Lake St. Catherine

Aquatic Vegetation Management Program
2010 - Year Seven Report

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF CHARTS

APPENDICES

INTRODUCTION

The 2010 season marked the seventh year of Aquatic Control's involvement in the Integrated Management Plan at Lake St. Catherine aimed at the control of non-native Eurasian watermilfoil in the lake. Management for milfoil was initiated in 2004 with a whole-lake Sonar (fluridone) application. The 2004 treatment was successful, significantly reducing milfoil coverage throughout the system; however, in the years following milfoil growth persisted, requiring additional management. Consistent with the initial Five Year management Plan (2004-2008) developed for Lake St. Catherine, management following the 2004 Sonar application focused on the control of milfoil in problematic and high-priority areas of the lake using area-specific spot-treatments with Renovate (triclopyr) herbicide coupled with diver assisted suction harvesting and hand-pulling. Following the conclusion of the original Five Year Management Plan in 2008 a second Five Year Management Plan (2009-2013) was prepared with the continued focus on maintenance control of Eurasian watermilfoil in the lake.

Management actions in 2010 included spot-treatment of seven areas totaling approximately 59 acres as well as diver hand-pulling and diver assisted suction harvesting. The following report summarizes the results of 2010 Treatment Program and details findings from the comprehensive aquatic plant survey. Recommendations for the 2011 season have also been included based on the results of the work performed in 2010. Specific information on the 2010 diver hand-pulling and diver assisted suction harvesting efforts will be provided by the Lake St. Catherine Association (LSCA) under a separate cover.

HERBICIDE TREATMENT PROGRAM - 2010

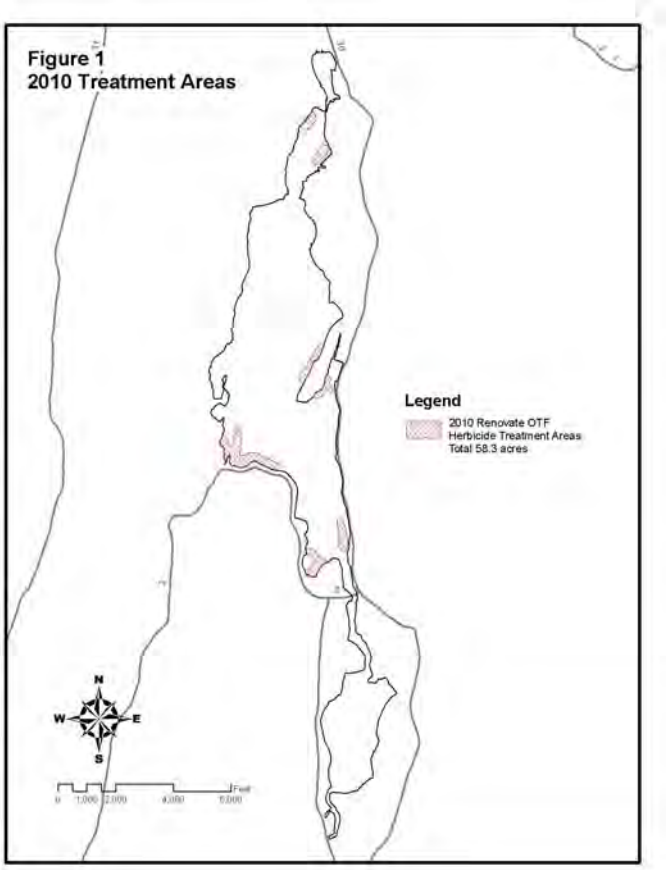
Program Chronology

A chronology of the 2010 treatment program is provided below:

- DEC permit issuance (ANC 2009-C02)..... May 16, 2009
- Pre-treatment inspection and finalize treatment areas..... May 27
- Treatment of approximately 58.7 acres with Renovate OTF ..... June 22
- Herbicide residue monitoring..... June 24, , July 1 & August 3
- Post-treatment inspections .....July 16
- Comprehensive aquatic plant survey ..... September 17-18

2010 Treatment Scope

Seven treatment areas were identified following the September 2009 survey as potential locations for treatment in 2010. Consistent with previous years, each potential treatment areas was evaluated with regards to milfoil 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. While some of the areas identified during the 2009 survey were modified slightly following the pre-treatment survey and discussions with LSCA and the inclusion of a couple of other areas was considered, ultimately all seven of the preliminary areas were treated in 2010.



Final treatment areas (Figure 1) were located along the eastern and western shorelines in the main basin. No treatment was performed in Lily Pond or Little Lake in 2010. The final treatment scope included 7 treatment areas ranging from 4.2 acres to 23 acres. In total, approximately 58.7 acres were targeted for treatment. Based on the morphology of treatment areas Renovate OTF was selected for use in 2010. Renovate OTF granular was used to minimize dilution and maximize herbicide contact time in these areas. Renovate OTF was applied at 2.0-2.25 ppm based on the bottom four feet of the water column.

Summary of 2010 Treatment

The treatment date of Tuesday, June 22, 2010 was selected to allow enough time to comply with the notification requirements of ANC Permit #2009-C02 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 partly sunny, with an air temperature ranging around 75° F. Wind was out of the southwest, estimated at <5 mph and did not interfere with treatment. Prior to treatment, water temperature was measured using a YSI Temperature/Dissolved Oxygen meter. Water temperature in the main basin averaged approximately 71.5° F the epilmnion (upper 5 meters at the time of treatment) with dissolved oxygen concentrations averaging 9.1 mg/L; equivalent to an oxygen saturation of roughly 100%.

The treatment was conducted using two boats, one airboat and one aluminum work skiff. The airboat was equipped with a calibrated cyclone spreader. The conventional boat was outfitted with a granular eductor spray system that fed the granular herbicide into a stream of water using a calibrated venturi-type eductor. The mixture was then sprayed off the stern of the boat using fan-pattern nozzles. Both boats were equipped with Differential/WAAS GPS navigation systems to insure that the herbicide was evenly applied to the designated treatment areas. A total of 13,480 pounds of Renovate OTF (granular) were applied to the designated treatment areas. The herbicide was applied in approximately 8.25 hours.

Herbicide Residue Testing

In compliance with conditions of the ANC Permit #2009-C02, water samples were collected from 9 locations 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. Additional sampling was then required until concentrations were <1 ppb before the irrigation restriction could be lifted.

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 24, July 3 & August 3. The highest in-lake concentration detected during the 24-hour sampling round was 0.097 ppm. The in-lake average for all sampled areas 24-hours post-treatment averaged roughly 0.034 ppm or 34 ppb. On July 1, 10 days post-treatment, three of the sites were tested and average concentrations had dropped significantly to 0.019 ppm or 19 ppb. At the time of the final sampling round on August 3 lake-wide concentrations average 0.003 ppm or 3 ppb. The highest concentration measured during the finial round of sampling which was recorded at two sample locations.

LATE SEASON COMPREHENSIVE AQUATIC VEGETATION SURVEY

Survey Methods

The late season comprehensive aquatic vegetation survey conducted on September 14 & 15, 2010 replicated the methods that were employed in the previous years of this management program.

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 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 during the pre-treatment inspection. 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

Note: Biomass at some data point locations was recorded with and additional 0.5 (e.g. 1.5 or 2.5). In each instance the 0.5 indicates that one or more species are growing taller in the water column than the more dominant species in the vegetation cover. In an instance where a biomass of 1.5 was denoted vegetation was generally low growing and another non-dominant species was growing higher in the water column. Typically the 0.5 added during the 2010 survey resulted from the presence of *Potamogeton amplifolius* and/or *Potamogeton illinoensis*)

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

Survey Findings

The overall distribution and quantitative measures of the aquatic plant community were comparable to prior years.

Table 1: Summary of Survey Data

LILY POND	2001	2004	2005	2006	2007	2008	2009	2010
Total Number of Data Points	24	24	24	22	24	24	24	24
Total Plant Cover	90%	80%	98%	88%	91%	98%	94%	98%
Milfoil Cover	9%	6%	2%	0%	2%	7%	<1%	<1%
Plant Biomass Index	3.1	2.5	3.3	2.5	2.8	3.3	2.7	2.3

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

LITTLE LAKE								
Total Number of Data Points	43	43	43	43	43	43	43	43
Total Plant Cover	72%	66%	78%	83%	83%	77%	58%	62%
Milfoil Cover	15%	0%	0%	2%	7%	10%	<1%	5%
Plant Biomass Index	2.3	2.1	2.4	2.9	2.8	2.7	2.2	2.7

Table 2: Species List and Frequency of Occurrence (entire lake system)

Macrophyte Species	Common Name	2001	2004	2005	2006	2007	2008	2009	2010
Potamogeton robbinsii	Pondweed	52%	76%	88%	74%	77%	68%	84%	78%
Myriophyllum spicatum	Eurasian watermilfoil	94%	44%	17%	33%	74%	65%	38%	40%
Potamogeton amplifolius	Large-leaf	33%	38%	43%	49%	52%	53%	51%	56%
Najas flexilis	Naiad	22%	0%	8%	39%	34%	22%	15%	16%
Potamogeton illinoensis	Illinois pondweed	4%	1%	2%	9%	23%	39%	29%	36%
Potamogeton zosteriformis	Flat-stem pondweed	28%	3%	29%	29%	23%	19%	16%	26%
Zosterella dubia	Water stargrass	1%	1%	9%	8%	23%	17%	7%	13%
Ceratophyllum demersum	Coontail	20%	8%	11%	12%	21%	18%	17%	22%
Nitella / Chara	Stonewort	17%	6%	36%	40%	14%	14%	13%	1.5%
Nymphaea odorata	White waterlily	16%	5%	11%	10%	11%	11%	10%	7%
Vallisneria americana	Wild celery/Tapegrass	29%	13%	2%	4%	9%	8%	15%	15%
Brasenia schreberi	Watershield	4%	8%	7%	7%	7%	6%	5%	5%
Utricularia vulgaris	Common bladderwort	8%	9%	2%	6%	7%	7%	11%	8%
Elodea canadensis	Waterweed	32%	1%	1%	1%	5%	43%	60%	30%
Chlorophyta	Filamentous green algae	2%	37%	26%	7%	4%	8%	3%	2%
Potamogeton crispus	Curly-leaf pondweed	2%	1%	7%	5%	3%	1%	0%	0%
Potamogeton epihydrus	Ribbon-leaf pondweed	2%	6%	7%	3%	3%	5%	1%	1%
Nuphar variegatum	Yellow waterlily	5%	5%	5%	2%	2%	1%	2%	1%
Potamogeton gramineus	Variable pondweed	23%	1%	6%	6%	2%	4%	4%	4%
Isoetes sp.	Quillwort	2%	6%	2%	5%	2%	3%	1%	0%
Utricularia gibba	Creeping bladderwort	2%	0%	1%	5%	1%	1%	4%	1%
Eleocharis sp.	Spikerush	1%	1%	1%	0%	0%	0%	0%	0%
Lemna minor	Duckweed	7%	1%	0%	1%	0%	1%	1%	0%
Megalodonta beckii	Water marigold	3%	0%	0%	0%	0%	0%	0%	0%

Lily Pond

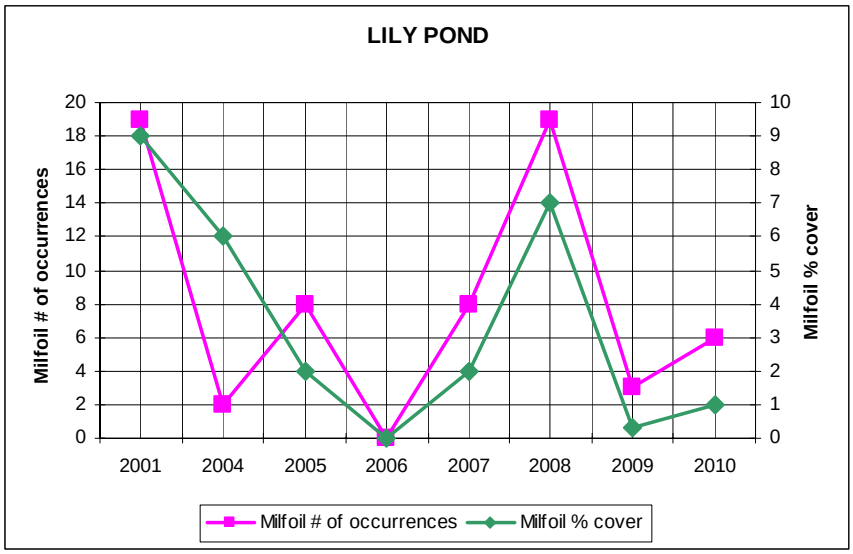
Milfoil distribution in Lily Pond remains reduced following treatment of this area with Renovate 3 in 2009. While milfoil frequency and cover did increase slightly and was encountered at 6 locations of the 24 (25.0%) data point locations, compared to only 3 (12.5%) in 2009. Milfoil cover where found remained low density, generally consisting widely scattered plants.

Native species in Lily Pond remained healthy with both cover and distribution similar to what has been recorded in previous years. *Potamogeton robbinsii* remained the most abundant plant in the basin followed closely by *Elodea canadensis* and *Ceratophyllum demersum*. *Potamogeton zosteriformis* and *Zosterella dubia* were also abundant and were encountered at greater than half of the surveyed locations.

Table 3: Lily Pond – Species List and Frequency of Occurrence

Macrophyte Species	Lily Pond							
	2001	2004	2005	2006	2007	2008	2009	2010
Potamogeton robbinsii	95.8%	91.7%	95.8%	95.5%	91.7%	87.5%	95.8%	95.8%
Ceratophyllum demersum	70.8%	4.2%	50.0%	45.5%	83.3%	83.3%	83.3%	79.2%
Potamogeton amplifolius	33.3%	100.0%	91.7%	77.3%	79.2%	87.5%	91.7%	87.5%
Potamogeton illinoensis	0.0%	4.2%	8.3%	9.1%	45.8%	41.7%	25.0%	16.7%
Myriophyllum spicatum	79.2%	8.3%	33.3%	0.0%	33.3%	79.2%	12.5%	25.0%
Potamogeton zosteriformis	58.3%	8.3%	62.5%	0.0%	25.0%	45.8%	12.5%	66.7%
Zosterella dubia	4.2%	0.0%	37.5%	0.0%	25.0%	20.8%	8.3%	50.0%
Nymphaea odorata	62.5%	16.7%	29.2%	9.1%	20.8%	25.0%	33.3%	16.7%
Potamogeton crispus	4.2%	4.2%	4.2%	4.5%	12.5%	0.0%	0.0%	0.0%
Chlorophyta	0.0%	29.2%	95.8%	31.8%	8.3%	29.2%	12.5%	4.2%
Elodea canadensis	29.2%	0.0%	8.3%	0.0%	8.3%	29.2%	45.8%	79.2%
Utricularia vulgaris	29.2%	37.5%	0.0%	27.3%	4.2%	12.5%	16.7%	4.2%
Chara sp. / Nitella sp.	0.0%	0.0%	0.0%	4.5%	4.2%	0.0%	0.0%	0.0%
Wolffia sp.	0.0%	0.0%	0.0%	4.5%	4.2%	0.0%	0.0%	0.0%
Potamogeton epihydrus	0.0%	12.5%	4.2%	0.0%	4.2%	4.2%	4.2%	0.0%
Potamogeton gramineus	16.7%	0.0%	8.3%	0.0%	4.2%	0.0%	8.3%	0.0%
Utricularia gibba	0.0%	0.0%	0.0%	40.9%	0.0%	0.0%	4.2%	0.0%
Potamogeton natans	0.0%	0.0%	0.0%	9.1%	0.0%	8.3%	8.3%	12.5%
Lemna minor	45.8%	8.3%	0.0%	4.5%	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%
Isoetes sp.	0.0%	4.2%	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%
Nuphar variegatum	16.7%	16.7%	16.7%	0.0%	0.0%	0.0%	0.0%	4.2%
Vallisneria americana	33.3%	45.8%	0.0%	0.0%	0.0%	0.0%	8.3%	4.2%

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



Lake St. Catherine (Main Basin)

The distribution of native plant species in the main basin of Lake St. Catherine was consistent with previous findings. The most notable change in the vegetative community was the decline in both density and distribution of *Elodea canadensis* which had expanded significantly in 2008 & 2009, quickly becoming one of the more dominant plants in the lake. Densities observed in 2010, more closely represented conditions historically documented at the lake. Occurrences of other aquatic plant species were otherwise similar to previous years. *Potamogeton robbinsi*i remains the most abundant species in the lake and was encountered at nearly 73% (94 of 129 data points); it was also the dominant species recorded at 62 (48%) of the data points in the main basin. Frequency and cover of other native plants remained relatively consistent with only minor fluctuations between 2009 and 2010.

