LAKE ST CATHERINE
AQUATIC VEGETATION MANAGEMENT PROGRAM
2015 ANNUAL REPORT

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TABLE OF CONTENTS

TABLE OF CONTENTS ..... **i**

1. INTRODUCTION **1**

2. HERBICIDE TREATMENT PROGRAM - 2015 ..... **1**

2.2 Program Chronology 1

2.3 Pre-Treatment Inspection 1

2.4 Summary of 2015 Treatment 2

3. LATE SEASON COMPREHENSIVE AQUATIC VEGETATION SURVEY **3**

3.1 Survey Methods 3

3.2 Survey Findings 4

3.3 Lily Pond 5

3.4 Lake St. Catherine (Main Basin) 7

3.5 Little Lake 8

3.6 Species Richness 10

3.7 Late Season Milfoil Bed Mapping 10

4.1 Renovate Herbicide Treatments 12

4.2 Spread Prevention and Non-Chemical Control Activities 12

5. DISCUSSION **12**

6. RECOMMENDATIONS FOR 2016 SEASON **13**

LIST OF FIGURES

Figure 1: Milfoil Bed Map September 2015 11
Figure 2: Preliminary 2016 Treatment Areas 14

LIST OF TABLES

Table 1: FasTEST Sampling Results 3
Table 2: Summary of Survey Data 4
Table 3: Species List and Frequency of Occurrence 5
Table 4: Lily Pond – Species List and Frequency of Occurrence 6
Table 5: Lake St. Catherine – Species List and Frequency of Occurrence 7
Table 6: Little Lake – Species List and Frequency of Occurrence 9
Table 7: Species Richness by Basin 10

LIST OF CHARTS

Chart 1: Lily Pond: *Myriophyllum spicatum* Number of Occurrences and Percent Cover 6
Chart 2: Lake St. Catherine: *Myriophyllum spicatum* Frequency of Occurrences and Percent Cover 8
Chart 3: Little Lake: *Myriophyllum spicatum* Number of Occurrences and Percent Cover 9

APPENDICES

Appendix A: Herbicide Residue Testing Results
Appendix B: Comprehensive Aquatic Vegetation Survey Information

1. INTRODUCTION

The 2015 season marked the twelfth year of Aquatic Control's involvement in the Integrated Management Plan at Lake St. Catherine developed to control the non-native Eurasian watermilfoil (*Myriophyllum spicatum*) in the lake. Milfoil management efforts under this plan have included a whole-lake Sonar (fluridone) herbicide treatment in 2004 followed by annual spot-treatments with Renovate (triclopyr) herbicide and diver assisted suction harvesting and hand-pulling.

Management activities in 2015 included spot-treatment of eight areas, totaling approximately 51.4 acres with Renovate OTF (triclopyr granular) herbicide, as well as diver hand-pulling and diver assisted suction harvesting. These efforts were consistent with the current five-year Integrated Management Plan (2014-2019).

The following report summarizes the results of 2015 Treatment Program and details findings from the late season comprehensive aquatic plant survey that has been performed annually to document in-lake plant conditions and help evaluate and refine management goals. Specific information on the 2015 diver hand-pulling and diver assisted suction harvesting efforts will be provided by the Lake St. Catherine Association (LSCA) under a separate cover.

2. HERBICIDE TREATMENT PROGRAM - 2015

2.2 Program Chronology

A chronology of the 2015 treatment program is provided below:

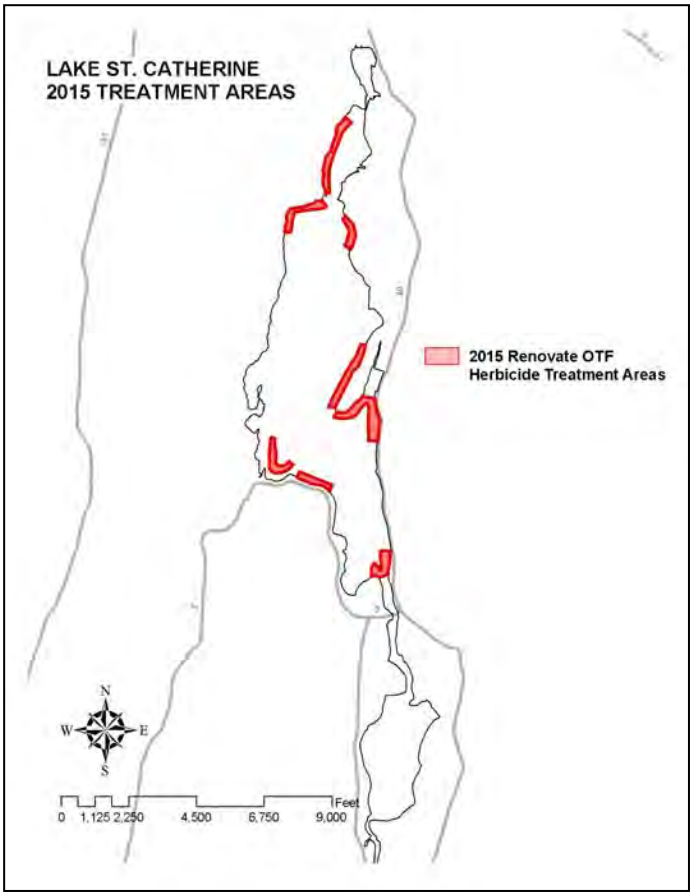
- Pre-treatment inspection and finalize treatment areas ..... May 29
- DEC permit issuance (ANC 2014-C01) ..... June 10
- Treatment of approximately 51.4 acres with Renovate OTF ..... June 24
- Herbicide residue monitoring ..... June 26, July 3 & 14
- Comprehensive aquatic plant survey ..... September 28-29

2.3 Pre-Treatment Inspection

On May 18, 2015 the entire shoreline littoral area of Lake St. Catherine (Lily Pond, Main Lake and Little Lake) was surveyed by Aquatic Control Technology to determine the stage of milfoil growth. At this time, the milfoil growth was found to be too low in the water column to determine an accurate density. Another survey was completed on May 29, 2015 to make adjustments to the 2015 treatment scope. The milfoil growth was at the expected height and density at the time of the second survey. Results of the survey were communicated to LSCA for their input and final determination on proposed treatment areas. At the time of the survey milfoil growth was actively growing and was generally within 3-4 feet tall.

2.4 Summary of 2015 Treatment

Ultimately five areas totaling 51.4 acres were targeted for treatment. Consistent with previous years, each treatment area was evaluated with regards to milfoil cover/distribution as well as several other factors including: the potential for increased milfoil spread; the potential for effective treatment; and the overall benefit of milfoil control with respect to the lake, lake residents and other potential users. A final treatment map was provided to DEC for review and approval.



The treatment date of Wednesday, June 24, 2015 was selected to allow enough time to comply with the notification requirements of ANC Permit #2014-C01 and so that the two-day swimming restriction (day of treatment and one additional day) would not be imposed over a weekend.

Weather conditions on the day of treatment were sunny with the air temperature at 70° F; wind was out of the southwest estimated at <5 mph. Surface water temperature in the main basin was approximately 22.8°C.

The treatment was conducted with a 24-foot fiberglass work skiff. The granular herbicide was applied using two stern mounted spreaders. The treatment boat was equipped with a Differential/WAAS GPS navigation system to insure that the herbicide was evenly applied to the designated treatment areas. The State Boat Ramp located on the channel between the Main Lake and Little Lake was used as the base of operations.

Treatment was performed as a split application whereby roughly 70-75% of the herbicide was applied to each of the designated areas initially and then the remaining 25-30% was applied several hours later. There was approximately 3-4 hours between each application. This split application approach has been used in recent years to increase concentration-exposure-time and help increase treatment efficacy. Renovate OTF (triclopyr granular) herbicide was applied at a target dose of 2.25 ppm in the bottom 4-feet of the water column. A total of 12,336 pounds of Renovate OTF were applied to the five treatment areas. The herbicide application took approximately 6 hours to complete.

2.5 Herbicide Residue Testing

In compliance with conditions of the ANC Permit #2014-C01, water samples were collected from within and immediately downstream of Lake St. Catherine following treatment for analysis of triclopyr concentrations. Sampling was required 24 hours following treatment and then at least monthly until concentrations at all sample locations dropped below 75 ppb, which was the drinking water restriction imposed by DEC.

A map of the sampling locations is attached to the end of this report (Appendix A). Sampling instructions and sample bottles were provided to LSCA representatives by ACT and SePRO. Collected samples were shipped via overnight delivery to SePRO's laboratory in Whittakers, North Carolina.

Samples were collected on June 25 and August 1. The highest in-lake concentration found 24hrs post-treatment was 32 ppb; this sample was collected at Site 1/A, located between Stonehenge Lane and Stonehenge Road.. Because the results were all below the 75 ppb DEC regulation another round of samples was not collected until September 1 at which time all samples had dropped below laboratory detection limits.

Table 1: FasTEST Sampling Results (ppb)

Site	25-June	01-Sept
1/A	31.9	<1.00
2/B	19.7	<1.00
3/D	9.4	<1.00
4/G	10.6	<1.00
5	<1.00	<1.00
6	<1.00	<1.00
7	<1.0	<1.0

3. LATE SEASON COMPREHENSIVE AQUATIC VEGETATION SURVEY

3.1 Survey Methods

The late season comprehensive aquatic vegetation survey conducted on September 28 & 29 replicated the methods that were employed in the previous years of this management program. The survey was performed by biologists from Aquatic Control and Northeast Aquatic Research (NEAR).

All three major lake basins were systematically toured by boat. Transect and data point locations established in 2001, were relocated using a Differential GPS system (Appendix B – Figure B_1). The following information was recorded at each data point: aquatic plants present, dominant species, percent total plant cover, plant biomass and percent milfoil cover. Water depths that were recorded during the pre-treatment survey were checked using a high-resolution depth finder. In most cases, the water depth at the data point was within 1 foot of what was recorded in 2001. The plant community was assessed through visual inspection, use of a long-handled rake and throw-rake, and with an Aqua-Vu underwater camera system. Plants were identified to genus and species level when possible. Plant cover was given a percentage rank based on the areal coverage of plants within an approximate 400 square foot area assessed at each data point. Generally, in areas with 100% cover, bottom sediments could not be seen through the vegetation. Percentages less than 100% indicated the amount of bottom area covered by plant growth. The percentage of Eurasian watermilfoil was also recorded at each data point. In addition to

cover percentage, a plant biomass index was assigned at each data point to document the amount of plant growth vertically through the water column. Plant biomass was estimated on a scale of 0-4, as follows:

0 No biomass; plants generally absent
1 Low biomass; plants growing only as a low layer on the sediment
2 Moderate biomass; plants protruding well into the water column but generally not reaching the water surface
3 High biomass; plants filling enough of the water column and/or covering enough of the water surface to be considered a possible recreational nuisance or habitat impairment
4 Extremely high biomass; water column filled and/or surface completely covered, obvious nuisance conditions and habitat impairment severe

Field data recorded at each transect and data point location is provided in the Field Survey Data Table found in Appendix B.

3.2 Survey Findings

Quantitative measures of the aquatic plant community documented in 2015 were comparable to prior years. While milfoil distribution (FOC - frequency of occurrence) and abundance (% cover) has fluctuated annually, overall vegetative cover and biomass indices remain relatively static in all three basins (Lilly Pond, Lake St. Catherine & Little Lake).

The composition of the vegetative community has also remained relatively unchanged since 2001 and is dominated by native pondweed species, namely: *Potamogeton robbinsii, Potamogeton illinoensis, Potamogeton amplifolius, Potamogeton zosteriformis* & *Ceratophyllum demersum.* Diversity has also been maintained throughout the course of management with 20 different aquatic plant species identified this fall.

Comparative data for all three basins from data collected during late season between 2001 and 2015 is listed below (Table 2).

Table 2: Summary of Survey Data

LILY POND	2001	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total Number of Data Points	24	24	24	22	24	24	24	24	24	24	24	24	24
Total Plant Cover	90%	80%	98%	88%	91%	98%	94%	98%	93%	94%	96%	94%	90%
Milfoil Cover	9%	6%	2%	0%	2%	7%	<1%	<1%	<1%	1%	5%	1.5%	2.2%
Plant Biomass Index	3.1	2.5	3.3	2.5	2.8	3.3	2.7	2.3	2.9	3.1	3.5	3.4	3.5

LAKE ST. CATHERINE													
Total Number of Data Points	129	129	129	129	129	129	129	129	129	129	129	129	129
Total Plant Cover	66%	46%	51%	57%	58%	66%	58%	63%	59%	56%	63%	63%	63%
Milfoil Cover	43%	16%	0%	4%	11%	4%	5%	2%	7%	8%	16%	15%	7%
Plant Biomass Index	1.9	1.5	1.6	1.8	2.0	2.0	2.0	1.3	1.8	1.5	2.0	2.0	2.0

LITTLE LAKE													
Total Number of Data Points	43	43	43	43	43	43	43	43	43	43	43	43	43
Total Plant Cover	72%	66%	78%	83%	83%	77%	58%	62%	76%	81%	80%	86%	96%
Milfoil Cover	15%	0%	0%	2%	7%	10%	<1%	5%	9%	14%	7%	10%	42%
Plant Biomass Index	2.3	2.1	2.4	2.9	2.8	2.7	2.2	2.7	3.3	2.5	3.0	3.2	3.8

Table 3: Species List and Frequency of Occurrence (entire lake system)

Macrophyte Species	2001	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Myriophyllum spicatum	94%	44%	17%	33%	74%	65%	38%	40%	43%	51%	64%	54%	48%
Najas flexilis	22%	0%	8%	39%	34%	22%	15%	16%	14%	8%	4%	7%	10%
Zosterella dubia	1%	1%	9%	8%	23%	17%	7%	13%	4%	2%	4%	11%	15%
Ceratophyllum demersum	20%	8%	11%	12%	21%	18%	17%	22%	10%	21%	15%	17%	15%
Nitella / Chara	17%	6%	36%	40%	14%	14%	13%	2%	2%	1%	0%	3%	19%
Nuphar variegatum	5%	5%	5%	2%	2%	1%	2%	1%	2%	1%	1%	0%	2%
Nymphaea odorata	16%	5%	11%	10%	11%	11%	10%	7%	7%	12%	12%	14%	13%
Vallisneria americana	29%	13%	2%	4%	9%	8%	15%	15%	14%	15%	18%	19%	26%
Brasenia schreberi	4%	8%	7%	7%	7%	6%	5%	5%	5%	3%	4%	4%	3%
Utricularia vulgaris	8%	9%	2%	6%	7%	7%	11%	8%	2%	4%	4%	7%	7%
Elodea canadensis	32%	1%	1%	1%	5%	43%	60%	30%	10%	14%	23%	12%	30%
Chlorophyta	2%	37%	26%	7%	4%	8%	3%	2%	3%	4%	3%	4%	2%
Potamogeton amplifolius	33%	38%	43%	49%	52%	53%	51%	56%	23%	35%	32%	31%	13%
Potamogeton robbinsii	52%	76%	88%	74%	77%	68%	84%	78%	57%	76%	76%	73%	57%
Potamogeton crispus	2%	1%	7%	5%	3%	1%	0%	0%	1%	1%	0%	1%	0%
Potamogeton epihydrus	2%	6%	7%	3%	3%	5%	1%	1%	1%	4%	1%	2%	<1%
Potamogeton illinoensis	4%	1%	2%	9%	23%	39%	29%	36%	35%	53%	56%	57%	44%
Potamogeton zosteriformis	28%	3%	29%	29%	23%	19%	16%	26%	22%	20%	23%	36%	15%
Potamogeton gramineus	23%	1%	6%	6%	2%	4%	4%	4%	11%	8%	3%	3%	4%
Isoetes sp.	2%	6%	2%	5%	2%	3%	1%	0%	1%	1%	0%	0%	1%
Utricularia gibba	2%	0%	1%	5%	1%	1%	4%	1%	0%	0%	0%	0%	2%
Eleocharis asicularia	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
Lemna minor	7%	1%	0%	1%	0%	1%	1%	0%	0%	0%	0%	0%	<1%
Megalodonta beckii	3%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0.5%	0%

