SARATOGA LAKE
AQUATIC VEGETATION MANAGEMENT PROGRAM
2012 ANNUAL HERBICIDE TREATMENT REPORT

November 2012

Prepared for:
Saratoga Lake Protection and Improvement District
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INTRODUCTION

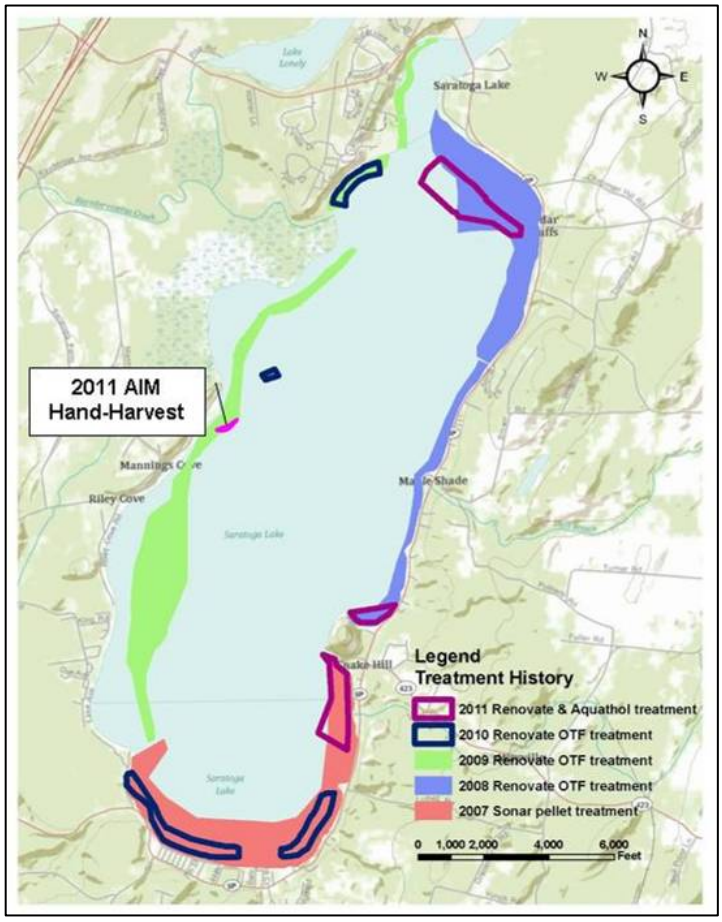
An integrated aquatic plant management program was performed at Saratoga Lake for the sixth consecutive year in 2012. The current program includes the use of aquatic herbicides to control invasive Eurasian watermilfoil (*Myriophyllum spicatum*) and curlyleaf pondweed (*Potamogeton crispus*), the use of mechanical harvesting equipment owned and operated by the Saratoga Lake Protection and Improvement District (SLPID) to manage nuisance plant growth along developed shoreline areas, and limited winter drawdowns. This IMP approach was developed after nearly a decade of investigations and studies and is detailed in the following documents: Watershed Management Plan prepared by The LA Group in 2002, the Long-Term Aquatic Vegetation Management Plan prepared by Aquatic Control Technology in 2005, and the EIS prepared by The LA Group in 2007. The balance of this report details the herbicide treatment program that was performed at Saratoga Lake during the 2012 season.

SUMMARY OF RECENT HERBICIDE TREATMENTS

Herbicide treatments were initially considered to control the dense beds of Eurasian watermilfoil that were documented to cover between 700 and 800 acres by the Darrin Fresh Water Institute (DFWI) in 2004. The considerable Eurasian watermilfoil biomass was overwhelming SLPID's harvesting program and was severely impacting recreational use of the lake. A phased herbicide treatment program was initiated in 2007 to target all of the dense beds of Eurasian watermilfoil over a three-year period. It was then hoped that drawdown and harvesting could be used to keep nuisance plant growth at manageable levels, and herbicides would be used as a complimentary maintenance strategy to control invasive species.

Since 2007, the following herbicide treatments have been performed at Saratoga Lake:

Year	*acres treated*	*location*	*herbicide applied*
2007	158	south end	Sonar PR & Q (fluridone pellets)
2008	292	northeast and east shore	Renovate OTF (triclopyr granular)
2009	285	northwest and west shore	Renovate OTF
2010	50	various locations	Renovate OTF
2011	100	northeast & southeast shore	Renovate 3 (triclopyr liquid) & Aquathol K (endothall liquid)
2012	100	southeast shore	Renovate OTF & Clearcast 2.7G (imazamox granular)



The three-year treatment program performed during the 2007, 2008 and 2009 seasons was very effective at reducing the distribution and biomass of Eurasian watermilfoil. Spot-treatment of recovering Eurasian watermilfoil was performed in 2010. Maintenance level treatments were continued in 2011 and 2012 and were expanded to also target curlyleaf pondweed.

HERBICIDE TREATMENT PROGRAM - 2012

The 2011 treatment program targeted control of both Eurasian watermilfoil (EWM) and curlyleaf pondweed (CLP) by using a combination of Renovate 3 (triclopyr liquid) and Aquathol K (endothall liquid). Excellent control of CLP was achieved in the treatment areas. The initial control of EWM appeared to be effective, but there was considerable late season recovery in two of the treatment areas. The likely explanation for the reduced level of EWM control appeared to be dilution and mixing that reduced the herbicide concentration-exposure-time (CET) below levels that were needed for good control of the root structures.

Herbicide treatment efforts were focused on the southeast shoreline in 2012. This area had not received a sizeable herbicide treatment since 2007, EWM was recovering to nuisance levels and CLP densities had been problematic in recent years. In an effort to increase herbicide CET it was agreed that one large contiguous block would be treated and granular formulations would be used to help limit mixing and dilution caused by wind and wave action. Renovate OTF (triclopyr granular) was selected for EWM control and Clearcast 2.7G (imazamox granular) was selected for CLP control. Clearcast 2.7G was registered for aquatic use in 2011. It has a very favorable toxicology profile and had demonstrated excellent efficacy on CLP at low concentrations.

