CA	CH	CP	DL	EF	ER	ES	FN	FO	FP	FQ
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P), rake rope (R), camera (C)	comments	Total Rake Fullness	*Myriophyllum spicatum*, Eurasian water-milfoil or Hybrid water-milfoil	*Chara* sp., Muskgrasses	*Elodea canadensis*, Common waterweed	*Heteranthera dubia*, Water star-grass	*Najas flexilis*, Slender naiad	*Najas marina*, Spiny naiad	*Nuphar variegata*, Spatterdock	*Potamogeton alpinus*, Alpine pondweed	*Potamogeton gramineus*, Variable pondweed	*Sagittaria cuneata*, Arum-leaved arrowhead	*Stuckenia pectinata*, Sago pondweed	*Utricularia vulgaris*, Common bladderwort	*Vallisneria americana*, Wild celery
162			161	22.5	s	r																			
163			162	31																					
164			163	33.5																					
165			164	34																					
166			165	36.5																					
167			166	39																					
168			167	40																					
169			168	40.5																					
170			169	42																					
171			170	39																					
172			171	27.5																					
173			172	0.5	r	p																			
174			173				LAND																		
175			174	2	s	p																			
176			175				LAND																		
177			176	5	m	p		1	1											1					
178			177	7	m	p																			
179			178	7	m	p		1												1					
180			179	6.5	m	p		1						1						1		1			
181			180	7	m	p		1														1			
182			181	7.5	m	p																			
183			182	7.5	m	p		1												1					
184			183	7	m	p																			
185			184	7	m	p																			
186			185	6.5	m	p		1												1					
187			186	6	m	p		1												1					
188			187	5	m	p																			
189			188	4	m	p		1		1										1					
190			189	13	s	r																			
191			190	30																					
192			191	36																					
193			192	36																					
194			193	37.5																					
195			194	40																					
196			195	40																					
197			196	42																					
198			197	43.5																					
199			198	44																					
200			199	42																					
201			200	37.5																					
202			201	16	s	r																			
203			202	6	r	p																			
204			203	5	r	p																			
205			204	9.5	r	p																			
206			205	12.5	s	r																			
207			206	16	s	r																			
208			207	10	s	p																			
209			208	7.5	s	p		1												1					
210			209	6	m	p		1						1											
211			210	7	m	p		1						1											
212			211	7	m	p		1						1											
213			212	8	m	p		1		1															
214			213	8	m	p																			
215			214	8	m	p																			
216			215	8	m	p		1						1											
217			216	7.5	m	p																			
218			217	7	m	p		1						1											
219			218	7	m	p																			
220			219	6	m	p		1												1					
221			220	5	m	p		1												1					
222			221	9.5	m	p		1		1												1			
223			222	6	s	p		1														1			
224			223	27.5																					
225			224	38																					
226			225	37																					
227			226	37																					
228			227	39.5																					
229			228	39																					
230			229	42																					
231			230	44.5																					
232			231	46																					
233			232	46																					
234			233	46																					
235			234	42.5																					
236			235	37																					
237			236	39.5																					
238			237	43																					
239			238	44																					
240			239	38																					
241			240	11	m	p																			

	A	I	J	M	N	O	P	Q	R	AG	AQ	AW	BR	BU	CA	CH	CP	DL	EF	ER	ES	FN	FO	FP	FQ
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P), rake rope (R), camera (C)	comments	Total Rake Fullness	*Myriophyllum spicatum*, Eurasian water-milfoil or Hybrid water-milfoil	*Chara* sp., Muskgrasses	*Elodea canadensis*, Common waterweed	*Heteranthera dubia*, Water star-grass	*Najas flexilis*, Slender naiad	*Najas marina*, Spiny naiad	*Nuphar variegata*, Spatterdock	*Potamogeton alpinus*, Alpine pondweed	*Potamogeton gramineus*, Variable pondweed	*Sagittaria cuneata*, Arum-leaved arrowhead	*Stuckenia pectinata*, Sago pondweed	*Utricularia vulgaris*, Common bladderwort	*Vallisneria americana*, Wild celery
242			241	7	m	p		1						1					1						
243			242	7	m	p		1											1						
244			243	7	m	p		1						1											
245			244	7.5	m	p																			
246			245	6.5	m	p		1											1						
247			246	8	m	p		1											1						
248			247	8	m	p																			
249			248	8	m	p		1						1											
250			249	8	m	p		1											1						
251			250	7	m	p		1											1						
252			251	7	m	p		1											1						
253			252	6	m	p																			
254			253	5	m	p		1											1						
255			254	4	m	p		1	1										1		1				
256			255	21	s	r																			
257			256	34																					
258			257	38																					
259			258	37.5																					
260			259	38																					
261			260	40																					
262			261	42																					
263			262	46																					
264			263	48																					
265			264	48																					
266			265	47																					
267			266	47																					
268			267	48																					
269			268	49																					
270			269	49.5																					
271			270	47																					
272			271	40																					
273			272	31																					
274			273	10.5	m	p		1											1						
275			274	7	m	p		1						1							1				
276			275	8	m	p		1		1															
277			276	7.5	m	p																			
278			277	7.5	m	p																			
279			278	7	m	p		1						1											
280			279	8	m	p																			
281			280	8.5	m	p		1											1						
282			281	8	m	p		1											1						
283			282	8	m	p																			
284			283	7.5	m	p																			
285			284	6.5	m	p		1											1						
286			285	6	m	p		1											1						
287			286	5	m	p		1	1	1									1						
288			287				SWIM AREA																		
289			288	9	s	p		1													1				
290			289	24																					
291			290	36																					
292			291	38																					
293			292	40																					
294			293	42																					
295			294	44																					
296			295	46																					
297			296	47																					
298			297	49.5																					
299			298	50																					
300			299	50																					
301			300	51.5																					
302			301	51.5																					
303			302	51																					
304			303	49																					
305			304	48.5																					
306			305	42																					
307			306	39																					
308			307	22.5	s	r																			
309			308	8	s	p																			
310			309	8	m	p		1		1									1						
311			310	7.5	m	p		1						1											
312			311	7.5	m	p		1						1					1						
313			312	8	m	p																			
314			313	9	m	p																			
315			314	8.5	m	p		1											1						
316			315	7.5	m	p		1											1						
317			316	7	m	p		1													1				
318			317	6.5	m	p		1											1						
319			318	5.5	m	p		1											1						
320			319	5	m	p		1													1				
321			320	2	r	p																			

	A	I	J	M	N	O	P	Q	R	AG	AQ	AW	BR	BU	CA	CH	CP	DL	EF	ER	ES	FN	FO	FP	FQ
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P), rake rope (R), camera (C)	comments	Total Rake Fullness	*Myriophyllum spicatum*, Eurasian water-milfoil or Hybrid water-milfoil	*Chara* sp., Muskgrasses	*Elodea canadensis*, Common waterweed	*Heteranthera dubia*, Water star-grass	*Najas flexilis*, Slender naiad	*Najas marina*, Spiny naiad	*Nuphar variegata*, Spatterdock	*Potamogeton alpinus*, Alpine pondweed	*Potamogeton gramineus*, Variable pondweed	*Sagittaria cuneata*, Arum-leaved arrowhead	*Stuckenia pectinata*, Sago pondweed	*Utricularia vulgaris*, Common bladderwort	*Vallisneria americana*, Wild celery
322			321	6	m	p		1						1							1				
323			322	12	s	p																			
324			323	38																					
325			324	40																					
326			325	44																					
327			326	45																					
328			327	45.5																					
329			328	46																					
330			329	46																					
331			330	48																					
332			331	50																					
333			332	51																					
334			333	52																					
335			334	52																					
336			335	52																					
337			336	52																					
338			337	52																					
339			338	51																					
340			339	48																					
341			340	37																					
342			341	20	s	r																			
343			342	14	s	r																			
344			343	8	m	p		1						1											
345			344	8	m	p		1						1					1						
346			345	7	m	p																			
347			346	9	m	p		1		1															
348			347	9	m	p																			
349			348	8	m	p																			
350			349	7	m	p		1											1						
351			350	6	m	p																			
352			351	6	m	p		1						1					1						
353			352	5.5	s	p																			
354			353	3	s	p		1		1								v			1				
355			354	5	s	p																			
356			355	7	s	p		1		1															
357			356	8	s	p																			
358			357	27.5																					
359			358	38																					
360			359	42.5																					
361			360	45																					
362			361	45.5																					
363			362	46.5																					
364			363	44																					
365			364	45																					
366			365	49																					
367			366	52																					
368			367	53																					
369			368	53																					
370			369	52.5																					
371			370	52.5																					
372			371	53																					
373			372	52																					
374			373	51																					
375			374	50																					
376			375	43																					
377			376	26.5																					
378			377	8	m	p		1						1					1						
379			378	8	m	p		1											1						
380			379	8	m	p		1						1											
381			380	9	m	p																			
382			381	8	m	p																			
383			382	6	m	p		1													1				
384			383	6	m	p		1													1				
385			384	5	m	p		1		1															
386			385	5	m	p		1											1						
387			386	3	m	p		2		2									1	1	1				
388			387	3	m	p		1		1									1						
389			388	5	s	p		1													1				
390			389	7.5	m	p		1		1															
391			390	7.5	m	p		1						1											
392			391	18	s	r																			
393			392	37																					
394			393	41																					
395			394	42																					
396			395	41.5																					
397			396	44.5																					
398			397	46																					
399			398	46																					
400			399	51																					
401			400	53																					

	A	I	J	M	N	O	P	Q	R	AG	AQ	AW	BR	BU	CA	CH	CP	DL	EF	ER	ES	FN	FO	FP	FQ
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P), rake rope (R), camera (C)	comments	Total Rake Fullness	*Myriophyllum spicatum*, Eurasian water-milfoil or Hybrid water-milfoil	*Chara* sp., Muskgrasses	*Elodea canadensis*, Common waterweed	*Heteranthera dubia*, Water star-grass	*Najas flexilis*, Slender naiad	*Najas marina*, Spiny naiad	*Nuphar variegata*, Spatterdock	*Potamogeton alpinus*, Alpine pondweed	*Potamogeton gramineus*, Variable pondweed	*Sagittaria cuneata*, Arum-leaved arrowhead	*Stuckenia pectinata*, Sago pondweed	*Utricularia vulgaris*, Common bladderwort	*Vallisneria americana*, Wild celery
402			401	54																					
403			402	53.5																					
404			403	53																					
405			404	53																					
406			405	53																					
407			406	52																					
408			407	51																					
409			408	50																					
410			409	45																					
411			410	30																					
412			411	9	m	p		1						1											
413			412	8	m	p		1						1											
414			413	9	m	p																			
415			414	8	m	p																			
416			415	4	r	p																			
417			416	3.5	s	p																			
418			417	4	s	p																			
419			418	5.5	m	p		1		1															
420			419	4	m	p		1		1										1					
421			420	4	m	p		2		2										1	1				
422			421	3	m	p		1														1			
423			422	5	s	p		1														1			
424			423	7	s	p		1												1					
425			424	22	s	r																			
426			425	33.5																					
427			426	39																					
428			427	39																					
429			428	38																					
430			429	40																					
431			430	46																					
432			431	49.5																					
433			432	53.5																					
434			433	56																					
435			434	56																					
436			435	56																					
437			436	54.5																					
438			437	54																					
439			438	53																					
440			439	51																					
441			440	50																					
442			441	50																					
443			442	48																					
444			443	43																					
445			444	20.5	s	r																			
446			445	19	s	r																			
447			446	8.5	s	p		1						1											
448			447	6	r	p		1						1								1			
449			448	2	m	p		1		1												1			
450			449	4	m	p		1	1	1												1			
451			450	3	m	p		1		1															
452			451	3	m	p		3		3												1			
453			452	3	m	p		1	1	1										1		1			
454			453	3	m	p		1				1	1									1			
455			454	6	s	p		1	1	1												1			
456			455	13.5	s	r																			
457			456	30.5																					
458			457	38																					
459			458	37																					
460			459	37																					
461			460	42																					
462			461	51																					
463			462	53																					
464			463	55																					
465			464	56																					
466			465	56																					
467			466	56																					
468			467	54																					
469			468	53.5																					
470			469	52																					
471			470	50																					
472			471	49																					
473			472	49.5																					
474			473	46.5																					
475			474	43																					
476			475	30																					
477			476	9	s	p		1						1											
478			477	8	s	p																			
479			478	5	s	p		1	1																
480			479	2	s	p		2	1	1												2			
481			480	3	m	p		2		2															

