Summary of 2004 survey results

A total of 32 lakes and ponds were surveyed in 2004. They ranged in area from 18.5 to 445 acres. Lakes were surveyed in all parts of the state except the extreme northeast corner; although the majority were in south-central Connecticut.

A total of 56 submerged and floating-leaved species (exclusive of duckweeds) were recorded (Table 1). In addition, several species of *Sparganium*, *Sagittaria* and other emergent plants were recorded growing in a submerged condition. Of the aquatic plants, three are listed as threatened or as species of special concern under the state's Endangered Species Act.

Of the 32 lakes, 24 had at least one invasive species, 75% of the total (Table 2). Lakes with invasive species had an average of two. Seven lakes had 1 invasive, 10 had 2, and six had 3. One lake had 4 invasive species – Lake Quonnipaug in Guilford.

We found 5 species that appear on the Invasive Plants Working Group list, which has a total of 12 invasive or potentially invasive aquatic plant species in Connecticut, and one additional invasive hybrid.

Of the invasive species, *Potamogeton crispus* occurred most widely, in 13 lakes. *Myriophyllum spicatum* was found in 11, *Najas minor* in 10, *M. heterophyllum* in 7, an invasive hybrid of *M. heterophyllum* and *M. laxum* in 3, and *Cabomba caroliniana* in 5. We found two other species that are listed by the Invasive Plant Atlas of New England as invasives, *Marsilea quadrifolia* (in two locations, one of which was a non-surveyed pond) and *Eichornea crassipes* (in a second, non-surveyed pond). The incidence of *Najas minor* was higher than anticipated. It was found in 31% of surveyed lakes in 2004. Our surveys found the species in six new locations and in three towns where it had not

previously been recorded – Branford, Trumbull and Farmington. The Farmington record was the first for Hartford County. The occurrence of *Marsilea quadrifolia* in Batterson Park Pond also was the first record for that species in Hartford County.

Of the native species, the one found most frequently in the lake surveys was *Potamogeton pusillus*, recorded in 19 water bodies, followed by *Ceratophyllum demersum* and *Elodea nuttallii*, each in 15. Among floating-leaved species, *Nymphaea odorata* occurred in 17 lakes, and *Brasenia schreberi* in 14.

The lake with the most species was 99-acre Quonnipaug, where 25 species were recorded. Manitook Lake in Granby and Holbrook Pond in Hebron were found to have 23 species each. These three lakes with the highest species totals all were < 100 acres in area.

The least rich lakes were Maltby Lake No. 1, Dooley Pond and North Farms Reservoir. Maltby 1 and Dooley are both very small (< 20 acres) and were the smallest lakes sampled in 2004. These water bodies had 6 or fewer aquatic plants, and Maltby 1 had only 4. The seven lakes with three or more invasives all were 60 acres or larger. Four of the seven largest surveyed lakes (all 140 acres or larger), had three invasives (57% of those seven), compared with 12% of the smaller lakes – 3 of 25).

The total number of aquatic plants recorded in the surveys increased with lake area (Figure 1), although the relationship was not significant in a linear regression after Hammonasset Lake was removed from the analysis because the water level had been much lowered, affecting what would be considered a natural level of aquatic plants at the time of the survey.

The lakes we surveyed were not representative of the lakes in Connecticut in terms of area; a disproportionate number were large (Figure 2). Statewide, 80% are less than 10 acres, and we surveyed no water bodies in that size class. Actually, the percentage is certainly higher than 80%: The very tiniest water bodies would not likely be listed in the state's data base of 3,436 lakes used to compare the size distributions. Further evidence of the very high number of unnamed, small ponds is provided by the DEP's aquatic plant pesticide treatment permit records for 2004: Of all permits issued, 89% were for ponds smaller than 10 acres and 52% were for ponds less than 1 acre in area. The smallest ponds and lakes in the state data base have no boat launches on them.

Table 1. The frequency of aquatic plants recorded during surveys of 32 Connecticut lakes and ponds is reported. Shown are the names of aquatic plants and the percentage of the surveyed lakes in which each was observed in 2004. Invasive species are in boldface.