Table 4: Lake St. Catherine – Species List and Frequency of Occurrence (main basin)

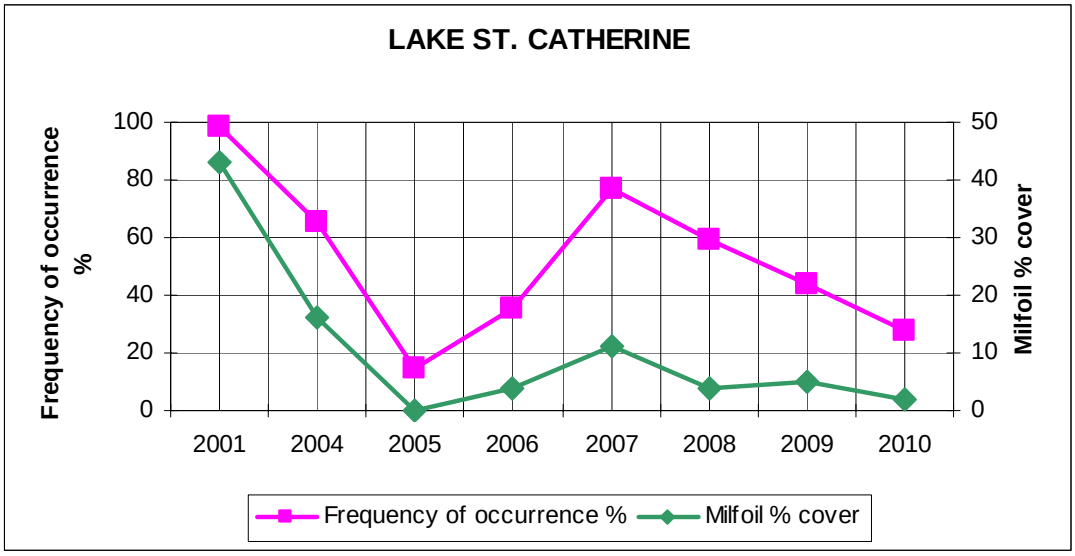
Macrophyte Species	Lake St. Catherine							
	2001	2004	2005	2006	2007	2008	2009	2010
Myriophyllum spicatum	98.4%	65.1%	14.7%	35.7%	76.7%	58.9%	44.2%	27.9%
Potamogeton robbinsii	31.0%	65.1%	82.2%	62.0%	66.7%	58.1%	78.3%	72.9%
Najas flexilis	19.4%	0.0%	12.4%	56.6%	50.4%	34.1%	21.7%	24.8%
Potamogeton amplifolius	28.7%	14.7%	25.6%	34.1%	38.8%	38.0%	41.1%	44.2%
Potamogeton zosteriformis	24.0%	2.3%	31.0%	41.9%	27.9%	18.6%	19.4%	23.3%
Zosterella dubia	0.0%	0.8%	4.7%	11.6%	27.9%	21.7%	7.8%	8.5%
Chara sp. / Nitella sp.	1.6%	17.1%	62.0%	57.4%	20.9%	21.7%	19.4%	2.3%
Potamogeton illinoensis	6.2%	0.8%	0.8%	8.5%	15.5%	34.1%	23.3%	31.0%
Potamogeton pusillus	0.0%	0.0%	0.0%	5.4%	12.4%	6.3%	5.4%	11.6%
Ceratophyllum demersum	10.9%	10.9%	6.2%	7.0%	10.9%	10.1%	7.8%	14.0%
Vallisneria americana	14.0%	3.1%	0.8%	3.1%	8.5%	9.3%	13.2%	13.2%
Elodea canadensis	27.9%	0.0%	0.0%	0.8%	4.7%	51.9%	71.3%	14.7%
Nymphaea odorata	3.1%	1.6%	2.3%	3.1%	3.1%	3.1%	3.1%	1.6%
Brasenia schreberi	0.0%	0.8%	0.8%	2.3%	2.3%	2.3%	2.3%	1.6%
Chlorophyta	0.0%	43.4%	14.7%	3.1%	2.3%	3.9%	0.8%	0.8%
Isoetes sp.	2.3%	8.5%	0.8%	6.2%	2.3%	4.7%	0.0%	0.0%
Potamogeton gramineus	17.8%	0.0%	4.7%	1.6%	2.3%	6.2%	3.1%	6.2%
Potamogeton crispus	1.6%	0.0%	9.3%	5.4%	1.6%	0.8%	0.0%	0.0%
Potamogeton epihydrus	2.3%	3.1%	5.4%	2.3%	0.8%	3.9%	0.8%	0.8%
Nuphar variegatum	0.8%	0.0%	0.0%	0.8%	0.8%	0.0%	0.0%	0.8%
Utricularia vulgaris	0.8%	0.8%	0.8%	0.0%	0.0%	1.6%	0.8%	3.1%
Lemna minor	1.6%	0.0%	0.0%	0.0%	0.0%	0.8%	0.8%	0.0%
Megalodonta beckii	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Some decrease in milfoil cover was realized between 2009 and 2010; however, milfoil was still regularly encountered, found at roughly 28% of the data points surveyed in the main basin. Scattered and sometimes moderate growth of milfoil was also recoded outside the pre-established data points.

While milfoil remains widespread, overall decreases in frequency speak to the success of the continued management efforts at Lake St. Catherine. Save for a few patches, most of the milfoil observed was scattered, low-density growth, averaging just 2.1% cover at the 36 data points where encountered. For compassion average milfoil cover in 2009 was 11.3% and it was encountered at 56 of the data points in

the main basin. Chart 2 (below) this represents a year-to-year decrease in both milfoil frequency in cover in the main basin.

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



Little Lake

Potamogeton robbinsii, *Potamogeton amplifolius* and *Potamogeton illinoensis* dominated the aquatic plant community in Little Lake accounting for a large percentage of the plant density recorded during the September 2010 survey. *Elodea canadensis*, *Utricularia vulgaris* and *Vallisneria americana* were also common, encountered at 47%, 26% and 26% of the surveyed data points, respectively. The frequency of occurrence for most other native plants recorded in Little Lake remained consistent with previous years.

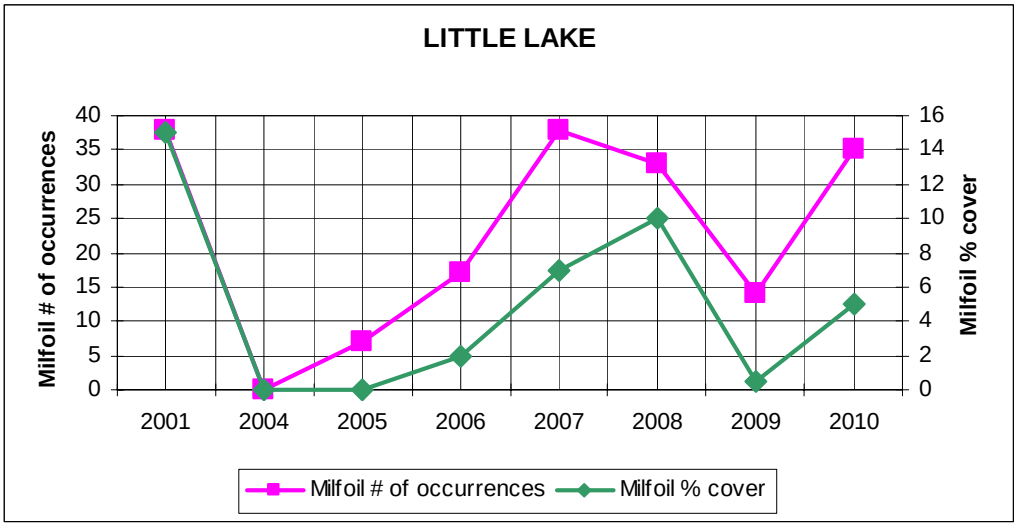
Table 5: Little Lake – Species List and Frequency of Occurrence

Macrophyte Species	Little Lake							
	2001	2004	2005	2006	2007	2008	2009	2010
Potamogeton robbinsii	88.4%	100.0%	100.0%	100.0%	100.0%	88.4%	95.3%	81.4%
Myriophyllum spicatum	88.4%	0.0%	16.3%	39.5%	88.4%	76.7%	32.6%	81.4%
Potamogeton amplifolius	44.2%	72.1%	69.8%	76.7%	74.4%	76.7%	55.8%	72.1%
Potamogeton illinoensis	0.0%	0.0%	0.0%	9.3%	32.6%	46.5%	48.5%	36.2%
Utricularia vulgaris	16.3%	18.6%	7.0%	11.6%	30.2%	18.6%	34.9%	25.6%
Nymphaea odorata	30.2%	9.3%	25.6%	30.2%	27.9%	10.1%	18.6%	18.6%
Brasenia schreberi	14.0%	30.2%	30.2%	23.3%	25.6%	20.9%	14.0%	11.6%
Ceratophyllum demersum	20.9%	0.0%	2.3%	9.3%	16.3%	7.0%	9.3%	16.3%
Vallisneria americana	72.1%	25.6%	7.0%	9.3%	14.0%	9.3%	25.6%	25.6%
Potamogeton zosteriformis	23.3%	2.3%	4.7%	4.7%	7.0%	4.7%	7.0%	9.3%
Zosterella dubia	2.3%	2.3%	4.7%	0.0%	7.0%	2.3%	4.7%	4.7%
Potamogeton pusillus	0.0%	0.0%	0.0%	2.3%	7.0%	2.3%	0.0%	0.0%
Chlorophyta	7.0%	20.9%	20.9%	4.7%	7.0%	9.3%	2.3%	2.3%
Nuphar variegatum	9.3%	14.0%	11.6%	7.0%	7.0%	2.3%	7.0%	2.3%
Potamogeton epihydrus	0.0%	11.6%	14.0%	7.0%	7.0%	7.0%	0.0%	0.0%
Utricularia gibba	7.0%	0.0%	2.3%	0.0%	4.7%	2.3%	14.0%	4.7%

Macrophyte Species	Little Lake							
	2001	2004	2005	2006	2007	2008	2009	2010
Najas flexilis	39.5%	0.0%	0.0%	4.7%	2.3%	0.0%	4.7%	0.0%
Elodea canadensis	46.5%	4.7%	0.0%	0.0%	2.3%	23.3%	34.9%	46.5%
Chara sp. / Nitella sp.	7.0%	4.7%	7.0%	11.6%	0.0%	0.0%	2.3%	0.0%
Potamogeton gramineus	41.9%	4.7%	9.3%	23.3%	0.0%	0.0%	4.7%	0.0%
Isoetes sp.	0.0%	0.0%	4.7%	2.3%	0.0%	0.0%	2.3%	0.0%
Potamogeton crispus	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%	0.0%
Polygonum sp.	0.0%	0.0%	0.0%	2.3%	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%
Megalodonta beckii	7.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

While reasonable control of milfoil was achieved following the Renovate 3 treatment performed in Little Lake in 2009, some recovering milfoil was evident by late May 2010; however, dense patches of curlyleaf pondweed along the shoreline areas obscured the extent of milfoil cover. Increasing milfoil cover was reported by LSCA members and documented during the late season survey. Although the density of milfoil remained quite low, averaging just 4.7%, and in most areas was low-density scattered growth, the frequency of occurrence increased significantly from 2009 from 33% to 81%.

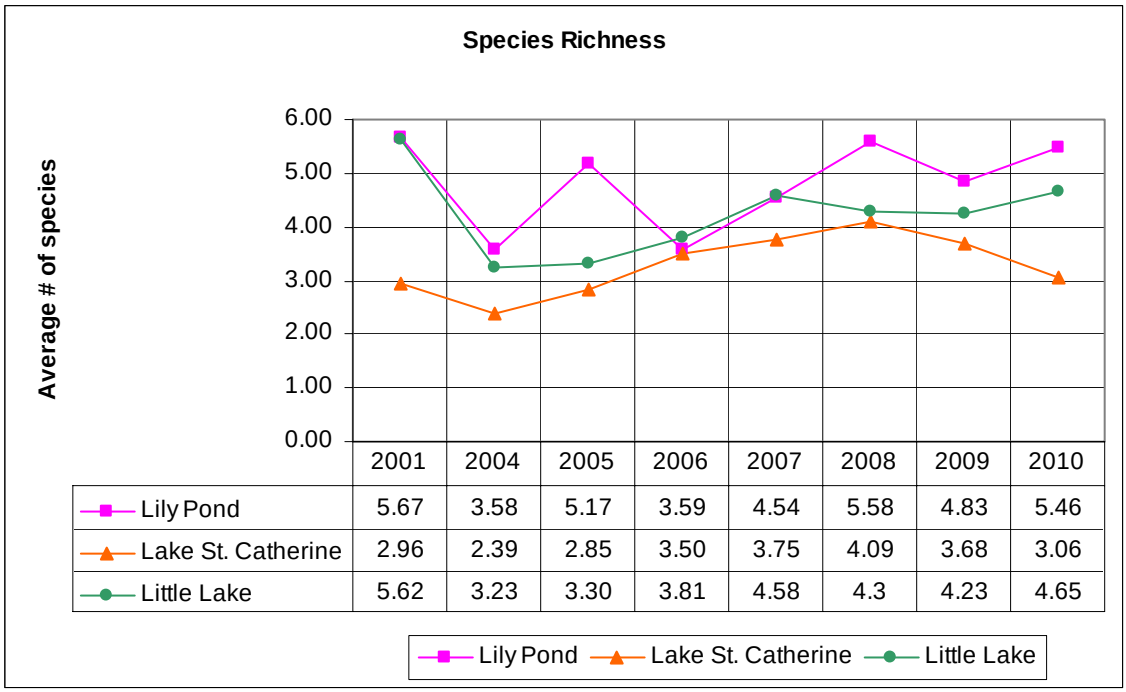
Chart 3: *Myriophyllum spicatum* Number of Occurrences and Percent Cover



Species Richness

Species richness was consistent in all three basins findings from the past four years. It does not appear that the triclopyr herbicide treatments have adversely impacted species richness or native plant diversity.

Table 6: Species Richness by Basin



	2001	2004	2005	2006	2007	2008	2009	2010
Lily Pond	5.67	3.58	5.17	3.59	4.54	5.58	4.83	5.46
Lake St. Catherine	2.96	2.39	2.85	3.50	3.75	4.09	3.68	3.06
Little Lake	5.62	3.23	3.30	3.81	4.58	4.3	4.23	4.65

Evaluation of 2010 Treatment Areas

Results of the 2010 treatment program were similar to what was seen in the main basin following the 2010 treatment program. Late season milfoil occurrences within the 2010 treatment areas were limited to the outer margins of treatment areas within Atwater Bay and Forest House Bay. The treatment appeared to achieve a successful reduction of the more abundant milfoil growth, although widely scattered milfoil plants did persist or regrow in many of the treatment areas by the time of the late season survey in mid September.

Comparing 2009 and 2010 late season survey data from the 31 data points located within the 2010 treatment areas, it is apparent that treatment in 2010 provided marked reductions of both distribution and density of milfoil in all of the seven treatment areas. Milfoil frequency of occurrence in the treated areas was reduced from 61.3% in 2009 to 19.4% in 2010 and average milfoil cover was reduced from 10.5% to 1.2%.