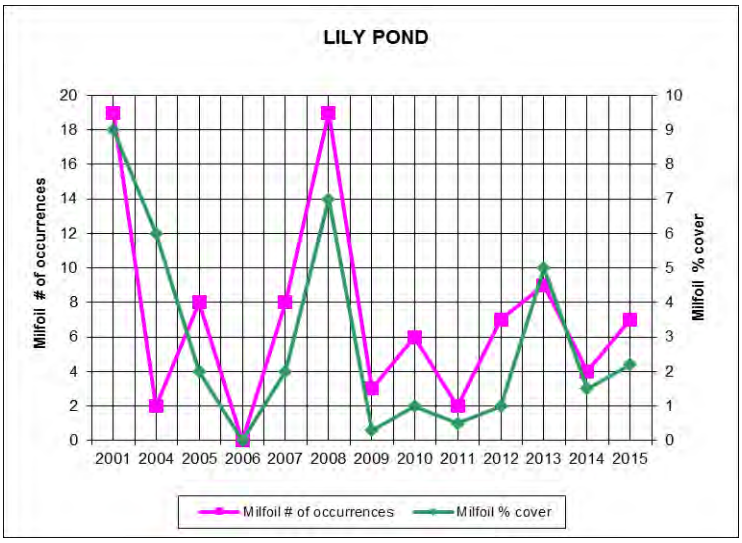
3.3 Lily Pond

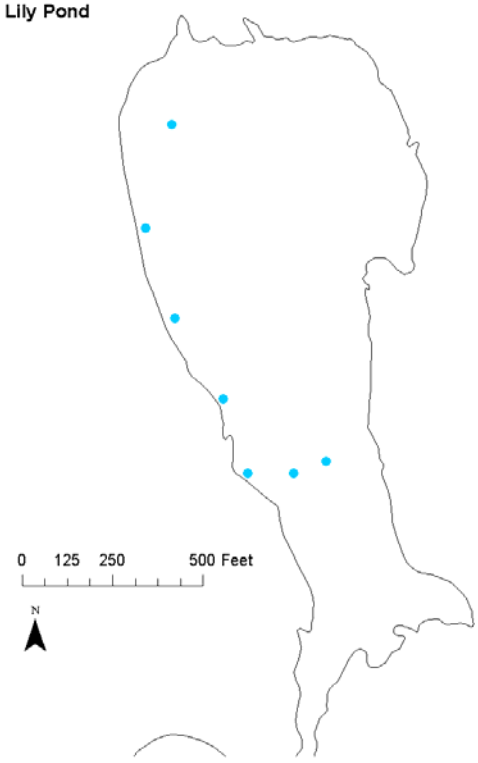
Milfoil FOC showed a minor increase between 2014 and 2015 due to lack of treatment in this area, rising from 17% to roughly 29%. Native species in Lily Pond remained healthy with both cover and distribution indices similar to what has been recorded in previous years. *Potamogeton robbinsii* (68%) remained the most abundant plant in the basin followed by *Ceratophyllum demersum* (64%), *Elodea canadensis (*48%) and *Potamogeton zosteriformis* (48%). *Zosterella dubia* and *Potamogeton praelongus* were also abundant and were encountered at 40% and 36% of the surveyed data points, respectively. FOC and percent cover of other plant species in Lily Pond was similar to previous years.

Table 4: Lily Pond – Species List and Frequency of Occurrence

Macrophyte Species													
	2001	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Potamogeton robbinsii	95.8%	91.7%	95.8%	95.5%	91.7%	87.5%	95.8%	95.8%	87.5%	95.8%	100%	100%	68.0%
Ceratophyllum demersum	70.8%	4.2%	50.0%	45.5%	83.3%	83.3%	83.3%	79.2%	75.0%	62.5%	66.7%	54.2%	64.0%
Potamogeton amplifolius	33.3%	100.0%	91.7%	77.3%	79.2%	87.5%	91.7%	87.5%	37.5%	45.8%	75.0%	75.0%	24.0%
Potamogeton illinoensis	0.0%	4.2%	8.3%	9.1%	45.8%	41.7%	25.0%	16.7%	45.8%	41.7%	45.8%	54.2%	16.0%
Myriophyllum spicatum	79.2%	8.3%	33.3%	0.0%	33.3%	79.2%	12.5%	25.0%	8.3%	29.2%	41.7%	16.7%	28.0%
Potamogeton zosteriformis	58.3%	8.3%	62.5%	0.0%	25.0%	45.8%	12.5%	66.7%	45.8%	33.3%	29.2%	66.7%	48.0%
Zosterella dubia	4.2%	0.0%	37.5%	0.0%	25.0%	20.8%	8.3%	50.0%	0.0%	0.0%	0.0%	16.7%	40.0%
Nymphaea odorata	62.5%	16.7%	29.2%	9.1%	20.8%	25.0%	33.3%	16.7%	25.0%	29.2%	37.5%	37.5%	28.0%
Potamogeton crispus	4.2%	4.2%	4.2%	4.5%	12.5%	0.0%	0.0%	0.0%	4.2%	0.0%	0.0%	0.0%	0.0%
Chlorophyta	0.0%	29.2%	95.8%	31.8%	8.3%	29.2%	12.5%	4.2%	16.7%	20.8%	16.7%	29.2%	8.0%
Elodea canadensis	29.2%	0.0%	8.3%	0.0%	8.3%	29.2%	45.8%	79.2%	16.7%	29.2%	16.7%	12.5%	48.0%
Utricularia vulgaris	29.2%	37.5%	0.0%	27.3%	4.2%	12.5%	16.7%	4.2%	16.7%	20.8%	16.7%	29.2%	28.0%
Chara sp. / Nitella sp.	0.0%	0.0%	0.0%	4.5%	4.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Wolffia sp.	0.0%	0.0%	0.0%	4.5%	4.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Potamogeton epihydrus	0.0%	12.5%	4.2%	0.0%	4.2%	4.2%	4.2%	0.0%	4.2%	4.2%	0.0%	0.0%	0.0%
Potamogeton gramineus	16.7%	0.0%	8.3%	0.0%	4.2%	0.0%	8.3%	0.0%	8.3%	8.3%	0.0%	0.0%	0.0%
Utricularia gibba	0.0%	0.0%	0.0%	40.9%	0.0%	0.0%	4.2%	0.0%	0.0%	0.0%	0.0%	0.0%	12.0%
Potamogeton natans	0.0%	0.0%	0.0%	9.1%	0.0%	8.3%	8.3%	12.5%	8.3%	0.0%	0.0%	12.5%	0.0%
Lemna minor	45.8%	8.3%	0.0%	4.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Brasenia schreberi	4.2%	4.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Isoetes sp.	0.0%	4.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Najas flexilis	4.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Nuphar variegatum	16.7%	16.7%	16.7%	0.0%	0.0%	0.0%	0.0%	4.2%	4.2%	0.0%	0.0%	0.0%	0.0%
Vallisneria americana	33.3%	45.8%	0.0%	0.0%	0.0%	0.0%	8.3%	4.2%	4.2%	0.0%	0.0%	0.0%	4.0%

Chart 1: Lily Pond: *Myriophyllum spicatum* Number of Occurrences and Percent Cover





3.4 Lake St. Catherine (Main Basin)

The distribution and composition of native plant species in the main basin of Lake St. Catherine was consistent with recent years. *Potamogeton robbinsii* remained the most common plant species in the main basin and was recorded at 49% of the surveyed locations. *Potamogeton illinoensis* and *Myriophyllum spicatum* were secondary in abundance and were recorded at 40% and 39% of surveyed data point locations in the Main Lake, respectively. Despite widespread cover, milfoil density in the Main Lake remained low with a recorded average percent cover of just 7.2% *Vallisneria americana* remained well distributed at 23% FOC. *Elodea canadensis* distribution increased significantly between 2014 and 2015 with and FOC increase of +23% in the Main Lake. Cover of other native plant species remained relatively consistent with previous years and only minor fluctuations in distribution indices were evident between 2014 and 2015.

Table 5: Lake St. Catherine – Species List and Frequency of Occurrence (main basin)

Macrophyte Species													
	2001	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Myriophyllum spicatum	98.4%	65.1%	14.7%	35.7%	76.7%	58.9%	44.2%	27.9%	49.6%	46.5%	65.6%	55.5%	39.4%
Potamogeton robbinsii	31.0%	65.1%	82.2%	62.0%	66.7%	58.1%	78.3%	72.9%	58.1%	66.7%	66.4%	60.9%	49.2%
Najas flexilis	19.4%	0.0%	12.4%	56.6%	50.4%	34.1%	21.7%	24.8%	20.2%	12.4%	5.5%	6.3%	15.9%
Potamogeton amplifolius	28.7%	14.7%	25.6%	34.1%	38.8%	38.0%	41.1%	44.2%	25.6%	34.9%	27.3%	25.0%	11.4%
Potamogeton zosteriformis	24.0%	2.3%	31.0%	41.9%	27.9%	18.6%	19.4%	23.3%	30.2%	20.2%	20.3%	32.0%	9.8%
Zosterella dubia	0.0%	0.8%	4.7%	11.6%	27.9%	21.7%	7.8%	8.5%	5.4%	1.6%	1.6%	13.3%	12.9%
Chara sp. / Nitella sp.	1.6%	17.1%	62.0%	57.4%	20.9%	21.7%	19.4%	2.3%	0.8%	0.0%	0.0%	4.7%	15.9%
Potamogeton illinoensis	6.2%	0.8%	0.8%	8.5%	15.5%	34.1%	23.3%	31.0%	32.6%	53.3%	57.0%	55.5%	40.2%
Potamogeton pusillus	0.0%	0.0%	0.0%	5.4%	12.4%	6.3%	5.4%	11.6%	12.4%	4.7%	3.9%	0.0%	14.4%
Ceratophyllum demersum	10.9%	10.9%	6.2%	7.0%	10.9%	10.1%	7.8%	14.0%	6.2%	10.9%	1.6%	4.7%	3.0%
Vallisneria americana	14.0%	3.1%	0.8%	3.1%	8.5%	9.3%	13.2%	13.2%	10.1%	9.3%	14.8%	14.1%	22.7%
Elodea canadensis	27.9%	0.0%	0.0%	0.8%	4.7%	51.9%	71.3%	14.7%	8.5%	7.0%	18.8%	7.0%	29.5%
Nymphaea odorata	3.1%	1.6%	2.3%	3.1%	3.1%	3.1%	3.1%	1.6%	2.3%	1.6%	0.8%	2.3%	5.3%
Brasenia schreberi	0.0%	0.8%	0.8%	2.3%	2.3%	2.3%	2.3%	1.6%	2.3%	0.8%	0.8%	2.3%	3.0%
Chlorophyta	0.0%	43.4%	14.7%	3.1%	2.3%	3.9%	0.8%	0.8%	3.1%	2.3%	0.0%	0.0%	0.0%
Isoetes sp.	2.3%	8.5%	0.8%	6.2%	2.3%	4.7%	0.0%	0.0%	0.8%	0.8%	0.0%	0.0%	1.5%
Potamogeton gramineus	17.8%	0.0%	4.7%	1.6%	2.3%	6.2%	3.1%	6.2%	14.7%	9.3%	3.1%	3.9%	6.1%
Potamogeton crispus	1.6%	0.0%	9.3%	5.4%	1.6%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%
Potamogeton epihydrus	2.3%	3.1%	5.4%	2.3%	0.8%	3.9%	0.8%	0.8%	0.8%	2.3%	0.0%	1.6%	0.0%
Nuphar variegatum	0.8%	0.0%	0.0%	0.8%	0.8%	0.0%	0.0%	0.8%	0.8%	0.0%	0.0%	0.0%	0.0%
Utricularia vulgaris	0.8%	0.8%	0.8%	0.0%	0.0%	1.6%	0.8%	3.1%	0.0%	0.8%	0.0%	0.8%	0.8%
Lemna minor	1.6%	0.0%	0.0%	0.0%	0.0%	0.8%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%
Megalodonta beckii	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

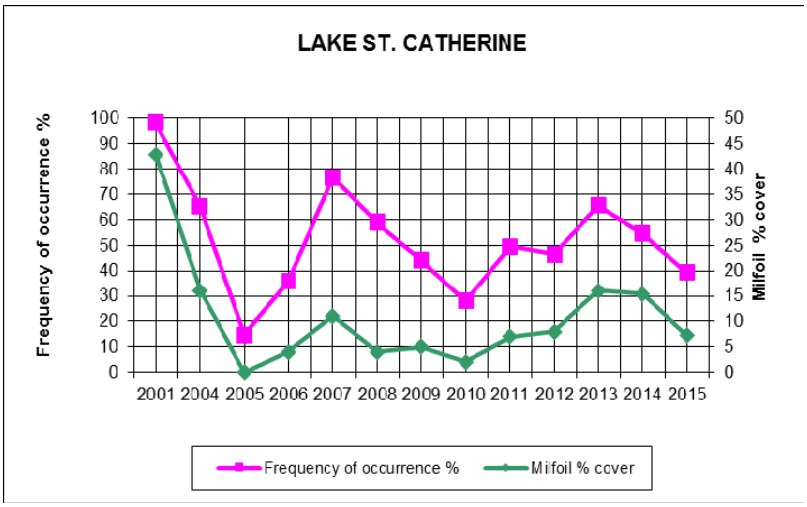
Milfoil FOC decreased between 2014 and 2015 from 56% to 39%, due in large part to successful treatment of a few of the large dense beds of milfoil. Robbins Pondweed (*P. robbinsii)* was the dominant species at nearly 50% of the locations where found. Average cover of milfoil displayed a favorable reduction in the Main Lake from 2014 to 2015, decreasing from 15% to roughly 7%.

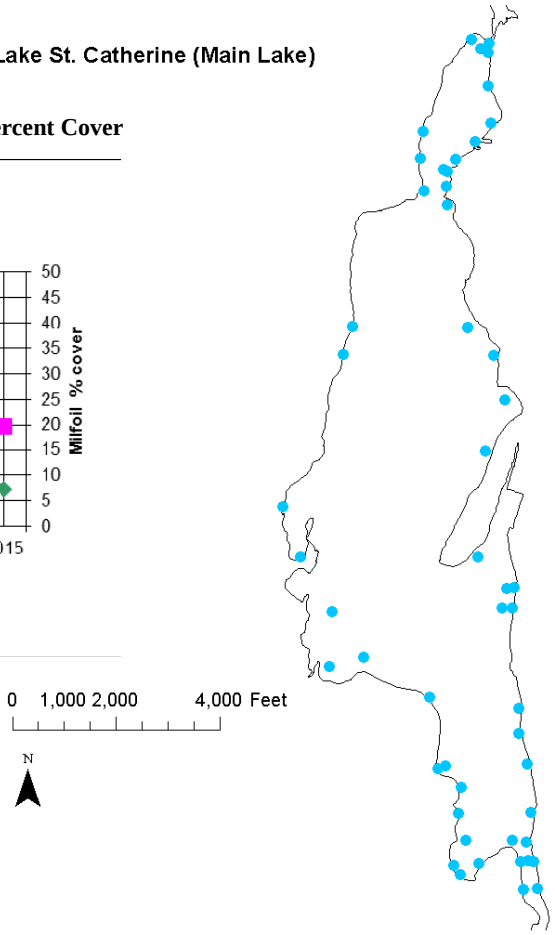
Despite favorable milfoil control within the treated areas, cover and distribution continued to increase outside of the surveyed data points with several dense beds noted around the shoreline of the Main Lake. While the annual spot-treatments and diver suction hand-pulling efforts have been relatively effective, milfoil growth remains well distributed in the Main Lake.

Locations of milfoil observed during the survey were recorded with a GPS unit. The collected GPS points as well as an estimated extent of dense milfoil beds observed during the September 2015 survey are depicted in Figure 1.

Chart 2 (below) represents year-to-year change in milfoil frequency and cover in the main basin.

