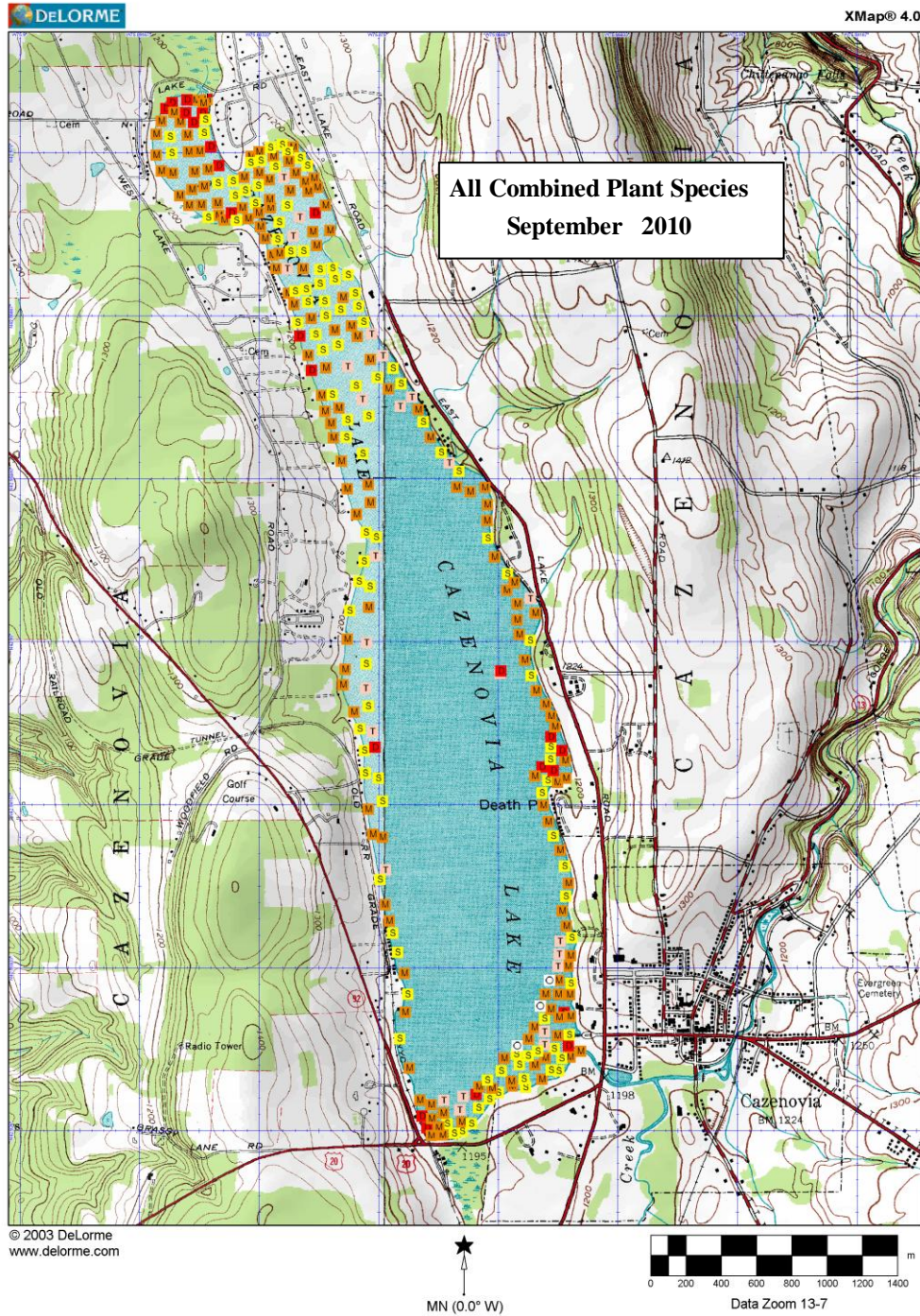


Cazenovia Lake Plant Community Response to the 2009 and 2010 Application of the Herbicide Triclopyr to Control Eurasian Watermilfoil



Abundance - All Plant Species

**Racine-Johnson Aquatic Ecologists
December 2010**

Cover Map

We show on the cover a map of the location and total species abundance of the 302 sample points (SPs) in Cazenovia Lake that we surveyed after the herbicide treatment with triclopyr (Renovate®) in 2010. We measured species presence and abundance by two rake tosses at each SP location pre-determined by Allied Biological Inc., in their fall 2008 survey (Allied Biological Inc., 2008). The cover map also includes two additional locations identified in this report as 303 and 304 (sunken island) and sampled by Racine-Johnson Aquatic Ecologists in 2009 and 2010.

Contents

Contents.....	3
List of Tables and Figures.....	4
Introduction.....	5
Methods.....	6
Results	10
References.....	16
Appendix.....	17

Racine-Johnson Aquatic Ecologists
1185 Ellis Hollow Road
Ithaca, NY 14850

Robert L. Johnson
rlj5@cornell.edu

Jason D. Johnson
Joellen M. Riggs
Jason A. Toner

Tables

Table 1. Abundance categories used to describe rake-toss samples with the assumed mean dry weight values (g / m ²) and ranges used in spreadsheet processing of field data to obtain an estimate of abundance for individual species or grouping of species (Tables A, B).....	8
Table 2. Species list and number of locations (SPs) out of the 302 total sampled 2010 locations where we found a species. We contrast to the 2008 and 2009 documented species and number of locations (SPs) (Allied Biological 2008, Racine-Johnson 2010) and does not include Racine-Johnson’s SPs 303 and 304.....	12
Table 3. Lake depths at 304 (SPs) in Cazenovia Lake on August 26, 27, 31 and September 2, 4, 8, 2009 (Racine-Johnson Aquatic Ecologists 2009).....	14
Table A. Results of a two rake-toss sampling of Cazenovia Lake on September 17, 18, 19, 23, 25, 2010 at 304 sample points (SPs).....	18
Table B. Conversion of September 17, 18, 19, 23, 25, 2010 rake-toss from Table A to Abundance categories for each species at each (SP).....	40
Table C. Aquatic plant species’ presence in Cazenovia Lake from two rake tosses on Sept. 17, 18, 19, 23, 25, 2010. Entries of “1” indicate species identified at that sample point (SP). Allied Biological chose the locations for (SPs) in October 2008 and we added 303 and 304.....	51

Figures

Figure 1a. Sample point (SP) locations in Cazenovia Lake where we collected rake-toss measurements from September 17- 25, 2009.....	6
Figure 1b. Sample point (SP) locations in Cazenovia Lake where we collected rake-toss measurements from September 17- 25, 2009. The red type SPs are locations at “sunken island” added in 2009.....	7
Figure 2. Sample with dual headed rake and separation to species for an estimate of species percentage.....	8
Figure 3. Best fit line to describe the relationship between estimates made with the rake-toss method and biomass measures in a previous study at the same locations and times (Racine - Johnson 2007).....	9
Figure 4. All combined plant species map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.....	13
Figures 5 - 34. Individual species maps of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.....	62 – 91

Introduction

This report summarizes the 2010 survey by Racine-Johnson Aquatic Ecologists for the Town of Cazenovia. In September 2010, we conducted a survey of the aquatic plant communities in Cazenovia Lake in order to describe and evaluate the impact of the 2009 and 2010 herbicide treatments of the lake with triclopyr (Renovate®) to control the growth of *Myriophyllum spicatum* (Eurasian watermilfoil). The triclopyr treatment dates in 2010 were June 15 - June 18, this partial lake herbicide application included areas in the southern half of the lake and the “Sunken Island Area” not treated in 2009. See detailed information of treatments on the Town of Cazenovia web site.

<http://townofcazenovia.org/content/Generic/View/28>

We report the results of our 2010 aquatic plant community study of Cazenovia Lake using a rake-toss method to determine plant species presence, location, and an estimate of species abundance. We contrast our September 2010 post-treatment results to our August 2009 post-treatment results and Allied Biological’s fall 2008 pre-treatment survey (Allied Biological Inc., 2008) in Cazenovia Lake.

Methods

To identify plant community structure and relative abundance in Cazenovia Lake we sampled and recorded aquatic plant species presence and abundance in 2010 at the same 304 specific locations sampled in 2009. The survey includes the original 302 sites chosen and sampled by Allied Biological Inc. in October 2008 as well as an additional 2 locations we identified (Sunken Island) that needed consideration for the herbicide treatment in 2010 (Figures 1a, b).

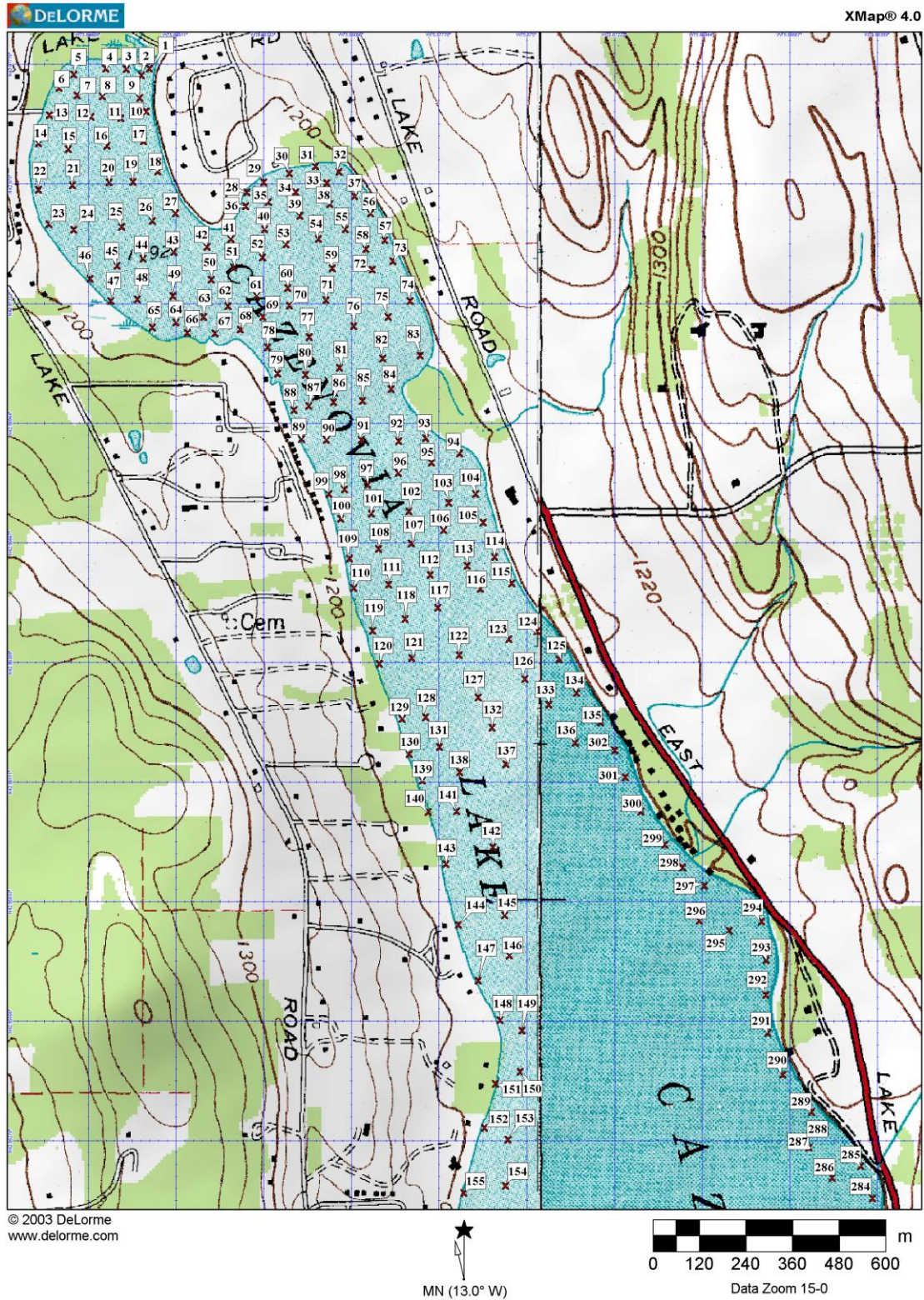
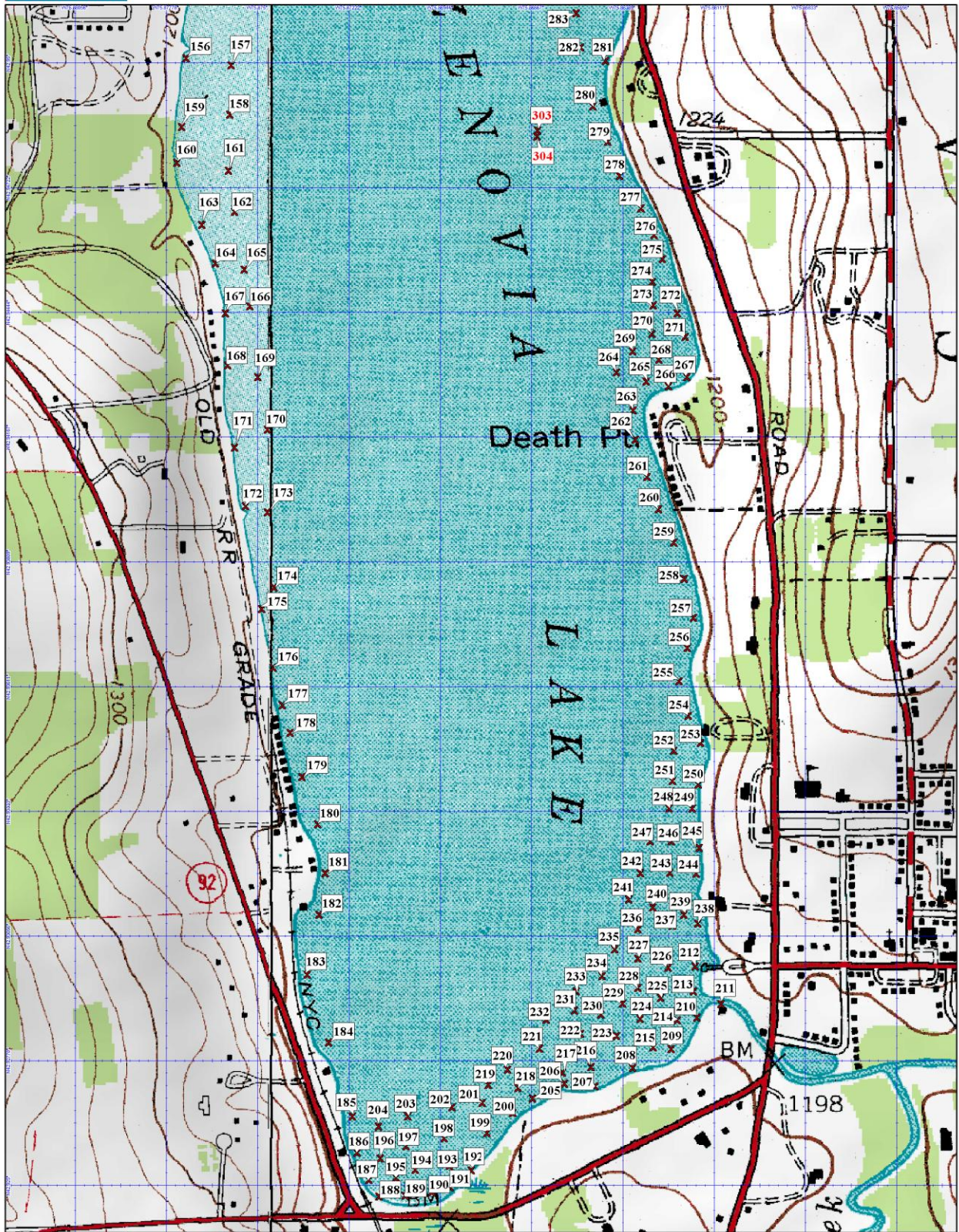
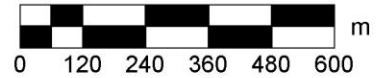


Figure 1a. Sample point (SP) locations in Cazenovia Lake where we collected rake-toss measurements from September 17 – September 25, 2010.



© 2003 DeLorme
www.delorme.com



Data Zoom 15-0

Figure 1b. Sample point (SP) locations in Cazenovia Lake where we collected rake-toss measurements from September 17 – September 25, 2010. The red type SPs are locations at “sunken island” added to the locations sampled in 2009 and sampled again in 2010 .

We use an enhanced modification of a basic point intercept rake-toss method (Madsen, 1999) where we used two randomly tossed rakes to collect submersed aquatic plants at the locations chosen by Allied Biological Inc. in 2008. We used a hand held GPS to navigate to Allied Biological’s 302 reported locations of 2008 using Allied Biological’s chosen latitude and longitude coordinates and we assumed a North American Datum of 1983 (NAD83) at true north. We navigated to the additional locations at “Sunken Island” in the same manner. At each location, we re-recorded latitude and longitude coordinates, but suspended depth recordings in 2010 at each sampling point after measuring similar depths as we found in 2009.

We brought the samples into the boat with a dual headed rake (Figure 2) and assigned an overall plant abundance estimate to the amount on the rake. We classified and recorded the entire rake sample as: “dense (D)” - more than an armful and difficult to get into the boat, “medium (M)” - an arm full, “sparse (S)” - two hands full, “trace (T)” - a small handful or less, or “zero (O)” - a bare rake (Table 1). The field crew then separated each sample to individual species, analyzed the separations by recording the species identification (Borman *et al.* 1999, Crow and Hellquist 1999) and a percentage estimate of each species on site. We later entered all data into an MS Excel spreadsheet and listed the collected information in Table A of this report.

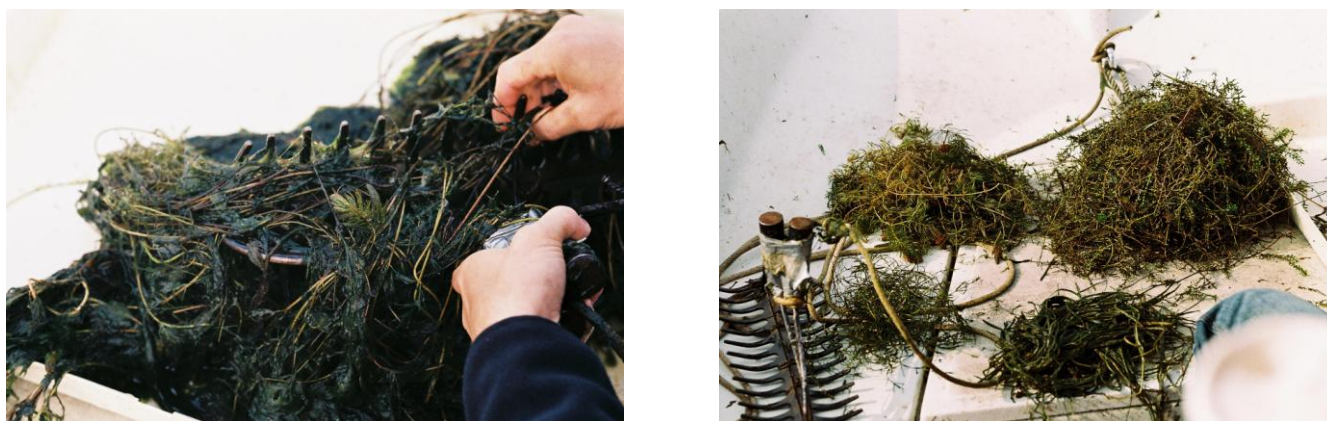


Figure 2. Sample with dual headed rake and separation to species for an estimate of species percentage.

Table 1. Abundance categories used to describe rake-toss samples with the assumed mean dry weight values (g / m^2) and ranges used in spreadsheet processing of field data to obtain an estimate of abundance for individual species or grouping of species (Tables A, B).

Abundance Categories	Rake-toss Abundance Number	Dry Weight (g/m^2) Ranges associated with Total Plants Abundance	Mean (g/m^2)	Dry Weight (g/m^2) Ranges associated with Single Species Abundance
“O” = no plant(s)	0	0.0	0.0	same
“T” = trace plant(s)	1	~0.0001 - 0.9999	0.5	same
“S” = sparse plant(s)	2	~1.0000 - 24.9999	13.0	same
“M” = medium plant(s)	3	~25.0000 - 99.9999	62.5	same
“D” = dense plant(s)	4	~100.0000 - 400.0000+	250.0	same

To obtain abundance values for tables and maps we used from the two rake tosses the two field estimated rake abundance categories recorded in Table A to produce a mean value” for the two “all plant species” rake tosses at each location and recorded as rake abundance in Table B and depicted on Figure 4.

To analyze our rake toss abundance data for individual species we use the previously constructed Table 1 from data collected from earlier studies where we compared our “rake-toss” estimates at specific locations to absolute dry biomass data collected from the same location at the same time (Racine - Johnson 2007). From these quadrat-sampling studies, we are able to produce Figure 3, as the best-fit regression line. For Figure 3 we initially used rake toss data from 18 lake locations and collected five 0.25m² quadrat samples from each location for a total of 90 biomass samples and we continue to update and use this standard for our abundance estimates of individual species as a percentage of the whole plant mass on the rake.

Table 1 displays the resulting assumptions and values we used to calculate our individual species abundance (Table B) and construct our maps of abundance for specific species (Figures 5- 34). We determined single species abundance using the standard mean biomass for a determined abundance category (Table 1) and a weighted mean of the two assigned field percent estimates to assign a species abundance category at each location (SP). In summary we use the relationships in Table 1 and the 2010 rake-toss data to calculate mean species abundances for each location sampled.

We recorded a summary of the results (Table B) and additionally placed the resulting abundance values on individual species maps for each sampled location to create a visual record of the relative species abundance (Figures 4 and 5 - 34) that can be contrasted to the previous surveys (Allied Biological 2008, Racine-Johnson 2009).

Biomass vs. Rake-toss Relationship for Chautauqua Lake 2007

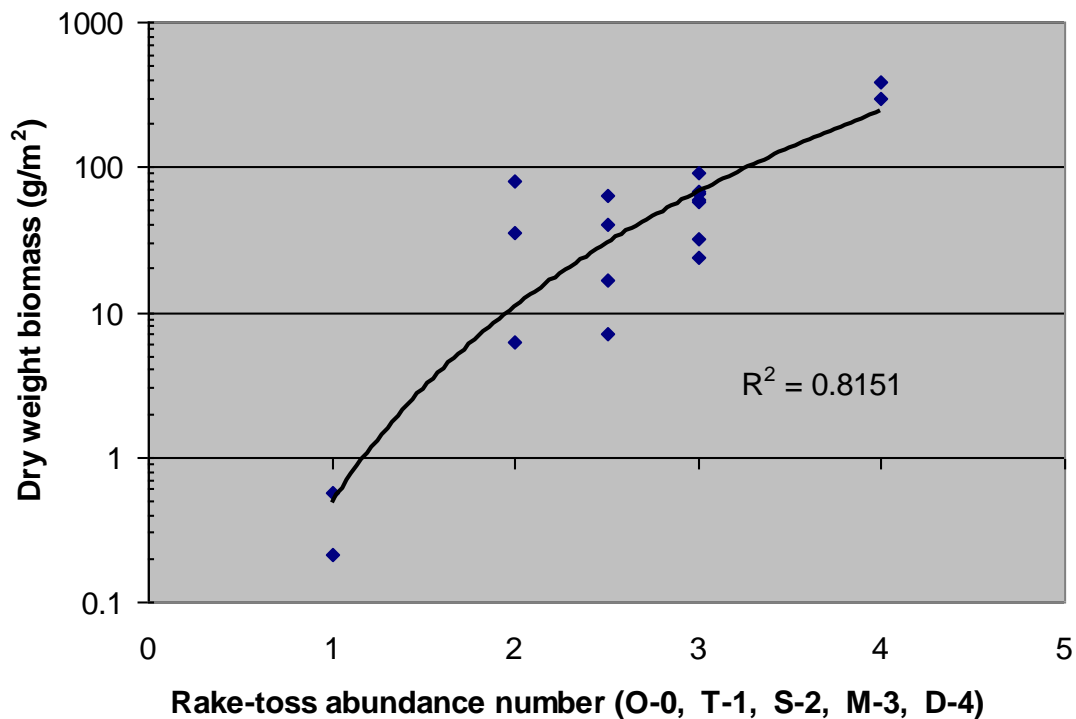


Figure 3. Best-fit line to describe the relationship between estimates made with the rake-toss method and biomass measures in a previous study at the same locations and times (Racine - Johnson 2007).

Results

We summarize and display the results of our 2010 aquatic plant species monitoring at Cazenovia Lake in the text, tables and figures that follow.

We list the primary results of this 2010 plant survey in Table 2 (page 12) and compare to the plant survey results reported by our 2009 survey and the 2008 Allied Biological Inc. survey. All three surveys sampled the same 302 locations and reported species found at the selected locations. Table 2 lists the number of locations out of a possible 302 where Allied Biological in 2008 and Racine-Johnson in 2009 and 2010 identified at least one individual species. The % column lists the percentage of the locations with individual species present out of the total 302 measured locations.

Table 3 (page 14) lists the lake depth recorded by Racine-Johnson from August 26 - September 8, 2009 at each of the sampled locations (Racine-Johnson Aquatic Ecologists 2009).

Table A (page 18) reports the field results of our rake-toss sampling on the lake from September 17, 18, 19, 23, 25, 2010 at each of the sampled locations.

Table B (page 40) is our conversion of Table A's rake-toss data to a table of general abundance categories of dense (D), medium (M), sparse (S), or trace (T) for each species allowing comparison to previous surveys.

Table C (page 51) lists the aquatic plant species' presence at each location and shows a recorded total for all sampled locations.

Figures 4 and 5 - 34 are maps that show a visual location of species and their relative abundance. Figure 4 (page 13) is a depiction of all species combined while Figures 5 - 34 (pages 62 -91) show location and abundance category.

Major findings are:

The target species *Myriophyllum spicatum* (Eurasian watermilfoil) presence in the lake reduced significantly in 2009, declined further to 88 locations in 2010 and very low relative abundance (richness and biomass) in the lake. Table 2 shows the presence of watermilfoil at 281 locations by Allied Biological in 2008, 122 locations reported by Racine-Johnson in 2009 after the initial (north half) treatment and currently at 88 locations in 2010 after the treatment of the southern half of the lake.

The target species *Myriophyllum spicatum* (Eurasian watermilfoil) abundance in the lake categorized to be dense or medium as 60% of the 281 *M. spicatum* locations reported in 2008 decreasing to 14% of 122 *M. spicatum* locations in 2009. In 2010, only 1% of the 86 reported watermilfoil locations were categorized as dense or medium (Allied Biological 2008, Racine-Johnson 2009, 2010).

The aquatic plant community of Cazenovia Lake is a very diverse and species rich plant assemblage with Allied Biological reporting 28 species with a mean of 5.1 species per sampled location in the pre-treatment survey. In 2009, Racine-Johnson Aquatic Ecologists reported 36 species identified with a mean of 7.9 species per sampled location after the northern partial lake treatment. In September 2010 after the June herbicide treatment of the southern half, we report 32 species or 6.6 species per sampled location (SP).

The 2009 and 2010 treatment with triclopyr appears to show no significant negative effect on an overwhelming number of non-target plant species.

