



**DARRIN**  
Fresh Water Institute

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Lake George, New York  
Adirondack Field Station at Bolton Landing

**A SURVEY OF TRIBUTARIES  
TO LAKE GEORGE, NEW YORK  
FOR THE PRESENCE OF  
EURASIAN WATERMILFOIL**

prepared for  
The Fund for Lake George

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## EXECUTIVE SUMMARY

A survey of tributary deltas in the south basin of Lake George was conducted in 2003 to assess the extent of Eurasian watermilfoil (*Myriophyllum spicatum* L.) infestation. The Darrin Fresh Water Institute conducted the project with financial support from the Fund for Lake George. Similar surveys were completed in 1987, 1989, 1991, 1994, 1997 and 2000 as reference points. Delta areas were chosen as readily identifiable points that historically harbor diverse assemblages of native aquatic plants.

Results of these surveys can be used to approximate the rate of spread of milfoil through the Lake George basin. In 1987, when surveys were initiated, 30 percent of the sites were found to have milfoil. By 1989, this percentage had dropped to 23 percent due to harvesting of milfoil, although three new locations were found in 1989. In 1991, over 45 percent of the tributary sites surveyed in the south basin had milfoil. Results from the 1994 survey showed a slight reduction to 41% of the sites colonized by Eurasian watermilfoil. The 1997 and 2000 surveys found this declining trend was continued from 1994, with 39% and 33% of the total sites infested, respectively. In 2003, the number of sites with Eurasian watermilfoil present remained at 33% of sites surveyed. The decline in sites with Eurasian watermilfoil present is attributed to hand harvesting of milfoil in prior years. No new sites supporting Eurasian watermilfoil were reported in the 2003 survey.

Management efforts to date have been implemented at 128 of 146 known milfoil locations. Management efforts have reduced the milfoil biomass in these locations; however, milfoil has only been eliminated at a handful of sites and reintroduction at these locations is highly probable. Thus maintenance becomes critical following initial management. At this time, Eurasian watermilfoil is ranked 12<sup>th</sup> by relative abundance (a function of cumulative percent cover) and 26<sup>th</sup> by frequency of occurrence for the 48 species found in this survey. The fact that milfoil has reached this level of abundance is testament to the plant's ability to spread rapidly and to outcompete native species. Maintenance will require site visits yearly or every other year to harvest regrowth of milfoil.

Although the number of samples is limited for development of a statistically reliable rate of colonization, new sites continue to be colonized on a year-to-year basis. Expansion of Eurasian watermilfoil at the 46 tributary sites over the sixteen year span of the study is approximately 2 new sites per year, or a 4% annual rate of colonization. The occurrence of milfoil at sites that had been cleared in previous years also indicates that continued surveillance and maintenance of milfoil sites is necessary. The more sobering indication from the recurrence of milfoil at previously harvested sites is that there are no sites or cases to indicate any natural mortality or demise of small populations of Eurasian watermilfoil in Lake George. Although these populations may not expand for several years, clearly they are not dying off on their own.

Tributary surveys demonstrate the need for continued management of Eurasian watermilfoil in Lake George. Management programs currently encompass several different techniques reflective of different stages of milfoil development. Tributary surveys provide a means of mapping milfoil colonization in Lake George, while management programs limit the spread of milfoil once sites have been located. Increased public awareness of the effects of growth and spread of Eurasian watermilfoil on the Lake George ecosystem can help reduce further introduction.

## 2003 TRIBUTARY SURVEY

### Introduction

Streams entering Lake George, with nutrients and suspended sediments derived from the terrestrial portion of the basin and deposited on their deltas, are prime habitats for the continued establishment and reestablishment of Eurasian watermilfoil (*Myriophyllum spicatum* L.). Delta areas are also disturbed habitats, as a result of sedimentation of terrestrially derived materials and scouring of existing sediments during times of accelerated runoff. The combination of changing sediment conditions and habitat disruption make tributary deltas prime locations for Eurasian watermilfoil infestation.

Around the entire lakeshore, there are 128 listed stream tributaries (Madsen et al. 1989<sup>1</sup>). Because human activity in the Lake George basin has historically exacerbated water quality conditions, relative to disturbed areas, the rate of establishment and spread of milfoil has been of particular concern in the management of Eurasian watermilfoil.

A survey of all the tributaries in the basin was performed as part of the 1987-88 Lake George Aquatic Plant Survey (Madsen et al. 1989). The survey provided a procedure for finding new sites with Eurasian watermilfoil, including the establishment of a regular search pattern for milfoil sites to ascertain the relative distribution of milfoil among the native plant communities in Lake George.

In order to balance the number of tributary sites surveyed each year and to stabilize the cost of the survey, the south basin tributaries were divided into two groups in 1991. With approximately 45 tributaries in each group, a three-year cycle of surveys has been established with a south, central and north component of nearly equal number of tributaries. The tributaries in the southern half of the south basin were surveyed in 1991, those in the northern half of the south basin (central) were the subject of the 1992, 1995 and 1998 surveys. The tributaries of the north basin were the subject of the 1993, 1996 and 1999 surveys.

The far south basin tributary survey was conducted in 1987, 1989, 1991, 1994, 1997 and in 2000 to provide information on the rate of colonization of Eurasian watermilfoil (Madsen et al, 1990). Since these are readily located sites for which the presence or absence of Eurasian watermilfoil was known from the previous surveys noted above, these sites were revisited in 2003 to determine whether appreciable new infestation, re-invasion or natural mortality of earlier infestation had occurred.

### Methods

The shoreline adjacent to tributary outflows in the south basin was surveyed for the presence of Eurasian watermilfoil. The tributaries comprising this portion of the survey were visited between July 24<sup>th</sup> and September 30<sup>th</sup>, 2003. Surveys consisted of swimming a 100-meter segment of shoreline from the edge of the water to the outer edge of the littoral zone (maximum depth of rooted plant growth).

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<sup>1</sup> All cited literature is found in **References** on Page 12.

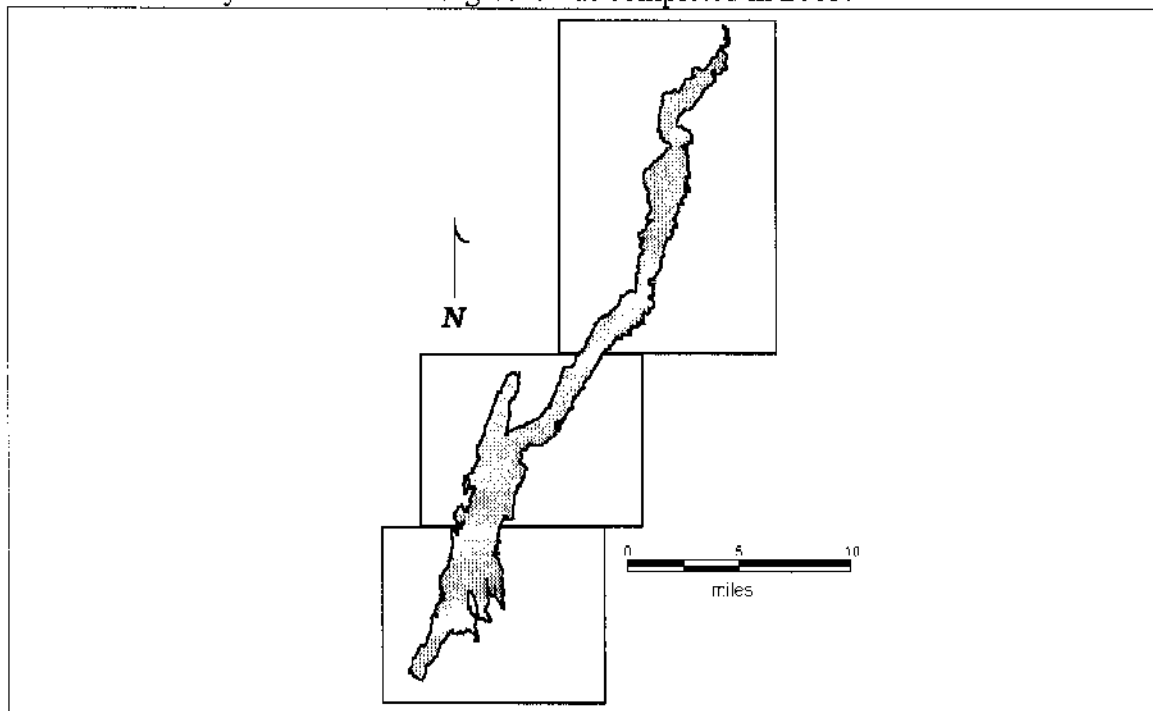
Diver swimover transects were also completed at each site in order to characterize the macrophyte (aquatic plant) community present. Divers skilled in plant identification estimated the abundance of all aquatic plant species in each 1-meter (3 ft) depth interval using the following abundance classes:

<u>Class</u>	<u>Code</u>	<u>% Cover Range</u>	<u>Centroid</u>
Abundant	A	greater than 50% cover	75.0%
Common	C	25% to 50% cover	37.5%
Present	P	15% to 25% cover	20.0%
Occasional	O	5% to 15% cover	10.0%
Rare	R	less than 5% cover	2.5%

Percent cover data provides both the average depth distribution of the plants present and an estimate of the relative abundance of species at the tributary sites. This information is also important for future management decisions concerning milfoil control alternatives and permit applications required as part of any control strategy.

A map showing the general location of this year's survey activity is shown in Figure 1. Specific tributary locations in the current survey are provided in Appendix A.

**Figure 1.** Map of Lake George indicating the three regions included in the Tributary Survey. The southern segment was completed in 2003.



## Results and Discussion

The current survey included the southernmost portion of the lake basin tributaries (46 sites). The central and northern portions of the lake were completed in 2001 and 2002, respectively. Maps with the locations of the tributaries surveyed in 2003 are provided as Appendix A. Aquatic plant abundance data for the 44 sites compared in the 1987 and 1989 surveys, plus 2 additional sites that were included during the 1991 survey are provided as Appendix B. Methodologies employed by the three surveys were the same. The results of the south basin tributary surveys for all survey years are presented in Table 1. For each site, the tributary number and site name is given.

**Table 1.** Tributary survey sites in the south basin and the presence (Yes) or absence (No) of Eurasian watermilfoil. M # is a sequential listing of sites with Eurasian watermilfoil discovered since the survey began.