Chart 2: ***Myriophyllum spicatum*** **Frequency of Occurrence and Percent Cover**





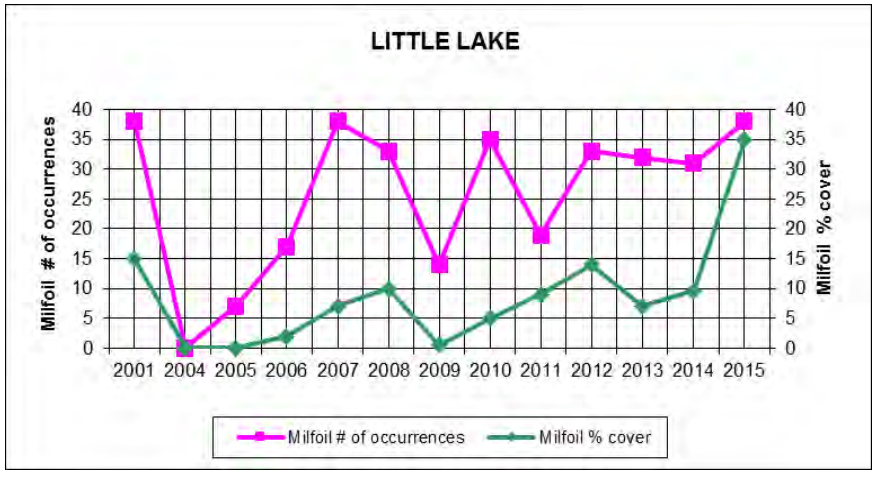
3.5 Little Lake

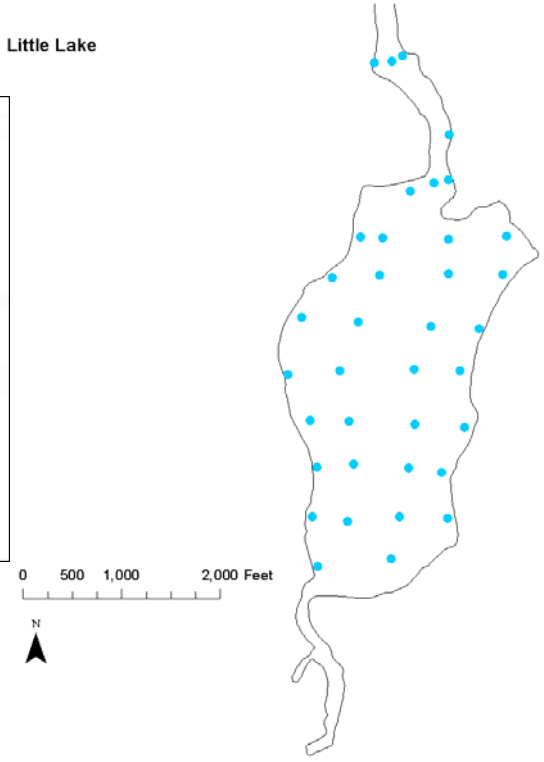
Potamogeton illinoensis (71%), *M.* spicatum (86%), *Vallisneria americana* (50%), and *Potamogeton robbinsii* (73%) dominated the aquatic plant community in Little Lake accounting for a large percentage of the plant density recorded during the September 2015 survey. *Ceratophyllum demersum, Elodea canadensis,* and *Nymphaea odorata* remain common in Little Lake and were encountered at of the surveyed data points, 23%, 23% and 27%, respectively. *Myriophyllum spicatum* FOC remained high (86%) in Little Lake. Cover of milfoil was in erratic with scattered dense patches throughout the basin. Despite widespread distribution milfoil was only the dominant species at 6 of the 38 locations where documented, however, average milfoil density increased significantly in Little Lake from a 2014 average of roughly 10% to over 35% estimated cover in 2015.

Table 6: Little Lake – Species List and Frequency of Occurrence

Macrophyte Species													
	2001	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Potamogeton robbinsii	88.4%	100.0%	100.0%	100.0%	100.0%	88.4%	95.3%	81.4%	86.0%	90.7%	93.0%	95.3%	72.7%
Myriophyllum spicatum	88.4%	0.0%	16.3%	39.5%	88.4%	76.7%	32.6%	81.4%	44.2%	76.6%	74.4%	72.1%	86.4%
Potamogeton amplifolius	44.2%	72.1%	69.8%	76.7%	74.4%	76.7%	55.8%	72.1%	27.9%	30.2%	20.9%	23.3%	13.6%
Potamogeton illinoensis	0.0%	0.0%	0.0%	9.3%	32.6%	46.5%	48.5%	36.2%	62.8%	60.5%	60.5%	65.1%	7.05%
Utricularia vulgaris	16.3%	18.6%	7.0%	11.6%	30.2%	18.6%	34.9%	25.6%	4.7%	2.3%	9.3%	14.0%	13.6%
Nymphaea odorata	30.2%	9.3%	25.6%	30.2%	27.9%	10.1%	18.6%	18.6%	23.3%	32.6%	30.2%	37.2%	27.3%
Brasenia schreberi	14.0%	30.2%	30.2%	23.3%	25.6%	20.9%	14.0%	11.6%	14.0%	11.6%	14.0%	11.6%	2.3%
Ceratophyllum demersum	20.9%	0.0%	2.3%	9.3%	16.3%	7.0%	9.3%	16.3%	27.9%	27.9%	27.9%	34.9%	22.7%
Vallisneria americana	72.1%	25.6%	7.0%	9.3%	14.0%	9.3%	25.6%	25.6%	34.9%	39.5%	39.5%	44.2%	50.0%
Potamogeton zosteriformis	23.3%	2.3%	4.7%	4.7%	7.0%	4.7%	7.0%	9.3%	9.3%	14.0%	27.9%	32.6%	11.4%
Zosterella dubia	2.3%	2.3%	4.7%	0.0%	7.0%	2.3%	4.7%	4.7%	2.3%	4.7%	14.0%	2.3%	9.1%
Potamogeton pusillus	0.0%	0.0%	0.0%	2.3%	7.0%	2.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%
Chlorophyta	7.0%	20.9%	20.9%	4.7%	7.0%	9.3%	2.3%	2.3%	2.3%	2.3%	2.3%	0.0%	2.3%
Nuphar variegatum	9.3%	14.0%	11.6%	7.0%	7.0%	2.3%	7.0%	2.3%	4.7%	2.3%	2.3%	0.0%	6.8%
Potamogeton epihydrus	0.0%	11.6%	14.0%	7.0%	7.0%	7.0%	0.0%	0.0%	2.3%	9.3%	2.3%	2.3%	2.3%
Utricularia gibba	7.0%	0.0%	2.3%	0.0%	4.7%	2.3%	14.0%	4.7%	0.0%	0.0%	0.0%	0.0%	2.3%
Najas flexilis	39.5%	0.0%	0.0%	4.7%	2.3%	0.0%	4.7%	0.0%	4.7%	0.0%	2.3%	14.0%	0.0%
Elodea canadensis	46.5%	4.7%	0.0%	0.0%	2.3%	23.3%	34.9%	46.5%	20.9%	27.9%	39.5%	25.6%	22.7%
Chara sp. / Nitella sp.	7.0%	4.7%	7.0%	11.6%	0.0%	0.0%	2.3%	0.0%	4.7%	2.3%	0.0%	0.0%	2.3%
Potamogeton gramineus	41.9%	4.7%	9.3%	23.3%	0.0%	0.0%	4.7%	0.0%	4.7%	4.7%	2.3%	0.0%	0.0%
Isoetes sp.	0.0%	0.0%	4.7%	2.3%	0.0%	0.0%	2.3%	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%
Potamogeton crispus	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%
Polygonum sp.	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Eleocharis sp.	4.7%	4.7%	4.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Megalodonta beckii	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%	0.0%

Chart 3: *Myriophyllum spicatum* Number of Occurrences and Percent Cover

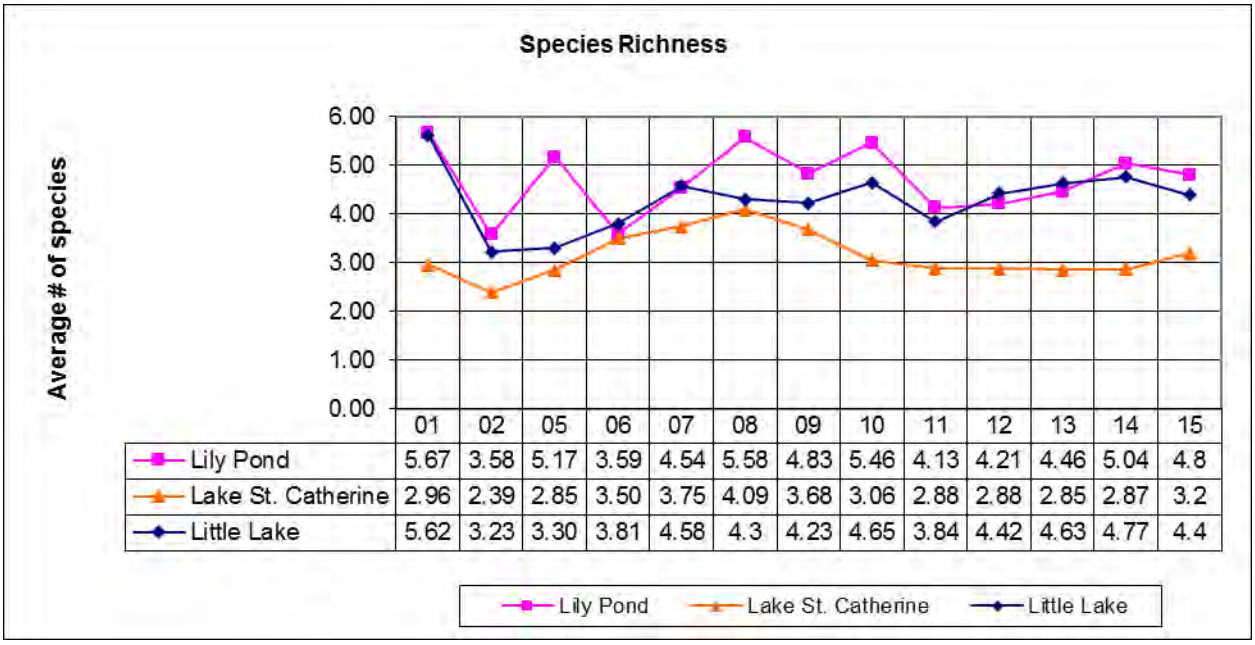




3.6 Species Richness

Species richness in all three basins was consistent with findings from the past five years. It does not appear that the maintenance herbicide treatments or other management practices have adversely impacted species richness or native plant diversity.

Table 7: Species Richness by Basin

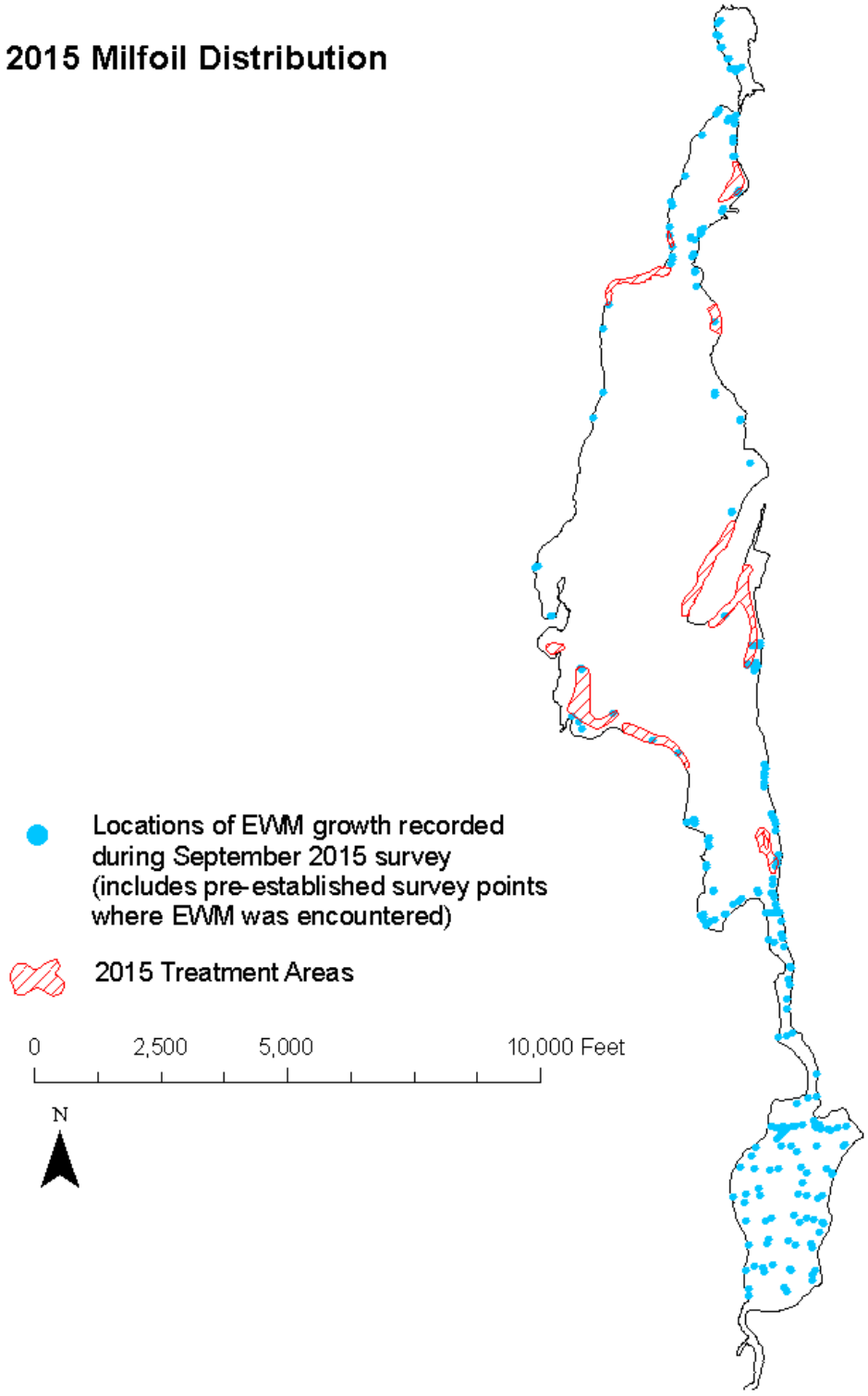


	01	02	05	06	07	08	09	10	11	12	13	14	15
Lily Pond	5.67	3.58	5.17	3.59	4.54	5.58	4.83	5.46	4.13	4.21	4.46	5.04	4.8
Lake St. Catherine	2.96	2.39	2.85	3.50	3.75	4.09	3.68	3.06	2.88	2.88	2.85	2.87	3.2
Little Lake	5.62	3.23	3.30	3.81	4.58	4.3	4.23	4.65	3.84	4.42	4.63	4.77	4.4

3.7 Late Season Milfoil Bed Mapping

Milfoil beds were visually surveyed and mapped during the late season survey. Weather conditions and visibility were good with little wind and partly cloudy skies for most of the survey. As with past mapping efforts areas of milfoil growth were visually identified or found using a high-resolution depth finder and an underwater camera. Locations where milfoil was encountered were recorded using a GPS unit. A map of the GPS referenced milfoil locations is shown in Figure 1.

Figure 1: Late season Eurasian watermilfoil distribution



4. SUMMARY OF 2015 AQUATIC VEGETATION MANAGEMENT PROGRAM

4.1 Renovate Herbicide Treatments

Results of the 2015 Renovate OTF (triclopyr granular) herbicide treatment program were consistent with treatment efforts performed in the Lake St. Catherine system in recent years. While some low density growth was observed around the outer extent of a few of the treated areas milfoil control overall was excellent. Based on results from previous triclopyr treatments at Lake St. Catherine we would expect to see reasonably good control of milfoil in these areas through the 2015 season

After numerous years of use at Lake St. Catherine it is clear that triclopyr is highly selective for milfoil and its use has not had a perceptible impact on other non-target aquatic plant species. While there continued to be fluctuations in the frequency of occurrence and species richness indices, no major shifts in plant composition have been documented following any of the triclopyr applications performed at the lake. Based on data collected in the Lake St. Catherine system and other Vermont lakes, seasonal variability in native plant populations as well as the limitations of the data point survey methodology likely account for many of the documented year to year changes.

4.2 Spread Prevention and Non-Chemical Control Activities

As required by the DEC Permit, non-chemical milfoil control activities continued at Lake St. Catherine during the 2015 season. Efforts included volunteer monitoring, volunteer and paid hand harvesting and diver assisted suction harvesting. Details of the non-chemical control efforts will be provided by LSCA under separate cover.