As reported in 2009 the species that decreased then and in 2010 other than Eurasian watermilfoil were *Nymphaea odorata* (white water lily) found at 3 locations in 2010 and *Myriophyllum sibiricum* (northern watermilfoil) that we did not find in the lake in 2010. As we reported, last year both species are sensitive to the herbicide triclopyr and a decrease in the presence of both species is expected.

The dominant species recorded in our 2009 survey found at greater than 2/3 of the surveyed locations were the native species *Ceratophyllum demersum* (coontail), *Elodea sp.* (elodea) and *Pithophora sp.* (benthic filamentous algae). In 2010, these three again were the most abundant but followed closely by other natives although all species in the lake generally were less abundant in 2010 than 2009.

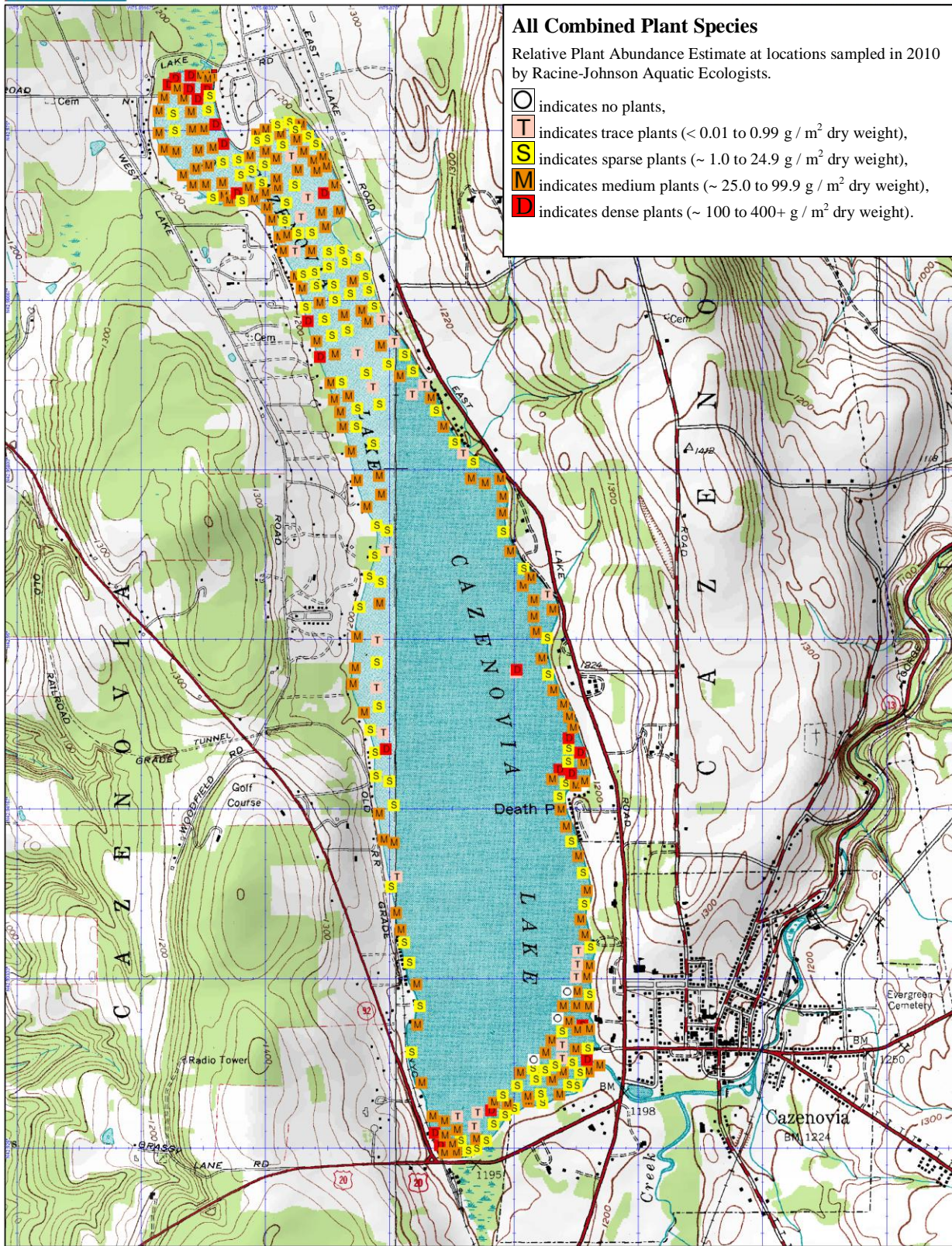
We reported an increase in two non-natives, *Potamogeton crispus* (curly-leaf pondweed) and *Nitellopsis obtusa* (starry stonewort) in 2009. In 2010, we show no increase by *P. crispus*. However, *N. obtusa* more than doubled in the number of sampled locations where found in 2010 compared to 2009.

The very positive high native plant species numbers (richness) present in Cazenovia Lake continue to constitute a very diverse aquatic plant (macrophyte) structure providing plant community stability that should slow invasion by non-native plant species. The abundant and diverse native macrophyte growth additionally aids nutrient cycling in the summer growing season insuring good water quality in the lake.

The Allied Biological report from their fall 2008 aquatic plant survey has an excellent description of plant species with photos of each species in Cazenovia Lake. We would refer those interested in identification to refer to the Allied Biological report. Additionally, the Racine-Johnson Aquatic Ecologists' report in 2009 describes five additional species important to Cazenovia Lake to supplement the Allied Biological Inc. report.

Table 2. Species list and number of locations (SPs) out of the 302 total sampled 2010 locations where we found a species. We contrast to the 2008 and 2009 documented species and number of locations (SPs) (Allied Biological 2008, Racine-Johnson 2010) and do not include Racine-Johnson’s SPs 303 and 304.

Scientific Name	Common Name	Allied Biological		Racine-Johnson		Racine-Johnson	
		2008		2009		2010	
		(SPs)	%	(SPs)	%	(SPs)	%
<i>Callitriche hermaphroditica</i>	autumnal water starwort	1	0.33	1	0.33	0	0
<i>Ceratophyllum demersum</i>	coontail, hornwort	187	62	248	82	200	66
<i>Chara vulgaris</i>	chara, muskgrass	99	33	129	43	167	55
<i>Elodea sp.</i>	elodea, common waterweed	129	43	203	67	186	62
<i>Fontinalis sp.</i>	water moss	3	0.99	64	21	80	26
<i>Hypericum ellipticum</i>	St. John's-wort	0	0	1	0.33	0	0
<i>Lemma minor</i>	small duckweed	3	0.99	3	0.99	7	2
<i>Lemma trisulca</i>	forked duckweed, star duckweed	6	2	50	17	28	9
<i>Megalodonta beckii</i>	water marigold	29	10	28	9	20	7
<i>Myriophyllum sibiricum</i>	northern watermilfoil	0	0	9	3	0	0
<i>Myriophyllum spicatum</i>	Eurasian watermilfoil	281	93	122	40	86	28
<i>Najas flexilis</i>	slender naiad, bushy naiad	60	20	46	15	28	9
<i>Najas guadalupensis</i>	southern naiad	0	0	125	41	116	38
<i>Nitella flexilis</i>	nitella, stonewort	0	0	24	8	19	6
<i>Nitellopsis obtusa</i>	starry stonewort	0	0	12	4	28	9
<i>Nuphar variegata</i>	spatterdock	12	4	10	3	9	3
<i>Nymphaea odorata</i>	white water lily	34	11	5	2	3	0.99
<i>Polygonum amphibium</i>	water smartweed	0	0	1	0.33	0	0
<i>Potamogeton amplifolius</i>	bass weed, large-leaf pondweed	26	9	71	24	38	13
<i>Potamogeton crispus</i>	curly-leaf pondweed	14	5	46	15	27	9
<i>Potamogeton foliosus</i>	leafy pondweed	8	3	23	8	2	0.66
<i>Potamogeton gramineus</i>	variable pondweed	12	4	46	15	59	20
<i>Potamogeton illinoensis</i>	Illinois pondweed	95	31	150	50	108	36
<i>Potamogeton praelongus</i>	white-stem pondweed	17	6	28	9	41	14
<i>Potamogeton pusillus</i>	small pondweed	0	0	41	14	36	12
<i>Potamogeton richardsonii</i>	clasping-leaf pondweed	6	2	12	4	13	4
<i>Potamogeton zosteriformis</i>	flat-stem pondweed	98	32	181	60	132	44
<i>Ranunculus trichophyllus</i>	white water crowfoot	28	9	49	16	54	18
<i>Spirodela polyrhiza</i>	great duckweed	1	0.33	4	1	9	3
<i>Stuckenia pectinata</i>	sago pondweed	37	12	52	17	27	9
<i>Stuckenia vaginata</i>	sheathed pondweed	0	0	57	19	15	5
<i>Utricularia vulgaris</i>	common bladderwort	4	1	12	4	6	2
<i>Vallisneria americana</i>	wild celery, eel grass, tapegrass	161	53	171	57	180	60
<i>Wolffia columbiana</i>	watermeal	6	2	4	1	11	4
<i>Zosterella dubia</i>	water stargrass	116	38	104	34	76	25
<i>Pithophora sp.</i>	benthic filamentous algae	65	22	243	80	195	65
Total locations sampled		302		302		302	
Total species occurrence for all sampled locations		1538		2375		2006	
Average number of species per sampled location		5.09		7.86		6.64	
Species Richness (number of individual species identified)		28		36		32	



All Combined Plant Species
 Relative Plant Abundance Estimate at locations sampled in 2010
 by Racine-Johnson Aquatic Ecologists.

- O indicates no plants,
- T indicates trace plants (< 0.01 to 0.99 g / m² dry weight),
- S indicates sparse plants (~ 1.0 to 24.9 g / m² dry weight),
- M indicates medium plants (~ 25.0 to 99.9 g / m² dry weight),
- D indicates dense plants (~ 100 to 400+ g / m² dry weight).

© 2003 DeLorme
 www.delorme.com

★
 ↑
 MN (0.0° W)

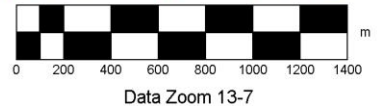


Figure 4. All combined plant species map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

Table 3. Lake depths at 304 (SPs) in Cazenovia Lake on August 26, 27, 31 and September 2, 4, 8, 2009 (Racine-Johnson Aquatic Ecologists 2009).

Sample Point (SP)	Latitude	Longitude	Depth (ft) on date	Depth (m) on date
C1	42.9776517	75.8871200	1.0	0.3
C2	42.9775198	75.8872126	1.6	0.5
C3	42.9776614	75.8876990	3.3	1.0
C4	42.9776742	75.8883369	3.3	1.0
C5	42.3977542	75.8893554	3.9	1.2
C6	42.9772273	75.8898137	3.3	1.0
C7	42.9770512	75.8892474	5.9	1.8
C8	42.9770271	75.8884454	7.5	2.3
C9	42.9769913	75.8872600	5.2	1.6
C10	42.9766792	75.8870589	3.3	1.0
C11	42.9765257	75.8878652	10.5	3.2
C12	42.9765540	75.8888094	9.0	2.8
C13	42.9765976	75.8901296	4.1	1.3
C14	42.9759387	75.8904761	3.6	1.1
C15	42.9758036	75.8895223	9.0	2.8
C16	42.9758839	75.8883072	10.8	3.3
C17	42.9759918	75.8871470	7.5	2.3
C18	42.9752870	75.8866842	4.9	1.5
C19	42.9750457	75.8874802	11.2	3.4
C20	42.9750334	75.8882365	10.5	3.2
C21	42.9749651	75.8893911	10.2	3.1
C22	42.9748581	75.8904700	4.3	1.3
C23	42.9740548	75.8901428	4.9	1.5
C24	42.9739341	75.8893533	8.5	2.6
C25	42.9740021	75.8878303	11.5	3.5
C26	42.9741368	75.8868632	11.5	3.5
C27	42.9743156	75.8861365	1.3	0.4
C28	42.9748021	75.8838658	4.3	1.3
C29	42.9750385	75.8833280	3.9	1.2
C30	42.9752415	75.8825262	3.3	1.0
C31	42.9754028	75.8816964	3.3	1.0
C32	42.9752738	75.8809542	3.9	1.2
C33	42.9750154	75.8813339	5.2	1.6
C34	42.9748007	75.8823264	6.6	2.0
C35	42.9745808	75.8831918	5.7	1.8
C36	42.9744812	75.8839023	4.6	1.4
C37	42.9747170	75.8804605	3.6	1.1
C38	42.9745272	75.8812385	7.2	2.2
C39	42.9742522	75.8821871	8.9	2.7
C40	42.9739459	75.8833035	7.4	2.3
C41	42.9737157	75.8843690	5.9	1.8
C42	42.9735318	75.8851375	5.7	1.8
C43	42.9734209	75.8861874	10.8	3.3
C44	42.9732563	75.8871586	13.1	4.0
C45	42.9730965	75.8879853	10.8	3.3
C46	42.9727927	75.8888289	3.6	1.1
C47	42.9722803	75.8881861	3.0	0.9
C48	42.9723151	75.8873411	9.2	2.8
C49	42.9723966	75.8862069	10.5	3.2
C50	42.9727738	75.8849941	10.5	3.2
C51	42.9730606	75.8842895	11.5	3.5
C52	42.9732875	75.8833700	10.8	3.3
C53	42.9735879	75.8826265	11.5	3.5
C54	42.9737212	75.8815971	11.5	3.5
C55	42.9739382	75.8807551	10.5	3.2
C56	42.9743169	75.8799511	4.3	1.3
C57	42.9736845	75.8794947	3.3	1.0
C58	42.9734881	75.8801008	7.2	2.2
C59	42.9730344	75.8811633	17.4	5.3
C60	42.9725813	75.8825812	14.8	4.5
C61	42.9724011	75.8835660	12.5	3.8
C62	42.9721624	75.8844711	13.5	4.1
C63	42.9719054	75.8852373	10.8	3.3
C64	42.9717794	75.8861146	7.9	2.4
C65	42.9716586	75.8868663	5.2	1.6
C66	42.9715393	75.8857554	3.9	1.2
C67	42.9715242	75.8848803	3.9	1.2
C68	42.9716138	75.8840747	6.9	2.1
C69	42.9719020	75.8833566	13.1	4.0
C70	42.9721660	75.8825192	13.5	4.1
C71	42.9722997	75.8813674	16.4	5.0
C72	42.9730035	75.8799040	7.4	2.3
C73	42.9732028	75.8792463	2.6	0.8
C74	42.9722799	75.8787055	3.0	0.9
C75	42.9719080	75.8793918	7.2	2.2
C76	42.9716923	75.8804835	19.7	6.0
C77	42.9714348	75.8818995	14.8	4.5
C78	42.9712043	75.8832194	6.6	2.0
C79	42.9705937	75.8828932	4.3	1.3
C80	42.9705660	75.8820202	11.5	3.5
C81	42.9707304	75.8809406	19.0	5.8
C82	42.9712400	75.8795300	13.1	4.0
C83	42.9710137	75.8783806	2.6	0.8
C84	42.9702305	75.8792937	2.3	0.7
C85	42.9699584	75.8802035	10.5	3.2
C86	42.9699251	75.8811233	11.5	3.5
C87	42.9698364	75.8819048	10.2	3.1
C88	42.9697445	75.8823727	3.6	1.1
C89	42.9690662	75.8821374	3.6	1.1
C90	42.9690518	75.8813570	10.2	3.1
C91	42.9690485	75.8802482	9.8	3.0
C92	42.9690193	75.8790655	5.9	1.8
C93	42.9690882	75.8782033	3.6	1.1
C94	42.9687384	75.8771237	2.6	0.8
C95	42.9685280	75.8780253	5.7	1.8
C96	42.9682861	75.8790745	6.9	2.1
C97	42.9680104	75.8800484	11.2	3.4
C98	42.9679045	75.8807838	10.8	3.3
C99	42.9677924	75.8812760	6.6	2.0
C100	42.9672178	75.8808920	3.3	1.0
C101	42.9673340	75.8799290	4.3	1.3
C102	42.9673922	75.8787366	9.0	2.8
C103	42.9675851	75.8774752	11.5	3.5
C104	42.9677963	75.8766177	3.3	1.0
C105	42.9671260	75.8763860	4.6	1.4
C106	42.9669547	75.8776315	8.5	2.6
C107	42.9666414	75.8786547	10.5	3.2
C108	42.9665132	75.8797000	6.9	2.1
C109	42.9662921	75.8806225	3.6	1.1
C110	42.9656107	75.8804896	3.3	1.0
C111	42.9656859	75.8793787	6.9	2.1
C112	42.9659134	75.8780624	11.8	3.6
C113	42.9661259	75.8768841	8.2	2.5
C114	42.9663321	75.8760186	3.3	1.0
C115	42.9657158	75.8754783	3.3	1.0
C116	42.9655924	75.8764797	10.5	3.2
C117	42.9651539	75.8778159	13.8	4.2
C118	42.9648903	75.8788614	7.2	2.2
C119	42.9646217	75.8798919	3.0	0.9
C120	42.9638469	75.8796666	2.3	0.7
C121	42.9639872	75.8786539	8.5	2.6
C122	42.9640562	75.8771422	19.0	5.8
C123	42.9644194	75.8755740	12.5	3.8
C124	42.9646037	75.8746784	4.9	1.5
C125	42.9639509	75.8739917	5.6	1.7
C126	42.9634950	75.8750705	20.7	6.3
C127	42.9630000	75.8769000	16.4	5.0
C128	42.9626120	75.8782140	9.2	2.8
C129	42.9625696	75.8789486	3.3	1.0
C130	42.9617547	75.8787332	2.6	0.8
C131	42.9619178	75.8777670	8.5	2.6
C132	42.9623696	75.8761069	24.6	7.5
C133	42.9629026	75.8743124	19.7	6.0
C134	42.9631780	75.8734217	8.5	2.6
C135	42.9624910	75.8726693	3.9	1.2
C136	42.9620143	75.8734742	23.0	7.0
C137	42.9615194	75.8756677	26.2	8.0
C138	42.9613350	75.8771279	8.5	2.6
C139	42.9611392	75.8783091	3.0	0.9
C140	42.9604037	75.8781300	3.3	1.0
C141	42.9604313	75.8772190	7.5	2.3
C142	42.9595200	75.8764300	9.8	3.0
C143	42.9592033	75.8775669	4.9	1.5
C144	42.9577861	75.8771686	3.3	1.0
C145	42.9580153	75.8757095	18.7	5.7
C146	42.9570793	75.8755557	12.5	3.8
C147	42.9564934	75.8765373	3.3	1.0
C148	42.9555737	75.8758508	4.6	1.4
C149	42.9553325	75.8751604	13.5	4.1
C150	42.9543763	75.8752152	16.4	5.0
C151	42.9540917	75.8759959	3.9	1.2
C152	42.9530739	75.8763460	5.2	1.6
C153	42.9528001	75.8755924	14.4	4.4

Table 3. (continued) Lake depths at 304 (SPs) in Cazenovia Lake on August 26, 27, 31 and September 2, 4, 8, 2009, (Racine-Johnson Aquatic Ecologists 2009).

Sample Point (SP)	Latitude	Longitude	Depth (ft) on date	Depth (m) on date
C154	42.9517314	75.8756775	14.8	4.5
C155	42.9515621	75.8770018	4.6	1.4
C156	42.9501003	75.8771800	4.9	1.5
C157	42.9499453	75.8758167	14.8	4.5
C158	42.9488451	75.8758542	18.7	5.7
C159	42.9485702	75.8773244	3.9	1.2
C160	42.9477748	75.8774691	3.3	1.0
C161	42.9475917	75.8758985	16.4	5.0
C162	42.9466809	75.8757081	16.4	5.0
C163	42.9463853	75.8767040	3.9	1.2
C164	42.9455270	75.8762902	4.3	1.3
C165	42.9453926	75.8754122	16.4	5.0
C166	42.9445793	75.8752376	16.4	5.0
C167	42.9444195	75.8759834	3.9	1.2
C168	42.9432615	75.8759196	3.9	1.2
C169	42.9429981	75.8750043	13.1	4.0
C170	42.9418304	75.8747106	14.4	4.4
C171	42.9414247	75.8757080	3.6	1.1
C172	42.9401233	75.8753818	5.9	1.8
C173	42.9399862	75.8747074	12.5	3.8
C174	42.9383104	75.8745134	19.7	6.0
C175	42.9378280	75.8748873	4.9	1.5
C176	42.9365290	75.8745377	4.9	1.5
C177	42.9356912	75.8742594	6.2	1.9
C178	42.9350748	75.8740183	6.6	2.0
C179	42.9340912	75.8736567	5.9	1.8
C180	42.9330340	75.8731804	6.6	2.0
C181	42.9319435	75.8729477	3.6	1.1
C182	42.9310224	75.8731385	4.9	1.5
C183	42.9296870	75.8735046	4.3	1.3
C184	42.9281775	75.8728412	4.3	1.3
C185	42.9265321	75.8721240	3.6	1.1
C186	42.9257155	75.8719777	3.3	1.0
C187	42.9251137	75.8716250	3.3	1.0
C188	42.9247432	75.8713105	1.6	0.5
C189	42.9247633	75.8705188	4.3	1.3
C190	42.9248473	75.8697053	3.0	0.9
C191	42.9249537	75.8691506	1.6	0.5
C192	42.9253350	75.8685134	2.0	0.6
C193	42.9254278	75.8691747	2.6	0.8
C194	42.9253384	75.8702124	5.6	1.7
C195	42.9251966	75.8708516	6.2	1.9
C196	42.9255932	75.8712796	6.2	1.9
C197	42.9258669	75.8704864	9.5	2.9
C198	42.9260443	75.8693318	9.5	2.9
C199	42.9261590	75.8680249	3.0	0.9
C200	42.9266074	75.8672421	3.0	0.9
C201	42.9268322	75.8681775	6.2	1.9
C202	42.9267355	75.8690874	21.7	6.6
C203	42.9265298	75.8704384	21.3	6.5
C204	42.9263044	75.8713266	8.9	2.7
C205	42.9269275	75.8666465	2.6	0.8
C206	42.9272609	75.8656704	3.3	1.0
C207	42.9272046	75.8647433	2.0	0.6
C208	42.9276074	75.8635928	2.3	0.7
C209	42.9280257	75.8624262	2.3	0.7
C210	42.9287360	75.8616444	2.3	0.7
C211	42.9290362	75.8609012	4.3	1.3
C212	42.9298672	75.8616947	4.3	1.3
C213	42.9293169	75.8617527	4.3	1.3
C214	42.9286751	75.8622374	4.3	1.3
C215	42.9280719	75.8629649	3.6	1.1
C216	42.9276304	75.8648623	4.3	1.3
C217	42.9275007	75.8657391	4.3	1.3
C218	42.9271591	75.8670809	4.9	1.5
C219	42.9272279	75.8679933	7.5	2.3
C220	42.9275721	75.8674094	6.9	2.1
C221	42.9280387	75.8664313	5.9	1.8
C222	42.9283663	75.8651808	5.6	1.7
C223	42.9283248	75.8640916	5.9	1.8
C224	42.9287048	75.8633765	5.9	1.8
C225	42.9291712	75.8627416	5.2	1.6
C226	42.9298394	75.8625205	5.9	1.8
C227	42.9300432	75.8634367	6.6	2.0
C228	42.9293931	75.8634320	5.9	1.8
C229	42.9290467	75.8638968	5.9	1.8
C230	42.9287962	75.8645679	6.2	1.9
C231	42.9288844	75.8653688	6.2	1.9
C232	42.9286809	75.8662364	16.4	5.0
C233	42.9293157	75.8653118	16.4	5.0
C234	42.9296609	75.8645246	6.6	2.0
C235	42.9302548	75.8641371	7.2	2.2
C236	42.9307040	75.8634337	7.2	2.2
C237	42.9307769	75.8623902	6.6	2.0
C238	42.9308294	75.8616143	4.3	1.3
C239	42.9310206	75.8620352	5.9	1.8
C240	42.9311872	75.8629885	6.6	2.0
C241	42.9313612	75.8637149	18.0	5.5
C242	42.9319507	75.8633538	13.1	4.0
C243	42.9319545	75.8624648	6.6	2.0
C244	42.9319412	75.8616640	3.9	1.2
C245	42.9325091	75.8615757	3.9	1.2
C246	42.9326620	75.8624227	4.9	1.5
C247	42.9326586	75.8630601	26.2	8.0
C248	42.9333868	75.8624961	11.5	3.5
C249	42.9333855	75.8617886	4.9	1.5
C250	42.9339217	75.8616015	3.3	1.0
C251	42.9340037	75.8623891	10.8	3.3
C252	42.9346773	75.8623507	11.5	3.5
C253	42.9348463	75.8615364	1.6	0.5
C254	42.9354530	75.8619048	3.3	1.0
C255	42.9362220	75.8621920	3.6	1.1
C256	42.9369650	75.8619328	3.6	1.1
C257	42.9376351	75.8617442	3.6	1.1
C258	42.9385100	75.8620200	3.6	1.1
C259	42.9393098	75.8623483	3.3	1.0
C260	42.9400512	75.8628134	8.9	2.7
C261	42.9407720	75.8631556	3.3	1.0
C262	42.9416008	75.8635156	4.9	1.5
C263	42.9422533	75.8635878	4.9	1.5
C264	42.9430995	75.8640906	9.2	2.8
C265	42.9429013	75.8631802	5.6	1.7
C266	42.9426494	75.8625223	5.6	1.7
C267	42.9430003	75.8619454	4.9	1.5
C268	42.9433829	75.8627976	9.8	3.0
C269	42.9435759	75.8636029	10.8	3.3
C270	42.9439633	75.8630170	9.2	2.8
C271	42.9438943	75.8620015	5.2	1.6
C272	42.9444150	75.8622345	4.9	1.5
C273	42.9445962	75.8629703	11.8	3.6
C274	42.9451239	75.8629946	13.8	4.2
C275	42.9456313	75.8626944	5.2	1.6
C276	42.9461594	75.8629479	5.9	1.8
C277	42.9467601	75.8633492	5.6	1.7
C278	42.9474827	75.8640020	8.2	2.5
C279	42.9482380	75.8643577	6.6	2.0
C280	42.9490292	75.8648116	8.2	2.5
C281	42.9500374	75.8644200	4.3	1.3
C282	42.9503459	75.8651772	11.2	3.4
C283	42.9511007	75.8653115	13.1	4.0
C284	42.9514316	75.8640595	4.3	1.3
C285	42.9521846	75.8644271	2.3	0.7
C286	42.9519156	75.8653291	7.5	2.3
C287	42.9526089	75.8660617	13.8	4.2
C288	42.9530069	75.8655404	3.6	1.1
C289	42.9534451	75.8659849	5.6	1.7
C290	42.9543054	75.8668946	6.2	1.9
C291	42.9552720	75.8673729	7.2	2.2
C292	42.9561640	75.8674418	4.9	1.5
C293	42.9569735	75.8674162	5.6	1.7
C294	42.9578700	75.8675725	4.9	1.5
C295	42.9576552	75.8686008	8.5	2.6
C296	42.9578858	75.8695389	11.2	3.4
C297	42.9586886	75.8693850	6.9	2.1
C298	42.9591254	75.8700775	4.9	1.5
C299	42.9596503	75.8706272	6.9	2.1
C300	42.9604199	75.8713875	6.9	2.1
C301	42.9612187	75.8718822	8.2	2.5
C302	42.9618373	75.8722143	7.5	2.3
C303	42.9484900	75.8664800	9.8	3.0
C304	42.9483600	75.8665100	8.2	2.5

References

- Allied Biological, Inc. 2008. Aquatic Macrophyte Survey September 18 & 19, 2008 Cazenovia Lake, Cazenovia, NY. Allied Biological, Inc., 580 Rockport Road, Hackettstown, NJ 07840. pp. 1 - 66.
- Borman, S., R. Korth, J. Temte. 1999. Through the Looking Glass: A Field Guide to Aquatic Plants. Wisconsin Lakes Partnership, University of Wisconsin-Extension. Reindl Printing, Inc. Merrill, WI. pp. 1 – 238.
- Crow, G. E., and C. B. Hellquist. 2000. Aquatic and Wetland Plants of Northeastern North America. The University of Wisconsin Press. 2 volumes. pp. 1 - 480; 1 - 400.
- Fassett, Norman C. 1972. A Manual of Aquatic Plants. The University of Wisconsin Press, Milwaukee.
- Johnson, R. L., J. A. Toner, J. A. Keith. 2006. Cazenovia Lake's Eurasian watermilfoil Herbivores in 2006. Cornell University Research Ponds, Dept of Ecology and Evolutionary Biology, Corson Hall, Cornell University, Ithaca, NY. pp. 1 – 29.
- Madsen, J. D. 1999. Point and line intercept methods for aquatic plant management. APCRP Technical Notes Collection (TN APCRP-M1-02), U.S. Army Engineer Research and Development Center, Vicksburg, MS. pp. 1 – 16. www.wes.army.mil/el/aqua.
- Racine-Johnson Aquatic Ecologists. 2008. Aquatic Plant and Aquatic Macroinvertebrate Monitoring in Chautauqua Lake during 2007. Racine-Johnson Aquatic Ecologists, 1185 Ellis Hollow Road, Ithaca, NY 14850. pp. 1 – 49.
- Racine-Johnson Aquatic Ecologists. 2009. Cazenovia Lake Plant Community Response to the 2009 Application of the Herbicide Triclopyr to Control Eurasian Watermilfoil. Racine-Johnson Aquatic Ecologists, 1185 Ellis Hollow Road, Ithaca, NY 14850. pp. 1 – 94.