	A	I	J	M	N	O	P	Q	R	AG	AQ	AW	BR	BU	CA	CH	CP	DL	EF	ER	ES	FN	FO	FP	FQ
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P), rake rope (R), camera (C)	comments	Total Rake Fullness	*Myriophyllum spicatum*, Eurasian water-milfoil or Hybrid water-milfoil	*Chara* sp., Muskgrasses	*Elodea canadensis*, Common waterweed	*Heteranthera dubia*, Water star-grass	*Najas flexilis*, Slender naiad	*Najas marina*, Spiny naiad	*Nuphar variegata*, Spatterdock	*Potamogeton alpinus*, Alpine pondweed	*Potamogeton gramineus*, Variable pondweed	*Sagittaria cuneata*, Arum-leaved arrowhead	*Stuckenia pectinata*, Sago pondweed	*Utricularia vulgaris*, Common bladderwort	*Vallisneria americana*, Wild celery
482			481				PIERS/DOCKS																		
483			482	2	s	p		1													1				
484			483	3	m	p		1		1											1				
485			484	2.5	m	p		2		2			1								1				
486			485	4	s	p		1		1											1				
487			486	7.5	m	p		1		1															
488			487	17	s	r																			
489			488	28																					
490			489	35																					
491			490	35																					
492			491	39																					
493			492	50.5																					
494			493	55																					
495			494	56																					
496			495	57																					
497			496	57																					
498			497	56																					
499			498	55																					
500			499	53																					
501			500	52																					
502			501	50																					
503			502	50																					
504			503	49																					
505			504	45																					
506			505	42																					
507			506	35																					
508			507	10	s	p																			
509			508	7	m	p																			
510			509	3	s	p		1		1															
511			510	6.5	s	p		1													1				
512			511	8.5	m	p		1						1											
513			512	23	s	r																			
514			513	32																					
515			514	36																					
516			515	46																					
517			516	53																					
518			517	57																					
519			518	57																					
520			519	57																					
521			520	56.5																					
522			521	56																					
523			522	54																					
524			523	54																					
525			524	52																					
526			525	57																					
527			526	48																					
528			527	46																					
529			528	39																					
530			529	27																					
531			530	12	s	p		1						1											
532			531	8	m	p		1		1				1							1				
533			532	5	s	p																			
534			533	3	s	p																			
535			534	7	r	p		1													1				
536			535	20.5																					
537			536	30																					
538			537	35.5																					
539			538	48.5																					
540			539	52																					
541			540	57																					
542			541	57																					
543			542	57																					
544			543	57																					
545			544	56																					
546			545	55																					
547			546	54																					
548			547	52.5																					
549			548	51																					
550			549	42																					
551			550	39																					
552			551	27																					
553			552	10	m	p		1						1						1					
554			553	9	m	p		1						1											
555			554	7.5	m	p		1								1					1				
556			555	5	s	p																			
557			556	9	s	p		1						1											
558			557	27																					
559			558	32																					
560			559	45																					
561			560	54																					

	A	I	J	M	N	O	P	Q	R	AG	AQ	AW	BR	BU	CA	CH	CP	DL	EF	ER	ES	FN	FO	FP	FQ
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P), rake rope (R), camera (C)	comments	Total Rake Fullness	*Myriophyllum spicatum*, Eurasian water-milfoil or Hybrid water-milfoil	*Chara* sp., Muskgrasses	*Elodea canadensis*, Common waterweed	*Heteranthera dubia*, Water star-grass	*Najas flexilis*, Slender naiad	*Najas marina*, Spiny naiad	*Nuphar variegata*, Spatterdock	*Potamogeton alpinus*, Alpine pondweed	*Potamogeton gramineus*, Variable pondweed	*Sagittaria cuneata*, Arum-leaved arrowhead	*Stuckenia pectinata*, Sago pondweed	*Utricularia vulgaris*, Common bladderwort	*Vallisneria americana*, Wild celery				
562			561	56																					
563			562	56																					
564			563	57																					
565			564	57																					
566			565	56																					
567			566	55																					
568			567	53																					
569			568	53																					
570			569	50.5																					
571			570	37																					
572			571	27																					
573			572	9	s	p																			
574			573	9.5	m	p		1						1											
575			574	8	r	p		1						1											
576			575	6		p																			
577			576	7	r	p																			
578			577	9	m	p		1		1				1						1		1			
579			578	28.5																					
580			579	44																					
581			580	51																					
582			581	54																					
583			582	55.5																					
584			583	56																					
585			584	50																					
586			585	55																					
587			586	53.5																					
588			587	52.5																					
589			588	51																					
590			589	46.5																					
591			590	36																					
592			591	13.5	s	r																			
593			592	9.5	s	p																			
594			593	8	r	p																			
595			594	9	s	p																			
596			595	39																					
597			596	49																					
598			597	52																					
599			598	54																					
600			599	55																					
601			600	55																					
602			601	54																					
603			602	54																					
604			603	53																					
605			604	51																					
606			605	46																					
607			606	35																					
608			607	18.5	s	r																			
609			608	1	r	p																			
610			609	8	r	p																			
611			610	15	s	r																			
612			611	38																					
613			612	49.5																					
614			613	51.5																					
615			614	53																					
616			615	54.5																					
617			616	54.5																					
618			617	54																					
619			618	57.5																					
620			619	53																					
621			620	46																					
622			621	36																					
623			622	12.5	s	p																			
624			623	7	s	p																			
625			624	27																					
626			625	47.5																					
627			626	51																					
628			627	52																					
629			628	53																					
630			629	54																					
631			630	54																					
632			631	54																					
633			632	53																					
634			633	44																					
635			634	21	s	r																			
636			635	9.5	s	p																			
637			636	6	r	p																			
638			637	9.5	r	p																			
639			638	35																					
640			639	46																					
641			640	51																					

	A	I	J	M	N	O	P	Q	R	AG	AQ	AW	BR	BU	CA	CH	CP	DL	EF	ER	ES	FN	FO	FP	FQ
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P), rake rope (R), camera (C)	comments	Total Rake Fullness	*Myriophyllum spicatum*, Eurasian water-milfoil or Hybrid water-milfoil	*Chara* sp., Muskgrasses	*Elodea canadensis*, Common waterweed	*Heteranthera dubia*, Water star-grass	*Najas flexilis*, Slender naiad	*Najas marina*, Spiny naiad	*Nuphar variegata*, Spatterdock	*Potamogeton alpinus*, Alpine pondweed	*Potamogeton gramineus*, Variable pondweed	*Sagittaria cuneata*, Arum-leaved arrowhead	*Stuckenia pectinata*, Sago pondweed	*Utricularia vulgaris*, Common bladderwort	*Vallisneria americana*, Wild celery				
642			641	53																					
643			642	54																					
644			643	55																					
645			644	55																					
646			645	54																					
647			646	50																					
648			647	34																					
649			648	8.5	r	p																			
650			649	9.5	r	p																			
651			650	11	r	p																			
652			651	37																					
653			652	48																					
654			653	48																					
655			654	50.5																					
656			655	52																					
657			656	53																					
658			657	52																					
659			658	50																					
660			659	38																					
661			660	11.5	s	p		1	1													1			
662			661	4	r	p																			
663			662	11.5	s	p																			
664			663	38																					
665			664	43																					
666			665				SWIMMERS/SKIERS																		
667			666				SWIMMERS/SKIERS																		
668			667	45																					
669			668	50																					
670			669	48																					
671			670	43.5																					
672			671	28																					
673			672	2	s	p		2					2	1								1			
674			673	5	s	p		1		1												1			
675			674	18.5	s	r																			
676			675	32																					
677			676	29																					
678			677	8	s	p		1						1						1					
679			678	39																					
680			679	44.5																					
681			680	43																					
682			681	39																					
683			682	35																					
684			683	10	r	p																			
685			684	3.5	s	p		1	1	1		1	1									1			
686			685	1.5	s	p		2				2										1			
687			686	5	r	p		1		1															
688			687	6.5	s	p																			
689			688	8	s	p		1	1					1						1		1			
690			689	11.5	s	p																			
691			690	33																					
692			691	41																					
693			692	42																					
694			693	38																					
695			694	33																					
696			695	15	s	r																			
697			696	3	s	p																			
698			697	4	s	p		1					1							1		1			
699			698	27																					
700			699	34																					
701			700	34																					
702			701	29.5																					
703			702	12	s	p		1	1																
704			703	5	s	p																			
705			704	6	s	p		1		1															
706			705	6	s	p		1														1			
707			706	11.5	s	p		1														1			
708			707	7.5	s	p		2		2															
709			708	8.5	s	p																			

	A	I	J	M	N	O	P	Q	R	S	AE	AG	AH	AQ	AW	BQ	BR	BU	CA	CB	CN	CP	CR	CS	CZ	DE	DN	DP	DQ	EC	EF	EJ	EL	EM	ER	ES	EW	FA	FP	FQ	FR
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P) or rake rope (R)?	comments	Total Rake Fullness	*Myriophyllum spicatum*, Eurasian water-milfoil or Hybrid water-milfoil	*Potamogeton crispus* Curly-leaf pondweed	*Ceratophyllum demersum*, Coontail	*Chara* sp., Muskgrasses	*Comarum palustre*, Marsh cinquefoil	*Elodea canadensis*, Common waterweed	*Heteranthera dubia*, Water star-grass	*Myriophyllum verticillatum*, Whorled water-milfoil	*Najas flexilis*, Slender naiad	*Najas marina*, Spiny naiad	*Nuphar variegata*, Spatterdock	*Nymphaea odorata*, White water lily	*Potamogeton foliosus*, Leafy pondweed	*Potamogeton gramineus*, Variable pondweed	*Potamogeton illinoensis*, Illinois pondweed	*Potamogeton natans*, Floating-leaf pondweed	*Potamogeton richardsonii*, Clasping-leaf pondweed	*Potamogeton zosteriformis*, Flat-stem pondweed	*Sagittaria latifolia*, Common arrowhead	*Sagittaria* sp., Arrowhead	*Schoenoplectus acutus*, Hardstem bulrush	*Sparganium* sp., Bur-reed	*Stuckenia pectinata*, Sago pondweed	*Typha* sp., Cattail	*Utricularia geminiscapa*, Twin-stemmed bladderwort	*Utricularia gibba*, Creeping bladderwort	*Utricularia vulgaris*, Common bladderwort	*Vallisneria americana*, Wild celery	*Zizania aquatica*, Southern wild rice	Freshwater sponge			
2	**Name**	Middle Lake	1	2	S	P		1	1									1	V																1					
3	**County**	Walworth	2	7	S	P		1				1																													
4	**WBIC**	755700	3	6.5	S	P		1	1																												1			
5	**Date**	08/11 - 08/13/2014	4	1.5	R	P		1				1							V																					
6	**Field Crew**	Posnanski, Ebersohl	5				TERRESTRIAL																																	
7		Kolasinski, Notbohm	6	4.5	S	P		1				1					1	1																						
8			7	4.5	S	P		1				1					1											1			1					1			
9			8	5	S	P		1										1																					
10			9	5.5	S	P																																		
11			10	4	S	P		1				1																												
12			11				TERRESTRIAL																																	
13			12	7.5	S	P																																		
14			13	6.5	S	P		1										1													1					1			
15			14	4	S	P		1														1						1			1					1			
16			15	5	S	P		1				1						1																					
17			16	6	S	P		1				1						1													1								
18			17	7	S	P		1				1						1																					
19			18	6.5	S	P		1				1						1																			1			
20			19	6.5	S	P		1				1						1																					
21			20	6	S	P		2				2						2																					
22			21	6	S	P		1				1																											
23			22	4	S	P		1				1					1					1									1					1			
24			23	4	S	P		1																				1								1			
25			24	6	S	P		1				1						1													1					1			
26			25	6	S	P		1																							1					1			
27			26				DOCK																																	
28			27	6	S	P		1				1																											
29			28	20.8	S	R																																		
30			29	22.6	S	R																																		
31			30	23.2	S	R																																		
32			31	12	S	P																																		
33			32	7.5	S	P		1				1						1																					
34			33	7	S	P		1										1													1								
35			34	6	S	P		2				2																											
36			35	5	S	P		1				1																			1								
37			36	4	S	P		1				1					1											1								1			
38			37				DOCK																																	
39			38	5.5	S	P		1				1																	1								1			
40			39	4	S	P																																		
41			40	4	S	P		1				1																											
42			41	22.4	S	R																																		
43			42	33.9																																				
44			43	33.8																																				
45			44	11.5	S	P																																		
46			45	26.3																																				
47			46	16.4	S	R																																		
48			47	8	S	P		1				1						1																					
49			48	6.5	S	P		1				1																											
50			49	5	S	P		1				1					1	1																					
51			50	4	S	P																																		
52			51	5.5	S	P		1				1						1																					
53			52	4	S	P		1				1																											
54			53	7	S	P		1				1																											
55			54	34.7																																				
56			55	41.5																																				
57			56	36																																				
58			57	26.2																																				
59			58	37.9																																				
60			59	33.3																																				
61			60	19.4	S	R																																		
62			61	6.5	S	P		1				1						1													1					1			
63			62	5.5	S	P		1				1					1														1					1			
64			63	5	S	P		1				1																1											
65			64	6	S	P		1				1																											
66			65	6	S	P		1				1																											
67			66	17	S	R																																		
68			67	41.9																																				
69			68	41.1																																				
70			69	24.2																																				
71			70	37.2																																				
72			71	38.5																																				
73			72	37																																				
74			73	34.9	S	R																																		
75			74	10	S	P																																		
76			75	7	S	P		1										1													1								
77			76	5	S	P																																		
78			77	4.5	S	P		1				1					1	1																					