Program Chronology

A chronology of the 2012 treatment program is provided below:

- Submission of permit application to DEC ..... February 14
- Pre-treatment inspection and finalize treatment areas ..... May 11
- DEC permit issuance ID 5-4199-00002/00008 & 11 ..... May 16
- Treatment of approximately 100 acres with Renovate OTF for EWM control and 50 acres with Clearcast 2.7G for CLP control ..... May 23
- Post-treatment inspections ..... July 5 & 12, Aug 12
- Comprehensive aquatic plant survey (DFWI) ..... Aug 29 & 30
- Late season inspections ..... Oct 9, Nov 12

Pre-Treatment Inspection

On 11 May 2012 the proposed treatment area on the southeast shore was surveyed by ACT to determine the stage of milfoil growth and to make adjustments to the 2012 treatment scope. CLP plants were healthy and showing approximately 4-5 feet of active plant growth. EWM plants were beginning to show active growth, but only 1-2 feet of new tissue growth was seen. The treatment areas were left essentially unchanged. Water temperatures were fairly uniform at 13.7 °C (57 °F) to a depth of 4 meters in the treatment area.

Summary of 2012 Treatment

A treatment date of Wednesday, 23 May 2012 was selected so that the one-day swimming restriction would not be imposed over the Memorial Day weekend. Weather conditions on the day of treatment began with overcast skies an air temperature of roughly 65° F and wind out of the north estimated at 10 mph which was producing a rough chop on the water's surface. Conditions improved by early afternoon as the clouds cleared and wind

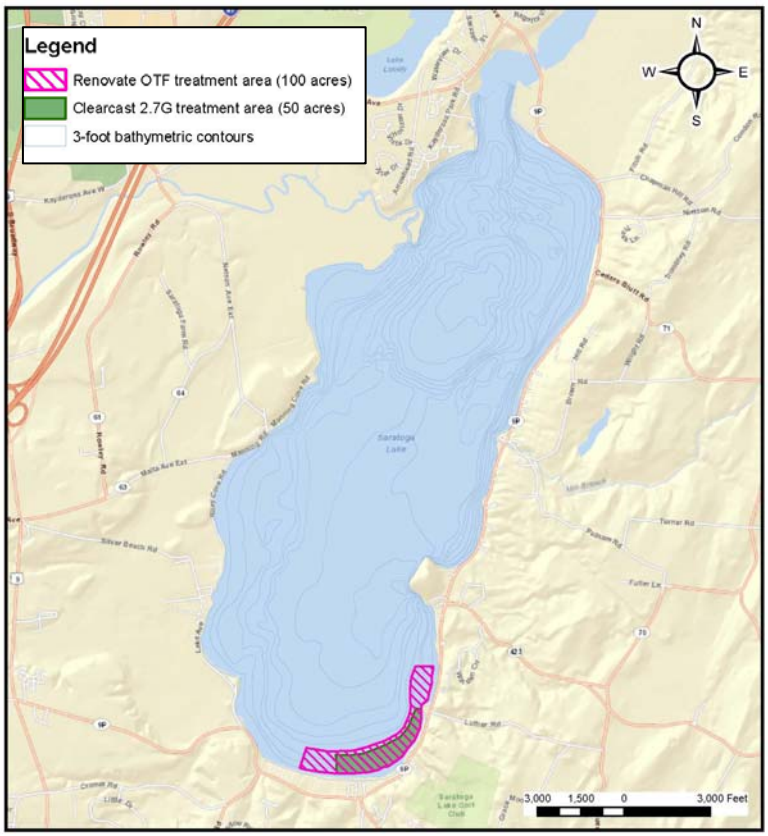
dropped to less than 5 mph. Surface water temperature was approximately 20.3° C and the dissolved oxygen concentration was 11.4 mg/L.

The treatment was conducted using two boats. A 24-foot fiberglass work skiff was outfitted with two calibrated, cyclone seeder/spreaders mounted in the stern, which produced approximately a 30-foot swath. The Renovate OTF (EPA Reg. No. 67690-42; SLN NY-070004) granules were loaded into the spreaders and evenly applied throughout pre-determined treatment sectors.

A 20-foot aluminum work skiff was equipped with a calibrated eductor system that delivered the granular Clearcast 2.7G (EPA Reg. No. 241-439-67690) in a 20-foot fan-shaped spray of lake water off the stern of the boat. The treatments occurred simultaneously.

Each boat was equipped with a WAAS GPS unit that had the treatment areas pre-loaded and they were used for real-time navigation and to insure that even applications were made within the designated treatment areas. A private boat ramp located on the southeast shore located towards the northern end of the treatment area was used as the base of operations.

Renovate was applied at 94.5 pounds/acre to achieve a target dose of 0.5 ppm throughout the water column. A total of 9,450 pounds of Renovate OTF were applied. Clearcast 2.7G was applied at a rate of 35 lbs/acre to achieve a target dose of 50 ppb throughout the water column. A total of 1,750 pounds of Clearcast 2.7G was applied.

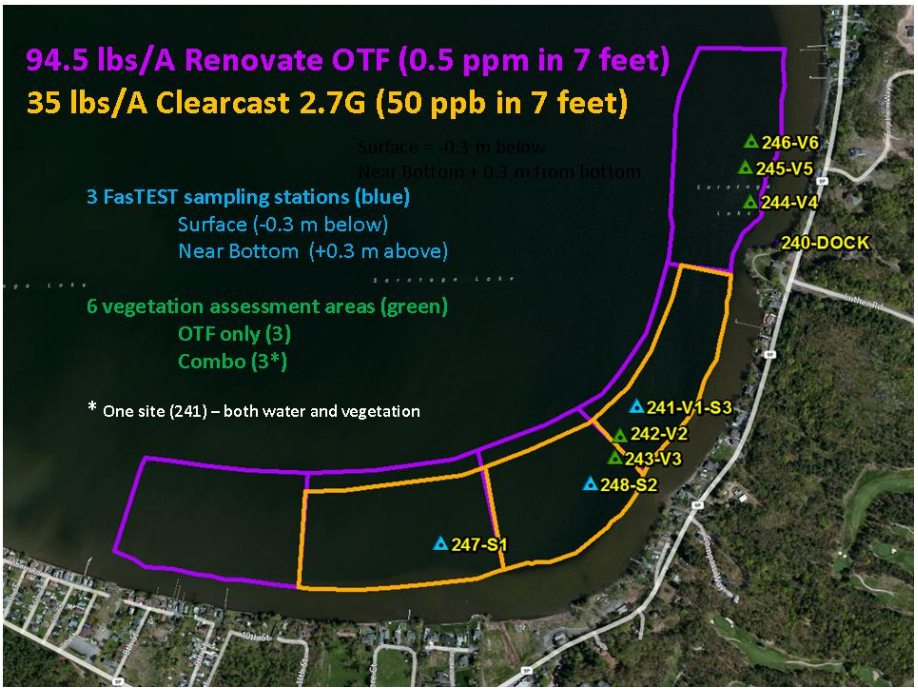


Post-Treatment Inspections

Because this was the first time that Clearcast 2.7G was being applied to a large lake in New York, SePRO Corporation, the manufacturer of both herbicides, provided technical support and oversight for the treatment program. They had researchers present on the day of treatment to assess plant growth and to perform post-treatment herbicide residue monitoring. Herbicide residue samples were collected 4 and 10 hours after treatment and 1, 2 and 6 days after treatment. Samples were collected from the surface and the bottom.