TRIB #	M #	SITE DESCRIPTION	Map Quadrangle	MILFOIL PRESENT						
				2003	2000	1997	1994	1991	1989	1987
T-21	M-81	Butternut Brook	Bolton	no	no	no	no	yes	no	no
T-22	M-82	Barber Bay	Bolton	yes	yes	yes	yes	yes	no	no
T-23		Isom, N of Echo Bay	Bolton	no	no	no	no	no	no	no
T-24	M-107	Van Warmer-near Eliz. Is.	Lk George	no	no	no	yes	no	no	no
T-25		Van Warmer Bay	Lk George	no	no	no	no	no	no	no
T-25a	M-83	Van Warmer Bay	Lk George	no	no	no	no	yes	no	no
T-26		Trout Pavilion Brook	Lk George	no	no	no	no	no	no	no
T-27	M-11	S Warner Bay-Wetland Trib	Lk George	yes	yes	yes	yes	no	yes	no
T-27a	M-37	S Warner Bay-Culvert	Lk George	yes	yes	yes	yes	yes	yes	yes
T-27b	M-38	S Warner Bay-Culvert	Lk George	yes	yes	yes	yes	yes	yes	yes
T-27c	M-39	S Kattskill Bay	Lk George	yes	yes	yes	yes	yes	no	yes
T-28	M-120	N Warner Bay-culvert	Lk George	yes	yes	yes	yes	yes	no	no
T-29a	M-108	Harris Bay-culvert	Lk George	yes	yes	yes	yes	no	no	no
T-29b		Harris Bay-culvert	Lk George	no	no	No	no	no	no	No
T-29c		Sandy Bay-culvert	Lk George	no	no	No	no	no	no	No
T-30	M-109	Bay SW Happy Family	Lk George	no	no	No	yes	no	no	No
T-30a	M-84	Harris Bay Inlet	Lk George	no	no	yes	no	yes		
T-32	M-85	Dunham Bay Inlet	Lk George	yes	yes	yes	yes	yes		
T-33	M-36	Bay E of Dark Bay	Lk George	yes	yes	yes	yes	yes	no	yes
T-34		Dark Bay	Lk George	no	no	No	no	no	no	No
T-35a	M-33	S of Plum Point	Lk George	no	no	No	no	no	no	yes
T-35b	M-34	Bay between Plum & Woods PT	Lk George	no	no	No	no	yes	no	yes
T-36		East Shore	Lk George	no	no	No	no	no	no	No
T-36a		East Shore	Lk George	no	no	No	no	no	no	No
T-36b		East Shore-culvert	Lk George	no	no	No	no	no	no	No
T-36c		East Shore	Lk George	no	no	No	no	no	no	No
T-36d	M-86	East Shore	Lk George	no	no	No	no	yes	no	No
T-36e	M-121	East Shore-culvert	Lk George	no	no	yes	no	no	no	No
T-36f		East Shore	Lk George	no	no	No	no	no	no	No
T-37a	M-32	Crosbyside-culvert	Lk George	no	no	No	no	yes	no	yes
T-37b	M-87	Crosbyside	Lk George	no	no	No	yes	yes	no	No
T-37c	M-88	Crosbyside	Lk George	no	no	No	no	yes	no	No
T-37d	M-89	Crosbyside-culverts	Lk George	no	no	no	no	yes	no	no
T-40	M-62	Marine Village-culvert	Lk George	yes	yes	yes	yes	yes	yes	no
T-41	M-31	English Brook	Lk George	no	no	yes	no	no	yes	yes

TRIB #	M #	SITE DESCRIPTION	Map Quadrangle	MILFOIL PRESENT						
				2003	2000	1997	1994	1991	1989	1987
T-41a	M-90	S. Tea Is. Bay-culvert	Lk George	yes	no	yes	yes	yes	yes	no
T-41b	M-30	N Tea Is. Bay	Lk George	yes	yes	yes	yes	yes	yes	yes
T-42	M-29	Bay NE of Tea Is.	Lk George	no	no	yes	yes	yes	yes	yes
T-43	M-28	Bay S of Hearthstone	Lk George	no	no	no	no	no	no	yes
T-44	M-27	NW of Cooper Pt.	Lk George	yes	yes	yes	yes	yes	yes	yes
T-45	M-26	SW of Cannon Pt.	Lk George	yes	yes	yes	yes	yes	yes	yes
T-46		Diamond Point area	Lk George	no	no	no	no	no	no	no
T-47	M-110	Diamond Point area	Lk George	no	no	no	yes	no	no	no
T-48		Diamond Point area	Lk George	no	no	no	no	no	no	no
T-49		Edmund's Brook	Lk George	no	no	no	no	no	no	no
T-99	M-136	Assembly Point	Shelving Rk	yes	yes	no	no	no	no	no
Total sites with milfoil				15	15	18	19	22	10	13
Total percent with milfoil				33	33	39	41	48	23	30

The results of the six surveys are further summarized in Tables 2 and Figure 2. In the 1987 survey, 13 (30%) of the 44 sites had Eurasian watermilfoil (Table 1).

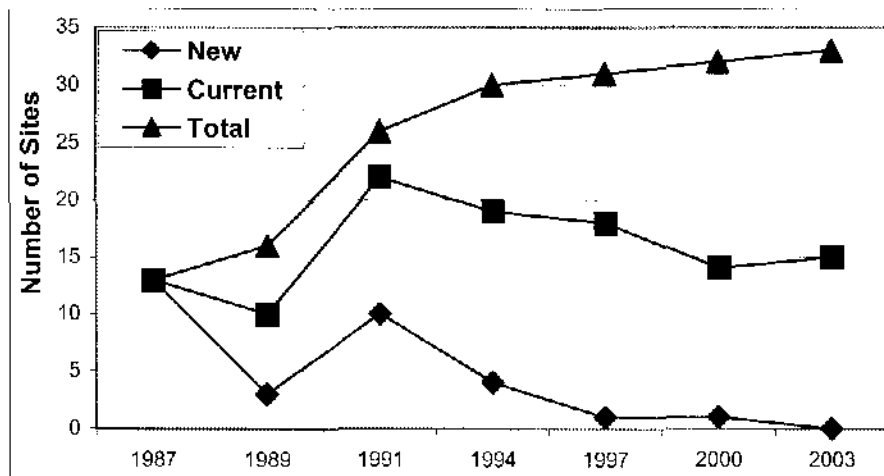
**Table 2.** Comparison of the presence of Eurasian watermilfoil between survey years 1987 and 2003. Numbers in ( ) represent row percentages, numbers in [ ] represent column percentages.

	Eurasian watermilfoil in 1987		
	Present	Absent	Total
Eurasian Watermilfoil in 2003			
Present	7 (47) [54]	8 (53) [24]	15 (100) [33]
Absent	6 (19) [46]	25 (81) [76]	31 (100) [67]
Total	13 (28) [100]	33 (72) [100]	46 (100) [100]

In 1989, the total had decreased to 10 (23%) of the 44 sites surveyed (Table 1). Eight new milfoil sites were found among the original 44 sites, and the two additional sites were also positive for milfoil during the 1991 survey. In the 1994 tributary survey, 19 (41%) of the sites had Eurasian watermilfoil (Table 4), four of which (9%) had not previously been found to have milfoil populations. Of the 46 sites visited in 1997, milfoil was found for the first time at one location (2%). Six (14%) of the sites at which milfoil occurred were positive for the invasive species in every survey since the initial survey in 1987. Four sites (21%) had milfoil present in 1994, but not in 1997. All four sites were hand harvested during the 1994 tributary survey or in subsequent years between surveys. Twelve of the

46 sites (26%) have had milfoil during at least one of the three previous tributary surveys, but not in the 1997 survey. In the 2000 survey, milfoil was found for the first time at one location (2%). Six (14%) of the sites at which milfoil occurred were positive for the invasive species in every survey since the initial survey in 1987. Five sites (11%) had milfoil present in 1997, but not in 2000. All five sites were hand harvested during the 1997 tributary survey or in subsequent years between surveys. Fifteen of the 46 sites (33%) have had milfoil during at least one of the three previous tributary surveys, but not in the 1997 survey. Of the 46 tributary sites in the far south basin, 32 (70%) sites have had milfoil present during at least one of the surveys performed since 1987. Not only initial colonization but also recolonization of tributary sites by Eurasian watermilfoil is occurring in Lake George. The rate of colonization, however, is variable from year to year and between the three portions of the survey.

**Figure 2.** Comparison of the number of sites currently with Eurasian watermilfoil versus the number of sites which have had milfoil during any of the surveys (cumulative), of the south basin.



The statistics of most interest are the number of sites that had Eurasian watermilfoil during one survey year, but not during the follow-up surveys. Two sites, South of Plum Point (T-35a, M-33) and Bay south of Hearthstone (T-43, M-28) have not had Eurasian watermilfoil since the 1987 survey. Seven sites which were cleared during the 1991 survey remained clear through the 2003 tributary survey, those being Crosbyside-culvert (T-37a, M-32), Bay between Plum and Woods Point (T-35b, M-34), Butternut Brook (T-21, M-81), Van Warner Bay (T-25a, M-83), East Shore (T-36d, M-86), Crosbyside (T-37c, M-88), and Crosbyside-culverts (T-37d, M-89). One site, Harris Bay inlet (T-30a, M-84), was cleared of milfoil in 1991, did not have Eurasian watermilfoil during the survey in 1994, but was found to be repopulated with scattered growth in 1997 and clear of milfoil in 2000 and 2003. The milfoil was removed by hand harvesting in the years following or during the 1991 survey. Four sites cleared of milfoil in 1997 remained clear in the 2000 survey, including East Shore Culvert (M-121), English Brook (M-31), S. Tea Island Bay Culvert (M-90), Bay NE of Tea Island (M-29). These results indicate that hand harvesting activities can eliminate small populations of Eurasian watermilfoil. There is



little or no evidence, however, to suggest that the loss of Eurasian watermilfoil populations at specific sites in Lake George can be attributed to natural mortality.

The following is a breakdown of the fifteen sites that had milfoil during the 2000 tributary survey. Seven of the fifteen milfoil sites were found to have eleven or fewer plants, all of which were hand harvested. In the 2000 survey, one new site, T-99 on Assembly Point, was found to have milfoil for the first time. This new site had one milfoil plant, which was removed. The remaining eight sites that had milfoil during the 2000 survey all had milfoil populations in one or more of the earlier tributary surveys.