	A	I	J	M	N	O	P	Q	R	S	AE	AG	AH	AQ	AW	BQ	BR	BU	CA	CB	CN	CP	CR	CS	CZ	DE	DN	DP	DQ	EC	EF	EJ	EL	EM	ER	ES	EW	FA	FP	FQ	FR
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P) or rake rope (R)?	comments	Total Rake Fullness	*Myriophyllum spicatum*, Eurasian water-milfoil or Hybrid water-milfoil	*Potamogeton crispus* Curly-leaf pondweed	*Ceratophyllum demersum*, Coontail	*Chara* sp., Muskgrasses	*Cornatum palustre*, Marsh cinquefoil	*Elodea canadensis*, Common waterweed	*Heteranthera dubia*, Water star-grass	*Myriophyllum verticillatum*, Whorled water-milfoil	*Najas flexilis*, Slender naiad	*Najas marina*, Spiny naiad	*Nuphar variegata*, Spatterdock	*Nymphaea odorata*, White water lily	*Potamogeton foliosus*, Leafy pondweed	*Potamogeton gramineus*, Variable pondweed	*Potamogeton illinoensis*, Illinois pondweed	*Potamogeton natans*, Floating-leaf pondweed	*Potamogeton richardsonii*, Clasping-leaf pondweed	*Potamogeton zosteriformis*, Flat-stem pondweed	*Sagittaria latifolia*, Common arrowhead	*Sagittaria* sp., Arrowhead	*Schoenoplectus acutus*, Hardstem bulrush	*Sparganium* sp., Bur-reed	*Stuckenia pectinata*, Sago pondweed	*Typha* sp., Cattail	*Utricularia geminiscapa*, Twin-stemmed bladderwort	*Utricularia gibba*, Creeping bladderwort	*Utricularia vulgaris*, Common bladderwort	*Vallisneria americana*, Wild celery	*Zizania aquatica*, Southern wild rice	Freshwater sponge			
79			78	6	S	P																																				
80			79	20.4	S	R																																				
81			80	33.9																																						
82			81	43.2																																						
83			82	44.3																																						
84			83	38.2																																						
85			84	19.4	S	R																																				
86			85	31.4																																						
87			86	38																																						
88			87	37.6																																						
89			88	29.8	S	R																																				
90			89	10	S	P		1									1																								
91			90	5.5	S	P																																				
92			91	5	S	P		2				2																									1					
93			92	22.6																																						
94			93	46.5																																						
95			94	47.7																																						
96			95	47.7																																						
97			96	43.7																																						
98			97	27																																						
99			98	31.6																																						
100			99	33.9																																						
101			100	28.2																																						
102			101	9	S	P		1										1																								
103			102	7	S	P		1				1						1																								
104			103	6	S	P		1				1																									1					
105			104	2	S	P																																				
106			105	5	M	P		1				1																														
107			106	23.9																																						
108			107	46.5																																						
109			108	49.6																																						
110			109	49.4																																						
111			110	49																																						
112			111	44.3																																						
113			112	21.4																																						
114			113	18																																						
115			114	25.7																																						
116			115	24.5																																						
117			116	6.5	M	P		1				1					1											1			1											
118			117	3.5	M	P		1									1											1														
119			118	5	S	P		1				1																														
120			119	7.5	S	P																																				
121			120	42.8																																						
122			121	50.2																																						
123			122	50																																						
124			123	48.3																																						
125			124	51.3																																						
126			125	26.1																																						
127			126	7	S	P																																				
128			127	6	S	P		1				1																														
129			128	7.5	S	P		1				1																														
130			129	6	M	P		2				2																														
131			130	5	M	P		1				1					1											1			1											
132			131				DOCK																																				
133			132	4.5	M	P		1				1																	1			1											
134			133	5.5	S	P		1																					1													
135			134	7.5	S	P																																				
136			135	30.8																																						
137			136	48.8																																						
138			137	52.1																																						
139			138	49.2																																						
140			139	44.8																																						
141			140	24.1																																						
142			141	6	S	P		1				1																														
143			142	6.5	S	P		1				1																														
144			143	6	S	P		1				1																														
145			144	6	S	P		1				1																														
146			145	5	M	P		2				2					1											1			1											
147			146	4	M	P		2				2																														
148			147	5	S	P		1				1																														
149			148	23.7																																						
150			149	40.8																																						
151			150	49.6																																						
152			151	50.9																																						
153			152	49.8																																						
154			153	40.7																																						
155			154	8	S	P																																				

	A	I	J	M	N	O	P	Q	R	S	AE	AG	AH	AQ	AW	BQ	BR	BU	CA	CB	CN	CP	CR	CS	CZ	DE	DN	DP	DQ	EC	EF	EJ	EL	EM	ER	ES	EW	FA	FP	FQ	FR
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P) or rake rope (R)?	comments	Total Rake Fullness	*Myriophyllum spicatum*, Eurasian water-milfoil or Hybrid water-milfoil	*Potamogeton crispus* Curly-leaf pondweed	*Ceratophyllum demersum*, Coontail	*Chara* sp., Muskgrasses	*Comarum palustre*, Marsh cinquefoil	*Elodea canadensis*, Common waterweed	*Heteranthera dubia*, Water star-grass	*Myriophyllum verticillatum*, Whorled water-milfoil	*Najas flexilis*, Slender naiad	*Najas marina*, Spiny naiad	*Nuphar variegata*, Spatterdock	*Nymphaea odorata*, White water lily	*Potamogeton foliosus*, Leafy pondweed	*Potamogeton gramineus*, Variable pondweed	*Potamogeton illinoensis*, Illinois pondweed	*Potamogeton natans*, Floating-leaf pondweed	*Potamogeton richardsonii*, Clasping-leaf pondweed	*Potamogeton zosteriformis*, Flat-stem pondweed	*Sagittaria latifolia*, Common arrowhead	*Sagittaria* sp., Arrowhead	*Schoenoplectus acutus*, Hardstem bulrush	*Sparganium* sp., Bur-reed	*Stuckenia pectinata*, Sago pondweed	*Typha* sp., Cattail	*Utricularia geminiscapa*, Twin-stemmed bladderwort	*Utricularia gibba*, Creeping bladderwort	*Utricularia vulgaris*, Common bladderwort	*Vallisneria americana*, Wild celery	*Zizania aquatica*, Southern wild rice	Freshwater sponge			
156			155	6	S	P		1				1																			1										
157			156	5	S	P																																			
158			157	4.5	R	P																																			
159			158	6	M	P		1				1																													
160			159	5.5	S	P		1				1																													
161			160	3.5	M	P		1				1																		1		1						1				
162			161	5	M	P		1				1					1												1												
163			162	6	S	P																																			
164			163	7.5	S	P																																			
165			164	7.5	S	P		1				1																													
166			165	36.8																																					
167			166	49.6																																					
168			167	50.3																																					
169			168	49																																					
170			169	38.1																																					
171			170	29.2																																					
172			171	6	M	P		1				1						1																							
173			172	2.5	S	P		1				1																				1									
174			173	3	R	P		1																							1										
175			174	4	R	P																																			
176			175	6	S	P																																			
177			176	5	M	P		1				1					1												1												
178			177	5	M	P		1									1																								
179			178	7	S	P																																			
180			179	27.6																																					
181			180	14.3	S	R																																			
182			181	8.5	S	P																																			
183			182	33.9																																					
184			183	48.1																																					
185			184	49.6																																					
186			185	48.7																																					
187			186	44.6																																					
188			187	16.8	S	R																																			
189			188	5.5	S	P		1				1																													
190			189				SHALLOW												V																						
191			190				SHALLOW																																			
192			191	6	S	P		1																						1											
193			192	6	S	P																																			
194			193	4	M	P		1																						1								1			
195			194	4	M	P		1				1																		1								1			
196			195	4	S	P																																			
197			196	4	S	P																																			
198			197	1	S	P																																			
199			198	2	M	P																								V										
200			199	2	M	P		1				1					V	V													1										
201			200	3	M	P		2				1					V		V				V		V		1			1								1			
202			201	3	M	P		3				3																													
203			202	3.5	M	P		3				3																													
204			203	9	S	P		1				1																													
205			204	10	S	P		1										1																				1			
206			205	33.5																																					
207			206	44.1																																					
208			207	47.9																																					
209			208	47.4																																					
210			209	45.7																																					
211			210	49																																					
212			211	50.3																																					
213			212	49.9																																					
214			213	35.3																																					
215			214	8	S	P																																			
216			215				DOCK																																			
217			216	2.5	M	P		1				1						1											V								1				
218			217	3.5	M	P		3	1			3																													
219			218	6	S	P																																			
220			219	4	M	P		1																																	
221			220	3.5	M	P		3				3																													
222			221	5	M	P		1				1						1														1				1					
223			222	3.5	M	P		3				3																													
224			223	3.5	M	P		1				1																		1								1			
225			224	2.5	M	P		1				1																													
226			225	2.5	M	P		1				1																		1											
227			226	4	M	P		1				1																													
228			227	3.5	M	P		1				1						1												1											
229			228	4	M	P		3				1						1												1											
230			229	4	M	P		3				2						2		V										1											
231			230	5	M	P		1	1																					1											
232			231	6.5	M	P		1	1																					1		1					1				

	A	I	J	M	N	O	P	Q	R	S	AE	AG	AH	AQ	AW	BQ	BR	BU	CA	CB	CN	CP	CR	CS	CZ	DE	DN	DP	DQ	EC	EF	EJ	EL	EM	ER	ES	EW	FA	FP	FQ	FR
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P) or rake rope (R)?	comments	Total Rake Fullness	*Myriophyllum spicatum*, Eurasian water-milfoil or Hybrid water-milfoil	*Potamogeton crispus* Curly-leaf pondweed	*Ceratophyllum demersum*, Coontail	*Chara* sp., Muskgrasses	*Comarum palustre*, Marsh cinquefoil	*Elodea canadensis*, Common waterweed	*Heteranthera dubia*, Water star-grass	*Myriophyllum verticillatum*, Whorled water-milfoil	*Najas flexilis*, Slender naiad	*Najas marina*, Spiny naiad	*Nuphar variegata*, Spatterdock	*Nymphaea odorata*, White water lily	*Potamogeton foliosus*, Leafy pondweed	*Potamogeton gramineus*, Variable pondweed	*Potamogeton illinoensis*, Illinois pondweed	*Potamogeton natans*, Floating-leaf pondweed	*Potamogeton richardsonii*, Clasping-leaf pondweed	*Potamogeton zosteriformis*, Flat-stem pondweed	*Sagittaria latifolia*, Common arrowhead	*Sagittaria* sp., Arrowhead	*Schoenoplectus acutus*, Hardstem bulrush	*Sparganium* sp., Bur-reed	*Stuckenia pectinata*, Sago pondweed	*Typha* sp., Cattail	*Utricularia geminiscapa*, Twin-stemmed bladderwort	*Utricularia gibba*, Creeping bladderwort	*Utricularia vulgaris*, Common bladderwort	*Vallisneria americana*, Wild celery	*Zizania aquatica*, Southern wild rice	Freshwater sponge			
233			232	8	M	P		1				1																													
234			233	26.6																																					
235			234	37.4																																					
236			235	46.1																																					
237			236	48.2																																					
238			237	50																																					
239			238	50																																					
240			239	50.2																																					
241			240	50.5																																					
242			241	47.8																																					
243			242	35.8																																					
244			243	7	M	P		1	1			1				1		1																			1				
245			244	4	M	P		2				2																									1				
246			245	6	S	P		1																					1												
247			246	6	S	P		1																					1												
248			247	4	M	P		2				2																													
249			248	4	M	P		2				1						1																			1				
250			249	2	M	P		2									1		V										2												
251			250	3	M	P		1				1																		1								1				
252			251	5	S	P		1				1																													
253			252	6	S	P		1									1												1												
254			253	5.5	S	P																																			
255			254	5.5	S	P																																			
256			255	6	S	P		1																					1												
257			256	7	M	P		1	1			1																	1												
258			257	9	M	P		1																					1												
259			258	10	M	P		1	1							1		1											1												
260			259	29.3																																					
261			260	42.1																																					
262			261	45.5																																					
263			262	37.3																																					
264			263	48.8																																					
265			264	49																																					
266			265	45.8																																					
267			266	45.6																																					
268			267	29.1																																					
269			268	7	M	P		1				1						1																							
270			269	6	S	P																																			
271			270	3	M	P		3				3				1		1	V																	1				
272			271	4	M	P		3				3				1																									
273			272	6.5	S	P																																			
274			273	6	M	P		1				1																	1												
275			274	5	M	P		1				1																	1												
276			275	2	S	P		1				1																													
277			276	4	M	P		1																					1												
278			277	5	M	P																																			
279			278	5	S	P																																			
280			279	6	S	P																																			
281			280	5.5	S	P																																			
282			281	7	M	P		1																					1												
283			282	6.5	S	P		1				1																													
284			283	6.5	M	P		1				1																													
285			284	8.5	M	P		1				1						1																							
286			285	19																																					
287			286	28.9																																					
288			287	36.2																																					
289			288	39.9																																					
290			289	43.6																																					
291			290	44.6																																					
292			291	34.7																																					
293			292	17.1	S	R																																			
294			293	7	S	P		1																					1												
295			294	1.5	S	P		1				1													V																
296			295	3	M	P		3	1			3						1			1																1				
297			296	3.5	M	P		2	1			2																	1			1									
298			297	2.5	M	P		1								1																1									
299			298	6	M	P		1										1																							
300			299	7	S	P																																			
301			300	6	S	P		1	1																				1												
302			301	5	R	P																																			
303			302	3.5	M	P		1																														1			
304			303	5	S	P																																			
305			304	6	S	P																																			
306			305	6	S	P																																			
307			306	6.5	S	P		1																					1												
308			307	6	S	P																																			
309			308	5	M	P		2				2				1													1									V			

