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2012

Aquatic vegetation survey

Water Chemistry

Aquatic plant management options

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The Connecticut Agricultural Experiment Station was founded in 1875. It is chartered by the General Assembly to make scientific inquiries and conduct experiments regarding plants and their pests, insects, soil and water, and to perform analyses for state agencies. Station laboratories are in New Haven and Windsor, and research farms in Hamden and Griswold.

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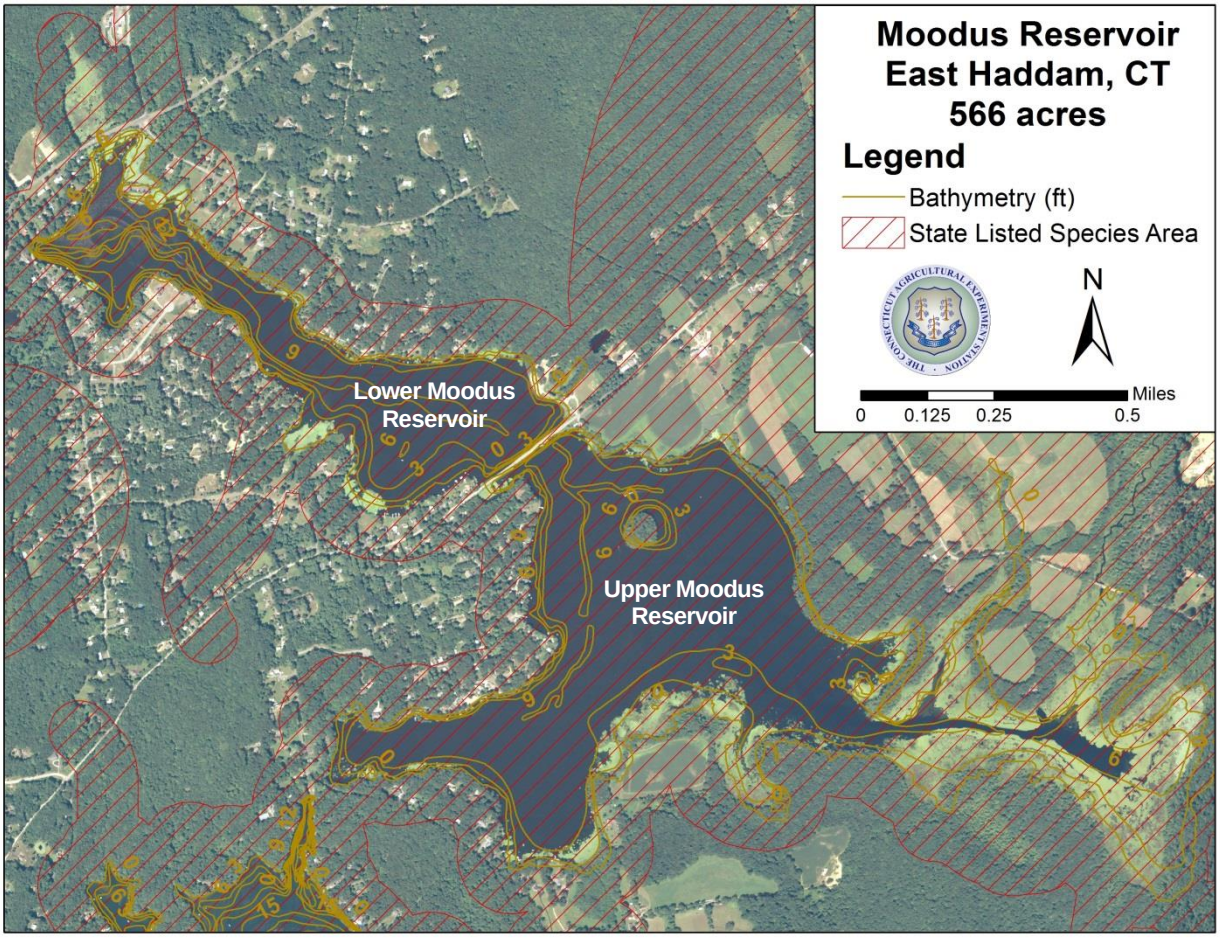

Figure 1. Upper and Lower Moodus Reservoir.

Introduction

Moodus Reservoir is a 566 acre lake located in Middlesex County (Figure 1). The lake is a man-made impoundment formed by the construction of a dam in the northwest portion. A causeway separates the 126 acre lower basin from the 440 acre upper basin. Moodus Reservoir has a maximum depth of 10 feet and an average depth of about six feet. The lake is accessible to state residents by boat launch ramps in each basin and to local residents via a town beach. The Moodus Reservoir dam was reconstructed in 2010 and 2011 when the lake was lowered several feet. This dam has an outlet gate at its base that allows the lake to be drained. Prior to the dam reconstruction partial winter drawdowns of approximately three feet were performed to protect docks, reduce the risk of flooding, allow homeowners to work on their lake frontage and possibly offer some weed control.

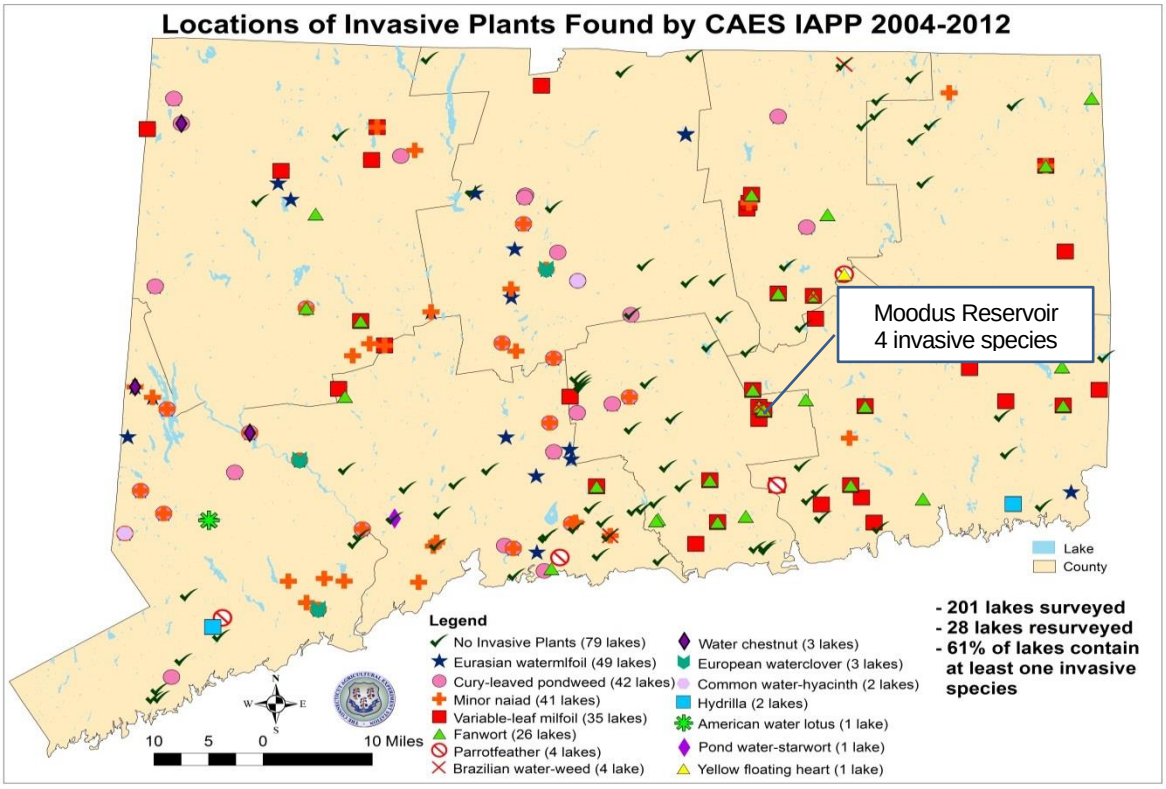

Figure 2. Locations of invasive aquatic plants in Connecticut lakes.

The first study on Moodus Reservoir was performed by Edward Deevey Jr. (1940) in the 1930's. This study found a maximum depth of 9.5 feet, a mean transparency of 6.2 feet and water with a "brown humus-like color." Details on aquatic vegetation were not reported. Work by the Connecticut State Board of Fisheries and Game (1942) found the shoreline to be "almost entirely weedy with dense beds of submerged vegetation." The specific aquatic plant species, however, were not detailed. The water was described as "brown in color from peat extractives." A similar study in the 1950's (Connecticut State Board of Fisheries and Game, 1959), described the lake as being "almost completely choked with submerged vegetation" As in the 1940 study, the specific species of plants were not stated . The study described the water as brown in color with a transparency of four feet. The Connecticut Agricultural Experiment Station (CAES) studied Moodus Reservoir in 1980 (Frink and Norvell, 1984). Although the main goal of this work was to determine water chemistry, a rudimentary aquatic plant survey was performed and the existence of fanwort (*Cabomba caroliniana)* was documented. The water transparency was 6.2 feet and concentrations of phosphorus and nitrogen were in the mid-range for Connecticut lakes. In 2002, CAES performed a diagnostic feasibility study on Moo-

Figure 3. CAES survey teams on Moodus Reservoir in 2012.

dus Reservoir (Bugbee and White, 2005) and documented 18 plant species with fanwort and variable water milfoil (*Myriophyllum heterophyllum*) being invasive. In 2009, CAES performed the most detailed general survey of the vegetation in Lower Moodus Reservoir (Figure 2) and established georeferenced transects to quantitatively document future changes in aquatic vegetation (CAES IAPP, 2013). This survey found abundant plant life throughout the lake with 24 native species and 3 invasive aquatic plant species (Figure 5).

Objectives:

Survey Upper and Lower Moodus Reservoir for aquatic vegetation. Provide detailed information for developing aquatic plant management strategies and tracking future changes in the aquatic plant community.

Materials and Methods:

Aquatic plant surveys and mapping:

We surveyed Upper Moodus Reservoir for aquatic vegetation from July 6 – July 12, 2012 and Lower Moodus Reservoir from July 13 – July 18, 2012. A survey looking for curly leaf pondweed (*Potamogeton crispus*), was done from June 7 – 8, 2012 because this plant senesces by early summer. Surveys were conducted from small boats traveling over areas shallow enough to support aquatic plants (Figure 3). We used the taxonomy of Crow and Hellquist (2000a,b) when further identification was needed. Plant species were recorded based on visual observation or collections with a

Figure 4. Abundant aquatic plants in the northeast Upper Moodus Reservoir (left) and sparse plants near homes in south central Upper Moodus Reservoir.

long-handled rake or grapple. Quantitative information on abundance was obtained from 80 m transects positioned perpendicular to the shoreline. We established 12 transects in Lower Moodus Reservoir and 18 transects in Upper Moodus Reservoir. Transect locations were selected to represent the variety of habitat types occurring in all portions of the two basins. Sampling locations were established along each transect at points 0, 5, 10, 20, 30, 40, 50, 60, 70, and 80 m from the shore. Abundance of each species present at each point were ranked on a scale of 1–5 (1 = rare, a single stem; 2 = uncommon, few stems; 3 = common; 4 = abundant; 5 = extremely abundant or dominant). We obtained transect data on Upper Moodus Reservoir from July 5 – 16, 2012 and on Lower Moodus Reservoir from July 26 – 30, 2012. One specimen of each species was collected in each lake and were dried and mounted in the CAES aquatic plant herbarium. Digitized mounts can be viewed online (www.ct.gov/caes/iapp).

Water sampling:

Water was sampled from Upper Moodus Reservoir on July 16, 2012 and from Lower Moodus Reservoir on July 18, 2012. Sampling sites (Figure 5 and 6) were located in the deepest part of each lake. Water temperature and dissolved oxygen were measured at a depth of 0.5 m and at 1 meter intervals thereafter until 0.5 m above the bottom. We obtained water samples at 0.5 m below the surface and 0.5 m above the bottom. Sample size was 250-mL and all samples were stored at 38°C until analyzed for pH, alkalinity, conductivity, and total phosphorus. A Fisher AR20 meter was used to determine pH and conductivity. Alkalinity (expressed as mg/l $CaCO_3$) was quantified by titra-

tion with 0.016 NH_2SO_4 to an end point of pH 4.5. We determined total phosphorus using the ascorbic acid method preceded by digestion with potassium persulfate (Eaton, 1995). Phosphorus was quantified using a Milton Roy Spectronic 20D spectrometer with a light path of 2 cm and a wave length of 880 nm. Water was tested for temperature and dissolved oxygen using an YSI 58 meter. Transparency (water clarity) was measured by lowering a six inch diameter black and white Secchi disk into the water and determining to what depth it could be viewed.