Since the 1987 survey, the number of tributary sites in this portion of the Lake George basin with milfoil present during subsequent surveys has increased by nineteen. The addition of two tributary sites in 1991, Harris Bay Inlet (T-30a) and Dunham Bay Inlet (T-32) raised the total to 31 of the 46 sites which have had a milfoil population since the survey began in 1987. The small number of plants found at most tributary sites indicates recent colonization. Six of the sites surveyed in 1997 had a milfoil population since the first tributary survey in 1987. Those sites being South Warner Bay - Culvert (M-37), South Warner Bay - Culvert (M-38), North Tea Island Bay (M-30), Bay Northeast of Tea Island (M-29), Northwest of Cooper Point (M-27), and Southwest of Cannon Point (M-26). One of these sites, Bay Northeast of Tea Island, was free of milfoil in 2000 and 2003, reducing the number of sites with continuous milfoil sites to five. Five of the six sites have been the subject of management activities in the last four years. The sites in South Warner Bay - Culvert (M-37), South Warner Bay - Culvert (M-38), Bay Northeast of Tea Island (M-30), and Southwest of Cannon Point (M-26) have been either suction harvested, covered with benthic barrier, hand harvested or a combination of the three (e.g. Cannon Point, M-26). Hand harvesting was conducted at all of the above sites at least once since they were discovered. Hand harvesting of low density milfoil infestations and the use of suction harvesting and benthic barrier on denser growth have been used as a means for maintaining milfoil at low density levels (Madsen et al, 1988). The remaining site North Tea Island Bay (M-30) has had no management activity to this point.

Of the 15 tributary sites in this section of the south basin with milfoil present, hand harvesting was employed to clear 12 sites. Hand harvesting was not attempted at the remaining three sites due to the size of the infested area.

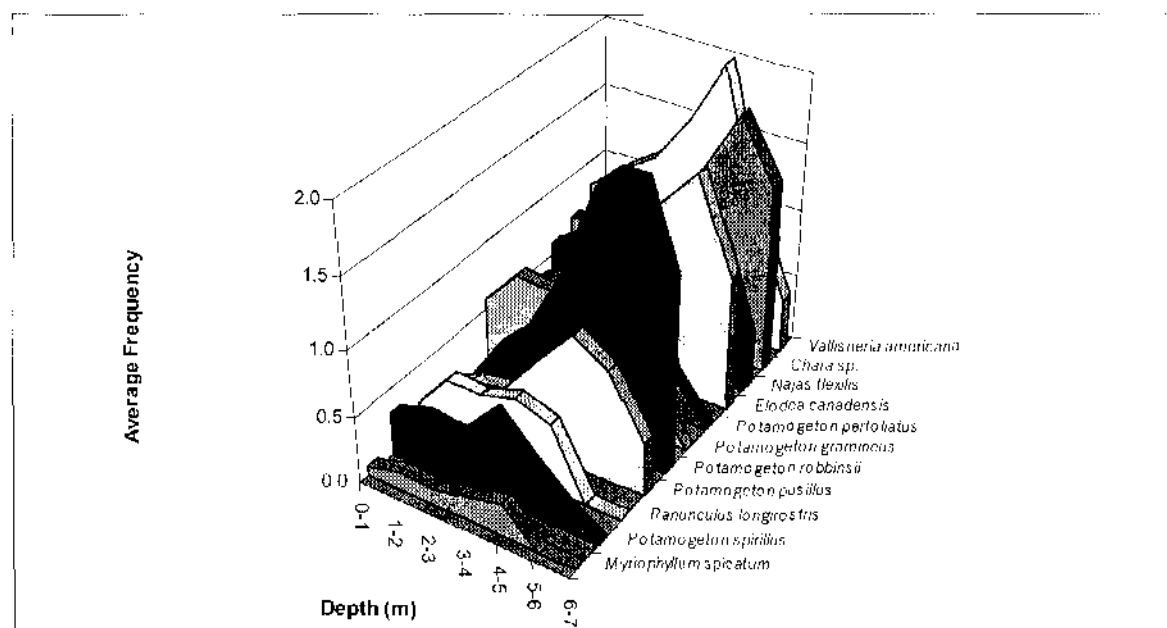
**Table 5.** Frequency of occurrence of all macrophyte species at the tributary sites.  
Species are ranked in order of frequency of occurrence.

Species	Depth Interval (m)							Total Frequency
	0-1	1-2	2-3	3-4	4-5	5-6	6-7	
<i>Vallisneria americana</i>	30	37	33	27	17	10	3	157
<i>Chara sp.</i>	30	31	28	19	14	11	10	152
<i>Potamogeton gramineus</i>	26	36	28	19	6	2		117
<i>Najas flexilis</i>	21	32	27	18	10	4		112
<i>Potamogeton perfoliatus</i>	19	30	29	23	8	1		110
<i>Elodea canadensis</i>	15	26	22	20	12	6	1	102
<i>Potamogeton robbinsii</i>	5	13	23	21	17	10	4	94
<i>Ranunculus longirostris</i>	9	21	20	20	6			76
<i>Isoetes echinospora</i>	12	20	21	14	2	1		70
<i>Potamogeton pusillus</i>	5	16	12	14	11	4	1	64
<i>Sagittaria graminea</i>	21	21	10	1				53
<i>Isoetes (macrospora) lacustris</i>			2	10	14	12	9	52
<i>Eleocharis acicularis</i>	18	22	8	1				49
<i>Sparganium sp.</i>	23	20	3	1				47
<i>Elatine minima</i>	19	19	7	1				46
<i>Potamogeton amplifolius</i>	3	9	14	12	5	1		44
<i>Myriophyllum tenellum</i>	14	18	9	1				42
<i>Ranunculus reptans</i>	15	18	7					40
<i>Heteranthera dubia</i>	11	14	8	5				38
<i>Potamogeton spirillus</i>	7	14	9	2				32
<i>Megalodonta (Bladens) beckii</i>	3	6	4	6	6	5	2	32
<i>Eriocaulon septangulare</i>	13	15	2					30
<i>Juncus pelocarpus</i>	10	12	6	2				30
<i>Potamogeton zosteriformis</i>	3	8	8	5	3	1		28
<i>Lobelia dortmanna</i>	11	11	2					24
<i>Myriophyllum spicatum</i>	4	7	6	5	1			23
<i>Subularia aquatica</i>	10	11	1					22
<i>Potamogeton vaseyii</i>	1	4	6	3	2	1		17
<i>Potamogeton praelongus</i>			3	6	5	2		16
<i>Nuphar variegata</i>	9	5	2					16
<i>Utricularia vulgaris</i>	5	5	1					11
<i>Utricularia resupinata</i>	4	5	1					10
<i>Nymphaea odorata</i>	6	4						10
<i>Myriophyllum alterniflorum</i>	3	4	2					9
<i>Potamogeton crispus</i>	1	3	2	1	1			8
<i>Potamogeton foliosus</i>	1	2	2	1				6
<i>Potamogeton pectinatus</i>	2	3	1					6
<i>Potamogeton friesii</i>	1	1	1	1	1			5
<i>Ceratophyllum demersum</i>	2	2	1					5
<i>Scirpus sp.</i>	2	2	1					5
<i>Sagittaria cuneata</i>	1	2	1					4
<i>Najas quadalupensis</i>	1				1	1		3
<i>Pontederia cordata</i>	3							3
<i>Potamogeton epihydrus</i>	1	1						2
<i>Fontinalis sp.</i>	2							2
<i>Myriophyllum sibiricum</i>		1						1
<i>Potamogeton obtusifolius</i>		1						1
<i>Typha variegata</i>	1							1

Percent cover data for all sites is provided in Appendix B. Of the 48 species of submersed aquatic plants identified for Lake George (Ogden et al. 1976), 46 species were found at the tributary sites. Two species not reported in Ogden et al., 1976 were also found. These included *Myriophyllum spicatum* and *Najas guadalupensis*. Three species reported for the 2003 Tributary Survey, *Isoetes lacustris*, *Myriophyllum alterniflorum*, and *Subularia aquatica*, are on the New York State Rare Plant List (Young, 2003). A single species is on the NYS Watch List, *Megalodonta beckii*, which suggests that the status of this species is uncertain. The rare and uncertain species are highlighted in Table 5. This is particularly important for plant management considerations given the impact that a given management technique may have on non-target species. The impact of the growth and spread of nuisance aquatic plants on the distribution of rare plants, however, must also be included in any management decisions. The diversity of species present at tributary sites is indicative of the suitability of these sites for aquatic plant growth and conversely, the high probability of milfoil infestation at these sites.

In Table 5, the species present and their depth distribution are ranked in order of the frequency with which they appeared at the tributary sites. The depth distribution of the ten most frequently occurring species is presented in Figure 3. Eurasian watermilfoil, ranked 26<sup>th</sup> by frequency of occurrence, is also included in the plot. Depth distribution and species diversity remains comparable to that reported in surveys conducted in the south basin of Lake George in 1987 and 1988 (Madsen et al. 1989).

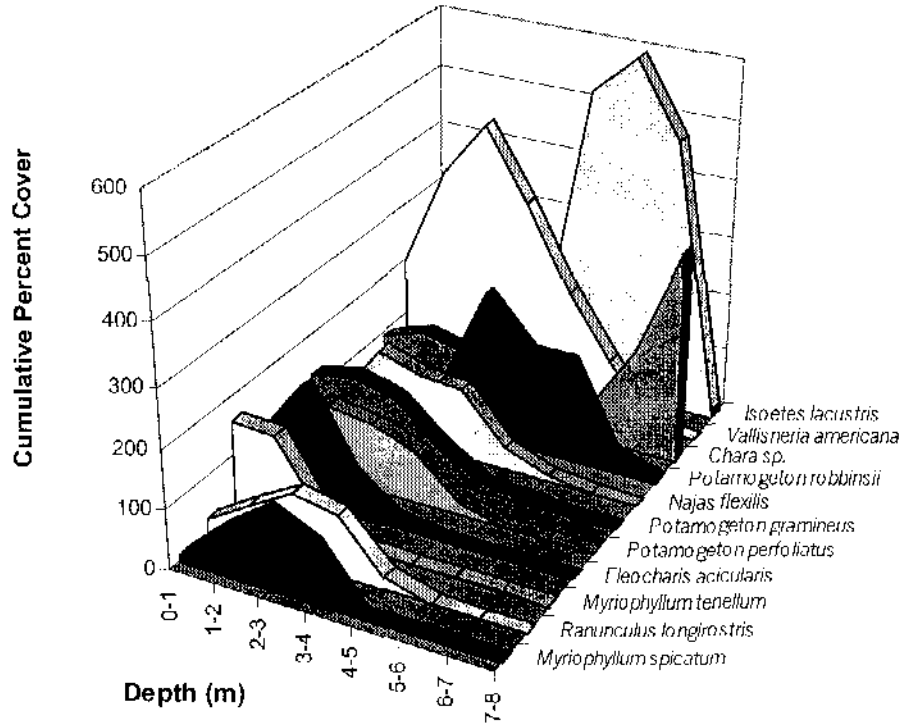
**Figure 3.** Frequency and depth distribution of the 10 most common macrophyte species and Eurasian watermilfoil.