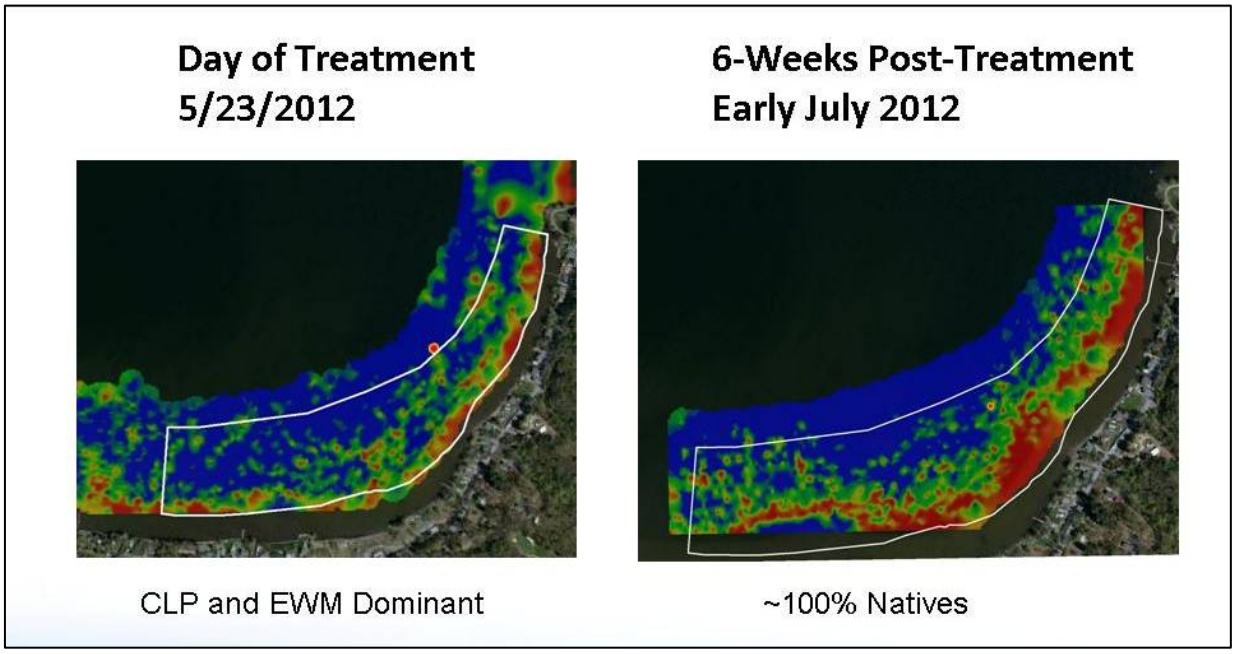
SePRO is still evaluating the data collected following the treatment and they will be using the information for product development purposes. Some of the preliminary data that they shared showed that the targeted concentrations were achieved within one day of the treatment and that the herbicide concentrations were considerably higher at the bottom than they were at the surface. This suggests that the granular formulations were successful in delivering the active ingredient to the bottom where it was subject to less mixing from wind and wave action.

Approximately four weeks post-treatment SePRO conducted a diving inspection of the treatment area and found that most of the targeted CLP plants were dead and decomposing on the bottom. Some EWM stems remained erect in the water column, but they were largely defoliated and appeared to be continuing to die-back. They also documented several healthy native plant species growing throughout the treatment area including: *Potmogeton richardonii, Potamogeton amplifolius, Potamogeton zosteriformis, Ceratophyllum demersum, Elodea canadensis, Stuckenia pectinatus, vallisneria Americana,* and *Zosterella dubia.*



Courtesy of SePRO Corporation

In another effort to assess treatment effectiveness, ACT utilized an acoustic mapping system on the day of treatment and again approximately six weeks post-treatment. The system records and maps the vegetation biovolume. The color gradient runs from blue – low plant growth to red – abundant plant growth. The images show higher vegetation biovolume six weeks post-treatment. The treatment area was dominated by CLP and EWM on the day of treatment and no remaining CLP or EWM biomass could be found in the water column six weeks after treatment, so all of the plant biovolume seen post-treatment was comprised by native plant species.



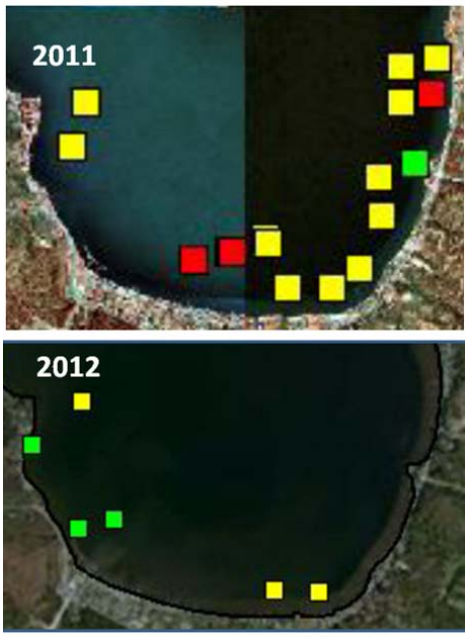
Another inspection of the treatment area was performed by ACT and SePRO on August 2. By that time there was some recovering EWM and CLP seen in the treatment area, but there still appeared to be a greater than 90 percent reduction in biomass of the two targeted invasive species.

2012 LATE SEASON COMPREHENSIVE AQUATIC VEGETATION SURVEY

The annual comprehensive aquatic plant survey was conducted by DFWI in late August. A copy of their interim report is provided in Attachment A. A point-intercept vegetation survey was performed throughout the littoral zone of the lake consistent with their survey efforts in prior years.

Within the treatment area there was an obvious reduction in EWM between the 2011 and 2012 surveys. Even though there were only a limited number of survey data points that fell within the treatment area, it was still evident that a considerable reduction in EWM was achieved by the treatment program.