	A	I	J	M	N	O	P	Q	R	S	AE	AG	AH	AQ	AW	BQ	BR	BU	CA	CB	CN	CP	CR	CS	CZ	DE	DN	DP	DQ	EC	EF	EJ	EL	EM	ER	ES	EW	FA	FP	FQ	FR
1	Entry		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P) or rake rope (R)?	comments	Total Rake Fullness	Myriophyllum spicatum , Eurasian water-milfoil or Hybrid water-milfoil	Potamogeton crispus Curly-leaf pondweed	Ceratophyllum demersum, Coontail	Chara sp., Muskgrasses	Cornatum palustre, Marsh cinquefoil	Elodea canadensis , Common waterweed	Heteranthera dubia , Water star-grass	Myriophyllum verticillatum , Whorled water-milfoil	Najas flexilis , Slender naiad	Najas marina , Spiny naiad	Nuphar variegata , Spatterdock	Nymphaea odorata , White water lily	Potamogeton foliosus , Leafy pondweed	Potamogeton gramineus , Variable pondweed	Potamogeton illinoensis , Illinois pondweed	Potamogeton natans, Floating-leaf pondweed	Potamogeton richardsonii , Clasping-leaf pondweed	Potamogeton zosteriformis , Flat-stem pondweed	Sagittaria latifolia , Common arrowhead	Sagittaria sp., Arrowhead	Schoenoplectus acutus , Hardstem bulrush	Sparganium sp., Bur-reed	Stuckenia pectinata , Sago pondweed	Typha sp., Cattail	Utricularia geminiscapa , Twin-stemmed bladderwort	Utricularia gibba , Creeping bladderwort	Utricularia vulgaris , Common bladderwort	Vallisneria americana , Wild celery	Zizania aquatica , Southern wild rice	Freshwater sponge			
310			309	3.5	S	P																						V													
311			310	3.5	S	P		1										1																							
312			311	7	S	P																																			
313			312	11	S	P																																			
314			313	10	S	P																																			
315			314	16.9																																					
316			315	11	S	P																																			
317			316	8.5	S	P																																			
318			317	1.5	M	R		1	1		1						1							V		1		1								1				
319			318				TERRESTRIAL																																			
320			319	0.8	M	R		1				1						1										V			1					V				
321			320	2.9	S	R		1	1			1						1																							
322			321	2.9	S	R		1				1										V																		
323			322	4	S	R		1				1																													
324			323	5.7	S	R																																			
325			324	5.6	S	R																																			
326			325	6	S	R																																			
327			326	3.5	M	R		1				1																													
328			327	2.5	M	R		1				1																											V		
329			328	2	M	R		1				1						V																						
330			329	1.9	M	R		1										V		1	V																	V		
331			330	1.7	M	R		1			1										V																			
332			331	1.6	M	R		1	V									1			V															V				
333			332	1.5	M	R		1			1							1		1		V																		
334			333	1	M	R		3				3				1		V			V															1	V			
335			334	1.5	M	R		1				1						1			V		1													V				
336			335	1.7	M	R		1	1			1						1	V		V																			
337			336	3.1	S	R		1				1																			1										
338			337	3	S	R		1				1					1												1		1										
339			338	3.3	S	R		1								1	1												1								1				
340			339	3.3	S	R		2	1			1					1												1			1				1				
341			340	2.9	S	R		1									1																							
342			341	6	S	R		1				1																													
343			342	5.3	S	R																																			
344			343	4.9	S	R		1				1				1																						1			
345			344	2.3	M	R		1				1						1														1									
346			345	2.3	M	R		1			V							V		1										V										
347			346	3.1	M	R		1										1												V							V				
348			347	3.3	M	R		1	1			1							V																				V		
349			348	1.4	M	R		1				1				1																						1			
350			349	2.1	M	R		1				1																													
351			350	3.3	S	R		1				1																													
352			351	3.9	S	R		1				1																													
353			352	3.3	S	R		1				1						1																							
354			353	3.3	S	R		1	1			1						1																							
355			354	12	S	R		1																						1										
356			355	4.8	S	R		1				1																													
357			356	3.5	S	R		1	1								1																			1				
358			357	2.7	S	R		1				1					1																								
359			358	3	M	R		1				1					1		V																						
360			359	3	M	R		1				1							V										V											
361			360	3.2	M	R		1				1					1		1	V	V									1	1										
362			361	3	M	R		1										1	1										V											
363			362	2.3	M	R		1				1								1																					
364			363	1.2	S	R		1				1									1																				
365			364	2.3	S	R		1	1			1							1																						
366			365	3.1	S	R		1				1				1																									
367			366	3.4	S	R		1				1																			1	1									
368			367	2.9	S	R		1								1							1															1			
369			368	3.9	S	R		1				1																	1			1									
370			369	3.2	S	R		1																								1								
371			370	2.1	S	R		1										1														1								
372			371	2.4	S	R		1										1														1								
373			372	2.6	S	R		2	V			2						1	V										V											
374			373	4.1	S	R		1	1			1						1		1																				
375			374	2.8	S	R		2				2						1	V										V											
376			375	3.4	S	R		1				1								1									V											
377			376	2.7	S	R		1				1					1	1	V										V											
378			377	3.1	S	R		1				1						1	V										V											
379			378	1.1	S	R		2				2																									1				
380			379	1	M	R		1													1															V				
381			380	0.5	M	R		3				3								V																1				
382			381	1.2	M	R		1				1						1	V	V																				
383			382	0.5	S	R		1				1																				1								
384			383	2.9	S	R		1	1			1						1	V	V																				
385			384	2.4	S	R		2				2				1																1					1			
386			385	3.4	S	R		1				1																													

	A	I	J	M	N	O	P	Q	R	S	AE	AG	AH	AQ	AW	BQ	BR	BU	CA	CB	CN	CP	CR	CS	CZ	DE	DN	DP	DQ	EC	EF	EJ	EL	EM	ER	ES	EW	FA	FP	FQ	FR
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P) or rake rope (R)?	comments	Total Rake Fullness	*Myriophyllum spicatum*, Eurasian water-milfoil or Hybrid water-milfoil	*Potamogeton crispus* Curly-leaf pondweed	*Ceratophyllum demersum*, Coontail	*Chara* sp., Muskgrasses	*Comarum palustre*, Marsh cinquefoil	*Elodea canadensis*, Common waterweed	*Heteranthera dubia*, Water star-grass	*Myriophyllum verticillatum*, Whorled water-milfoil	*Najas flexilis*, Slender naiad	*Najas marina*, Spiny naiad	*Nuphar variegata*, Spatterdock	*Nymphaea odorata*, White water lily	*Potamogeton foliosus*, Leafy pondweed	*Potamogeton gramineus*, Variable pondweed	*Potamogeton illinoensis*, Illinois pondweed	*Potamogeton natans*, Floating-leaf pondweed	*Potamogeton richardsonii*, Clasping-leaf pondweed	*Potamogeton zosteriformis*, Flat-stem pondweed	*Sagittaria latifolia*, Common arrowhead	*Sagittaria* sp., Arrowhead	*Schoenoplectus acutus*, Hardstem bulrush	*Sparganium* sp., Bur-reed	*Stuckenia pectinata*, Sago pondweed	*Typha* sp., Cattail	*Utricularia geminiscapa*, Twin-stemmed bladderwort	*Utricularia gibba*, Creeping bladderwort	*Utricularia vulgaris*, Common bladderwort	*Vallisneria americana*, Wild celery	*Zizania aquatica*, Southern wild rice	Freshwater sponge			
387			386	3.3	S	R		1				1						1												1											
388			387	2.4	S	R		1				V						1		1										V											
389			388	3.2	S	R		1	1			1						1	V																						
390			389	1.6	M	R		1	1									1	V																V						
391			390	4.1	M	R		1	1									1	V										V											
392			391	2.1	M	R		1										1	V											1											
393			392	1.9	M	R		1				1							V	V									V												
394			393	3.8	S	R													V	V									V											
395			394	1.6	S	R		1				1							V	V										1											
396			395	2.8	S	R		1											V	V							1			1											
397			396	1.1	M	R		1				1							V					V	V																
398			397	1.2	M	R		1				1					V																		1		1			
399			398	1.2	M	R		2				2							V	V																				
400			399	1	M	R		3				3								V											1				V					
401			400	0.9	M	R		2				1						2		V											1			1						
402			401	1	M	R		1			V							1			1																			
403			402	1.4	S	R		1				1						1			1														1					
404			403	1.4	S	R		2				2				1																								
405			404	2.2	S	R		2				3				1			V	V																		1			
406			405	3.3	M	R		1				1						1	V																					
407			406	2.9	M	R		1																						1	1									
408			407	1.7	S	R		1				1					1		V		1								V		V									
409			408	2.1	S	R		1				1							V										V											
410			409	2.6	S	R		1				1						1	V										1											
411			410	3.2	S	R		1				1						1		1									V											
412			411	2.3	S	R		1				1						1	V		V								V											
413			412	1.4	S	R		1				1						1	V										V											
414			413	2.1	S	R		1				1						1	V										V											
415			414	2.1	S	R		1				1							V										V											
416			415	3.4	S	R		1										1		1									V											
417			416	2.2	S	R		1										1	V		V								V											
418			417	2.8	S	R		1				1							V										V							1				
419			418	0.8	S	R		1								1		1			V										V									
420			419	1	M	R		3				3									1															1				
421			420				NONNAVIGABLE (PLANTS)																																			
422			421	1	M	R		1				1						1		V									V											
423			422	1.4	M	R		1				1						1	V	V																				
424			423	2	M	R		1				1							V	V																				
425			424	2.1	S	R		1				1							V	V												V				1				
426			425	2.2	S	R		1				1						1	V	V																1				
427			426	2.8	S	R		1				1				V		1				V																			
428			427	1.3	S	R		1	1										V																1	1				
429			428	2.9	S	R		1				1																			1										
430			429	3.3	S	R		1				1																												
431			430	2.1	S	R		1										1	V	V									V											
432			431	2.1	S	R		1				1							V	V									V											
433			432	2	S	R		1				1						1		V									V											
434			433	1.8	S	R		1				1							V	V									V											
435			434	1.9	S	R		1										1			1								V											
436			435	2.3	S	R		1				1						1	V																					
437			436	2.1	S	R		1				1						1	V						1															
438			437	3.8	S	R		1				1							V	V									V							1				1
439			438	1.2	M	R		2				2				V															V								
440			439	2.2	M	R		1				1							V	V									V		V									
441			440	2.3	M	R		1				1						1	V	V																V				
442			441	2.1	M	R		2				2																			1									
443			442	3.8	S	R		1				1																												
444			443	1.8	S	R		2				2					1		V																					
445			444	1.8	S	R		1				1							V	V									V											
446			445	2.4	S	R		1				1						1	V										V											
447			446	4.4	M	R		1				1						1																						
448			447	2.3	S	R		1				1							V										V											
449			448	1.8	S	R		1										1		V									V		1									
450			449	1	M	R														V									V											
451			450	1.9	S	R		1				1																												
452			451	2.2	S	R		1												V									V											
453			452	1.7	S	R		1				1						1	V												V									
454			453	3.5	M	R		1														1																		
455			454	1.1	M	R		2				2					1		V																					
456			455	1.7	M	R		1				1									V																			
457			456	3.2	M	R		1	V			1								V	V																			
458			457	2.2	M	R		1				1							1	V	V								V			1				V				
459			458	0.5	M	R		1				1				V																								
460			459	1.2	M	R		1				1						V			V									V										
461			460	0.8	M	R		1				1						V												V										
462			461	2.5	M	R		1				1							1																					
463			462	2.3	M	R		1				1																												

	A	I	J	M	N	O	P	Q	R	S	AE	AG	AH	AQ	AW	BQ	BR	BU	CA	CB	CN	CP	CR	CS	CZ	DE	DN	DP	DQ	EC	EF	EJ	EL	EM	ER	ES	EW	FA	FP	FQ	FR
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P) or rake rope (R)?	comments	Total Rake Fullness	*Myriophyllum spicatum*, Eurasian water-milfoil or Hybrid water-milfoil	*Potamogeton crispus* Curly-leaf pondweed	*Ceratophyllum demersum*, Coontail	*Chara* sp., Muskgrasses	*Comarum palustre*, Marsh cinquefoil	*Elodea canadensis*, Common waterweed	*Heteranthera dubia*, Water star-grass	*Myriophyllum verticillatum*, Whorled water-milfoil	*Najas flexilis*, Slender naiad	*Najas marina*, Spiny naiad	*Nuphar variegata*, Spatterdock	*Nymphaea odorata*, White water lily	*Potamogeton foliosus*, Leafy pondweed	*Potamogeton gramineus*, Variable pondweed	*Potamogeton illinoensis*, Illinois pondweed	*Potamogeton natans*, Floating-leaf pondweed	*Potamogeton richardsonii*, Clasping-leaf pondweed	*Potamogeton zosteriformis*, Flat-stem pondweed	*Sagittaria latifolia*, Common arrowhead	*Sagittaria* sp., Arrowhead	*Schoenoplectus acutus*, Hardstem bulrush	*Sparganium* sp., Bur-reed	*Stuckenia pectinata*, Sago pondweed	*Typha* sp., Cattail	*Utricularia geminiscapa*, Twin-stemmed bladderwort	*Utricularia gibba*, Creeping bladderwort	*Utricularia vulgaris*, Common bladderwort	*Vallisneria americana*, Wild celery	*Zizania aquatica*, Southern wild rice	Freshwater sponge			
464			463	2.5	S	R		1				1						V	V	V																				
465			464	1.4	S	R		2				1						1	V	V																				
466			465	1.5	S	R		1				1								V																				
467			466	1	S	R		1										1		V								V												
468			467	1.1	M	R		1										1	V		1																			
469			468				NONNAVIGABLE (PLANTS)																																			
470			469	0.5	M	R		1								1																		1	1					
471			470	2.9	M	R		1				1				V												V												
472			471	0.4	M	R		3				3																	V							1				
473			472	0.5	M	R		1				1		1				1																		1				
474			473	0.5	M	R		1				1						1	V	V									V		1				V					
475			474	0.5	M	R		2				1						V		V										2					1	V					
476			475	1.9	M	R		1				1						1		V									V											
477			476	1.5	M	R		2				2						1	V						1							1								
478			477	1.8	M	R		1				1								V																				
479			478	3	M	R		1				1							1										V			1								
480			479	1.5	M	R		1				1						1		V									V											
481			480	2.1	M	R		1											V										V											
482			481	1	M	R		1				1						1		V																				
483			482	0.5	M	R					V							V		V									V				V							
484			483	0.15	M	R														V													V							
485			484	0.5	M	R		1													1														1	1				
486			485	1.2	M	R		1				1							V		1														1	1				
487			486	1	M	R		1				1				V					1														V	V				
488			487	2.5	M	R		1	V			1								1																				
489			488	0.5	M	R		1				1				V		V											V			1			V					
490			489	1	M	R		1				1				V			1	V												V		V						
491			490	2	M	R		1				1							V		1								V			1								
492			491	1.4	M	R		1											V											1		1								
493			492	2.8	M	R		1				1							V										V			1								
494			493	2.6	M	R		1				1						1	V	V												1								
495			494	1	M	R		3				3																		V			V							
496			495	0.5	M	R		1										1																						
497			496	1	M	R		2				2								V												V			1				
498			497	0.9	M	R		2				2								V												V				1			
499			498	1.2	M	R		1	V			1							V										V										
500			499	1.6	M	R		1				1							V										V										
501			500	1	M	R		1				1						V			1																			
502			501	1.7	S	R		1				1								V												1								
503			502	3.8	M	R		1				1																				1			1					
504			503	3.4	M	R		1				1						1																						
505			504	4.4	M	R		1				1																												
506			505	4.2	M	R		1				1																											V	
507			506				NONNAVIGABLE (PLANTS)																																			
508			507	1	M	R		1				1									1											1			1	1				
509			508	1.6	M	R		2	1			2								V								V												
510			509	4	M	R		2	1			1					1				1								V												
511			510	1.8	M	R														V						V														
512			511	1.5	M	R		1				1									V											V								
513			512	0.5	M	R		1				1							1		V								V											
514			513	1	M	R		2				1							1		V								V		1									
515			514	2.9	M	R		1				1																												
516			515	2.3	M	R		1				1																												
517			516	4.4	M	R		1				1							1																					
518			517	4.4	M	R		1				1																							1					
519			518	2.4	M	R		1				1								V	V			1						V								V		
520			519	0.5	M	R		2				2									V																			
521			520	1	M	R		1	1			1									V											V								
522			521	2	M	R		3				3							V																					
523			522	3.3	M	R		1	V			1				V						V							V											
524			523	0.9	M	R		1	1	1		1																	V							V				
525			524	2	M	R		1		V		1								V						V												V		
526			525	3.7	M	R		1				1																												
527			526	2.5	M	R		1				1								V																				
528			527	0.5	M	R		1	V			1							1										V			V								
529			528	3.2	M	R		1				1																												
530			529	4.2	M	R		1				1																				1								
531			530	3	M	R		1				1								V																				
532			531	3.9	M	R		1				1																												
533			532	2.5	M	R		1				1																				1								
534			533	3.3	M	R		2				2																		V										
535			534	1.5	M	R		1				1				1				V					1															
536			535	2.2	M	R		1				1								1	V																			
537			536	2.1	M	R		1				1								V												V								
538			537	3.4	M	R		3				3																												
539			538	3.1	M	R		1												V	V		V									1						V		
540			539	3.6	M	R		1																								1								