Frequency, or the number of tributaries where each species was present, is an important measure of the distribution of species but does not consider the relative abundance of species within the overall population. Table 6 contains the species present and their depth distribution ranked in order of cumulative percent cover. This ranking is a better measure of the dominance of certain species and, in conjunction with frequency data, provides a more complete picture of aquatic plant community structure. In Figure 4, the depth

distribution of the 10 most abundant species is presented. Eurasian watermilfoil is ranked 12<sup>th</sup> by relative abundance. A comparison of Figures 3 and 4 indicates nine species are ranked in the top 10 for both frequency of occurrence and relative percent cover.

**Figure 4.** Cumulative percent cover and depth distribution of the 10 most common macrophyte species and Eurasian watermilfoil.



Comparisons of the major species by frequency of occurrence reported during the 1997 tributary survey (Eichler et al. 1995) with the current list (Table 5) show few differences. Seven of the ten most abundant species are the same. *Ranunculus reptans* was not within the top ten species during the 1994 survey, but was ranked tenth in the 1997 survey. This species dropped to 24<sup>th</sup> in 2000 and was ranked 18<sup>th</sup> in 2003. Eurasian watermilfoil was ranked 16<sup>th</sup> and 18<sup>th</sup> by frequency of occurrence in the 1991 and 1994 surveys, respectively. In 1997, Eurasian watermilfoil was ranked 24<sup>th</sup> by frequency of occurrence and declined to 27<sup>th</sup> in 2000. A slight increase in rank (26<sup>th</sup>) was observed in 2003. The decline in frequency of occurrence of milfoil over the survey years can be attributed to the removal of milfoil by hand harvesting and other management techniques, and thus a reduction in the number of sites with milfoil.

Although the number of samples is limited for development of a statistically reliable rate of colonization, new sites continue to be colonized on a year-to-year basis. The rate of

**Table 6.** Cumulative percent cover of all macrophyte species at the tributary sites. Species are listed in order of decreasing abundance.

Species	Depth Interval (m)								Total
	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	
<i>Isoetes lacustris</i>			12.5	110	527.5	595	472.5	12.5	<b>1730</b>
<i>Vallisneria americana</i>	192.5	370	467.5	347.5	205	102.5	7.5		<b>1692.5</b>
<i>Chara sp.</i>	90	115	95	77.5	65	60	175	360	<b>1037.5</b>
<i>Potamogeton robbinsii</i>	12.5	40	87.5	250	170	170	25	2.5	<b>757.5</b>
<i>Najas flexilis</i>	52.5	152.5	127.5	122.5	40	10			<b>505</b>
<i>Potamogeton gramineus</i>	127.5	142.5	122.5	55	15	5			<b>467.5</b>
<i>Potamogeton perfoliatus</i>	70	127.5	117.5	87.5	20	2.5			<b>425</b>
<i>Eleocharis acicularis</i>	102.5	200	67.5	10					<b>380</b>
<i>Myriophyllum tenellum</i>	157.5	155	37.5	2.5					<b>352.5</b>
<i>Ranunculus longirostris</i>	30	75	117.5	102.5	22.5				<b>347.5</b>
<i>Isoetes echinospora</i>	30	120	135	35	22.5	2.5			<b>345</b>
<i>Myriophyllum spicatum</i>	10	77.5	130	92.5	2.5				<b>312.5</b>
<i>Sagittaria graminea</i>	82.5	162.5	65	2.5					<b>312.5</b>
<i>Elodea canadensis</i>	37.5	80	62.5	50	30	15	2.5		<b>277.5</b>
<i>Potamogeton amplifolius</i>	7.5	45	87.5	82.5	27.5	2.5			<b>252.5</b>
<i>Eriocaulon septangulare</i>	97.5	95	5						<b>197.5</b>
<i>Potamogeton pusillus</i>	12.5	40	30	35	50	17.5	2.5	2.5	<b>190</b>
<i>Ranunculus reptans</i>	45	105	32.5						<b>182.5</b>
<i>Sparganium sp.</i>	65	82.5	22.5	2.5					<b>172.5</b>
<i>Juncus pelocarpus</i>	32.5	67.5	37.5	5					<b>142.5</b>
<i>Heteranthera dubia</i>	42.5	50	27.5	12.5					<b>132.5</b>
<i>Elatine minima</i>	47.5	47.5	17.5	2.5					<b>115</b>
<i>Megulodonta heckki</i>	7.5	15	10	22.5	25	12.5	5		<b>97.5</b>
<i>Potamogeton zosteriformis</i>	7.5	20	27.5	20	15	2.5			<b>92.5</b>
<i>Nymphaea odorata</i>	80	10							<b>90</b>
<i>Potamogeton spirillus</i>	17.5	35	22.5	5					<b>80</b>
<i>Nuphar variegata</i>	60	12.5	5						<b>77.5</b>
<i>Potamogeton praelongus</i>			7.5	37.5	20	12.5			<b>77.5</b>
<i>Lobelia dortmanna</i>	35	35	5						<b>75</b>
<i>Subularia aquatica</i>	25	27.5	2.5						<b>55</b>
<i>Potamogeton vaseyiii</i>	2.5	10	15	7.5	5	2.5			<b>42.5</b>
<i>Utricularia vulgaris</i>	20	20	2.5						<b>42.5</b>
<i>Utricularia resupinata</i>	10	27.5	2.5						<b>40</b>
<i>Scirpus</i>	12.5	12.5	10						<b>35</b>
<i>Pontedaria cordata</i>	25								<b>25</b>
<i>Myriophyllum alterniflorum</i>	7.5	10	5						<b>22.5</b>
<i>Ceratophyllum demersum</i>	12.5	5	2.5						<b>20</b>
<i>Potamogeton crispus</i>	2.5	7.5	5	2.5	2.5				<b>20</b>
<i>Sagittaria cuneata</i>	2.5	12.5	2.5						<b>17.5</b>
<i>Potamogeton foliosus</i>	2.5	5	5	2.5					<b>15</b>
<i>Potamogeton pectinatus</i>	5	7.5	2.5						<b>15</b>
<i>Potamogeton friesii</i>	2.5	2.5	2.5	2.5	2.5				<b>12.5</b>
<i>Najas guadalupensis</i>	2.5				2.5	2.5			<b>7.5</b>
<i>Fontinalis sp.</i>	5								<b>5</b>
<i>Potamogeton epihydrus</i>	2.5	2.5							<b>5</b>
<i>Myriophyllum sibiricum</i>		2.5							<b>2.5</b>
<i>Potamogeton obtusifolius</i>		2.5							<b>2.5</b>
<i>Typha</i>	2.5								<b>2.5</b>

increase of the presence of Eurasian watermilfoil at the 46 tributary sites over the thirteen year span of the study is approximately 2 new sites per year, or an 4% annual rate of colonization. At the current rate, all remaining tributaries would be colonized by Eurasian watermilfoil over the course of the next three to four years. The occurrence of milfoil at sites which had been cleared in previous years also indicates that continued surveillance and maintenance of milfoil sites is necessary. The more sobering indication from the recurrence of milfoil at previously harvested sites is that there are no sites or cases to indicate any natural mortality or demise of small populations of Eurasian watermilfoil in Lake George. Although these populations may not expand for several years, clearly they are not dying off on their own.

Results of tributary surveys in combination with the Eurasian watermilfoil management program (Eichler et al., 1997) demonstrate the need for continued management of Eurasian watermilfoil in Lake George. The management program encompasses several different techniques reflective of different stages of milfoil development. Tributary surveys provide a means of mapping the rate of milfoil colonization, and the management program provides a means of limiting the rate of spread once these sites have been located. Increasing public awareness of the effects that milfoil has on the Lake George ecosystem, and how the public can help reduce further introduction into the Lake George watershed is an additional benefit.

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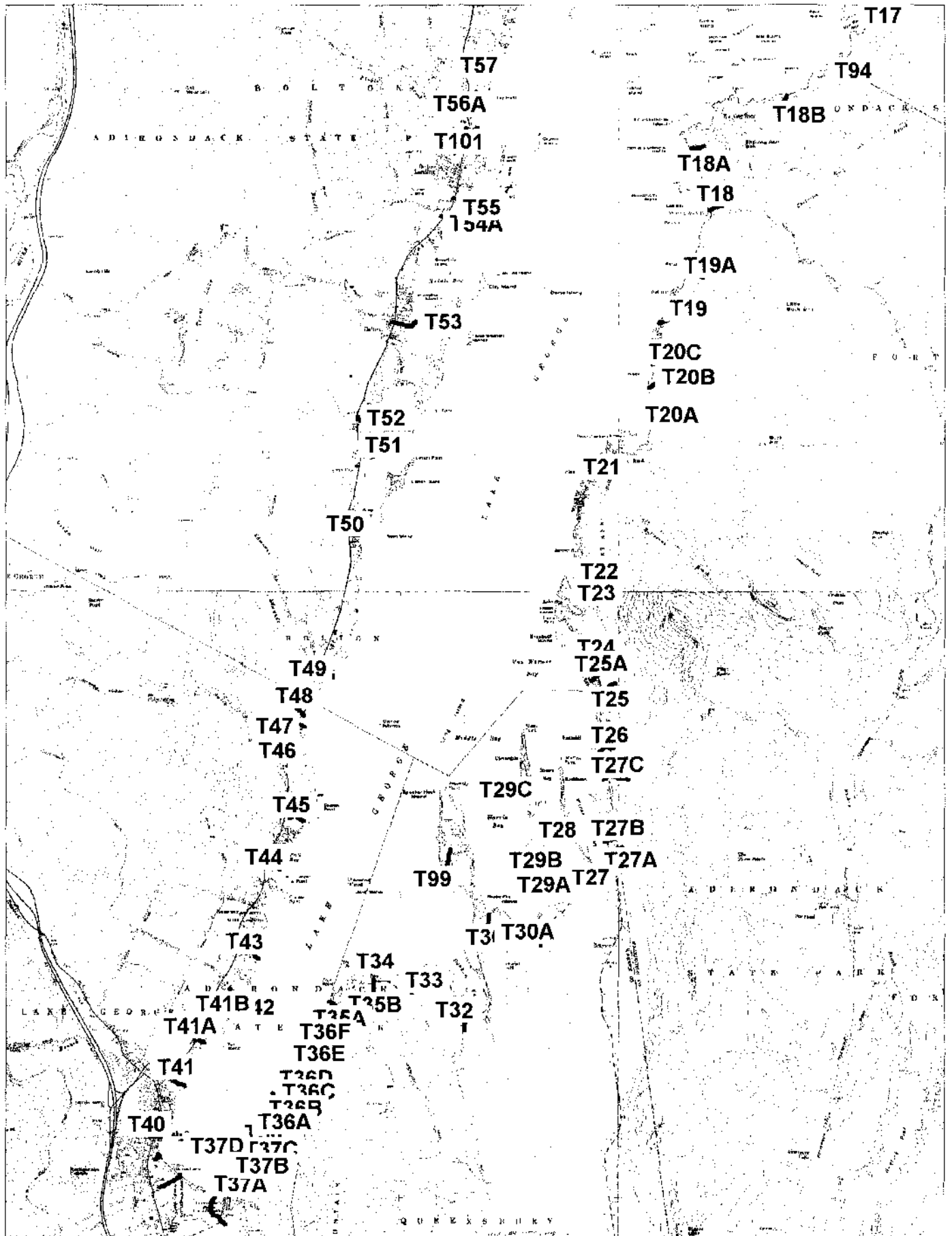
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**APPENDIX A**  
**SITE LOCATIONS**