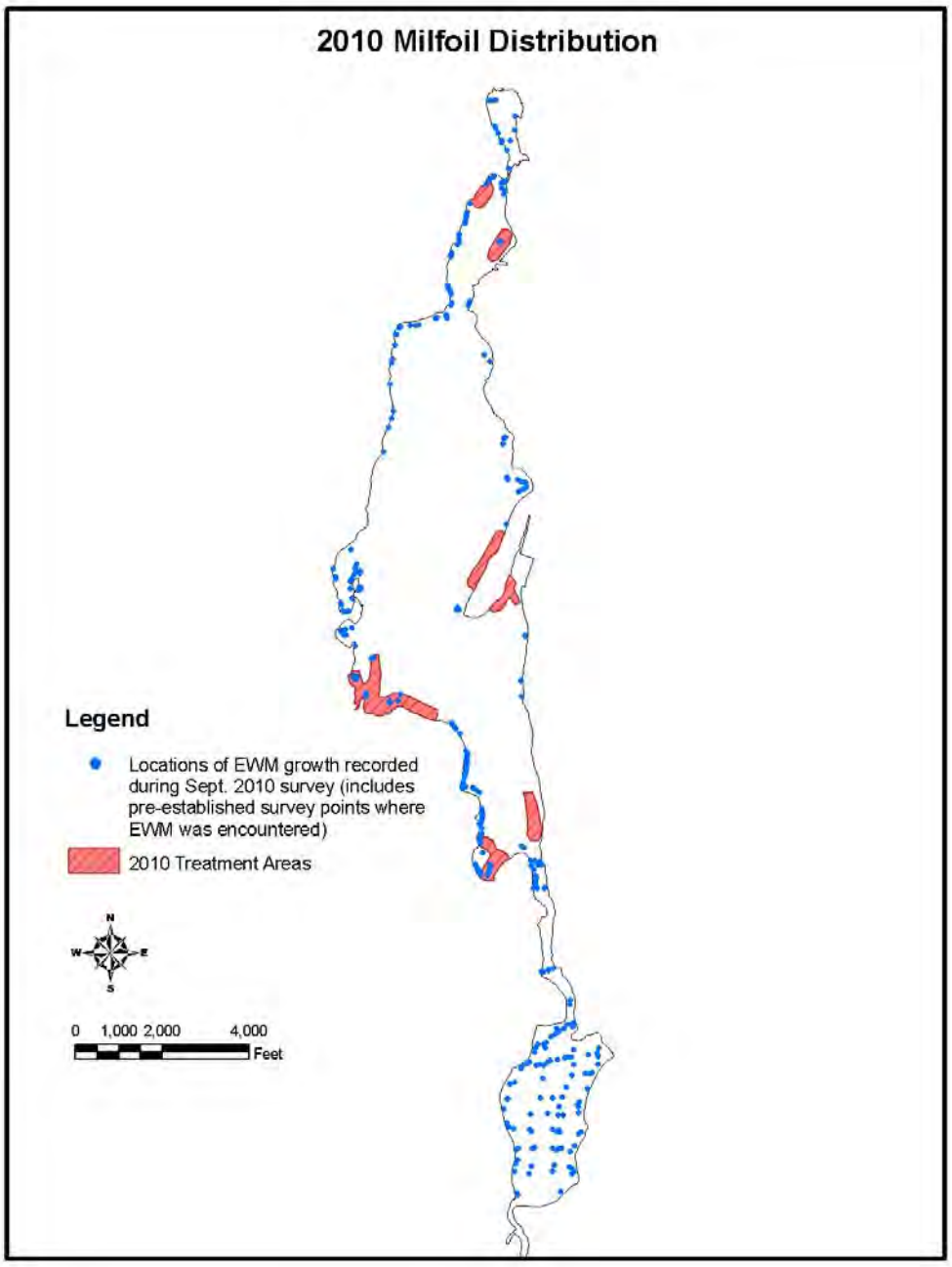
Frequency of occurrence elodea was also significantly reduced in the treatment areas from roughly 70% in 2009 to 10% in 2010; however this is consistent with other areas of the lake and is not attributed to the 2010 treatment.

While reductions in frequency of milfoil and elodea were apparent in treated areas, the frequency of occurrence of both *Potamogeton robbinsii* and *Potamogeton amplifolius* increased by roughly 20% to 87% and 45%, respectively. The frequency of occurrence values for other native plants in the treatment areas were otherwise largely unchanged, although some increase of *Ceratophyllum demersum* (+12%), *Vallisneria americana* (+16%) cover were realized.

Late Season Milfoil Bed Mapping

Milfoil beds were visually surveyed and mapped during the late season survey. Gusting winds made visibility difficult in some exposed areas, but generally visibility for milfoil identification was fair to good. As with past mapping efforts areas of milfoil growth were recorded using a GPS unit. A map of the GPS referenced milfoil locations is shown in Figure 2.

Figure 2: Late season Eurasian watermilfoil distribution



SUMMARY OF 2010 AQUATIC VEGETATION MANAGEMENT PROGRAM

Renovate Herbicide Treatments

Results of the 2010 Renovate OTF herbicide treatments were similar to the results of the 2009 treatment program. The frequency of occurrence of milfoil in the 2010 treatment areas dropped from 61% in September 2009 to approximately 19% in September 2010, and the estimated milfoil cover dropped from over 10% to approximately 1%. While some scattered milfoil persisted in a few of the treatment areas along the western shoreline, control in most other treatment areas was more complete.

Renovate remained highly selective for milfoil and measured indices of native plant cover were consistent with previous years. While there were some fluctuations in the frequency of occurrence and species richness indices, no major shifts in plant composition were documented following treatment.

The rapid re-infestation of milfoil in Little Lake during the 2010 season was disappointing. The majority of Little Lake was treated with Renovate 3 (liquid) herbicide during the 2009 season. Milfoil control appeared to be favorable during the 2009 season, but the duration of control was short-lived. The highest density milfoil was seen along the east and west shorelines, in areas with the highest level of disturbance, but milfoil plants were found throughout the Little Lake Basin.

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 2010 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.

RECOMMENDATIONS FOR 2011 AND BEYOND

Milfoil cover remains significantly reduced from what was documented in Lake St. Catherine prior to the 2004 Sonar treatment, (estimated total milfoil cover in all three basins was 49% in 2001 and was 2.5% in 2010), but milfoil cover has been persistent and widespread. Successful declines in the milfoil frequency of occurrence and percent cover indices were achieved in the main basin over the past three years. Lily Pond appears to have responded favorably to the 2009 treatment, but the same was not true for Little Lake. Continued management will be required to prevent milfoil from returning to nuisance-level densities and different management approaches should be considered in different sections of the lake.

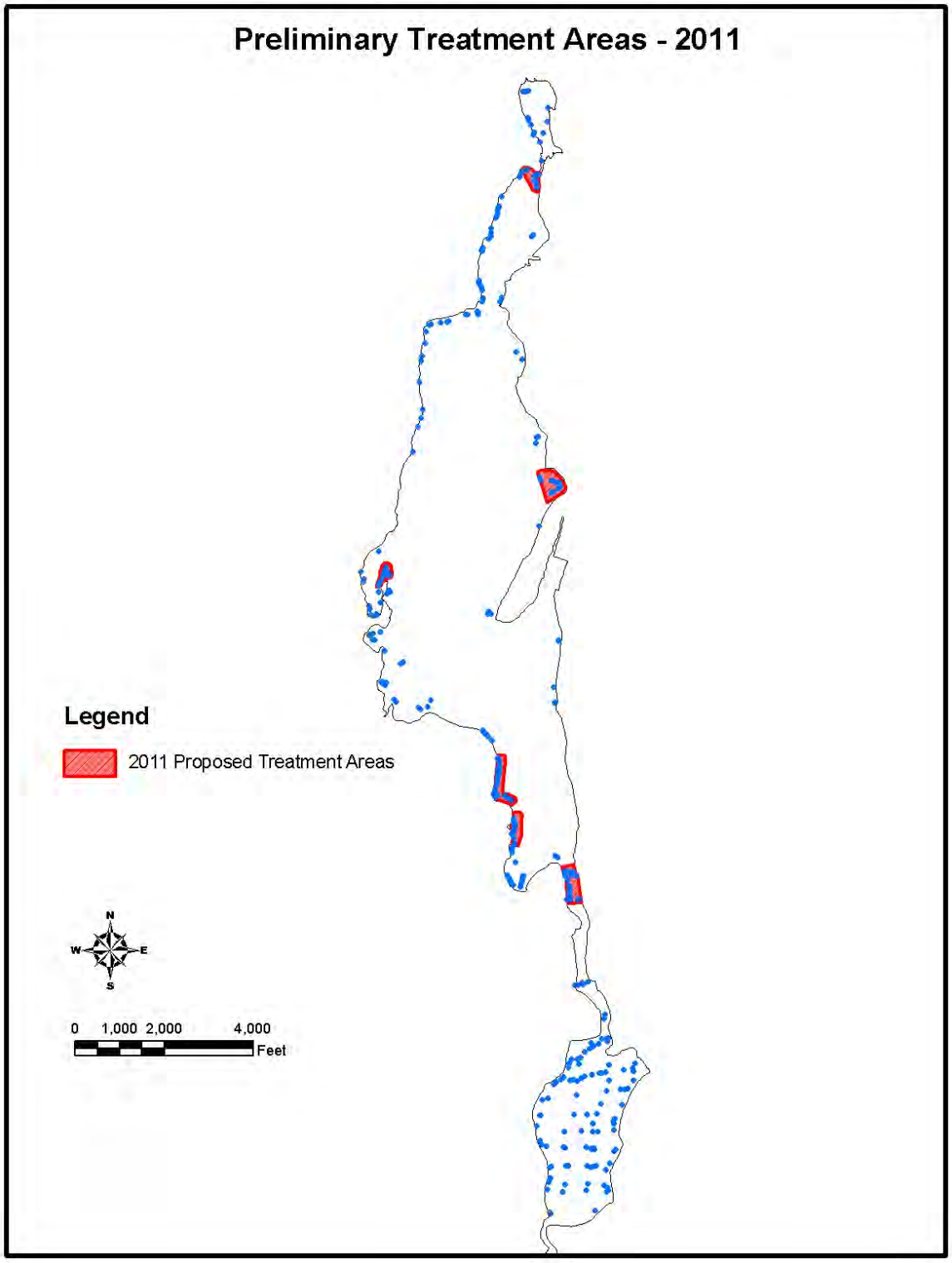
Spot-treatments with Renovate OTF (granular) herbicide performed during the 2009 and 2010 season were fairly successful in the main basin. The higher application rate (240 pounds per acre) and later treatment timing (mid-June) helped increase treatment efficacy. However, it is apparent that treatment of cove areas or larger treatment blocks (both reduce the edge to treatment area ratio and help limit the effects of dilution) yielded more effective results. Narrow shoreline bands of milfoil prove to be more challenging to treat effectively. Potential changes in Renovate OTF treatment protocol to increase efficacy include: increasing the size of treatment areas, increasing the application rate, or performing split-applications. The purpose of these changes would be to increase the herbicide concentration-exposure-time, but they will all carry higher per-acre treatment costs. Future Renovate OTF herbicide treatments should focus on cove areas and large-block treatment areas where herbicide concentrations can be most effectively maintained. Non-chemical control strategies, specifically diver hand-pulling and suction harvesting, should be utilized along steeply sloped and exposed areas and for areas with lower density milfoil growth.

Little Lake, and to a lesser extent Lily Pond, may warrant a more aggressive management strategy. The duration of milfoil control seen in these areas following recent Renovate treatments has not been as favorable as the main basin. Little Lake and Lily Pond are shallower, have more organic bottom sediments and support abundant growth of native plants and milfoil. Renovate treatments have provided season-long milfoil control, but milfoil has rebounded to nuisance densities within one year of treatment in Little Lake (2009-2010) and within two years of treatment in Lily Pond (2006-2008). These basins will likely require either more frequent Renovate herbicide treatments, or treatment with Sonar (fluridone) herbicide to improve the duration of milfoil control.

Successive years of Renovate treatment appears to have significantly increased the duration of milfoil control at Lake Morey, but this would not address the overabundant growth of native pondweeds that are causing as much use impairment as dense milfoil growth. When Little Lake was being aggressively harvested, the native pondweed growth was likely being suppressed. Where harvesting operations have been suspended and milfoil densities have been reduced, pondweed growth has reached nuisance densities. Harvesting could be used to control pondweed in combination with continued Renovate herbicide treatment for milfoil control, but this combination-approach would be expensive.

Treating Little Lake and Lily Pond with the time-release pellet formulations of Sonar herbicide is another option that should be considered. Sonar herbicide provided nearly three years of nuisance-level milfoil control in Little Lake following the 2004 treatment. The duration of control did not last as long in Lily Pond due to dilution from excessive flushing. The time-release pellet formulations of Sonar will help to preserve concentrations within the basins with fewer applications than was required when using the liquid formulation. Sonar would be expected to provide longer duration control of milfoil and should also provide some suppression of the native pondweed growth. Some year-of-treatment impacts will likely be seen on other non-target native species, but recovery will occur in the years after treatment. A Sonar pellet treatment performed at the south end of Saratoga Lake in New York in 2007 provided four years of nuisance-level milfoil control with minimal impacts on non-target, native plants. For extended duration of milfoil control and suppression of problematic native plant growth, Sonar may prove to be a more cost-effective option in Little Lake and Lily Pond.

Figure 3: Preliminary 2011 Renovate OTF treatment areas in the main basin

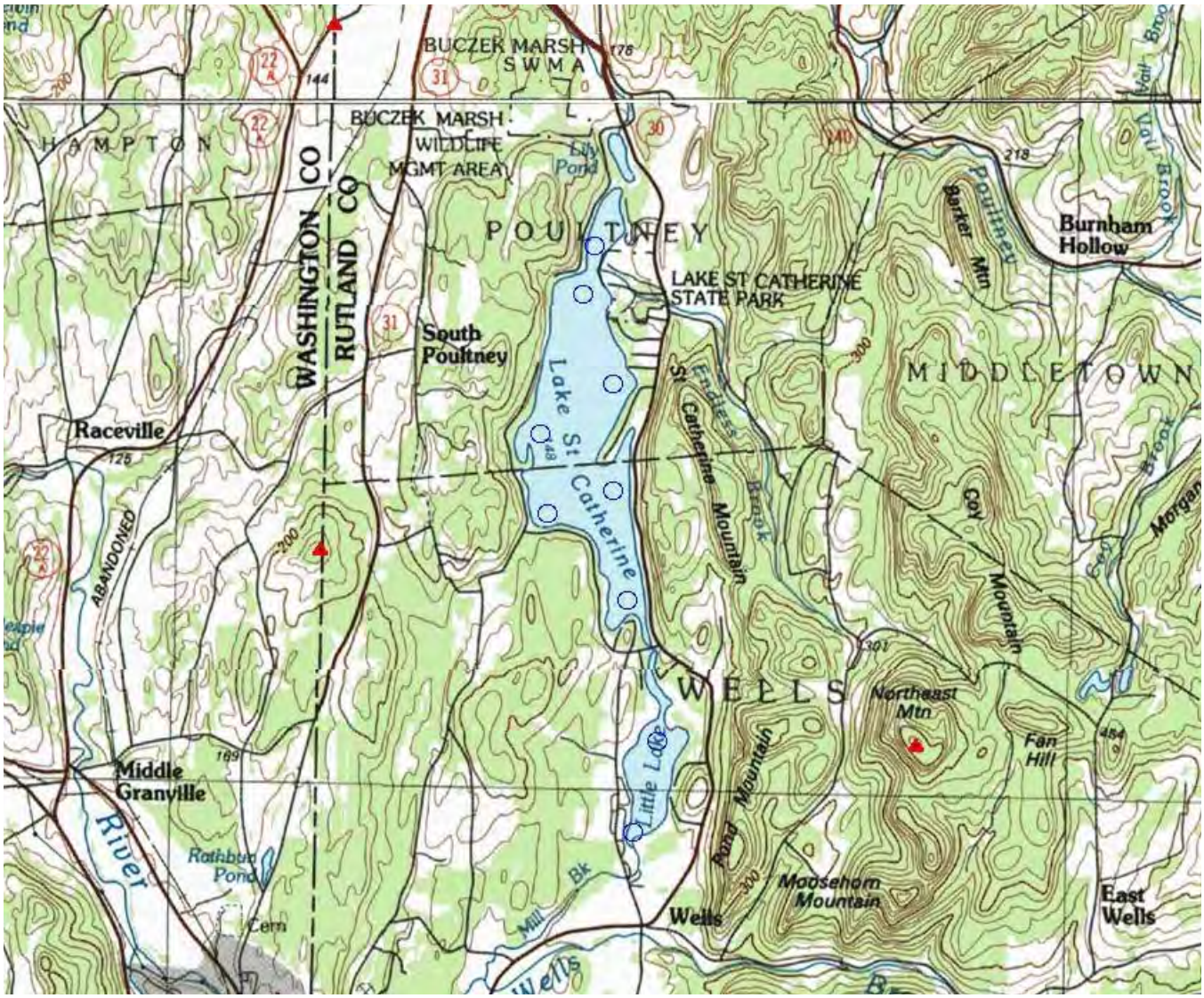


APPENDIX A

Herbicide Residue Testing Results

- Sampling Location Map – prepared by DEC
- Sampling Results Summary
- SePRO Laboratory Report – 6/24/10 sampling round
- SePRO Laboratory Report – 7/1/10 sampling round
- SePRO Laboratory Report – 8/3/10 sampling round

Permit #2009-C02(HB): Lake St. Catherine
Sampling Site Locations – Identified by DEC for 2010 Treatment Program