Results and Discussion

General Aquatic Plant Survey

Both Lower and Upper Moodus Reservoir are extremely species rich lakes by Connecticut standards (CAES IAPP, 2013). Our 2012 general plant survey found 33 plants species in Lower Moodus Reservoir (Figure 5) and 36 species in Upper Moodus Reservoir (Figure 6). In both basins, fanwort covered the greatest area with dense stands reaching the surface and flowering in many sites less than 6 feet deep. Interestingly, in most of the areas where fanwort grew, it did not produce nuisance stands. These areas were in both shallow and deep water thus depth and associated light limitation could not be the entire cause. Sediment type, nutrients or other factors could be the controlling variable. Invasive variable milfoil was found closer to the shoreline in both basins. In Lower Moodus Reservoir, variable watermilfoil was sparse, perhaps being out competed by fanwort. In Upper Moodus Reservoir a considerably greater amount of variable watermilfoil was found growing in dense stands, sometimes co-dominant with fanwort. Among the invasives, natives such as fine and large leaf pondweeds (*Potamogeton* spp.), bladderworts (*Utricularia* spp.), and coontails *(Ceratophyllum sp.)* were common. In the shallow coves native species such as white water lily (*Nymphaea odorata*), yellow water lily (*Nuphar variegata*), and water shield (*Brasenia schreberi*) formed dense patches. Near the shoreline patches of these plants were sporadic with the exception of the southern shoreline and eastern half of Upper Moodus Reservoir where the water lilies and water shield densely covered the majority of the surface. Native species such as waterwort (*Elatine sp.*), spikerush (*Eleocharis sp.*), golden hedge hyssop (*Gratiola aurea*), and pickerel weed *(Pontederia cordata)* were common along the shore. Patches of waterweed (*Elodea nuttallii*), sevenangle pipewort (*Eriocaulon aquaticum)*, and quillwort (*Isoetes sp.*) were sporadic. Swamp like conditions in large areas of the eastern part of Upper Moodus Reservoir limited our access and the plants shown on the

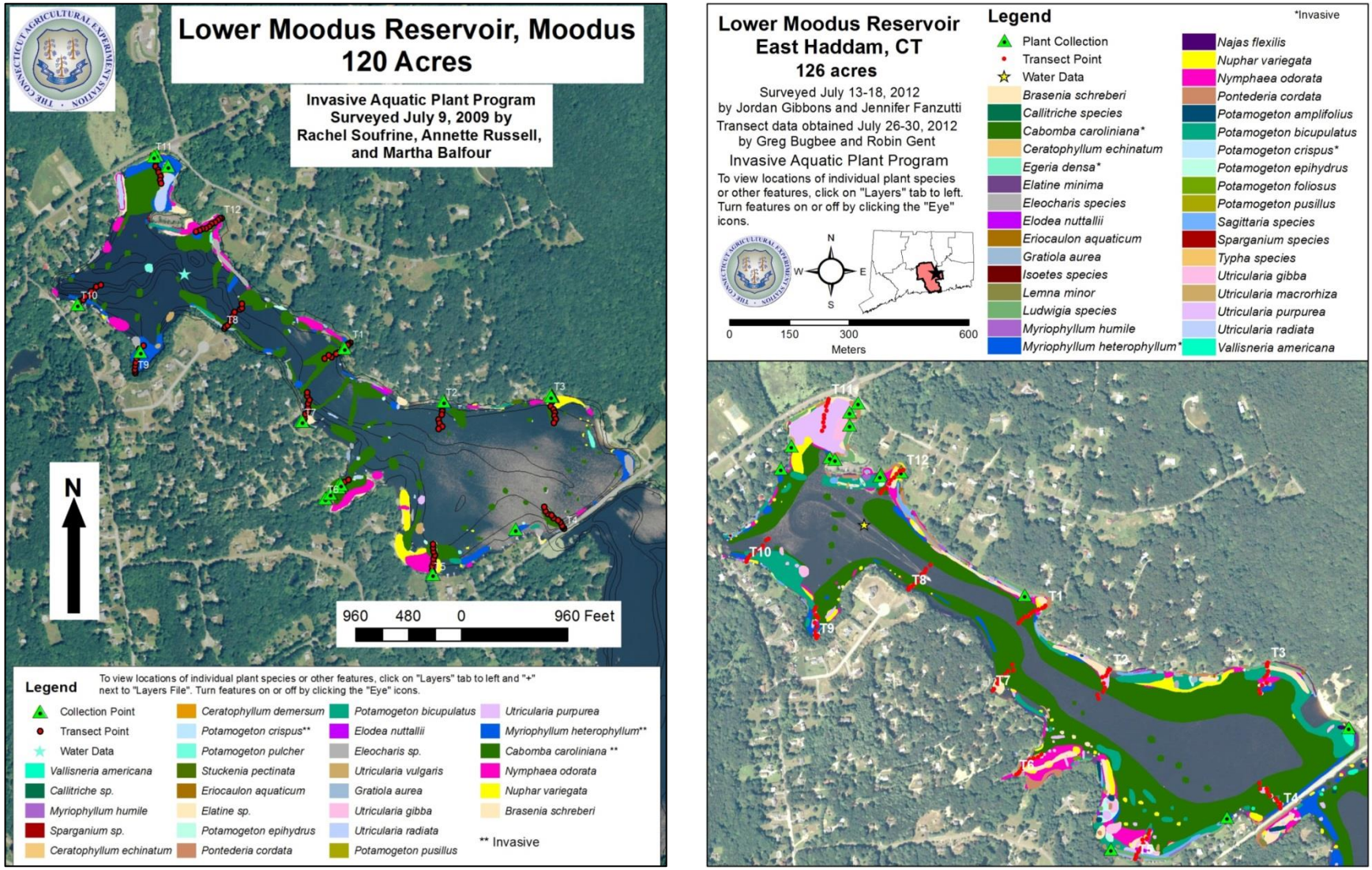

Figure 5. General aquatic plant survey of Lower Moodus Reservoir 2009 (left) and 2012 (right).

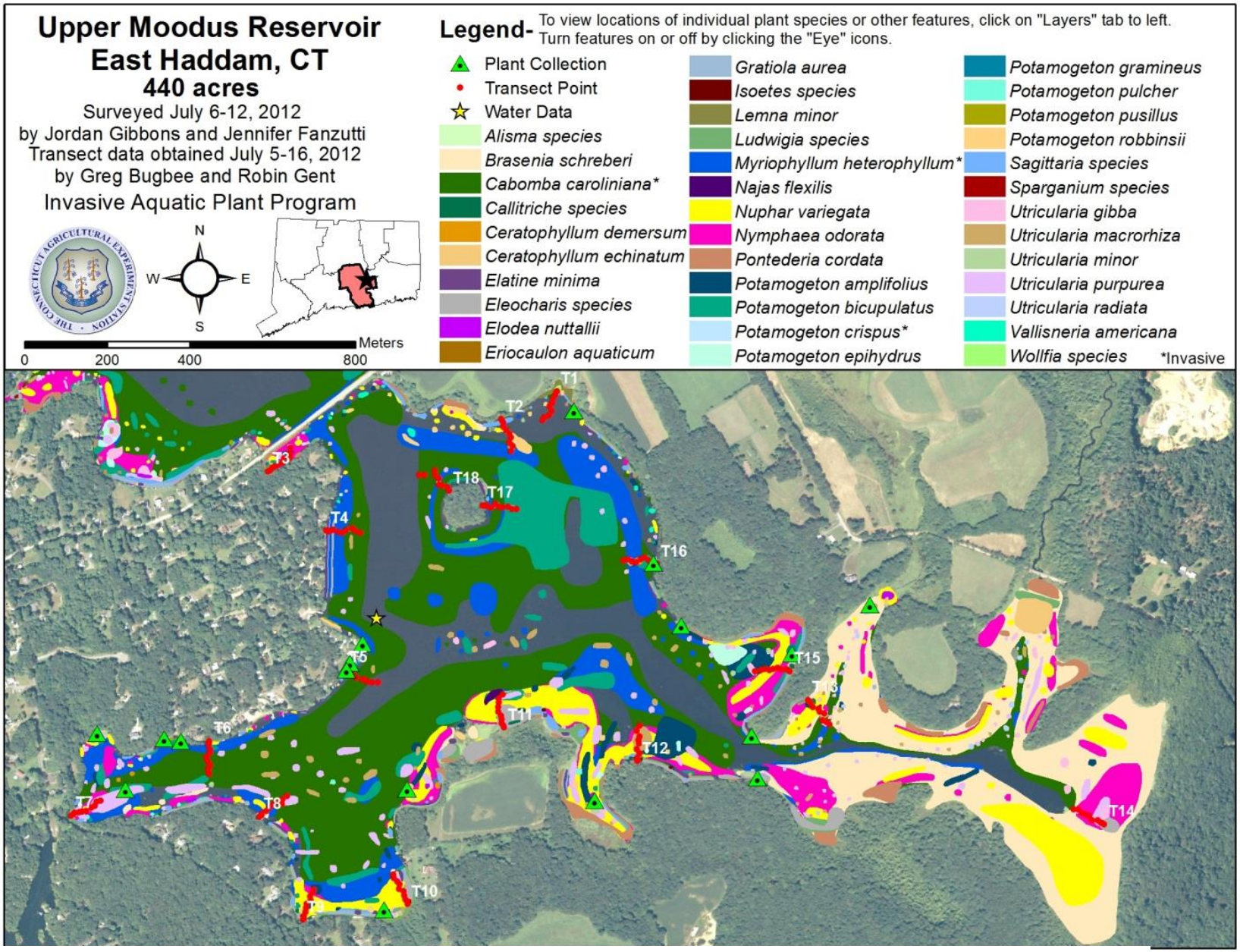

Figure 6. General aquatic plant survey of Upper Moodus Reservoir 2012).

Table 1. Aquatic plants on transects in Lower (2009 and 2012) and Upper Moodus Reservoir.

Scientific Name	Common Name	Lower Moodus (percent*) 2009	Lower Moodus (percent*) 2012	Upper Moodus (percent*) 2012
Brasenia schreberi	Watershield	25.0	28.3	22.8
Cabomba caroliniana	**Fanwort**	**70.0**	**76.7**	**71.1**
Callitriche species	Water starwort	1.7	0.0	0.6
Ceratophyllum demersum	Coontail	1.7	0.0	7.8
Ceratophyllum echinatum	Spiny coontail	4.2	6.7	2.8
Egeria densa	**Brazilian waterweed**	**0.0**	**1.7**	0.0
Elatine minima	Waterwort	2.5	3.3	3.3
Eleocharis species	Spikerush	21.7	5.0	14.4
Eriocaulon aquaticum	Sevenangle pipewort	5.8	0.0	0.6
Gratiola aurea	Golden hedge-hyssop	1.7	2.5	0.6
Isoetes species	Quillwort	0.0	0.8	0.6
Lemna minor	Duckweed	0.8	0.8	2.2
Ludwigia species	Primrose willow	0.8	11.7	10.6
Myriophyllum heterophyllum	**Variable watermilfoil**	**20.0**	**22.5**	**31.1**
Myriophyllum humile	Low watermilfoil	0.8	0.0	0.0
Najas guadalupensis	Southern waternymph	0.8	0.0	0.0
Nuphar variegata	Yellow water lily	31.7	24.2	16.7
Nymphaea odorata	White water lily	25.0	44.2	39.4
Pontederia cordata	Pickerelweed	3.3	11.7	6.7
Potamogeton amplifolius	Large leaved pondweed	0.0	0.0	4.4
Potamogeton bicupulatus	Snailseed pondweed	3.3	19.2	16.7
Potamogeton crispus	**Curlyleaf pondweed**	**1.7**	**0.8**	**1.1**
Potamogeton epihydrus	Ribbonleaf pondweed	3.3	1.7	1.7
Potamogeton pusillus	Small pondweed	8.3	0.8	0.6
Potamogeton pulcher	Spotted pondweed	0.0	0.0	6.7
Potamogeton robbinisii	Robbin's pondweed	0.0	0.0	8.3
Potamogeon spirillus	Spiral pondweed	1.7	0.0	0.0
Sagittaria species	Arrowhead	0.0	1.7	2.8
Sparganium species	Bur reed	6.7	10.8	7.2
Stuckenia pectinata	Sago pondweed	0.8	0.0	0.0
Typha species	Cat tail	0.0	0.8	0.0
Utricularia gibba	Humped bladderwort	6.7	27.5	7.8
Utricularia macrorhiza	Common bladderwort	10.8	5.8	11.1
Utricularia purpurea	Eastern purple bladderwort	10.8	30.0	24.4
Utricularia radiata	Little floating bladderwort	25.0	4.2	0.6
Vallisneria americana	Eel grass	0.8	0.0	1.1
Wolffia species	Watermeal	0.0	0.0	4.4
	Total Species Richness	**29**	**25**	**31**
	Native Species Richness	**26**	**21**	**28**
	Invasive Species Richness	**3**	**4**	**3**

Invasive Plant

* Percent occurrence on 120 points in 12 transects in Lower Moodus and 180 points in 18 transects in Upper Moodus

maps in these areas were estimated from similar areas that we could observe. Because the brownish water color caused limited visibility of the bottom, fanwort was usually not seen from the surface and didn't appear to have a negative impact on the lake. In shallower areas, fanwort often reached the surface and emerged flowers were present. With the possible exception of lily pads and water shield, the diverse array of native plant species that grow in Moodus Reservoir are generally not large or dense enough to be considered a problem and probably contribute to diverse aquatic life and an improved fishery.

Comparison of the general surveys performed on Lower Moodus Reservoir (Figure 5) prior to the dam rebuild in 2009 and after in 2012 showed a remarkably resilient aquatic plant community after the associated long-term drawdown. Although we will discuss this in detail later in this report little adverse effect on the native plant community appeared likely. Comparing the 2009 and 2012 general survey maps (Figure 5) shows a possible expansion of fanwort into deeper areas of the lakes.

Aquatic Plant Survey on Transects

In 2012 we found 25 aquatic plant species along 12 transects in Lower Moodus Reservoir and 31 plant species along 18 transects in Upper Moodus Reservoir (Table 1). This places the two basins among the most species rich lakes CAES has surveyed. Lower Moodus had four invasive species (fanwort, variable milfoil, curly leaf pondweed and Brazilian waterweed *(Egeria densa)*. Brazilian waterweed is a common aquarium plant and likely reached the lake via an aquarium dump. It is limited to one small cove (map on page 34 in the appendix). Once thought to be tropical in nature and not able to survive the winters in Connecticut, CAES has now located the plant on three other lakes. In one of the lakes CAES has documented rapid expansion since 2009. Upper Moodus Reservoir has the same invasive species as Lower Moodus with the exception of Brazilian waterweed. The most common plants found on the transects in 2012 were fanwort (76.7%), white water lily (44.2%), purple bladderwort (*Utricularia purpurea*) (30.0%), watershield (28.3%), humped bladderwort (*Utricularia gibba*) (27.5%), yellow water lily (24.2%), variable watermilfoil (22.5%), snailseed pondweed (*Potamogeton pusillus*) (19.2%), pickerelweed (11.7%), primrose willow (*Ludwigia* sp.), and burr weed (*Sparganium* sp.) (10.8%). All other species occurred on less 7 % of the transect points. The dominance of invasive fanwort on the transect points in 2012 suggests this plant poses the biggest threat to the aquatic plant community and recreational use of the lake.