**APPENDIX B**

**MACROPHYTE COMMUNITY ASSESSMENT DATA**

2003 Lake George Tributary Survey

Site: T-21	Date: 9/12/03							
Butternut Brook								
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Chara sp.	2.5	2.5	2.5					
Elatine	2.5	2.5	2.5					
Eleocharis acicularis	2.5	2.5	2.5					
Eriocaulon	2.5	2.5						
Isoetes echinospora	2.5	2.5	2.5					
Juncas	2.5	10						
Lobelia dortmanna	2.5	2.5						
Megalodonta beckii	2.5	2.5						
Myriophyllum tenellum	2.5	10						
Najas flexilis	2.5	2.5						
Nuphar variegata	2.5	2.5	2.5					
Potamogeton perfoliatus	10	2.5	2.5					
Potamogeton gramineus	10	2.5	10					
Potamogeton zosteriformis	2.5	2.5						
Ranunculus reptans	2.5	10	10					
Sagittaria graminea	2.5	10						
Scirpus	10	2.5						
Sparganium sp.	10	10	10					
Utricularia vulgaris	2.5	2.5						
Vallisneria americana	20	10	10					

Site: T-22	Date: 9/12/03							
Barber Bay								
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Chara sp.	2.5	2.5	2.5	2.5				
Elatine minima	2.5	2.5						
Eleocharis	20	10						
Elodea canadensis	2.5	2.5	2.5	2.5				
Eriocaulon septangulare	2.5	2.5						
Heteranthera dubia	2.5	10						
Isoetes echinospora	2.5	2.5	2.5	2.5				
Juncus pelocarpus	2.5	2.5						
Megalodonta beckii			2.5	10				
Myriophyllum spicatum				2.5				
Najas flexilis	2.5	2.5	2.5	2.5				
Nuphar	10	2.5						
Potamogeton gramineus		2.5	2.5	2.5				
Potamogeton perfoliatus	10	2.5	2.5	2.5				
Potamogeton robbinsii			10	37.5				
Potamogeton spirillus	2.5	2.5						
Potamogeton zosteriformes				2.5				
Potamogeton amplifolius		2.5	10	10				
Ranunculus longirostris		2.5	2.5	2.5				
R. reptans	2.5	10						
Subularia aquatica		2.5						
Sparganium	2.5	2.5						
Vallisneria americana	10	2.5	10	37.5				

Site: T-23

Date: 9/12/03

Isom Bay

Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Megalodonta beckii		2.5						
Chara	2.5	2.5						
Elatine minima	2.5							
Eleocharis	2.5	2.5						
Elodea canadensis	2.5	2.5						
Eriocaulon septangulare	37.5	37.5						
Heteranthera dubia	2.5							
Isoetes echinospora	2.5	2.5						
Juncus pelocarpus	10	2.5						
Najas flexilis	2.5	10						
Nuphar variegata	2.5							
Nymphaea	10							
Potamogeton amplifolius		2.5						
Potamogeton foliosus	2.5	2.5						
Potamogeton gramineus	2.5	2.5						
Pontederia cordata	2.5							
Potamogeton pectinatus	2.5	2.5						
Potamogeton perfoliatus	2.5	2.5						
Potamogeton pusillus		2.5						
Potamogeton robbinsii		2.5						
Potamogeton spirillus	2.5	2.5						
Potamogeton zosteriformis		2.5						
Ranunculus longirostris	2.5	2.5						
Ranunculus reptans	2.5	2.5						
Subularia aquatica	2.5	2.5						
Sparganium	2.5	2.5						
Utricularia resupinata	2.5	2.5						
Vallisneria americana	2.5	20						

Site: T-24

Date: 9/12/03

Elizabeth Isl.

Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Megalodonta beckii				2.5				
Chara	2.5	2.5	2.5	2.5				
Elatine	2.5	2.5						
Eleocharis acicularis	2.5	10						
Elodea canadensis	2.5	2.5	2.5	2.5				
Heteranthera dubia	2.5	2.5	2.5					
Isoetes echinospora	2.5	2.5	2.5					
Myriophyllum tenellum	10	10						
Najas flexilis	2.5	10	2.5	2.5				
Najas guadalupensis	2.5							
Nuphar variegata	10	2.5						
Potamogeton amplifolius		2.5	10	10				
Potamogeton epihydrus	2.5							
Potamogeton gramineus	2.5	2.5	2.5	10				
Potamogeton perfoliatus	10	2.5	2.5	2.5				
Potamogeton pusillus								2.5
Potamogeton robbinsii		2.5	10	37.5				
Potamogeton spirillus	2.5							
Ranunculus longirostris		2.5	10	10				
Sagittaria cuneata	2.5	10	2.5					
Sagittaria graminea	2.5	10	10					
Sparganium sp.	2.5	2.5						
Utricularia vulgaris		2.5						
Vallisneria americana	10	10	37.5	20				

Site: T-25

Date: 9/24/03

Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Megalodonta beckii					10	2.5		
Chara sp.	2.5	2.5	2.5	2.5	2.5	2.5		
Elatine	2.5	2.5						
Eleocharis	2.5	10						
Elodea	2.5	2.5		2.5	2.5			
Isoetes echinospora	2.5	10	2.5	2.5	2.5			
Isoetes lacustris					2.5	75		
Juncus	2.5	2.5						
Myriophyllum tenellum	2.5	10						
Najas flexilis	2.5	2.5	10	10	2.5			
Potamogeton friesii	2.5	2.5	2.5	2.5	2.5			
Potamogeton perfoliatus	2.5	2.5	2.5	2.5	2.5	2.5		
Potamogeton pusillus	2.5	2.5	2.5	2.5	2.5	2.5		
Potamogeton robbinsii			2.5	2.5	10	2.5		
Potamogeton spirillus			2.5					
Potamogeton gramineus	10	10	10	2.5	2.5	2.5		
S. aquatica	2.5	2.5						
Sparganium sp.	2.5	2.5						
Vallisneria americana	10	10	10	10	20	10		

Site: T-25a

Date: 9/12/03

Bombard's camp

Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Chara	2.5	2.5	2.5	2.5	2.5	2.5		
Elatine	2.5	2.5						
Elodea canadensis			2.5	2.5	2.5	2.5		
Hotcranthera dubia	2.5	2.5						
Juncus	2.5	2.5	2.5					
Lobelia	2.5							
Megalodonta beckii					2.5	2.5		
Myriophyllum tenellum	10							
Najas flexilis	2.5	2.5	2.5	2.5	2.5			
Potamogeton amplifolius			10	10	2.5			
Potamogeton foliosus		2.5	2.5					
Potamogeton robbinsii			2.5	10	20	37.5		
Potamogetonperfoliatus	2.5	2.5	2.5	2.5	2.5			
Potamogeton gramineus	2.5	2.5	2.5	2.5	2.5	2.5		
R. longirostris			2.5	2.5				
R. reptans	2.5	10	2.5					
S. aquatica	2.5	2.5						
Sagittaria graminea	2.5							
Sparganium sp.	2.5	2.5	2.5	2.5				
Vallisneria americana	10	10	10	10	10	10		

Site: T-26	Date: 9/24/03							
Trout Pavilion								
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Chara	2.5	2.5	2.5					
Elatine minima	2.5	2.5						
Eriocaulon	2.5							
Eleocharis acicularis	10							
Isoetes echinospora	2.5	2.5	2.5					
Lobelia	2.5							
Myriophyllum tenellum	37.5	10	2.5					
Najas flexilis	2.5	2.5	2.5					
Potamogeton robbinsii			2.5					
Potamogeton gramineus	20	2.5	2.5					
Potamogeton spirillus		2.5	2.5					
R.replans	2.5							
Sparganium sp.	2.5	2.5						
Vallisneria americana	2.5	10	10					

Site: T-27	Date: 9/24/03							
S. Warner Bay Trib wetland								
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7 8
Megalodonta beckii	2.5	2.5						
Chara sp.		2.5						
Elodea	2.5	2.5						
Fontinalis sp.	2.5							
Myriophyllum sibiricum		2.5						
Myriophyllum spicatum		2.5						
Najas flexilis	2.5	2.5						
Nuphar variegata	10							
Nymphaea	10	2.5						
Pontederia cordata	2.5							
Potamogeton gramineus	10	10						
Potamogeton robbinsii	2.5	2.5						
Potamogeton zosteriformes	2.5	2.5						
Potamogeton amplifolius	2.5	2.5						
Ranunculus longirostris	2.5	2.5						
Sagittaria graminea	10	10						
Utricularia vulgaris	2.5	2.5						
Vallisneria americana	10	10						

Site: T-27a and b

Date: 9/24/03

Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Megalodonta beckii	2.5	2.5	2.5					
Chara sp.	10	10	2.5					
Elodea canadensis	2.5	2.5	2.5					
Heteranthera dubia	10	10	10					
Isoetes echinospora	2.5	2.5	2.5					
Myriophyllum spicatum	2.5	20	10					
Najas flexilis	2.5	2.5	2.5					
Nuphar variegata	2.5							
Nymphaca odorata	10							
Potamogeton gramineus	2.5	2.5	2.5					
Potamogeton perfoliatus		2.5	2.5					
Potamogeton pusillus	2.5	2.5	2.5					
Potamogeton praelongus			2.5					
Potamogeton robbinsii		10	10					
Potamogeton spirillus	2.5							
Potamogeton zosteriformis		2.5	2.5					
Potamogeton amplifolius	2.5	10	10					
Ranunculus longirostris	2.5							
Sagittaria graminea	2.5	2.5						
Utricularia vulgaris	2.5	2.5						
Vallisneria americana	10	37.5	37.5					