O denotes 9 Sample Sites

Lake St. Catherine 2010 Renovate Assay Results

Treatment date: 6/22/2010

	Residue (ppm)		
Collection Date	**6/24**	**7/1**	**8/3**
1	0.048		0.003
2	0.015		0.003
3	0.034		0.004
4	0.097	0.024	0.004
5	0.054	0.030	0.004
6	0.003		0.000
7	0.001	0.000	0.000
8	0.027		0.003
9	0.030		0.004
Lake Average (1-9)	0.034	0.018	0.003
Days after treatment	1	10	42

SRTC SePRO Research & Technology Campus SePRO

Chain of Custody B94CF4C8-8

Customer Company		Customer Contact	
Company Name:	Aquatic Control Technology, Inc.	Contact Person:	Gerald N
Address:	11 John Road	E-mail Address:	gnsmith@aquaticcontroltech.com
City:	Sutton	Phone:	
State:	MA 01590-2509	Fax:	

Payment Information

Payment Type:	Invoice	Card Number/Expiration Num:	

Waterbody Information

Waterbody:	Lake St. Catherine	Waterbody Size (acres):	0.00
Depth Average:	0.00		
Target Plants			

Sample Information

Sample Site ID	Date Treated	Date Sample Collected	Sample Location	Products	Acres Treated	Rate	Active	Result
1	06/22/2010	06/24/2010	time- 13:10	Renovate 3	0	0	Triclopyr	**0.048 ppm**
2	06/22/2010	06/24/2010	time- 13:15	Renovate 3	0	0	Triclopyr	**0.015 ppm**
3	06/22/2010	06/24/2010	time- 13:25	Renovate 3	0	0	Triclopyr	**0.034 ppm**
4	06/22/2010	06/24/2010	time- 13:29	Renovate 3	0	0	Triclopyr	**0.097 ppm**
5	06/22/2010	06/24/2010	time- 13:35	Renovate 3	0	0	Triclopyr	**0.054 ppm**
6	06/22/2010	06/24/2010	time- 13:45	Renovate 3	0	0	Triclopyr	**0.003 ppm**
7	06/22/2010	06/24/2010	time- 13:53	Renovate 3	0	0	Triclopyr	**0.001 ppm**
8	06/22/2010	06/24/2010	time- 14:10	Renovate 3	0	0	Triclopyr	**0.027 ppm**
9	06/22/2010	06/24/2010	time- 14:15	Renovate 3	0	0	Triclopyr	**0.030 ppm**

Laboratory Information

Date Received:	6/28/2010	Date Analysis Performed:	6/28/2010
Date Results Sent:	6/28/2010	Storage Conditions	Analyzed Immediately

SRTC SePRO Research & Technology Campus

Chain of Custody 43937670-8

Customer Company		Customer Contact	
Company Name:	Aquatic Control Technology, Inc.	Contact Person:	Gerald N
Address:	11 John Road	E-mail Address:	gnsmith@aquaticcontroltech.com
City:	Sutton	Phone:	
State:	MA 01590-2509	Fax:	

Payment Information

Payment Type:	Invoice	Card Number/Expiration Num:	

Waterbody Information

Waterbody:	Lake St. Catherine	Waterbody Size (acres):	0.00
Depth Average:	0.00		
Target Plants			

Sample Information

Sample Site ID	Date Treated	Date Sample Collected	Sample Location	Products	Acres Treated	Rate	Active	Result
4	06/22/2010	07/01/2010	0810	Renovate OTF	0	0	Triclopyr	**0.024 ppm**
5	06/22/2010	07/01/2010	0815	Renovate OTF	0	0	Triclopyr	**0.039 ppm**
7	06/22/2010	07/01/2010	0840	Renovate OTF	0	0	Triclopyr	**0.000 ppm**

Laboratory Information

Date Received:	7/2/2010	Date Analysis Performed:	7/6/2010
Date Results Sent:	7/6/2010	Storage Conditions	Analyzed Immediately

SRTC SePRO Research & Technology Campus SePRO

Chain of Custody 56931BCD-0

Customer Company		Customer Contact	
Company Name:	Aquatic Control Technology, Inc.	Contact Person:	Gerald N
Address:	11 John Road	E-mail Address:	gnsmith@aquaticcontroltech.com
City:	Sutton	Phone:	
State:	MA 01590-2509	Fax:	

Payment Information

Payment Type:	Invoice	Card Number/Expiration Num:	

Waterbody Information

Waterbody:	Lake St. Catherine	Waterbody Size (acres):	0.00
Depth Average:	0.00		
Target Plants			

Sample Information

Sample Site ID	Date Treated	Date Sample Collected	Sample Location	Products	Acres Treated	Rate	Active	Result
1	06/22/2010	08/03/2010	time- 8:03	Renovate OTF	0	0	Triclopyr	**0.003 ppm**
2	06/22/2010	08/03/2010	time- 8:09	Renovate OTF	0	0	Triclopyr	**0.003 ppm**
3	06/22/2010	08/03/2010	time- 8:17	Renovate OTF	0	0	Triclopyr	**0.004 ppm**
4	06/22/2010	08/03/2010	time-8:23	Renovate OTF	0	0	Triclopyr	**0.004 ppm**
5	06/22/2010	08/03/2010	time-8:31	Renovate OTF	0	0	Triclopyr	**0.004 ppm**
6	06/22/2010	08/03/2010	time- 8:42	Renovate OTF	0	0	Triclopyr	**0.000 ppm**
7	06/22/2010	08/03/2010	time-8:51	Renovate OTF	0	0	Triclopyr	**0.000 ppm**
8	06/22/2010	08/03/2010	time-9:12	Renovate OTF	0	0	Triclopyr	**0.003 ppm**
9	06/22/2010	08/03/2010	time-9:59	Renovate OTF	0	0	Triclopyr	**0.004 ppm**

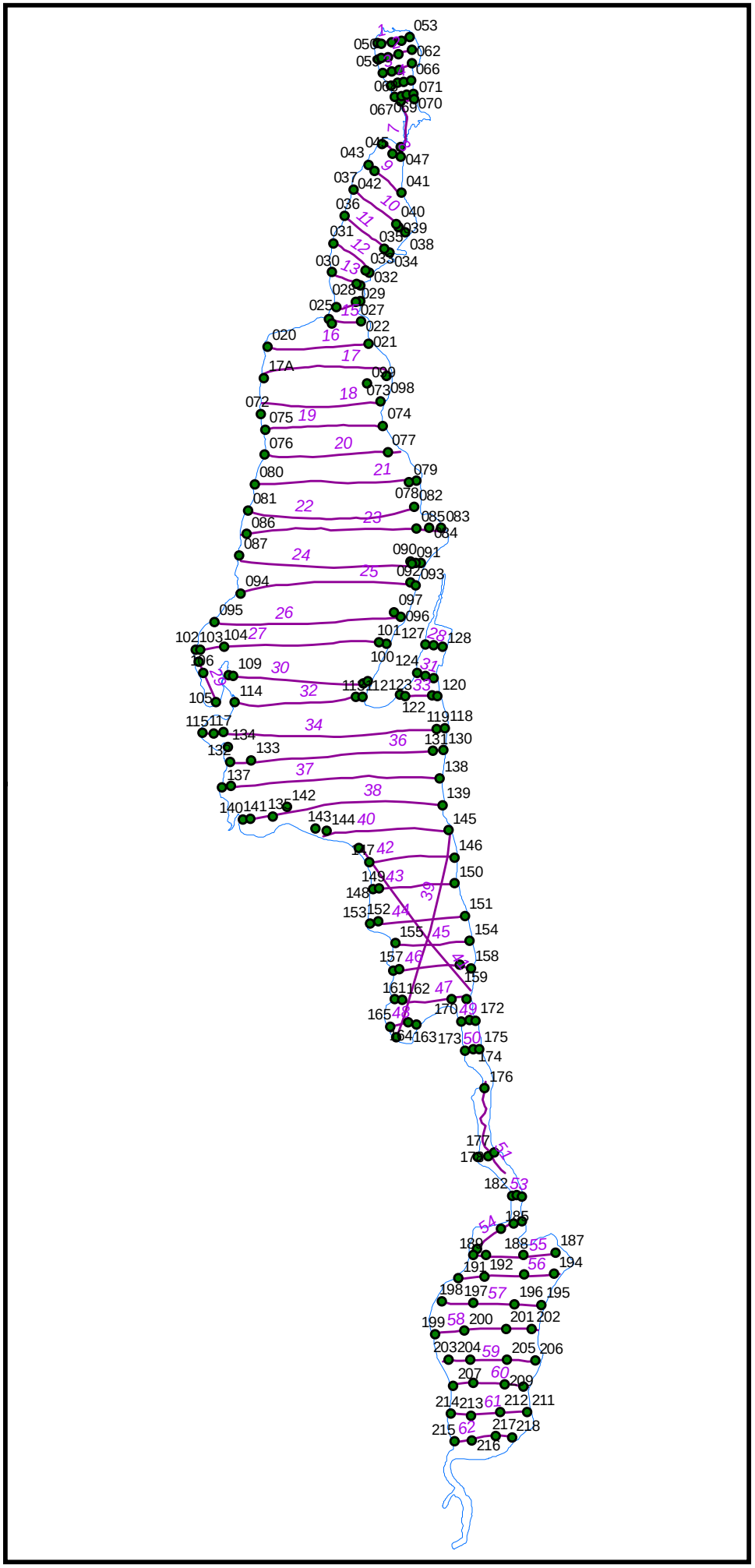
Laboratory Information

Date Received:	8/5/2010	Date Analysis Performed:	8/5/2010
Date Results Sent:	8/5/2010	Storage Conditions	Analyzed Immediately

APPENDIX B

Comprehensive Aquatic Vegetation Survey Information

- Data Point Sampling Location Map
- Field Data Table
- Overall Vegetation Density Map
- Vegetation Species Distribution Maps (presented in decreasing order of abundance)
- Late Season Milfoil Distribution - 2010
- Proposed Treatment Areas - 2011



Lake St. Catherine

Poultney & Wells, VT

Transects & Data Point Locations for Vegetation Survey

FIGURE:	SURVEY DATE:	MAP DATE:
B-1	9/14 - 9/15/09	10/26/10

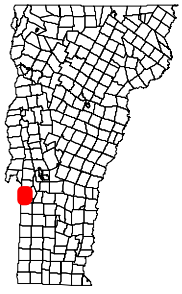
Legend

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

Transect	Point #	Distance from Shore	Depth (ft)	% Cover	% Ms Cover	Biomass	Species/ Point (Richness)	Pr	Ms	Pa	Ec	Pi	Nf	Pz	Cd	Zd	Ca	Ny	Mu	V	Fa	Pp	Uv	B	Pe	Pg	I	Pn	Ug	Nu	Lm	Ngram	Mv
1	49	25	3	100	0	3	5	D		X	X			X	X																		
1	50	100	3	100	0	3	5	D		X	X			X	X																		
1	51	MID	3	100	0	2	6	D		X	X			X	X	X																	
1	52	150	3	100	0	2	5	D		X	X			X														X					
1	53	30	3	100	0	4	7	D		X	X			X		X		X										X					
2	54	40	3	100	0	3	6	D		X	X			X	X	X																	
2	55	25	3	100	0	1	3	D		X					X																		
2	56	180	5	100	0	1	4	D		X				X	X																		
2	57	60	3	100	0	3.5	7	D		X				X	X	X		X										X					
2	58	150	6	100	0	1	5	D		X				X	X	X																	
3	59	25	3	100	0	2	5	D		X	X			X		X																	
3	60	120	4	100	0	2	7	D		X	X	X		X	X								X										
3	61	MID	4	100	0	1	6	D		X	X			X	X	X																	
3	62	15	3	100	1	2.5	5	D	X	X	X					X																	
4	63	20	4	100	1	2.5	6	D	X	X	X			X	X																		
4	64	100	5	100	0	2	6	D		X	X	X		X	X																		
4	65	100	4	100	0	2	5	D		X	X				X	X																	
4	66	30	3	100	1	2	5	D	X	X	X				X																		
5	68	60	3	100	0	2	3	X		X	D																						
5	69	50	3	100	1	3	6	D	X		X				X	X		X															
5	71	15	1	100	0	4	8	D		X	X	X		X	X	X					X												
6	67	10	2	100	1	3	6	X	X		D			X	X	X																	
6	70	20	3	100	0	4	7	D		X	X	X			X			X		X													
7	47	30	3	60	0	0	3	D	X						X																		
		Average	**3.3**	**98.3**	**0.2**	**2.3**	**5.5**																										

Lily Pond Totals

	Pr	Ms	Pa	Ec	Pi	Nf	Pz	Cd	Zd	Ca	Ny	Mu	V	Fa	Pp	Uv	B	Pe	Pg	I	Pn	Ug	Nu	Lm	Ngram	Mv
Present	2	6	21	17	4	0	16	19	12	0	4	0	1	1	0	1	0	0	0	0	3	0	0	0	0	0
Dominant	21	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	23	6	21	19	4	0	16	19	12	0	4	0	1	1	0	1	0	0	0	0	3	0	0	0	0	0
% frequency	95.8%	25.0%	87.5%	79.2%	16.7%	0.0%	66.7%	79.2%	50.0%	0.0%	16.7%	0.0%	4.2%	4.2%	0.0%	4.2%	0.0%	0.0%	0.0%	0.0%	12.5%	0.0%	0.0%	0.0%	0.0%	0.0%

Lake St. Cathreine

Transect	Point #	Distance from Shore	Depth (ft)	% Cover	% Ms Cover	Biomass	Species/Point (Richness)	Pr	Ms	Pa	Ec	Pi	Nf	Pz	Cd	Zd	Ca	Ny	Mu	V	Fa	Pp	Uv	B	Pe	Pg	I	Pn	Ug	Nu	Lm	Ngram	Mv
7	48	MID	4	100	0	2	4	X			D			X	X																		
8	44	50	3	100	5	1	4	D	X	X										X													
8	45	MID	4	100	0	2	2	D		X																							
8	46	25	3	100	0	1	2	D		X																							
9	41	15	3	5	0	1	3	X				X								D													
9	42	150	10	70	0	1	2	D		X																							
9	43	40	1	100	0	1	3	D		X										X													
10	38	40	4	100	0	1	4	X		X				X						D													
10	39	150	9	100	0	1	2	D		X																							
10	40	220	12	30	1	1	5	X	X				X		D								X										
11	34	20	3	100	0	4	5	X		D		X												X						X			
11	35	100	7	100	0	1	3	D		X	X																						
11	36	30	5	70	5	2.5	5	D	X	X		X				X																	
11	37	35	6	100	0	2	2	X		D																							
12	31	25	6	100	1	1.5	4	D	X			X				X																	
12	32	25	4	100	0	1.5	3	D		X		X																					
12	33	75	8	100	0	1	2	D		X																							
13	28	35	4	10	0	1	3	X					D	X																			
13	29	120	8	100	0	1	2	D		X																							
13	30	25	7	100	0	1	2	D		X																							
14	25	20	4	60	1	2.5	5	X	X	X		D				X																	
14	26	30	3	100	1	2.5	5		X	D		X				X				X													
14	27	60	12	100	0	2	2	D		X																							
15	22	75	5	10	0	1	1	D																									
15	23	50	4	100	0	2.5	3	X		X		D																					
15	24	125	10	50	40	3	2		D	X																							
16A	20	100	7	90	5	1	4	D	X	X		X																					
16B	21	70	8	90	0	1	1	D																									
17A	17A	25	8	100	5	1	3	D	X			X																					
17	98	80	8	80	0	2	3	D		X		X																					
18	72	15	9	0	0	0	0																										
18	73	30	10	100	0	1	2	D						X																			
19	74	25	5	100	0	1	5	D		X	X	X			X																		