SUBMERGED SPECIES			
Potamogeton pusillus	59.4	*Potamogeton spirillus*	12.5
Ceratophyllum demersum	46.9	*Elodea canadensis*	12.5
Elodea nuttallii	46.9	*Najas gracillima*	12.5
Najas flexilis	43.8	*Gratiola aurea*	12.5
Potamogeton bicupulatus	40.6	*Potamogeton illinoensis*	9.4
Potamogeton epihydrus	40.6	***Myriophyllum heterophyllum* X *laxum***	**9.4**
Potamogeton crispus	**40.6**	*Utricularia intermedia*	9.4
Utricularia gibba	37.5	*Isoëtes* sp.	9.4
Myriophyllum spicatum	**34.4**	*Potamogeton vaseyi*	6.3
Vallisneria americana	34.4	*Potamogeton oakesianus*	6.3
Najas minor	**31.3**	*Myriophyllum tenellum*	6.3
Potamogeton amplifolius	28.1	*Myriophyllum humile*	6.3
Potamogeton gramineus	28.1	*Zosterella dubia*	6.3
Potamogeton robbinsii	28.1	*Zannichellia palustris*	6.3
Potamogeton natans	25.0	*Isoëtes tuckermanii*	6.3
Utricularia purpurea	25.0	*Isoëtes echinospora*	6.3
Myriophyllum heterophyllum	**21.9**	*Elatine triandra*	6.3
Najas guadalupensis	21.9	*Callitriche sp.*	6.3
Potamogeton perfoliatus	18.8	*Potamogeton friesii*	3.1
Potamogeton pulcher	18.8	*Myriophyllum sibiricum*	3.1
Potamogeton zosteriformis	18.8	*Utricularia minor*	3.1
Utricularia geminiscapa	18.8	*Utricularia subulata*	3.1
Utricularia vulgaris	15.6	*Ranunculus longirostris*	3.1
Utricularia radiata	15.6	*Isoëtes lacustris*	3.1
Ceratophyllum echinatum	15.6	*Elatine minima*	3.1
Polygonum amphibium	15.6	*Elatine americana*	3.1
Cabomba caroliniana	**15.6**	*Callitriche heterophylla*	3.1
FLOATING LEAVED SPECIES		EMERGENTS	
Nymphaea odorata	56.3	*Eleocharis acicularis*	40.6
Nuphar variegata	53.1	*Eriocaulon aquaticum*	21.9
Brasenia schreberi	43.8	*Sparganium* sp.	6.25
Nymphoides cordata	15.6	*Eleocharis parvula*	3.1
Nymphaea odorata ssp. *tuberosa*	3.1	Unidentified sedges	21.9
Marsilea quadrifolia	**3.1**	*Sagittaria* sp.	*
Lemnaceae	*		

* Several species in the family Lemnaceae and the genus *Sagittaria* also were observed, but their presence was not recorded.

Table 2. Lakes and ponds surveyed during 2004, arranged from largest to smallest and showing the total number of submerged and floating-leaved aquatic plant species recorded in each and the number of these that were invasive species.

Lake	Area	Species	Invasives
Highland Lake	445	16	3
Lake Saltonstall	422	13	3
Lake Wononscopomuc	348	18	2
Bashan Lake	273	17	1
Hammonasset Lake	243.4	7	0
Silver Lake	146	14	3
Batterson Park Pond	140	9	3
Beseck Lake	116	13	1
Lake Quonnipaug	98.7	25	4
Holbrook Lake	83.3	23	3
Lake Terramuggus	83	7	0
Pickerel Lake	82.2	15	2
Black Pond	76	19	2
Cedar Lake	69.3	21	2
Uncas Lake	68.9	18	0
North Farms Reservoir	64.4	6	2
Canoe Brook Lake	63.7	10	1
Pinewood Lake	60.2	10	1
Lake Kenosia	59.5	9	3
Manitook Lake	56.9	23	2
Anderson Pond	56.6	18	2
Gorton Pond	52.4	17	1
Lake Wintergreen	44.4	10	0
Crystal Lake	32.4	7	2
Higganum Reservoir	30.8	4	0
Norwich Pond	30.1	13	0
Dodge Pond	29.9	15	0
Maltby Lake 3	25.3	10	1
Maltby Lake 2	23	8	1
Graniss Lake	20	7	2
Maltby Lake 1	19	4	0
Dooley Pond	18.5	5	2

* Three additional species were recorded in this water body in early October, none of them invasive. The lake had been drained for two years and was refilled only a few months before the original survey.