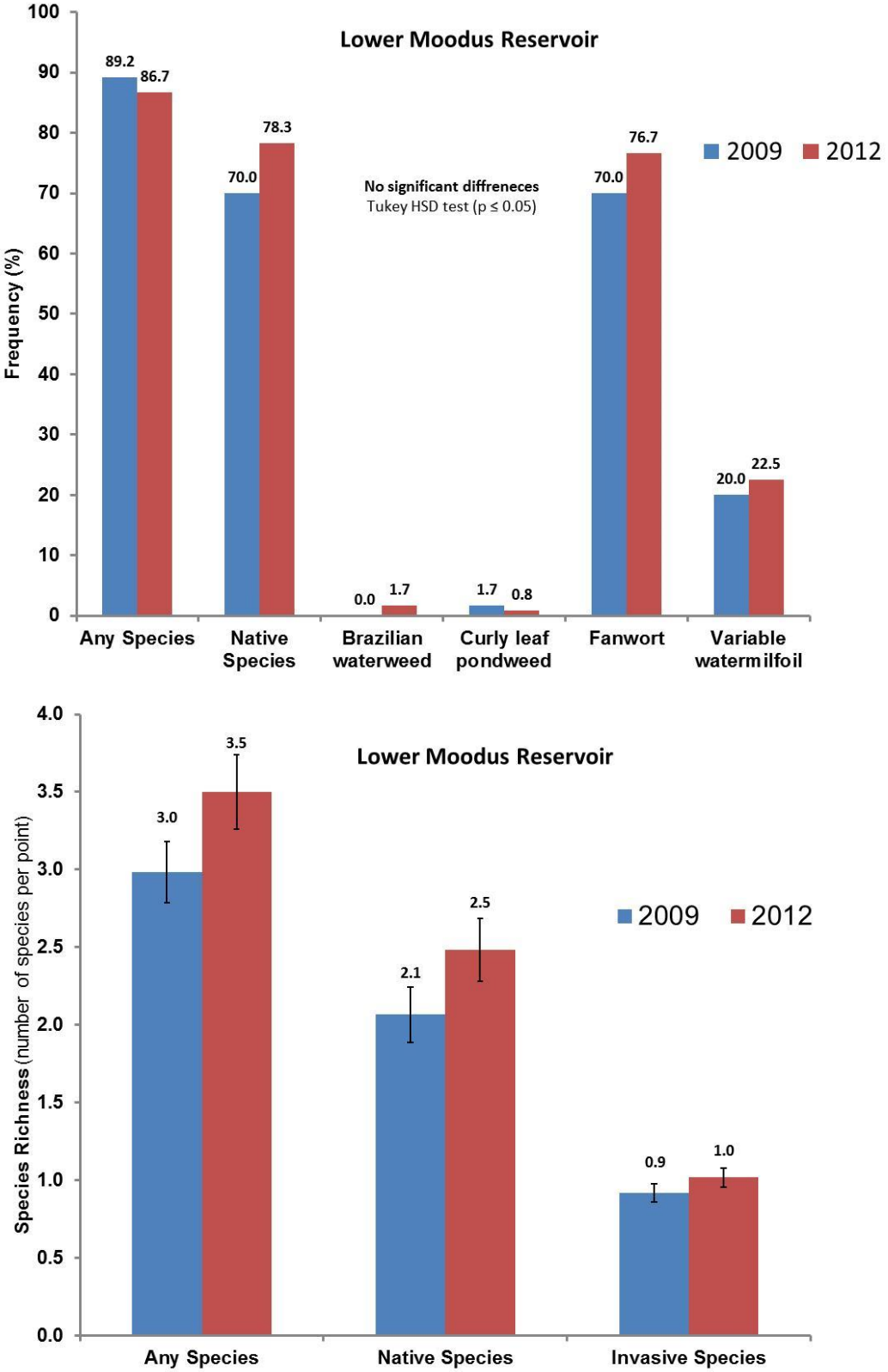

Figure 7. Frequency of occurrence (top) and species richness (bottom) in Lower Moodus Reservoir. Error bars equal plus or minus one standard error of the mean.

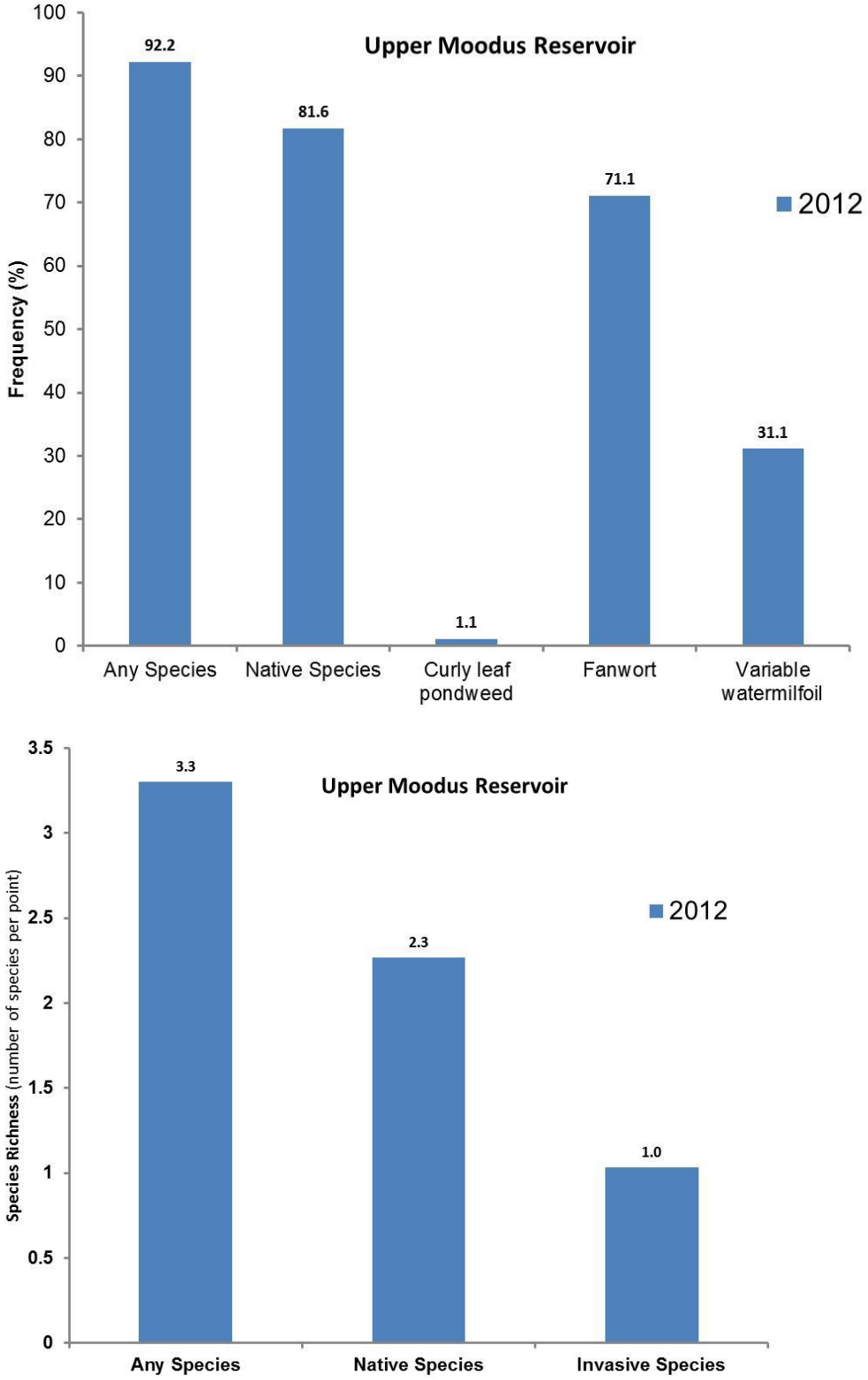

Figure 8. Frequency of occurrence (top) and species richness (bottom) in Upper Moodus Reservoir.

When native frequency of occurrence and species richness is high, biodiversity is often considered optimal. The frequency of occurrence of native species in 2012 was 78.3 % in Lower Moodus and 81.6 % in Upper Moodus. No statistical difference in native frequency of occurrence was found in Lower Moodus from 2009 (70.0%) to 2012 (Tukey HSD, $p > 0.05$). The mean native species richness on transect points in 2012 was 2.5 in Lower Moodus and 2.3 in Upper Moodus (Figures 7 and 8). In Lower Moodus our 2009 study found a native species richness of 2.1 which is not statistically different to 2012 (± 1 SEM). These data suggest that high native frequency of occurrence and species richness may be providing some resistance to invasion from non-native plant species.

Comparison of the 2009 (pre-dam construction) and the 2012 (post-dam construction) plant community on transects suggests a minor effect of the long-term drawdown. Eight plant species found in 2009 were not found in 2012 these include pipewort (*Eriocaulon aquaticum*) water starwort (*Callitriche* sp.), Coontail (*Ceratophyllum demersum*), low milfoil (*Myriophyllum humile*), southern waternymph (*Najas guadalupensis*), spiral pondweed (*Potamogeton spirillus*), sago pondweed (*Stuckenia pectinata*), and Eel grass (*Vallisneria americana*) (Table 1). With the exception of pipewort which was found on 5.8% of the transect points in 2009 and spiral pondweed which was found on 1.7% of the points all other species were found on less than 1.0%. Southern waternymph, spiral pondweed, and sago pondweed were not found elsewhere in the lake during the full survey while the other 5 species were found. Three native species; quillwort (*Isoetes* sp.), arrowhead (*Sagittaria* sp.) and Cat tail (*Typha* sp.) were found in 2012 and not 2009. Cat tail being a wetland plant is not always reported by surveyors and therefore may not be a reliable estimate. On the other hand the drawdown may have allowed cat tails to move into the lake. As with the plants that were found in 2009 and not 2012, the plants that were found in 2012 and not 2009 occurred at frequencies of less than 2.0% and therefore are subject to not being found in a given year due to the level of detail possible by the transect methods.

Table 2. Water data collected for Lower Moodus Reservoir on July 18, 2012.

Latitude*	**Longitude**	**Depth (m)**	**Dissolved Oxygen** (mg/L)	**Temperature** (°C)	**pH**	**Alkalinity** CaCO3 (mg/L)	**Conductivity** (µs/cm**)**	**Phosphorus** (ppb)
41.51451	-72.42203	0.5	7.6	30.7	6.5	11	64	33
		1	7.1	28.7				
		2	1.4	27.2				
		3	0.0	24.3	6.0	13	68	97

Table 3 Water data collected for Upper Moodus Reservoir on July 16, 2012.

Latitude*	**Longitude**	**Depth (m)**	**Dissolved Oxygen** (mg/L)	**Temperature** (°C)	**pH**	**Alkalinity** CaCO3 (mg/L)	**Conductivity** (µs/cm**)**	**Phosphorus** (ppb)
41.50400	-72.40700	0.5	8.8	28.9	6.8	9	55	57
		1	9.2	28.5				
		2	8.4	27.5				
		3	0.3	26.0	6.3	10	55	82

Water Chemistry

The transparency in Lower and Upper Moodus Reservoir was 6.5 feet (2.0 m) and 4.0 feet (1.5 m) respectively. This suggests little change since the 1940's when the transparency ranged between four and seven feet. Much of the limitation in transparency is because of the brown coloration of the water (Figure 9). This is caused by organic decay and not by algae. The brown coloration has been a component of the lake water in all the previously mentioned studies and, therefore, is not new. Temperature profiles in upper and lower basins (Tables 2 and 3) were near 80° F (30 ° C) at the surface and near 77° F (25° C) at the bottom. Compared to deeper Connecticut lakes this represents limited temperature stratification. This was probably because of the mixing action of wind over the lake's large surface area and the lakes shallow nature. Conversely, dissolved oxygen show intense stratification with near-

ly no oxygen in the bottom water and high oxygen levels of 7.7 to 8.8 mg/L near the surface. Low oxygen levels near the bottom can release phosphorus from the sediment and enrich the lake.

The alkalinity, pH and conductivity for Connecticut lakes average near 22 mg/L $CaCO_3$, 7.0 and 95 *u*s/cm respectively (CAES IAPP, 2013). Alkalinity in Lower and Upper Moodus Reservoir ranged between 9 and 11 mg/L $CaCO_3$ in 2012 . This compares to 4 - 10 mg/l in 2002 (Bugbee and White, 2005), 5 and 11 mg/l in 1980 (Frink and Norvell, 1984) and 12.0 mg/L in the 1930's (Deevey, 1940). This suggests the alkalinity of the lake has changed little over the last century. The pH of the surface water ranged between 6.5 and 6.8 while the bottom water ranged between 6.0 and 6.3. The conductivities of Lower and Upper Moodus Reservoir were similar at both depths ranging between 55 and 68 *us*/cm. These values are similar to those found in the 2002 CAES study (Bugbee and White, 2005). Because the range is considerably below the state average, this indicates little influence of outside sources of salt such as that used in road deicing.

Phosphorus (P) concentrations were considerably higher in the upper basin (57 ppb) compared to the lower basin (33 ppb). This is similar to the CAES 2002 study (Bugbee and White, 2005). Surface phosphorus was lower than the bottom water in both basins which is likely caused by the low dissolved oxygen levels near the bottom. Surface water P values of over 30 ppb categorize the lake as eutrophic. Causes for the difference in P between the basins are unclear but may be related to bioaccumulation of P as it moves to the outlet. P levels were 12 ppb in the 1930's, 22 - 33 ppb in 1980 and 14 - 39 in this study. A trend toward increased P enrichment appears likely, however, the variability in the 1980 and 2002 data and the relatively few years of measurements could be misleading.

Figure 9. Brown coloration of water in Moodus Reservoir.