Transect	Point #	Distance from Shore	Depth (ft)	% Cover	% Ms Cover	Biomass	Species/ Point (Richness)	Pr	Ms	Pa	Ec	Pi	Nf	Pz	Cd	Zd	Ca	Ny	Mu	V	Fa	Pp	Uv	B	Pe	Pg	I	Pn	Ug	Nu	Lm	Ngram	Mv
19	75	25	13	0	0	0	0																										
20	76	20	7	100	5	3	4		X		X			X												D							
20	77	125	11	100	0		3				X		X				D																
21	78	40	6	100	0	2	3	X		X		D																					
21	79	80	9	60	60	3	1		D																								
21	80	15	6	10	0	1	1					D																					
22	81	30	6	80	0	3.5	5			X	X	X										X				D							
22	82	30	8	50	0	1.5	3	X				X	D																				
23	83	25	3	40	0	1	5						X							D			X	X		X							
23	84	120	5	100	10	2	6		X	X		D	X	X						X													
23	85	200	6	90	5	1	5	X	X	X			D													X							
23	86	40	10	10	0	1	2	X														D											
24	87	40	8	40	0	1	5			X	X		X				X					D											
24	88	25	3	5	0	2	1																			D							
24	90	100	10	70	0	1	5	D					X	X	X							D											
25	92	70	11	20	0	1	2						D													X							
25	93	15	4	30	5	2	4		X	X		D														X							
25	94	20	11	30	0	1	1	D																									
26	95	50	5	0	0	0	0																										
26	96	100	4	10	0	1	3	D		X		X																					
26	97	175	12	60	0	1	3	X					D	X																			
27	102	20	4	100	0	1.5	9	D	X			X	X	X		X		X		X						X							
27	103	70	10	100	0	1	1	D																									
27	104	225	10	30	20	2	2	S	D					X																			
27	100	20	5	50	0	1	4				D		X	X									X										
27	101	150	8	80	0	1	5	X		X		X	D		X																		
28	127	30	4	100	0	1	4	D					X							X		X											
28	129	MID	6	100	0	1	5	D		X				X	X							X											
28	128	40	4	100	0	2.5	4	D		X		X						X															
29	107	30	5	80	1	1	6	D	X	X						X	X			X													
29	106	30	13	100	0	1	1	D																									
29	105	30	6	100	5	1.5	8	D	X		X		X	X	X	X									X								
30	108	25	5	10	10	1.5	1		D																								
30	109	100	12	0	0	0	0																										
30	111	150	10	100	0	1	3	X					D	X																			
30	110	50	4	0	0	0	0																										
31	124	25	5	80	0	1	3	D		X				X																			
31	125	MID	8	20	0	1	3	D							X						X												
31	126	30	5	100	0	1	2	D		X																							
32	114	15	6	5	0	1	2	D				X																					
32	113	125	8	100	1	1	4	X	X				X									X											
32	112	30	4	60	0	1.5	5	X				D	X	X						X													
33	122	30	4	80	0	1	3	D		X		X																					
33	123	120	10	100	0	2	2	X							D																		
33	121	125	13	30	0	1	4	D						X	X							X											
33	120	50	6	20	0	1	4				X	D	X									X											
34	115	40	5	100	0	1	2	D		X																							
34	116	150	10	100	0	1	3	D		X												X											
34	117	250	12	5	0	1	1				D																						
34	119	150	6	80	0	1	2						D									X											
34	118	30	3	80	5	2	4	D	X	X				X																			
35	134	50	7	30	0	1	3				X	X			D																		
35	135	125	14	80	1	1	4	X	X				D									X											
36	132	25	8	0	0	0	0																										
36	133	300	10	20	5	1	3	X	X						D																		
36	131	250	12	60	0	1	4	D					X	X								X											
36	130	50	7	100	0	1	4	D		X		X		X																			
37	138	15	10	0	0	0	0																										
37	136	100	13	20	20	1.5	2	X	D																								
37	137	25	6	100	0	1	3	D		X				X																			
38	140	120	5	0	0	0	0																										
38	141	300	6	30	0	1	3	X					D										X										
38	142	300	6	60	1	1	3	D	X					X																			
38	139	10	7	20	5	1	3	D	X					X																			
39	166	50	3	70	0	1	4	X		X	X									D													
40	143	100	6	0	0	0	0																										
40	144	100	10	100	0	1	3	D				X								X													
40	145	20	10	40	0	1	2	D						X																			
41	168	50	6	50	1	1	3	D		X			X																				
42	147	35	9	80	0	1	1	D																									
42	146	10	12	5	0	1	2						D						X														

Transect	Point #	Distance from Shore	Depth (ft)	% Cover	% Ms Cover	Biomass	Species/ Point (Richness)	Pr	Ms	Pa	Ec	Pi	Nf	Pz	Cd	Zd	Ca	Ny	Mu	V	Fa	Pp	Uv	B	Pe	Pg	I	Pn	Ug	Nu	Lm	Ngram	Mv
43	148	35	7	40	5	1	4	D	X	X				X																			
43	149	100	13	100	0	1	2	D							X																		
43	150	30	7	10	0	1	2	D					X																				
44	153	75	5	100	5	1	5	X	X	D				X	X																		
44	152	175	10	100	0	1	4	D					X	X	X																		
44	151	20	7	80	0	1	6	X		X	X	X	X							X													
45	155	25	8	70	0	1	1	D																									
45	154	20	6	10	0	1	3					X	D	X																			
46	156	60	4	60	20	2	2		X							D																	
46	157	200	9	80	0	1	2	X							D																		
46	159	175	13	10	0	1	4	X			X	X			D																		
46	158	35	7	5	0	3	1					D																					
47	161	25	4	100	0	1	2	X		D																							
47	162	125	10	20	0	1	2	X							D																		
47	169	150	7	5	2	2	5		D		X	X							X				X										
47	160	100	3	80	0	1	5			X	X	X							D			X											
48	165	40	5	100	0	1	4	X		D		X	X																				
48	164	MID	11	50	10	1	4	D	X	X	X																						
48	163	45	5	40	0	1	5	X			X	D				X				X													
49	170	25	5	50	1	1	7	D	X	X		X		X		X				X													
49	171	MID	8	100	1	1.5	5	D	X	X	X	X																					
49	172	15	4	80	1	2	5	D	X	X		X		X																			
50	173	20	3	100	5	2	6	D	X	X			X			X				X													
50	174	MID	7	100	0	1	2	D		X																							
50	175	20	6	60	1	2	3	D	X	X																							
		Average	**7.1**	**62.8**	**2.1**	**1.3**	**3.1**																										

St. Catherine Totals

	Pr	Ms	Pa	Ec	Pi	Nf	Pz	Cd	Zd	Ca	Ny	Mu	V	Fa	Pp	Uv	B	Pe	Pg	I	Pn	Ug	Nu	Lm	Ngram	Mv
Present	32	30	51	17	30	20	30	11	10	2	2	2	13	1	12	4	2	1	5	0	0	0	1	0	0	0
Dominant	62	6	6	2	10	12	0	7	1	1	0	1	4	0	3	0	0	0	3	0	0	0	0	0	0	0
Total	94	36	57	19	40	32	30	18	11	3	2	3	17	1	15	4	2	1	8	0	0	0	1	0	0	0
% frequency	72.9%	27.9%	44.2%	14.7%	31.0%	24.8%	23.3%	14.0%	8.5%	2.3%	1.6%	2.3%	13.2%	0.8%	11.6%	3.1%	1.6%	0.8%	6.2%	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%	0.0%

Little Pond

Transect	Point #	Distance from Shore	Depth (ft)	% Cover	% Ms Cover	Biomass	Species/ Point (Richness)	Pr	Ms	Pa	Ec	Pi	Nf	Pz	Cd	Zd	Ca	Ny	Mu	V	Fa	Pp	Uv	B	Pe	Pg	I	Pn	Ug	Nu	Lm	Ngram	Mv
51	176	MID	6	80	0	2	2	D		X																							
52	179	30	3	100	5	3.5	6	X	X	D	X							X						X									
52	178	MID	5	20	1	1	5	D	X		X				X								X										
52	177	20	4	80	10	3.5	6	D	X	X								X		X				X									
53	182	20	3	100	0	4	5	X		X						X		D						X									
53	181	MID	5	100	0	1	4	D		X					X								X										
53	180	20	3	100	0	2	6	D		X	X				X								X							X			
54	183	25	3	100	5	3	9	D	X	X	X	X			X						X		X						X				
54	184	40	5	40	1	1	3	D	X														X										
54	185	MID	4	100	5	4	7	D	X	X		X			X			X					X										
54	186	100	3	100	1	3	7	D	X	X	X	X				X		X															
55	190	75	3	100	5	2	5	D	X	X	X	X																					
55	189	250	3	50	1	4	3		X			D								X													
55	188	150	3	100	10	2	7	D	X	X	X	X			X								X										
55	187	100	3	100	20	4	7	D	X	X	X	X						X					X										
56	194	50	3	100	5	3	7	D	X	X	X	X		X									X										
56	193	500	3	100	5	3.5	6	X	X	X	X	D											X										
56	192	400	3	40	1	3.5	3		X			D								X													
56	191	30	3	100	1	4	7	X	X	X		X						D		X									X				
57	198	120	3	75	20	3.5	6	D	X	X	X	X											X										
57	197	600	3	40	0	4	3			X		D								X													
57	196	500	3	40	10	3.5	5		X	X	X	D								X													
57	195	75	4	20	15	4	4	X	D		X			X																			
58	202	60	6	30	20	3	2	X	D																								
58	201	600	3	60	20	3.5	5	X	D	X		X								X													
58	200	700	3	20	0	3	2			X		D																					
58	199	40	3	60	1	3	6	D	X	X	X				X					X													
59	203	35	3	90	1	1	6	D	X	X	X			X						X													
59	204	700	3	60	1	2.5	5	X	X	D	X	X																					
59	205	500	4	40	5	3.5	5	X	X	X	X	D																					
59	206	125	5	40	10	2.5	3	D	X		X																						
60	210	75	5	60	5	2	4	D	X	X		X																					

Transect	Point #	Distance from Shore	Depth (ft)	% Cover	% Ms Cover	Biomass	Species/ Point (Richness)	Pr	Ms	Pa	Ec	Pi	Nf	Pz	Cd	Zd	Ca	Ny	Mu	V	Fa	Pp	Uv	B	Pe	Pg	I	Pn	Ug	Nu	Lm	Ngram	Mv
60	209	450	4	90	5	3.5	5	D	X		X	X								X													
60	208	500	4	20	1	3	3	D	X			X																					
60	207	100	4	10	1	1	4	D	X	X				X																			
61	214	40	3	10	1	1	3	D	X	X																							
61	213	300	4	5	1	3	2		X			D																					
61	212	800	5	20	1	1	4	D	X	X		X																					
61	211	75	3	100	5	2.5	5	D	X	X	X	X																					
62	215	50	3	100	1	3.5	7	X	X	X		D						X		X				X									
62	216	700	5	0	0	0	0																										
62	217	120	4	1	0	3	1					D																					
62	218	30	3	80	1	3	5	X	X	X		D												X									
		Average	**3.7**	**62.3**	**4.7**	**2.7**	**4.7**																										

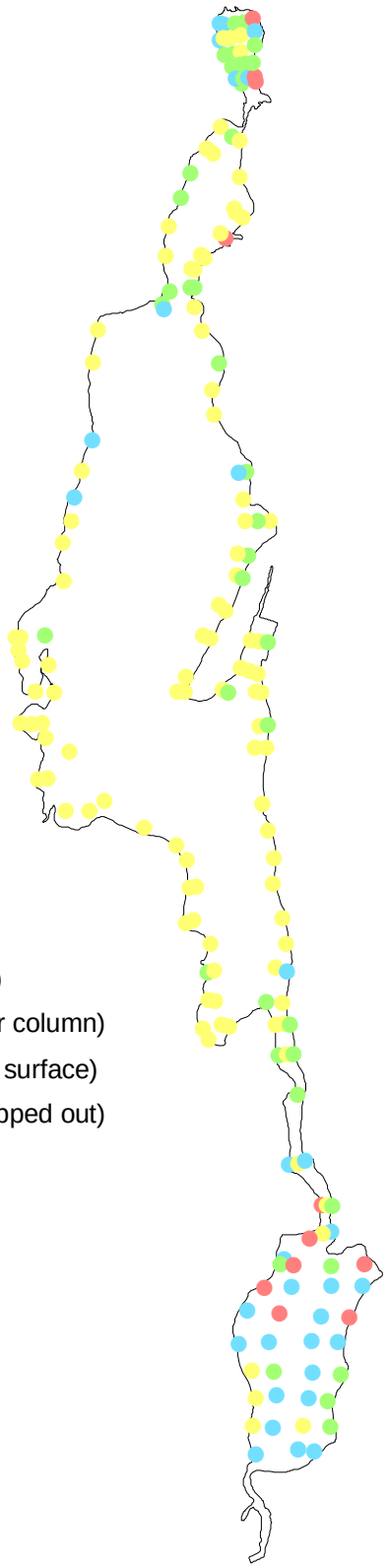
Little Lake Totals

	Pr	Ms	Pa	Ec	Pi	Nf	Pz	Cd	Zd	Ca	Ny	Mu	V	Fa	Pp	Uv	B	Pe	Pg	I	Pn	Ug	Nu	Lm	Ngram	Mv
Present	11	32	29	20	16	0	4	7	2	0	6	0	11	1	0	11	5	0	0	0	0	2	1	0	0	0
Dominant	24	3	2	0	11	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	35	35	31	20	27	0	4	7	2	0	8	0	11	1	0	11	5	0	0	0	0	2	1	0	0	0
% frequency	81.4%	81.4%	72.1%	46.5%	62.8%	0.0%	9.3%	16.3%	4.7%	0.0%	18.6%	0.0%	25.6%	2.3%	0.0%	25.6%	11.6%	0.0%	0.0%	0.0%	0.0%	4.7%	2.3%	0.0%	0.0%	0.0%

LAKE TOTALS

	Pr	Ms	Pa	Ec	Pi	Nf	Pz	Cd	Zd	Ca	Ny	Mu	V	Fa	Pp	Uv	B	Pe	Pg	I	Pn	Ug	Nu	Lm	Ngram	Mv
Present	45	68	101	54	50	20	50	37	24	2	12	2	25	3	12	16	7	1	5	0	3	2	2	0	0	0
Dominant	107	9	8	5	21	12	0	7	1	1	2	1	4	0	3	0	0	0	3	0	0	0	0	0	0	0
Total	152	77	109	59	71	32	50	44	25	3	14	3	29	3	15	16	7	1	8	0	3	2	2	0	0	0
% frequency	77.6%	39.3%	55.6%	30.1%	36.2%	16.3%	25.5%	22.4%	12.8%	1.5%	7.1%	1.5%	14.8%	1.5%	7.7%	8.2%	3.6%	0.5%	4.1%	0.0%	1.5%	1.0%	1.0%	0.0%	0.0%	0.0%

2010 TOTAL VEGETATION BIOMASS



Legend

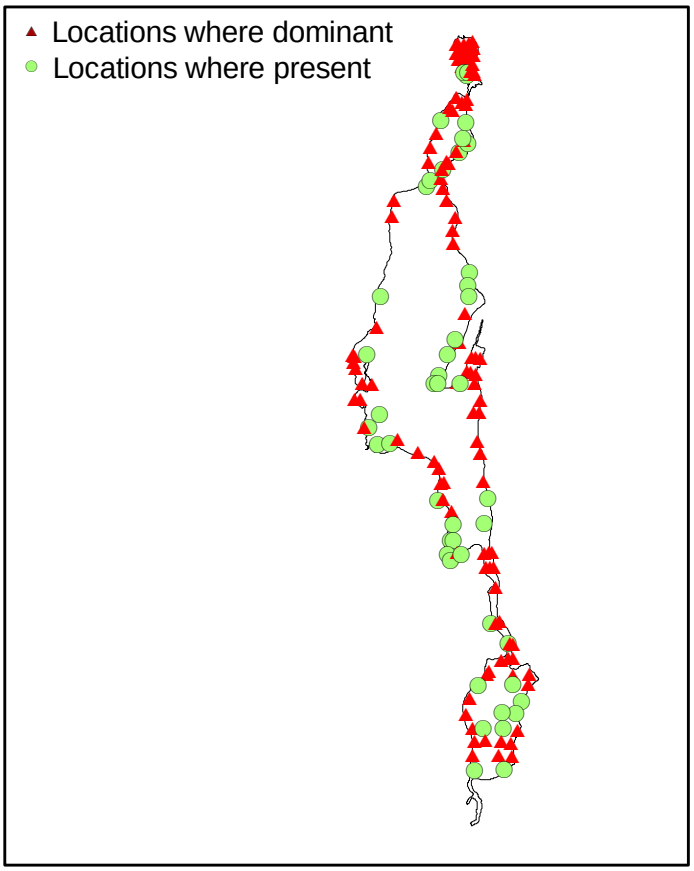
Biomass indices reported
during 9/14 & 9/15/10 survey