Site: T-27c

Date: 9/24/03

S. of Fishers Marina

Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7
Chara	2.5	2.5					
Fleocharis acicularis	10	10					
Elodea canadensis	2.5	2.5					
Eriocaulon scptangulare	37.5	10					
Heteranthera dubia	2.5	2.5					
Juncus pelocarpus	10	10					
Myriophyllum tenellum	20	2.5					
Najas flexilis	2.5	10					
Nuphar luteum	10	2.5					
Pontedaria cordata	10						
Potamogeton amplifolius	2.5						
Potamogeton gramineus	2.5	2.5					
Potamogeton perfoliatus	2.5	2.5					
Potamogeton pusillus	2.5	2.5					
Potamogeton robbinsii	2.5	2.5					
Potamogeton spirillus	2.5	2.5					
Potamogeton vaseyii	2.5	2.5					
R. reptans	2.5	10					
Ranunculus longirostris	2.5	2.5					
Sagittaria graminea	10	2.5					
Sparganium sp.	2.5	2.5					
U. vulgaris	2.5	2.5					
Vallisneria americana	10	10					

Site: T-28	Date: 9/30/03						
N. Warner Bay							
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7
<i>Elatine minima</i>	2.5	2.5					
<i>Eleocharis</i>	2.5	2.5					
<i>Eriocaulon</i>		2.5					
<i>Elodea canadensis</i>		2.5	2.5	2.5	2.5		
<i>Isoetes echinospora</i>		2.5	2.5				
<i>Juncus pelocarpus</i>	2.5	10	2.5				
<i>Megalodonta beckii</i>				2.5	2.5		
<i>Myriophyllum spicatum</i>				2.5	2.5		
<i>Potamogeton amplifolius</i>			2.5	10	10		
<i>Potamogeton perfoliatus</i>		2.5	2.5	2.5	2.5		
<i>Potamogeton robbinsii</i>			2.5	10	10		
<i>Potamogeton praelongus</i>				2.5	2.5		
<i>Potamogeton gramineus</i>	2.5	2.5	2.5	2.5	2.5		
<i>R. reptans</i>	2.5	2.5					
<i>Ranunculus longirostris</i>		2.5	2.5	2.5	2.5		
<i>Subularia aquatica</i>	2.5						
<i>Sparganium</i>	2.5	2.5					
<i>Vallisneria americana</i>	2.5	2.5	2.5	10	10		

Site: I-29h	Date: 9/30/03						
Harris Bay culvert, by red A-frame							
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7
<i>Chara sp.</i>	2.5	2.5	2.5	2.5			
<i>Elodea canadensis</i>	2.5	2.5	2.5	2.5	2.5		
<i>Eliocharis</i>	2.5						
<i>Isoetes</i>				2.5			
<i>Ceratophyllum demersum</i>	2.5	2.5					
<i>M. spicatum</i>				2.5			
<i>Najas flexilis</i>	2.5	2.5	2.5	2.5	2.5		
<i>Potamogeton perfoliatus</i>	2.5	2.5	2.5	2.5	2.5		
<i>Potamogeton pusillus</i>	2.5			2.5	2.5		
<i>Potamogeton robbinsii</i>				2.5	2.5		
<i>Potamogeton spirillus</i>				2.5			
<i>Potamogeton gramineus</i>	2.5	2.5	2.5	2.5	2.5		
<i>Potamogeton praelongus</i>				2.5	2.5		
<i>Ranunculus longirostris</i>				2.5	2.5		
<i>Sparganium</i>	2.5	2.5					
<i>Vallisneria americana</i>	2.5	2.5	2.5	2.5			

Site: T-29c	Date: 9/30/03						
Sandy Bay							
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7
<i>Chara sp.</i>	2.5	2.5	2.5				
<i>Eliocharis acicularis</i>	2.5						
<i>Elodea canadensis</i>	2.5	2.5	2.5				
<i>Heteranthera dubia</i>	2.5	2.5					
<i>Najas flexilis</i>	2.5	2.5	2.5	2.5			
<i>Potamogeton perfoliatus</i>	2.5	2.5	2.5	2.5			
<i>Potamogeton robbinsii</i>			2.5				
<i>Potamogeton spirillus</i>	2.5	2.5					
<i>Potamogeton gramineus</i>	2.5	2.5	2.5	2.5			
<i>Ranunculus longirostris</i>	2.5	2.5					
<i>Vallisneria americana</i>	10	10	2.5	2.5			



Site: T-30		Date: 8/19/03						
Bay SW Happy Family Isl.								
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	
Chara	2.5	2.5	2.5					
Elatine minima	2.5							
Elodea canadensis	2.5	2.5						
Eleocharis acicularis	2.5	2.5						
Eriocaulon septangulare	2.5							
Juncus pelocarpus		2.5						
Lobelia	2.5							
Myriophyllum tenellum		2.5	2.5					
Najas flexilis		2.5						
Potamogeton epihydrus		2.5						
Potamogeton gramineus	2.5	2.5						
Potamogeton perfoliatus	2.5	2.5						
Potamogeton spirillus		2.5						
Ranunculus reptans	2.5							
Sparganium		2.5						
Utricularia respinata		2.5	2.5					
Vallisneria americana	2.5	2.5						

Site: T-30a		Date: 8/19/03						
Harris Bay inlet								
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	
Elodea	2.5							
Eriocaulon septangulare	10	10						
Heteranthera dubia	2.5	2.5						
Juncus pelocarpus	2.5	10						
Megalodonta beckii		2.5						
Myriophyllum alterniflorum		2.5						
Najas flexilis	2.5	2.5						
Nuphar variegata	10	2.5						
Potamogeton amplifolius		2.5						
Potamogeton gramineus	2.5	2.5						
Potamogeton robbinsii	2.5	2.5						
Potamogeton pusillus		2.5						
Pontederia cordata	20							
Ranunculus longirostris		2.5						
Sagittaria graminea	10	10						
Sparganium sp.	2.5	10						
Utricularia respinata	2.5	10						
Utricularia vulgaris	2.5							

Site: T-32

Date: 8/19/03

Dunham's Bay

Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7
<i>Ceratophyllum demersum</i>	10	2.5	2.5				
<i>Eleocharis acicularis</i>	10						
<i>Elodea</i>	2.5	2.5	2.5				
<i>Fontinalis</i>	2.5						
<i>Myriophyllum spicatum</i>	2.5	2.5	2.5				
<i>Myriophyllum tenellum</i>	10	10					
<i>Najas flexilis</i>	2.5	37.5	2.5				
<i>Nuphar variegata</i>	10	2.5	2.5				
<i>Nymphaea odorata</i>	37.5	2.5					
<i>Potamogeton gramineus</i>	10	10	2.5				
<i>Potamogeton perfoliatus</i>	2.5	2.5	2.5				
<i>Potamogeton pusillus</i>	2.5	2.5					
<i>Potamogeton robbinsii</i>		2.5	2.5				
<i>Potamogeton vaseyi</i>	2.5	2.5					
<i>Potamogeton zosteriformis</i>		2.5	2.5				
<i>Ranunculus longirostris</i>	2.5	2.5	2.5				
<i>Sagittaria cuneata</i>		2.5					
<i>Sagittaria graminea</i>	10	10	2.5				
<i>Scirpus</i>	2.5	10	10				
<i>Sparganium</i> sp.	2.5	20	10				
<i>Utricularia vulgaris</i>	10	10	2.5				
<i>Vallisneria americana</i>	10	10	37.5				

Site: T-33

Date: 7/31/03

B-F Dark Bay

Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7
<i>Chara</i> sp.	2.5	2.5	2.5	2.5	2.5		
<i>Elatine minima</i>	2.5	2.5	2.5				
<i>Eleocharis acicularis</i>		2.5	10				
<i>Elodea canadensis</i>		2.5	2.5				
<i>Isoetes echinospora</i>		2.5	10	2.5			
<i>Isoetes lacustris</i>				2.5	10		
<i>M. tenellum</i>	2.5	2.5					
<i>Najas flexilis</i>		2.5	2.5	2.5	2.5		
<i>Potamogeton gramineus</i>	2.5	2.5	2.5				
<i>Potamogeton perfoliatus</i>	2.5	2.5	2.5	2.5	2.5		
<i>Potamogeton praelongus</i>			2.5	10	2.5		
<i>Potamogeton robbinsii</i>					2.5		
<i>Potamogeton spirillum</i>		2.5	2.5				
<i>Ranunculus longirostris</i>				2.5			
<i>Sagittaria graminea</i>	2.5	2.5					
<i>Sparganium</i> sp.	2.5	2.5					
<i>Vallisneria americana</i>	2.5	10	10	10	10		

Site: T-34		Date: 7/31/03						
Dark Bay								
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	
<i>Elatine minima</i>	2.5							
<i>Fleocharis acicularis</i>	2.5	10	10					
<i>Elodea canadensis</i>			2.5					
<i>Isoetes echinospora</i>				2.5				
<i>Isoetes lacustris</i>						75	75	
<i>Lobelia dortmanna</i>	2.5							
<i>Myriophyllum tenellum</i>		2.5	2.5					
<i>Najas flexilis</i>		2.5	10	10	10	2.5		
<i>Potamogeton gramineus</i>		2.5	10	2.5				
<i>Potamogeton perfoliatus</i>			2.5	2.5				
<i>Potamogeton robbinsii</i>				2.5	10	2.5		
<i>Ranunculus reptans</i>		2.5						
<i>Sparganium</i> sp.	2.5							
<i>Vallisneria americana</i>		2.5	10	10	10	10		

Site: T-35a		Date: 7/31/03							
S. of Plum Pt.									
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	
<i>Chara</i> sp.	2.5	10	2.5	2.5	2.5	2.5	2.5	37.5	
<i>Elatine minima</i>	2.5	2.5	2.5						
<i>Eleocharis acicularis</i>	2.5	2.5							
<i>Isoetes echinospora</i>	2.5	2.5	10	2.5					
<i>Isoetes lacustris</i>					10	10	10	2.5	
<i>Lobelia dortmanna</i>	2.5	10							
<i>Myriophyllum tenellum</i>	2.5	10	2.5						
<i>Najas flexilis</i>		2.5	10	10	10	2.5			
<i>Potamogeton perfoliatus</i>		2.5	10	10					
<i>Potamogeton pusillus</i>		2.5	2.5	2.5	10	10			
<i>Potamogeton gramineus</i>	2.5	10	10	2.5					
<i>Ranunculus longirostris</i>		2.5	10	2.5					
<i>R. reptans</i>		2.5							
<i>Sagittaria graminea</i>		2.5							
<i>Sparganium</i> sp.	2.5	2.5							
<i>Subularia aquatica</i>	2.5	2.5	2.5						
<i>Vallisneria americana</i>	2.5	2.5	10	20	20	20			

Site: T-35b

Date: 7/31/03

Plum/Woods Pt.

Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7
<i>Chara</i> sp.	2.5	2.5	2.5	2.5	2.5		
<i>Elatine minima</i>		2.5					
<i>Elodea canadensis</i>		2.5	2.5	2.5	2.5		
<i>Eleocharis acicularis</i>	37.5	10					
<i>Eriocaulon</i>		2.5					
<i>Heteranthera dubia</i>		2.5	2.5				
<i>Isoetes echinospora</i>			2.5	2.5			
<i>Isoetes lacustris</i>				37.5	75		
<i>Juncas</i>			10	2.5			
<i>Myriophyllum tenellum</i>			10	2.5			
<i>Najas flexilis</i>			2.5	10			
<i>Potamogeton perfoliatus</i>		10	10	2.5	2.5		
<i>Potamogeton pusillus</i>		2.5	2.5	2.5			
<i>Potamogeton robbinsii</i>		2.5	2.5	10	2.5		
<i>Potamogeton spirillus</i>		2.5	2.5	2.5			
<i>Potamogeton vaseyi</i>		2.5	2.5	2.5			
<i>Potamogeton gramineus</i>		2.5	2.5	2.5	2.5		
<i>Ranunculus longirostris</i>		2.5	2.5	10	2.5		
<i>Ranunculus reptans</i>			10				
<i>Subularia aquatica</i>		2.5					
<i>Vallisneria americana</i>	2.5	10	10	10	10		

note: heavy filamentous algae growth on delta

Site: T-36

Date: 7/30/03

North of Wiawaka

Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8
<i>Chara</i> sp.	2.5	2.5	2.5	10	10	10	2.5	2.5
<i>Elatine minima</i>		2.5	2.5	2.5				
<i>Elodea canadensis</i>		2.5	2.5	2.5				
<i>Heteranthera dubia</i>		2.5	2.5					
<i>Isoetes echinospora</i>		20	10	2.5				
<i>Isoetes lacustris</i>					75	75	10	
<i>Juncas</i>		2.5	10	2.5				
<i>Lobelia dortmanna</i>		2.5	2.5					
<i>Myriophyllum tenellum</i>		10	2.5					
<i>Najas flexilis</i>			2.5	10				
<i>Potamogeton amplifolius</i>				2.5				
<i>Potamogeton foliosus</i>			2.5	2.5				
<i>Potamogeton gramineus</i>		2.5	2.5	2.5				
<i>Potamogeton perfoliatus</i>		2.5	2.5	10	2.5			
<i>Potamogeton robbinsii</i>			2.5	2.5	10	10	2.5	2.5
<i>Potamogeton pusillus</i>		2.5	2.5	2.5	2.5	2.5	2.5	2.5
<i>Potamogeton vaseyi</i>			2.5					
<i>Ranunculus longirostris</i>		2.5	2.5	2.5				
<i>Ranunculus reptans</i>		2.5	2.5					
<i>Sagittaria graminea</i>		2.5	2.5					
<i>Vallisneria americana</i>		10	10	10	10			

Site: T-36a		Date: 7/30/03							
East Shore									
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	
Chara sp.	2.5	2.5	2.5	2.5	10	10	10	37.5	
Elatine minima		2.5							
Fleocharis acicularis		10							
Elodea canadensis		2.5	2.5	2.5	2.5				
Isoetes echinospora		10	10	2.5					
Isoetes lacustris				2.5	10	37.5	75	2.5	
Najas flexilis		2.5	2.5	10	2.5				
Potamogeton amplifolus	2.5	10	10	10					
Potamogeton gramineus		2.5	2.5	2.5					
Potamogeton perfoliatus	2.5	10	10	10					
Potamogeton pusillus				2.5	10				
Potamogeton praelongus			2.5	2.5					
Potamogeton robbinsii			2.5	10	10	20	10		
Ranunculus longirostris		2.5	10	2.5	10				
R. reptans		10							
Sagittaria graminea	2.5	37.5	2.5						
Sparganium sp.	2.5	2.5							
Vallisneria americana	2.5	10	10	10	10	10			

Site: T-36b		Date: 7/30/03							
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	
Chara sp.	10	2.5	2.5	10	2.5	2.5	2.5	37.5	
Elatine minima	2.5	2.5	2.5						
Fleocharis acicularis		10	2.5						
Elodea canadensis		2.5	2.5	2.5	2.5	2.5	2.5		
Eriocaulon	2.5	2.5							
Isoetes echinospora		10	10	2.5					
Isoetes lacustris				2.5	75	75	75	2.5	
Lobelia		2.5							
Megalodonta beckii					2.5				
Najas flexilis	2.5	2.5	2.5	2.5					
Potamogeton gram	10	10	2.5	2.5					
Potamogeton obtusifolius		2.5							
Potamogeton perfoliatus		2.5	10	2.5					
Potamogeton pusillus		2.5	2.5	2.5	2.5				
Potamogeton robbinsii		2.5	2.5	10	10	2.5			
Potamogeton spirillus		2.5	2.5						
Ranunculus longirostris		2.5	2.5	10					
R. reptans	2.5	10	2.5						
Sparganium sp.	2.5	2.5							
Subularia aquatica		2.5							
Vallisneria americana		10	10	20	10	2.5	2.5		

Site: T-36c

Date: 7/30/03

Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7
Chara sp.	2.5	2.5	2.5				
Elatine minima	2.5	2.5	2.5				
Eleocharis	10	20	20	10			
Elodea canadensis				2.5	2.5	2.5	
Eriocaulon septangulare	2.5	2.5					
Heteranthera dubia				2.5			
Isoetes echinospora			2.5	2.5	20	2.5	
Isoetes lacustris						2.5	75
Juncus pelocarpus		10	10				
Lobelia	2.5	2.5					
Megalodonta beckii						2.5	2.5
Myriophyllum tenellum	10	10	2.5				
Najas flexilis	2.5	2.5	10	10	2.5	2.5	
Potamogeton amplifolius				2.5			
Potamogeton gramineus	2.5	2.5	2.5	2.5			
Potamogeton perfoliatus	2.5	2.5	2.5	2.5			
Potamogeton pusillus			2.5	2.5			
Potamogeton robbinsii				2.5	10	37.5	2.5
Potamogeton spirillus		2.5	2.5				
Potamogeton vaseyii			2.5	2.5	2.5		
Ranunculus longirostris			2.5	2.5	2.5		
Ranunculus reptans	2.5	2.5					
Subularia aquatica	2.5	2.5					
Vallisneria americana	2.5	10	10	10	10	10	2.5

Site: T-36d

Date: 7/30/03

East Shore

Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Chara sp.	2.5	2.5	2.5	10	10	2.5	75	75
Elatine minima	2.5	2.5						
Elodea canadensis				2.5	2.5	2.5		
Eriocaulon septangulare	10	10						
Isoetes lacustris			10	20	75	75	2.5	
Lobelia dortmanna	2.5	2.5						
Myriophyllum tenellum	10	20						
Najas flexilis		2.5	10	10				
Potamogeton amplifolius			2.5	2.5	2.5			
Potamogeton gramineus	2.5	2.5	2.5	2.5				
Potamogeton perfoliatus		2.5	2.5	2.5				
Potamogeton pusillus		2.5	2.5	2.5	2.5			
Potamogeton spirillus	2.5	2.5						
Sagittaria graminea		2.5						
Sparganium sp.	2.5	2.5						
Subularia aquatica	2.5	2.5						
Vallisneria americana	2.5	10	10	10	2.5			

Site: T-36e

Date: 7/30/03

Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Chara sp.	2.5	2.5	2.5	2.5	2.5	2.5	2.5	75
Elatine minima	2.5	2.5						
Eleocharis		2.5	10					
Elodea canadensis			2.5	2.5	2.5			
Eriocaulon	10	10						
Isoetes echinospora	2.5	2.5	2.5	2.5				
Isoetes lacustris				10	75	75	75	2.5
Juncus pelocarpus	2.5	10						
Lobelia	10	2.5						
Myriophyllum tenellum	37.5	10						
Najas flexilis		2.5	10	20	2.5			
Potamogeton gramineus	2.5	2.5	10	2.5				
Potamogeton spirillus			2.5					
Potamogeton robbinsii			2.5	10	10			
Potamogeton vaseyi		2.5	2.5					
Ranunculus longirostris				10				
R. reptans	2.5	10	2.5					
Subularia aquatica	2.5	2.5						
Vallisneria americana		2.5	10	10	2.5			

Site: T-36f

Date: 7/30/03

Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Chara sp.	2.5	2.5	2.5	2.5	2.5	2.5	2.5	10
Elatine minima	2.5	2.5	2.5					
Isoetes lacustris			2.5	10	75	75	75	2.5
Heteranthera dubia				2.5				
Najas flexilis	2.5	10						
Potamogeton gramineus	10	10						
Potamogeton pusillus		2.5	2.5	2.5	2.5			
Potamogeton vaseyi			2.5	2.5				
Sparganium sp.	2.5							
Vallisneria americana	2.5	10	20	10				

Site: T-37a & b & c

Date: 7/24/03

Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Megalodonta beckii				2.5	2.5	2.5	2.5	
Chara sp.	2.5	2.5	2.5				2.5	10
Eleocharis		10						
Isoetes echinospora		10	10	2.5				
Isoetes lacustris					2.5	10		
Myriophyllum tenellum		20						
Najas flexilis	2.5	2.5	2.5					
Potamogeton gramineus		2.5	2.5					
Potamogeton perfoliatus		10	2.5	2.5				
Potamogeton robbinsii			10	20	20	10	10	
Potamogeton zosteriformis			2.5	2.5	2.5			
Ranunculus longirostris			10	10				
Sagittaria graminea	2.5	2.5						
Sparganium sp.	2.5							
Subularia aquatica	2.5							
Vallisneria americana		10	37.5	20	20	10	2.5	

Site: T-37 d		Date: 7/24/03							
Crosbyside									
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	
Megalodonta beckii				2.5	2.5				
Chara sp.	2.5	2.5	2.5	2.5	2.5	2.5	37.5	75	
Eleocharis acicularis		10	2.5						
Elodea canadensis		2.5							
Isoetes echinospora			10						
Isoetes lacustris				2.5	37.5				
Najas flexilis	2.5	2.5	2.5						
Potamogeton gramineus		2.5							
Potamogeton perfoliatus		2.5	2.5						
Potamogeton robbinsii			2.5	37.5	2.5				
Ranunculus longirostris			10	2.5					
Ranunculus reptans	2.5	10							
Sagittaria graminea	10	10							
Sparganium sp.	2.5	2.5							
Vallisneria americana			37.5	10	2.5				