Aquatic vegetation management options

Managing nuisance aquatic vegetation in Moodus Reservoir will be extremely challenging because the basins are shallow and support abundant plant life. Large numbers of residents utilize the lake for recreational activities, particularly fishing, boating and swimming. An abundance of aquatic vegetation has been present since the first study in the 1940's. Fanwort currently exists over most of the lake bottom, but is only a problem in select areas where it reaches the surface in dense stands. Because both Lower and Upper Moodus Reservoirs are shallow, the only limitation to light penetrating to the bottom and supporting plants is the brown coloration of the water (Figure 9). A change in water level, nutrient status or water clarity could allow the fanwort to reach the surface in most of the lake. This would drastically deteriorate the native plant community and recreation value of the lake. Controlling aquatic weeds in large lakes with extensive areas of desirable native vegetation requires techniques that target the nuisance vegetation. Options include: deepening the lake by dredging, water level drawdown, harvesting, biological controls, bottom barriers and herbicides (Cooke et al., 2005).

Figure 10. Winter drawdown in Candlewood Lake.

Dredging removes nutrients in the sediment, positions the lake bottom to where low light deters plant growth and returns the lake to conditions similar to those at its inception. It can be an excellent long-term solution but is impractical for most large lakes. Wet dredging removes sediment by cranes from shore or on a barge. Usually nearby drying beds are necessary and this requires suitable land. Dry dredging requires draining part or all of the lake and excavating the overburden. Because Moodus Reservoir has a dam that allows the lake to be drained, dry dredging would be an option. If the material in the lake bottom is sand, gravel or other marketable material, the cost of the dredging can be significantly offset by its sale. Both types of dredging are disruptive to lake ecology. Dry dredging is particularly so because the lake may be without water for years. The permitting process for dredging through the CTDEEP, the United States Army Corp of Engineers and the town is lengthy, expensive and often unsuccessful. Partial dredging or removal of sediment to an insufficient depth often yields disappointing results. Approximately 60 acres of 960-acre Bantam Lake, in Litchfield, CT, were dredged from 1982 to 1990. About 370,000 cubic yards of sediment were removed at a cost of 1.7 million dollars (Baystate Environmental Consultants, Inc., 1992). Although some weed control was achieved, many areas of weeds remained in undredged areas and locations not dredged sufficiently deep.

Figure 11. Mechanical harvester (left), suction harvester (middle), plants from suction harvesting (right).

Water level drawdown can be effective if weeds are allowed to freeze or dry, but this has adverse effects on non-target aquatic organisms. Weed control by winter drawdown can be affected by weather. Some weeds, like milfoil, have root systems and other plant parts that can survive substantial drying (Standifer and Madsen, 1997) Best control can be expected if the bottom sediment is allowed to freeze. Drawdown is possible in Moodus Reservoir because the dam has a functioning gate valve and the water can be drained to expose most of the bottom. Deep drawdowns could negatively affect the largemouth bass fishery. CAES has been monitoring the yearly drawdowns in Candlewood Lake and has observed rapid regrowth of vegetation in drawn down areas (Figure 10).

Mechanical or suction harvesting (Figure 11) has the benefit of providing immediate control but problems include rapid regrowth, finding suitable disposal sites and spreading of weeds by fragmentation (Cooke et al., 2005). Weeds like milfoil (Madsen, et al, 1988) and fanwort spread by the rooting of broken pieces. Harvesting practices can distribute the weed throughout a lake. These weeds also have strong root systems that will cause regrowth. Usually, harvesting has to be done every year. Some lakes have purchased mechanical harvesters at costs in the area of $100,000. Suction harvesting is better for small areas and costs for divers and equipment can be hundreds of dollars per hour.

Herbicides can be effective in controlling unwanted aquatic vegetation. Aquatic herbicide use requires permits from the Connecticut Department of Energy and Environmental Protection (CTDEEP). The fee for a permit is currently $200. Some of the most widely used aquatic herbicides in Connecticut are fluridone (Sonar™, Avast™), diquat (Reward™), 2,4-D (Navigate™, AquaKlean™) and Glyphosate (Rodeo™). In recent years, several new products have emerged such as Flumioxazin (Clipper™), Imazamox (Clearcast™) and Triclopyr (Renovate™). Fluridone, 2, 4-D, glyphosate,

Table 4. Prices, rates and restrictions of common aquatic herbicides.*

Product	Price*	Rate*	Restrictions*
2, 4-D	$3 per pound	100 pounds per acre	Potable water Irrigation
Diquat	$100 per gallon	1-2 gallons per acre	Irrigation 2-5 days
Flumioxazin	$250 per pound	1-15 pounds per acre	Irrigation 5 days
Fluridone	$1500 per gallon	0.5-1 gallon per acre	Irrigation 14-30 days
Glyphosate	$50 per gallon	0.5-1 gallon per acre	None
Imazamox	$350 per gallon	0.5-2 gallons per acre	Irrigation
Triclopyr	$150 per gallon	1-25 gallons per acre	Potable water Irrigation

* For general information only, consult label and CTDEEP for specific information.

imazamox and triclopyr are translocated throughout the entire plant, causing dieback of the roots and shoots. Diquat, and flumioxazin destroys only foliage, and regrowth from the roots is likely. Fluridone and flumioxazin are the only herbicides that are currently considered effective against fanwort. Because whole lake herbicide treatments would cause damage to non-target organisms and be cost prohibitive, spot treatments would be needed. Fluridone requires many weeks of contact time and therefore a granular formulation would likely be needed. Glyphosate is sprayed directly on plants and is effective only on weeds like water lily and water shield that have large areas of foliage above the surface. Both Lower and Upper Moodus Reservoirs are inhabited by state listed species (Figure 1) and this could affect the use of aquatic herbicides. Aquatic herbicides can be expensive and often have associated water use restrictions (Table 4). Annual treatments are common. Specifics on the use of aquatic herbicides in Connecticut are found in the CTDEEP (2005) publication entitled "Nuisance Aquatic Vegetation Management: A Guidebook."

Although efforts are underway to find biological controls for nuisance aquatic vegetation, breakthroughs have been limited. Plant eating fish, called grass carp *(Ctenopharyngodon idella)*, can effectively reduce the populations of certain aquatic weeds. Often it is an "all or nothing" procedure where

Figure 12. Introduction of grass carp (left), screen at outlet (middle), control after five years (right).

too few are introduced to have much of an effect or too many are introduced and both nuisance and desirable vegetation is eliminated. The introduction of grass carp into Connecticut lakes requires approval by the CTDEEP. Often these fish are considered inappropriate because their feeding is not selective and desirable plants can be eliminated. In addition, if the fish begin to breed, they could move to other lakes and harm desirable native plants. In Connecticut, only sterile grass carp (triploid) are permitted. They are usually 10-12 inches in length when introduced (Figure 12, left) and can grow to over 30 inches. Typically 10-20 fish per vegetated acre are used at a cost of $10-$15 per fish. All lake inlets and outlets must be screened to prevent movement of the fish (Figure 12, middle). These screens must be CTDEEP approved and cannot interfere with the flow of water or the integrity of the dam. The screen must be kept free of debris to prevent flooding. Written approval by all lakefront landowners may be necessary. Introducing grass carp in Moodus Reservoir could cause damage to non-target plants necessary to maintain the current fishery. CAES research on the control of curlyleaf pondweed in Grannis Lake (Figure 12, right) and found reductions in abundance per point but little difference in frequency. This is likely because of the grass carp of grazing on the terminal portions of plants while leaving basal portions intact. CAES has worked with officials from the United Sates Department of Agriculture to find new plant pathogens and insects that control nuisance aquatic plants with little success.

Conclusions

The shallow nature of both Lower and Upper Moodus Reservoir make it prime habitat for aquatic vegetation. Over thirty plant species occur in both basins with four being invasive in Lower Moodus

and three being invasive in Upper Moodus. Moodus Reservoir has a unique combination of large shallow areas with emergent vegetation and large areas of open water suitable for boating, fishing, swimming and other recreational opportunities. Extensive growth of aquatic vegetation has been part of the lake since records began in the 1930's. The shallows are often adjacent to large areas of wooded undeveloped shoreline that make excellent wildlife habitat. The brown water coloration caused by organic compounds has been a part of the lake since the first water tests in the 1930's and is not a sign of pollution. Of greatest concern is the nearly complete coverage of the bottom with the non-native aquatic plant called fanwort that appears to be expanding. Fortunately, the fanwort does not reach the surface in most of the lake and recreational uses are usually not impaired lakewide. This may be because the water color limits light penetration. If conditions change and the fanwort begins to reach the surface, the lake will be seriously impacted. A new infestation of Brazilian waterweed poses a threat for the future. Temporary control of fanwort or other nuisance plant species can be accomplished by harvesting, spot applications of herbicides, localized dredging or bottom barriers. Winter drawdown may temporally control nuisance vegetation on the exposed bottom areas but will probably not result in significant changes in the plant community. Yearly monitoring for new invasive vegetation could result in its removal before it becomes a problem. Citizen lake watchers or hired lake professionals could help accomplish this activity.

Acknowledgments

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Martha Barton
Michael Cavadini
Jennifer Fanzutti
Robin Gent
Rachel Soufrine

Funding:

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Appendix

CAES IAPP On-Lake Time

Upper Moodus Reservoir (Lead surveyor)	**Lower Moodus Reservoir** (Lead surveyor)
6/7/2012 (Gibbons)	6/8/2012 (Gibbons)
7/5/2012 (Bugbee)	7/13/2012 (Gibbons)
7/6/2012 (Gibbons)	7/16/2012 (Gibbons)
7/9/2012 (Gibbons)	7/17/2012 (Gibbons)
7/10/2012 (Bugbee)	7/18/2012 (Gibbons)
7/10/2012 (Gibbons)	7/26/2012 (Bugbee)
7/11/2012 (Bugbee)	7/30/2012 (Bugbee)
7/11/2012 (Gibbons)	
7/12/2012 (Gibbons)	
7/16/2012 (Bugbee)	
8 days	**7 days**

Invasive Plant Descriptions

Cabomba caroliniana


Photo by CAES IAPP

Common names:
Fanwort
Carolina fanwort

Origin:
Southeast United States
South America

Key features:
Plants are submersed

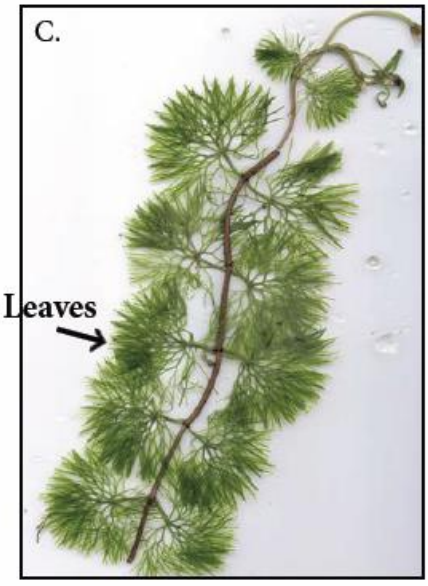
Stems: Can be 6 feet (2 m) long

Leaves: Dissected, opposite leaves 0.8-2 inches (2-5 cm) are fan-like and made up of forked leaflets attached to the stem by a petiole. Floating leaves 0.2-0.8 inches (6-20 mm) wide are oblong and produced on flower shoots

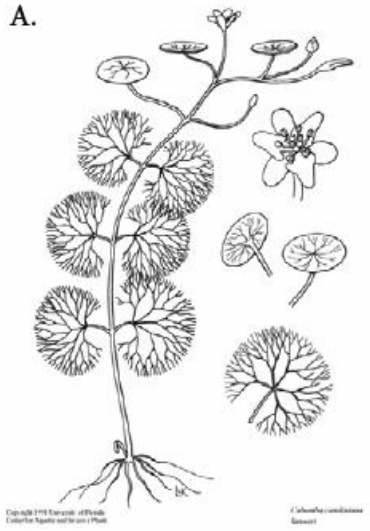
Flowers: Small, solitary flowers are usually white to pinkish

Fruits/Seeds: Flask shaped

Reproduction: Seed and fragmentation



Easily confused species:
Watermilfoils: *Myriophyllum* spp.
White water crowfoot: *Ranunculus longirostris*
Water marigold: *Megalodonta beckii*



A. Copyright 1991 Univ. of Florida, Center for Aquatic and Invasive Plants
B. Copyright 2002 Univ. of Florida, Photo by A. Murray
C. Photo by A. Smagula

Egeria densa

Common names:
Brazilian waterweed
Brazilian elodea
South American waterweed

Origin:
South America

Key features:
Plants are submersed

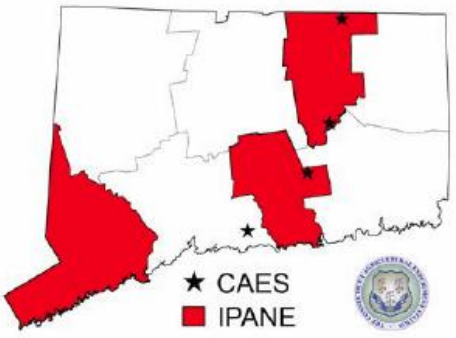
Stems: Plant stems green, soft and typically 1-2 ft (0.3-0.6 m) long

Leaves: Leaves entire 0.4-1.2 inches (1-3 cm) long by 0.2 in (5 mm) wide, leaves toothed (need magnification), leaves are whorled with typically 4 leaves per whorl

Flowers: Small white flowers with three petals, only staminate (male) flowers found in the US

Reproduction: Fragmentation

Easily confused species:
Waterweeds (Native): *Elodea nuttallii* and *E. canadensis*
Hydrilla: *Hydrilla verticillata*



Myriophyllum heterophyllum

Common names:
Variable-leaf watermilfoil
Variable watermilfoil
Two-leaf watermilfoil

Origin:
Southern United States

Key features:
Plants are submersed

Stems: Dark brown stems extend to the water's surface and spread to form large mats