Appendix

Table A. Results of a two rake-toss sampling of Cazenovia Lake on September 17, 18, 19, 23, 25, 2010 at 304 sample points (SPs).

Pages 18 – 39

Table B. Conversion of September 17, 18, 19, 23, 25, 2010 rake-toss from Table A to abundance categories for each species at each (SP).

Pages 40 – 50

Table C. Aquatic plant species' presence in Cazenovia Lake from two rake tosses on Sept. 17, 18, 19, 23, 25, 2010. Entries of "1" indicate species identified at that sample point (SP). Allied Biological chose the locations for (SPs) in October 2008 and we added 303 and 304.

Pages 51 – 61

Figures 5 - 34. Individual species maps of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

Pages 62 – 91

Table A. (continued) Results of a two rake-toss sampling of Cazenovia Lake on September 17, 18, 19, 23, 25, 2010 at 304 sample points (SPs).

Sample Point (SP)	Rake toss #	Latitude	Longitude	Depth (m) 2009 - Racine J	Rake Abundance	Ceratophyllum demersum	Chara vulgaris	Elodea sp.	Fontinalis sp.	Lemna minor	Lemna trisulca	Megalodonta beckii	Myriophyllum spicatum	Najas flexilis	Najas guadalupensis	Nitella flexilis	Nitellopsis obtusa	Nuphar variegata	Nymphaea odorata	Potamogeton amplifolius	Potamogeton crispus	Potamogeton foliosus	Potamogeton gramineus	Potamogeton illinoensis	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton zosteriformis	Ranunculus trichophyllus	Spirodela polyrrhiza	Stuckenia pectinata	Stuckenia vaginata	Utricularia vulgaris	Vallisneria americana	Wolffia columbiana	Zostera dubia	benthic filamentous algae					
C57	1	42.9736845	75.8794947	1.0	M	0	10	30				0	5	0.01						0				10											40		0					
	2				M	10	2	15				8	20	0.01						30				10												2		1				
C58	1	42.9734881	75.8801008	2.2	M	20		20															0													20		20	20			
	2				M	20		30															20													5		5	25			
C59	1	42.9730344	75.8811633	5.3	T	0		20																															60			
	2				M	10		5																																80		
C60	1	42.9725813	75.8825812	4.5	S	94		1	0.01		0										0.01																		5			
	2				M	70		0	0.01		1										0																			29		
C61	1	42.9724011	75.8835660	3.8	T	0		0	0				100																										0			
	2				S	5		5	0.01				0																											85		
C62	1	42.9721624	75.8844711	4.1	M	40		30			0										0																			30		
	2				S	94		0	1		0.01										0.01																			5		
C63	1	42.9719054	75.8852373	3.3	D	64		0													0.01																			1		
	2				D	95		5													0																			0		
C64	1	42.9717794	75.8861146	2.4	M	80					1		0																												4	
	2				S	80					0		2																												10	
C65	1	42.9716586	75.8868663	1.6	T	20		20	20		20									0																					20	
	2				S	85		0	0		5									5																					5	
C66	1	42.9715393	75.8857554	1.2	M	66		5	2																																	
	2				M	18		80	2					20																												
C67	1	42.9715242	75.8848803	1.2	S	40		40	20		0.01										0																					
	2				S	20		55	1		0										2																					
C68	1	42.9716138	75.8840747	2.1	D	65		5			0.01																															
	2				M	25		10			0.01																															
C69	1	42.9719020	75.8833566	4.0	T	60					0																															
	2				M	98					0.01																															
C70	1	42.9721660	75.8825192	4.1	M	95			0.01																																	
	2				T	0			100																																	

Table A. (continued) Results of a two rake-toss sampling of Cazenovia Lake on September 17, 18, 19, 23, 25, 2010 at 304 sample points (SPs).

Sample Point (SP)	Rake toss #	Latitude	Longitude	Depth (m) 2009 - Racine J	Rake Abundance	Ceratophyllum demersum	Chara vulgaris	Elodea sp.	Fontinalis sp.	Lemna minor	Lemna trisulca	Megalodonta beckii	Myriophyllum spicatum	Najas flexilis	Najas guadalupensis	Nitella flexilis	Nitellopsis obtusa	Nuphar variegata	Nymphaea odorata	Potamogeton amplifolius	Potamogeton crispus	Potamogeton foliosus	Potamogeton gramineus	Potamogeton illinoensis	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton zosteriformis	Ranunculus trichophyllus	Spirodela polyrrhiza	Stuckenia pectinata	Stuckenia vaginata	Utricularia vulgaris	Vallisneria americana	Zostera dubia	benthic filamentous algae											
C113	1	42.9661259	75.8768841	2.5	M		10	5	5					10	0									20	0	5	5								5	20	20										
	2				M		7	0	2						10	10							50	1	1	5	5								3	10	2										
C114	1	42.9663321	75.8760186	1.0	S		15	30					10	15								0													30												
	2				S		45	0					0	45									5											0													
C115	1	42.9657158	75.8754783	1.0	T	0							0														0	100																			
	2				T	30							40														3	25																			
C116	1	42.9655924	75.8764797	3.2	S	12	25	5	3					5									0				20									0		30	30								
	2				M	1	40	3	5					0									40				0									1			10	10							
C117	1	42.9651539	75.8778159	4.2	S		5	5	5													85																	5	5							
	2				T		0		50														0																	50	50						
C118	1	42.9648903	75.8788614	2.2	S	5	0		5														40													40			10	10							
	2				S	10	2	8															20														8			50	50						
C119	1	42.9646217	75.8798919	0.9	M		77																																	1	1						
	2				M		50																38																		3	1					
C120	1	42.9638469	75.8796666	0.7	M		95	5																																							
	2				D		80	5																																							
C121	1	42.9639872	75.8786539	2.6	M	60			10				10																													20	20				
	2				M	30		2					0										40																					28	28		
C122	1	42.9640562	75.8771422	5.8	O	0																																				0	0				
	2				T	30																																						70	70		
C123	1	42.9644194	75.8755740	3.8	S		5	15						0																																	
	2				M		80	4							0.01																																
C124	1	42.9646037	75.8746784	1.5	T																																										
	2				T																																										
C125	1	42.9639509	75.8739917	1.7	S	15	30	5						0																																	
	2				S	3	0	30							2																																
C126	1	42.9634950	75.8750705	6.3	T																																										
	2				S																																										

Table A. (continued) Results of a two rake-toss sampling of Cazenovia Lake on September 17, 18, 19, 23, 25, 2010 at 304 sample points (SPs).

Sample Point (SP)	Rake toss #	Latitude	Longitude	Depth (m) 2009 - Racine J	Rake Abundance	Ceratophyllum demersum	Chara vulgaris	Elodea sp.	Fontinalis sp.	Lemna minor	Lemna trisulca	Megalodonta beckii	Myriophyllum spicatum	Najas flexilis	Najas guadalupensis	Nitella flexilis	Nitellopsis obtusa	Nuphar variegata	Nymphaea odorata	Potamogeton amplifolius	Potamogeton crispus	Potamogeton foliosus	Potamogeton gramineus	Potamogeton illinoensis	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton zosteriformis	Ranunculus trichophyllus	Spirodela polyrrhiza	Stuckenia pectinata	Stuckenia vaginata	Utricularia vulgaris	Vallisneria americana	Wolffia columbiana	Zostera dubia	benthic filamentous algae		
C141	1	42.9604313	75.8772190	2.3	T	45	0	2						0																				8			45		
	2				S	0	5	3						10																			22			60			
C142	1	42.9595200	75.8764300	3.0	S	15	40	0																20							7	3					15		
	2				T	15	5	30																0							0	0					50		
C143	1	42.9592033	75.8775669	1.5	M		20	0	3					5	5			50						10									7				0		
	2				M		50	20	0					0	0			0						0										20			5		
C144	1	42.9577861	75.8771686	1.0	S		70	10				6		2										10	0						0	0		2				0	
	2				M		60	0				0		0									10	15							5	0		0				5	
C145	1	42.9580153	75.8757095	5.7	M	99																																1	
	2				M	100																																0.01	
C146	1	42.9570793	75.8755557	3.8	M	90																													2			0	
	2				M	98																													0			2	
C147	1	42.9564934	75.8765373	1.0	S		80	0						3	0																				10			7	
	2				M		35	15						3	2																				35			0	
C148	1	42.9555737	75.8758508	1.4	S		4	4						0																					10				
	2				S		3	20						30																					40				
C149	1	42.9553325	75.8751604	4.1	S	0	70	0.01						5	5																								
	2				S	97	0	0						0	3																								
C150	1	42.9543763	75.8752152	5.0	T		0	0																														90	
	2				T		99		1																													0	
C151	1	42.9540917	75.8759959	1.2	S		40	10	1					5	15																							0	
	2				S		30	0	0					0	0																							25	
C152	1	42.9530739	75.8763460	1.6	S		50	1																														30	
	2				S		0	0																														3	
C153	1	42.9528001	75.8755924	4.4	T	0	0																															0	
	2				S	0.01	5								45																							1	
C154	1	42.9517314	75.8756775	4.5	S	40																																20	
	2				M	100									0																								20
					M										0.01																								0

Table A. (continued) Results of a two rake-toss sampling of Cazenovia Lake on September 17, 18, 19, 23, 25, 2010 at 304 sample points (SPs).

Sample Point (SP)	Rake toss #	Latitude	Longitude	Depth (m) 2009 - Racine J	Rake Abundance	Ceratophyllum demersum	Chara vulgaris	Elodea sp.	Fontinalis sp.	Lemna minor	Lemna trisulca	Megalodonta beckii	Myriophyllum spicatum	Najas flexilis	Najas guadalupensis	Nitellopsis obtusa	Nuphar variegata	Nymphaea odorata	Potamogeton amplifolius	Potamogeton crispus	Potamogeton foliosus	Potamogeton gramineus	Potamogeton illinoensis	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton zosteriformis	Ranunculus trichophyllus	Spirodela polyrrhiza	Stuckenia pectinata	Stuckenia vaginata	Utricularia vulgaris	Vallisneria americana	Wolffia columbiana	Zostera dubia	benthic filamentous algae				
C155	1	42.9515621	75.8770018	1.4	S		1	4	0													0	70		0.01								10	15	0					
	2				S		10	0	3													10	40		0								10	20	7					
C156	1	42.9501003	75.8771800	1.5	S		65	15	2					2													8	0					0		0	8				
	2				M		90	5	0					0													0	3					2		0	0				
C157	1	42.9499453	75.8758167	4.5	S	30	2																	60												8	8			
	2				O	0	0																	0												0	0			
C158	1	42.9488451	75.8758542	5.7	O	0																															0	0		
	2				M	80																															0	20		
C159	1	42.9485702	75.8773244	1.2	S		5	20				10																							50	5	0			
	2				M		5	37			10											3												10	20	3	0			
C160	1	42.9477748	75.8774691	1.0	S		85	10	0																										5					
	2				M		85	5	5																									5						
C161	1	42.9475917	75.8758985	5.0	T	0																															100			
	2				T	5																															95			
C162	1	42.9466809	75.8757081	5.0	S	95							0																								5			
	2				T	0							30																									70		
C163	1	42.9463853	75.8767040	1.2	S	0	98	0																													0	0		
	2				M	4	18	18							7																				23	23				
C164	1	42.9455270	75.8762902	1.3	S	80							10																								0	0		
	2				S	40	10						0																								10			
C165	1	42.9455926	75.8754122	5.0	T	90																																		
	2				O	0																																		
C166	1	42.9445793	75.8752376	5.0	S	20							T																											
	2				D	80							10																											
C167	1	42.9444195	75.8759834	1.2	S		30	30					0																								5	3	0	
	2				S		40	0					2																								10	8	2	
C168	1	42.9432615	75.8759196	1.2	S		5	30																																
	2				S		20	20																																

Table A. (continued) Results of a two rake-toss sampling of Cazenovia Lake on September 17, 18, 19, 23, 25, 2010 at 304 sample points (SPs).

Sample Point (SP)	Rake toss #	Latitude	Longitude	Depth (m) 2009 - Raccine J	Rake Abundance	Ceratophyllum demersum	Chara vulgaris	Elodea sp.	Fontinalis sp.	Lemna minor	Lemna trisulca	Megalodonta beckii	Myriophyllum spicatum	Najas flexilis	Najas guadalupensis	Nitellopsis obtusa	Nuphar variegata	Nymphaea odorata	Potamogeton amplifolius	Potamogeton crispus	Potamogeton foliosus	Potamogeton gramineus	Potamogeton illinoensis	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton zosteriformis	Ranunculus trichophyllus	Spirodela polyrrhiza	Stuckenia pectinata	Stuckenia vaginata	Utricularia vulgaris	Vallisneria americana	Wolffia columbiana	Zostera dubia	benthic filamentous algae							
C211	1	42.9290362	75.8609012	1.3	M	46	48																		0.01		1	5				0.00					0						
	2				M	0	60																		0		2	6				30					2						
C212	1	42.9298672	75.8616947	1.3	S	10	5	20	0.01			5			10						0												5					45					
	2				S	0.01	25	10	0			0			20						2												5					38					
C213	1	42.9293169	75.8617527	1.3	M	30	20					0.01			1				2				35						0				2										
	2				D	60	8					0			0.00				20				0						1				3										
C214	1	42.9286751	75.8622374	1.3	S	0	17														0								0	3			10					70					
	2				S	15	25														5								5	10			20					15					
C215	1	42.9280719	75.8629649	1.1	S		90																								10												
	2				S		90																							10													
C216	1	42.9276304	75.8648623	1.3	S		85																																				
	2				S		60																																				
C217	1	42.9275007	75.8657391	1.3	S	5	5																																				
	2				M	0	50																																				
C218	1	42.9271591	75.8670809	1.5	M	0	5	10							55																												
	2				S	10	5	0							5																												
C219	1	42.9272279	75.8679933	2.3	M	10	1																																				
	2				M	40	0																																				
C220	1	42.9275721	75.8674094	2.1	S	0	0	0.01																																			
	2				S	0.01	5	0																																			
C221	1	42.9280387	75.8664313	1.8	S		2	3	2																																		
	2				S		0	25	0																																		
C222	1	42.9283663	75.8651808	1.7	S		5		0.01																																		
	2				S		5		0																																		
C223	1	42.9283248	75.8640916	1.8	S	10	15	0							0																												
	2				M	5	1	3							1																												
C224	1	42.9287048	75.8633765	1.8	T		0	2	0						0																												
	2				M		30	10	0.01						10																												

Table A. (continued) Results of a two rake-toss sampling of Cazenovia Lake on September 17, 18, 19, 23, 25, 2010 at 304 sample points (SPs).

Sample Point (SP)	Rake toss #	Latitude	Longitude	Depth (m) 2009 - Racine J	Rake Abundance	Ceratophyllum demersum	Chara vulgaris	Elodea sp.	Fontinalis sp.	Lemna minor	Lemna trisulca	Megalodonta beckii	Myriophyllum spicatum	Najas flexilis	Najas guadalupensis	Nitella flexilis	Nitellopsis obtusa	Nuphar variegata	Nymphaea odorata	Potamogeton amplifolius	Potamogeton crispus	Potamogeton foliosus	Potamogeton gramineus	Potamogeton illinoensis	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton zosteriformis	Ranunculus trichophyllus	Spirodela polyrrhiza	Stuckenia pectinata	Stuckenia vaginata	Utricularia vulgaris	Vallisneria americana	Wolffia columbiana	Zostera dubia	benthic filamentous algae								
C267	1	42.9430003	75.8619454	1.5	M		70		0							0							28												2										
	2				S		60		1							8							30												1										
C268	1	42.9433829	75.8627976	3.0	D	5		0															90		0							0				0			0						
	2				D	0		10															50		8											20			10						
C269	1	42.9435759	75.8636029	3.3	D	60																	35																5						
	2				M	70																	25																5						
C270	1	42.9439633	75.8630170	2.8	S	40							0		10								50																						
	2				S	0							5		0								95																						
C271	1	42.9438943	75.8620015	1.6	S		60	0					2		15								15		0							0			1			15	0						
	2				M		10	2					0		50								50		5								5			10			2	3					
C272	1	42.9444150	75.8622345	1.5	D	20	0	0							0																										14				
	2				D	5	15	3							3								60		0																13				
C273	1	42.9445962	75.8629703	3.6	S	90																																			10				
	2				S	90																																			0				
C274	1	42.9451239	75.8629946	4.2	M	80																																							
	2				D	50																																							
C275	1	42.9456313	75.8626944	1.6	S	0		40							0																												30		
	2				M	2		20							8																												10		
C276	1	42.9461594	75.8629479	1.8	S		5	25							25																												25		
	2				M		0	15							15																												15		
C277	1	42.9467601	75.8633492	1.7	S			20							2																													2	
	2				M			40							4																													8	
C278	1	42.9474827	75.8640020	2.5	M	15	5	5																																				75	
	2				M	15	0	10																																				5	
C279	1	42.9482380	75.8643577	2.0	S			30							0																													20	
	2				S			40							10																														30
C280	1	42.9490292	75.8648116	2.5	M	0	18	20							2																													40	
	2				S	3	20	30							0																														0

Table C. Aquatic plant species' presence in Cazenovia Lake from two rake tosses on Sept. 17, 18, 19, 23, 25, 2010. Entries of "1" indicate species identified at that sample point (SP). Allied Biological chose the locations for (SPs) in October 2008 and we added 303 and 304.

Sample Point (SP)	Depth (m) 2009 - Racine J	Ceratophyllum demersum	Chara vulgaris	Elodea sp.	Fontinalis sp.	Lemna minor	Lemna trisulca	Megalodonta beckii	Myriophyllum spicatum	Najas flexilis	Najas guadalupensis	Nitella flexilis	Nitellopsis obtusa	Nuphar variegata	Nymphaea odorata	Potamogeton amplifolius	Potamogeton crispus	Potamogeton foliosus	Potamogeton gramineus	Potamogeton illinoensis	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton zosteriformis	Ranunculus trichophyllus	Spirodela polytricha	Stuckenia pectinata	Stuckenia vaginata	Utricularia vulgaris	Vallisneria americana	Wolffia columbiana	Zosterella dubia	floating filamentous algae	Native Species	Non-native Species	Total
C1	0.3	1		1	1	1	1					1										1	1	1	1	1						1	11	0	11	
C2	0.5	1		1	1	1	1		1						1								1	1	1	1	1					1	13	1	12	
C3	1.0	1		1			1							1									1	1	1	1	1					1	10	0	10	
C4	1.0	1	1	1		1	1		1			1											1	1	1	1	1					1	14	2	12	
C5	1.2	1	1	1		1	1		1			1		1									1	1	1	1	1					1	16	3	13	
C6	1.0	1	1	1	1	1			1			1		1									1	1	1	1	1					1	16	2	14	
C7	1.8	1		1																												1	6	1	5	
C8	2.3	1		1		1			1		1		1										1	1	1	1	1					1	12	3	9	
C9	1.6	1		1	1	1			1														1	1	1	1	1					1	14	2	12	
C10	1.0	1	1	1		1	1		1			1		1									1	1	1	1	1					1	15	3	12	
C11	3.2	1	1	1	1	1	1		1			1		1									1	1	1	1	1					1	17	3	14	
C12	2.8	1											1										1	1	1	1	1					1	8	2	6	
C13	1.3	1		1								1											1	1	1	1	1					1	7	0	7	
C14	1.1	1	1	1					1														1	1	1	1	1					11	2	9		
C15	2.8	1											1																			1	4	1	3	
C16	3.3	1									1												1	1	1	1	1					1	4	0	4	
C17	2.3	1																					1	1	1	1	1					1	5	0	5	
C18	1.5	1		1																			1	1	1	1	1					1	9	0	9	
C19	3.4	1																														1	3	0	3	
C20	3.2	1		1																			1	1	1	1	1					1	4	0	4	
C21	3.1	1											1																			1	5	2	3	
C22	1.3	1	1			1							1										1	1	1	1	1					1	11	1	10	
C23	1.5	1	1	1					1			1		1											1	1	1					1	7	2	5	
C24	2.6	1											1																				2	1	1	
C25	3.5	1											1																			2	1	1		
C26	3.5	1		1																												1	4	0	4	
C27	0.4	1	1	1								1		1																	1	12	1	11		
C28	1.3	1	1	1					1			1											1	1	1	1	1					1	11	1	10	
C29	1.2	1	1	1																			1	1	1	1	1					1	9	0	9	
C30	1.0	1		1					1																							1	7	1	6	

Table C. (continued) Aquatic plant species' presence in Cazenovia Lake from two rake tosses on Sept. 17, 18, 19, 23, 25, 2010. Entries of "1" indicate species identified at that sample point (SP). Allied Biological chose the locations for (SPs) in October 2008, we added 303 and 304.

Sample Point (SP)	Depth (m) 2009 - Racine J	Ceratophyllum demersum	Chara vulgaris	Elodea sp.	Fontinalis sp.	Lemna minor	Lemna trisulca	Megalodonta beckettii	Myriophyllum spicatum	Najas flexilis	Najas guadalupensis	Nitella flexilis	Nitellopsis obtusa	Nuphar variegata	Nymphaea odorata	Potamogeton amplifolius	Potamogeton crispus	Potamogeton foliosus	Potamogeton gramineus	Potamogeton illinoensis	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton zosteriformis	Ranunculus trichophyllus	Spirodela polyrhiza	Stuckenia pectinata	Stuckenia vaginata	Utricularia vulgaris	Vallisneria americana	Wolffia columbiana	Zosterella dubia	floating filamentous algae	Total	Non-native Species	Native Species	
C31	1.0								1				1																				1	6	2	4	
C32	1.2			1				1																										1	11	0	11
C33	1.6																																		4	0	4
C34	2.0																																	1	8	0	8
C35	1.8																																	1	6	0	6
C36	1.4																																	1	8	0	8
C37	1.1																																		4	0	4
C38	2.2																																	1	7	0	7
C39	2.7																																	1	4	0	4
C40	2.3																																	1	8	0	8
C41	1.8																																	1	4	0	4
C42	1.8																																	1	7	0	7
C43	3.3																																	1	4	0	4
C44	4.0																																	4	4	1	3
C45	3.3																																	3	1	2	
C46	1.1																																		7	1	6
C47	0.9																																	1	10	1	9
C48	2.8																																	1	8	2	6
C49	3.2																																	1	6	1	5
C50	3.2																																	1	5	0	5
C51	3.5																																	1	3	0	3
C52	3.3																																	1	5	0	5
C53	3.5																																	1	6	0	6
C54	3.5																																	1	6	0	6
C55	3.2																																	1	5	0	5
C56	1.3																																	1	5	0	5
C57	1.0																																	1	11	1	10
C58	2.2																																	1	6	0	6
C59	5.3																																	1	5	0	5
C60	4.5																																	1	6	1	5

Table C. (continued) Aquatic plant species' presence in Cazenovia Lake from two rake tosses on Sept. 17, 18, 19, 23, 25, 2010. Entries of "1" indicate species identified at that sample point (SP). Allied Biological chose the locations for (SPs) in October 2008, we added 303 and 304.

Sample Point (SP)	Depth (m) 2009 - Racine J	Ceratophyllum demersum	Chara vulgaris	Elodea sp.	Fontinalis sp.	Lemna minor	Lemna trisulca	Megalodonta beckii	Myriophyllum spicatum	Najas flexilis	Najas guadalupensis	Nitella flexilis	Nitellopsis obtusa	Nuphar variegata	Nymphaea odorata	Potamogeton amplifolius	Potamogeton crispus	Potamogeton foliosus	Potamogeton gramineus	Potamogeton illinoensis	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton zosteriformis	Ranunculus trichophyllus	Spirodela polyrhiza	Stuckenia pectinata	Stuckenia vaginata	Utricularia vulgaris	Vallisneria americana	Wolffia columbiana	Zosterella dubia	benthic filamentous algae	Total	Non-native Species	Native Species	floating filamentous algae
C61	3.8	1		1	1				1				1																				1	6	2	4	
C62	4.1	1	1	1			1										1						1										1	7	1	6	
C63	3.3	1	1														1						1										1	5	1	4	
C64	2.4	1					1		1														1					1					1	6	1	5	
C65	1.6	1		1	1		1							1									1										1	7	0	7	
C66	1.2	1	1	1					1															1									1	7	1	6	
C67	1.2	1	1	1			1														1			1									1	7	1	6	
C68	2.1	1		1			1						1							1	1		1									1	9	1	8		
C69	4.0	1					1														1		1									1	5	0	5		
C70	4.1	1			1																												1	3	0	3	
C71	5.0	1					1																1									1	4	0	4		
C72	2.3	1		1																	1		1				1					1	9	1	8		
C73	0.8	1	1	1							1																1						7	0	7		
C74	0.9	1	1	1																	1	1	1				1					13	1	12			
C75	2.2	1		1					1														1									1	6	1	5		
C76	6.0																															1	1	0	1		
C77	4.5	1		1	1		1					1										1										1	9	1	8		
C78	2.0	1		1	1																		1	1								1	6	0	6		
C79	1.3	1	1	1			1													1			1	1								1	12	0	12		
C80	3.5	1																														3	1	2			
C81	5.8	1			1																											1	3	0	3		
C82	4.0	1		1					1																							4	1	3			
C83	0.8	1	1	1					1																							6	1	5			
C84	0.7	1	1	1					1			1									1		1	1								12	1	11			
C85	3.2	1			1															1												1	5	0	5		
C86	3.5	1		1					1																							1	7	2	5		
C87	3.1	1		1	1																						1					1	6	0	6		
C88	1.1	1	1	1	1		1														1		1	1								11	0	11			
C89	1.1	1	1	1																												5	0	5			
C90	3.1	1		1																												1	3	0	3		

Table C. (continued) Aquatic plant species' presence in Cazenovia Lake from two rake tosses on Sept. 17, 18, 19, 23, 25, 2010. Entries of "1" indicate species identified at that sample point (SP). Allied Biological chose the locations for (SPs) in October 2008, we added 303 and 304.