	A	I	J	M	N	O	P	Q	R	S	AE	AG	AH	AQ	AW	BQ	BR	BU	CA	CB	CN	CP	CR	CS	CZ	DE	DN	DP	DQ	EC	EF	EJ	EL	EM	ER	ES	EW	FA	FP	FQ	FR
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P) or rake rope (R)?	comments	Total Rake Fullness	*Myriophyllum spicatum* , Eurasian water-milfoil or Hybrid water-milfoil	*Potamogeton crispus* Curly-leaf pondweed	*Ceratophyllum demersum* Coontail	*Chara* sp., Muskgrasses	*Comarum palustre* , Marsh cinquefoil	*Elodea canadensis* , Common waterweed	*Heteranthera dubia* , Water star-grass	*Myriophyllum verticillatum* , Whorled water-milfoil	*Najas flexilis* , Slender naiad	*Najas marina* , Spiny naiad	*Nuphar variegata* , Spatterdock	*Nymphaea odorata* , White water lily	*Potamogeton foliosus* , Leafy pondweed	*Potamogeton gramineus* , Variable pondweed	*Potamogeton illinoensis* , Illinois pondweed	*Potamogeton natans* , Floating-leaf pondweed	*Potamogeton richardsonii* , Clasping-leaf pondweed	*Potamogeton zosteriformis* , Flat-stem pondweed	*Sagittaria latifolia* , Common arrowhead	*Sagittaria* sp., Arrowhead	*Schoenoplectus acutus* , Hardstem bulrush	*Sparganium* sp., Bur-reed	*Stuckenia pectinata* , Sago pondweed	*Typha* sp., Cattail	*Utricularia geminiscapa* , Twin-stemmed bladderwort	*Utricularia gibba* , Creeping bladderwort	*Utricularia vulgaris* , Common bladderwort	*Vallisneria americana* , Wild celery	*Zizania aquatica* , Southern wild rice	Freshwater sponge			
541			540	3.1	M	R		1				1								V									V												
542			541	2.5	M	R		1				1						1		V									V												
543			542	2.5	M	R		1				1							V			1							1												
544			543	2.4	M	R		1				1								V																				
545			544	1	M	R		1				1				V		1	V																1					
546			545	3.7	M	R		2				2																												
547			546	1.7	M	R				V									V									V												
548			547	4.7	M	R				V				V																										
549			548	3.2	M	R		1																V					V						1					
550			549	1	M	R		1											V												1		1						
551			550	1.7	M	R		1				1						V	V	V												V								
552			551	2.2	M	R		1				1						V			1																			
553			552	2.8	M	R		1				1							V													1								
554			553	1.7	M	R		1				1				V				1	V									V										
555			554	1.3	M	R		1				1																				1								
556			555	2.5	M	R		1				1							V																					
557			556	1.9	M	R		1				1				V						V		1				V			V							V		
558			557	2.2	M	R		1				1																V												
559			558	3.4	M	R		1	V																			V		1										
560			559	1.5	M	R		1				1					1			V												1		1						
561			560	1.9	M	R		1				1								V												1				V				
562			561	1.7	M	R		1				1								V																				
563			562	1	M	R		1				1																		V		V								
564			563	1.5	M	R		1				1						V			1									V										
565			564	1	M	R		1				1							1		V									V										
566			565	1	M	R		1				1									V											1								
567			566	3.2	M	R		1				1								V																				
568			567	4.3	M	R		1				1															V														
569			568	3.3	M	R																																			
570			569	1	M	R		3				3								V																V				
571			570	1.5	M	R		1				1							1		1													1						
572			571	0.9	M	R		1				1							1	V	V																			
573			572	1.9	M	R		1				1							1	V																				
574			573	1.1	M	R		1				1							1		V																			
575			574	1.5	M	R		1				1								V	V									V										
576			575	1.5	M	R		1				1							1		V											V								
577			576	4.1	M	R		1	1			1																												
578			577	3	M	R		1				1					1			V																				
579			578	1.9	M	R		1		V		1		1																		1								
580			579	3.8	M	R		1	1			1																												
581			580	1	M	R		1	1			1																												
582			581	1.6	M	R		1				1				V					1											1								
583			582	1.5	M	R		1				1						1		V										V										
584			583	1.5	M	R		1				1									1																				
585			584	1.5	M	R		1				1								V										V										
586			585	1	M	R		1				1				V			1													V		V						
587			586	0.5	M	R		1				1							1	V																				
588			587	4.6	M	R		1				1																												
589			588	2.8	M	R		1	1																															
590			589	2	M	R		1	V							V			1		V																			
591			590	1.5	M	R		3	1			2									1																				
592			591	1	M	R																								V										
593			592	1	M	R		1				1							1		V																			
594			593	1	M	R		2				2							1		V																			
595			594	1.5	M	R		2				2																												
596			595	4.6	M	R		2	V			2																												
597			596	3.2	M	R		1		V		1															1													
598			597	2.4	M	R		1				1								V												1								
599			598	3.2	M	R		1						1																										
600			599	4.5	M	R		1				1																				V								
601			600	2.8	M	R		1				1		1																										

	A	I	J	M	N	O	P	Q	R	S	AE	AG	AQ	AW	BR	BU	CA	CB	CH	CS	DE	DL	EF	ER	ES	FN	FO	FP	FQ
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P), rake rope (R), camera (C)	comments	Total Rake Fullness	*Myriophyllum spicatum* , Eurasian water-milfoil or Hybrid water-milfoil	*Potamogeton crispus* ,Curly-leaf pondweed	*Ceratophyllum demersum* , Coontail	*Chara* sp., Muskgrasses	*Elodea canadensis* , Common waterweed	*Heteranthera dubia* , Water star-grass	*Najas flexilis* , Slender naiad	*Najas marina* , Spiny naiad	*Nuphar variegata* , Spatterdock	*Nymphaea odorata* , White water lily	*Potamogeton alpinus* , Alpine pondweed	*Potamogeton natans* , Floating-leaf pondweed	*Potamogeton zosteriformis* , Flat-stem pondweed	*Sagittaria cuneata* , Arum-leaved arrowhead	*Stuckenia pectinata* , Sago pondweed	*Utricularia vulgaris* , Common bladderwort	*Vallisneria americana* , Wild celery
2	**Lake**	Mill Lake	1	2.5	m	p		1			1																		
3	**County**	Walworth	2	2.5	m	p																							
4	**WBIC**		3	4	m	p		1											1										
5	**Date**	07/30/14	4	3	m	p		2				2																	
6	**Field Crew**	James Scharl	5	3	m	p		2						1												2			
7		Thomas Lamppa	6	3.5	s	p		1				1																	
8			7	5.5	m	p		1				1																	
9			8	4	m	p		2				2																	
10			9	4.5	m	p																							
11			10	3.5	m	p		2				2																	
12			11	2	m	p		1				1														1			
13			12	2	m	p		1				1														1			
14			13	3.5	m	p		1	1																	1			
15			14	3.5	m	p		1			1															1			
16			15	2	s	p		1	1													1		1	1				
17			16	4.5	m	p		1				1														1			
18			17	6	m	p																							
19			18	5	m	p																							
20			19	5	m	p		1				1																	
21			20	4	s	p		1								1										1			
22			21	3	m	p		1			1	1														1			
23			22	3.5	m	p		1																		1			
24			23	2.5	m	p		1	1			1	1													1			
25			24	2.5	m	p																							
26			25	3	r	p		1				1																	
27			26	6	m	p		1				1													1				
28			27	7	s	p																							
29			28	5	m	p		1								1													
30			29	5	m	p		1	1			1													1				
31			30	5	m	p		1	1			1				1													
32			31	3	m	p		2	1		1	2														1			
33			32	4	m	p		1	1										1							1			
34			33	4	m	p		1			1															1			
35			34	3	m	p		1	1			1														1			
36			35				LAND																						
37			36	4	m	p		1				1														1			
38			37	5	m	p		1				1				1													
39			38	5.5	m	p		1								1													
40			39	6	m	p		1	1			1				1													
41			40	6	m	p		1								1													
42			41	6	m	p		1	1							1									1				
43			42	7	m	p		1				1													1				
44			43	5.5	m	p		1								1										1			
45			44	5	m	p		1				1				1													
46			45																										
47			46	4	m	p																							
48			47	4	m	p		1	1																				
49			48	2	m	p		2				2				1													
50			49	2	m	p		1				1				1		1		1				1	1				
51			50	4	s	p		1																		1			
52			51	5	s	p		1				1				1													
53			52	9	s	p																							
54			53	17	s	r																							
55			54	14	s	r																							
56			55	6.5	m	p																							
57			56	7	m	p																							
58			57	7	m	p		1			1					1								1					
59			58	7	m	p		1								1													
60			59	7	s	p		1								1													
61			60	6	m	p		1								1													
62			61	5	m	p		1	1							1													
63			62				PIER/DOCK/SHORE																						
64			63	4	m	p		1				1				1													
65			64	3	m	p		1					1			1								1		1			
66			65	4	m	p		1				1				1									1	1			
67			66	10	s	p																							
68			67	16	s	r																							
69			68	7	s	p		1				1				1													
70			69	18	s	r																							
71			70	21	s	r																							
72			71	23																									
73			72	24																									
74			73	15.5	s	r																							
75			74	7.5	m	p																							
76			75	7	m	p		1								1								1		1			
77			76	6	m	p		1								1								1	1				
78			77	6	m	p		1								1													
79			78	6	m	p		1								1										1			
80			79	5	m	p		1								1										1			
81			80	5	m	p		1								1										1			
82			81	3	r	p		1				1																	
83			82	4.5	m	p		1				1																	
84			83	20	s	r																							
85			84	17	s	r																							
86			85	22	s	r																							
87			86	27.5																									
88			87	22.5	s	r																							
89			88	8.5	s	p																							
90			89	27																									
91			90	34.5																									
92			91	28																									
93			92	23.5																									
94			93	9	m	p		1				1																	
95			94	7.5	m	p																							
96			95	6	m	p		1								1													
97			96	6	m	p		1								1													
98			97	6	m	p																							
99			98	6	m	p		1								1													
100			99	5	m	p		2				1				2				1									
101			100	5	m	p																							
102			101	4	m	p		2	1							2													
103			102	3	m	p		1				1								1		1							
104			103	2	s	p		1				1										1		1					
105			104	4	s	p																							
106			105	11	s	p																							