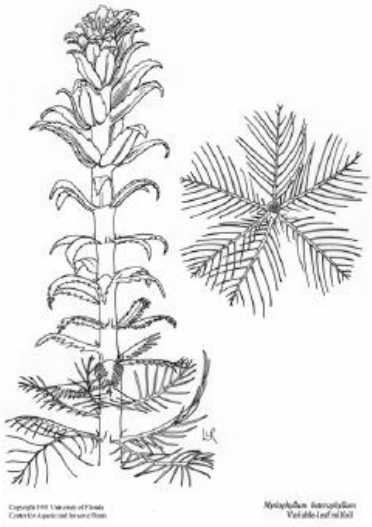
Leaves: Triangular with ≤ 11 pairs of leaflets. Leaves are dissected and whorled (4-6 leaves/whorl) resulting in a feathery appearance with leaf whorls < 1 inch apart giving it a ropy appearance

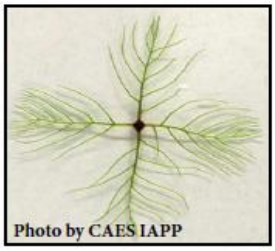
Flowers: Inflorescence spike 2-14 inches (5-35 cm) long extend beyond the water's surface with flowers in whorls of four with reddish petals

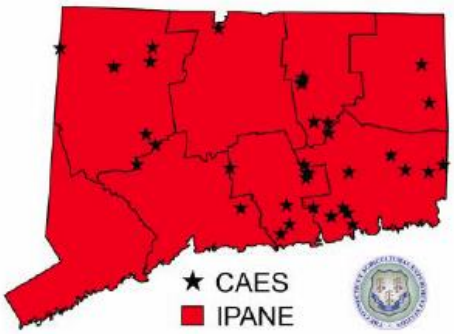
Fruits/Seeds: Fruits are almost round, with a rough surface

Reproduction: Fragmentation and seeds

Easily confused species:
Eurasian watermilfoil: *Myriophyllum spicatum*
Low watermilfoil: *Myriophyllum humile*







Potamogeton crispus

Common names:
Curly leaf pondweed
Crispy-leaved pondweed
Crisped pondweed

Origin:
Asia, Africa, and Europe

Key features:
Plants are submersed

Stems: Stems are flattened, can form dense stands in water up to 15 feet (5 m) deep

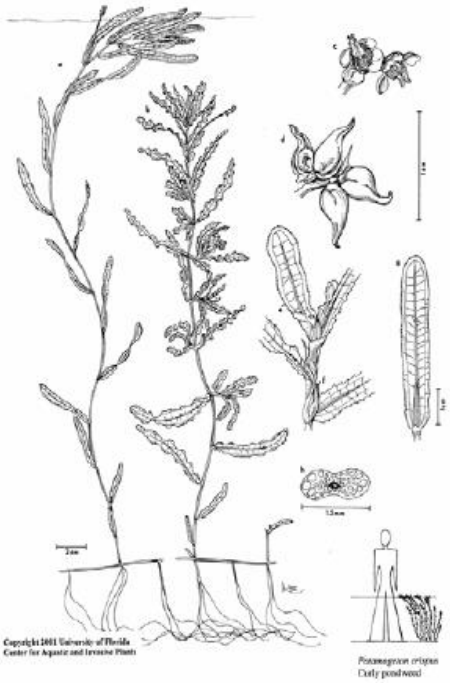
Leaves: Alternate leaves 0.3-1 inches (3-8 cm) wide with wavy edges (similar to lasagna) with a prominent mid-vein

Flowers: Brown and inconspicuous

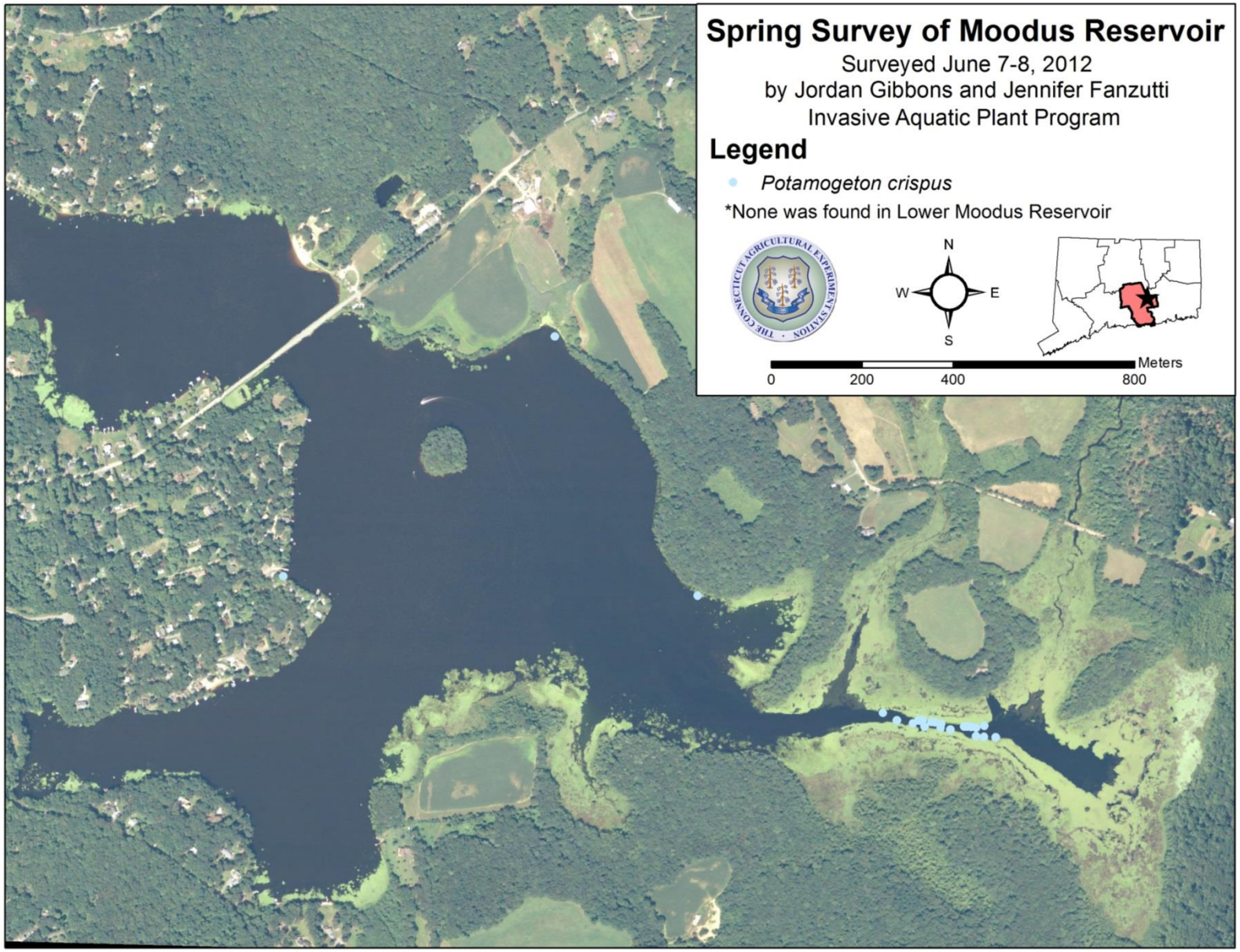
Fruits/Seeds: Fruit is oval 0.1 inches (3 mm) long

Reproduction: Turions (right) and seeds

Easily confused species:
None



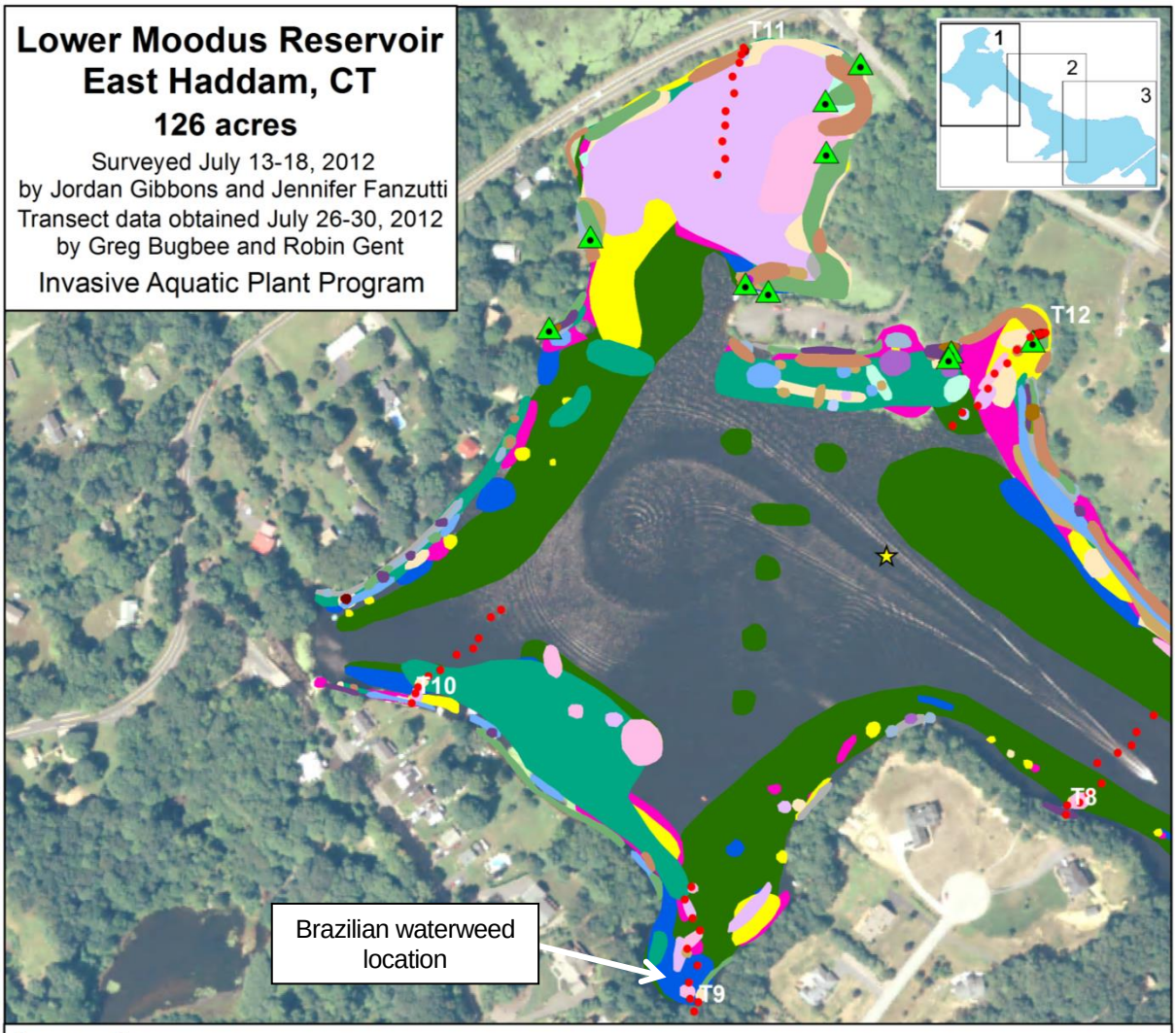
Detailed Aquatic Survey Maps


Spring Survey of Moodus Reservoir
Surveyed June 7-8, 2012
by Jordan Gibbons and Jennifer Fanzutti
Invasive Aquatic Plant Program
Legend
Potamogeton crispus
*None was found in Lower Moodus Reservoir
THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION
N
W
E
S
0
200
400
800
Meters

Lower Moodus Reservoir
East Haddam, CT
126 acres

Surveyed July 13-18, 2012
by Jordan Gibbons and Jennifer Fanzutti
Transect data obtained July 26-30, 2012
by Greg Bugbee and Robin Gent

Invasive Aquatic Plant Program



Legend

- Plant Collection
- Transect Point
- Water Data
- *Brasenia schreberi*
- *Callitriche species*
- *Cabomba caroliniana**
- *Ceratophyllum echinatum*
- *Egeria densa**
- *Elatine minima*
- *Eleocharis species*
- *Elodea nuttallii*
- *Eriocaulon aquaticum*
- *Gratiola aurea*
- *Isoetes species*
- *Lemna minor*
- *Ludwigia species*
- *Myriophyllum humile*
- *Myriophyllum heterophyllum**
- *Najas flexilis*
- *Nuphar variegata*
- *Nymphaea odorata*
- *Pontederia cordata*
- *Potamogeton amplifolius*
- *Potamogeton bicupulatus*
- *Potamogeton crispus**
- *Potamogeton epihydrus*
- *Potamogeton foliosus*
- *Potamogeton pusillus*
- *Sagittaria species*
- *Sparganium species*
- *Typha species*
- *Utricularia gibba*
- *Utricularia macrorhiza*
- *Utricularia purpurea*
- *Utricularia radiata*
- *Vallisneria americana*