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

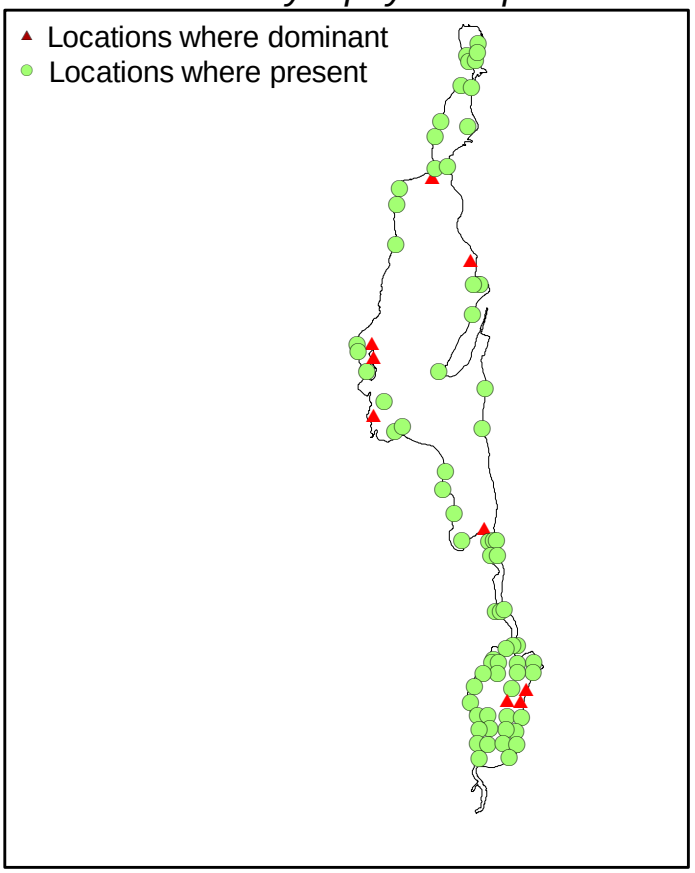
N
W E
S

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

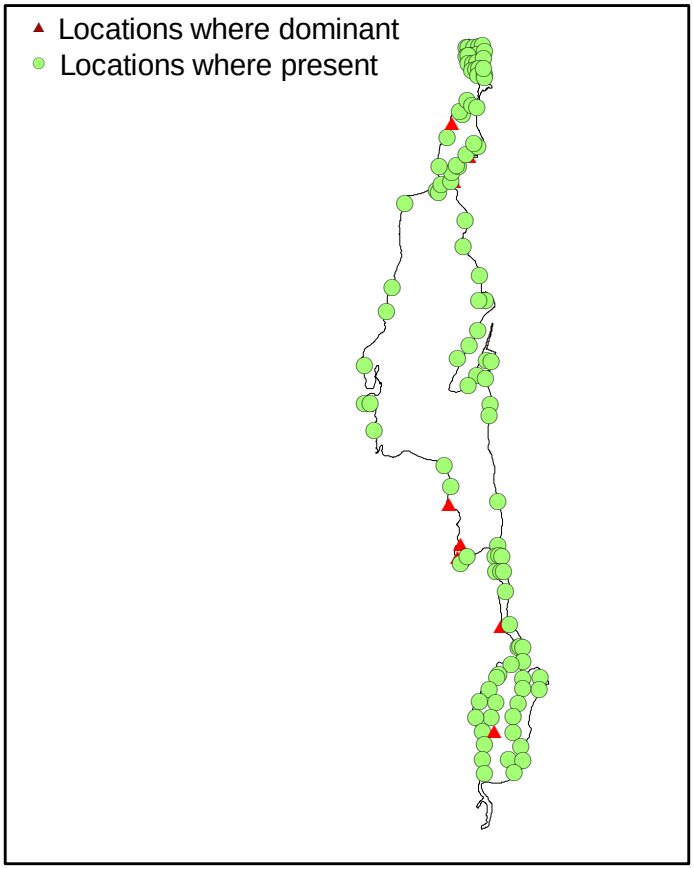
Distribution of *Potamogeton robbinsii*



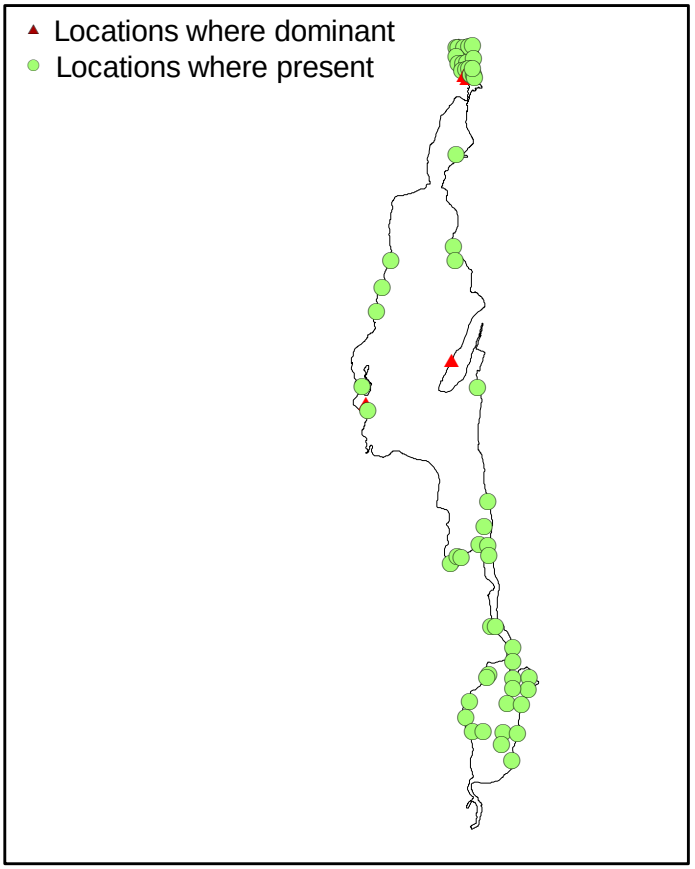
Distribution of *Myriophyllum spicatum*



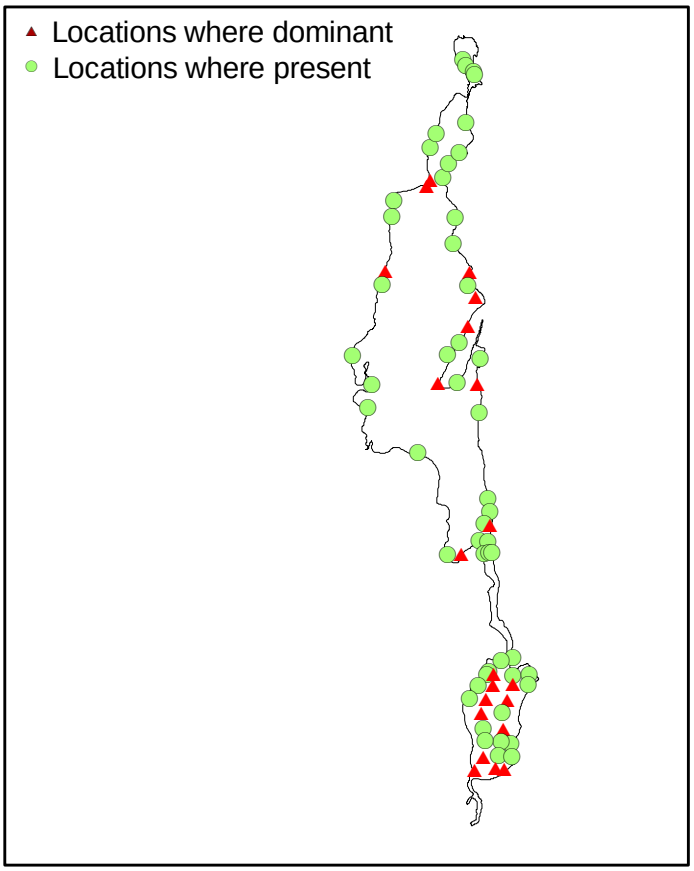
Distribution of *Potamogeton amplifolius*



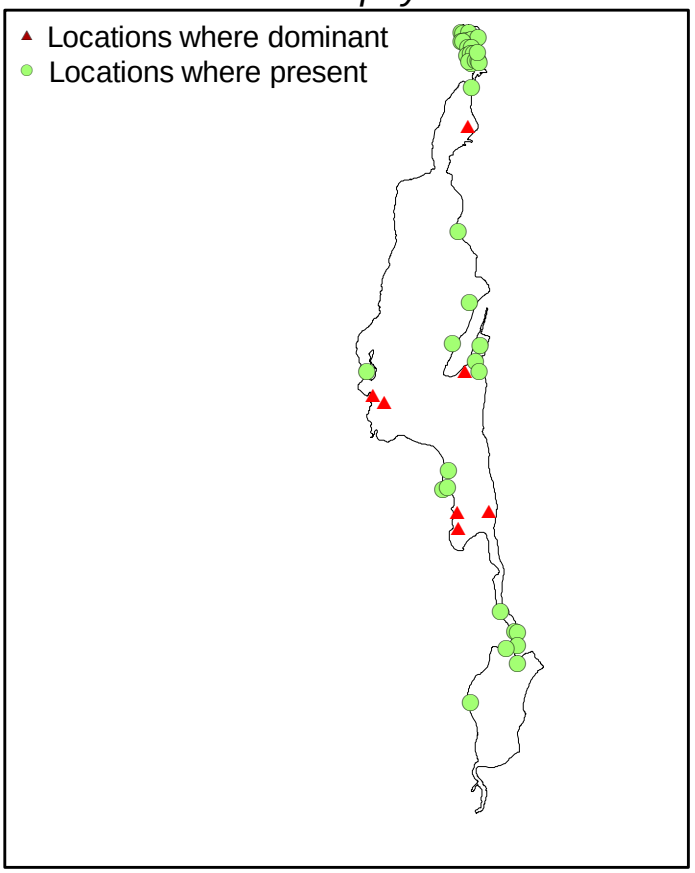
Distribution of *Elodea canadensis*



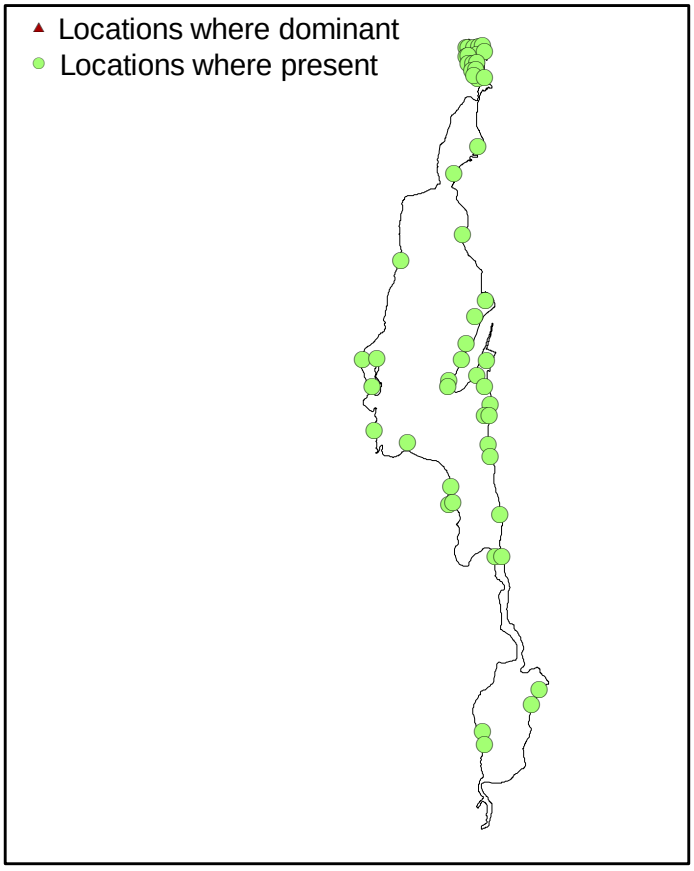
Distribution of *Potamogeton illionensis*



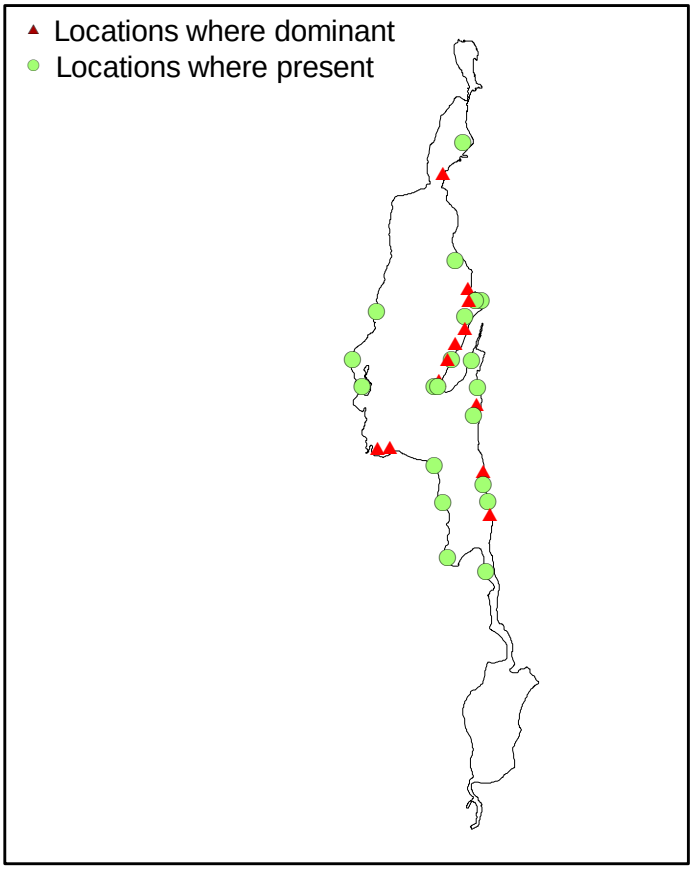
Distribution of *Ceratophyllum demersum*



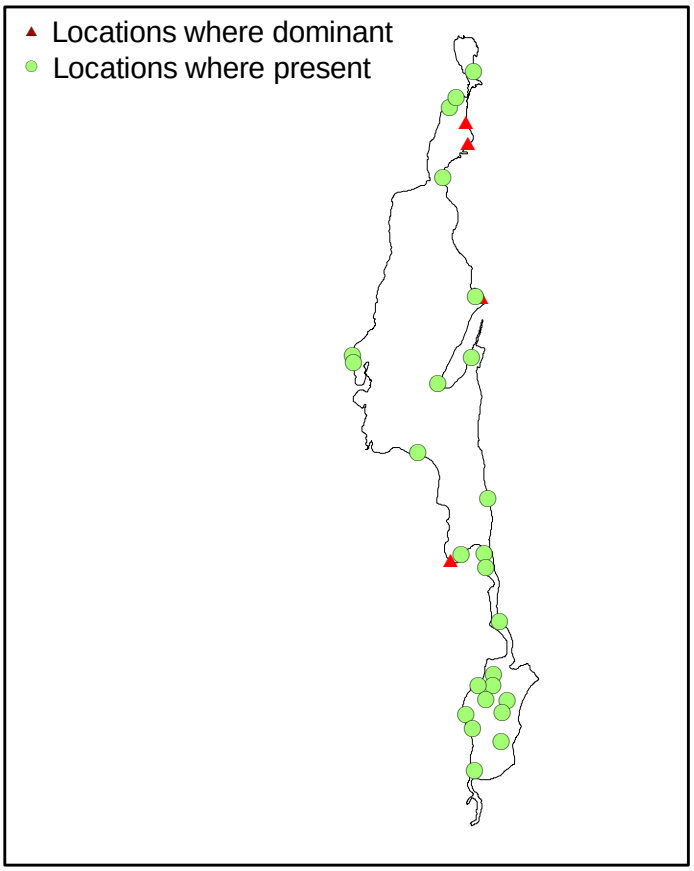
Distribution of *Potamogeton zosterformis*