	A	I	J	M	N	O	P	Q	R	S	AE	AG	AQ	AW	BR	BU	CA	CB	CH	CS	DE	DL	EF	ER	ES	FN	FO	FP	FQ
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P), rake rope (R), camera (C)	comments	Total Rake Fullness	*Myriophyllum spicatum* , Eurasian water-milfoil or Hybrid water-milfoil	*Potamogeton crispus*,Curly-leaf pondweed	*Ceratophyllum demersum*, Coontail	*Chara* sp., Muskgrasses	*Elodea canadensis*, Common waterweed	*Heteranthera dubia* , Water star-grass	*Najas flexilis* ,Slender naiad	*Najas marina* , Spiny naiad	*Nuphar variegata* , Spatterdock	*Nymphaea odorata* , White water lily	*Potamogeton alpinus* , Alpine pondweed	*Potamogeton natans* , Floating-leaf pondweed	*Potamogeton zosteriformis* , Flat-stem pondweed	*Sagittaria cuneata* , Arum-leaved arrowhead	*Stuckenia pectinata* , Sago pondweed	*Utricularia vulgaris*, Common bladderwort	*Vallisneria americana*, Wild celery
107			106	30.5																									
108			107	23																									
109			108	28																									
110			109	32.5																									
111			110	32.5																									
112			111	28																									
113			112	40																									
114			113	40																									
115			114	24																									
116			115	8.5	s	p																							
117			116	7	s	p																							
118			117	6.5	s	p																							
119			118	6	s	p		1								1													
120			119	6	s	p		1								1							1						
121			120	7	s	p																							
122			121	6	s	p																							
123			122	6	m	p		1								1													
124			123	5.5	m	p																							
125			124	5	s	p		1	1			1												1					
126			125	4	m	p		1								1								1					
127			126	3	m	p		1	1			1				1						1			1				
128			127																										
129			128	2.5	m	p		1				1																	
130			129	3	m	p		1				1																	
131			130	4.5	s	p		1	1							1													
132			131	17	s	r																							
133			132	30																									
134			133	34																									
135			134	39																									
136			135	40.5																									
137			136	43																									
138			137	46																									
139			138	50																									
140			139	48																									
141			140	27.5																									
142			141	6.5	m	p		1								1							1	1					
143			142	6	m	p		1								1							1						
144			143	6.5	m	p		1															1						
145			144	7	m	p																							
146			145	6	m	p		1								1													
147			146	6.5	m	p		1															1						
148			147	6	m	p		1				1											1						
149			148	5	m	p		1								1							1						
150			149	5	m	p		1				1																	
151			150	5	m	p		1				1																	
152			151	5	m	p		1				1																	
153			152	3.5	m	p		1	1							1							1						
154			153	3	m	p		1				1													1				
155			154	3	m	p		1				1												1	1				
156			155	5	m	p		1	1			1													1				
157			156	24																									
158			157	41																									
159			158	40.5																									
160			159	44																									
161			160	48																									
162			161	52																									
163			162	56																									
164			163	58																									
165			164	59																									
166			165	41																									
167			166	8	s	p		1															1						
168			167	8.5	s	p		1								1													
169			168	8	m	p		1								1									1				
170			169	10	m	p		1	1		1					1							1						
171			170	8	m	p		1															1						
172			171	7.5	m	p		1															1						
173			172	7	m	p		1								1							1						
174			173	7	m	p		1															1	1					
175			174	5	m	p		1								1							1						
176			175	5	m	p		1															1						
177			176	4	m	p		1	1														1		1				
178			177	4	m	p		1								1									1				
179			178	13.5	s	r																							
180			179	34																									
181			180	42																									
182			181	45																									
183			182	48																									
184			183	53																									
185			184	56																									
186			185	58.5																									
187			186	61																									
188			187	58.5																									
189			188	11	m	p																							
190			189	9	s	p																							
191			190	9	s	p		2	1		2																		
192			191	17	m	r																							
193			192	11	m	p																							
194			193	7	m	p																							
195			194	7	m	p		1								1							1	1					
196			195	6	m	p		1				1																	
197			196	5.5	m	p		1				1											1						
198			197	3	m	p		2				2													1				
199			198	2	s	p		2				1													2				
200			199	11	m	p		2				2							1					1					
201			200	28																									
202			201	39																									
203			202	46																									
204			203	51																									
205			204	54																									
206			205	56																									
207			206	59																									
208			207	56																									
209			208	44																									
210			209	10	s	p																							
211			210	9	s	p		1																1					

	A	I	J	M	N	O	P	Q	R	S	AE	AG	AQ	AW	BR	BU	CA	CB	CH	CS	DE	DL	EF	ER	ES	FN	FO	FP	FQ
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P), rake rope (R), camera (C)	comments	Total Rake Fullness	*Myriophyllum spicatum* , Eurasian water-milfoil or Hybrid water-milfoil	*Potamogeton crispus* ,Curly-leaf pondweed	*Ceratophyllum demersum* , Coontail	*Chara* sp., Muskgrasses	*Elodea canadensis* , Common waterweed	*Heteranthera dubia* , Water star-grass	*Najas flexilis* , Slender naiad	*Najas marina* , Spiny naiad	*Nuphar variegata* , Spatterdock	*Nymphaea odorata* , White water lily	*Potamogeton alpinus* , Alpine pondweed	*Potamogeton natans* , Floating-leaf pondweed	*Potamogeton zosteriformis* , Flat-stem pondweed	*Sagittaria cuneata* , Arum-leaved arrowhead	*Stuckenia pectinata* , Sago pondweed	*Utricularia vulgaris*, Common bladderwort	*Vallisneria americana*, Wild celery
212			211	8	m	p		1	1															1					
213			212	11	m	p																							
214			213	9	m	p		1	1		1																		
215			214	7.5	m	p		1								1							1	1					
216			215	6	m	p		1								1							1	1					
217			216	5	m	p		1															1		1				
218			217	5	s	p																							
219			218	3	m	p		2				2							1										
220			219	4	m	p		2				2																	
221			220	7	m	p		1											1										
222			221	27																									
223			222	41																									
224			223	50																									
225			224	49																									
226			225	49																									
227			226	32																									
228			227	12	m	p																							
229			228	6.5	m	p		1																	1				
230			229	7	s	p																							
231			230	6	s	p		1				1											1		1				
232			231	11.5	m	p		1								1													
233			232	6.5	m	p		1				1				1								1	1				
234			233	6.5	m	p		1								1													
235			234	5	m	p		1								1							1	1					
236			235	4	s	p		1				1													1				
237			236				LAND																						
238			237	5	s	p																							
239			238	6	m	p		1	1										1						1				
240			239	12.5	s	p																							
241			240	29																									
242			241	30																									
243			242	17	s	r																							
244			243	5	s	p		1				1												1	1				
245			244	5.5	s	p		1	1			1																	
246			245	3.5	r	p		1	1			1							1					1					
247			246	3.5	s	p		1				1																	
248			247	5	s	p		2	1		1	2																	
249			248	5	m	p		1	1							1							1	1					
250			249	5	m	p		1				1				1													
251			250	1	s	p		1	1			1	1				1												
252			251	4	s	p		1				1																	
253			252	5.5	m	p		1				1																	
254			253	4	s	p		2				2																	
255			254	3.5	s	p		2	1			2											1		1				
256			255	2.5	s	p		1				1																	
257			256	4	s	p		1				1													1				
258			257	5.5	s	p		1																	1				
259			258	2.5	r	p		1				1																	
260			259	2	s	p		1	1				1					1							1				
261			260	3	m	p		2				2																	
262			261	4	m	p																							
263			262	3.5	m	p		1	1			1													1				
264			263	1	s	p		1	1			1													1				
265			264	4	m	p		1				1													1				
266			265	4	m	p		1				1							1										
267			266	5	m	p		1	1										1						1				
268			267	5	s	p		1																	1				
269			268	2	s	p		1		1		1			1														
270			269	2	m	p		2	1			2																	
271			270	4	m	p		1				1													1				
272			271	5	m	p		1																	1				
273			272	3	s	p		1				1												1	1				
274			273	1	s	p		1		1		1	1	1	1														
275			274	2	s	p		2				2													1				
276			275	3	m	p		2				2													1				
277			276	3	s	p		1				1																	
278			277	4	m	p		1				1													1				
279			278	5	m	p		1	1																1				
280			279	4	m	p		1	1			1							1						1				
281			280	4	m	p		1	1																1				
282			281	5	m	p		1	1			1	1												1				
283			282	4	m	p																							
284			283	2.5	s	p		1	1			1													1	1			
285			284	4	m	p		1				1													1				
286			285	3	r	p		1				1																	
287			286	4	m	p		1				1													1				
288			287	2	s	p		1	1			1							1						1				
289			288	2	s	p		1				1											1						
290			289	4	m	p		1				1																	
291			290	5	m	p		1	1		1	1							1		1								
292			291	4	m	p		1	1																				
293			292	4	m	p		1											1						1				
294			293	4.5	m	p		1																	1				
295			294	5	m	p		1				1													1				
296			295	4	m	p		1	1			1													1				
297			296	3.5	m	p		1				1													1				
298			297	4	m	p		1											1						1				
299			298	3.5	m	p		1	1																1				
300			299	3	s	p		2				2													1				
301			300	3	m	p		2	1			2													1				
302			301	3	m	p		2	1			2													1				
303			302	3	m	p		1	1			1					1								1				
304			303	4	m	p		1				1													1				
305			304	5	m	p		1																	1				
306			305	5	m	p		1																	1				
307			306	4	m	p		1	1																1				
308			307	4	m	p		1	1																1				
309			308	4	m	p		1	1																				
310			309	4	m	p		1																	1				
311			310	0.5	s	p		1				1																	
312			311	2	m	p		1						1											1				
313			312	5.5	s	p		1				1																	
314			313	5	s	p																							
315			314	5	m	p		1																	1				
316			315	4	m	p		1	1																1				

	A	I	J	M	N	O	P	Q	R	S	AE	AG	AQ	AW	BR	BU	CA	CB	CH	CS	DE	DL	EF	ER	ES	FN	FO	FP	FQ
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P), rake rope (R), camera (C)	comments	Total Rake Fullness	*Myriophyllum spicatum* , Eurasian water-milfoil or Hybrid water-milfoil	*Potamogeton crispus* ,Curly-leaf pondweed	*Ceratophyllum demersum* , Coontail	*Chara* sp., Muskgrasses	*Elodea canadensis* , Common waterweed	*Heteranthera dubia* , Water star-grass	*Najas flexilis* , Slender naiad	*Najas marina* , Spiny naiad	*Nuphar variegata* , Spatterdock	*Nymphaea odorata* , White water lily	*Potamogeton alpinus* , Alpine pondweed	*Potamogeton natans* , Floating-leaf pondweed	*Potamogeton zosteriformis* , Flat-stem pondweed	*Sagittaria cuneata* , Arum-leaved arrowhead	*Stuckenia pectinata* , Sago pondweed	*Utricularia vulgaris* , Common bladderwort	*Vallisneria americana* , Wild celery
317			316	4.5	m	p		1																	1				
318			317	4.5	m	p																							
319			318	3	s	p		1				1												1	1				
320			319	3	m	p		1																	1				
321			320	3.5	m	p																							
322			321	2	r	p		1	1						1										1				
323			322				SHALLOW																						
324			323				SHALLOW																						
325			324				SHALLOW	1				1																	
326			325	3	m	p		1	1										1						1				
327			326	4	m	p																							
328			327	5	m	p		1				1													1				
329			328	5.5	m	p		1	1																1				
330			329	5	m	p		1	1			1													1				
331			330	5	m	p																							
332			331	5	m	p		1	1																				
333			332	5	m	p		1				1													1				
334			333	4	m	p		1							1										1				
335			334	3	m	p		1	1		1																		
336			335				LAND																						
337			336				LAND																						
338			337	1	r	p		1				1																	
339			338	2	m	p																							
340			339	3	m	p		1				1													1				
341			340	4	m	p		1							1										1				
342			341	4	m	p																							
343			342	6	s	p																							
344			343	5	m	p		1											1										
345			344	5	m	p		1	1																1				
346			345	5	m	p		1	1						1														
347			346	5	m	p		1				1													1				
348			347	3	m	p		1											1						1				
349			348	4	m	p		1	1				1		1														
350			349	8	m	p		1			1																		
351			350	6	m	p		1	1																				
352			351	6	m	p		1	1																1				
353			352	6	m	p		1	1						1														
354			353	6	m	p		1	1						1										1				
355			354	6	m	p		1	1																1				
356			355	2	s	p		2				2			1										1				
357			356	6	s	p																							
358			357	4	m	p		1	1																1				
359			358	5	m	p		1	1										1						1				
360			359	5	s	p																							
361			360	5	s	p																							
362			361	3	m	p																							
363			362	4.5	s	p		1							1														
364			363	5.5	m	p																							
365			364	5	m	p																							
366			365	5	m	p																							
367			366	6.5	m	p																							
368			367	8	m	p		1					1																
369			368	8	m	p		1	1																				
370			369	7.5	m	p		1	1																				
371			370	4	m	p		1	1																				
372			371	4	m	p		1	1																1				
373			372	6	s	p																							
374			373	5	m	p		1	1																				
375			374	4.5	m	p		1	1																1				
376			375	5	m	p																							
377			376	5	s	p		1	1																				
378			377	6	s	p		1	1																				
379			378	5	m	p																							
380			379	4	m	p																							
381			380	5	m	p																							
382			381	6	m	p																							
383			382	5	m	p																							
384			383	4	m	p		1	1																1				
385			384	5	m	p		1																	1				
386			385	4	s	p																							
387			386	6	m	p		1																	1				
388			387	5	m	p		1	1						1										1				
389			388	4.5	m	p		1	1						1										1				
390			389	4	m	p		1							1										1				
391			390	5	s	p																							
392			391	6	s	p																							
393			392	5	m	p		1	1			1																	
394			393	5	m	p		1	1																1				
395			394	5	m	p		1	1																1				
396			395	5	m	p																							
397			396	5	s	p																							
398			397	5	s	p																							
399			398	5	m	p																							
400			399	5	m	p																							
401			400	4.5	m	p																							
402			401	4	m	p		1	1																1				
403			402	7.5	m	p																							
404			403	3	s	p																							
405			404	1.5	m	p		1			1		1																
406			405	3	m	p		1				1																	
407			406	6.5	s	p		1				1	1																
408			407	6	m	p		1	1			1			1										1				
409			408	6	m	p		1	1																1				
410			409	5	m	p		1	1			1	1												1				
411			410	4.5	m	p		1	1			1												1	1				
412			411	4.5	m	p																							
413			412	3	m	p		1																	1				
414			413	4	m	p		1	1			1													1				
415			414	4.5	m	p																							
416			415	4.5	m	p																							
417			416	4.5	m	p		1				1																	
418			417	6	m	p		1	1																				
419			418	4.5	m	p		1	1			1													1				
420			419	3	m	p		1	1																				
421			420	2	m	p																							