Reviewing the DFWI data for the entire lake, there appeared to be slight decline in frequency of occurrence of EWM between 2011 and 2012, and a slight increase in CLP. The maintenance treatments performed over the past three years appear to be maintaining the lake-wide populations of EWM and CLP at fairly low levels.



Maps from DFWI 2011 and 2012 reports

Frequency of Occurrence data from DFWI surveys

Year	*2004*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*
Treatment performed	*Pre-treatment*	*South end Sonar 158 acres*	*East and northeast shore Renovate OTF 292 acres*	*West shore Renovate OTF 285 acres*	*Spot-treatment Renovate OTF 50 acres*	*Spot-treatment Renovate & Aquathol liquid 100 acres*	*Spot-treatment Renovate OTF & Clearcast 2.7G granular 100 acres*
Eurasian watermilfoil	54.2%	49.7%	13.0%	6.8%	22.1%	29.3%	25.6%
Curlyleaf pondweed	5.6%	5.6%	5.6%	3.1%	9.4%	0.7%	2.3%

Native species continue to dominate the aquatic plant community in Saratoga Lake. Quantitative measures of frequency of occurrence and species richness were consistent with prior years. Twenty-four species were encountered during the 2011 survey, which is the same number that was found in 2011 and remains comparable with prior years. Slight changes in the frequency of occurrence values of native species are seen from year to year, but this is probably attributable to annual variation in growth and limitations of the survey methodology that is being employed. The only noteworthy difference seen in 2012 was a significant expansion in the frequency of occurrence of Richardsons' Pondweed (*Potamogeton richardonii)*, which increased from 0.3% in 2011 to 22.0%. This plant was forming large beds of plant growth that were approaching the surface in many areas around the

lake including throughout the 2012 treatment area. This may have been due to ideal growing conditions for this species in 2012, since there were reports of other area lakes with significant increases such as Hadlock Pond in Washington County. Overall, the native plant population appeared to be stable and growing robustly.

SUMMARY AND DISCUSSION

By all measures, the 2012 herbicide treatment on Saratoga Lake provided effective control of Eurasian watermilfoil and curlyleaf pondweed. Only low densities of two targeted invasive species were found in the treatment area during late season inspections, while the area supported diverse and abundant growth of several native plant species. The simultaneous application of Renovate OTF and Clearcast 2.7G herbicides did appear to provide better selectivity and more complete control of Eurasian watermilfoil than was seen following 2011 Renovate and Aquathol combination treatment. Improved treatment efficacy is likely attributable to the use of granular formulations and limiting treatment to one large contiguous block to reduce dilution caused when there is higher edge to treatment area ratios.

Saratoga Lake is a productive system and it will continue to support growth of invasive Eurasian watermilfoil and curlyleaf pondweed. Herbicide treatment programs performed since 2007 have controlled dense beds of Eurasian watermilfoil and have allowed for recovery of a diverse native plant assemblage. However, the treatments do not provide complete control and recovery of Eurasian watermilfoil will occur at accelerated rates if ongoing management is not continued. Future herbicide treatments should continue to be "fine-tuned" based on the recent experiences at Saratoga Lake and at other lakes in the Northeast.

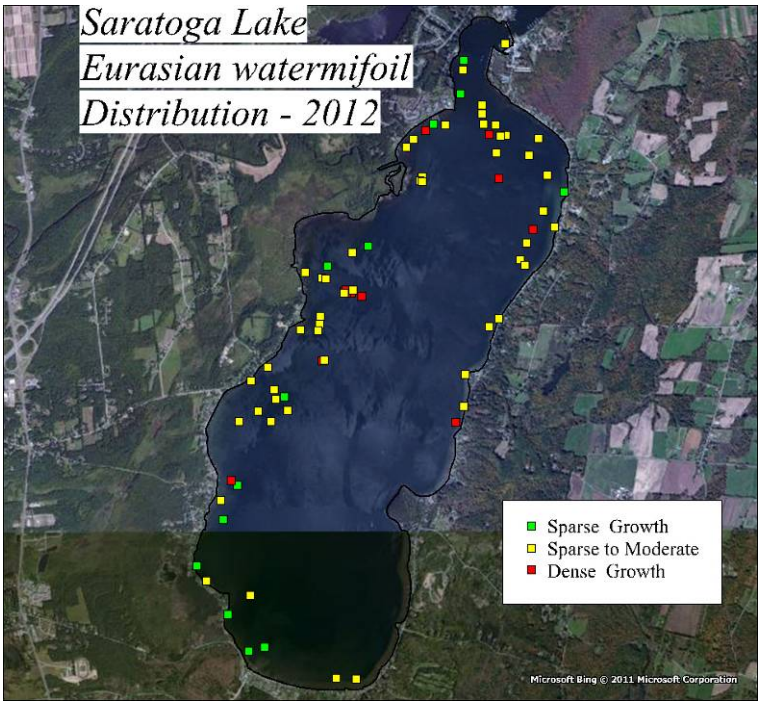
RECOMMENDATIONS FOR 2013 SEASON

The results of the DFWI August 2012 survey and observations made during late season inspections suggest that the northern end, especially the northeast corner between Franklin Beach Road and Cedar Bluff Road, will support the most robust Eurasian watermilfoil growth on the lake during the 2013 season.

After seeing the visual depiction of the Eurasian watermilfoil distribution, the point-intercept survey data for this area was analyzed. The frequency of occurrence value for Eurasian watermilfoil at the northern end of the lake was almost 40%, as compared to the lake-wide frequency value of 26%. Curlyleaf pondweed only had a 2% frequency value.

The native plant species in this area were dominated by *Ceratophyllum demersum* (75%), *Najas guadalupensis* (45%), *Zosterella dubia* (43%), *Potmogeton perfoliatus* (33%) and *Vallisneria americana* (25%).