*Invasive

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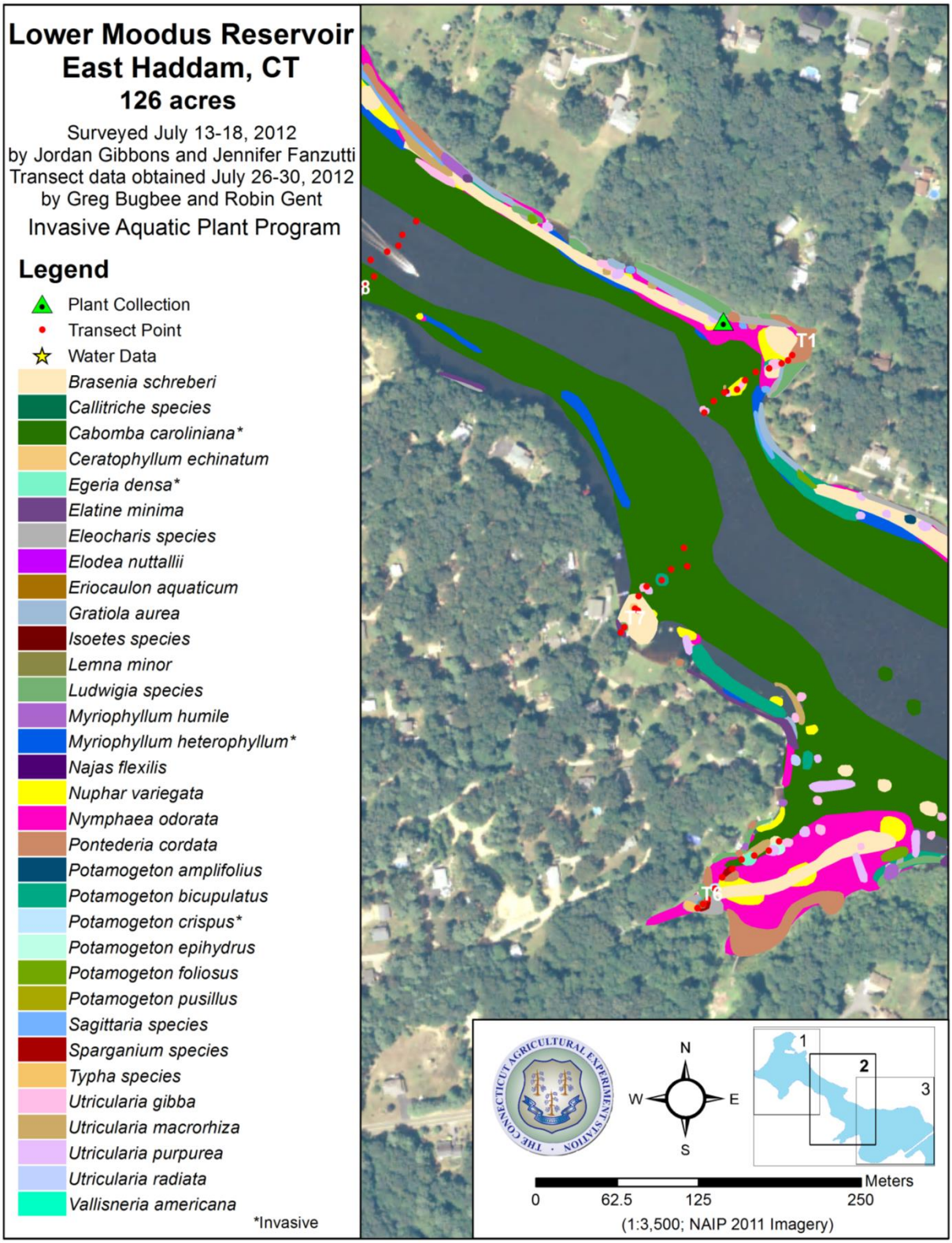
Meters

(1:3,500; NAIP 2011 Imagery)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East Haddam, CT
126 acres
Surveyed July 13-18, 2012
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Transect data obtained July 26-30, 2012
by Greg Bugbee and Robin Gent
Invasive Aquatic Plant Program
Legend
Plant Collection
Transect Point
Water Data
Brasenia schreberi
Callitriche species
Cabomba caroliniana*
Ceratophyllum echinatum
Egeria densa*
Elatine minima
Eleocharis species
Elodea nuttallii
Eriocaulon aquaticum
Gratiola aurea
Isoetes species
Lemna minor
Ludwigia species
Myriophyllum humile
Myriophyllum heterophyllum*
Najas flexilis
Nuphar variegata
Nymphaea odorata
Pontederia cordata
Potamogeton amplifolius
Potamogeton bicupulatus
Potamogeton crispus*
Potamogeton epihydrus
Potamogeton foliosus
Potamogeton pusillus
Sagittaria species
Sparganium species
Typha species
Utricularia gibba
Utricularia macrorhiza
Utricularia purpurea
Utricularia radiata
Vallisneria americana
*Invasive
T1
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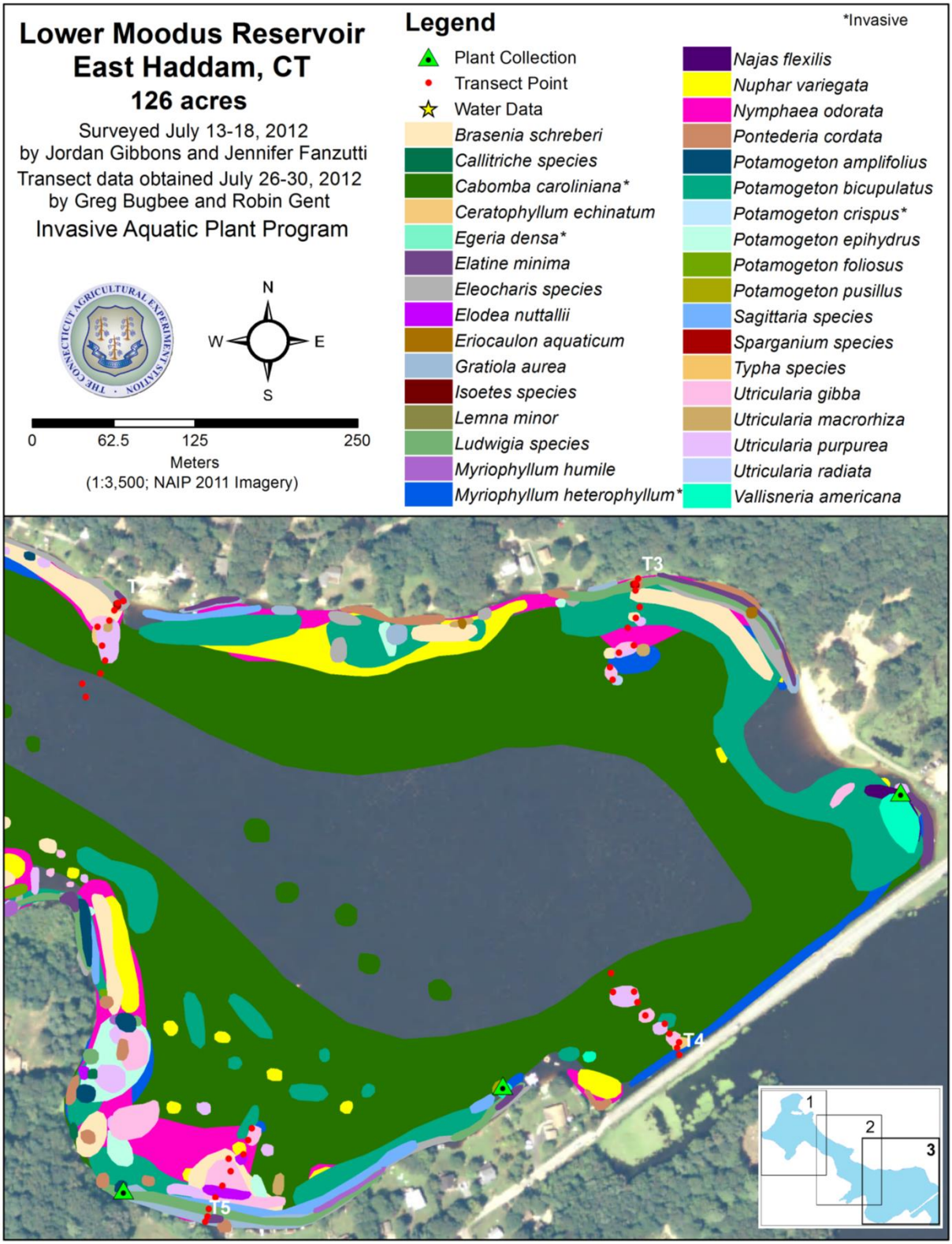
(1:3,500; NAIP 2011 Imagery)