Sample Point (SP)	Depth (m) 2009 - Racine J	Ceratophyllum demersum	Chara vulgaris	Elodea sp.	Fontinalis sp.	Lemna minor	Lemna trisulca	Megalodonta beckii	Myriophyllum spicatum	Najas flexilis	Najas guadalupensis	Nitella flexilis	Nitellopsis obtusa	Nuphar variegata	Nymphaea odorata	Potamogeton amplifolius	Potamogeton crispus	Potamogeton foliosus	Potamogeton gramineus	Potamogeton illinoensis	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton zosteriformis	Ranunculus trichophyllus	Spirodela polyrhiza	Stuckenia pectinata	Stuckenia vaginata	Utricularia vulgaris	Vallisneria americana	Wolffia columbiana	Zosterella dubia	benthic filamentous algae	Total	Non-native Species	Native Species	floating filamentous algae	
C91	3.0	1		1	1															1													1	6	0	6		
C92	1.8		1		1																											1		1	4	0	4	
C93	1.1		1	1						1	1																								5	0	5	
C94	0.8		1							1	1																								5	0	5	
C95	1.8	1	1	1	1						1																					1		1	9	0	9	
C96	2.1		1		1					1																								1	6	1	5	
C97	3.4		1	1	1																													1	6	0	6	
C98	3.3			1																														1	2	0	2	
C99	2.0	1		1																														1	7	0	7	
C100	1.0	1		1																														1	7	1	6	
C101	1.3	1	1	1	1		1																											1	9	0	9	
C102	2.8	1			1																													1	4	0	4	
C103	3.5		1							1	1																								6	0	6	
C104	1.0		1	1							1																								7	1	6	1
C105	1.4	1	1	1							1																								8	1	7	1
C106	2.6		1	1	1					1	1																							1	8	0	8	
C107	3.2	1	1																															1	5	0	5	
C108	2.1	1			1																													1	5	0	5	
C109	1.1	1	1	1	1			1			1																							1	10	1	9	
C110	1.0	1	1	1	1						1																								6	0	6	
C111	2.1	1	1		1																													1	4	0	4	
C112	3.6	1		1	1																													1	4	0	4	
C113	2.5		1	1	1						1	1																						1	11	0	11	
C114	1.0		1	1							1																								7	1	6	
C115	1.0	1																																	5	1	4	1
C116	3.2	1	1	1	1						1																							1	9	0	9	
C117	4.2		1	1	1																													1	4	0	4	
C118	2.2	1	1	1	1						1																							1	7	0	7	
C119	0.9		1																															1	7	0	7	
C120	0.7		1	1																															3	0	3	

Table C. (continued) Aquatic plant species' presence in Cazenovia Lake from two rake tosses on Sept. 17, 18, 19, 23, 25, 2010. Entries of "1" indicate species identified at that sample point (SP). Allied Biological chose the locations for (SPs) in October 2008, we added 303 and 304.

Sample Point (SP)	Depth (m) 2009 - Racine J	Ceratophyllum demersum	Chara vulgaris	Elodea sp.	Fontinalis sp.	Lemna minor	Lemna trisulca	Megalodonta beckettii	Myriophyllum spicatum	Najas flexilis	Najas guadalupensis	Nitella flexilis	Nitellopsis obtusa	Nuphar variegata	Nymphaea odorata	Potamogeton amplifolius	Potamogeton crispus	Potamogeton foliosus	Potamogeton gramineus	Potamogeton illinoensis	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton zosteriformis	Ranunculus trichophyllus	Spirodela polyrhiza	Stuckenia pectinata	Stuckenia vaginata	Utricularia vulgaris	Vallisneria americana	Wolffia columbiana	Zosterella dubia	benthic filamentous algae	Total	Non-native Species	Native Species	Floating filamentous algae	
C121	2.6	1			1				1											1												1	5	1	4			
C122	5.8	1																															1	2	0	2		
C123	3.8		1	1						1			1							1													8	2	6			
C124	1.5								1													1											3	1	2			
C125	1.7	1	1	1						1		1										1											8	0	8			
C126	6.3																																1	1	0	1		
C127	5.0	1	1																			1											1	7	0	7		
C128	2.8		1	1																													1	5	0	5		
C129	1.0		1	1																														5	0	5	1	
C130	0.8	1	1	1	1							1																					7	0	7			
C131	2.6	1	1	1									1																				1	7	2	5	1	
C132	7.5																																	1	1	0	1	
C133	6.0	1	1								1																							1	6	0	6	
C134	2.6	1	1	1																														9	2	7		
C135	1.2		1							1																								5	0	5	1	
C136	7.0		1																															3	1	2		
C137	8.0																																	1	1	0	1	
C138	2.6	1			1																													7	1	6		
C139	0.9		1	1						1																								6	0	6		
C140	1.0		1	1	1			1																										10	1	9		
C141	2.3	1	1	1																														6	0	6		
C142	3.0	1	1	1																														7	0	7		
C143	1.5		1	1	1					1																								10	0	10	1	
C144	1.0		1	1				1																										10	0	10		
C145	5.7	1																																1	2	0	2	
C146	3.8	1																																1	4	0	4	
C147	1.0		1	1						1																								7	0	7		
C148	1.4		1	1																														7	1	6		
C149	4.1	1	1	1						1																								6	0	6	1	
C150	5.0		1	1	1																													1	4	0	4	

Table C. (continued) Aquatic plant species' presence in Cazenovia Lake from two rake tosses on Sept. 17, 18, 19, 23, 25, 2010. Entries of "1" indicate species identified at that sample point (SP). Allied Biological chose the locations for (SPs) in October 2008, we added 303 and 304.

Sample Point (SP)	Depth (m) 2009 - Racine J	Ceratophyllum demersum	Chara vulgaris	Elodea sp.	Fontinalis sp.	Lemna minor	Lemna trisulca	Megalodonta beckii	Myriophyllum spicatum	Najas flexilis	Najas guadalupensis	Nitella flexilis	Nitellopsis obtusa	Nuphar variegata	Nymphaea odorata	Potamogeton amplifolius	Potamogeton crispus	Potamogeton foliosus	Potamogeton gramineus	Potamogeton illinoensis	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton zosteriformis	Ranunculus trichophyllus	Spirodela polyrhiza	Stuckenia pectinata	Stuckenia vaginata	Utricularia vulgaris	Vallisneria americana	Wolffia columbiana	Zosterella dubia	benthic filamentous algae	Total	Non-native Species	Native Species	Floating filamentous algae
C151	1.2		1	1	1				1	1											1								1			1	9	1	8	1	
C152	1.6		1	1						1	1										1		1							1			8	0	8		
C153	4.4	1	1								1									1	1									1			7	0	7		
C154	4.5	1									1																			1			4	0	4		
C155	1.4		1	1	1						1											1							1			9	0	9	1		
C156	1.5		1	1	1							1												1					1			8	0	8			
C157	4.5	1	1																	1									1			4	0	4			
C158	5.7	1																											1			2	0	2			
C159	1.2		1	1				1			1												1						1			10	0	10			
C160	1.0		1	1	1																		1									4	0	4			
C161	5.0	1																											1			2	0	2			
C162	5.0	1							1																				1			3	1	2			
C163	1.2	1	1	1							1													1								8	0	8			
C164	1.3		1	1						1																						5	1	4			
C165	5.0	1																														2	0	2			
C166	5.0	1																			1	1										5	1	4			
C167	1.2		1	1						1																						9	1	8			
C168	1.2		1	1								1											1									6	0	6			
C169	4.0	1																														2	0	2			
C170	4.4	1																														2	0	2			
C171	1.1	1	1	1							1																		1			10	0	10			
C172	1.8	1	1	1																												7	0	7			
C173	3.8	1																														4	1	3			
C174	6.0																															1	1	0	1		
C175	1.5	1		1																												7	0	7	1		
C176	1.5	1	1	1																												6	0	6			
C177	1.9	1		1																												9	1	8			
C178	2.0	1		1																												7	0	7			
C179	1.8	1	1	1			1																									8	0	8			
C180	2.0	1	1	1				1																								10	0	10			

Table C. (continued) Aquatic plant species' presence in Cazenovia Lake from two rake tosses on Sept. 17, 18, 19, 23, 25, 2010. Entries of "1" indicate species identified at that sample point (SP). Allied Biological chose the locations for (SPs) in October 2008, we added 303 and 304.

Sample Point (SP)	Depth (m) 2009 - Racine J	Ceratophyllum demersum	Chara vulgaris	Elodea sp.	Fontinalis sp.	Lemna minor	Lemna trisulca	Megalodonta beckettii	Myriophyllum spicatum	Najas flexilis	Najas guadalupensis	Nitella flexilis	Nitellopsis obtusa	Nuphar variegata	Nymphaea odorata	Potamogeton amplifolius	Potamogeton crispus	Potamogeton foliosus	Potamogeton gramineus	Potamogeton illinoensis	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton zosteriformis	Ranunculus trichophyllus	Spirodela polyrhiza	Stuckenia pectinata	Stuckenia vaginata	Utricularia vulgaris	Vallisneria americana	Wolffia columbiana	Zosterella dubia	benthic filamentous algae	Total	Non-native Species	Native Species	Floating filamentous algae	
C181	1.1	1	1						1	1									1					1						1				5	0	5		
C182	1.5	1		1					1										1					1							1				9	1	8	
C183	1.3	1		1					1	1																								5	1	4		
C184	1.3	1	1	1					1	1	1	1							1					1							1			12	1	11		
C185	1.1		1						1										1															4	0	4		
C186	1.0	1	1	1		1			1	1	1								1												1			13	1	12		
C187	1.0	1		1					1	1	1		1											1										11	2	9		
C188	0.5	1		1					1	1	1													1										9	2	7	1	
C189	1.3	1	1	1				1		1	1								1					1										13	0	13		
C190	0.9	1	1	1					1	1	1								1					1										11	1	10	1	
C191	0.5		1						1	1	1													1										6	0	6	1	
C192	0.6		1	1					1	1	1								1															4	0	4	1	
C193	0.8		1						1	1	1								1															5	0	5		
C194	1.7	1		1					1	1	1																							5	1	4		
C195	1.9	1		1					1	1	1								1					1										9	1	8		
C196	1.9	1		1					1	1	1													1										7	0	7		
C197	2.9	1		1					1	1	1								1															7	1	6		
C198	2.9	1							1	1	1																							2	0	2		
C199	0.9		1		1				1	1	1																							4	0	4	1	
C200	0.9		1	1					1	1	1																							6	0	6	1	
C201	1.9	1		1					1	1	1								1															9	1	8		
C202	6.6	1							1	1	1																							2	0	2		
C203	6.5								1	1	1																							1	0	1		
C204	2.7	1		1					1	1	1																								8	1	7	
C205	0.8	1							1	1	1																							4	0	4	1	
C206	1.0		1	1					1	1	1																							6	0	6		
C207	0.6		1						1	1	1													1										3	0	3	1	
C208	0.7		1						1	1	1																							2	0	2		
C209	0.7		1	1					1	1	1																							6	0	6	1	
C210	0.7		1						1	1	1																							4	1	3		

Table C. (continued) Aquatic plant species' presence in Cazenovia Lake from two rake tosses on Sept. 17, 18, 19, 23, 25, 2010. Entries of "1" indicate species identified at that sample point (SP). Allied Biological chose the locations for (SPs) in October 2008, we added 303 and 304.

Sample Point (SP)	Depth (m) 2009 - Racine J	Ceratophyllum demersum	Chara vulgaris	Elodea sp.	Fontinalis sp.	Lemna minor	Lemna trisulca	Megalodonta beckettii	Myriophyllum spicatum	Najas flexilis	Najas guadalupensis	Nitella flexilis	Nitellopsis obtusa	Nuphar variegata	Nymphaea odorata	Potamogeton amplifolius	Potamogeton crispus	Potamogeton foliosus	Potamogeton gramineus	Potamogeton illinoensis	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton zosteriformis	Ranunculus trichophyllus	Spirodela polyrhiza	Stuckenia pectinata	Stuckenia vaginata	Utricularia vulgaris	Vallisneria americana	Wolffia columbiana	Zosterella dubia	benthic filamentous algae	Total	Non-native Species	Native Species	Floating filamentous algae
C211	1.3	1		1													1					1	1									1	7	0	7		
C212	1.3	1	1	1	1			1			1						1																1	9	1	8	
C213	1.3	1		1				1			1					1						1											10	0	10		
C214	1.3	1		1													1						1										8	1	7		
C215	1.1		1																								1						2	0	2		
C216	1.3		1								1																						3	0	3		
C217	1.3	1	1								1												1										5	0	5		
C218	1.5	1	1	1					1		1												1										10	1	9		
C219	2.3	1	1						1														1										8	1	7		
C220	2.1	1		1	1																	1											8	0	8		
C221	1.8		1	1	1				1																								10	1	9		
C222	1.7		1		1																												7	0	7		
C223	1.8	1	1	1						1													1										15	0	15		
C224	1.8		1	1	1																												8	0	8		
C225	1.6		1		1																												8	0	8		
C226	1.8	1		1	1																												8	1	7		
C227	2.0	1		1	1																												6	0	6		
C228	1.8	1		1	1																		1										7	0	7		
C229	1.8			1	1																												6	0	6		
C230	1.9			1	1				1																								7	1	6		
C231	1.9	1	1	1	1																												6	0	6	1	
C232	5.0	1																															2	0	2		
C233	5.0																																0	0	0		
C234	2.0	1	1	1					1																								11	1	10		
C235	2.2	1		1	1				1																								7	1	6		
C236	2.2	1		1	1				1																								7	1	6		
C237	2.0	1	1	1				1																									11	0	11		
C238	1.3	1	1	1	1			1																									10	0	10		
C239	1.8	1		1													1																8	0	8		
C240	2.0	1	1	1																													8	0	8		

Table C. (continued) Aquatic plant species' presence in Cazenovia Lake from two rake tosses on Sept. 17, 18, 19, 23, 25, 2010. Entries of "1" indicate species identified at that sample point (SP). Allied Biological chose the locations for (SPs) in October 2008, we added 303 and 304.

Sample Point (SP)	Depth (m) 2009 - Racine J	Ceratophyllum demersum	Chara vulgaris	Elodea sp.	Fontinalis sp.	Lemna minor	Lemna trisulca	Megalodonta beckettii	Myriophyllum spicatum	Najas flexilis	Najas guadalupensis	Nitella flexilis	<i>Nitellopsis obtusa</i>	Nuphar variegata	Nymphaea odorata	Potamogeton amplifolius	<i>Potamogeton crispus</i>	Potamogeton foliosus	Potamogeton gramineus	Potamogeton illinoensis	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton zosteriformis	Ranunculus trichophyllus	Spirodela polyrhiza	Stuckenia pectinata	Stuckenia vaginata	Utricularia vulgaris	Vallisneria americana	Wolffia columbiana	Zosterella dubia	benthic filamentous algae	Total	Non-native Species	Native Species	floating filamentous algae
C271	1.6		1	1				1	1		1								1	1	1		1				1		1	1	1	1	11	1	10		
C272	1.5	1	1	1							1													1				1		1	1	10	0	10			
C273	3.6	1									1																						3	0	3		
C274	4.2	1									1													1									7	0	7		
C275	1.6	1		1							1																						6	0	6		
C276	1.8		1	1					1		1																						6	1	5		
C277	1.7			1							1													1									6	0	6		
C278	2.5	1	1	1					1		1													1									7	1	6		
C279	2.0			1					1		1													1									6	1	5		
C280	2.5	1	1	1					1		1												1										9	1	8		
C281	1.3		1	1							1																						6	0	6	1	
C282	3.4	1	1								1																						8	0	8		
C283	4.0	1		1					1		1													1									8	1	7		
C284	1.3	1	1	1	1			1	1		1														1								14	1	13		
C285	0.7		1																														2	0	2		
C286	2.3		1	1					1		1																						9	1	8		
C287	4.2		1	1					1		1																						7	1	6		
C288	1.1		1	1					1		1																						6	1	5		
C289	1.7	1	1						1		1																						10	1	9		
C290	1.9		1	1					1		1																						7	1	6		
C291	2.2	1	1	1							1																						9	0	9		
C292	1.5		1	1							1																						6	0	6		
C293	1.7	1	1	1					1		1																						10	1	9		
C294	1.5		1								1																							6	0	6	
C295	2.6		1	1	1				1		1																						7	1	6		
C296	3.4	1	1	1							1																						7	0	7		
C297	2.1			1							1																						3	0	3		
C298	1.5		1								1																						4	0	4	1	
C299	2.1		1								1																						4	0	4		
C300	2.1		1	1	1					1	1																						8	1	7		

Table C. (continued) Aquatic plant species' presence in Cazenovia Lake from two rake tosses on Sept. 17, 18, 19, 23, 25, 2010. Entries of "1" indicate species identified at that sample point (SP). Allied Biological chose the locations for (SPs) in October 2008, we added 303 and 304.

Sample Point (SP)	Depth (m) 2009 - Racine J	Ceratophyllum demersum	Chara vulgaris	Elodea sp.	Fontinalis sp.	Lemna minor	Lemna trisulca	Megalodonta beckii	Myriophyllum spicatum	Najas flexilis	Najas guadalupensis	Nitella flexilis	Nitellopsis obtusa	Nuphar variegata	Nymphaea odorata	Potamogeton amplifolius	Potamogeton crispus	Potamogeton foliosus	Potamogeton gramineus	Potamogeton illinoensis	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton zosteriformis	Ranunculus trichophyllus	Spirodela polyrhiza	Stuckenia pectinata	Stuckenia vaginata	Utricularia vulgaris	Vallisneria americana	Wolffia columbiana	Zostera dubia	benthic filamentous algae	Total	Non-native Species	Native Species	Floating filamentous algae					
C301	2.5		1	1						1								1														1		6	0	6						
C302	2.3		1	1						1								1													1		7	0	7							
C303	3.0			1					1																								2	1	1							
C304	2.5			1					1								1																4	2	2							
# in 304		202	167	188	80	7	28	20	88	28	116	19	28	9	3	38	27	2	59	108	41	36	13	132	54	9	27	15	6	180	11	76	195	2012	143	1869	30					
% of 304		66	55	62	26	2.3	9.2	6.6	29	9.2	38	6.3	9	3	1	13	9	0.7	19	36	13	12	4.3	43	18	3	8.9	4.9	2	59	3.6	25	64									

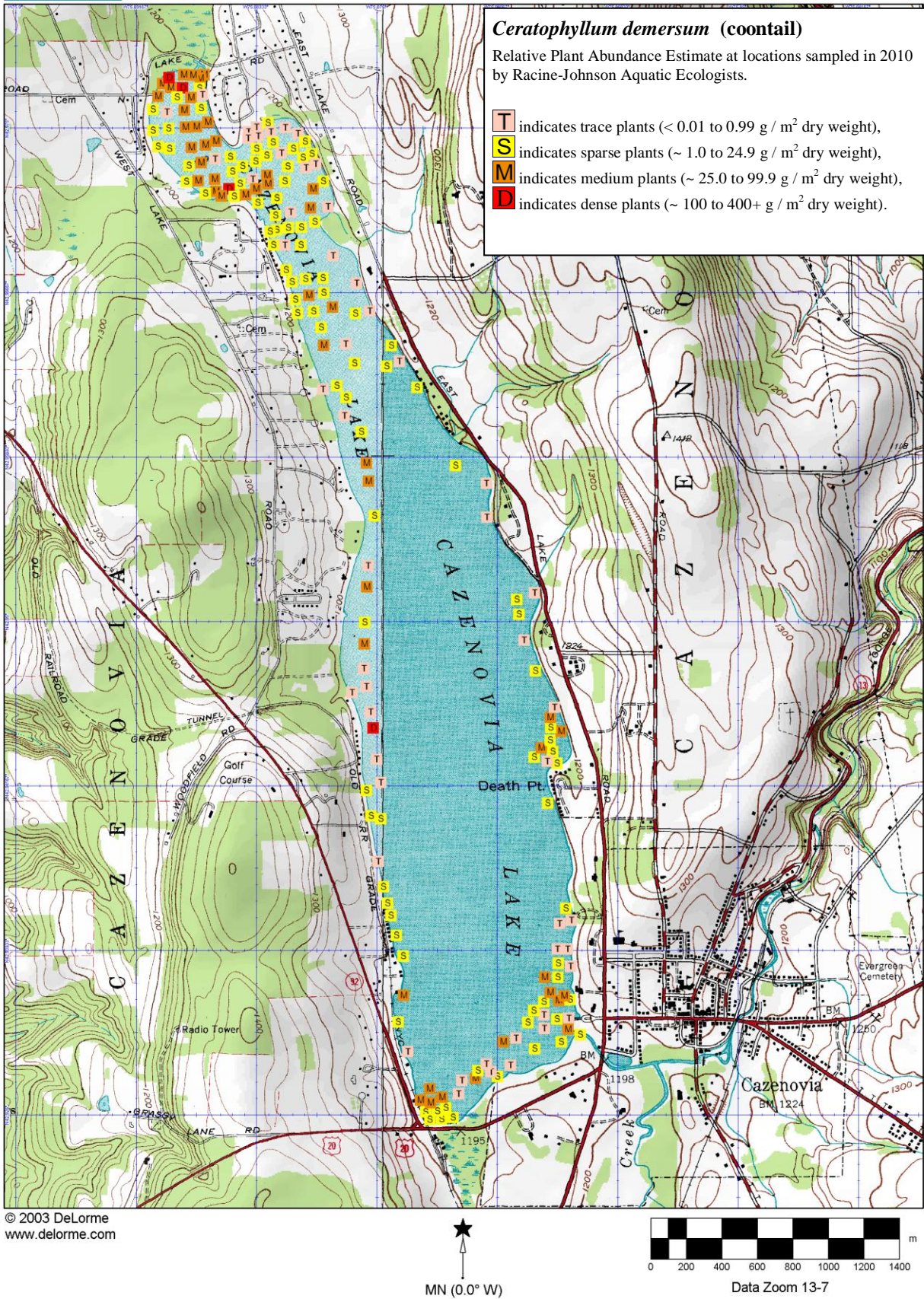
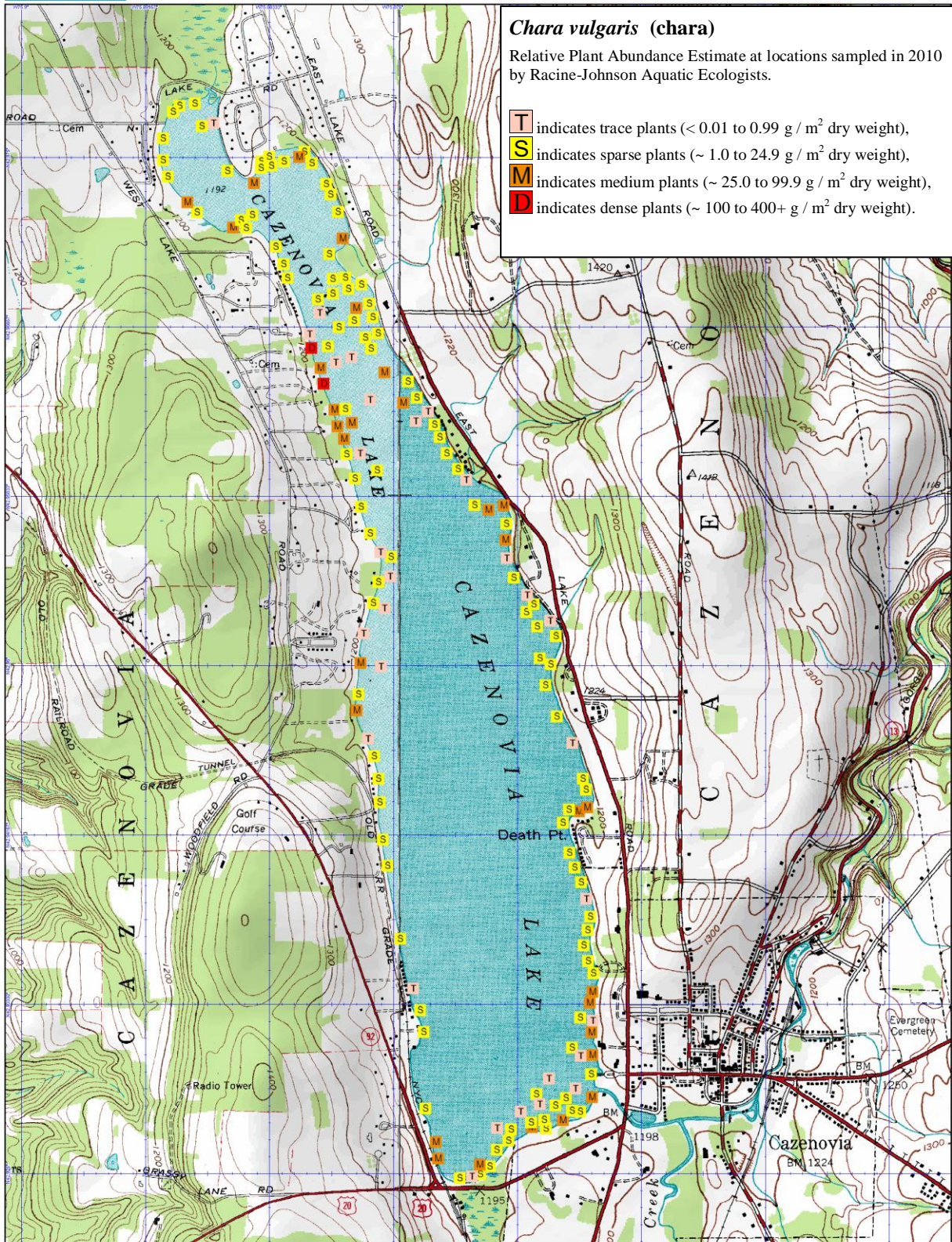


Figure 5. *Ceratophyllum demersum* (coontail) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.



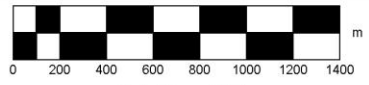
***Chara vulgaris* (chara)**

Relative Plant Abundance Estimate at locations sampled in 2010 by Racine-Johnson Aquatic Ecologists.

- T** indicates trace plants (<math>< 0.01\text{ to }0.99\text{ g/m}^2\text{ dry weight}</math>),
- S** indicates sparse plants ($\sim 1.0\text{ to }24.9\text{ g/m}^2\text{ dry weight}$),
- M** indicates medium plants ($\sim 25.0\text{ to }99.9\text{ g/m}^2\text{ dry weight}$),
- D** indicates dense plants ($\sim 100\text{ to }400+\text{ g/m}^2\text{ dry weight}$).