5. DISCUSSION

Recent milfoil management efforts at Lake St. Catherine have focused on controlling areas of dense milfoil growth and maintaining it at non-nuisance levels. Renovate OTF (triclopyr granular) herbicide treatments have proven effective at providing selective control of milfoil where used, however, benefits from treatment have typically only been maintained for two growing seasons. While generally effective, triclopyr has also demonstrated some limitations when used in open water or smaller treatment areas where increased dilution and decreased concentration-exposure-time (CET) have resulted in less than optimal results. To maximize the effectiveness of annual treatments Aquatic Control has tried to identify and select treatment areas with the greatest chance of successful milfoil control. Additionally we have tried to improve CET by: delaying treatment until mid-June when more active plant tissue was present to maximize herbicide absorption; treating larger contiguous areas; and performing split-applications to extend the time that triclopyr was released off of the granule carrier.

It is apparent that there are still limitations of the Renovate OTF formulation to provide sufficient CET to insure complete milfoil control for partial lake or shoreline applications. Early studies with triclopyr on Eurasian watermilfoil suggested that CET's of 1.5 ppm were needed for 24 hours or 0.5 ppm were needed for 48 hours to insure >85% reduction of milfoil biomass (Netherland and Getsinger 1992). Future treatment efforts should continue to focus on improving the CET and ultimately longer-term milfoil control.

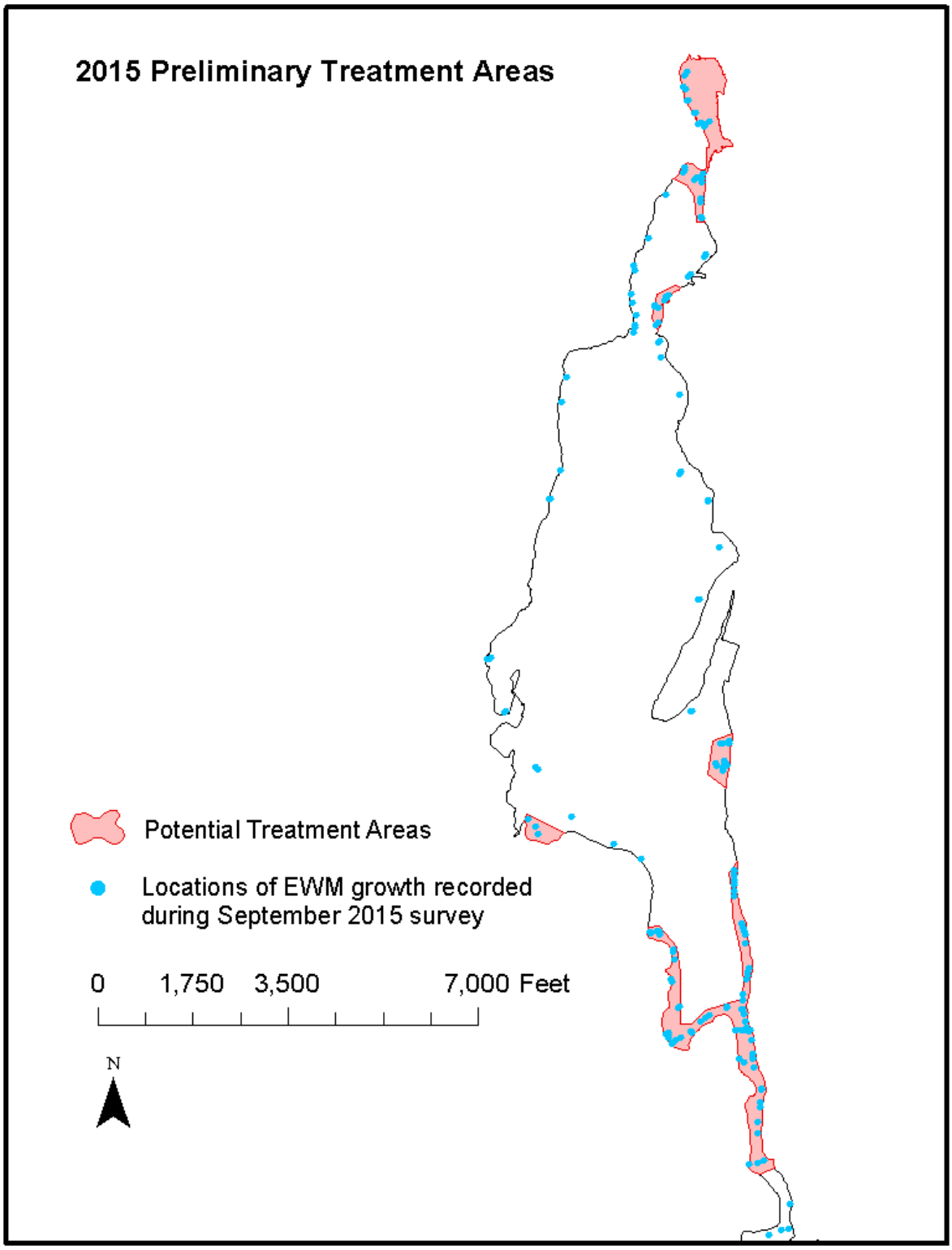
6. RECOMMENDATIONS FOR 2016 SEASON

Results from the 2015 Renovate OTF treatment program were good with nearly complete control of milfoil in the eight areas treated. Although some low-density milfoil was observed in a few of the treated areas, most of it was found along the edges where dilution is higher and CET is more challenging. Despite some reduction in efficacy on the outer extent of the treatment areas, milfoil control overall was very good. We attribute the improved milfoil control to successful management of the CET which we have been working to improve annually.

Unless alternative herbicides are permitted for use at the lake, or new products become available, it is likely that the use of Renovate (triclopyr) will remain the only viable herbicide option for milfoil control at Lake St. Catherine. As we have seen at Lake St. Catherine and other sites, the CET when using Renovate is critical for achieving good milfoil control. While potential treatment sites have typically been evaluated based on factors including: treatment area size, shape and location, results from this year's herbicide residue testing suggest that plant maturity may be playing a bigger role in herbicide CET then previously considered. While timing of treatment is dictated by a number of factors and treatment will likely continue to be performed in mid-late June results from this year's treatment program suggest that plant maturity and its impact on treatment efficacy should be considered when scheduling future treatments at Lake St. Catherine.

Preliminary 2016 treatment areas are depicted on the following page. Based on the density and distribution of milfoil growth observe this past fall we anticipate treatment of 50-70 acres in the main lake. Potential treatment areas will be inspected in the early spring and will be finalized with the LSCA and VT DEP prior to treatment.

Figure 2: Preliminary 2015 Management Areas



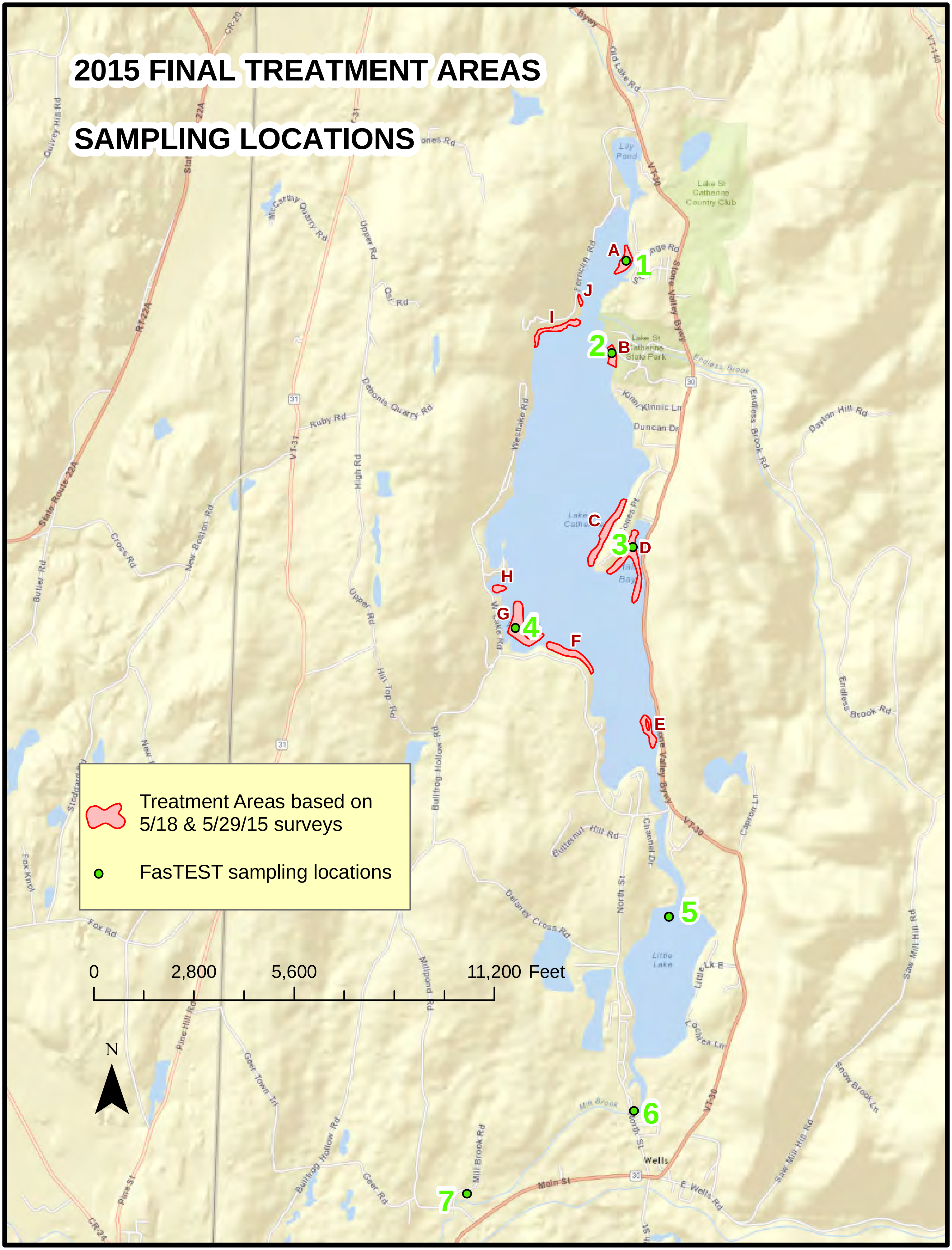
REFERENCES

Netherland, M.D. and K.D. Getsinger. 1992. Efficacy of Triclopyr on Eurasian Watermilfoil: Concentration and Exposure Time Effects. J. Aquat. Plant Manage. 30: 1-5.

APPENDIX A

Herbicide Residue Testing Results

- Sampling Location Map
- SePRO Laboratory Report – 6/25/15 sampling round
- SePRO Laboratory Report – 9/1/15 sampling round


2015 FINAL TREATMENT AREAS
SAMPLING LOCATIONS
Treatment Areas based on 5/18 & 5/29/15 surveys
FasTEST sampling locations
0
2,800
5,600
11,200 Feet
N
1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
I
J
Lake St Catherine Country Club
Lake St Catherine State Park
Lily Pond
Little Lake
Wells
Main St
VT-30
VT-31
State Route 22A
Endless Brook Rd
Dayton Hill Rd
Westlake Rd
Bullfrog Hollow Rd
Mill Brook Rd
Delaney Cross Rd
Butternut Hill Rd
Channel Dr
North St
Mill Brook
Stoddard Rd
Fox Rd
Pine Hill Rd
Geer Town Trl
Geer Rd
Millpond Rd
Hill Top Rd
Upper Rd
High Rd
Ruby Rd
Debonis Quarry Rd
McCarthy Quarry Rd
New Boston Rd
Cross Rd
Butler Rd
Quivey Hill Rd
Old Lake Rd
Kinny Kinnic Ln
Duncan Dr
Capron Ln
Saw Mill Hill Rd
Snow Brook Ln
E Wells Rd
Little Lk E
Endless Brook

SePRO Research & Technology Campus
16013 Watson Seed Farm Road, Whitakers, NC 27891

RECEIVED JUN 30 2015

PJLA Testing
Accreditation #: 777497

FasTEST*

Chain of Custody: 2015-45120-00

LABORATORY REPORT

Customer Company

Company Name: Aquatic Control Tech Inc
Address: 11 John Road
Sutton, MA 01590-2509

Customer Contact

Contact Person: Marc Bellaud
E-Mail Address: mbellaud@aquaticcontroltech.com
Phone: (508) 865-1000
Fax:

Waterbody Information

Waterbody: Lake St. Catherine - MA Waterbody Size (acres): 0.00 Depth Average: 0.0

Sample Information

Lab ID	Sample Location	Test Method	Results	Sampling Date	Sampling Time	Temp at Receipt (C)
38475	#1/A			06/25/2015		
		Renovate/Triclopyr (µg/L) SOP: FAST 02	**31.9**			
38476	#2/B			06/25/2015		
		Renovate/Triclopyr (µg/L) SOP: FAST 02	**19.7**			
38477	#3/D			06/25/2015		
		Renovate/Triclopyr (µg/L) SOP: FAST 02	**9.4**			
38478	#4/G			06/25/2015		
		Renovate/Triclopyr (µg/L) SOP: FAST 02	**10.6**			
38479	#5			06/25/2015		
		Renovate/Triclopyr (µg/L) SOP: FAST 02	**< 1.00**			
38480	#6			06/25/2015		
		Renovate/Triclopyr (µg/L) SOP: FAST 02	**< 1.00**			
38481	#7			06/25/2015		
		Renovate/Triclopyr (µg/L) SOP: FAST 02	**< 1.00**			

Original

SePRO Research & Technology Campus

Chain of Custody: **2015-45120-00**

Waterbody Information

Waterbody: Lake St. Catherine - MA Waterbody Size (acres): 0.00 Depth Average: 0.0

Sample Information

Lab ID	Sample Location	Test Method	**Results**	Sampling Date	Sampling Time	Temp at Receipt (C)

ANALYSIS STATEMENTS:
SAMPLE RECEIPT /HOLDING TIMES: All samples arrived in an acceptable condition and were analyzed within prescribed holding times in accordance with the SRTC Laboratory Sample Receipt Policy unless otherwise noted in the report.
PRESERVATION: Samples requiring preservation were verified prior to sample analysis and any qualifiers will be noted in the report.
QA/QC CRITERIA: All analyses met method criteria, except as noted in the report with data qualifiers.
ACCREDITED METHODS: This laboratory is not accredited for the tests marked "‡"
COMMENTS: No significant observations were made unless noted in the report.
MEASUREMENT UNCERTAINTY: Uncertainty of measurement has been accounted for with regards to determination of compliance of instruments used for analysis; uncertainty measurements are available upon request.

Laboratory Information

Date Received: 06/29/2015
Time Received: 11:00am
Date Results Sent: 06/30/2015
Date Analysis Performed: 06/30/2015

Disclaimer: The results listed within this Laboratory Report relate only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a dry weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the exclusive use of SRTC Laboratory and its client. This report shall not be reproduced, except in full, without written permission from SRTC Laboratory. The Chain of Custody is included and is an essential component of this report.
This entire report was reviewed and approved for release.

Reviewed By: Quality Control Analyst

Original

SePRO Research & Technology Campus
16013 Watson Seed Farm Road, Whitakers, NC 27891

PJLA Testing
Accreditation #: 777497

RECEIVED SEP - 3 2015

FasTEST*

Chain of Custody: 2015-49514-00

LABORATORY REPORT

Customer Company

Company Name: Aquatic Control Tech Inc
Address: 11 John Road
Sutton, MA 01590-2509

Customer Contact

Contact Person: Marc Bellaud
E-Mail Address: mbellaud@aquaticcontroltech.com
Phone: (508) 865-1000
Fax:

Waterbody Information

Waterbody: Lake St. Catherine - MA Waterbody Size (acres): 0.00 Depth Average: 0.0

Sample Information

Lab ID	Sample Location	Test Method	Results	Sampling Date	Sampling Time	Temp at Receipt (C)
39477	#1/A			09/01/2015		
		Renovate/Triclopyr (µg/L) SOP: FAST 02	**< 1.00**			
39478	#2/B			09/01/2015		
		Renovate/Triclopyr (µg/L) SOP: FAST 02	**< 1.00**			
39479	#3/C			09/01/2015		
		Renovate/Triclopyr (µg/L) SOP: FAST 02	**< 1.00**			
39480	#4/D			09/01/2015		
		Renovate/Triclopyr (µg/L) SOP: FAST 02	**< 1.00**			
39481	#5			09/01/2015		
		Renovate/Triclopyr (µg/L) SOP: FAST 02	**< 1.00**			
39482	#6			09/01/2015		
		Renovate/Triclopyr (µg/L) SOP: FAST 02	**< 1.00**			
39483	#7			09/01/2015		
		Renovate/Triclopyr (µg/L) SOP: FAST 02	**< 1.00**			

Original

SePRO Research & Technology Campus

Chain of Custody: 2015-49514-00

Waterbody Information

Waterbody: Lake St. Catherine - MA Waterbody Size (acres): 0.00 Depth Average: 0.0

Sample Information

Lab ID	Sample Location	Test Method	Results	Sampling Date	Sampling Time	Temp at Receipt (C)

ANALYSIS STATEMENTS:
SAMPLE RECEIPT /HOLDING TIMES: All samples arrived in an acceptable condition and were analyzed within prescribed holding times in accordance with the SRTC Laboratory Sample Receipt Policy unless otherwise noted in the report.
PRESERVATION: Samples requiring preservation were verified prior to sample analysis and any qualifiers will be noted in the report.
QA/QC CRITERIA: All analyses met method criteria, except as noted in the report with data qualifiers.
ACCREDITED METHODS: This laboratory is not accredited for the tests marked "‡"
COMMENTS: No significant observations were made unless noted in the report.
MEASUREMENT UNCERTAINTY: Uncertainty of measurement has been accounted for with regards to determination of compliance of instruments used for analysis; uncertainty measurements are available upon request.