Lower Moodus Reservoir
East Haddam, CT
126 acres
Surveyed July 13-18, 2012
by Jordan Gibbons and Jennifer Fanzutti
Transect data obtained July 26-30, 2012
by Greg Bugbee and Robin Gent
Invasive Aquatic Plant Program
N
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250
Meters
(1:3,500; NAIP 2011 Imagery)
Legend
*Invasive
Plant Collection
Transect Point
Water Data
Brasenia schreberi
Callitriche species
Cabomba caroliniana*
Ceratophyllum echinatum
Egeria densa*
Elatine minima
Eleocharis species
Elodea nuttallii
Eriocaulon aquaticum
Gratiola aurea
Isoetes species
Lemna minor
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Myriophyllum humile
Myriophyllum heterophyllum*
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Sparganium species
Typha species
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Vallisneria americana
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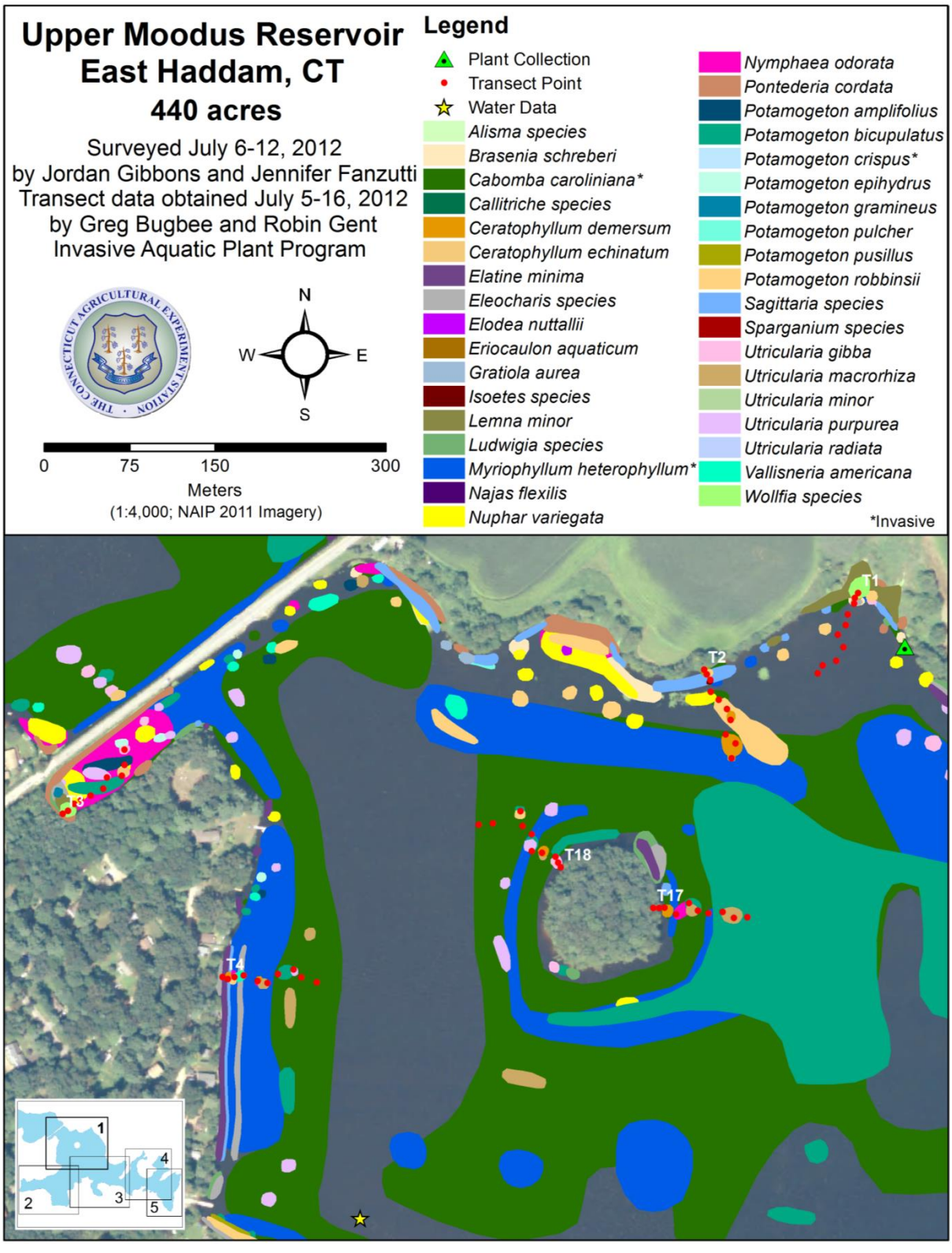
Upper Moodus Reservoir
East Haddam, CT
440 acres
Surveyed July 6-12, 2012
by Jordan Gibbons and Jennifer Fanzutti
Transect data obtained July 5-16, 2012
by Greg Bugbee and Robin Gent
Invasive Aquatic Plant Program
THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION
N
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75
150
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Meters
(1:4,000; NAIP 2011 Imagery)
Legend
Plant Collection
Transect Point
Water Data
Alisma species
Brasenia schreberi
Cabomba caroliniana*
Callitriche species
Ceratophyllum demersum
Ceratophyllum echinatum
Elatine minima
Eleocharis species
Elodea nuttallii
Eriocaulon aquaticum
Gratiola aurea
Isoetes species
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Ludwigia species
Myriophyllum heterophyllum*
Najas flexilis
Nuphar variegata
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Potamogeton amplifolius
Potamogeton bicupulatus
Potamogeton crispus*
Potamogeton epihydrus
Potamogeton gramineus
Potamogeton pulcher
Potamogeton pusillus
Potamogeton robbinsii
Sagittaria species
Sparganium species
Utricularia gibba
Utricularia macrorhiza
Utricularia minor
Utricularia purpurea
Utricularia radiata
Vallisneria americana
Wollfia species
*Invasive
T1
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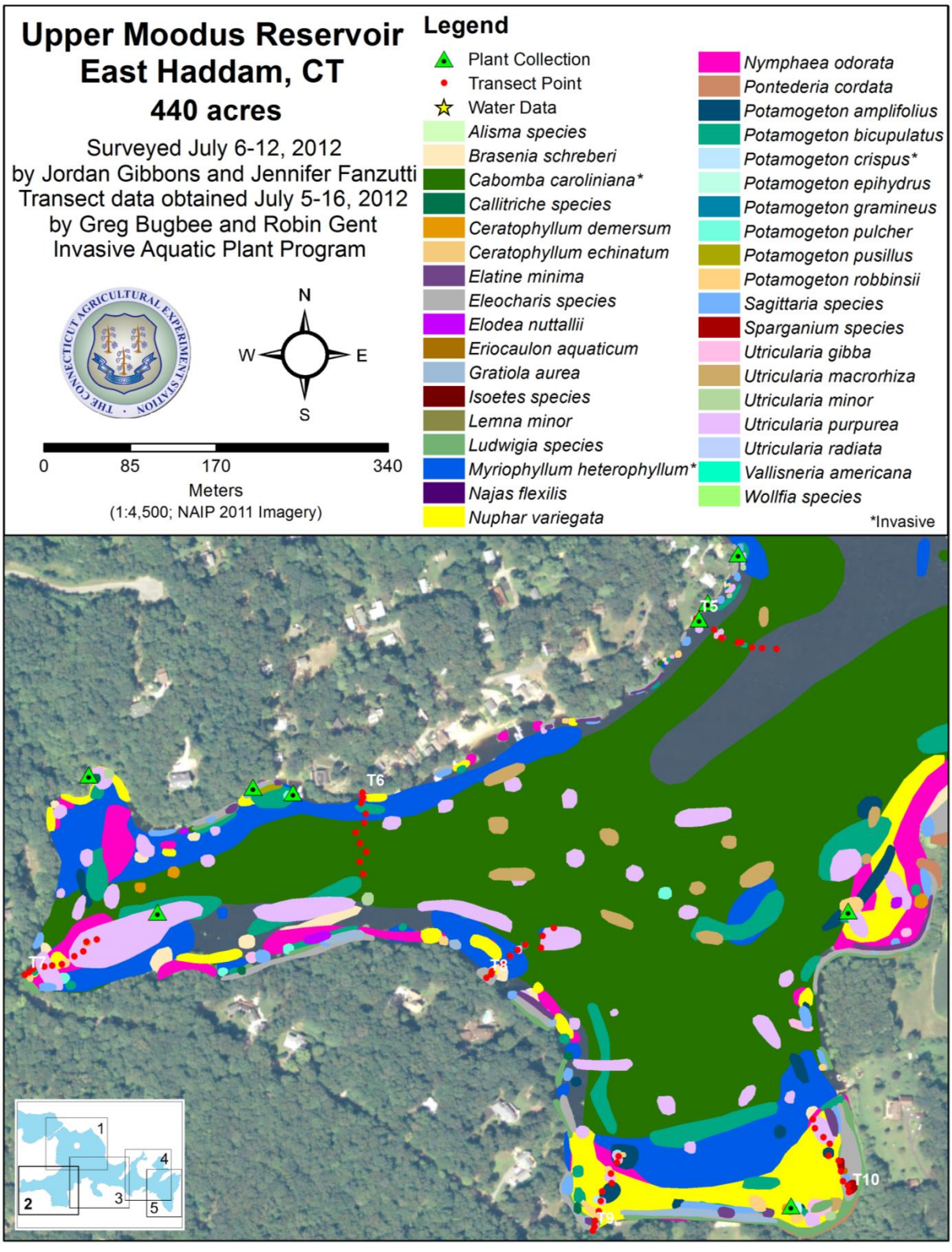
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Invasive Aquatic Plant Program
THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION
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170
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Meters
(1:4,500; NAIP 2011 Imagery)
Legend
Plant Collection
Transect Point
Water Data
Alisma species
Brasenia schreberi
Cabomba caroliniana*
Callitriche species
Ceratophyllum demersum
Ceratophyllum echinatum
Elatine minima
Eleocharis species
Elodea nuttallii
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Potamogeton gramineus
Potamogeton pulcher
Potamogeton pusillus
Potamogeton robbinsii
Sagittaria species
Sparganium species
Utricularia gibba
Utricularia macrorhiza
Utricularia minor
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Wollfia species
*Invasive
T5
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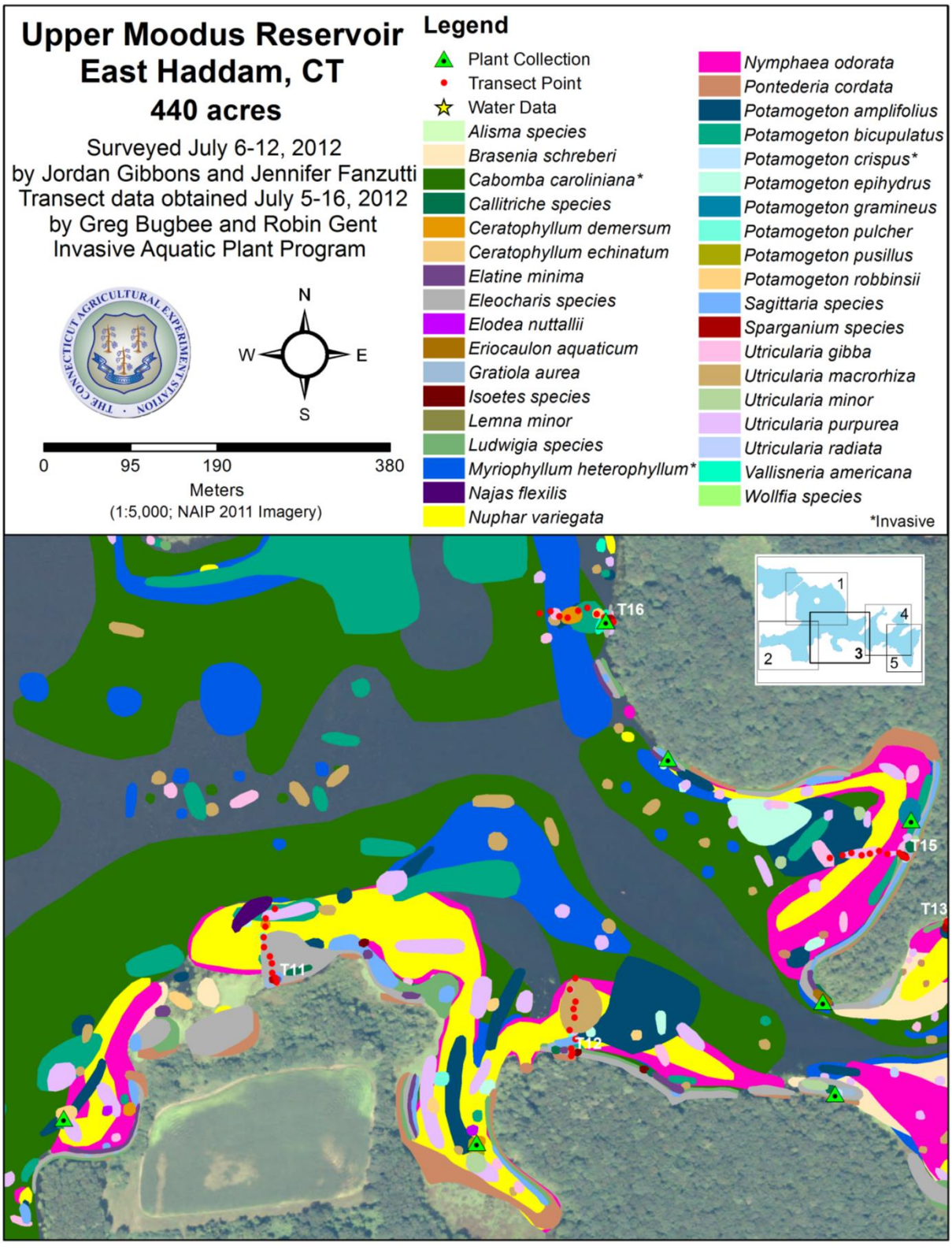
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440 acres
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Invasive Aquatic Plant Program
THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION
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Meters
(1:5,000; NAIP 2011 Imagery)
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Plant Collection
Transect Point
Water Data
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Callitriche species
Ceratophyllum demersum
Ceratophyllum echinatum
Elatine minima
Eleocharis species
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Potamogeton epihydrus
Potamogeton gramineus
Potamogeton pulcher
Potamogeton pusillus
Potamogeton robbinsii
Sagittaria species
Sparganium species
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Utricularia macrorhiza
Utricularia minor
Utricularia purpurea
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Vallisneria americana
Wollfia species
*Invasive
T16
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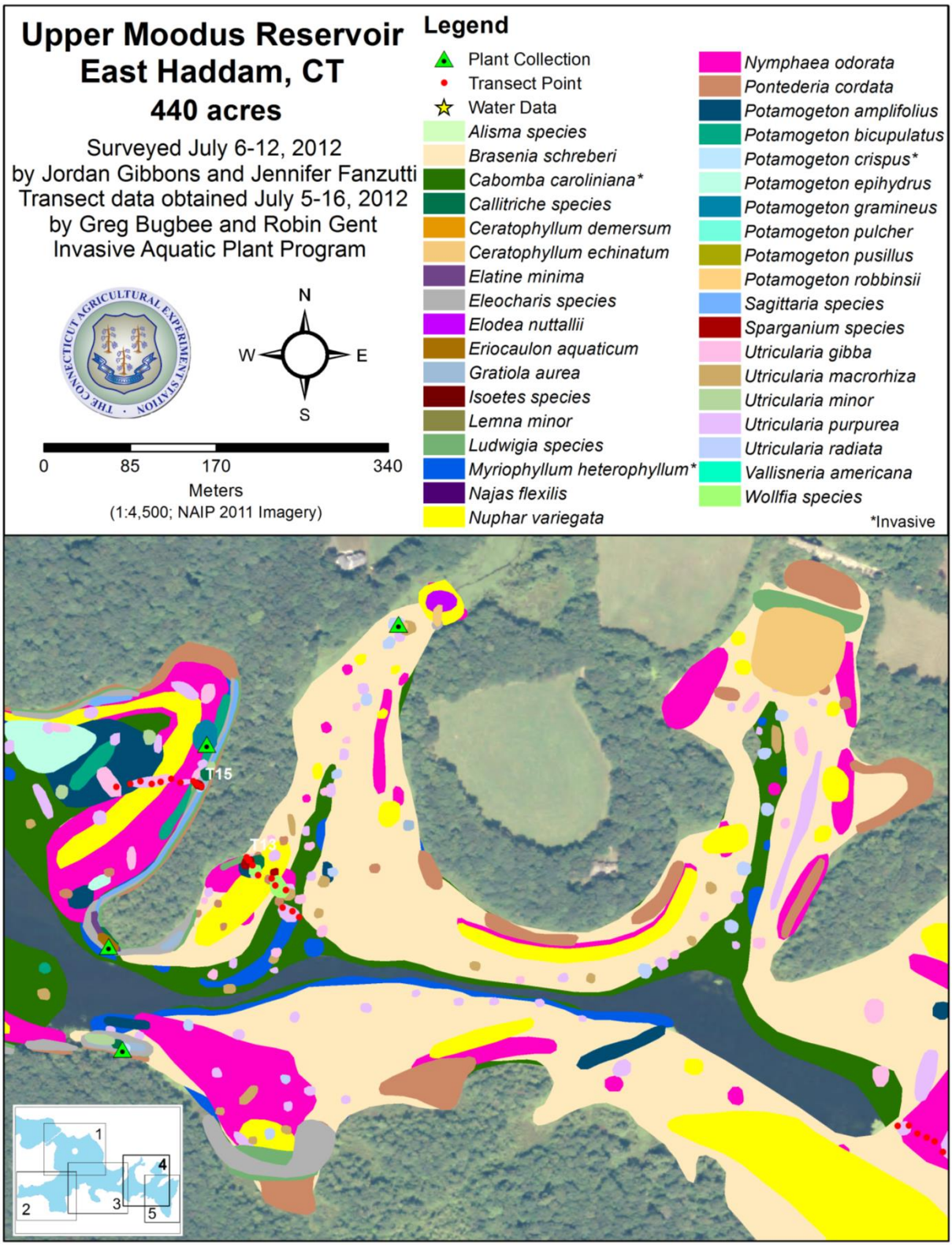
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East Haddam, CT
440 acres
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Transect data obtained July 5-16, 2012
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Invasive Aquatic Plant Program
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(1:4,500; NAIP 2011 Imagery)
Legend
Plant Collection
Transect Point
Water Data
Alisma species
Brasenia schreberi
Cabomba caroliniana*
Callitriche species
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Ceratophyllum echinatum
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Potamogeton pusillus
Potamogeton robbinsii
Sagittaria species
Sparganium species
Utricularia gibba
Utricularia macrorhiza
Utricularia minor
Utricularia purpurea
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Vallisneria americana
Wollfia species
*Invasive
T15
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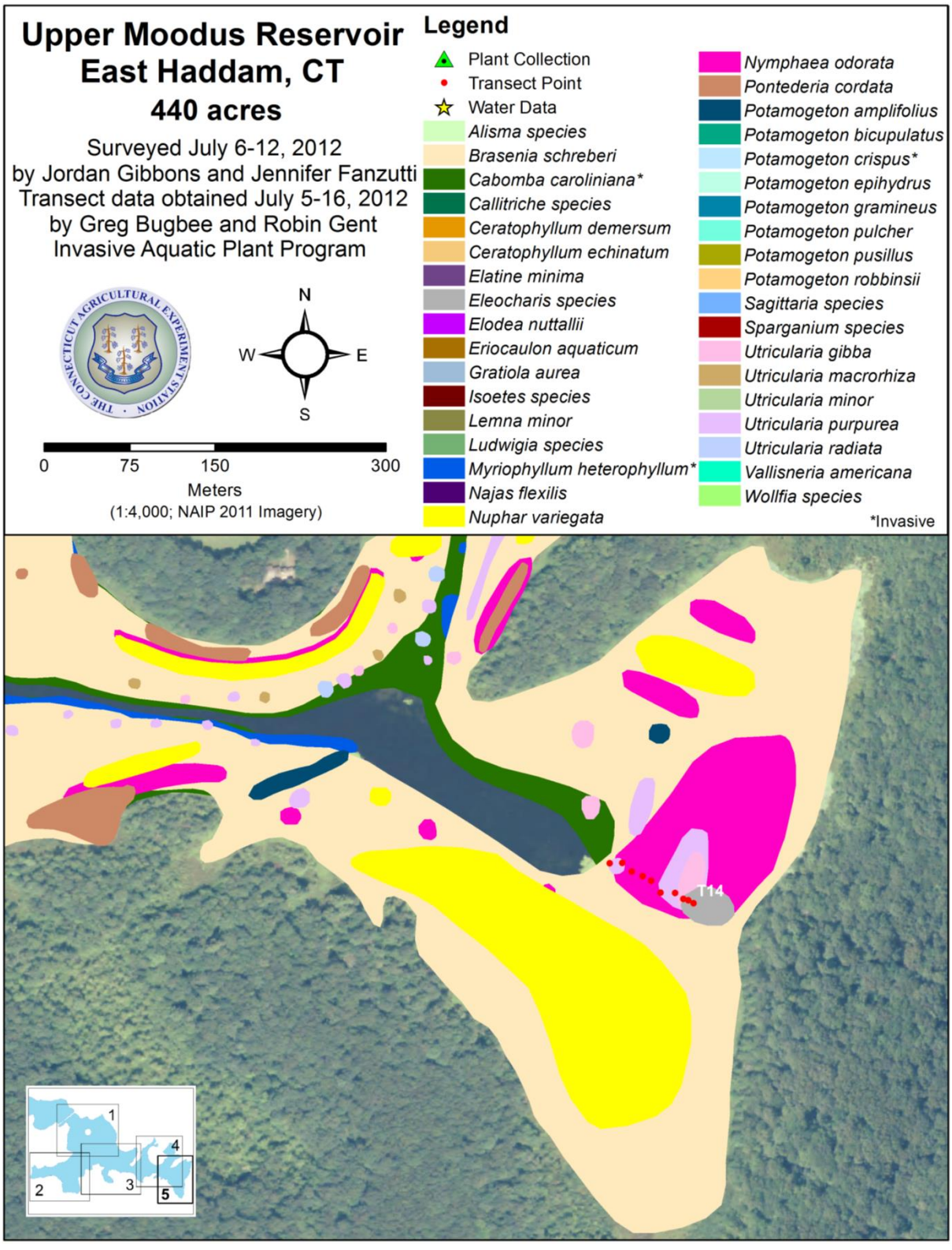
Upper Moodus Reservoir
East Haddam, CT
440 acres
Surveyed July 6-12, 2012
by Jordan Gibbons and Jennifer Fanzutti
Transect data obtained July 5-16, 2012
by Greg Bugbee and Robin Gent
Invasive Aquatic Plant Program
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0
75
150
300
Meters
(1:4,000; NAIP 2011 Imagery)
Legend
Plant Collection
Transect Point
Water Data
Alisma species
Brasenia schreberi
Cabomba caroliniana*
Callitriche species
Ceratophyllum demersum
Ceratophyllum echinatum
Elatine minima
Eleocharis species
Elodea nuttallii
Eriocaulon aquaticum
Gratiola aurea
Isoetes species
Lemna minor
Ludwigia species
Myriophyllum heterophyllum*
Najas flexilis
Nuphar variegata
Nymphaea odorata
Pontederia cordata
Potamogeton amplifolius
Potamogeton bicupulatus
Potamogeton crispus*
Potamogeton epihydrus
Potamogeton gramineus
Potamogeton pulcher
Potamogeton pusillus
Potamogeton robbinsii
Sagittaria species
Sparganium species
Utricularia gibba
Utricularia macrorhiza
Utricularia minor
Utricularia purpurea
Utricularia radiata
Vallisneria americana
Wollfia species
*Invasive
T14
1
2
3
4
5