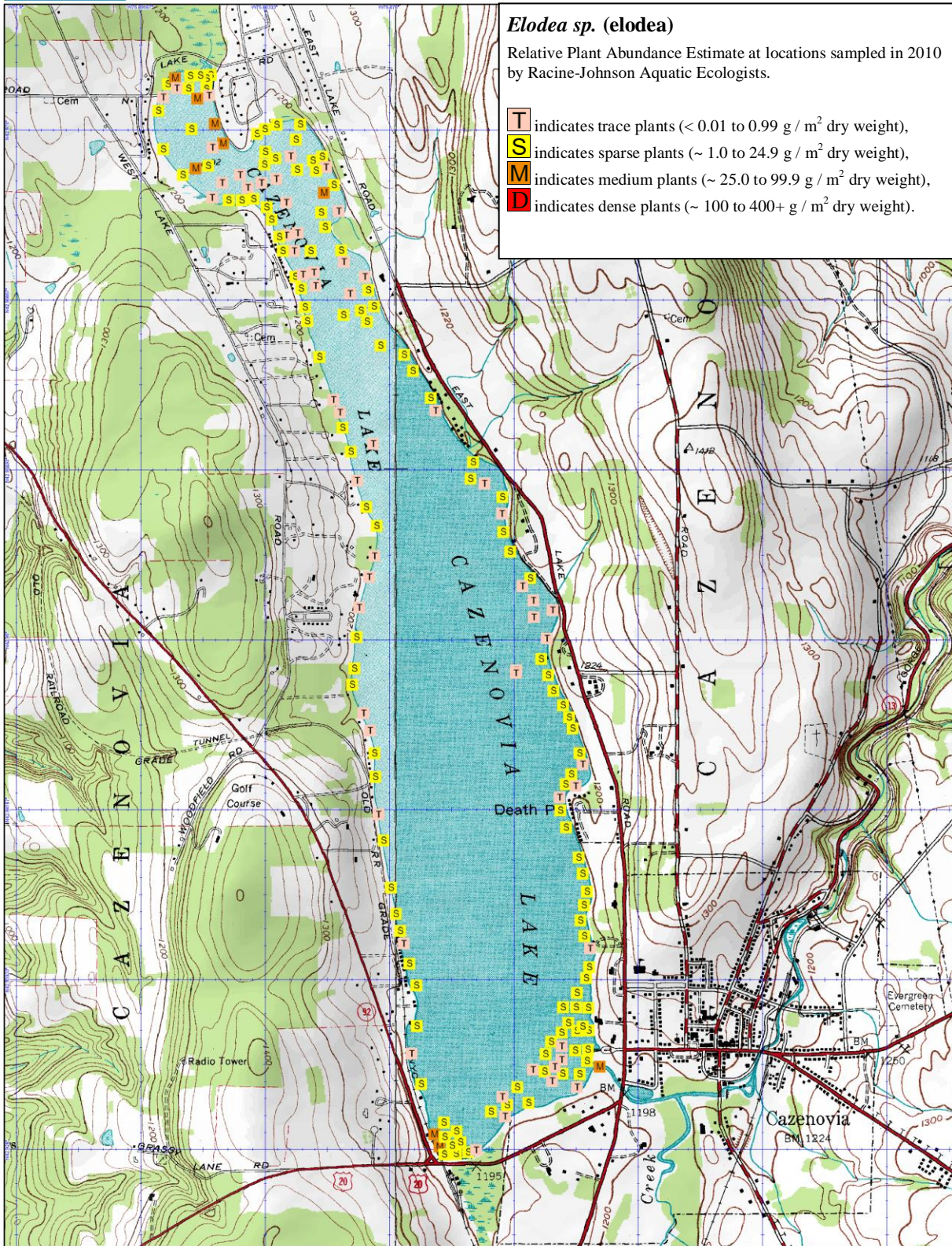
© 2003 DeLorme
www.delorme.com

★
MN (0.0° W)



Data Zoom 13-7

Figure 6. *Chara vulgaris* (chara) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

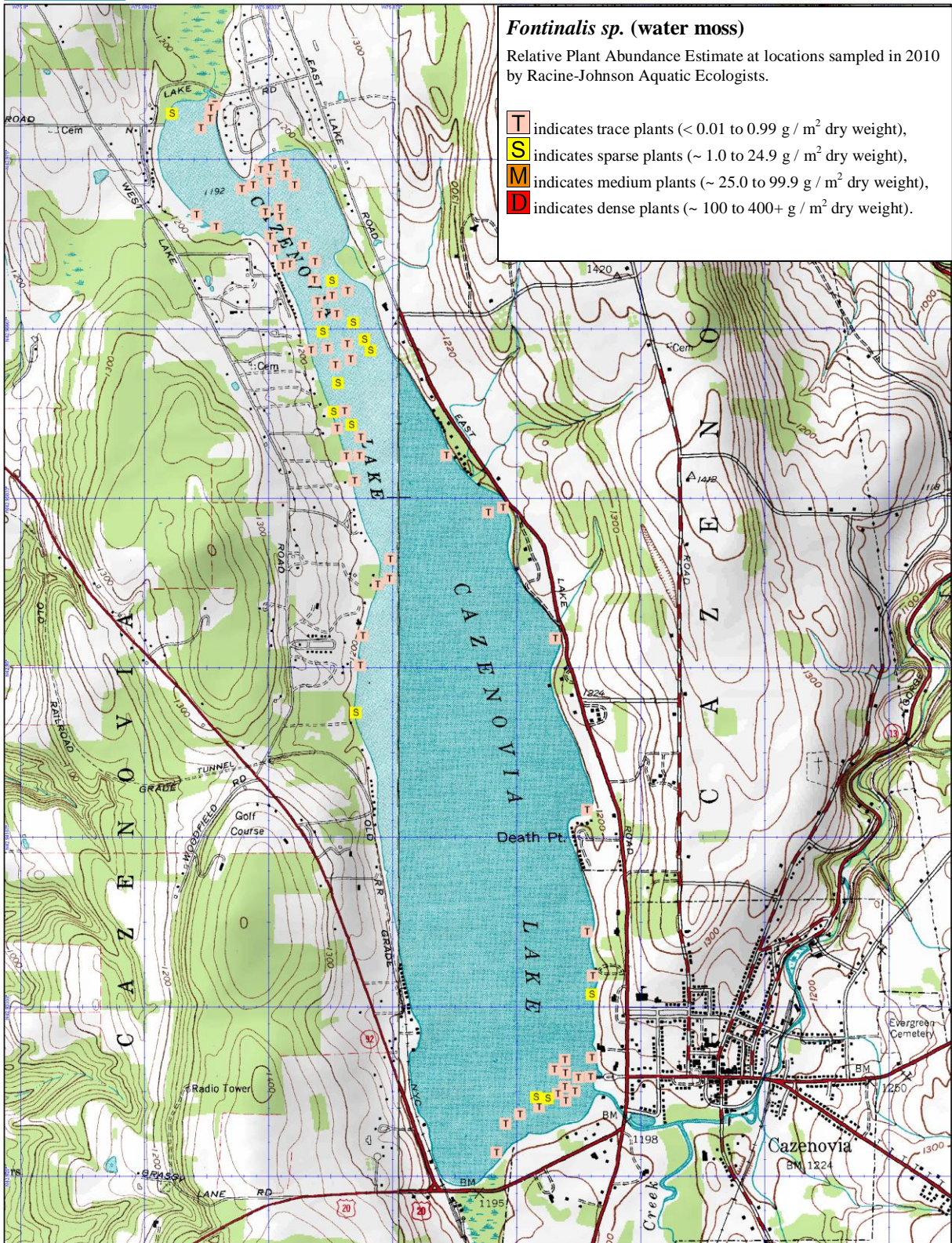


© 2003 DeLorme
 www.delorme.com

★
 MN (0.0° W)

0 200 400 600 800 1000 1200 1400 m
 Data Zoom 13-7

Figure 7. *Elodea sp.* (elodea) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

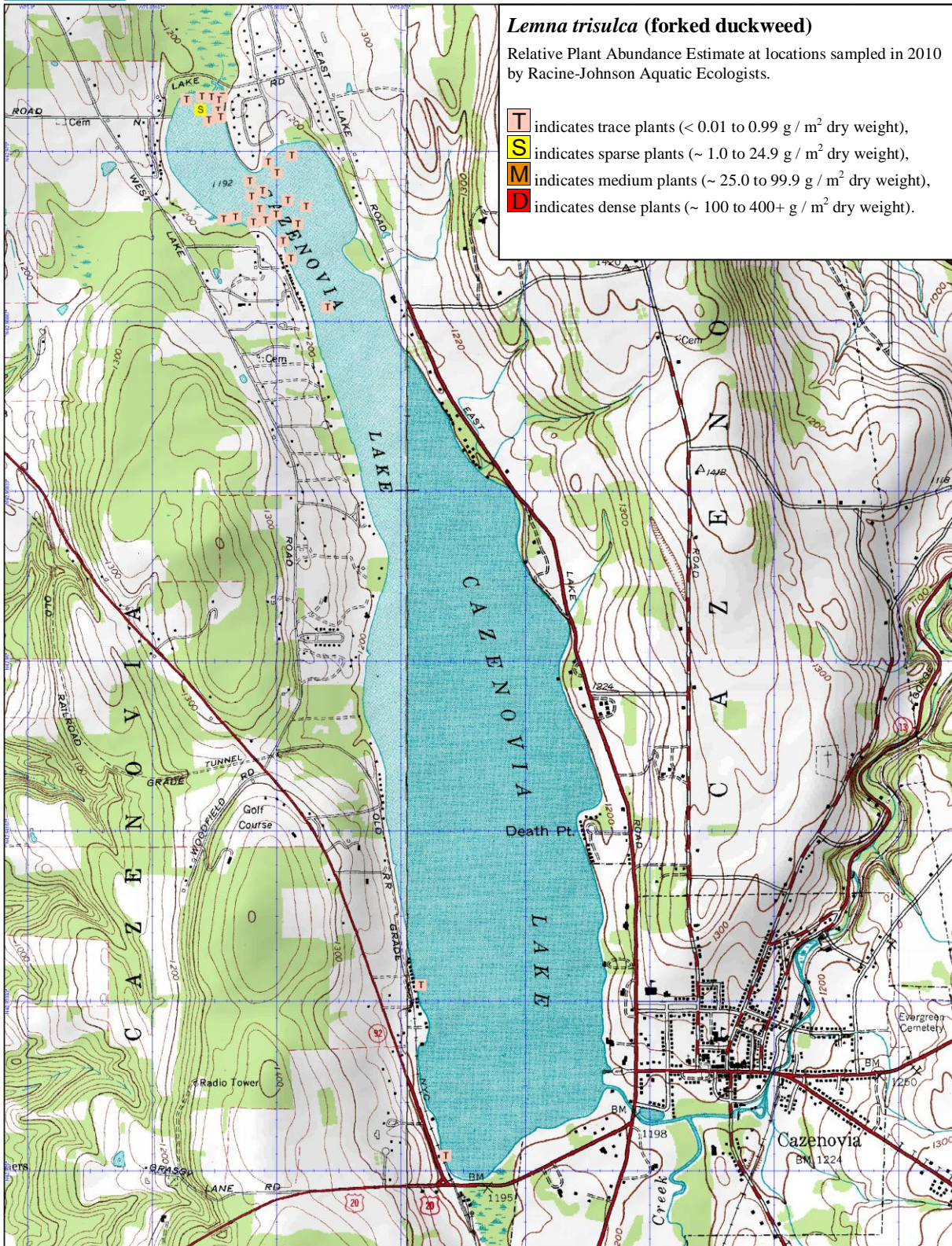


© 2003 DeLorme
 www.delorme.com

★
 MN (0.0° W)

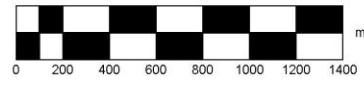
0 200 400 600 800 1000 1200 1400 m
 Data Zoom 13-7

Figure 8. *Fontinalis sp.* (water moss) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.



© 2003 DeLorme
 www.delorme.com

★
 MN (0.0° W)



Data Zoom 13-7

Figure 9. *Lemna trisulca* (forked duckweed) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

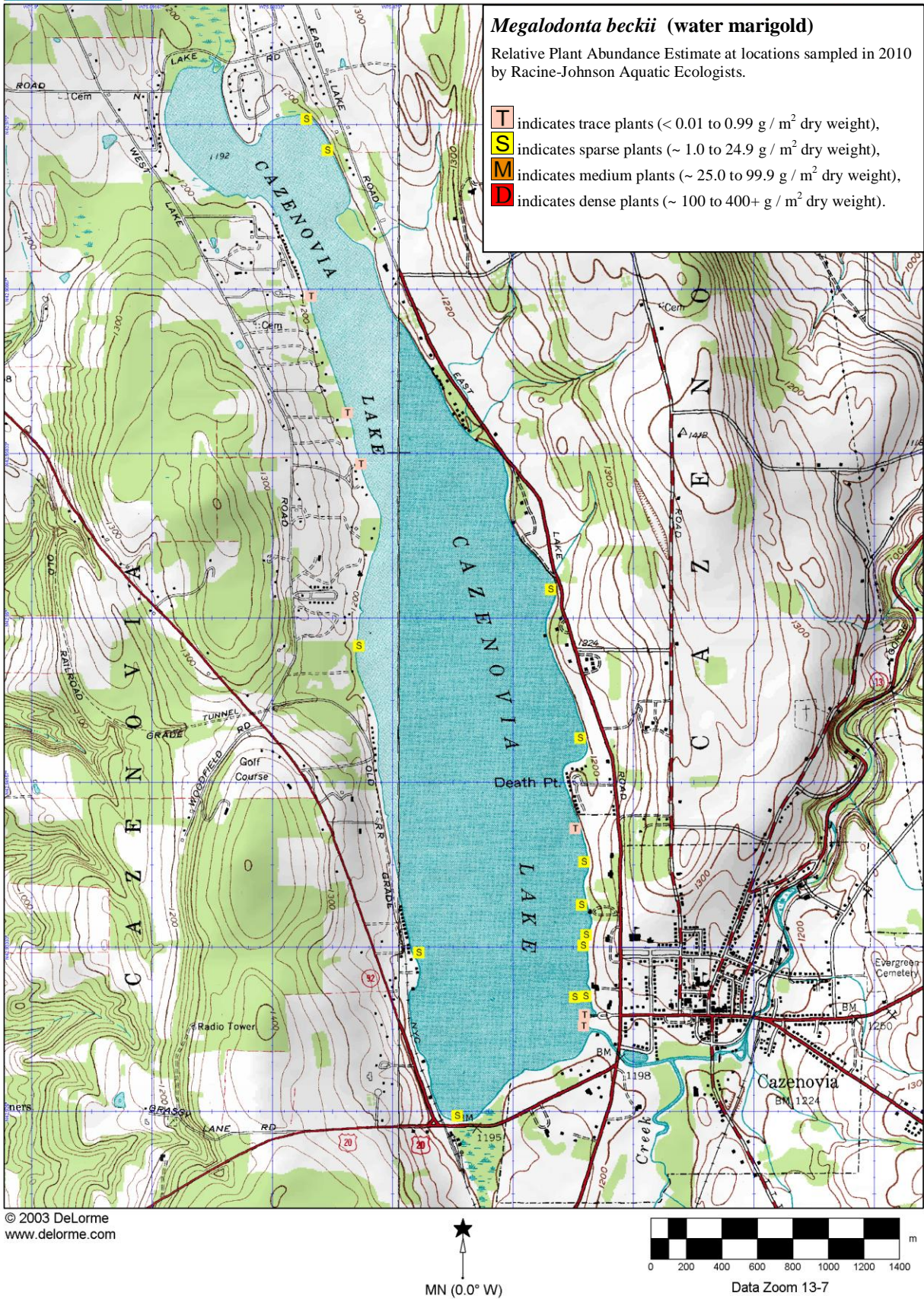


Figure 10. *Megalodonta beckii* (water marigold) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

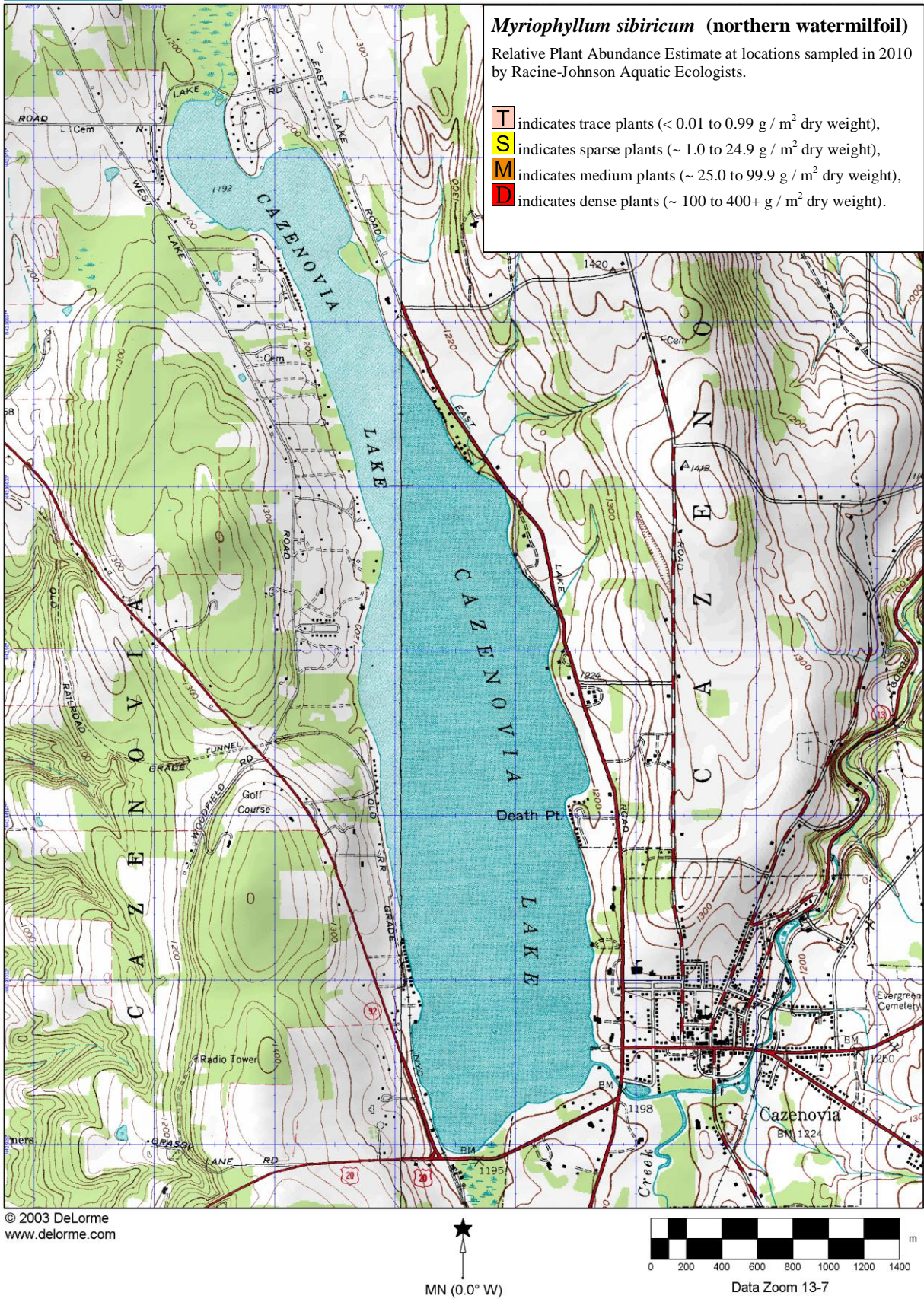


Figure 11. *Myriophyllum sibiricum* (northern watermilfoil) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

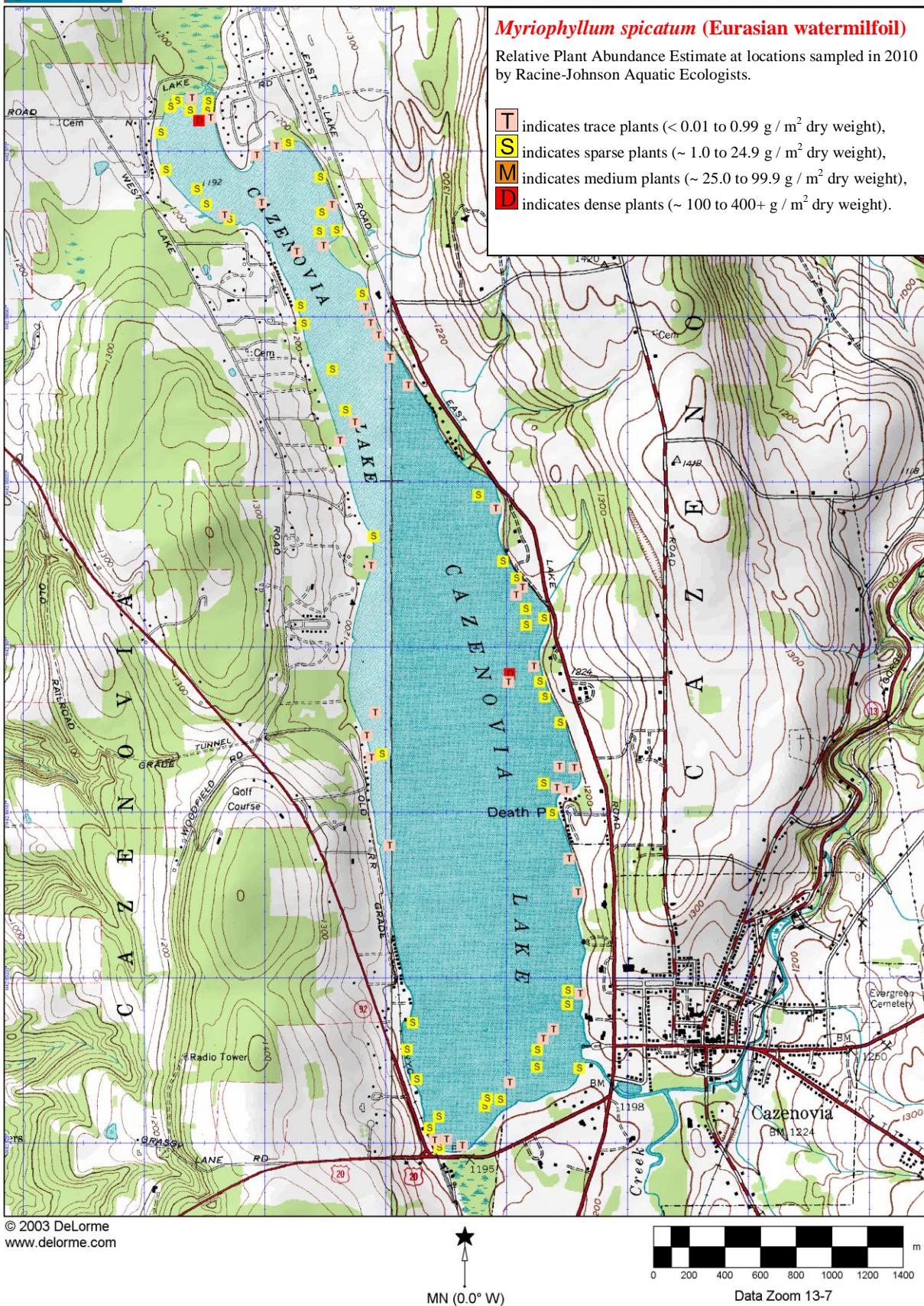
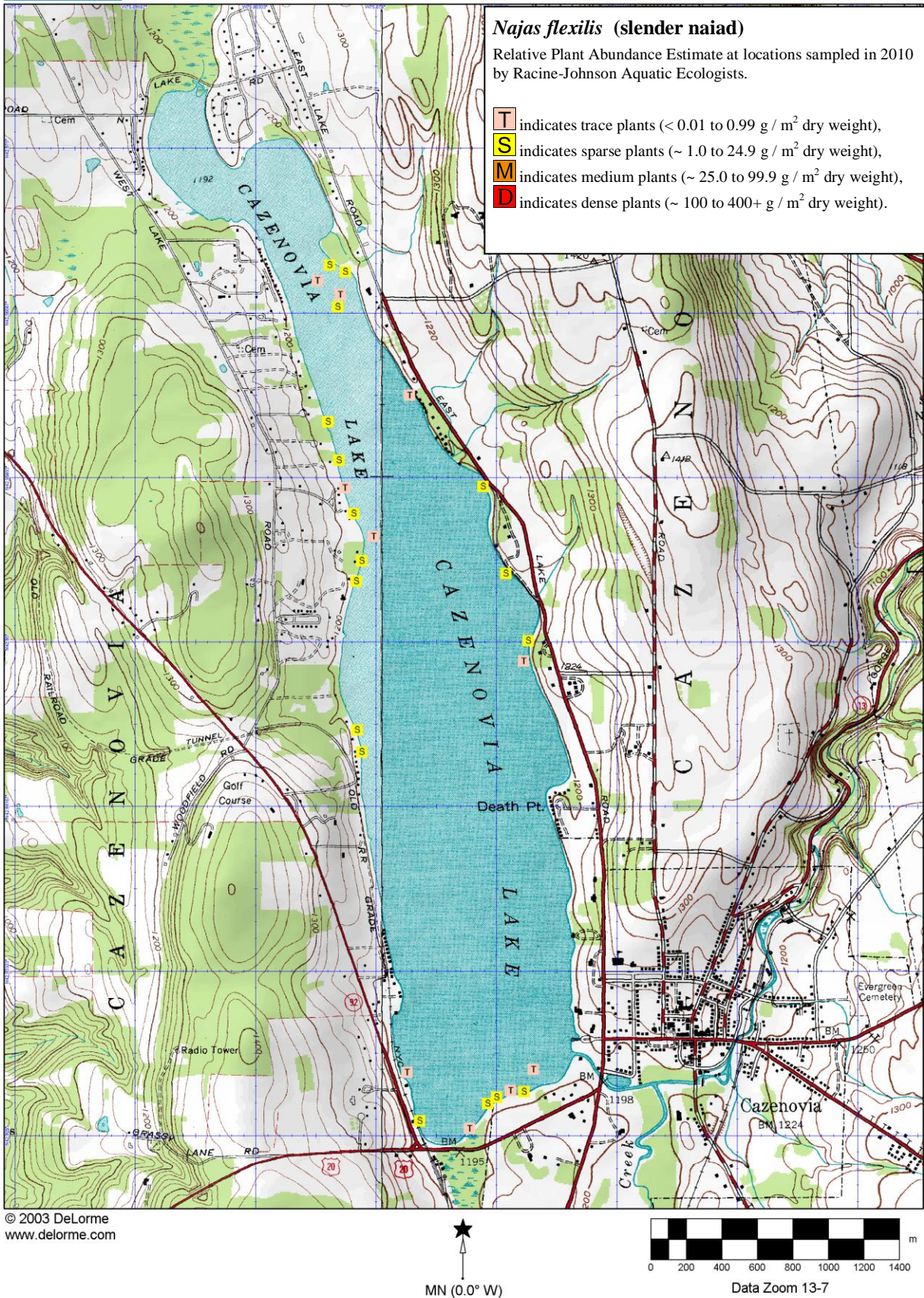


Figure 12. *Myriophyllum spicatum* (Eurasian watermilfoil) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

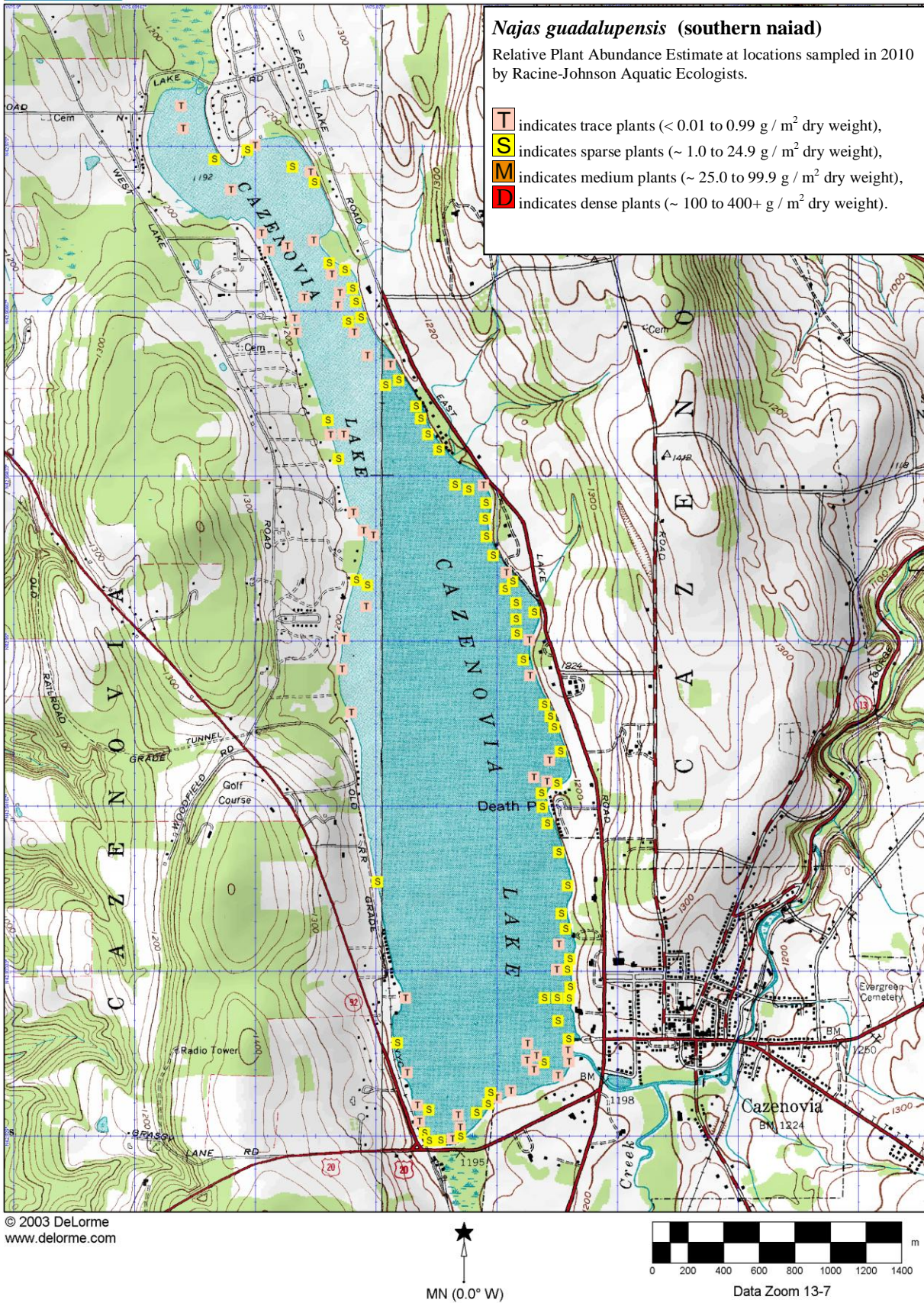


© 2003 DeLorme
 www.delorme.com

MN (0.0° W)

Data Zoom 13-7

Figure 13. *Najas flexilis* (slender naiad) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.