Laboratory Information

Date Received: 09/02/2015
Time Received: 11:00am
Date Results Sent: 09/03/2015
Date Analysis Performed: 09/03/2015

This entire report was reviewed and approved for release.

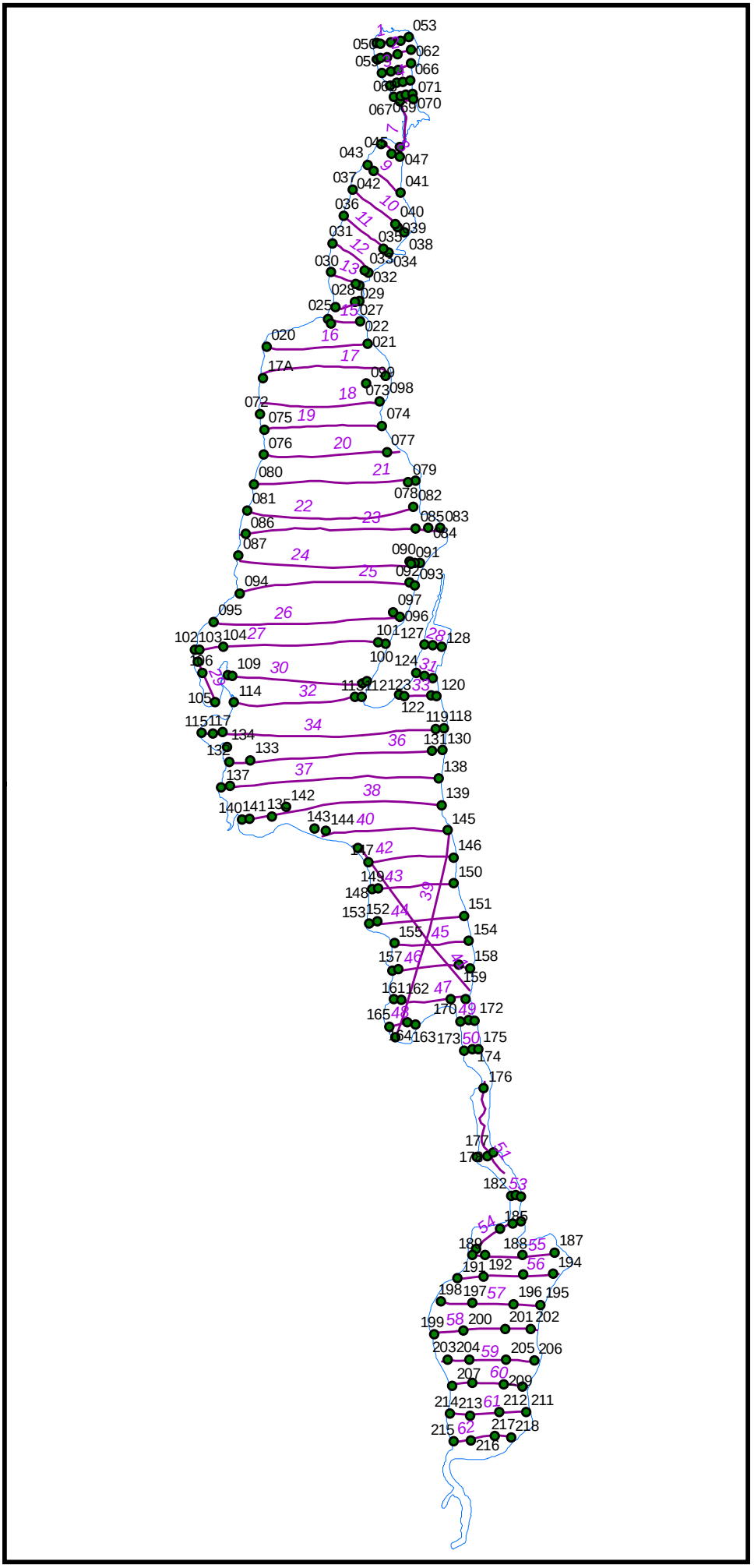
Reviewed By: Quality Control Analyst

Original

APPENDIX B

Comprehensive Aquatic Vegetation Survey Information

- Data Point Sampling Location Map
- Field Data Table
- Overall Vegetation Density Map
- Vegetation Species Distribution Maps
- Late Season Milfoil Distribution - 2015



Lake St. Catherine

Poultney & Wells, VT

Transects & Data Point Locations for Vegetation Survey

FIGURE:	SURVEY DATE:	MAP DATE:
B-1	9/28 & 9/29/15	11/4/14

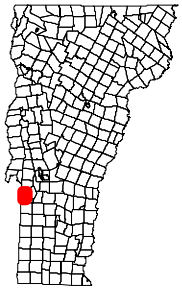
Legend

Data point locations recorded with GPs unit during ACT/ ReMetrix 2001 survey. Sampling replicated during ACT 2007 survey. Data points relocated with DGPS unit with sub-meter accuracy.

Transects recorded during ACT/ ReMetrix 2001 survey using DGPS.

N
W E
S

0 500 1,000 2,000 3,000
Feet



AQUATIC CONTROL TECHNOLOGY, INC.
11 JOHN ROAD
SUTTON, MASSACHUSETTS 01590
PHONE: (508) 865-1000
FAX: (508) 865-1220
WEB: WWW.AQUATICCONTROLTECH.COM

Lily Pond

Point #	% Cover	% Ms Cover	Species Richness	Biomass	Pr	Ms	Ec	Pi	Nf	Pz	Cd	Zd	Ca	Ny	Mu	V	Fa	Uv	B	Pe	Pg	I	Pn	Ug	Nu	Pc	Lm	Pa	En	Ni	Pp	Eo	Pcd	Pb	Ng	Cd2	Ui	Pspp	Pprea	Nm	Sg	Spar	Mv
48	100	0	6	4	D						X	X						X											X									X					
49	100	0	6	4	X		X	X			X	4.8		X																													
50	100	5	7	4	X	X	X	X			X	D		X																													
51	100	0	6	4	D					X								X						X				X										X				
52	100	0	7	4	X		X			D								X						X				X										X				
53	100	0	5	4	X					X								X					D						X													
53	100	0	1	3										D																												
54	100	5	7	4	D	X	X	X			X	X																											X				
55	100	0	5	4	X		X			X	X																												D				
56	70	0	2	3							D																												X				
57	0	0	0	0																																						
58	100	0	7	4	X		X			D	X	X					X											X														
59	100	5	6	4	X	X	D				X	X																X														
60	100	0	5	4	X					D	X						X																						X				
61	100	0	4	4						D	X							X																					X				
62	100	0	7	4			X			D	X			X				X						X															X				
63	100	10	6	4	X	X	X					D		X																							X						
64	100	0	5	4	D		X			X																		X										X				
65	100	0	3	4	X					D	X																																
66	100	0	7	4	X		D			X	X	X		X		X																											
67	100	15	6	4	X	X	D				X	X		X																													
68	100	10	5	4	D	X					X																	X	X														
69	100	5	5	4		X		X		X	X	D																															
70	0	0	0	0																																							
71	75	0	2	2														X											D														
	89.8	**2.2**	**4.8**	**3.52**																																							

	Pr	Ms	Ec	Pi	Nf	Pz	Cd	Zd	Ca	Ny	Mu	V	Fa	Uv	B	Pe	Pg	I	Pn	Ug	Nu	Pc	Lm	Pa	En	Ni	Pp	Eo	Pcd	Pb	Ng	Cd2	Ui	Pspp	Pprea	Nm	Sg	Spar	Mv
Present	12	7	9	4	0	6	15	6	0	6	0	1	2	7	0	0	0	0	0	3	0	0	0	6	3	0	0	0	0	0	0	1	0	1	8	0	0	0	0
Dominant	5	0	3	0	0	6	1	3	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Total	17	7	12	4	0	12	16	9	0	7	0	1	2	7	0	0	0	0	1	3	0	0	0	6	4	0	0	0	0	0	0	1	0	1	9	0	0	0	0
Frequency	68.0%	28.0%	48.0%	16.0%	0.0%	48.0%	64.0%	36.0%	0.0%	28.0%	0.0%	4.0%	8.0%	28.0%	0.0%	0.0%	0.0%	0.0%	4.0%	12.0%	0.0%	0.0%	0.0%	24.0%	16.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.0%	0.0%	4.0%	36.0%	0.0%	0.0%	0.0%	0.0%

Lake St. Catherine

17	95	5	8	2	D	X		X	X	X		X				X												X														
20	40	0	3	1	D			X								X																										
21	5	0	1	1									D																													
22	5	5	1	1		D																																				
23	100	0	4	3	D		X	X								X																										
24	100	0	3	3	D			X			X																															
25	100	60	3	3	X	D		X																																		
26	100	10	6	3	D	X		X						X		X					X																						
27	0	0	0	0																																						
28	45	5	2	2		X		D																																		
29	90	90	1	4		D																																			
30	100	40	3	2	X	X	D																																		
31	100	50	3	2	X	D	X																																		
32	100	5	4	4	X	X		X																				D														
33	100	0	4	3	X														D									X	X													
34	100	3	6	3	X	X	X	X						D					X																							
35	100	0	4	4			X	X																				D										X				
36	60	0	3	1	D		X	X																																		
37	100	0	4	3	D		X							X														X														
38	100	3	5	3	D	X	X	X								X																										
39	90	0	2	2	D			X																																		
40	60	0	3	2	D		X	X																																		
41	60	20	3	2		D	X						X																													
42	60	0	2	2	D			X																																		
43	65	0	4	2	D			X								X												X														
44	100	10	4	3	D	X	X				X																															
45	100	60	4	4	D	X												X																				X				
46	100	15	3	4	D	X																						X														
47	100	10	7	4		X															X					X	X				X				D	X					
72	20	0	2	1																								D	X												
73	85	0	2	2	D					X																																
74	30	0	5	1			X		X				X								D									X												
75	0	0	0	0																																						
76	45	10	3	2		X		D																						X												
77	75	20	5	2		X	D	X	X			X																														
78	5	5	1	1		D																																				
79	30	0	1	2	D																																					
80	100	50	7	4		D		X	X				X			X												X	X													
81	0	0	0	0																																						
82	100	0	6	3	X		X	D	X							X														X												
83	75	0	3	2												D															X									X		
84	100	5	5	4	D	X	X	X								X																										
85	95	0	5	2								X	X			X													D											X		
86	0	0	0	0																																						
87	0	0	0	0																																						
88	25	0	4	1					X				X								X									D												

89	45	0	3	2				D		X																				X													
90	0	0	0	0																																							
91	35	0	2	2						X																					D												
92	58	5	4	2		X	D	X	X																																		
93	55	0	6	1									D			X					X	X									X										X		
94	0	0	0	0																																							
95	20	0	2	1					D				X																														
96	100	0	3	3	D			X																							X												
97	0	0	0	0																																							
98	85	0	2	2	D			X																																			
99	0	0	0	0																																							
100	100	0	7	4			D	X				X	X								X	X									X												
101	0	0	0	0																																							
102	95	20	9	3		D		X	X			X	X	X		X														X		X											
103	100	0	5	3	D		X	X	X							X																											
104	50	0	4	1				X	X																				D	X													
105	100	10	10	4	X	X		X	X	X		D				X													X	X	X												
106	40	0	1	1	D																																						
107	100	0	3	3	X			D						X																													
108	35	0	3	2																	X								X		D												
109	93	0	4	1					X																				X	D	X												
110	80	0	3	3			X					X	D																														
111	50	0	2	2	D			X																																			
112	38	0	4	1			D		X				X																			X											
113	90	0	1	2	D																																						
114	0	0	0	0																																							
115	100	0	7	4	D		X	X						X		X			X									X															
116	80	0	4	2	D			X	X																					X													
117	30	0	1	2	D																																						
118	100	20	4	3	D	X	X																								X												
119	30	5	5	1		X		X					D																	X	X												
120	40	0	3	2			X						D			X																											
121	60	0	2	1	D			X																																			
122	100	0	6	2			D	X				X				X												X		X													
123	65	10	4	3		X		D	X			X																															
124	100	0	4	3			X					D	X																		X												
125	100	0	3	4	X			D								X																											
126	65	0	4	2	D		X		X				X																														
127	100	0	2	3	D											X																											
128	100	0	4	4	D			X				X							X																								
129	100	0	3	3	D			X		X																																	
130	100	40	8	3		D	X	X	X	X	X																			X					X								
131	100	5	3	2	D	X		X																																			
132	0	0	0	0																																							
133	25	5	2	1		X																							D														
134	0	0	0	0																																							
135	0	0	0	0																																							
136	30	0	2	2	D					X																																	
137	100	0	9	4	X				X	X				D		X					X							X	X	X													
138	0	0	0	0																																							
139	0	0	0	0																																							
140	0	0	0	0																																							
141	58	3	3	2		X																							X		D												
142	5	5	1	1		X																																					
143	100	0	5	3			X	X	X																				D	X													
144	0	0	0	0																																							
145	10	0	1	1																									D														
146	85	60	4	3		D							X																	X	X												
147	85	0	2	2	D											X																											
148	95	0	4	2	D		X									X												X															
149	0	0	0	0																																							
150	50	10	3	2	X	X																							D														
151	13	3	3	1		X																							X		X												
152	65	10	4	2	X	X			X	D																																	
153	100	5	5	3	D	X	X	X																				X															
154	5	0	1	1			D																																				
155	100	10	4	2	D	X		X								X																											
156	30	5	4	1		X				D			X																		X												
157	100	0	3	3	D							X																	X														
158	90	50	4	4		X	X	X				D																															
159	60	0	1	1	D																																						
160	35	5	3	1		X	X						D																														
161	75	0	5	2	D		X	X								X																			X								
162	95	20	3	2	D	X																																		X			
163	100	5	6	4	D	X		X								X													X	X													
164	80	0	2	2	D		X																																				
165	100	20	5	4	D	X	X	X																				X															
166	100	10	6	3	D	X	X				X	X																X															
168	90	10	3	2	X	X						D																															
169	25	5	3	1		X							D																X														
170	100	60	3	4		D		X				X																															
171	100	20	5	3	D	X				X																			X										X				
172	100	5	7	3	D	X	X					X				X												X			X												
173	100	15	6	4	D	X	X	X								X														X													
174	60	0	2	2												D												X															
175	100	10	7	4	D	X		X		X			X			X													X														
	62.6	**7.2**	**3.2**	**2.0**																																							