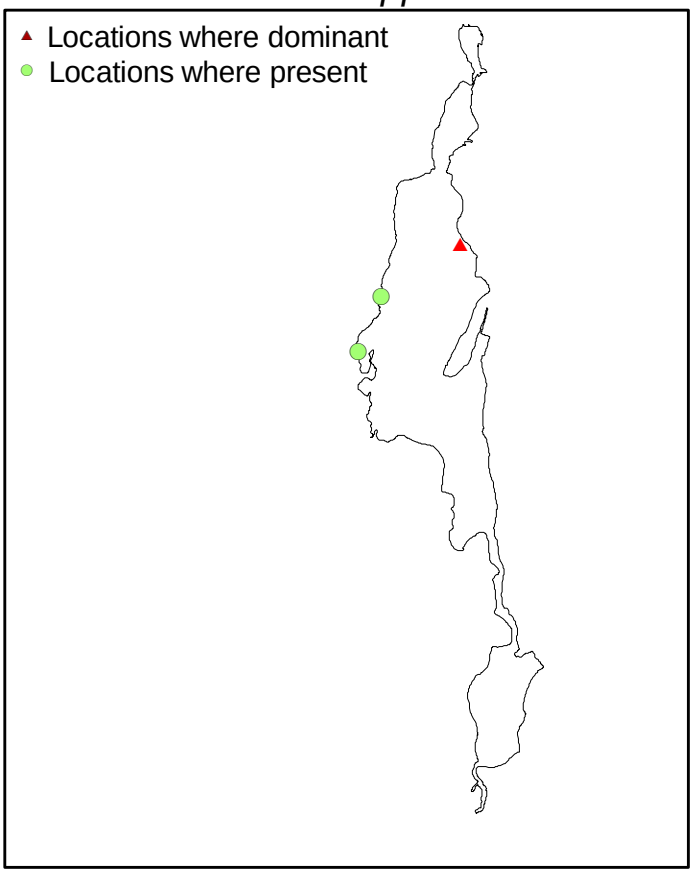
Distribution of *Najas flexilis*



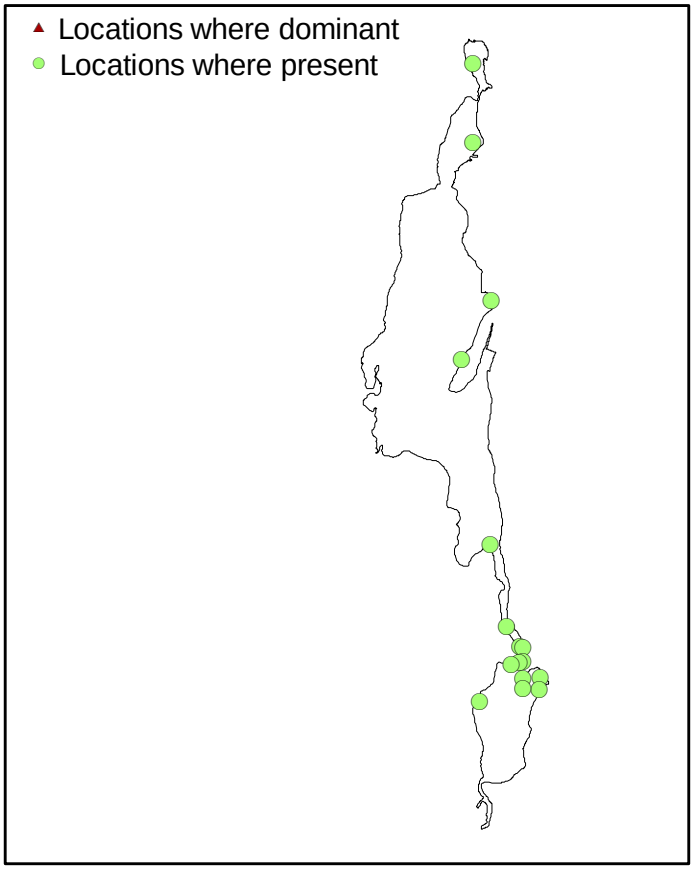
Distribution of *Vallisneria americana*



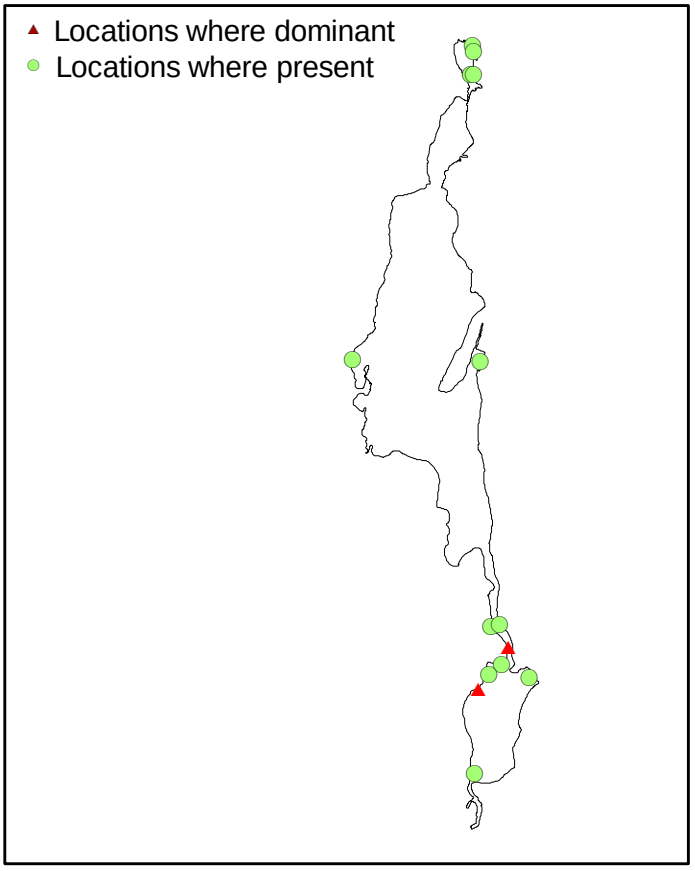
Distribution of *Chara spp.*



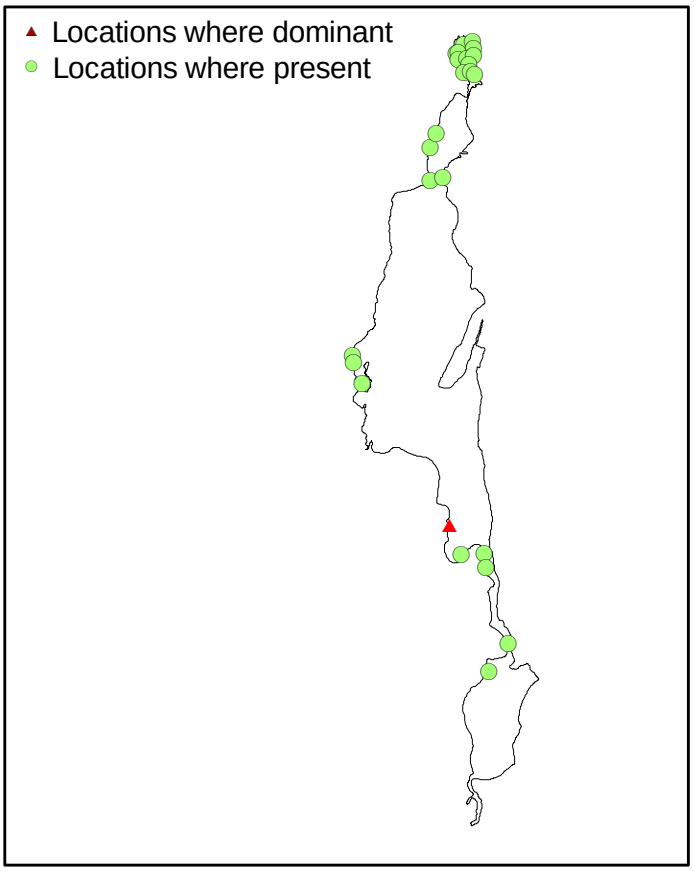
Distribution of *Utricularia vulgaris*



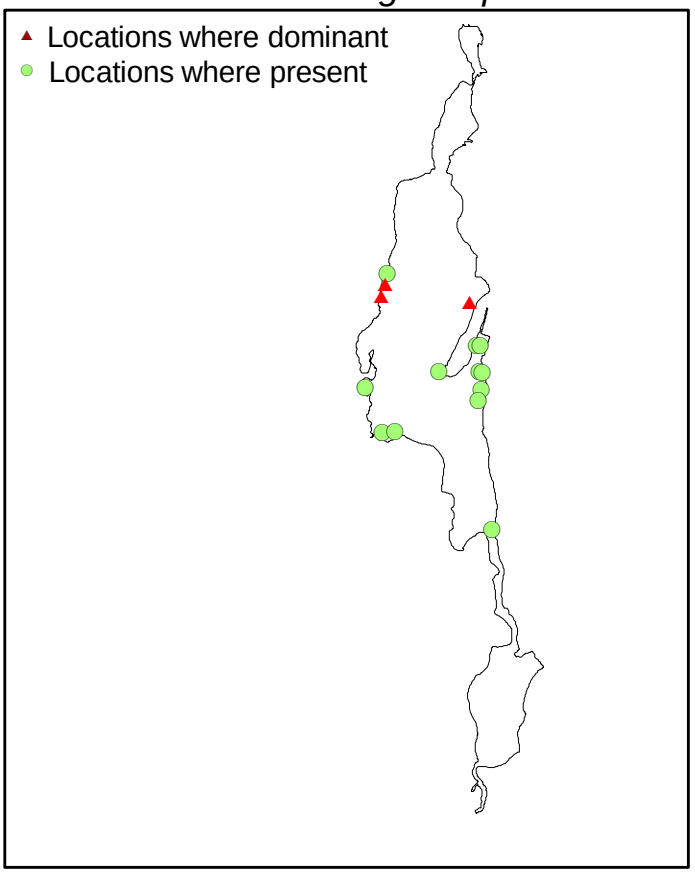
Distribution of *Nymphaea odorata*



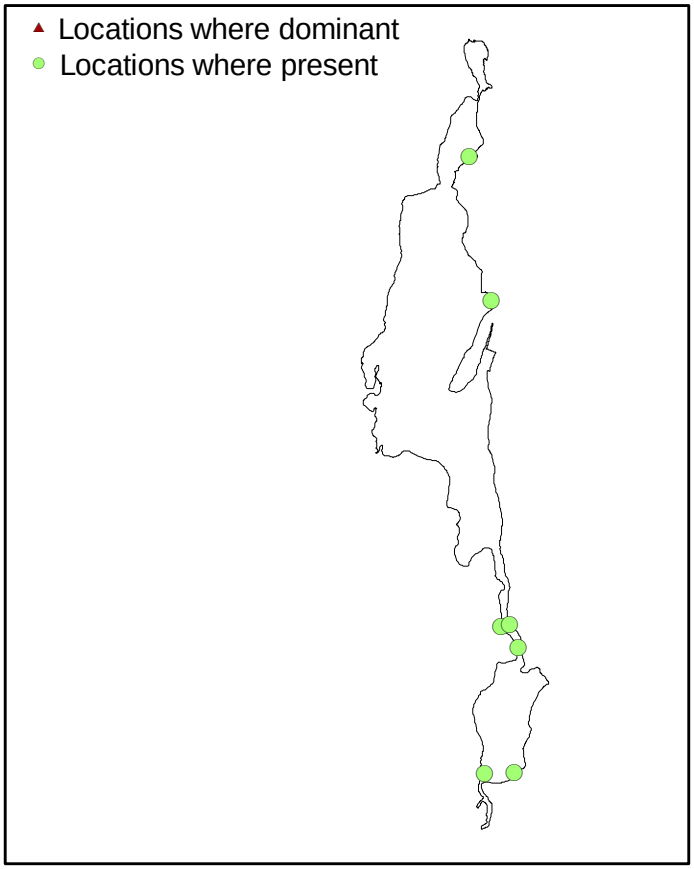
Distribution of *Zosterella dubia*



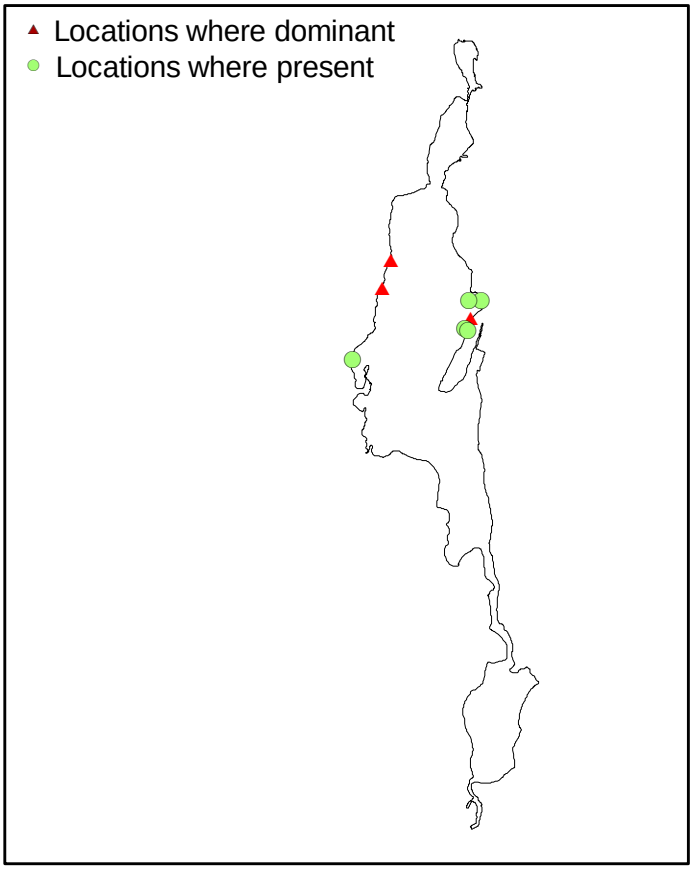
Distribution of *Potamogeton pusillus*



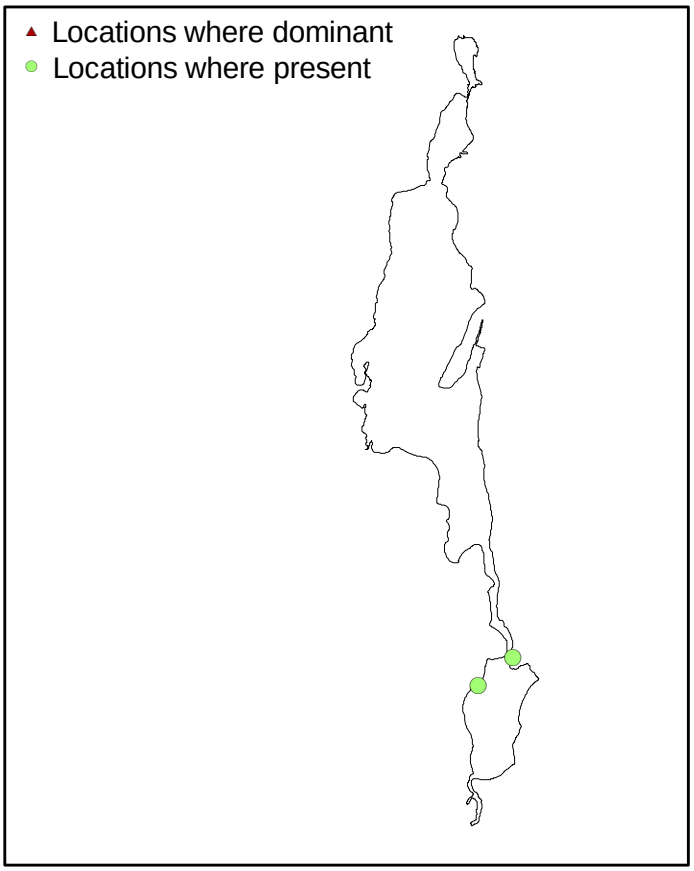
Distribution of *Brasenia schreberi*



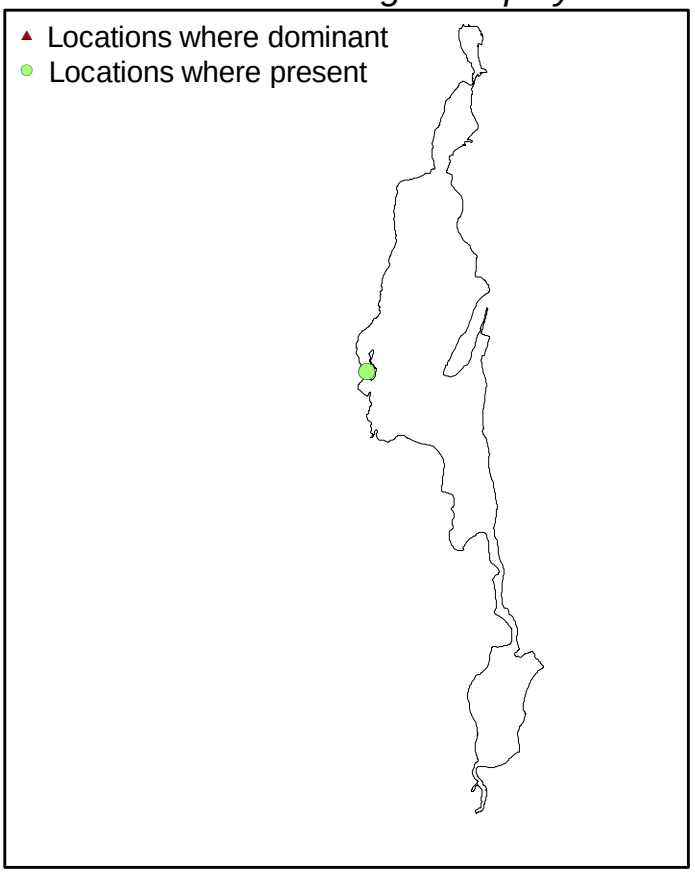
Distribution of *Potamogeton gramineus*



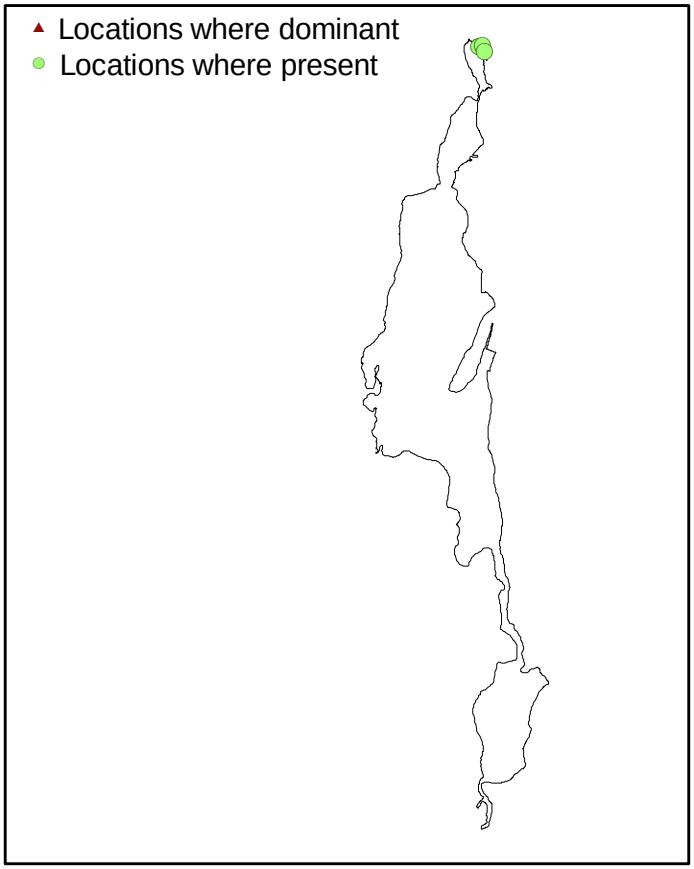