© 2003 DeLorme
 www.delorme.com

MN (0.0° W)

Data Zoom 13-7

Figure 14. *Najas guadalupensis* (southern naiad) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

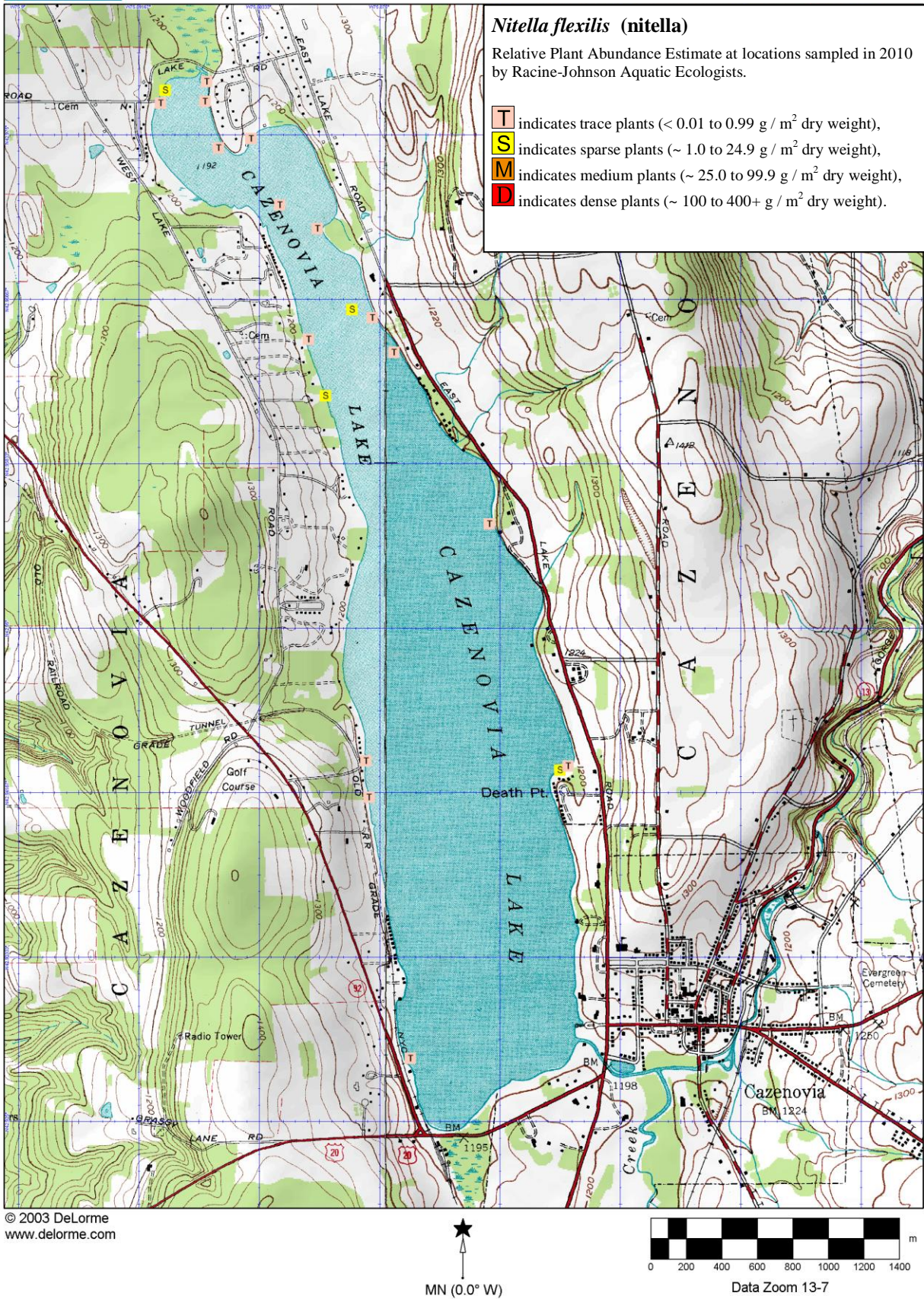


Figure 15. *Nitella flexilis* (nitella) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

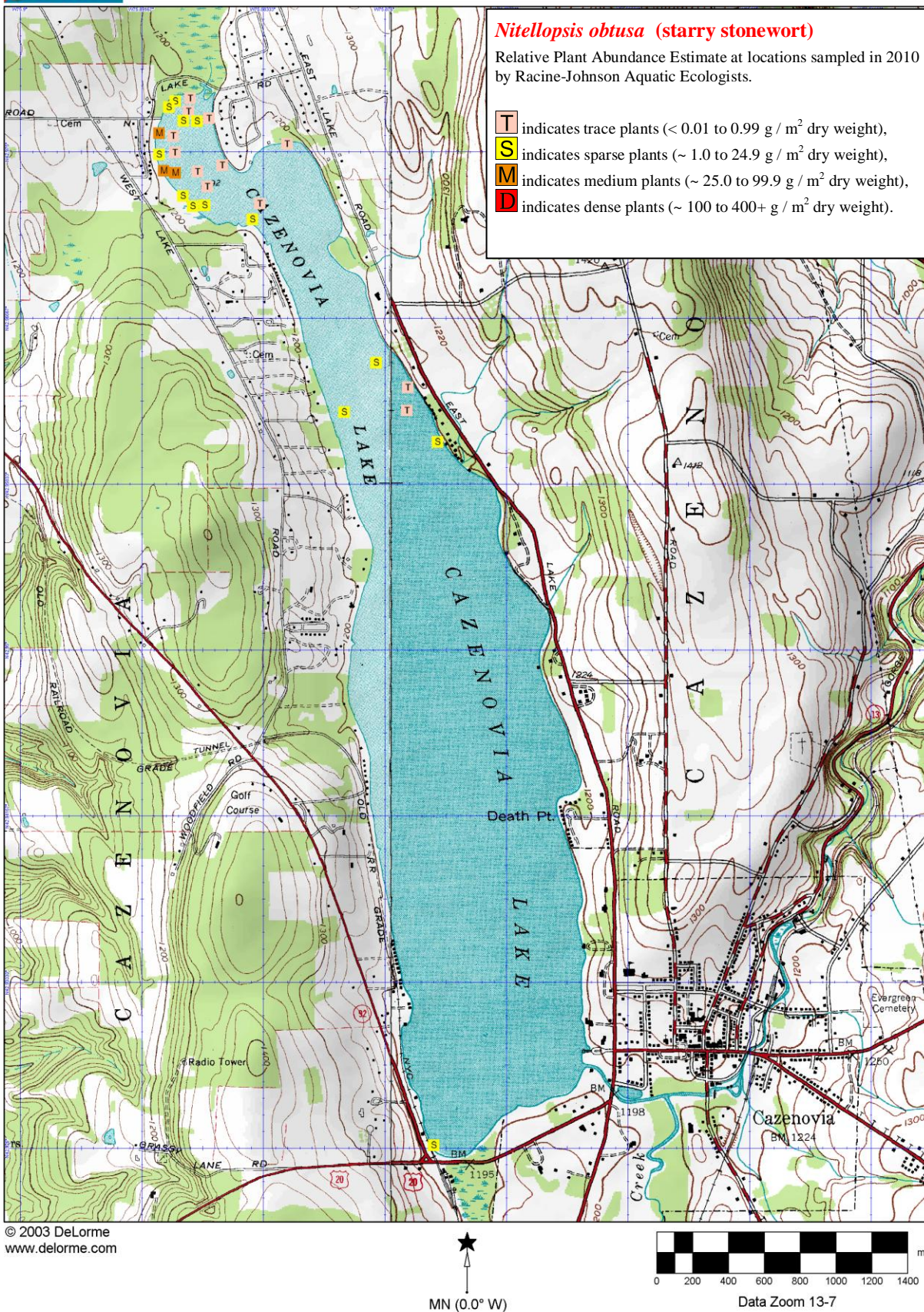


Figure 16. *Nitellopsis obtusa* (starry stonewort) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

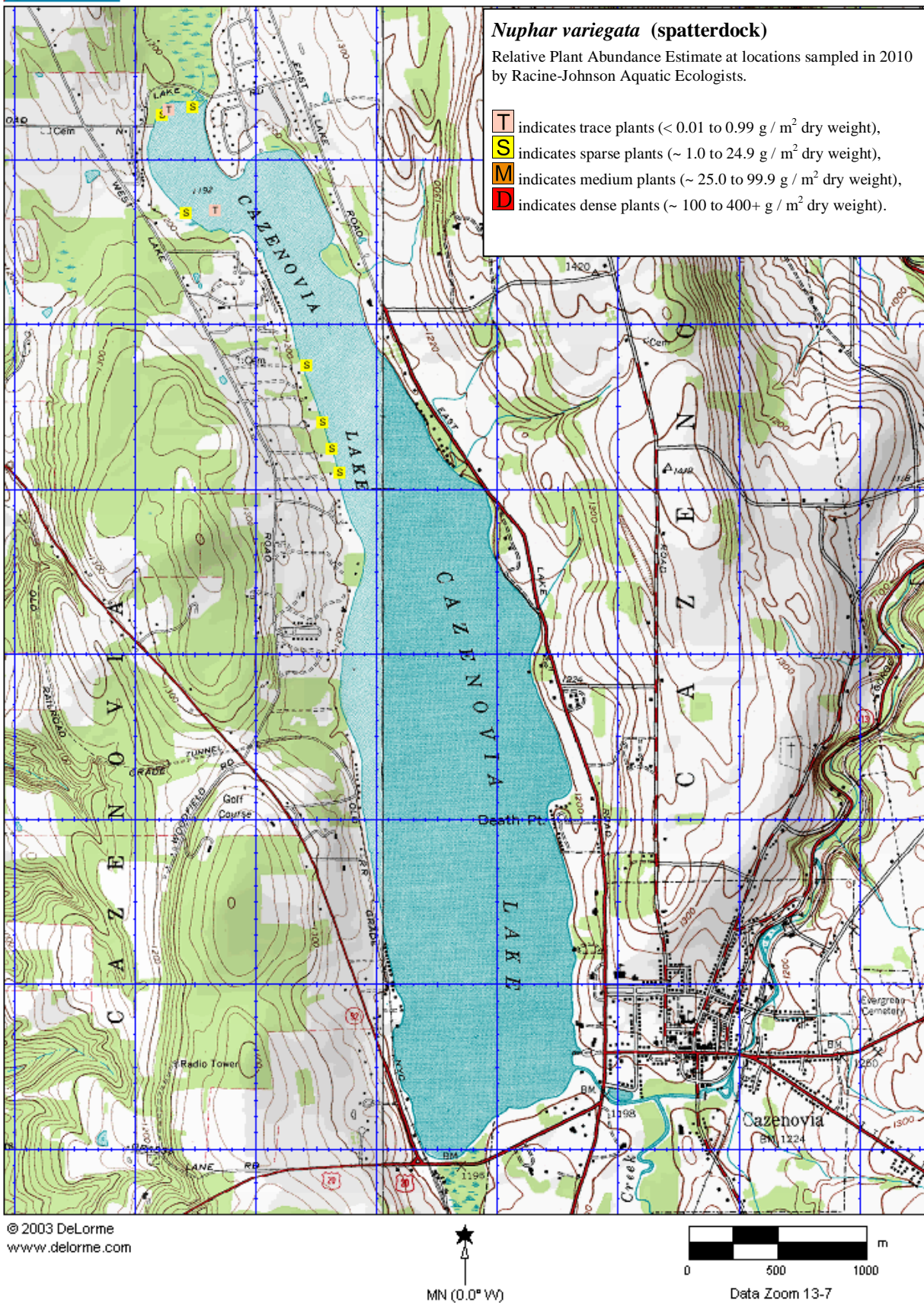


Figure 17. *Nuphar variegata* (spatterdock) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

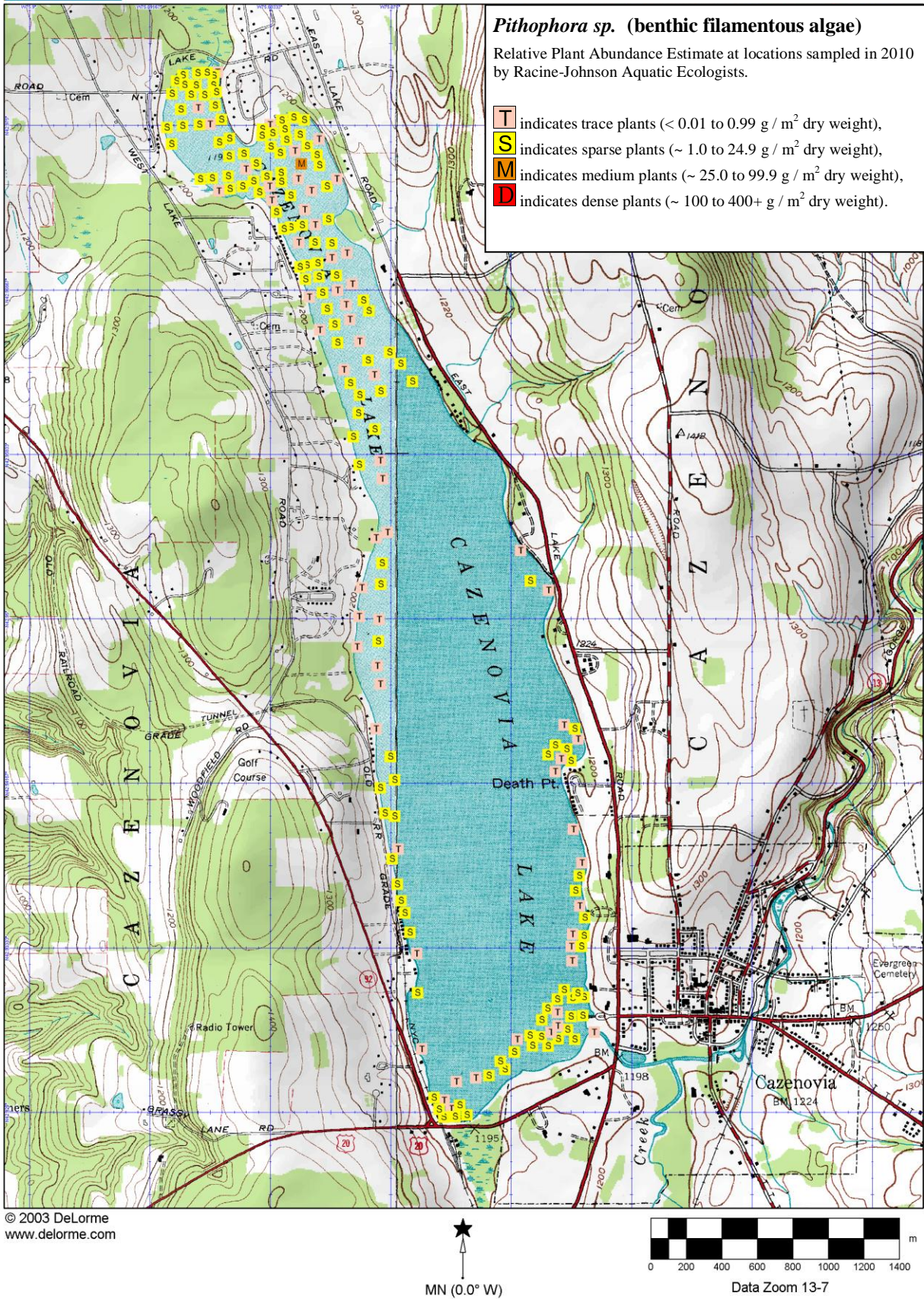


Figure 18. *Pithophora sp.* (benthic filamentous algae) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

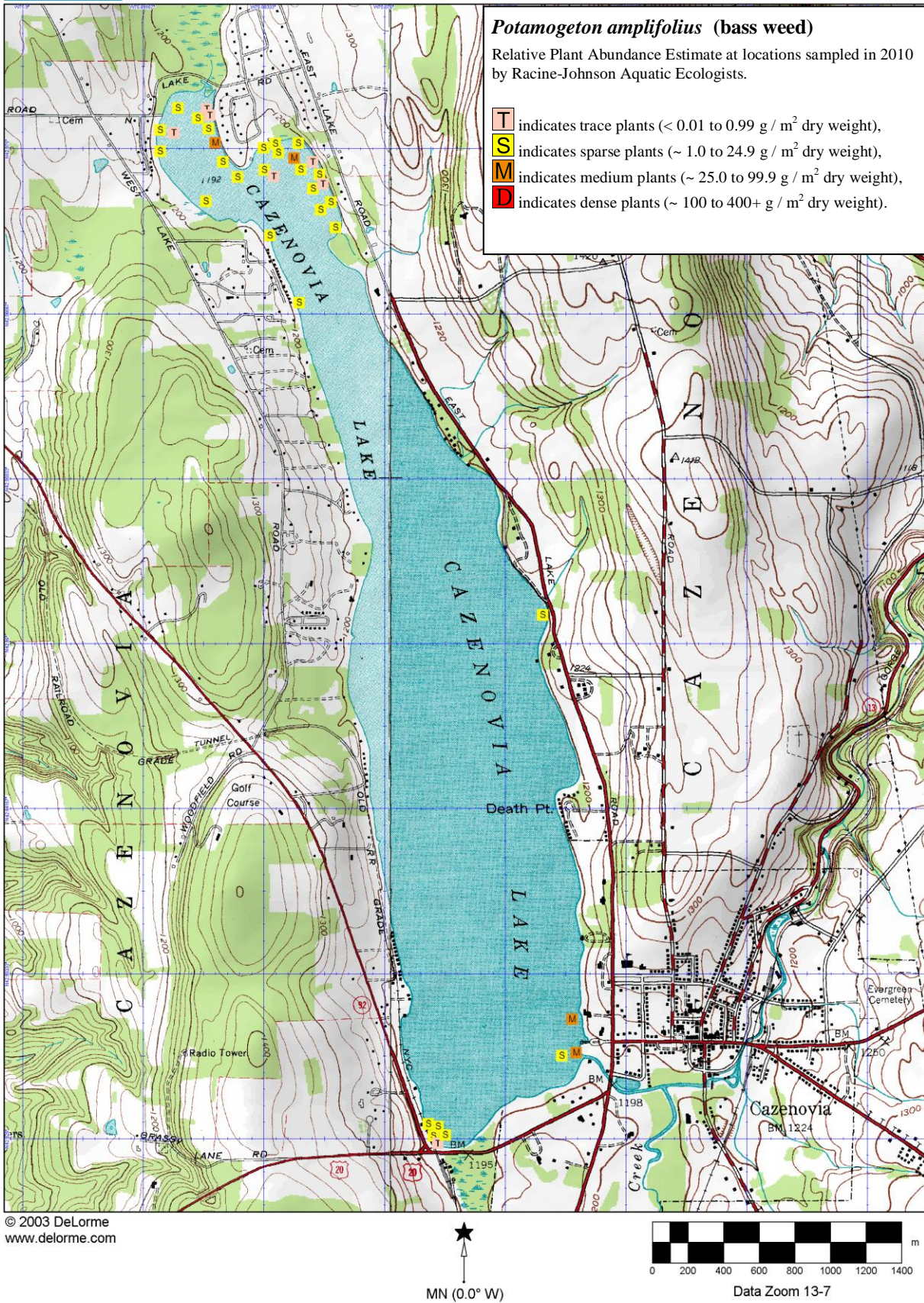
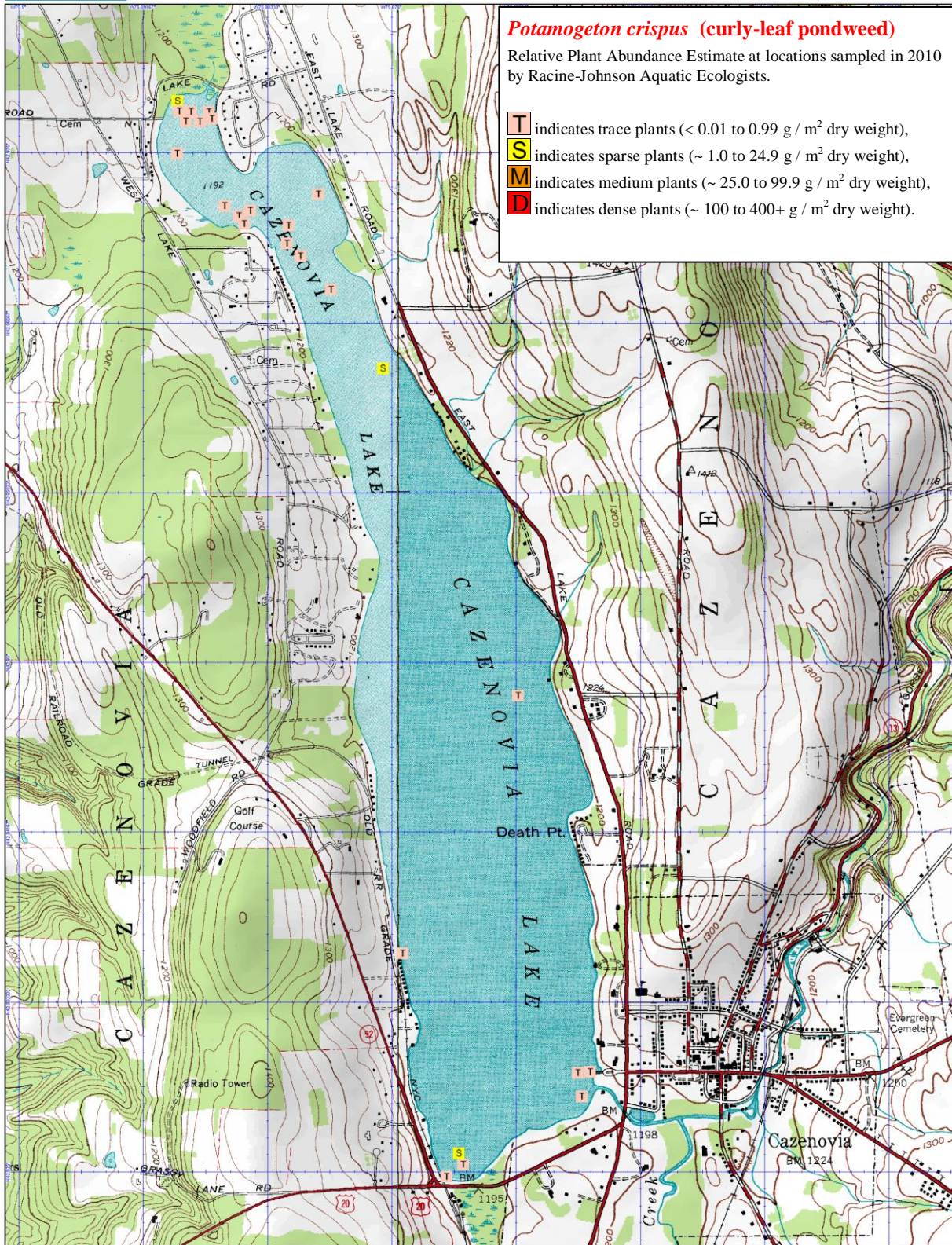
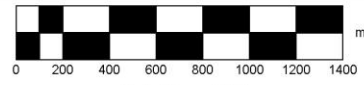
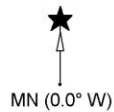


Figure 19. *Potamogeton amplifolius* (bass weed) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