	A	I	J	M	N	O	P	Q	R	S	AE	AG	AQ	AW	BR	BU	CA	CB	CH	CS	DE	DL	EF	ER	ES	FN	FO	FP	FQ
1	**Entry**		sampling point	Depth (ft)	Dominant sediment type (M=muck, S=Sand, R=Rock)	Sampled holding rake pole (P), rake rope (R), camera (C)	comments	Total Rake Fullness	*Myriophyllum spicatum* , Eurasian water-milfoil or Hybrid water-milfoil	*Potamogeton crispus* ,Curly-leaf pondweed	*Ceratophyllum demersum* , Coontail	*Chara* sp., Muskgrasses	*Elodea canadensis* , Common waterweed	*Heteranthera dubia* , Water star-grass	*Najas flexilis* , Slender naiad	*Najas marina* , Spiny naiad	*Nuphar variegata* , Spatterdock	*Nymphaea odorata* , White water lily	*Potamogeton alpinus* , Alpine pondweed	*Potamogeton natans* , Floating-leaf pondweed	*Potamogeton zosteriformis* , Flat-stem pondweed	*Sagittaria cuneata* , Arum-leaved arrowhead	*Stuckenia pectinata* , Sago pondweed	*Utricularia vulgaris* , Common bladderwort	*Vallisneria americana* , Wild celery
422			421	4	m	p		1	1			1			1										1				
423			422	7	m	p		1	1																				
424			423	7	m	p		1	1																				
425			424	4	m	p		1	1			1																	
426			425	4	m	p																							
427			426	3	m	p		1																	1				
428			427	1	m	p		1	1			1					1								1				
429			428				BOG																						
430			429	2	m	p		1				1			1										1				
431			430	5	m	p		1				1																	
432			431	6	s	p		1				1																	
433			432	4	m	p		1				1																	
434			433	2	m	p		1																	1				
435			434	4	m	p		1	1																1				
436			435	5	m	p		1	1																				
437			436	7	m	p		1	1																				
438			437	4	m	p		1	1			1													1				
439			438	3.5	m	p		1				1																	
440			439	3	m	p		1	1			1																	
441			440	2.5	m	p		1				1																	
442			441	3.5	m	p																							
443			442	5	s	p																							
444			443	3.5	m	p		1				1	1																
445			444	2.5	m	p		1					1		1														
446			445				SHALLOW																						
447			446	2	m	p		1	1																				
448			447	4	m	p		1																	1				
449			448	4	m	p		1	1																1				
450			449	4	m	p		1	1			1													1				
451			450	4	m	p		1				1																	
452			451	5	m	p		1	1																1				
453			452	5	m	p		1				1			1														
454			453	6	s	p																							
455			454	4	m	p		1							1														
456			455				LAND																						
457			456				SHALLOW																						
458			457	1	m	p																							
459			458	4	m	p		1	1																				
460			459	5	m	p		1				1													1				
461			460	5	m	p																							
462			461	5	m	p																							
463			462	5	m	p																							
464			463	5	m	p																							
465			464	3	m	p		1				1													1				
466			465	2	m	p		1	1		1	1																	
467			466	3	m	p		1	1			1																	
468			467	3	m	p		1	1																				
469			468	3	m	p																							
470			469	2.5	m	p		1				1																	
471			470	2	m	p																							
472			471	1	s	p		1										1							1				

Appendix E

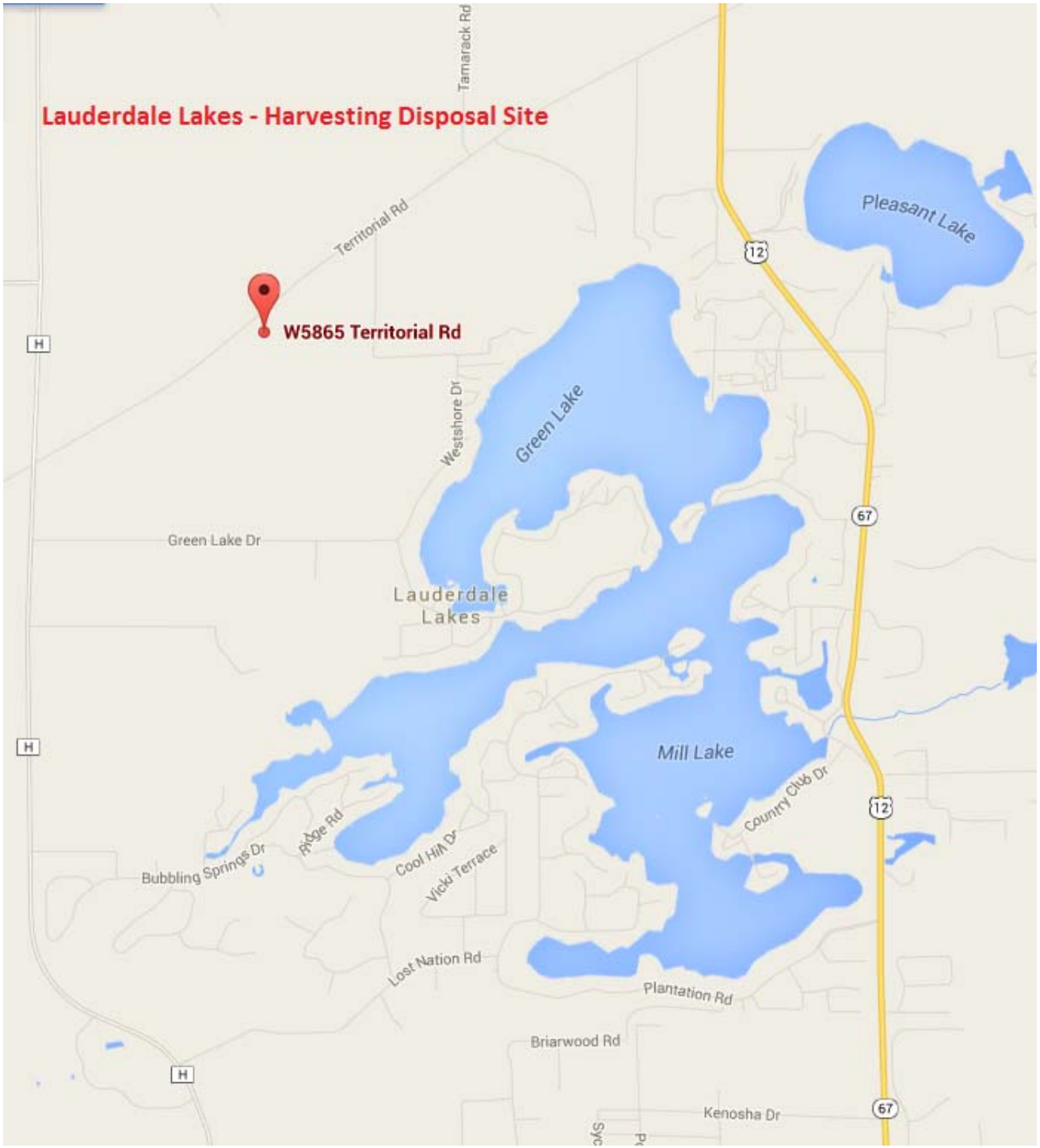
Aquatic Plant Harvesting Guidance and Disposal Site Map

GENERAL GUIDANCE FOR HARVESTER OPERATION

- EXCEPT FOR NAVIGATIONAL ACCESS LANES, ONLY CUT IN DEPTHS MORE THAN THREE FEET
- PRIORITIZE HARVESTING AREAS TO FOCUS ON GREATEST NEED – Highest priority should be on maintaining navigation access lanes to/from boat landings and common navigational lanes. In these areas, you must leave 12 inches of plant on the lake bottom. Individual areas by priority are included in the table below.
- TOP CUT IN AREAS FOR EWM MANAGEMENT – These areas are of moderate priority. Restrict cutting up to a depth of 4', leaving a minimum of 12 inches of plant growth on the lake bottom in areas shallower than 5 feet.
- RECREATIONAL HARVESTING AREAS – These areas of low priority and are to alleviate nuisance, surface-matting growth for riparian owners. Restrict harvesting from the end of pier heads to open water. Harvesting from pier-heads to shore should be done manually only.
- WILD CELERY – Removal of water celery shall be limited to areas that reach "nuisance" conditions – when water celery is closer than 2 feet from the water's surface
- Harvesting of native pondweeds and/or muskgrass is prohibited.
- MINIMIZE IMPACTS TO WDNR ENVIRONMENTALLY SENSITIVE AREAS – Restrict harvesting to navigation channels only within these areas and to a depth of 2 feet, leaving 12 inches of plant growth on the lake bottom. Harvesting to occur after June 30th only.
- SURFACE SKIMMING ALLOWED IN ALL LOCATIONS EXCEPT FOR WDNR SENSITIVE AREAS – Outside of mapped areas, harvester may surface skim free-floating vegetation that has been previously cut or uprooted, but not collected, to a depth of 1 ft. **Use of the cutter head is not permitted for this action.**
- ALL CUT MATERIAL SHOULD BE INSPECTED FOR FISH AND ANIMALS. ANY ORGANISMS FOUND SHOULD BE IMMEDIATELY RETURNED TO THE WATER.
- ALL CUT MATERIALS SHOULD BE COLLECTED AND DEPSITED AT THE DESIGNATED DISPOSAL SITE – Mr. Donald West's property at W5865.
- Maps of all harvesting location and disposal site are included in Appendix E.

Area	Description	Instructions
HIGH PRIORITY AREAS		
A_1	Common access navigation lane	Cut a lane 50' wide to the 5' contour - must leave 12" of plant growth on the bottom*
A_2	Boating access lane	Cut a lane 15' wide to the 5' contour - must leave 12" of plant growth on the bottom*
MODERATE PRIORITY AREAS		
B_1	EWM management areas	EWM Management Areas: Top cut to a depth of 4' to control surface matting of EWM growth and promote native species growth. Must leave 12" of plant growth on the bottom.
B_2	Riparian access	Top cut 2' from pier heads to open water for riparian access
LOW PRIORITY AREAS		
C	Recreational areas	Surface cut only from pier heads to open water (variable widths). Manual harvest ONLY from shore to pier heads

*** - In Middle Lake, cutting depth limited to 2 feet, beginning after June 30th ONLY**


Lauderdale Lakes - Harvesting Disposal Site
W5865 Territorial Rd
Tamarack Rd
Territorial Rd
Pleasant Lake
12
H
Westshore Dr
Green Lake
67
Green Lake Dr
Lauderdale Lakes
H
Mill Lake
Country Club Dr
12
Bubbling Springs Dr
Ridge Rd
Cool Hill Dr
Vicki Terrace
Lost Nation Rd
Plantation Rd
Briarwood Rd
H
Kenosha Dr
67

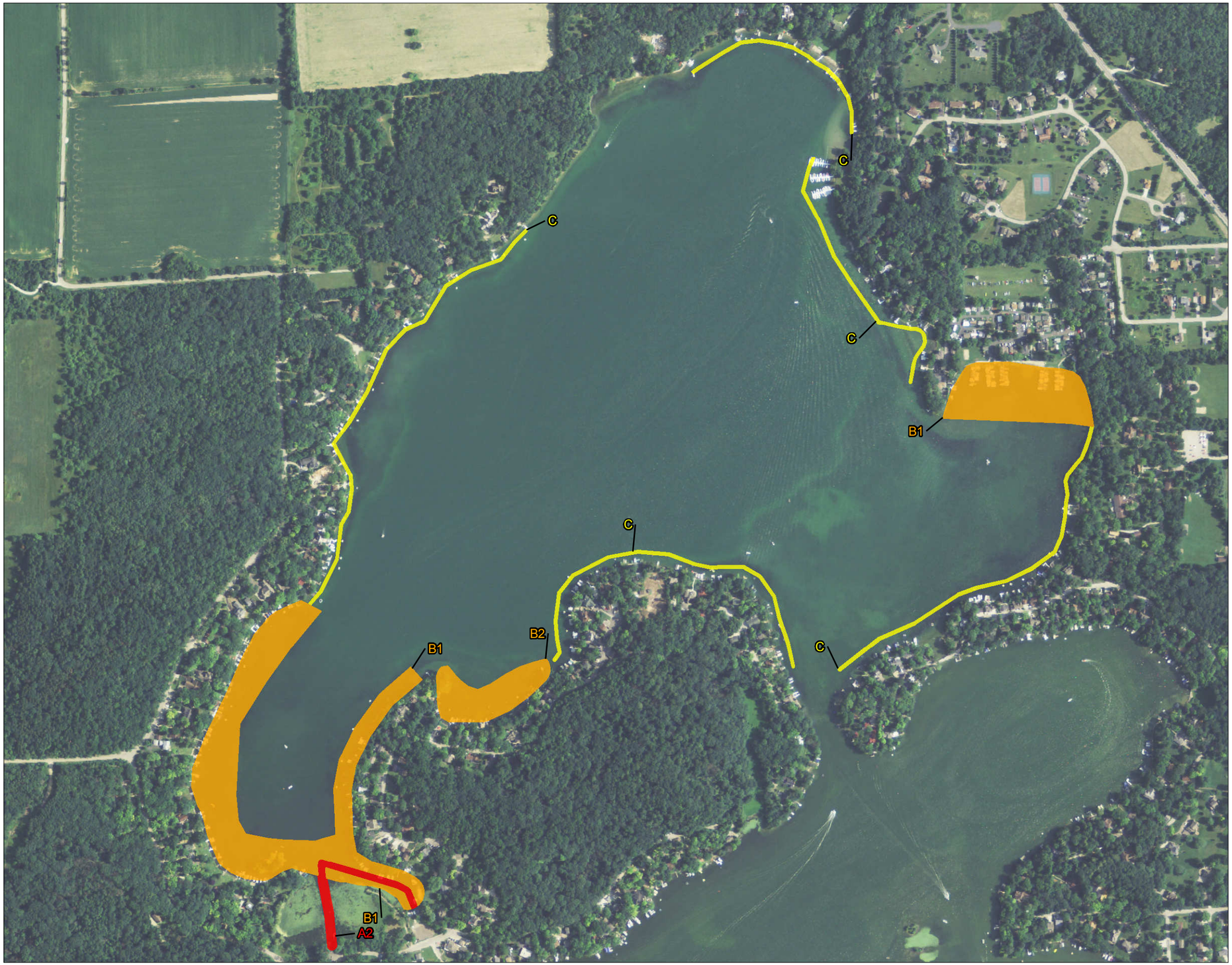


Figure No.
1

Title
Green Lake
2015 Harvest Plan

Client/Project
Lauderdale Lakes
Management District

Project Location
T. of Elkhorn,
Walworth Co., WI

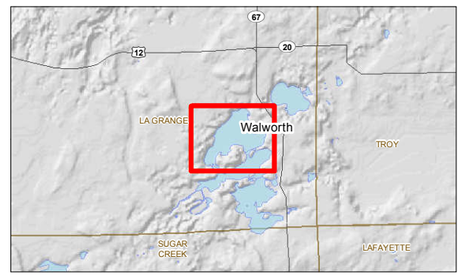
193703101
Prepared by KAS on 2015-02-11
Technical Review by AB on 2015-02-11
Independent Review by JS on 2015-02-11