	Pr	Ms	Ec	Pi	Nf	Pz	Cd	Zd	Ca	Ny	Mu	V	Fa	Uv	B	Pe	Pg	I	Pn	Ug	Nu	Pc	Lm	Pa	En	Ni	Pp	Eo	Pcd	Pb	Ng	Cd2	Ui	Pspp	Pprea	Nm	Sg	Spar	Mv
Present	14	41	32	46	20	11	4	13	14	5	0	28	0	1	3	0	7	2	0	0	0	1	1	13	14	15	15	3	1	0	2	1	1	0	2	2	2	0	0
Dominant	51	11	7	7	1	2	0	4	7	2	0	2	0	0	1	0	1	0	0	0	0	0	0	2	6	2	4	0	0	0	0	1	0	0	0	0	0	0	0
Total	65	52	39	53	21	13	4	17	21	7	0	30	0	1	4	0	8	2	0	0	0	1	1	15	20	17	19	3	1	0	2	2	1	0	2	2	2	0	0
Frequency	49.2%	39.4%	29.5%	40.2%	15.9%	9.8%	3.0%	12.9%	15.9%	5.3%	0.0%	22.7%	0.0%	0.8%	3.0%	0.0%	6.1%	1.5%	0.0%	0.0%	0.0%	0.8%	0.8%	11.4%	15.2%	12.9%	14.4%	2.3%	0.8%	0.0%	1.5%	1.5%	0.8%	0.0%	1.5%	1.5%	1.5%	0.0%	0.0%

Little Lake

					Pr	Ms	Ec	Pi	Nf	Pz	Cd	Zd	Ca	Ny
177	100	15	11	4	X	X		X		X	X	X		X
178	100	80	5	4	x	D	X				X			
179	100	40	8	4	X	X		X			X	X		D
180	100	10	10	4	X	X	X			X	X			
181	100	0	4	4	X									
182	0	0	0	0										
183	50	5	5	2		X					X			X
184	100	30	6	4	D	X		X						
185	100	50	3	4		X						X		D
186	100	0	1	4										D
187	100	20	7	4	D	X		X						X
187	0	0	0	0										
188	100	30	4	4	D	X		X						
189	100	30	4	4		X		D		X				
190	100	50	8	4	X	X	X	X		X				D
191	100	75	2	4	D	X								
192	100	40	4	4		X	X	D						
192	100	30	4	4	X	X		D						
193	100	40	4	4	X	X		X						
194	100	35	5	4		X	X					X		
195	100	30	5	4	D	X		X			X			
196	100	30	4	4		X		X			X			
197	100	30	4	4	X	X		D						
198	100	90	5	4	X	D		X						X
199	100	90	4	4	X	D		X						
200	100	20	4	4	D	X		X						
201	100	30	4	4	X	X		D						
202	100	20	3	4	D	X		X						
203	100	15	6	4	X	X	X	D		X				
204	100	20	5	4	D	X	X	X						
205	100	70	4	4	X	X		D			X			
206	100	80	3	4	X	D					X			
207	100	40	4	4	D	X								
208	100	60	5	4	D	X	X	X						
209	100	50	5	4	X	X	X	D						
210	100	20	4	4	D	X	X	X						
211	100	30	7	4	D	X		X			X			X
212	100	30	3	4	D	X		X						
213	100	30	3	4	D	X		X						
214	100	90	4	4	X	D		X						
215	100	50	5	4	D	X		X						X
216	20	0	1	1				D						
217	100	30	5	4		D		X						X
218	100	0	1	4										D
	92.5	**34.9**	**4.4**	**3.7**										

	Mu	V	Fa	Uv	B	Pe	Pg	I	Pn	Ug	Nu	Pc	Lm	Pa
177		D		X		X					X			
178														X
179										X				
180		X		X							D			
181											D			
182														
183				D										
184				X										X
185														
186														
187				X										
187														
188														X
189		X												
190		X	X											
191														
192		X												
192		X												
193		D												
194		D												X
195		X												
196		D												
197		X												
198		X												
199		X												
200		X												
201		X												
202														
203		X												
204		X												
205														
206														
207		X												X
208		X												
209		X												
210														
211		X												X
212														
213														
214														
215		X												
216														
217				X	X									
218														

	En	Ni	Pp	Eo	Pcd	Pb	Ng	Cd2	Ui	Pspp	Pprea	Nm	Sg	Spar	Mv
177															
178															
179			X												
180								X							X
181							X								X
182															
183															X
184	X														
185															
186															
187		X													X
187															
188															
189															
190															
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211															
212															
213															
214	X														
215															
216															
217															
218															

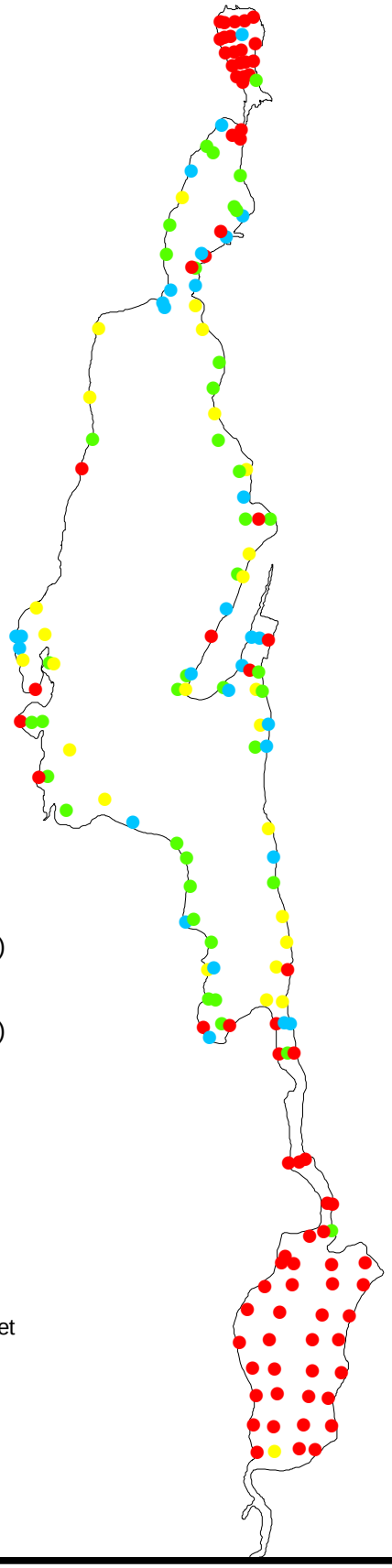
	Pr	Ms	Ec	Pi	Nf	Pz	Cd	Zd	Ca	Ny	Mu	V	Fa	Uv	B	Pe	Pg	I	Pn	Ug	Nu	Pc	Lm	Pa	En	Ni	Pp	Eo	Pcd	Pb	Ng	Cd2	Ui	Pspp	Pprea	Nm	Sg	Spar	Mv
Present	17	32	10	22	0	5	10	4	0	7	0	18	1	5	1	1	0	0	0	1	1	0	0	6	2	1	1	0	0	0	1	1	0	0	0	0	0	0	4
Dominant	15	6	0	9	0	0	0	0	0	5	0	4	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	32	38	10	31	0	5	10	4	0	12	0	22	1	6	1	1	0	0	0	1	3	0	0	6	2	1	1	0	0	0	1	1	0	0	0	0	0	0	4
Frequency	72.7%	86.4%	22.7%	70.5%	0.0%	11.4%	22.7%	9.1%	0.0%	27.3%	0.0%	50.0%	2.3%	13.6%	2.3%	2.3%	0.0%	0.0%	0.0%	2.3%	6.8%	0.0%	0.0%	13.6%	4.5%	2.3%	2.3%	0.0%	0.0%	0.0%	2.3%	2.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.1%

Entire Lake

72.247475 12.76263 3.6767677 2.5757576

	Pr	Ms	Ec	Pi	Nf	Pz	Cd	Zd	Ca	Ny	Mu	V	Fa	Uv	B	Pe	Pg	I	Pn	Ug	Nu	Pc	Lm	Pa	En	Ni	Pp	Eo	Pcd	Pb	Ng	Cd2	Ui	Pspp	Pprea	Nm	Sg	Spar	Mv
Present	43	80	51	72	20	22	29	23	14	18	0	47	3	13	4	1	7	2	0	4	1	1	1	25	19	16	16	3	1	0	3	3	1	1	10	2	2	0	4
Dominant	71	17	10	16	1	8	1	7	7	8	0	6	0	1	1	0	1	0	1	0	2	0	0	2	7	2	4	0	0	0	0	1	0	0	1	0	0	0	0
Total	114	97	61	88	21	30	30	30	21	26	0	53	3	14	5	1	8	2	1	4	3	1	1	27	26	18	20	3	1	0	3	4	1	1	11	2	2	0	4
Frequency	56.7%	48.3%	30.3%	43.8%	10.4%	14.9%	14.9%	14.9%	10.4%	12.9%	0.0%	26.4%	1.5%	7.0%	2.5%	0.5%	4.0%	1.0%	0.5%	2.0%	1.5%	0.5%	0.5%	13.4%	12.9%	9.0%	10.0%	1.5%	0.5%	0.0%	1.5%	2.0%	0.5%	0.5%	5.5%	1.0%	1.0%	0.0%	2.0%

2015 TOTAL VEGETATION BIOMASS



Legend

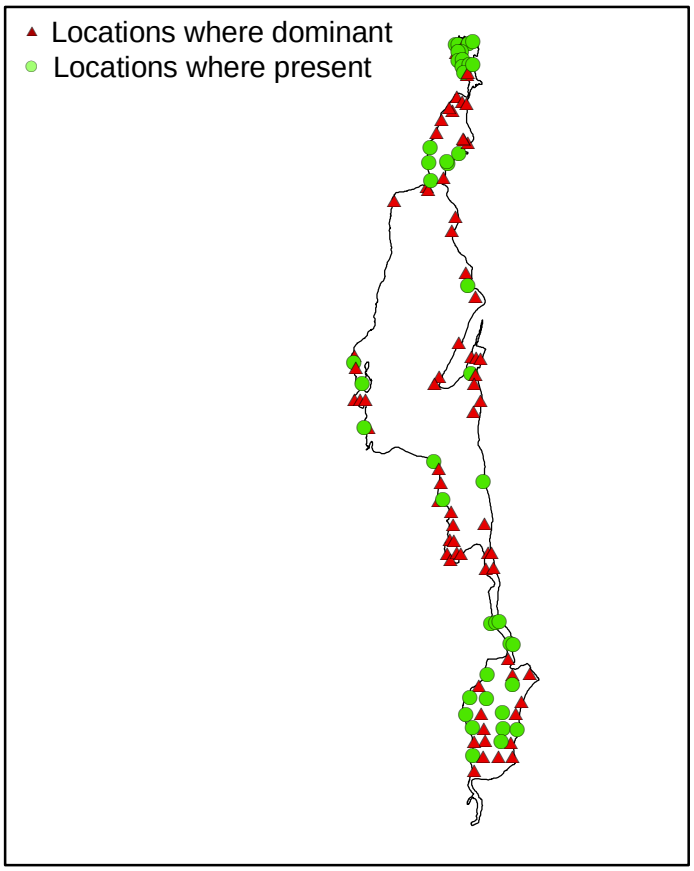
Biomass indices reported
during 9/28 & 9/28/15 survey

- 1 - low biomass (along bottom)
- 2 - moderate biomass (in water column)
- 3 - high biomass (approaching surface)
- 4 - extremely high biomass (topped out)