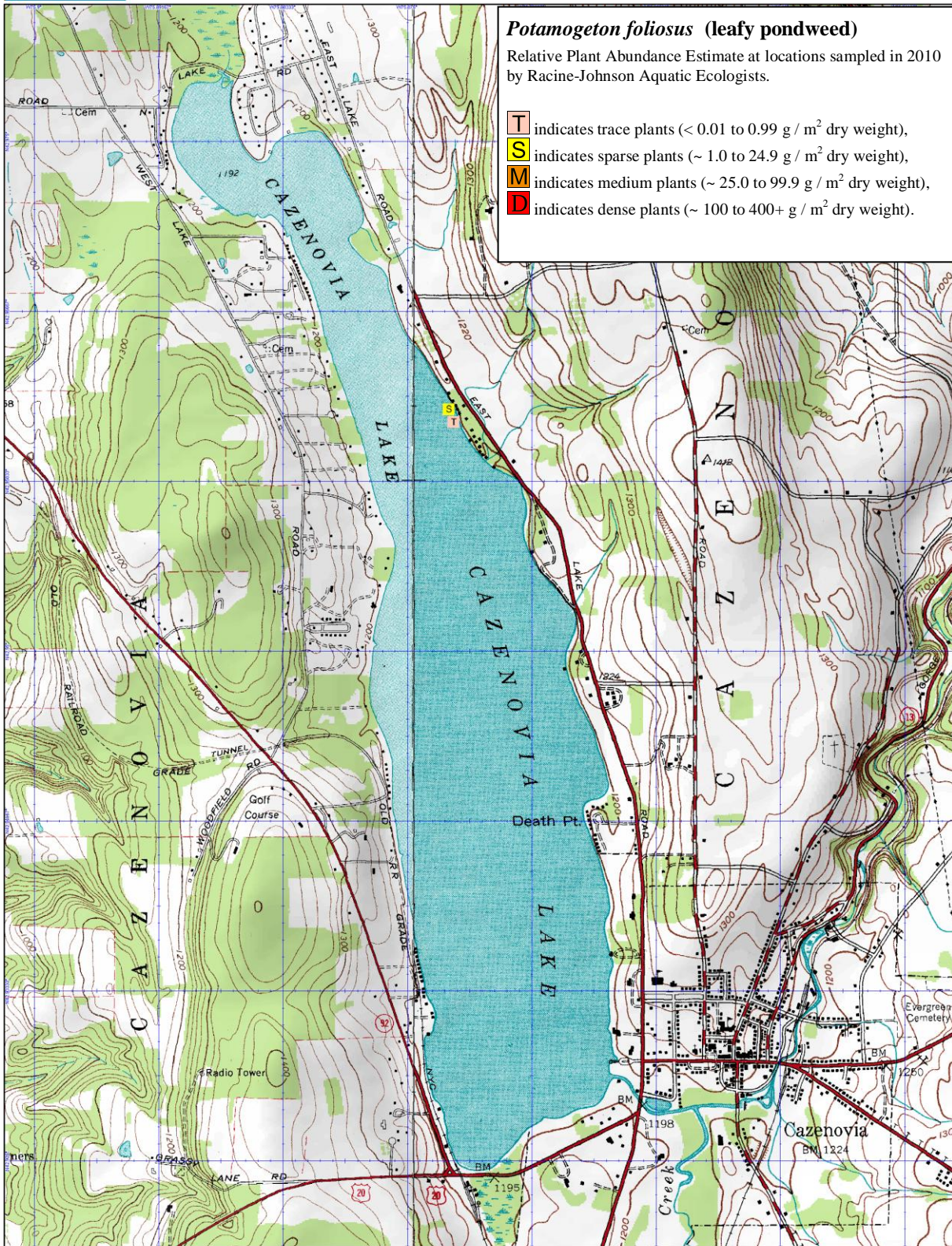


© 2003 DeLorme
 www.delorme.com

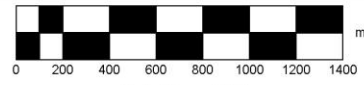
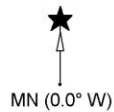


Data Zoom 13-7

Figure 20. *Potamogeton crispus* (curly-leaf pondweed) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

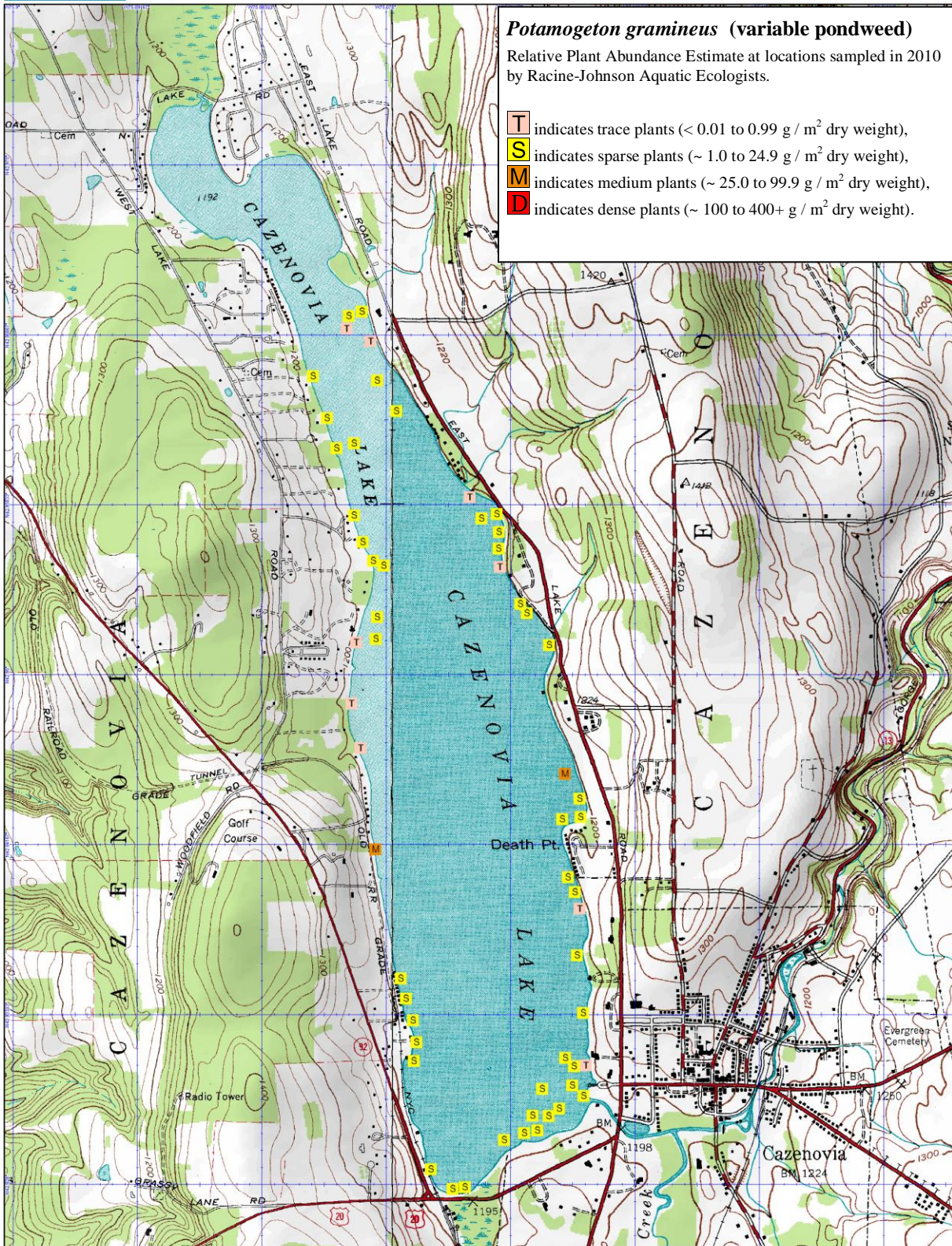


© 2003 DeLorme
 www.delorme.com



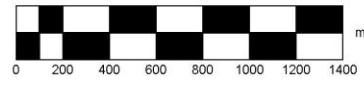
Data Zoom 13-7

Figure 21. *Potamogeton foliosus* (leafy pondweed) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.



© 2003 DeLorme
 www.delorme.com

★
 MN (0.0° W)



Data Zoom 13-7

Figure 22. *Potamogeton gramineus* (variable pondweed) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

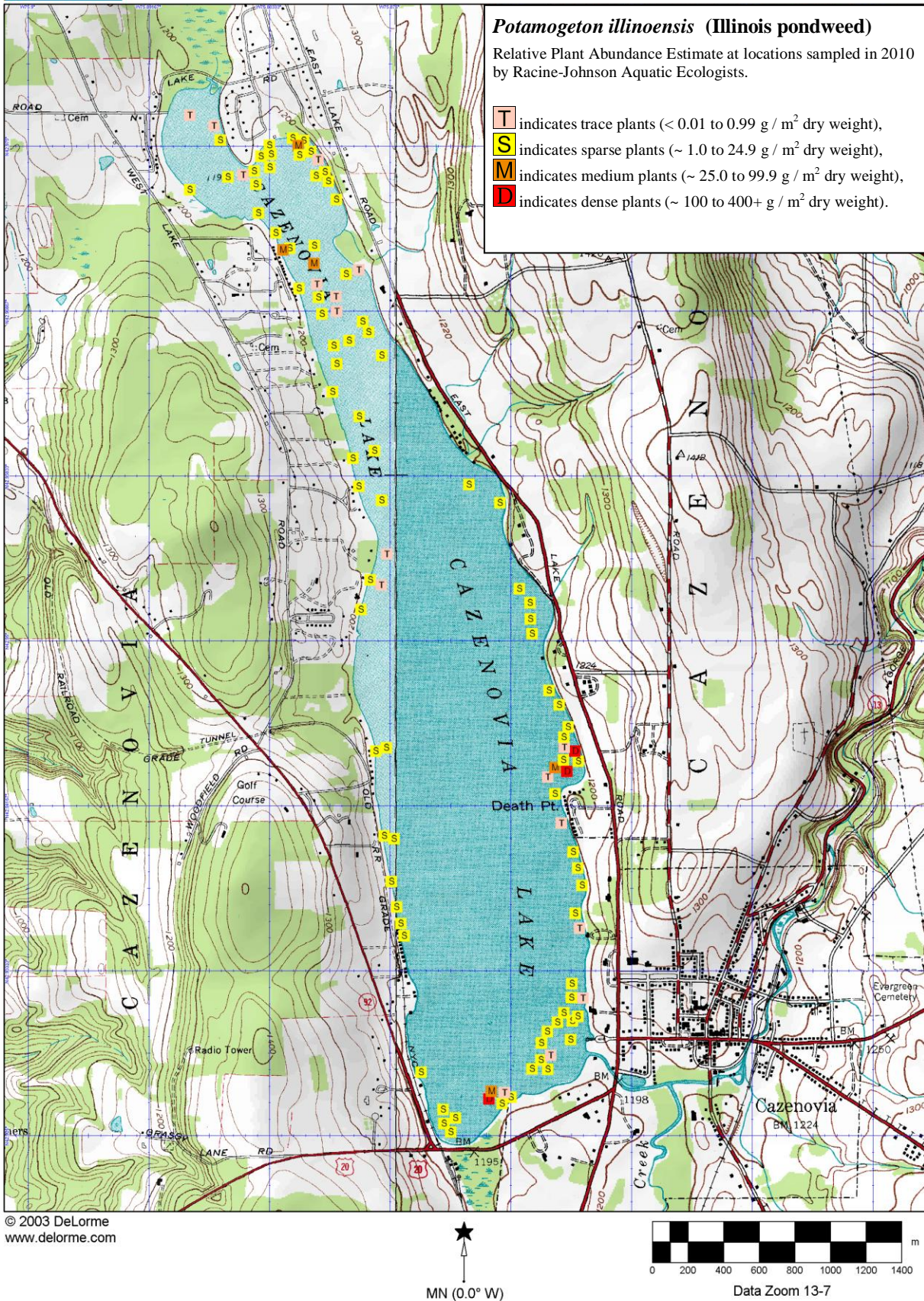


Figure 23. *Potamogeton illinoensis* (Illinois pondweed) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

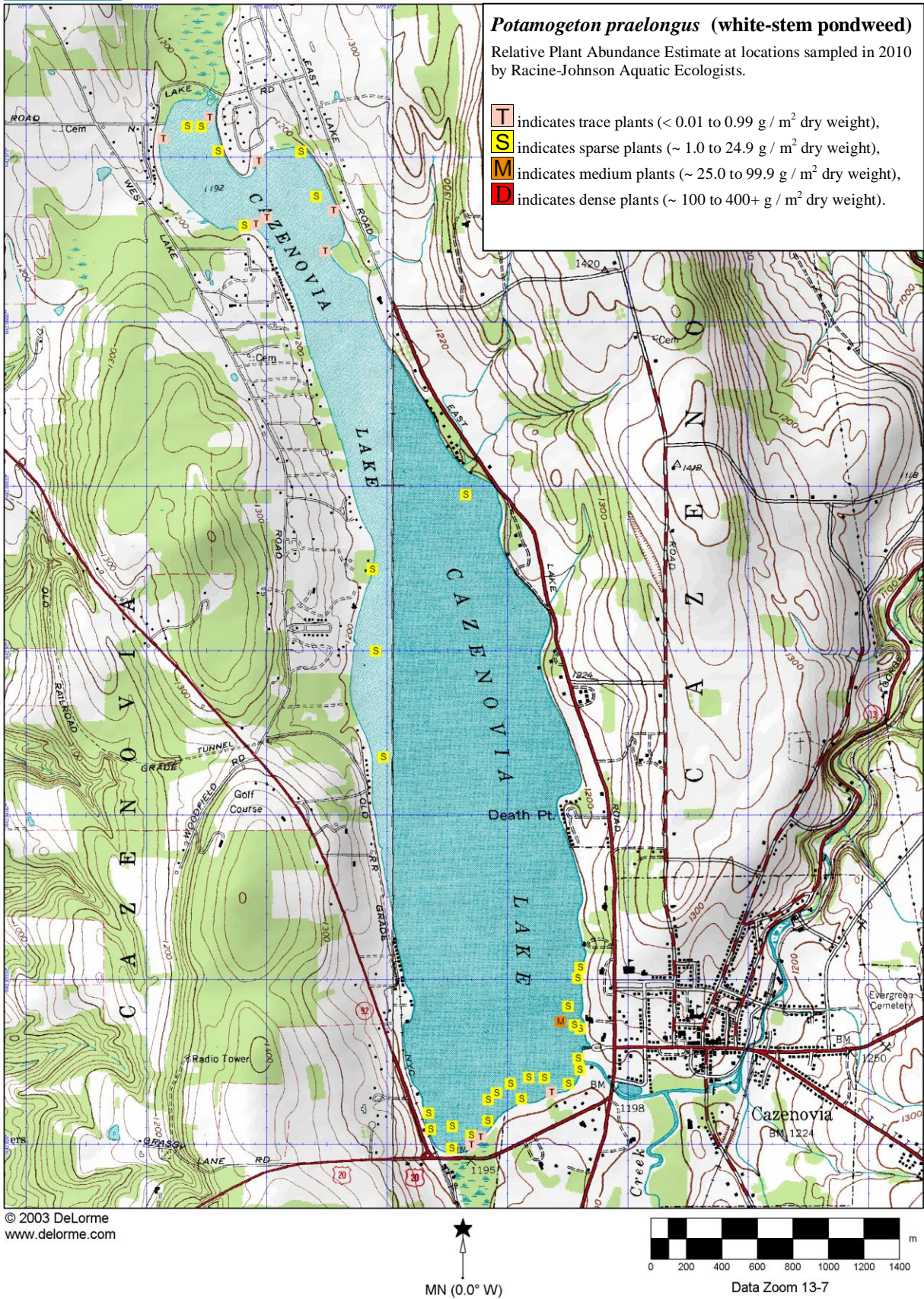
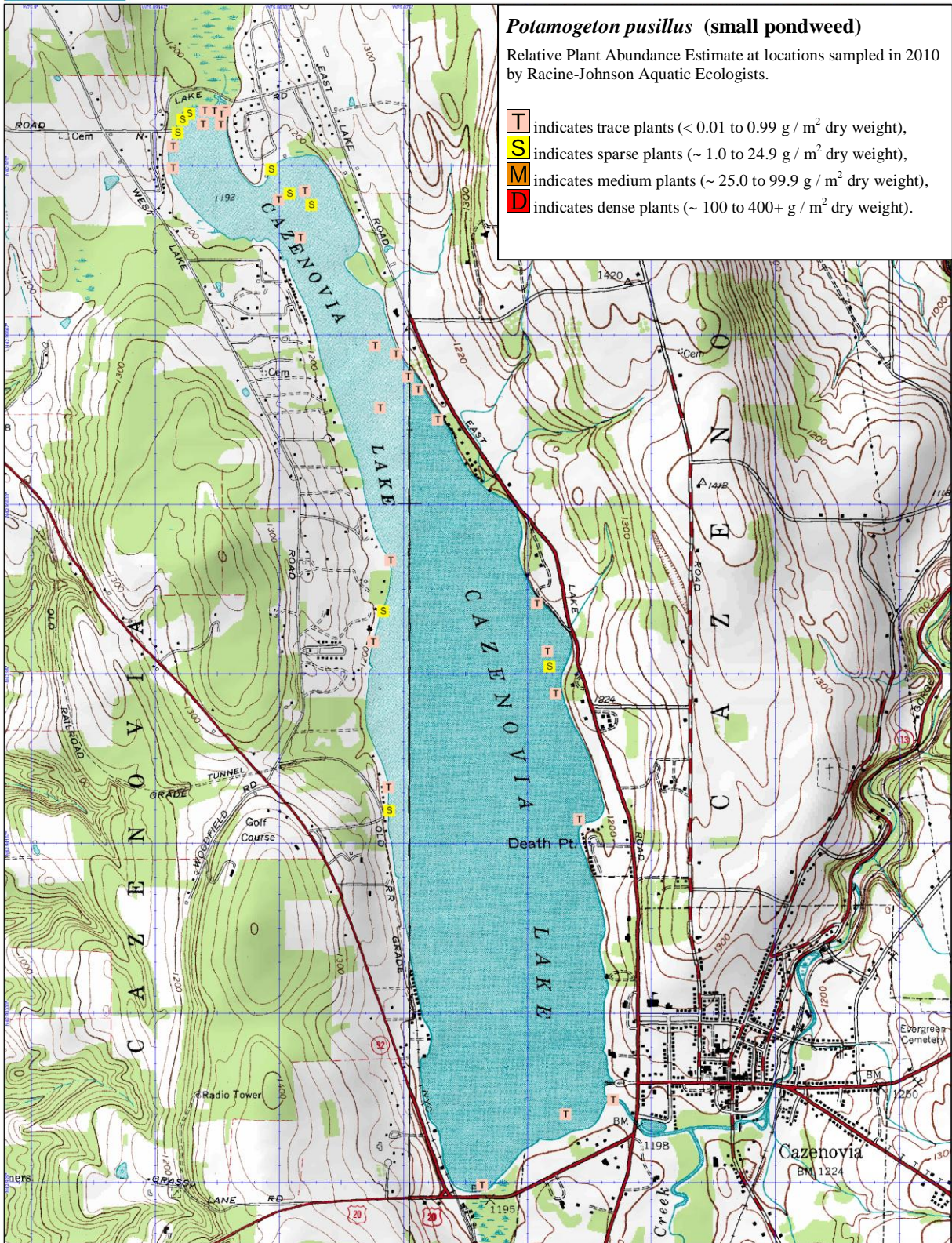
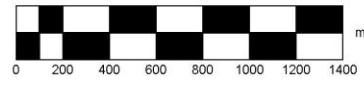


Figure 24. *Potamogeton praelongus* (white-stem pondweed) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.



© 2003 DeLorme
 www.delorme.com

★
 MN (0.0° W)



Data Zoom 13-7

Figure 25. *Potamogeton pusillus* (small pondweed) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

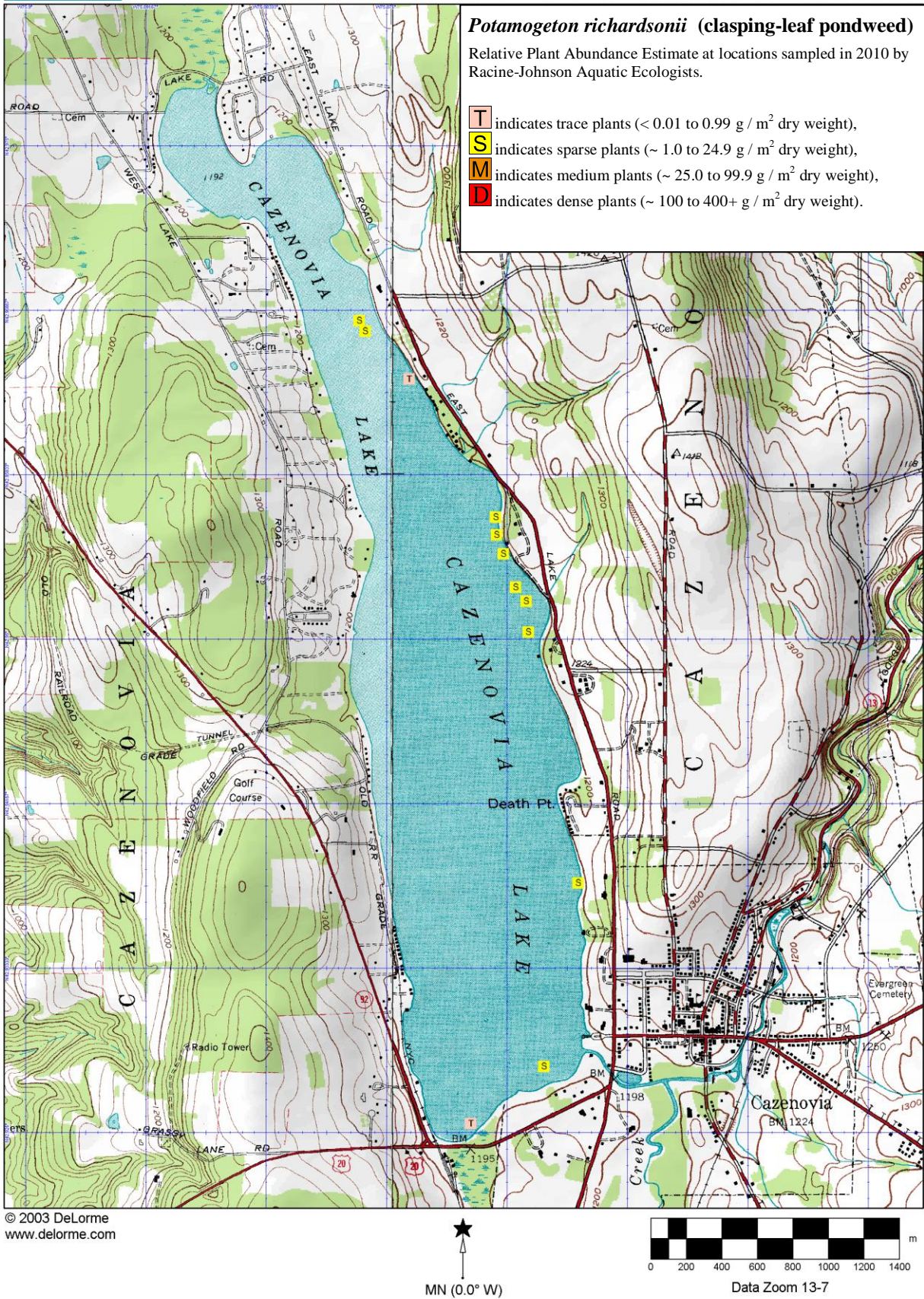
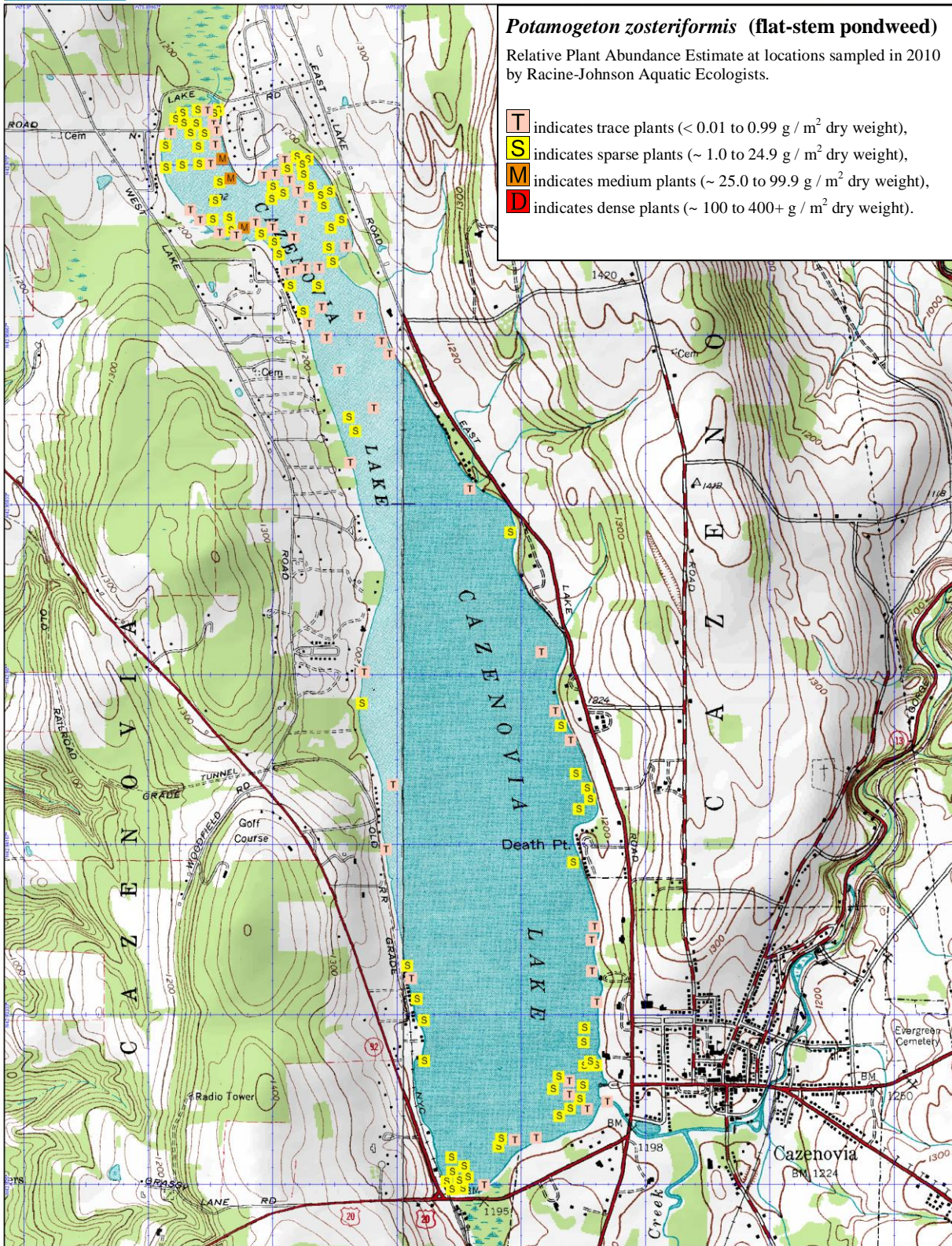
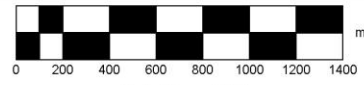
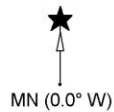


Figure 26. *Potamogeton richardsonii* (claspingleaf pondweed) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.