0 300 600 Feet

1:7,200 (At original document size of 11x17)

N

Area	Instructions
HIGH PRIORITY AREAS - 1.34 ac	
A_1	Cut a lane 50' wide to the 5' contour - Must leave 12" of plant growth on the bottom
A_2	Cut a lane 15' wide to the 5' contour - Must leave 12" of plant growth on the bottom
MODERATE PRIORITY AREAS - 24.12 ac	
B_1	EWM Management Areas: Top cut to a depth of 4' to control to control surface matting of EWM growth and promote native species growth - Must leave 12" of plant growth on the bottom
B_2	Top cut 2' from pier heads out to the 5' contour for riparian access
LOW PRIORITY AREAS	
C	Surface cut only from pier heads to open water (variable widths) - Manual harvest ONLY from shore to pier heads



Notes
1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec and WDNR
3. Orthophotography: 2013 NAIP

Stantec

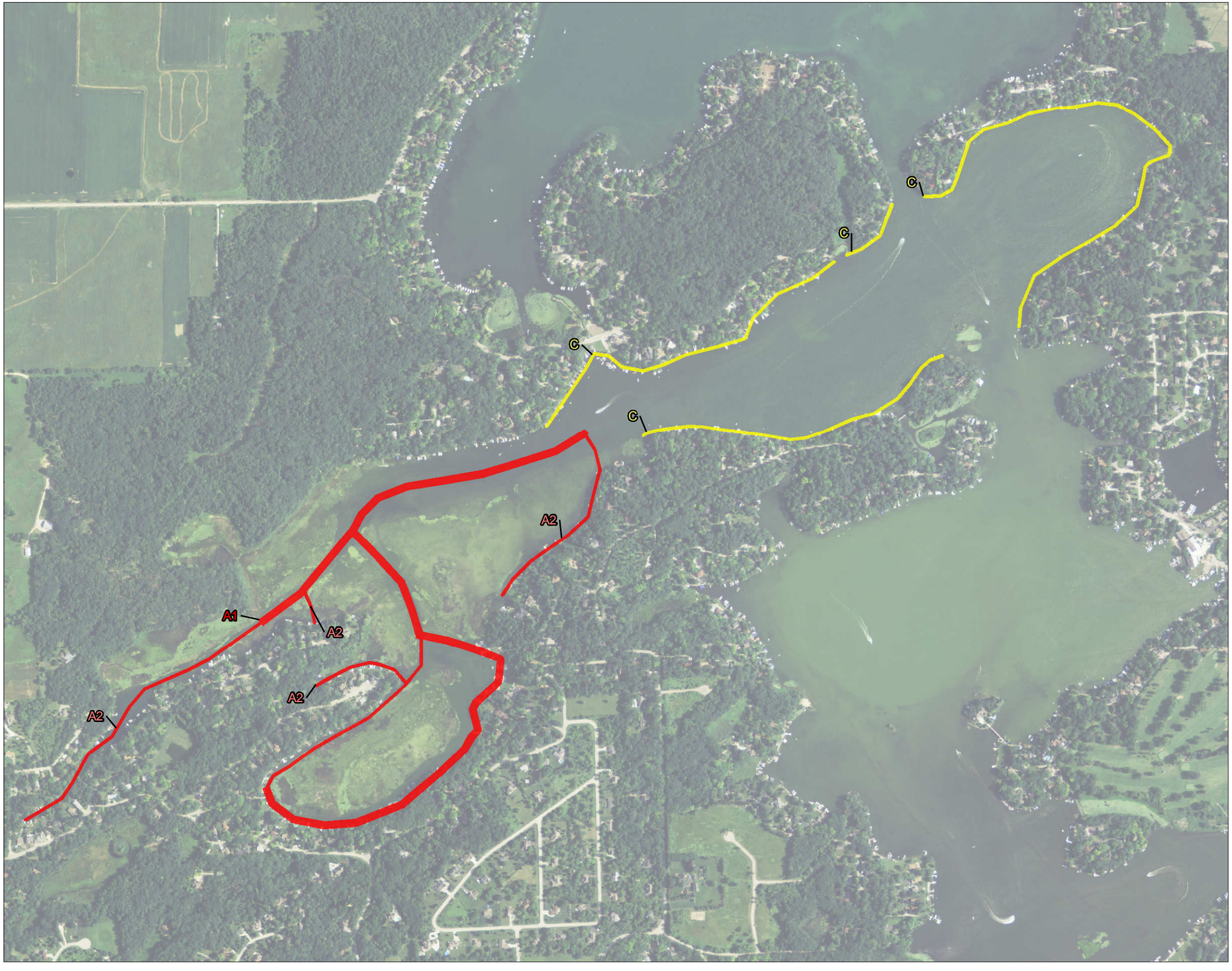


Figure No.

2

Title

Middle Lake
2015 Harvest Plan

Client/Project

Lauderdale Lakes
Management District

Project Location

T. of Elkhorn,
Walworth Co., WI

193703101
Prepared by KAS on 2015-02-11
Technical Review by AB on 2015-02-11
Independent Review by JS on 2015-02-11

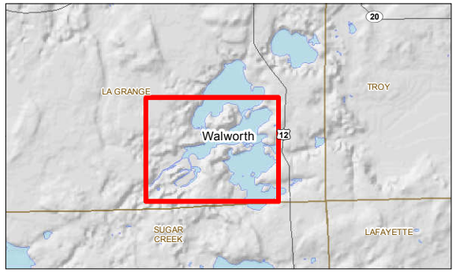
0 400 800 Feet

1:9,600 (At original document size of 11x17)

N

Area	Instructions
HIGH PRIORITY AREAS* - 11.04 ac	
A_1	Cut a lane 50' wide to the 5' contour - Must leave 12" of plant growth on the bottom
A_2	Cut a lane 15' wide to the 5' contour - Must leave 12" of plant growth on the bottom
MODERATE PRIORITY AREAS - None	
B_1	EWM Management Areas: Top cut to a depth of 4' to control to control surface matting of EWM growth and promote native species growth - Must leave 12" of plant growth on the bottom
B_2	Top cut 2' from pier heads out to the 5' contour for riparian access
LOW PRIORITY AREAS	
C	Surface cut only from pier heads to open water (variable widths) - Manual harvest ONLY from shore to pier heads

***Harvesting to begin after June 30th ONLY and limited to 2' depth of cut**



Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec, WDOT, and WDNR
3. Orthophotography: 2013 NAIP

Stantec

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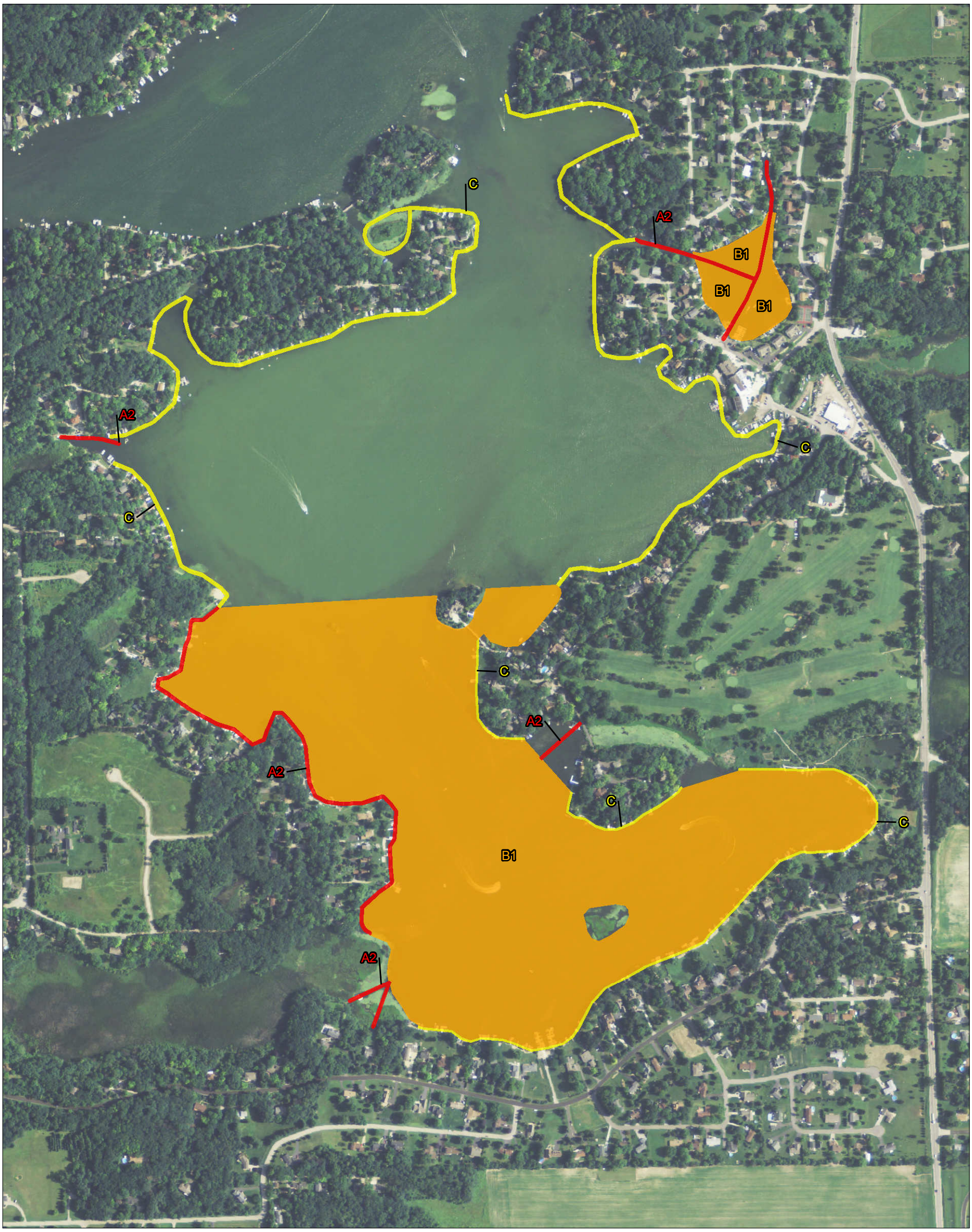

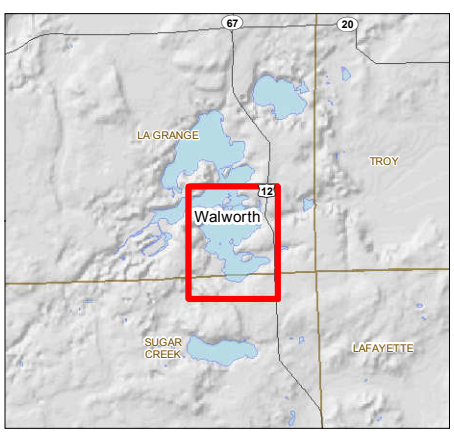

Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec and WDNR
3. Orthophotography: 2013 NAIP

Area	Instructions
HIGH PRIORITY AREAS - 2.27 ac	
A_1	Cut a lane 50' wide to the 5' contour - Must leave 12" of plant growth on the bottom
A_2	Cut a lane 15' wide to the 5' contour - Must leave 12" of plant growth on the bottom
MODERATE PRIORITY AREAS - 112.42 ac	
B_1	EWM Management Areas: Top cut to a depth of 4' to control to control surface matting of EWM growth and promote native species growth - Must leave 12" of plant growth on the bottom
B_2	Top cut 2' from pier heads out to the 5' contour for riparian access
LOW PRIORITY AREAS	
C	Surface cut only from pier heads to open water (variable widths) - Manual harvest ONLY from shore to pier heads

Figure No.

3

Title

Mill Lake
2015 Harvest Plan

Client/Project

Lauderdale Lakes Management District

Project Location

T. of Elkhorn, Walworth Co., WI

193703101

Prepared by KAS on 2015-02-12
Technical Review by PM on 2015-02-12
Independent Review by JS on 2015-02-12

0 300 600 Feet

1:7,200 (At Original document size of 11x17)

N

Stantec