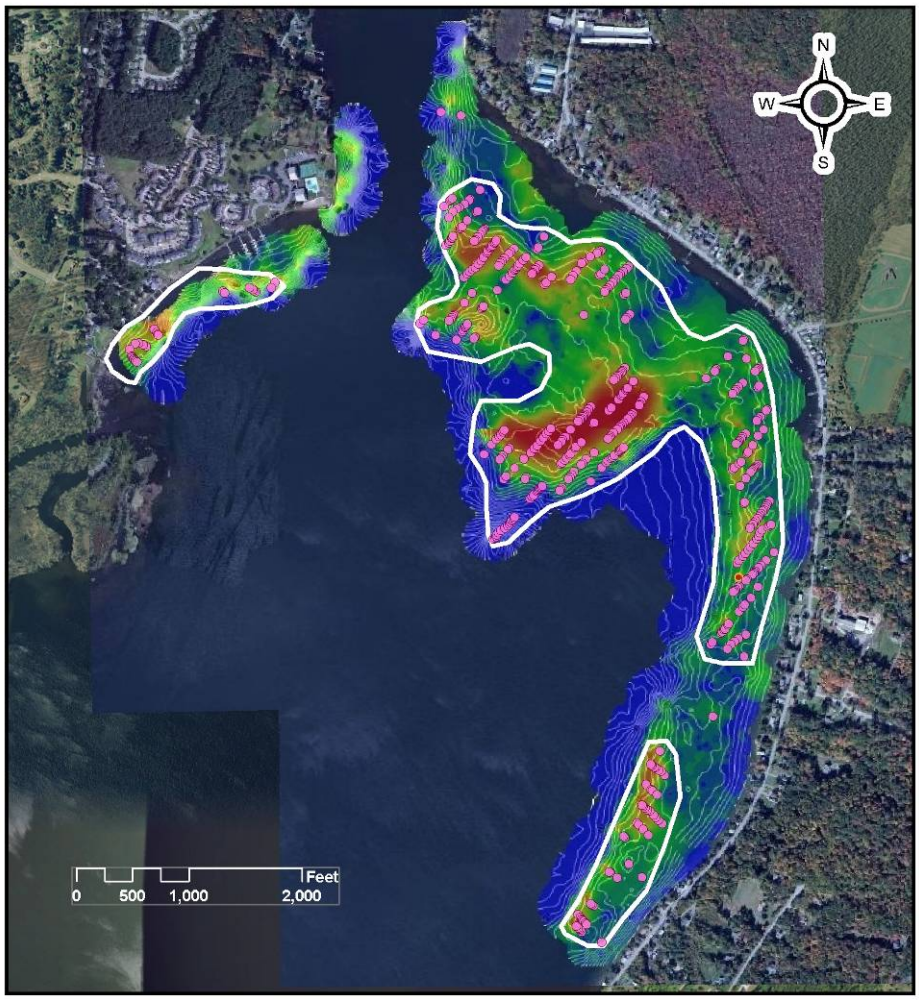
The north end of Saratoga Lake is more challenging to treat than the south end due to its proximity to the primary inlet (Kayaderosseras Creek), the outlet (Fish Creek), the deep hole, and the fact that it



Map from DFWI 2012 interim report

is often on the receiving end of the prevailing winds. Treatment of the northeast corner was effective in 2008 when nearly 300 contiguous acres were treated, but the 2011 spot-treatment did appear to be adversely impacted by dilution and herbicide dissipation that was likely accelerated by wind and wave action.

Preliminary treatment areas are depicted in the figure to the right. In order to develop an accurate treatment plan, acoustic mapping of the area was performed in mid-November. At that time, Eurasian watermilfoil was still standing upright in the water column, while many of the taller native plants had senesced, which made it possible to record locations of milfoil growth using a GPS unit (red points). The areas supporting more extensive milfoil growth were fairly consistent with the biovolume estimates provided by the acoustic mapping system. Bathymetric contours were also recorded throughout the potential treatment area which will allow for accurate water volume calculation.



The final areas to be targeted for treatment in 2013 still need to be agreed to by SLPID. However, it is already expected that Renovate OTF (triclopyr granular) will be the only herbicide applied in 2013, since this area does not appear to support extensive cover of curlyleaf pondweed. Due to the greater average water depth and the proximity to the inlet, outlet and deep hole, Renovate OTF application rates will be up to 1.5 to 2.0 times higher than the rate that was used in 2012. There may also be a need to split the application over two consecutive days to maximize the potential herbicide concentration-exposure-time. Treatment timing will likely stay similar to recent years, targeting a mid-late May treatment date. The objective will be to schedule treatment when there is at least 3 or more feet of active Eurasian watermilfoil growth, and when there is still a temperature gradient in the water column that will help limit herbicide dissipation. It will also be necessary to maintain some flexibility in the treatment date should there be adverse weather conditions, such as high winds that could accelerate wind driven mixing.

ATTACHMENT C

- Comprehensive Aquatic Plant Survey – 2012 Interim Report (prepared by Darrin Fresh Water Institute)

Interim Report on Vegetation of Saratoga Lake, New York

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Background.

Quantitative aquatic plant surveys were undertaken for Saratoga Lake, New York as part of a cooperative effort between Aquatic Control Technologies (ACT) and the Darrin Fresh Water Institute, and supported by the Saratoga Lake Protection and Improvement District (SLPID). The aquatic plant survey was designed to be comparable to pre-treatment and post-treatment data collected by the author in 2004, and 2007 thru 2011 (Eichler & Boylen 2011) to evaluate a treatment program based on application of the herbicide fluridone (SONAR^{TM}) in 2007 and the herbicide triclopyr (Renovate) in 2008 thru 2012 (Figure 1) to control Eurasian watermilfoil (*Myriophyllum spicatum*). In 2011, hand harvesting of Eurasian watermilfoil by SCUBA divers was also conducted by Adirondack Invasives Management (AIM) in an area south of Mannings Cove. The Point-Intercept Rake Toss method presently required by NYS DEC for Tier III Lakes was employed.

The project was designed to obtain data to evaluate current aquatic plant management efforts and review potential new strategies. The assessment will generate the information necessary to: 1) review effectiveness of aquatic plant management efforts, 2) meet all permit requirements and 3) provide data for comparison of post-treatment conditions to prior survey information.

Methods

1. Species List and Herbarium Specimens. As the lake was surveyed, the occurrence of each aquatic plant species observed was recorded and adequate herbarium specimens collected. Herbarium specimens were pressed, dried, and mounted (Hellquist 1993) at the Darrin Fresh Water Institute Laboratory in Bolton Landing, NY, where they became part of the permanent collection.

2. Point Intercept. The frequency and richness of aquatic plant species were evaluated using a point intercept (rake toss) method (Madsen 1999). At each grid point intersection, all species located at that point were recorded, as well as water depth. Species were located by a visual inspection of the point and by deploying a rake to the bottom, and examining the plants retrieved. A differential global positioning system (DGPS) was used to navigate to each point for the survey observation. Point intercept plant frequencies were surveyed on August 29-30 of 2012, at the time of maximum aquatic plant abundance. Based on an 80 m grid and excluding the majority of points outside the littoral zone, we surveyed a total of 306 points on Saratoga Lake (Figure 2). The point intercept method allows a large number of discrete observations in a short

period of time facilitating statistical analysis and comparisons. Point intercept methods also allow for production of distribution maps for all species listed.