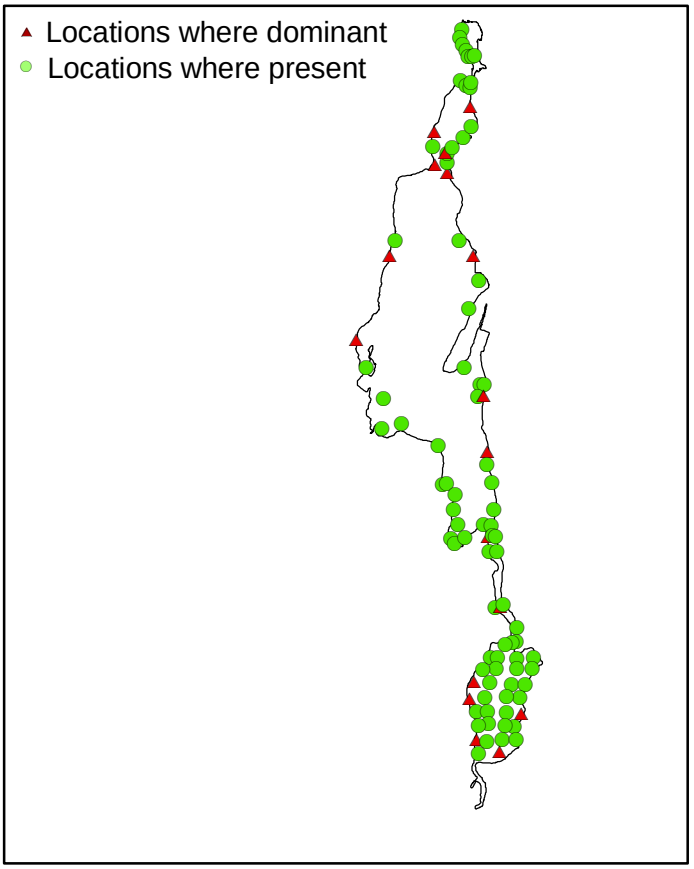
N
W E
S

0 1,000 2,000 4,000 6,000 8,000
Feet

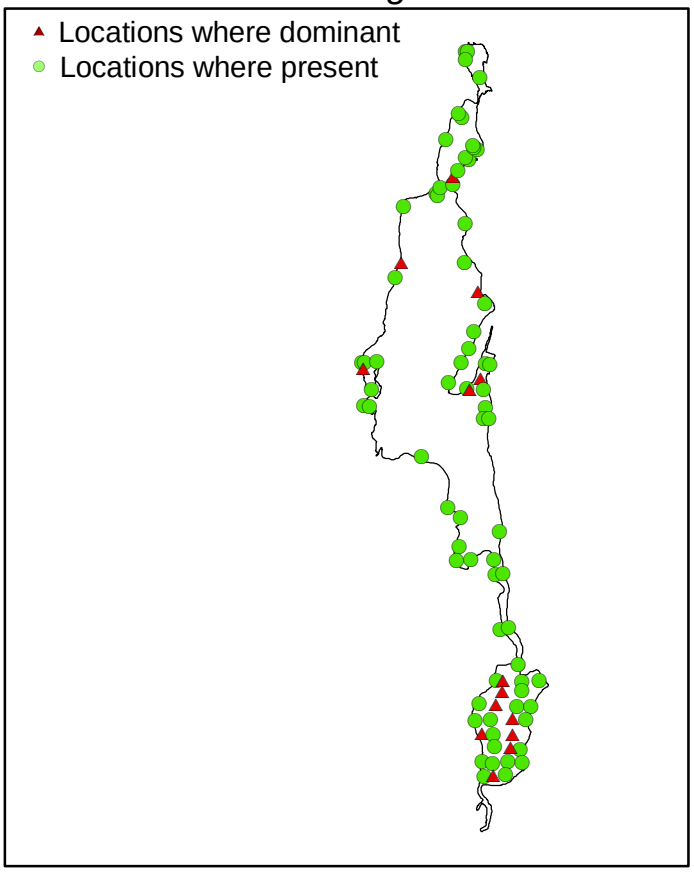
Distribution of *Potamogeton robbinsii*



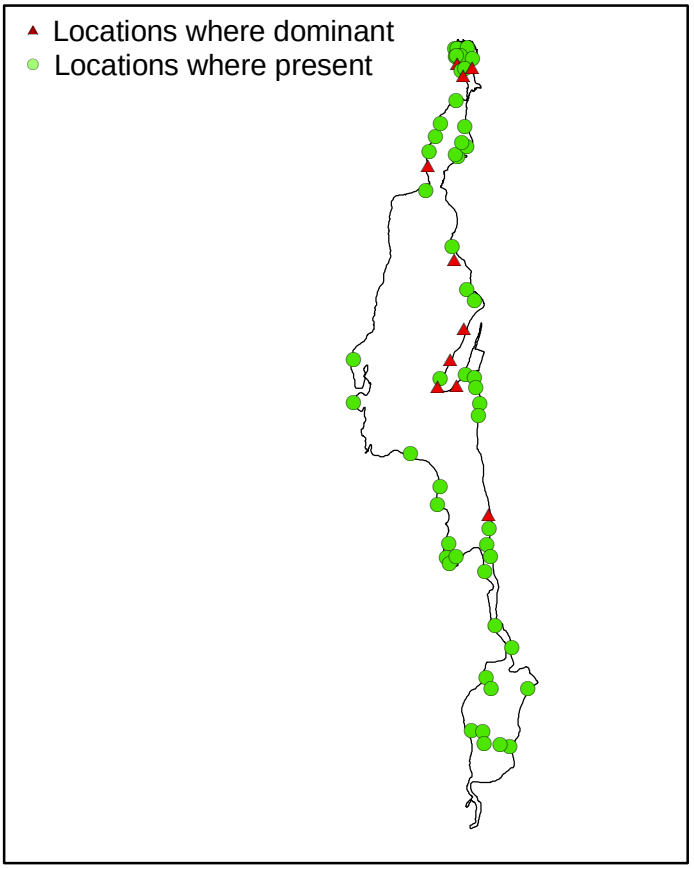
Distribution of *Myriophyllum spicatum*



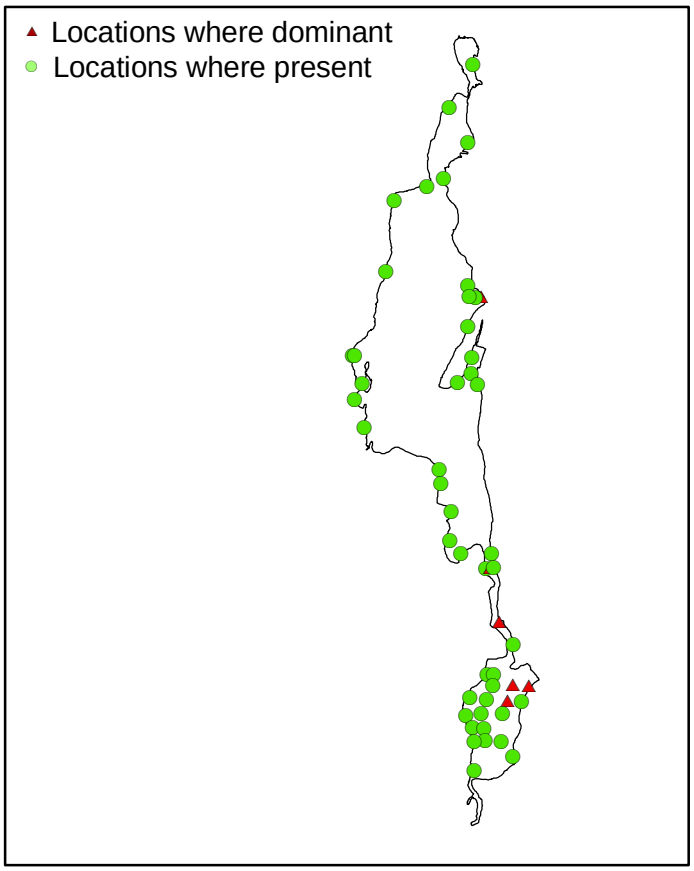
Distribution of *Potamogeton illionensis*



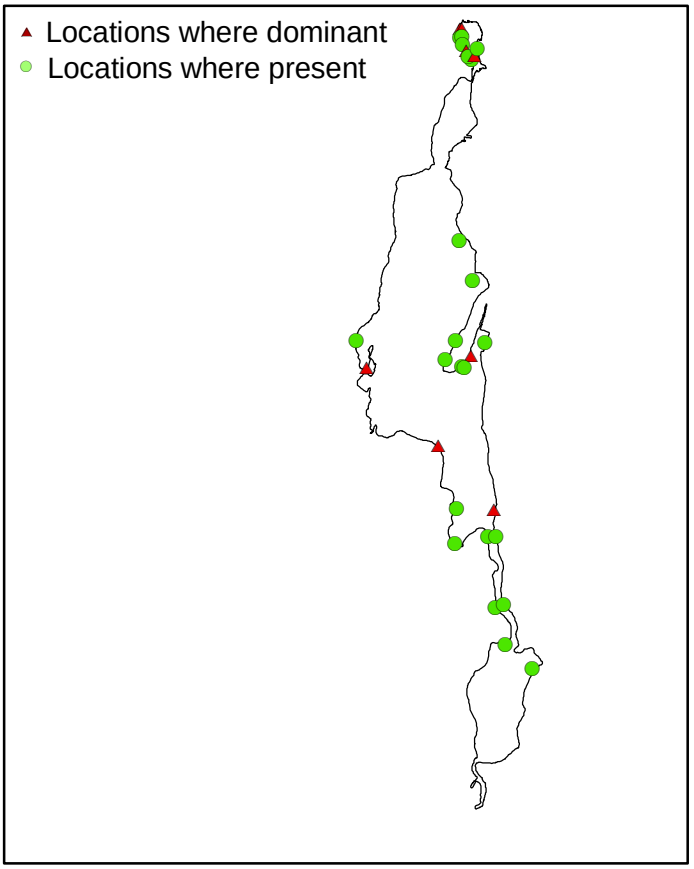
Distribution of *Elodea canadensis*



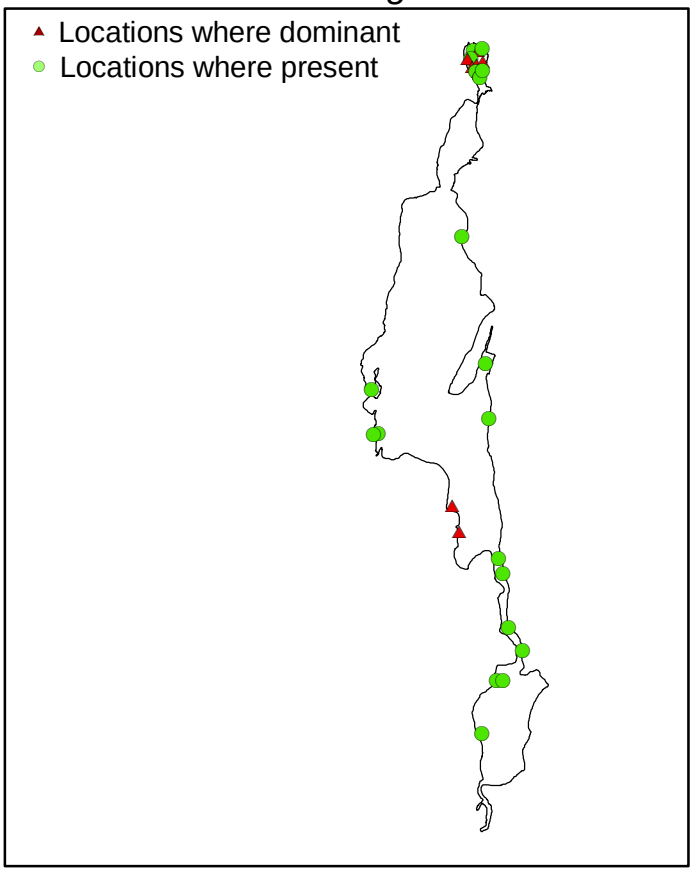
Distribution of *Vallisneria americana*



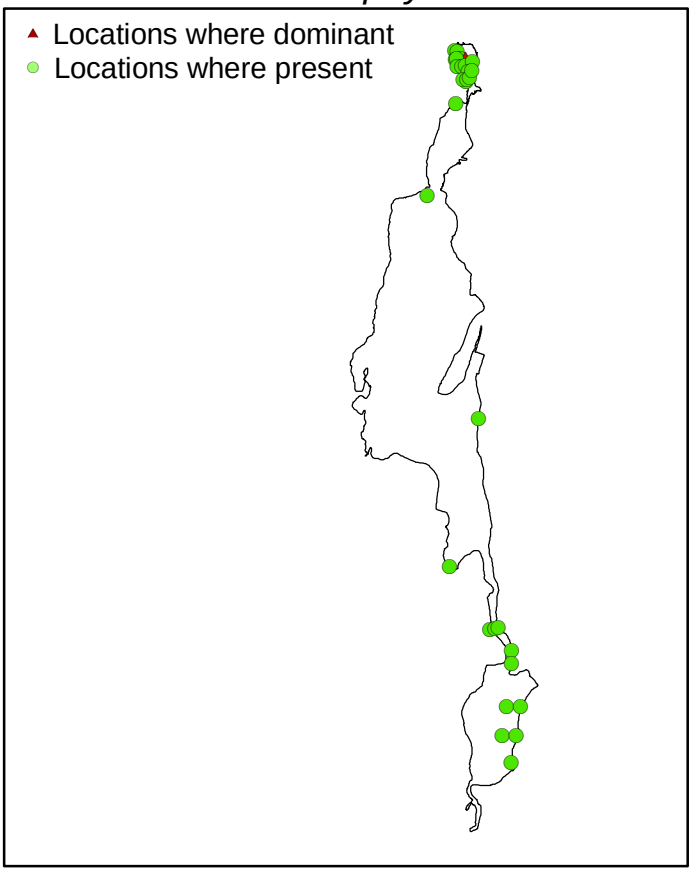
Distribution of *Zosterella dubia*



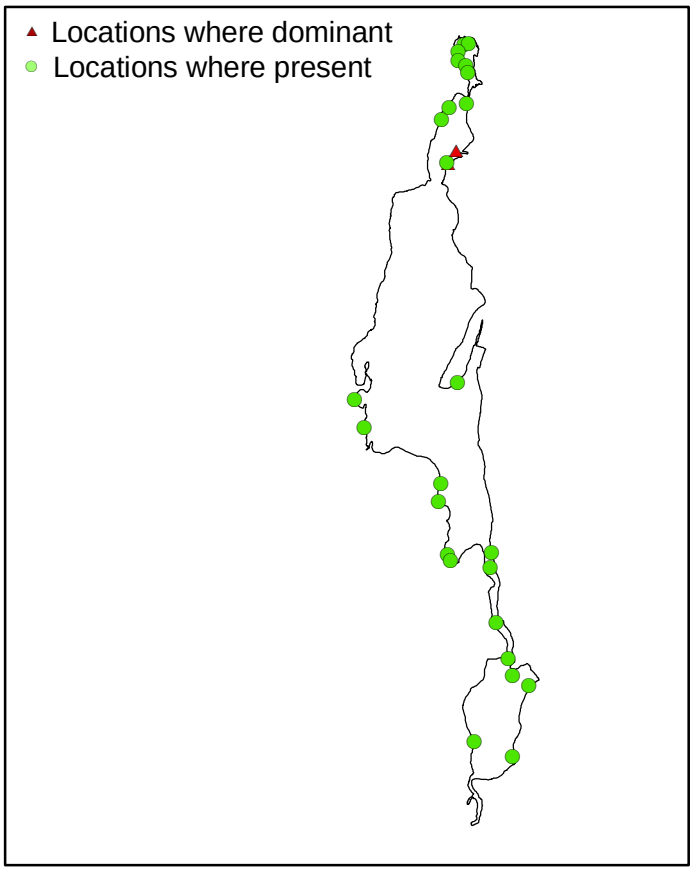
Distribution of *Potamogeton zosterformis*



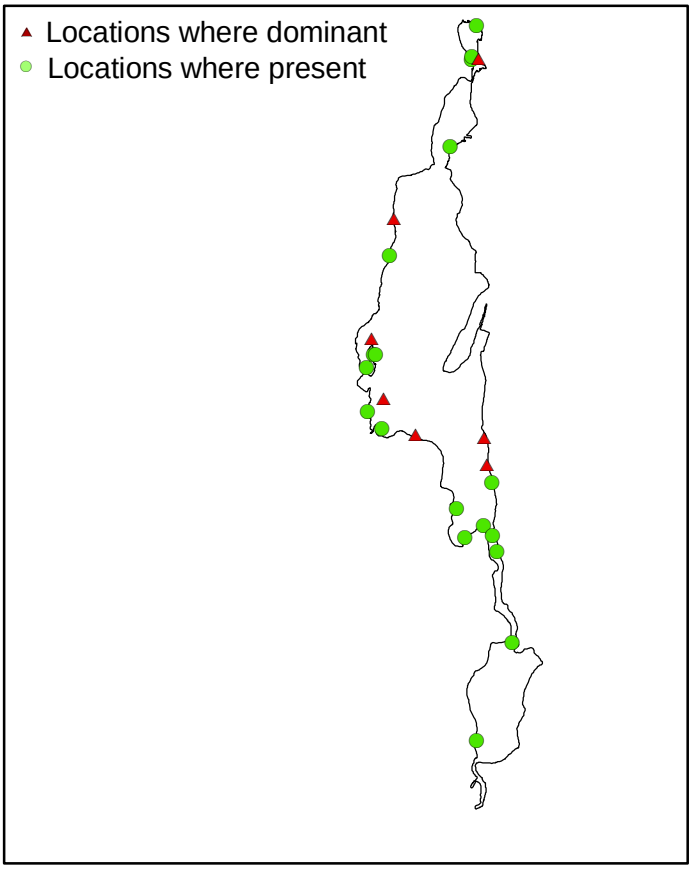
Distribution of *Ceratophyllum demersum*



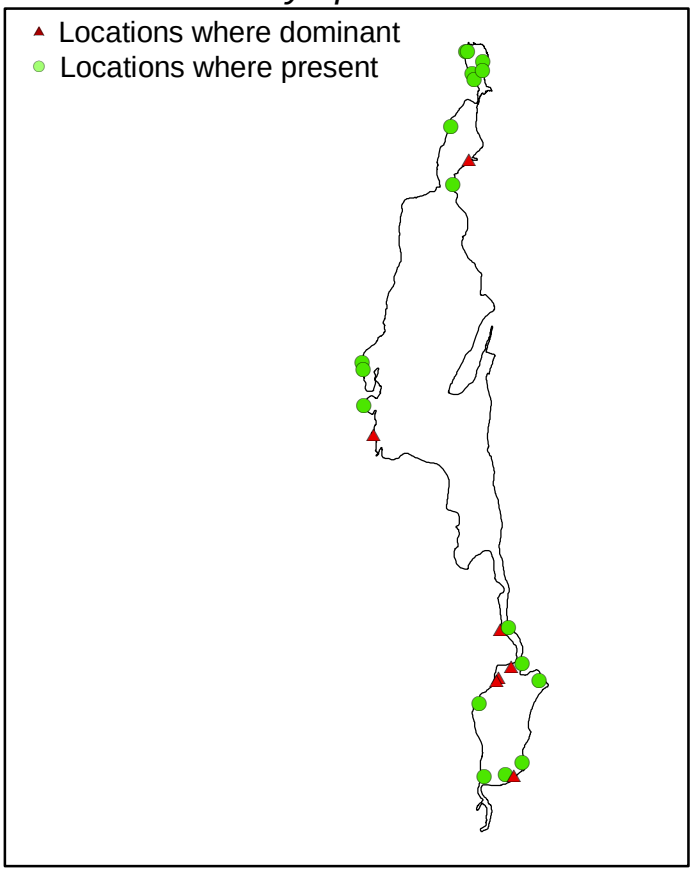
Distribution of *Potamogeton amplifolius*