© 2003 DeLorme
 www.delorme.com



Data Zoom 13-7

Figure 27. *Potamogeton zosteriformis* (flat-stem pondweed) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

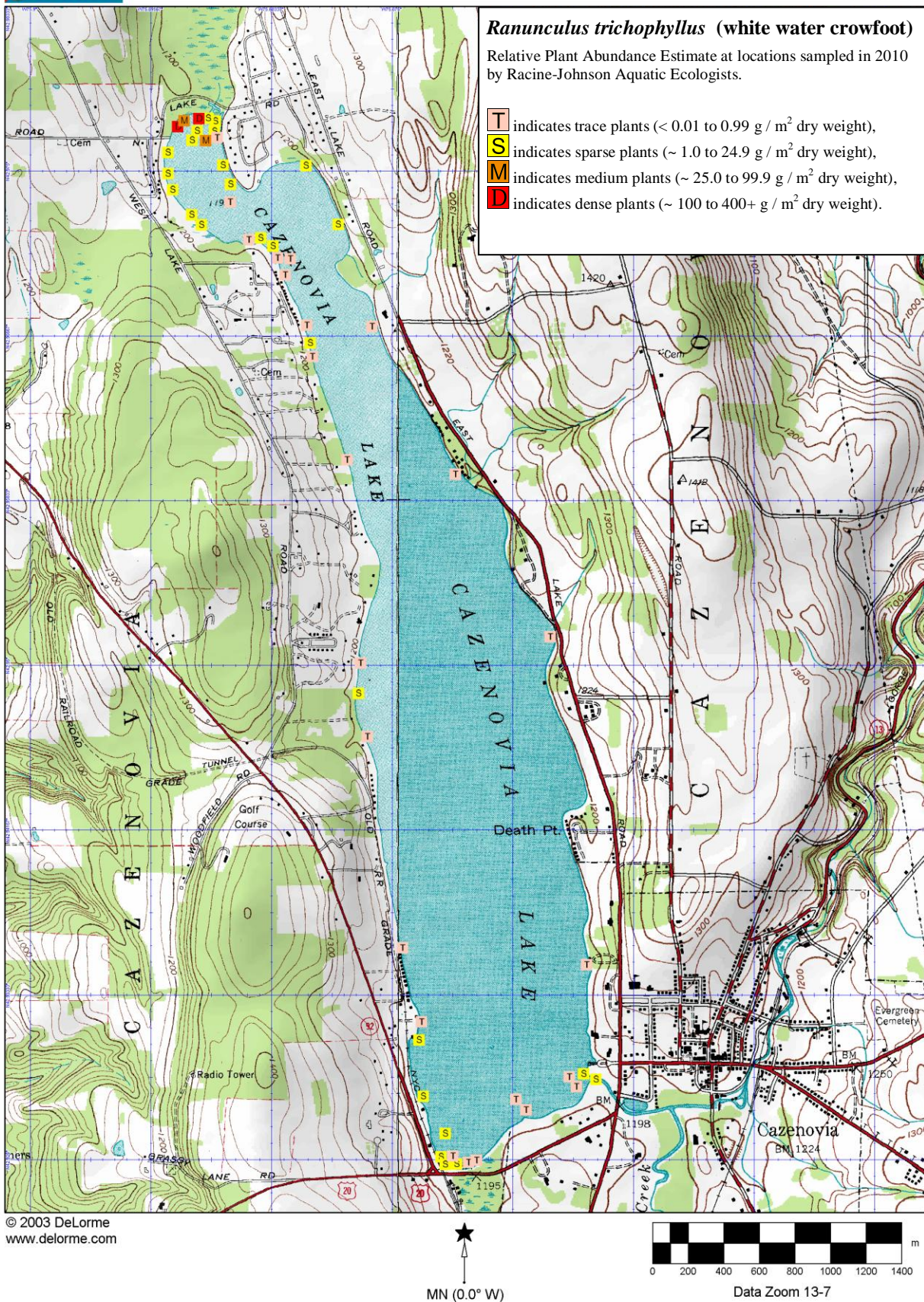


Figure 28. *Ranunculus trichophyllus* (white water crowfoot) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

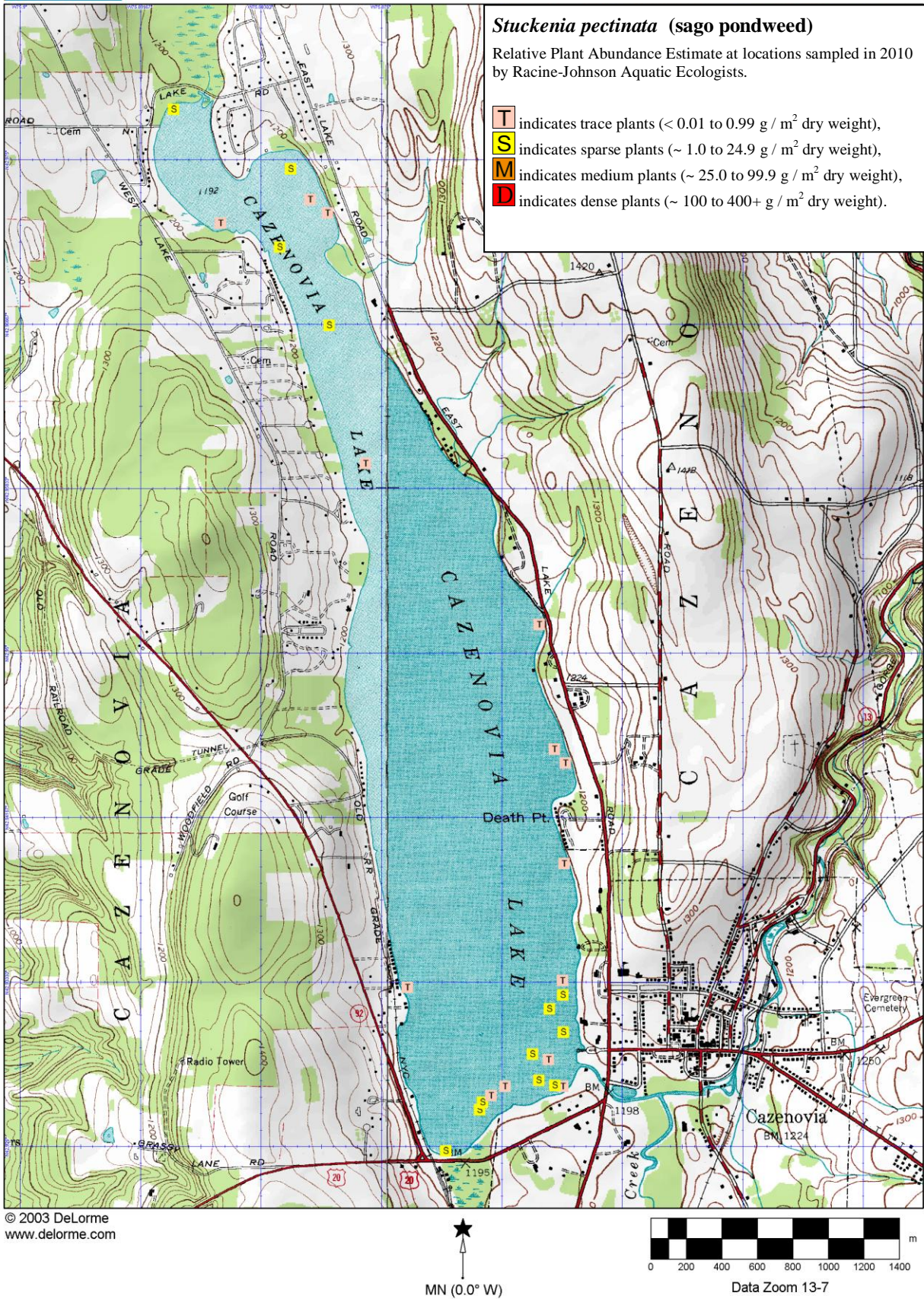


Figure 29. *Stuckenia pectinata* (sago pondweed) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

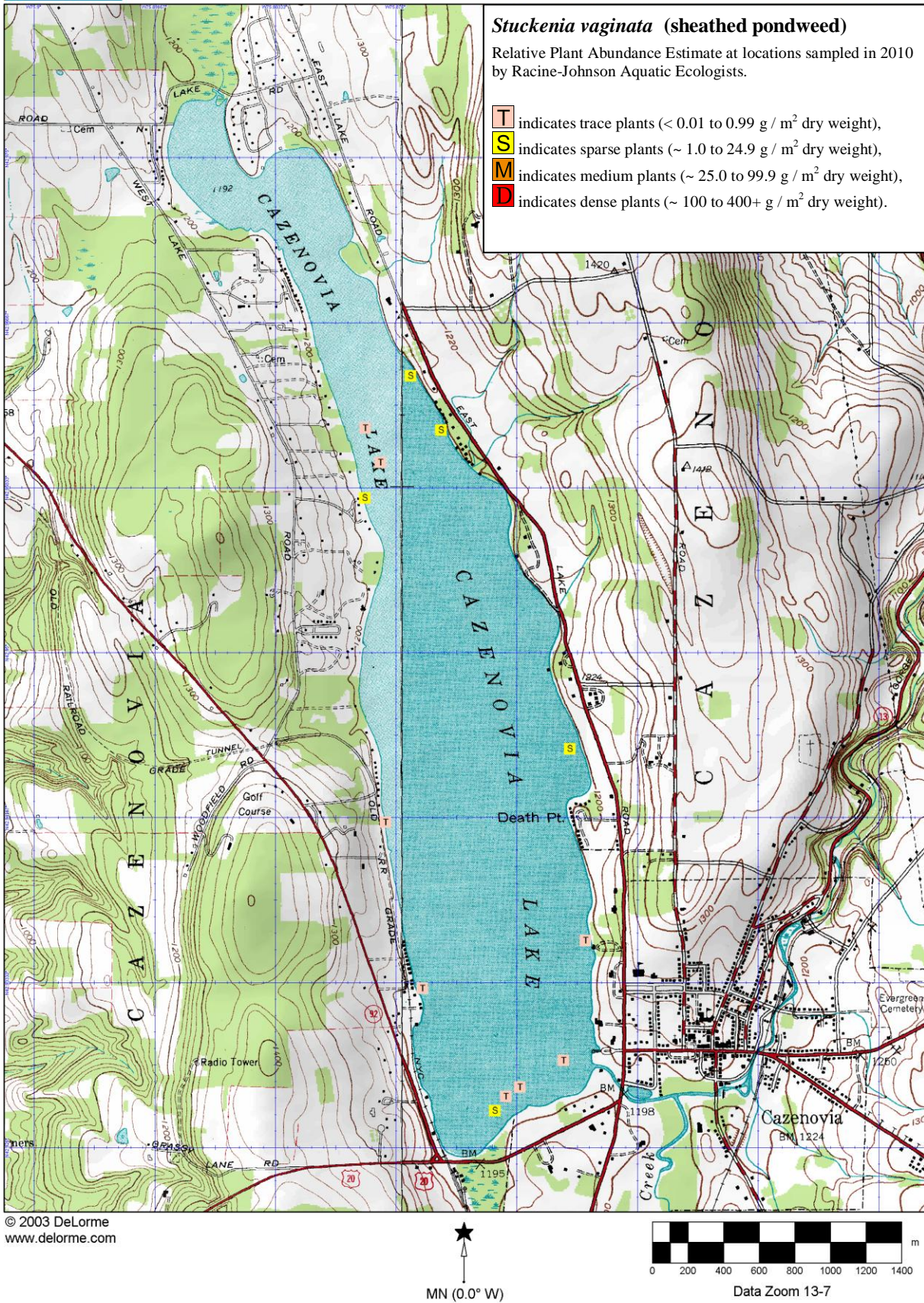


Figure 30. *Stuckenia vaginata* (sheathed pondweed) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

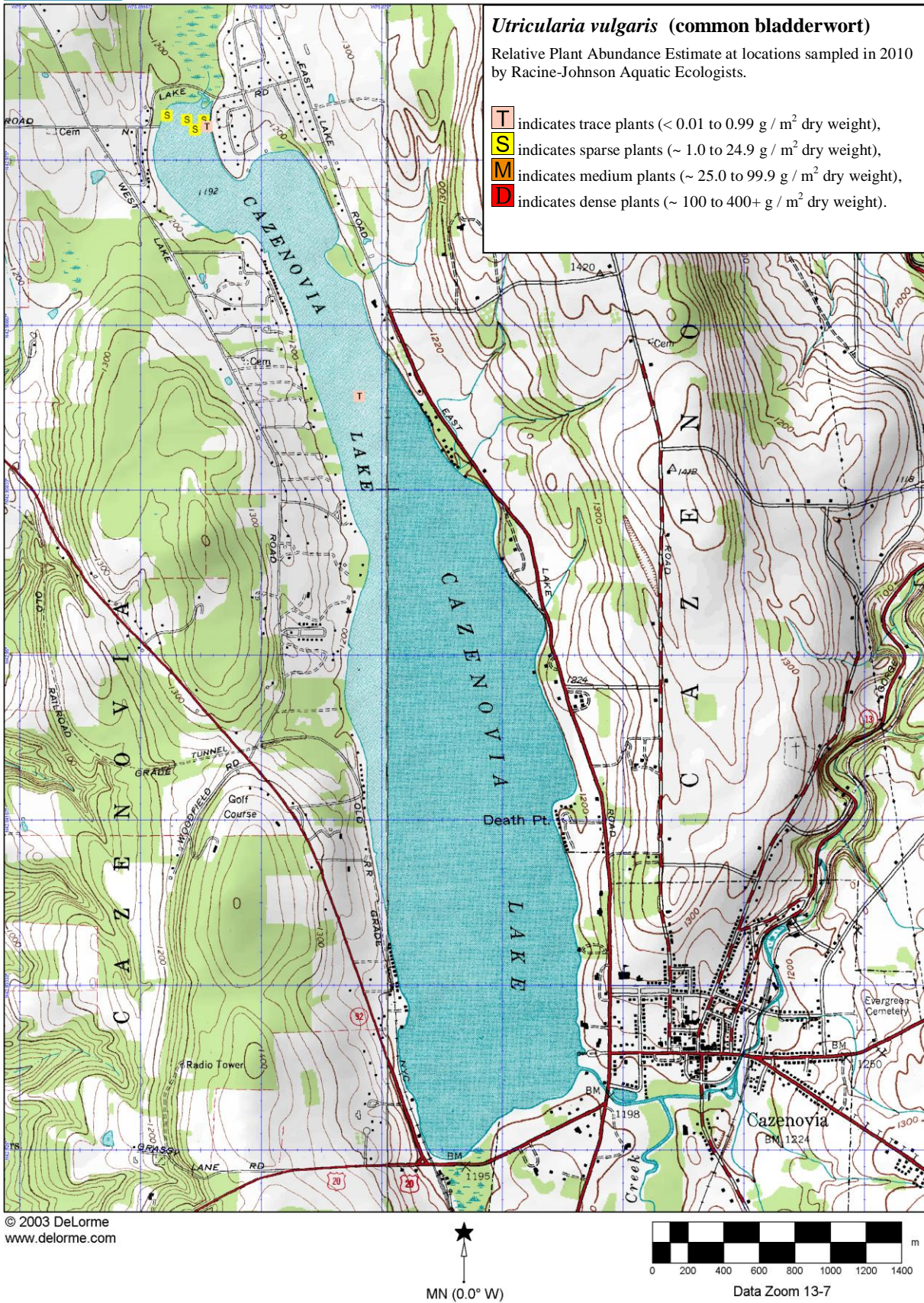
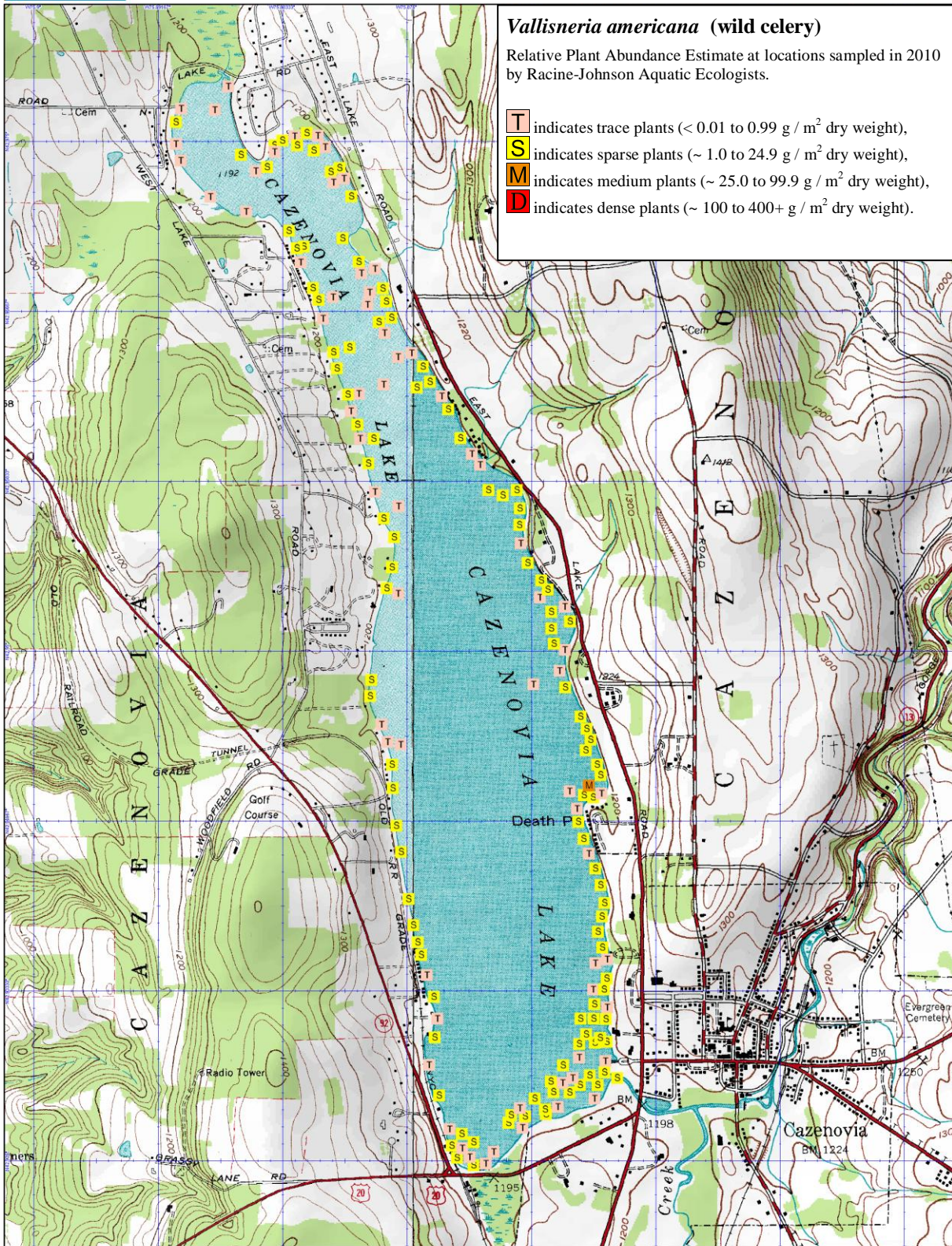
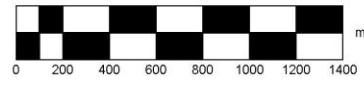


Figure 31. *Utricularia vulgaris* (common bladderwort) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.



© 2003 DeLorme
 www.delorme.com

★
 MN (0.0° W)



Data Zoom 13-7

Figure 32. *Vallisneria americana* (wild celery) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

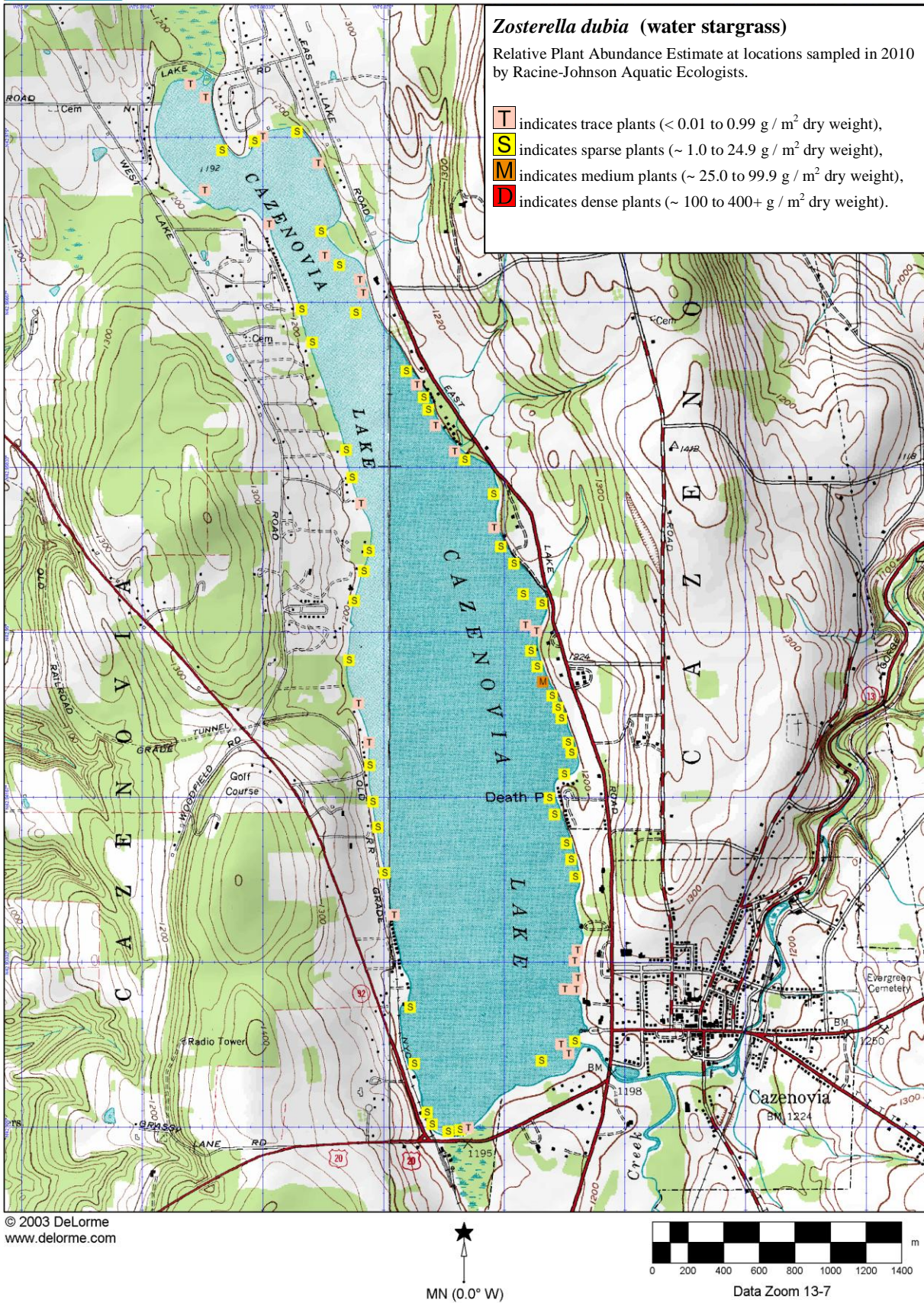


Figure 33. *Zosterella dubia* (water stargrass) map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.

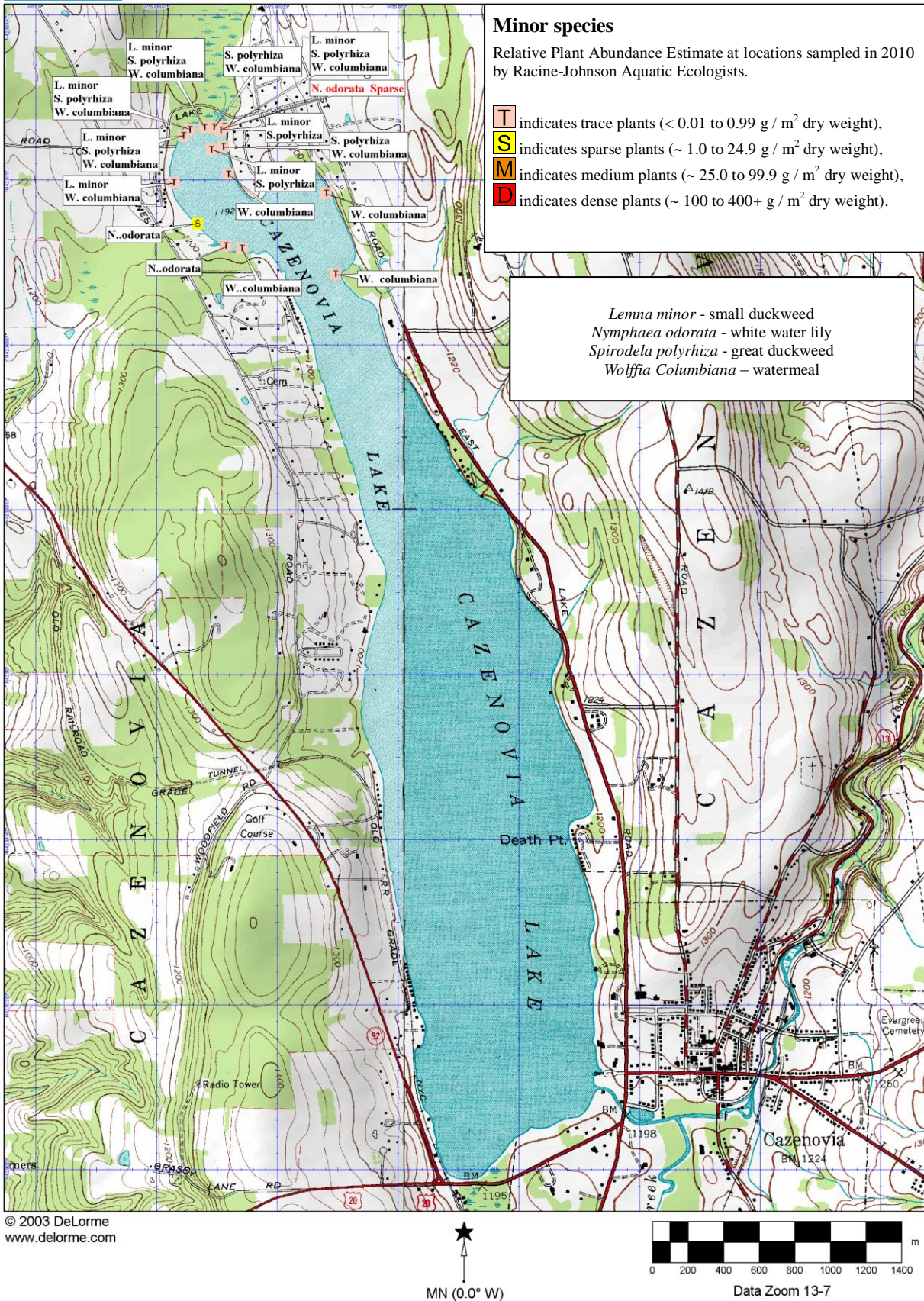


Figure 34. Minor species map of relative abundance at sampled locations in Cazenovia Lake where we collected two rake tosses in 2010.