Figure 1. Aquatic plant management plan for Saratoga Lake prepared by Aquatic Control Technologies, Inc.

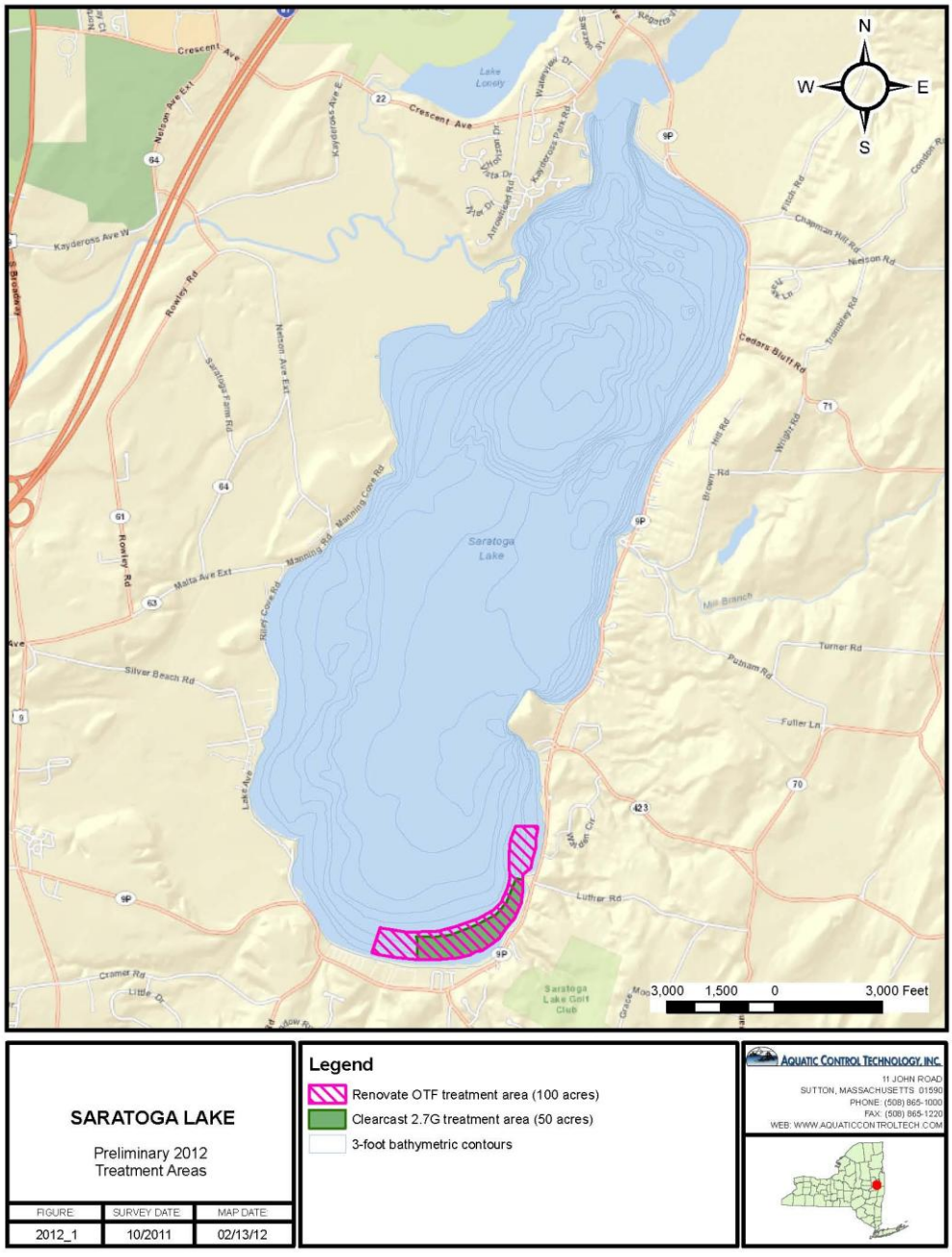
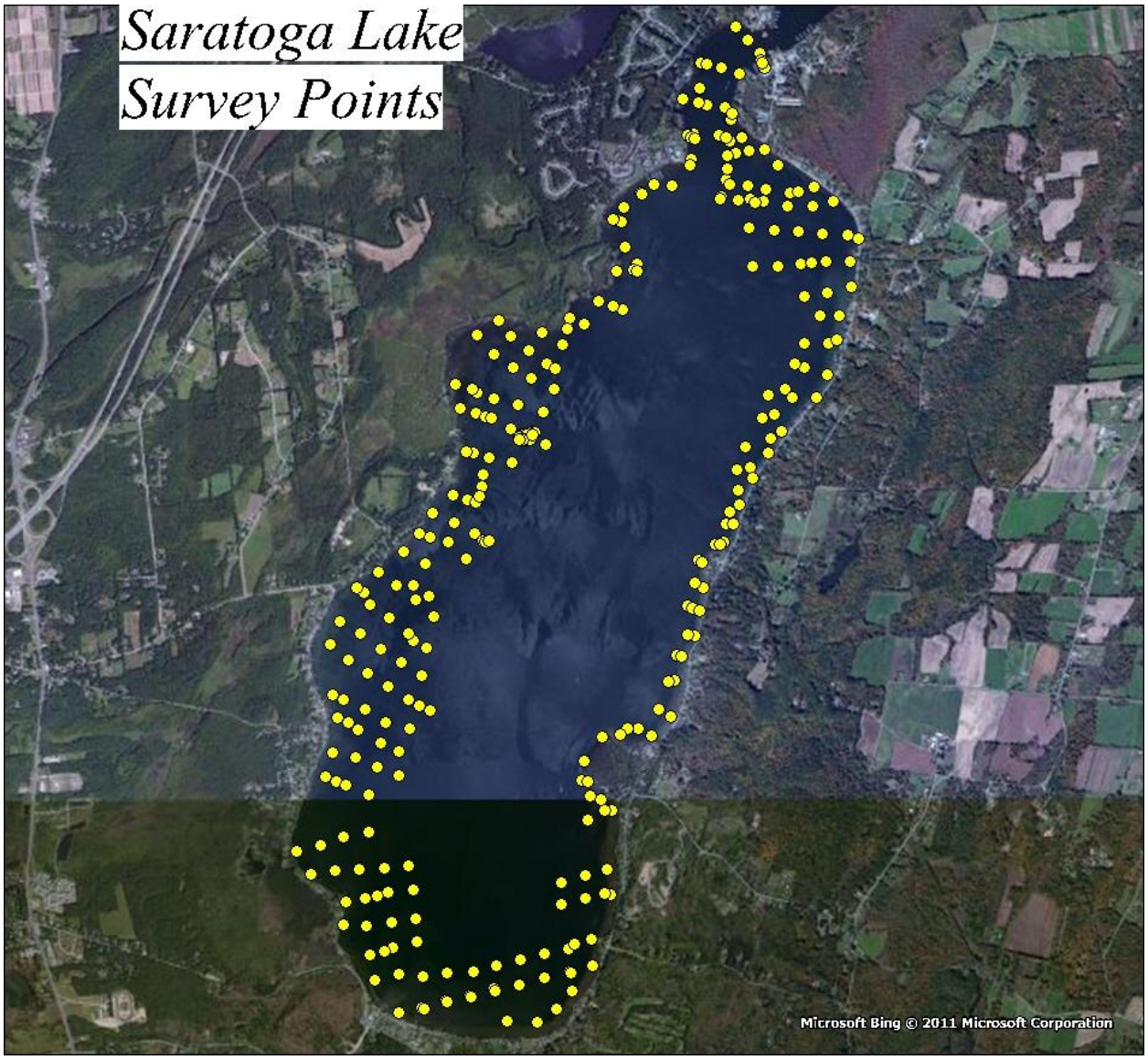