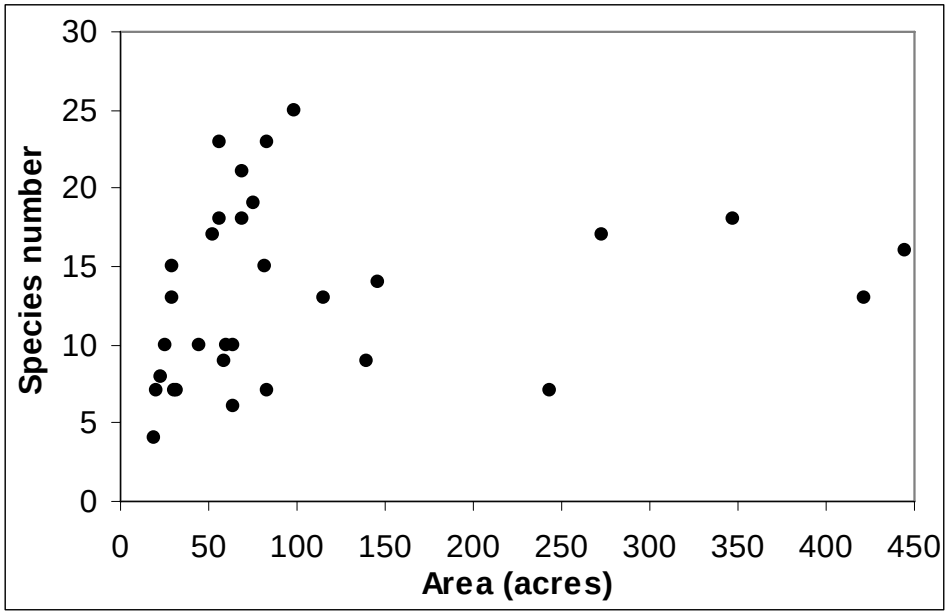

Figure 1. The number of aquatic plants found in surveys of 32 lakes is plotted on the area of the lakes, showing that there was a general increase in species number with area.

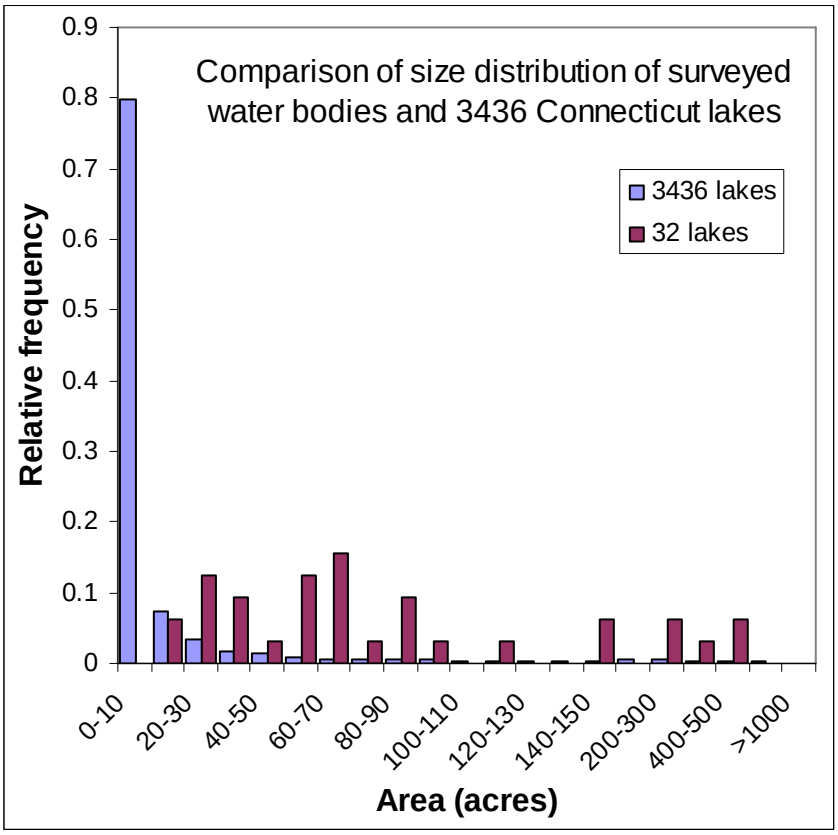

Figure 2. The size distribution of lakes we surveyed in 2004 is compared with the size distribution of 3436 water bodies in a state data base.