Distribution of *Utricularia gibba*



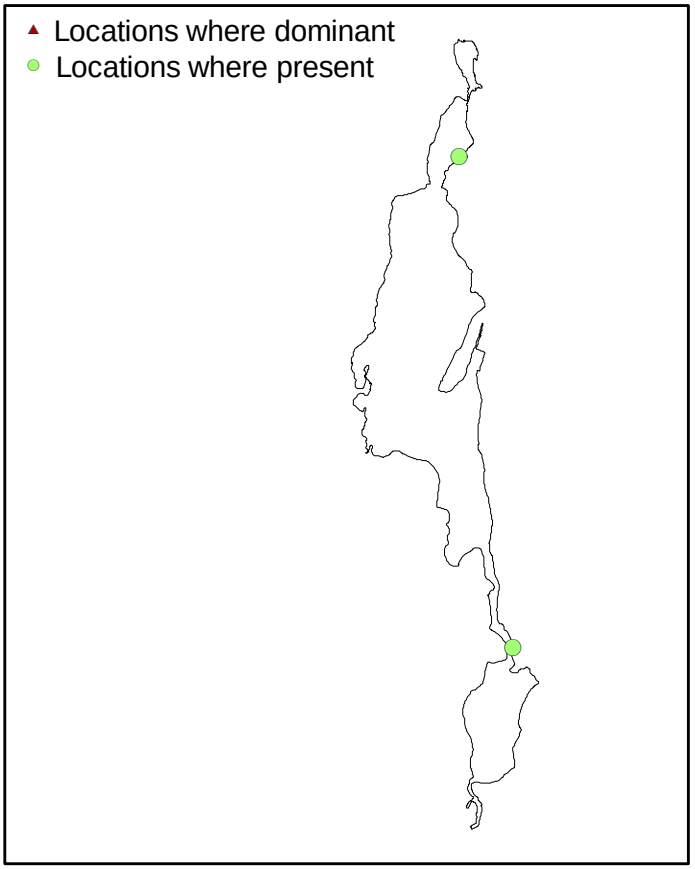
Distribution of *Potamogeton epihydrus*



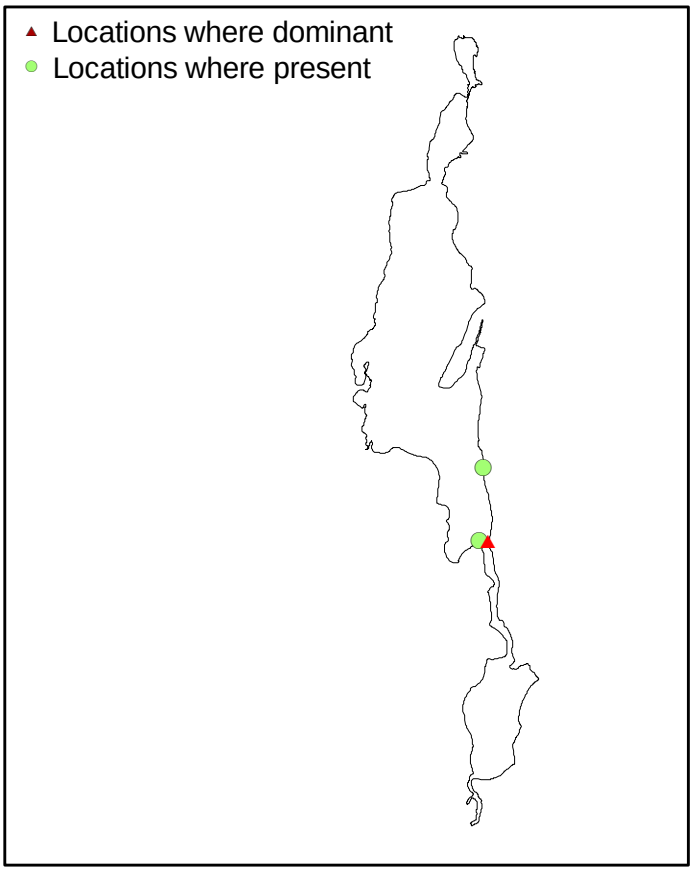
Distribution of *Potamogeton natans*



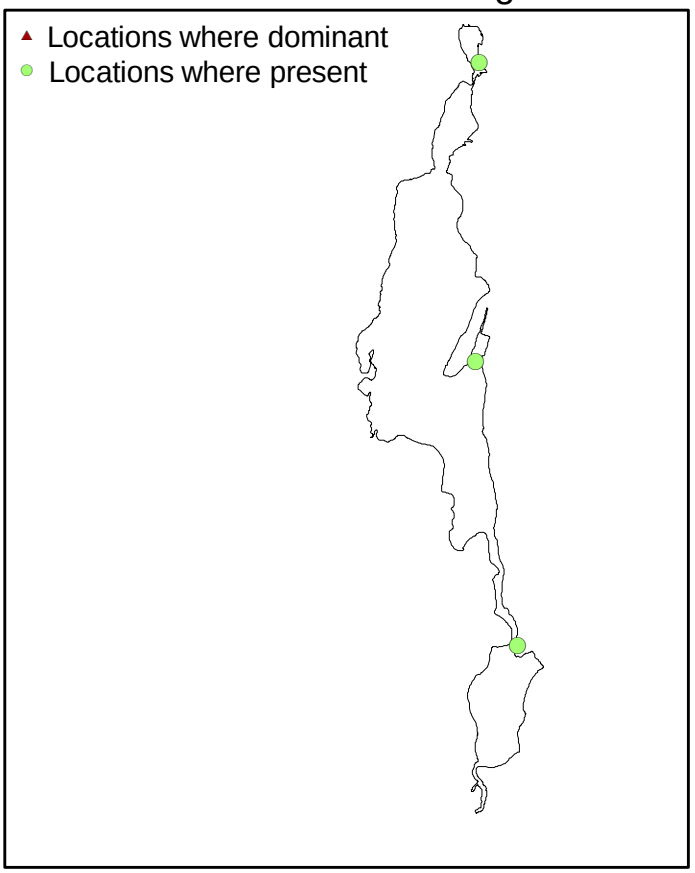
Distribution of *Nuphar variegatum*



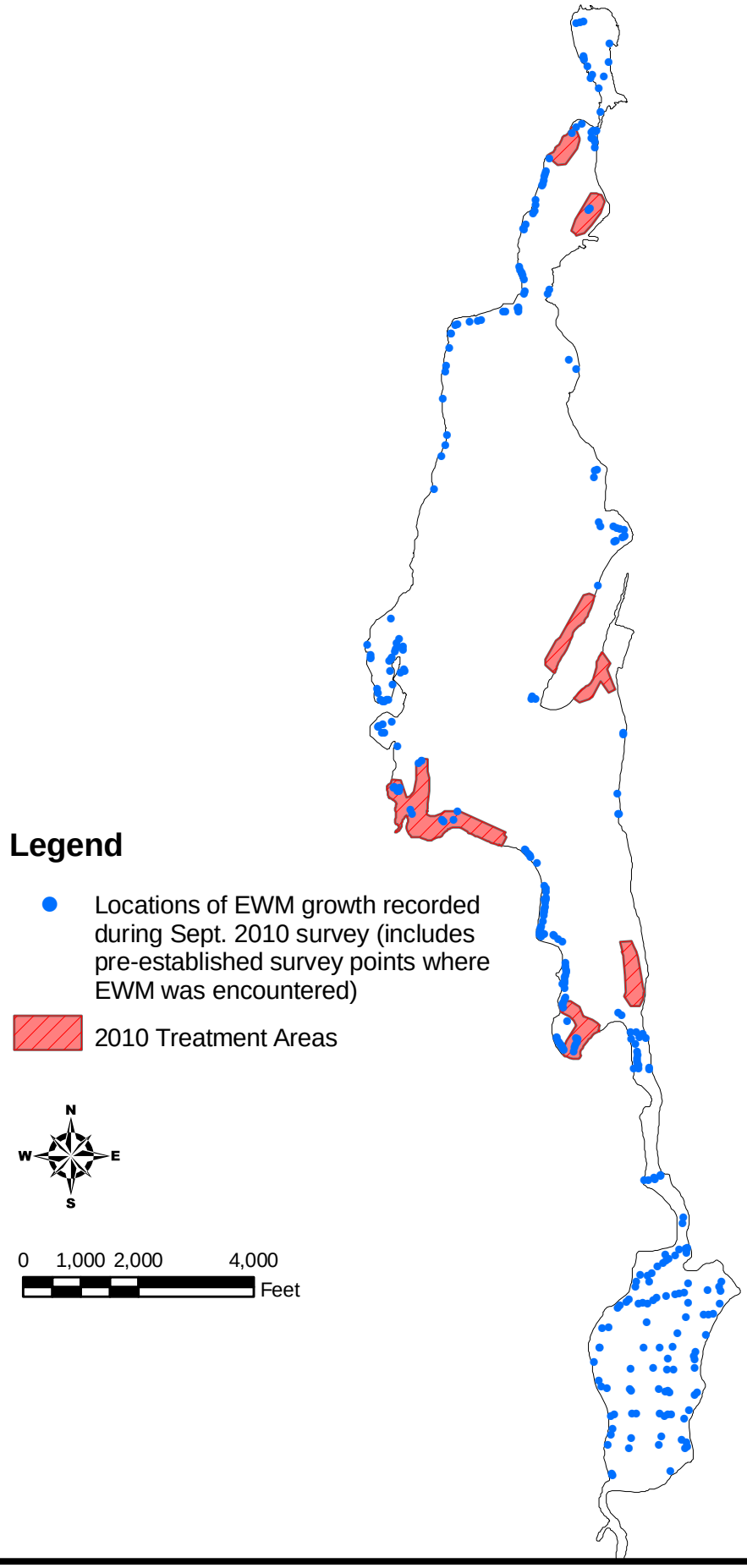
Distribution of *Musci spp.*



Distribution of Filamentous algae



2010 Milfoil Distribution



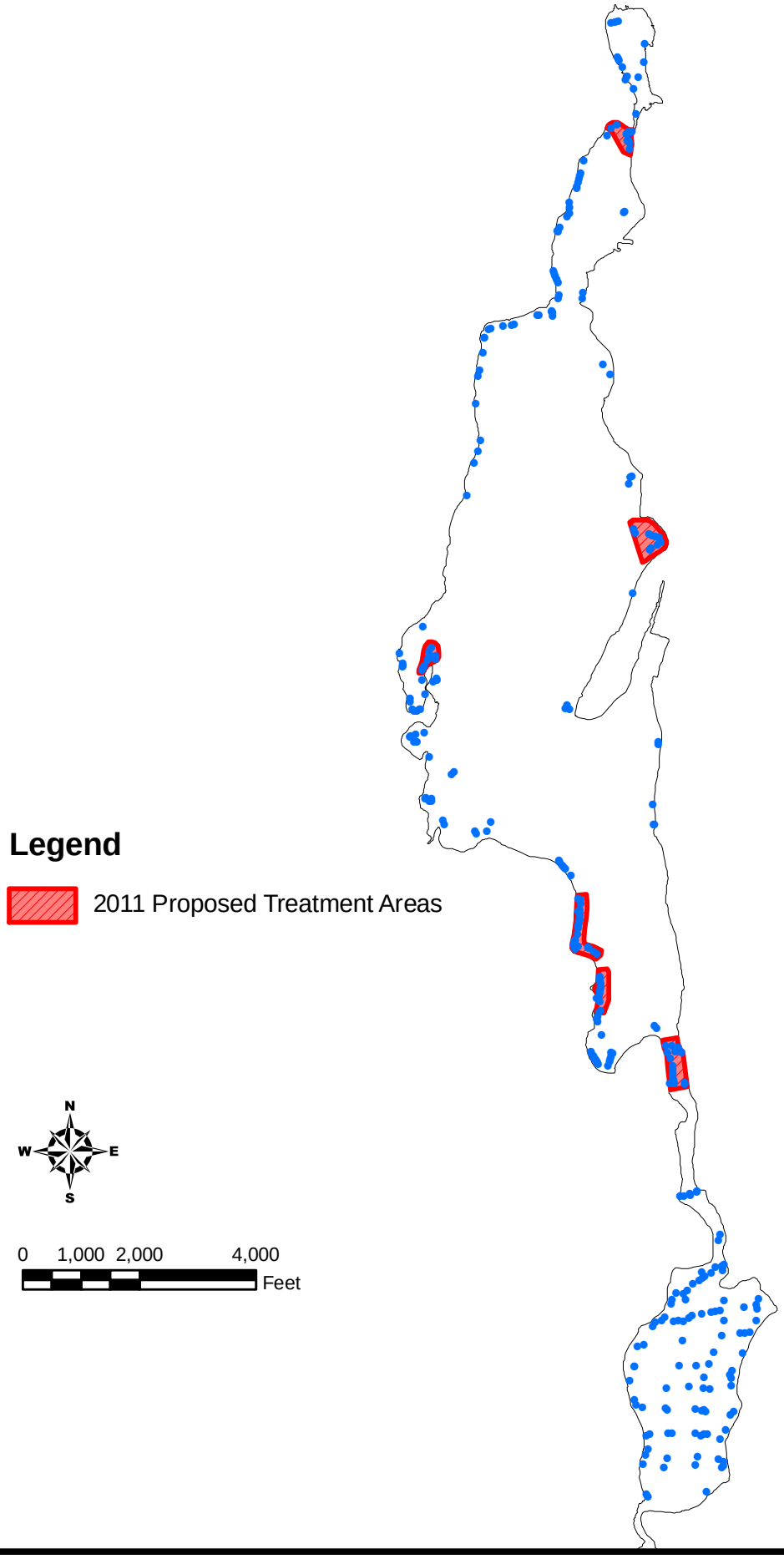
Legend

- Locations of EWM growth recorded during Sept. 2010 survey (includes pre-established survey points where EWM was encountered)
- 2010 Treatment Areas

N
W E
S

0 1,000 2,000 4,000
Feet

Preliminary Treatment Areas - 2011



Legend

2011 Proposed Treatment Areas

N
W E
S

0 1,000 2,000 4,000
Feet