Figure 2. Sampling points for 2012 Saratoga Lake aquatic plant survey.



Results

1. Species List. A preliminary list of species observed for Saratoga Lake is provided in Table 1. A total of 24 species were collected in the point intercept portion of the survey and 28 species were observed in Saratoga Lake in 2012. These results are comparable to previous surveys in 2010 (24 species, Eichler and Boylen 2010), 2009 (29 species, Eichler and Boylen 2009), 2007 - 2008 (25 species, Eichler and Boylen 2008), 2004 (21 species, Eichler and Boylen 2004), 1994 (22 species, Eichler and Boylen 1995), 1982 (21 species, Hardt et al. 1983) and 1969 (20 species, Dean 1969). None of the species encountered in Saratoga Lake are on the New York State Rare Species List (Young, 2010).

2. Species Frequency. Species richness in Saratoga Lake was quite high, with a large number of species occurring in more than 5% of survey points (Table 2). Eurasian watermilfoil was the fifth most widely distributed plant (26% of survey points, Figure 3), the same rank as in 2011, but an increase from seventh in 2010 and ninth in 2009 (Figure 3). Common native species included *Ceratophyllum demersum* (54%), *Najas guadalupensis* (33%), *Zosterella dubia* (36%), *Vallisneria americana* (33%), *Elodea canadensis* (22%), *Potamogeton richardsonii* (22%), *Potamogeton perfoliatus* (6%), and *Potamogeton praelongus* (5%). *Potamogeton richardsonii* has increased dramatically in frequency of occurrence over the past year. Average number of species per sample point was (2.59 ± 0.12), similar to 2011 (2.79 ± 0.11), 2009 (2.74 ± 0.12) and 2008 (2.47 ± 0.12), but less than in 2010 (3.47 ± 0.12). Exclusion of all survey points outside the littoral zone in 2010 may account for this change.

Figure 3. Distribution of Eurasian watermilfoil (*Myriophyllum spicatum*) in surveyed areas of Saratoga Lake in 2012.

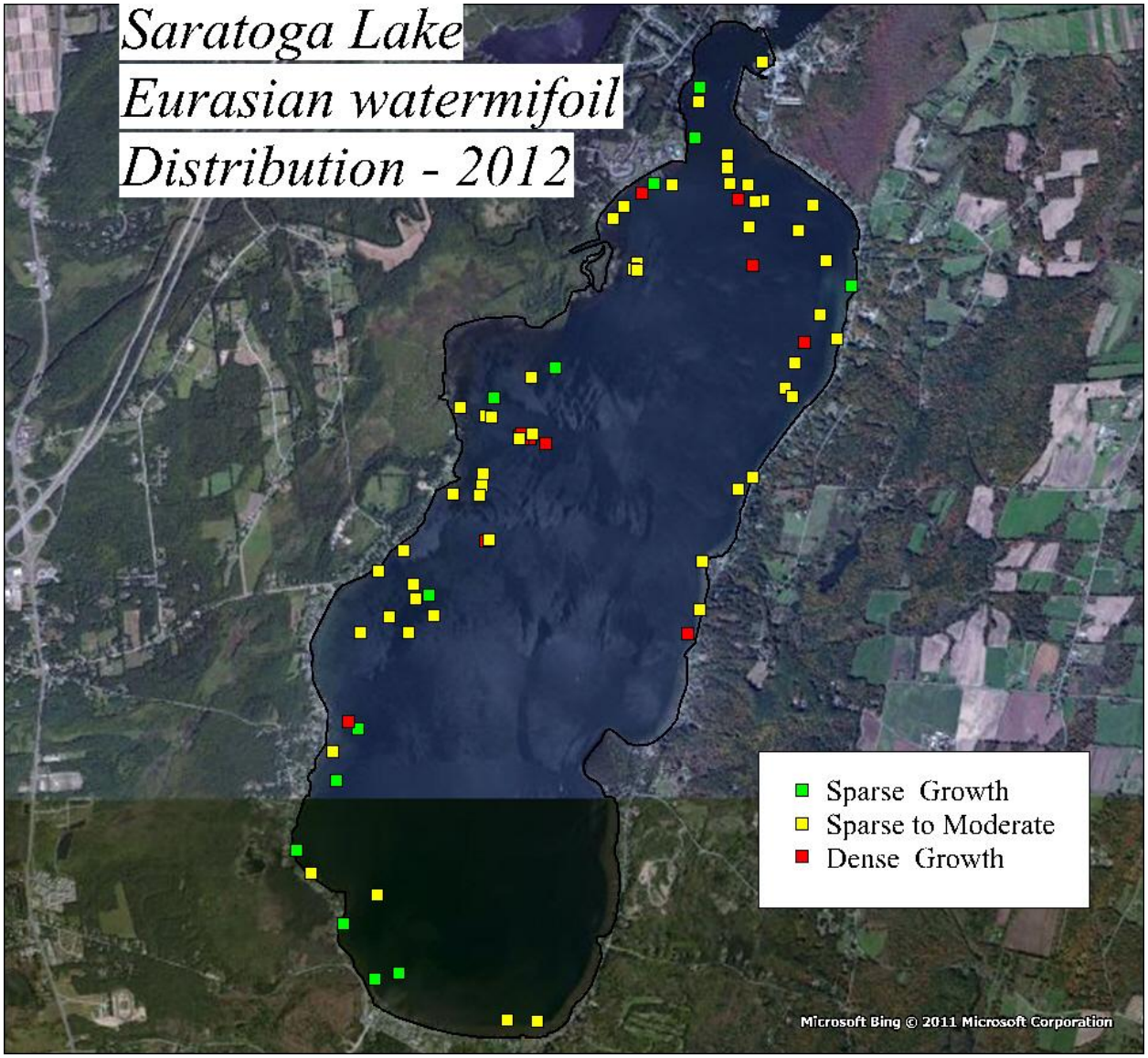


Table 1. Aquatic plant species present in Saratoga Lake in recent surveys.