Site: T-40		Date: 7/24/03							
Marine Village culvert									
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7		
Chara sp.	2.5	10	10	10					
Eleocharis acicularis	2.5	2.5							
Elodea canadensis	2.5	10	2.5	2.5					
Heteranthera dubia	2.5	2.5	2.5						
Megalodonta beckii		2.5	2.5	2.5					
Potamogeton perfoliatus	2.5	10	2.5	2.5					
Potamogeton zosteriformis		2.5	2.5						
Ranunculus longirostris	2.5	2.5	10	2.5					
Sagittaria graminea	2.5	10	2.5						
Vallisneria americana	10	10	10	20					



Site: T-41		Date: 7/25/03						
English Brook								
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	
<i>Elodea canadensis</i>		2.5	2.5	2.5				
<i>Myriophyllum alterniflorum</i>	2.5	2.5	2.5					
<i>Najas flexilis</i>		2.5	2.5					
<i>Potamogeton amplifolius</i>			10	2.5				
<i>Potamogeton gramineus</i>		2.5	10					
<i>Potamogeton perfoliatus</i>	2.5		2.5	2.5				
<i>Potamogeton praelongus</i>				10				
<i>Potamogeton robbinsii</i>			2.5	2.5				
<i>Ranunculus longirostris</i>		2.5						
<i>Sagittaria graminea</i>	2.5		10	2.5				
<i>Sagittaria</i> sp.	2.5							
<i>Sparganium</i> sp.	2.5							
<i>Vallisneria americana</i>		2.5	20	10				

Site: T-41a		Date: 7/25/03						
Tahoe culvert, S. Tea Island								
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	
<i>Elodea canadensis</i>		10	2.5	2.5	2.5	2.5		
<i>Heteranthera dubia</i>	2.5	2.5						
<i>Megalodonta beckii</i>					2.5	2.5		
<i>Myriophyllum spicatum</i>		2.5	2.5					
<i>N. quadalupensis</i>					2.5	2.5		
<i>Potamogeton amplifolius</i>					2.5			
<i>Potamogeton crispus</i>		2.5	2.5	2.5	2.5			
<i>Potamogeton gramineus</i>		2.5			2.5			
<i>Potamogeton perfoliatus</i>		10	2.5	2.5	2.5			
<i>Potamogeton praelongus</i>					2.5	2.5		
<i>Potamogeton pusillus</i>		2.5	2.5	2.5	2.5			
<i>Potamogeton robbinsii</i>		2.5	2.5	10	20	37.5		
<i>Potamogeton zosteriformis</i>		2.5	10	10	10	2.5		
<i>Ranunculus longirostris</i>		10	2.5	2.5				
<i>Sagittaria graminea</i>	2.5	10	2.5					
<i>Vallisneria americana</i>	2.5	10	20	20	37.5	10		

Site: T-41b		Date: 7/25/03						
North Tea Island Bay								
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	
<i>Elodea canadensis</i>	2.5	2.5	2.5	2.5				
<i>Myriophyllum spicatum</i>	2.5	10	75	75				
<i>Najas flexilis</i>		2.5	2.5					
<i>Potamogeton amplifolius</i>		2.5	2.5					
<i>Potamogeton crispus</i>		2.5	2.5					
<i>Potamogeton perfoliatus</i>	2.5	2.5	2.5	2.5				
<i>Potamogeton pusillus</i>		2.5						
<i>Potamogeton robbinsii</i>	2.5	2.5	2.5	2.5				
<i>Potamogeton zosteriformis</i>	2.5	2.5	2.5					
<i>Ranunculus longirostris</i>	10	10	2.5					
<i>Vallisneria americana</i>	20	37.5	10	2.5				

Site: T-42		Date: 7/25/03						
Bay Northeast Tca Island								
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	
Chara sp.	2.5	2.5	2.5	2.5	2.5	20	37.5	
Elatine minima	2.5	2.5						
Eleocharis acicularis	2.5	10						
Elodea canadensis	2.5	2.5	10	2.5	2.5	2.5		
Heteranthera dubia	2.5	2.5	2.5	2.5				
Isoetes echinospora	2.5	10	10	2.5				
Isoetes lacustris					2.5	10		
Najas flexilis		2.5	2.5	2.5	2.5	2.5		
Potamogeton amplifolius			10	10	10	2.5		
Potamogeton crispus	2.5	2.5						
Potamogeton gramineus	2.5	2.5	10	2.5				
Potamogeton praelongus				10	10	10		
Potamogeton robbinsii			2.5	10	10	10		
Potamogeton pusillus		2.5	2.5	2.5	10	2.5		
Potamogeton vaseyi					2.5	2.5		
Potamogeton zosteriformis			2.5	2.5	2.5			
Ranunculus longirostris	2.5	10	10	10	2.5			
Ranunculus reptans	2.5	10						
Sagittaria graminea	2.5	2.5						
Vallisneria americana	10	10	10	20	10	10		

Site: T-43		Date: 7/25/03						
Hearthstone								
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	
Chara sp.	2.5	2.5	2.5	2.5	10			
Elodea canadensis		2.5	2.5	2.5				
Eleocharis acicularis		10						
Heteranthera dubia		2.5	2.5	2.5				
Isoetes echinospora		10	10	2.5				
Isoetes lacustris				20	2.5			
Najas flexilis		10	10	2.5				
Potamogeton amplifolius		10	2.5	10				
Potamogeton gramineus		10	2.5	2.5				
Potamogeton pectinallis		2.5						
Potamogeton perfoliatus		10	10	10				
Potamogeton pusillus					2.5			
Potamogeton robbinsii			2.5	10	10			
Potamogeton vaseyii		2.5	2.5					
Ranunculus longirostris		2.5	10	2.5				
Ranunculus reptans		2.5						
Sagittaria graminea		10						
Vallisneria americana		10	2.5	2.5				

Site: T-44		Date: 8/6/03						
NW Coopers Point, Green Harbor								
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	
Megalodonta beckii			2.5					
Chara sp.	2.5	2.5	2.5					
Elodea canadensis		2.5						
Eriocaulon septangulare		2.5	2.5					
Juncus pelocarpus			2.5					
Myriophyllum spicatum		2.5	2.5					
Najas flexilis	2.5	10	10					
Nymphaea odorata	10	2.5						
Potamogeton amplifolius			2.5					
Potamogeton pectinalis	2.5	2.5	2.5					
Potamogeton perfoliatus		10	10					
Potamogeton pusillus		2.5	2.5					
Potamogeton robbinsii	2.5	2.5	2.5					
Ranunculus longirostris		2.5	10					
Sagittaria graminea	2.5	10	20					
Sparganium sp.	2.5	2.5						
Typha	2.5							
Vallisneria americana	2.5	10	10					

Site: T-45		Date: 8/6/03						
SW Cannon Point								
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	
Chara	2.5	10	2.5	2.5				
Eleocharis acicularis	20	20						
Elodea canadensis		2.5	2.5	2.5				
Eriocaulon	2.5	2.5						
Heteranthera dubia		2.5	2.5	2.5				
Lobelia		2.5						
Myriophyllum alterniflorum	2.5	2.5						
M. spicatum	2.5	37.5	37.5	10				
M. tenellum	10	2.5						
Potamogeton amplifolius			2.5	2.5				
Potamogeton gramineus	2.5	2.5	2.5	2.5				
Potamogeton perfoliatus	2.5	2.5	2.5	2.5				
Potamogeton pusillus	2.5	2.5		2.5				
Potamogeton robbinsii		2.5	2.5	10				
Potamogeton spirillus		2.5	2.5					
Potamogeton zosteriformis			2.5	2.5				
Ranunculus longirostris			2.5	10				
Ranunculus reptans	2.5	2.5						
Sagittaria graminea	2.5	2.5	2.5					
Subularia aquatica	2.5	2.5						
Vallisneria americana	10	20	10	20				

Site: T-46 Smith Brook		Date: 8/6/03						
Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7	
Chara sp.	2.5	10	20					
Eriocaulon septangulare		2.5	2.5					
Isoetes echinospora		10	10					
Lobelia dortmanna		2.5	2.5					
Myriophyllum alterniflorum		2.5	2.5					
Myriophyllum tenellum		10	10					
Potamogeton amplifolius			2.5					
Potamogeton gramineus	2.5	2.5	2.5					
Potamogeton perfoliatus	2.5	2.5	2.5					
Potamogeton spirillus		2.5	2.5					
Sagittaria graminea	2.5	2.5	10					
Vallisneria americana	2.5	10	10					

Site: T-47 Date: 8/6/03  
Stepping Stones, Diamond Pt area

Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7
Chara sp.	2.5	2.5					
Eriocaulon septangulare	2.5	2.5					
Isoetes echinospora	2.5	2.5	10				
Juncas	2.5	2.5					
Lobelia dortmanna	2.5	2.5					
Myriophyllum tenellum	2.5	2.5	2.5				
Najas flexilis	2.5	2.5	2.5				
Potamogeton gramineus	2.5	2.5	2.5				
Potamogeton spirillus	2.5	2.5					
R.reptans	2.5	2.5	2.5				
Sagittaria graminea	2.5						
Utricularia resupinata	2.5	2.5					
Vallisneria americana	2.5	2.5					

Site: T-99 Date: 8/19/03  
Assembly Point

Species	0-1	1-2	2-3	3-4	4-5	5-6	6-7
Elatine minima	2.5	2.5					
Eleocharis acicularis	2.5	2.5					
Elodea canadensis	2.5	2.5					
Eriocaulon septangulare	10	2.5					
Heteranthera dubia	10	2.5					
Isoetes echinospora	2.5	2.5					
Juncus pelocarpus	2.5						
Lobelia dortmanna	2.5	2.5					
M. alterniflorum	2.5						
M. tenellum	10	2.5					
Najas flexilis	2.5	2.5					
Nuphar	2.5						
Nymphaea odorata	2.5	2.5					
Potamogeton gramineus	2.5	2.5					
Potamogeton perfoliatus	2.5	2.5					
Potamogeton robbinsii	2.5	2.5					
Potamogeton spirillus		2.5					
Ranunculus longirostris	2.5	2.5					
Ranunculus reptans	10	2.5					
Sagittaria graminea	2.5	2.5					
Sparganium sp.	2.5	2.5					
Utricularia resupinata	2.5	10					
Vallisneria americana	2.5	2.5					