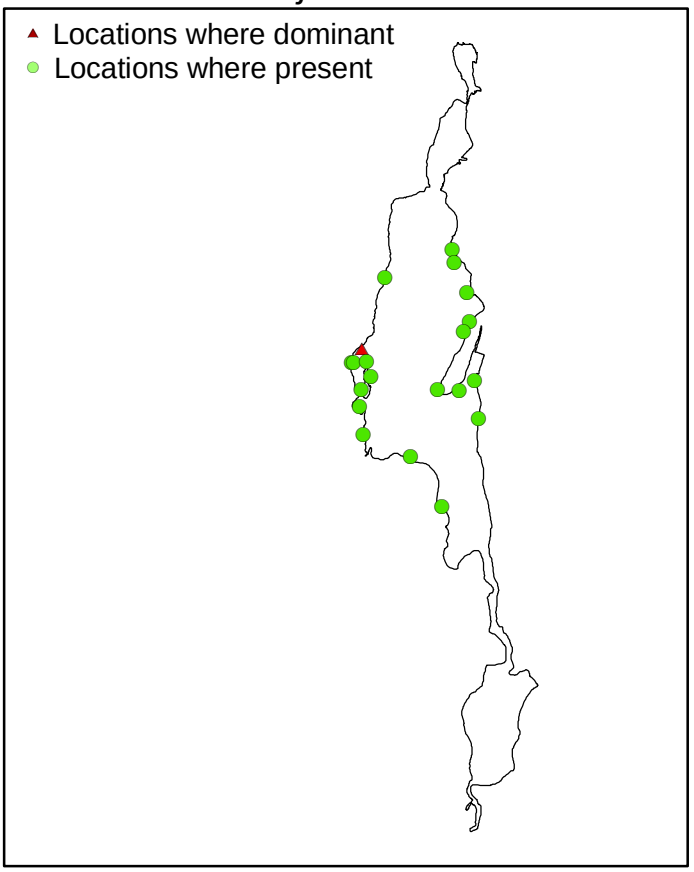
Distribution of *Elodea nuttallii*



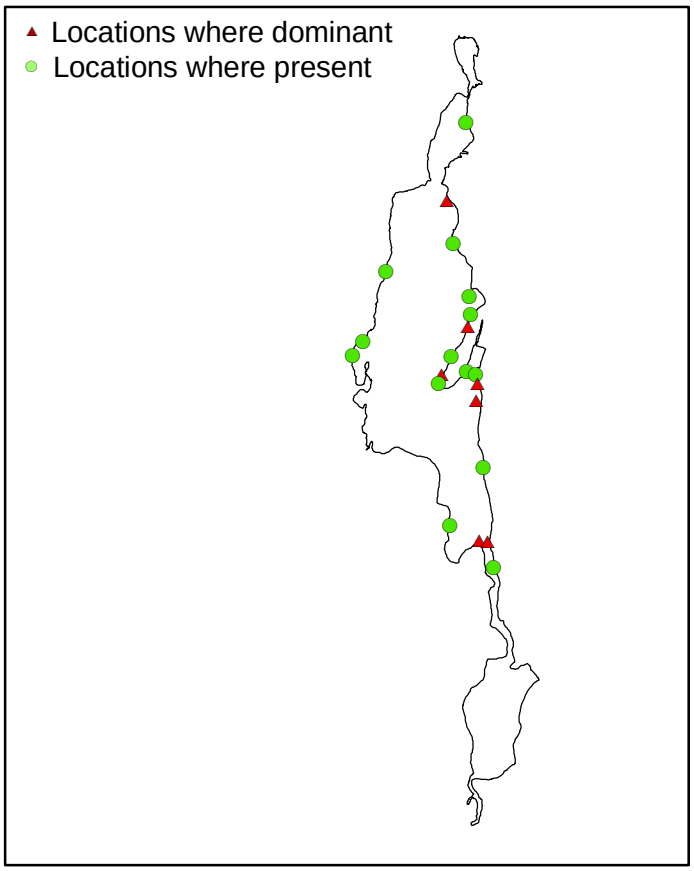
Distribution of *Nymphaea odorata*



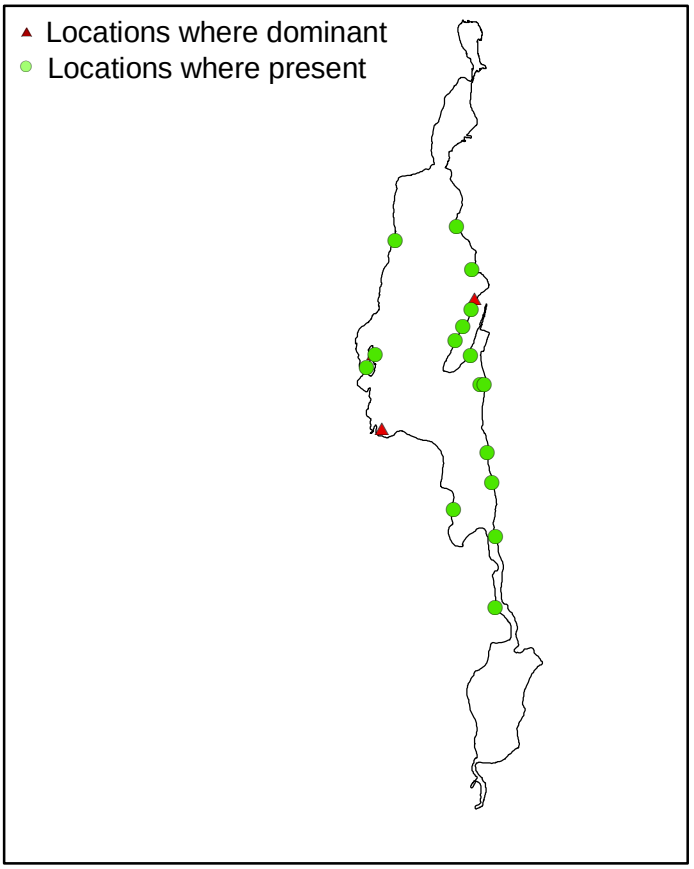
Distribution of *Najas flexilis*



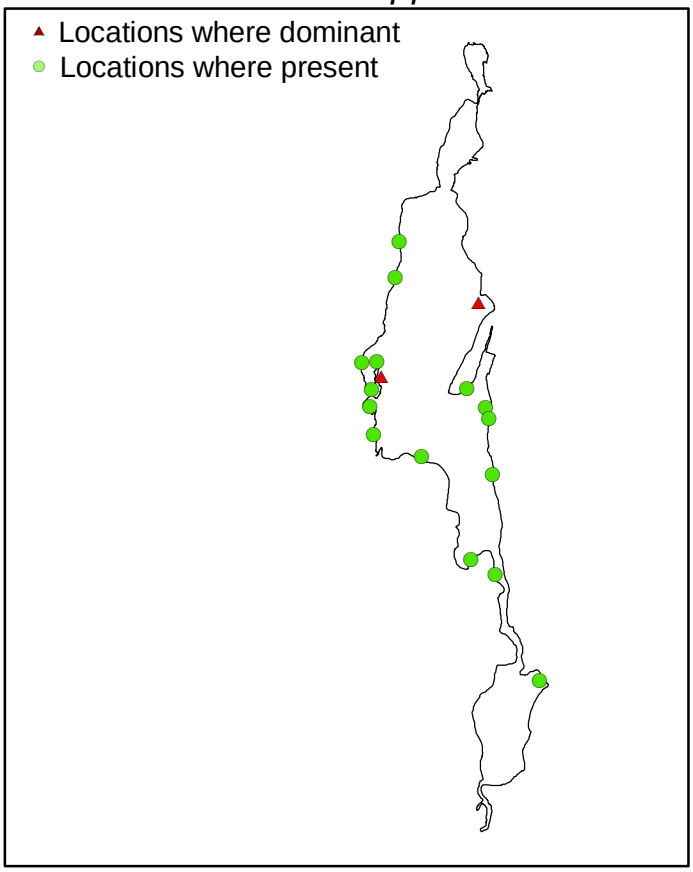
Distribution of *Chara spp.*



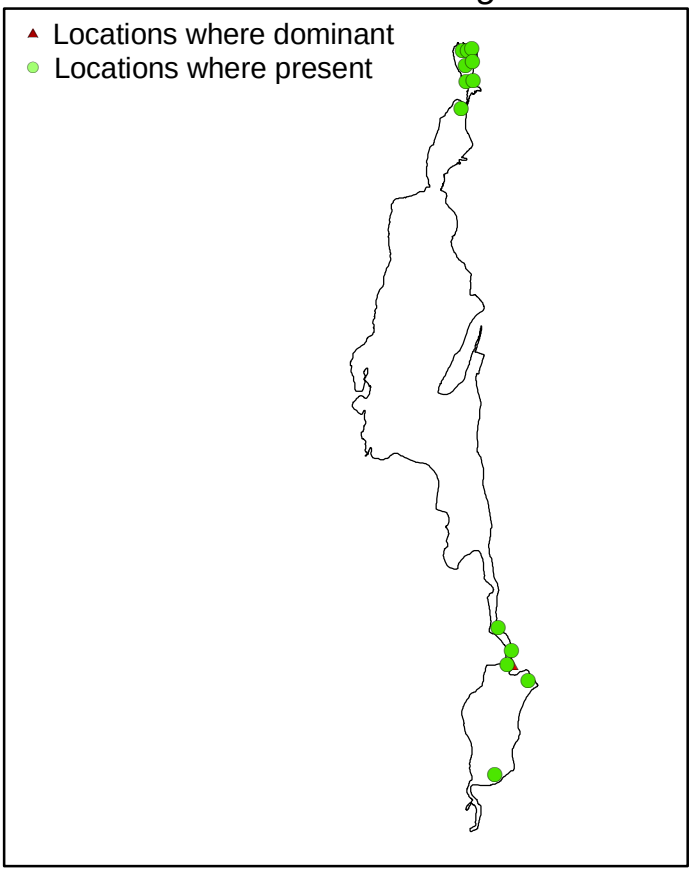
Distribution of *Potamogeton pusillus*



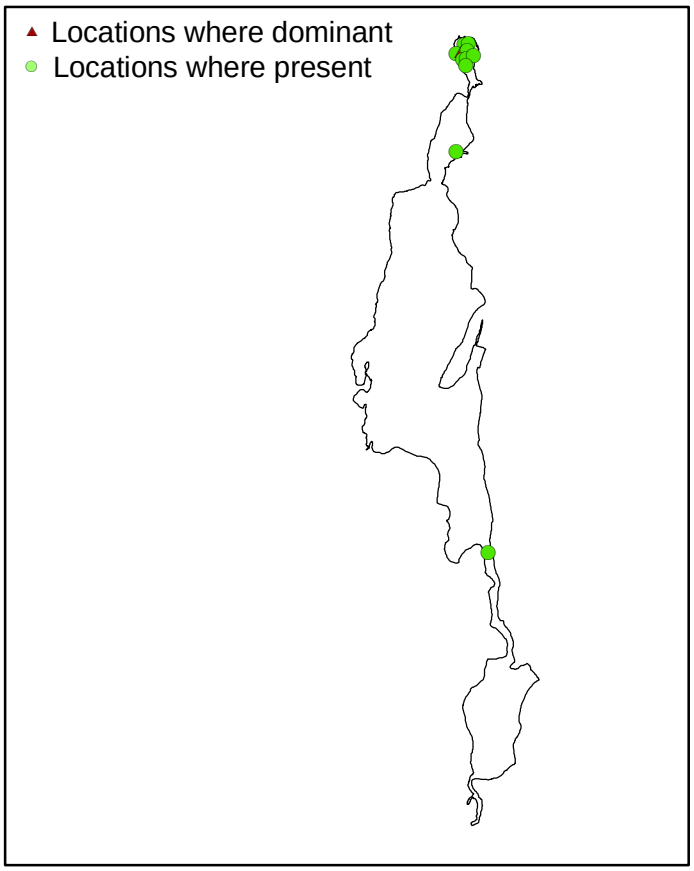
Distribution of *Nitella spp.*



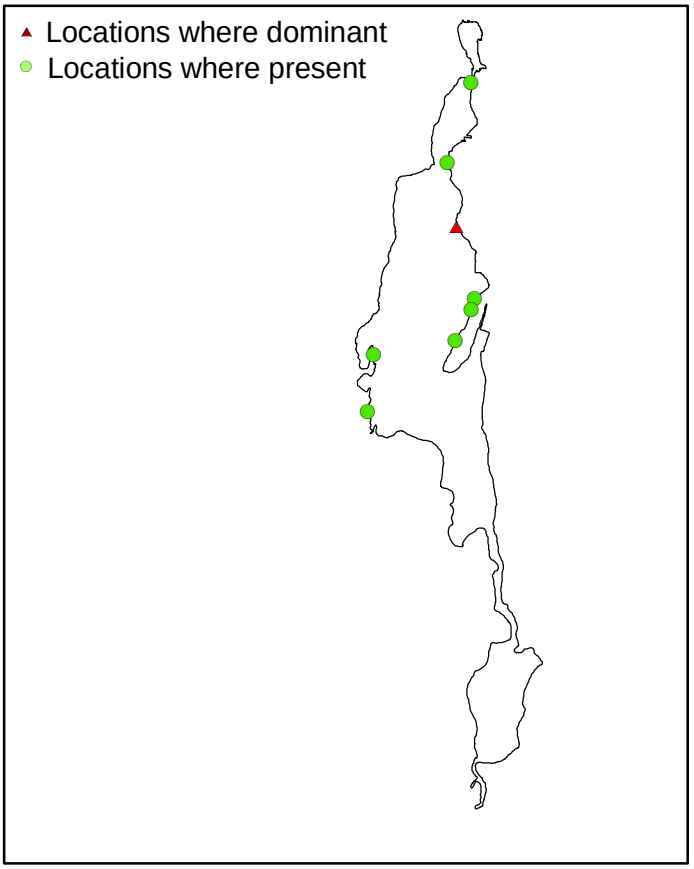
Distribution of *Utricularia vulgaris*



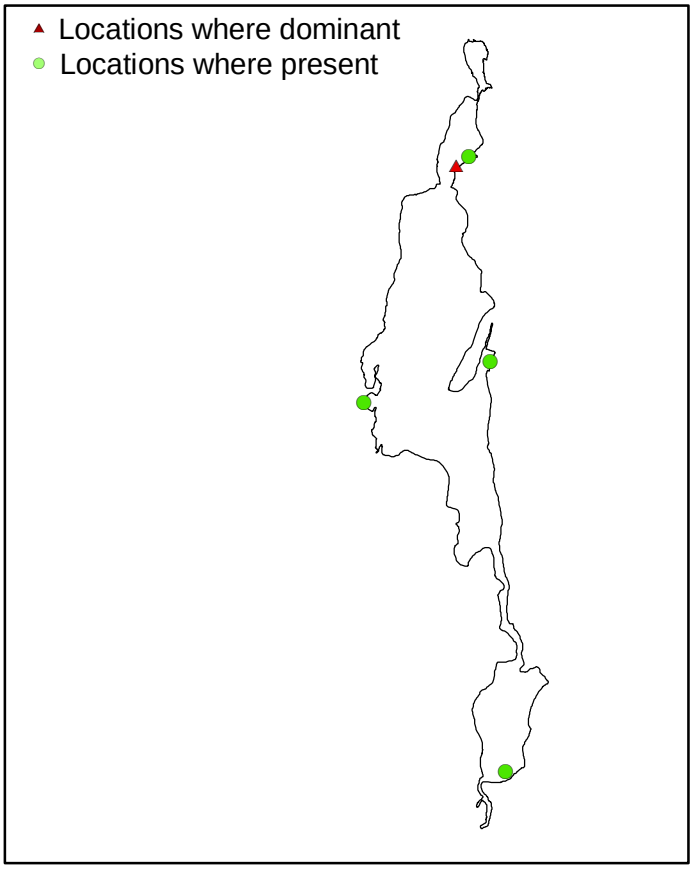
Distribution of *Potamogeton praelongus*



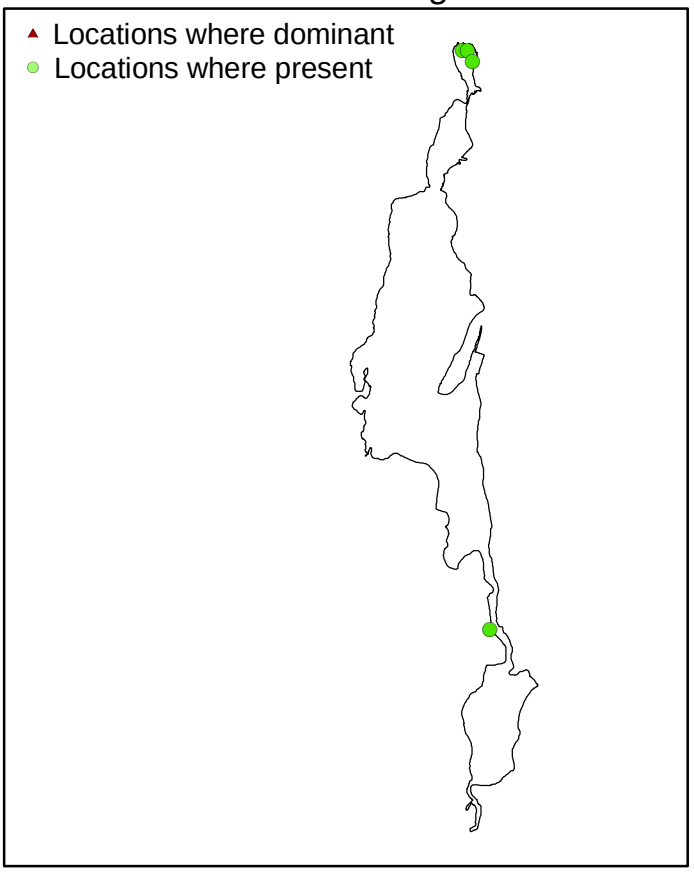
Distribution of *Potamogeton gramineus*



Distribution of *Brasenia schreberi*



Distribution of *Utricularia gibba*



2015 Milfoil Distribution