Species	**Common Name**	**2009**	**2010**	**2011**	**2012**
Ceratophyllum demersum L.	coontail	**x**	**x**	**x**	**x**
Chara/Nitella sp.	muskgrass, chara	**x**	**x**	**x**	**x**
Elodea canadensis Michx.	elodea	**x**	**x**	**x**	**x**
Lemna minor L.	duckweed	**x**	**x**	**x**	**x**
Lemna trisulca L.	duckweed	**x**	**x**	**x**	**x**
Megalodonta beckii Torr.	water marigold	**x**	**x**	**x**	**x**
Myriophyllum spicatum L.	Eurasian watermilfoil	**x**	**x**	**x**	**x**
Najas flexilis (Willd.) Rostk. & Schmidt.	bushy pondweed	**x**	**x**	**x**	**x**
Najas minor All.	Minor Naiad			**x**	
Najas guadalupensis (Spreng.) Magnus	Southern naiad	**x**	**x**	**x**	**x**
Nuphar variegata Engelm. ex Durand	yellow pondlily	**x**	**x**	**x**	**x**
Nymphaea odorata Ait.	white pondlily	**x**	**x**	**x**	**x**
Pontederia cordata L.	pickerelweed	**x**	**x**	**x**	**x**
Potamogeton amplifolius Tuckerm.	largeleaf pondweed	**x**	**x**	**x**	**x**
Potamogeton crispus L.	curlyleaf pondweed	**x**	**x**	**x**	**x**
Potamogeton epihydrus Raf.	ribbon-leaf pondweed				
Potamogeton gramineus L.	variable-leaf pondweed	**x**	**x**	**x**	**x**
Potamogeton illinoensis L.	Illinois pondweed	**x**	**x**	**x**	**x**
Potamogeton perfoliatus L	Clasping-leaved Pondweed	**x**	**x**	**x**	**x**
Potamogeton praelongus Wulfen	white-stem pondweed	**x**	**x**	**x**	**x**
Potamogeton pusillus L.	small pondweed	**x**	**x**	**x**	**x**
Potamogeton richardsonii (Ar. Benn.) Rydb.	Richardsons' pondweed			**x**	**x**
Potamogeton robbinsii Oakes	Robbins' pondweed	**x**	**x**	**x**	**x**
Potamogeton zosteriformis Fern.	flat-stem pondweed	**x**	**x**	**x**	**x**
Ranunculus longirostris Godron	white watercrowfoot		**x**	**x**	
Sparganium sp.	burreed			**x**	**x**
Stuckenia pectinata L.	sago pondweed	**x**	**x**	**x**	**x**
Trapa natans L.	waterchestnut		**x**	**x**	**x**
Typha	cattail	**x**	**x**	**x**	**x**
Utricularia vulgaris L.	great bladderwort	**x**	**x**	**x**	
Vallisneria americana L.	wild celery	**x**	**x**	**x**	**x**
Zosterella dubia Jacq.	water stargrass	**x**	**x**	**x**	**x**

Table 2. Percent frequency of occurrence of aquatic plant species in Saratoga Lake. Invasive species are in bold.

Species	Common Name	2009	2010	2011	2012
Ceratophyllum demersum	coontail	61.4%	62.3%	62.9%	54.1%
Chara/Nitella	muskgrass, chara	10.5%	11.9%	8.5%	9.5%
Elodea canadensis	elodea	40.7%	46.3%	26.2%	22.3%
Lemna trisulca	duckweed	2.5%	2.5%	2.4%	1.0%
Megalodonta beckii	water marigold	0.9%	2.0%	0.3%	0.3%
Myriophyllum spicatum	**Eurasian watermilfoil**	**6.8%**	**22.1%**	**29.3%**	**25.6%**
Najas flexilis	bushy pondweed	13.6%	7.8%	9.2%	3.0%
Najas guadalupensis	Southern naiad	38.3%	48.0%	41.8%	32.8%
Najas minor	**brittle naiad**			**0.3%**	
Nuphar variegata	yellow pondlily	0.3%	0.4%	0.3%	0.3%
Nymphaea odorata	white pondlily	0.3%	0.8%	0.3%	0.3%
Potamogeton amplifolius	largeleaf pondweed	1.2%	2.5%	1.7%	1.6%
Potamogeton crispus	**curlyleaf pondweed**	**3.1%**	**9.4%**	**0.7%**	**2.3%**
Potamogeton gramineus	variable-leaf pondweed	1.9%		0.3%	0.7%
Potamogeton illinoensis	Illinois pondweed	4.6%	6.6%	3.1%	4.3%
Potamogeton perfoliatus	Clasping-leaved Pondweed	8.0%	15.6%	11.6%	5.9%
Potamogeton praelongus	white-stem pondweed	3.1%	4.1%	3.4%	4.6%
Potamogeton pusillus	small pondweed	6.5%	5.7%	2.3%	0.7%
Potamogeton richardsonii	Richardsons' Pondweed			0.3%	22.0%
Potamogeton robbinsii	Robbins' pondweed	0.9%	0.4%		0.3%
Potamogeton zosteriformes	flat-stem pondweed	17.3%	22.5%	6.5%	2.6%
Ranunculus longirostris	white watercrowfoot	0.3%	1.6%	0.3%	
Stuckenia pectinata	sago pondweed	0.3%	0.4%	1.4%	1.0%
Trapa natans	**waterchestnut**				0.3%
Utricularia vulgaris	great bladderwort	0.3%			
Vallisneria americana	wild celery	31.2%	43.4%	33.0%	33.1%
Zosterella dubia	water stargrass	20.4%	30.3%	35.4%	36.1%

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