Transect Data

Appendix Lower Moodus Transect Data (1 of 5)

Transect	Point	Distance from shore (m)	Surveyor	Latitude	Longitude	Date	Depth (m)	Substrate	Notes	*Brasenia schreberi*	*Cabomba caroliniana*	*Ceratophyllum echinatum*	*Egeria densa*	*Elatine minima*	*Eleocharis species*	*Gratiola aurea*	*Isoetes species*	*Lemna minor*	*Ludwigia species*	*Myriophyllum heterophyllum*	*Nuphar variegata*	*Nymphaea odorata*	*Pontederia cordata*	*Potamogeton bicupulatus*	*Potamogeton crispus*	*Potamogeton epihydrus*	*Potamogeton pusillus*	*Sagittaria species*	*Sparganium species*	*Typha species*	*Utricularia gibba*	*Utricularia macrorhiza*	*Utricularia purpurea*	*Utricularia radiata*
1	1	0.5	Jennifer Fanzutti	41.51267	-72.41659	7/18/2012	0.10	Muck		2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	2	5	Jennifer Fanzutti	41.51263	-72.41663	7/18/2012	0.00	Sand		3	3	0	0	0	0	3	0	0	2	0	1	1	3	0	0	0	0	0	0	0	0	0	0	0
1	3	10	Jennifer Fanzutti	41.51261	-72.41669	7/18/2012	0.50	Sand		0	2	0	0	0	0	0	0	0	3	2	2	2	3	2	0	0	0	0	0	2	0	3	0
1	4	20	Jennifer Fanzutti	41.51258	-72.4168	7/18/2012	1.00	Sand		3	2	0	0	0	0	0	0	0	0	3	4	4	0	0	0	0	0	0	0	2	0	2	3
1	5	30	Jennifer Fanzutti	41.51255	-72.41693	7/18/2012	0.80	Sand		0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	6	40	Jennifer Fanzutti	41.51249	-72.41703	7/18/2012	1.10	Sand		0	5	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0
1	7	50	Jennifer Fanzutti	41.51243	-72.4171	7/18/2012	1.30	Sand		0	5	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0
1	8	60	Jennifer Fanzutti	41.51241	-72.41722	7/18/2012	1.40	Sand		0	4	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	2	3	0
1	9	70	Jennifer Fanzutti	41.51235	-72.41731	7/18/2012	1.50	Sand		0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	10	80	Jennifer Fanzutti	41.51227	-72.4174	7/18/2012	1.70	Sand		0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
2	1	0.5	Greg Bugbee	41.51122	-72.41465	7/26/2012	0.20	Sand		0	0	0	0	2	2	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	2	5	Greg Bugbee	41.5112	-72.4147	7/26/2012	1.00	Sand		2	2	0	0	0	2	0	0	0	0	0	0	4	0	0	0	0	0	0	2	0	0	2	0	0
2	3	10	Greg Bugbee	41.51115	-72.41473	7/26/2012	1.50	Silt		2	2	0	0	0	2	0	0	0	0	0	0	3	0	2	0	0	0	0	0	0	0	2	0	0
2	4	20	Greg Bugbee	41.51108	-72.41477	7/26/2012	1.80	Silt		4	2	2	0	0	2	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	2	2	2	0
2	5	30	Greg Bugbee	41.51104	-72.41488	7/26/2012	2.00	Silt		2	2	2	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2	0
2	6	40	Greg Bugbee	41.51091	-72.41484	7/26/2012	2.20	Silt		0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
2	7	50	Greg Bugbee	41.5108	-72.41481	7/26/2012	2.50	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
2	8	60	Greg Bugbee	41.51071	-72.41486	7/26/2012	2.50	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	9	70	Greg Bugbee	41.51065	-72.41503	7/26/2012	2.50	Silt		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	10	80	Greg Bugbee	41.51055	-72.41499	7/26/2012	2.50	Silt		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	1	0.5	Greg Bugbee	41.51136	-72.40991	7/30/2012	0.30	Muck		0	2	0	0	0	0	0	0	0	2	0	3	3	2	2	0	0	0	0	2	0	0	0	0	0
3	2	5	Greg Bugbee	41.51132	-72.40993	7/30/2012	1.00	Muck		2	2	0	0	0	0	0	0	0	3	2	4	3	2	2	0	0	0	0	2	0	0	0	2	0
3	3	10	Greg Bugbee	41.51127	-72.40993	7/30/2012	1.00	Muck		2	2	0	0	0	0	0	0	0	0	3	2	4	2	0	0	0	0	0	0	0	0	0	0	0
3	4	20	Greg Bugbee	41.51116	-72.40989	7/30/2012	1.50	Silt		0	0	0	0	0	0	0	0	0	0	2	0	4	0	0	0	0	0	0	0	0	0	0	0	0
3	5	30	Greg Bugbee	41.51109	-72.40993	7/30/2012	2.00	Silt		1	3	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0
3	6	40	Greg Bugbee	41.51102	-72.41	7/30/2012	2.00	Silt		0	3	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
3	7	50	Greg Bugbee	41.5109	-72.40995	7/30/2012	2.00	Silt		0	3	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	1	2	2	0
3	8	60	Greg Bugbee	41.51085	-72.41008	7/30/2012	2.50	Silt		2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0

Appendix Lower Moodus Transect Data (2 of 5)

Transect	Point	Distance from shore (m)	Surveyor	Latitude	Longitude	Date	Depth (m)	Substrate	Notes	*Brasenia schreberi*	*Cabomba caroliniana*	*Ceratophyllum echinatum*	*Egeria densa*	*Elatine minima*	*Eleocharis species*	*Gratiola aurea*	*Isoetes species*	*Lemna minor*	*Ludwigia species*	*Myriophyllum heterophyllum*	*Nuphar variegata*	*Nymphaea odorata*	*Pontederia cordata*	*Potamogeton bicupulatus*	*Potamogeton crispus*	*Potamogeton epihydrus*	*Potamogeton pusillus*	*Sagittaria species*	*Sparganium species*	*Typha species*	*Utricularia gibba*	*Utricularia macrorhiza*	*Utricularia purpurea*	*Utricularia radiata*
3	9	70	Greg Bugbee	41.51075	-72.41017	7/30/2012	2.20	Silt		0	3	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0
3	10	80	Greg Bugbee	41.51066	-72.41014	7/30/2012	2.50	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
4	1	0.5	Greg Bugbee	41.50806	-72.40954	7/26/2012	0.20	Gravel		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	2	10	Greg Bugbee	41.50811	-72.40956	7/26/2012	0.00	Silt		0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	3	10	Greg Bugbee	41.50815	-72.40955	7/26/2012	2.50	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
4	4	20	Greg Bugbee	41.50821	-72.40963	7/26/2012	2.50	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
4	5	30	Greg Bugbee	41.50828	-72.40968	7/26/2012	2.50	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0
4	6	40	Greg Bugbee	41.50834	-72.40986	7/26/2012	2.50	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
4	7	50	Greg Bugbee	41.50843	-72.40993	7/26/2012	2.50	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
4	8	60	Greg Bugbee	41.5085	-72.40996	7/26/2012	2.50	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
4	9	70	Greg Bugbee	41.5085	-72.41015	7/26/2012	2.80	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
4	10	80	Greg Bugbee	41.50863	-72.41017	7/26/2012	2.50	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1	0.5	Greg Bugbee	41.50692	-72.41391	7/26/2012	0.20	Sand		0	0	1	0	3	3	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
5	2	5	Greg Bugbee	41.50696	-72.41389	7/26/2012	1.00	Sand		0	2	2	0	0	0	0	0	0	0	2	2	2	0	2	0	0	0	0	0	0	0	0	0	0	0
5	3	10	Greg Bugbee	41.50701	-72.41388	7/26/2012	2.00	Silt		0	4	0	0	0	0	0	0	0	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
5	4	20	Greg Bugbee	41.50709	-72.41382	7/26/2012	1.50	Silt		0	3	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	2	0	2	0	0
5	5	30	Greg Bugbee	41.50717	-72.41375	7/26/2012	0.00	Silt		0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	2	0	0	0	0
5	6	40	Greg Bugbee	41.50727	-72.41368	7/26/2012	1.50	Silt		0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	2	0	0	0	0
5	7	50	Greg Bugbee	41.50736	-72.4137	7/26/2012	2.00	Silt		0	4	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0
5	8	60	Greg Bugbee	41.50739	-72.41356	7/26/2012	2.00	Silt		0	4	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
5	9	70	Greg Bugbee	41.50748	-72.41352	7/26/2012	2.00	Silt		0	3	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	2	0	0	0	0
5	10	80	Greg Bugbee	41.50757	-72.41348	7/26/2012	2.00	Silt		0	2	0	0	0	0	0	0	0	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
6	1	0.5	Greg Bugbee	41.50884	-72.41748	7/26/2012	0.20	Muck		0	2	0	0	0	2	0	0	1	0	0	0	0	0	2	0	0	0	3	2	2	0	0	0	0	0
6	2	5	Greg Bugbee	41.50887	-72.41743	7/26/2012	0.80	Muck		2	3	0	0	0	0	0	0	0	0	0	2	1	2	2	0	0	0	0	3	0	0	0	0	0	0
6	3	10	Greg Bugbee	41.5089	-72.41738	7/26/2012	0.80	Muck		1	3	0	0	0	0	0	0	0	2	2	2	0	2	2	0	0	0	0	0	0	2	0	0	0	0
6	4	20	Greg Bugbee	41.50898	-72.41732	7/26/2012	1.00	Muck		0	3	0	0	0	0	0	0	0	2	2	3	2	2	2	2	0	0	0	1	0	0	0	0	0	0
6	5	30	Greg Bugbee	41.50906	-72.41725	7/26/2012	1.00	Muck		0	3	0	0	0	0	0	0	0	2	2	2	3	2	0	0	2	0	0	3	0	0	0	0	0	0
6	6	30	Greg Bugbee	41.50912	-72.41716	7/26/2012	0.00	Muck		2	3	0	2	0	0	0	0	0	2	0	2	2	2	2	0	0	0	0	2	0	0	0	0	0	0

Appendix Lower Moodus Transect Data (3 of 5)

Transect	Point	Distance from shore (m)	Surveyor	Latitude	Longitude	Date	Depth (m)	Substrate	Notes	*Brasenia schreberi*	*Cabomba caroliniana*	*Ceratophyllum echinatum*	*Egeria densa*	*Elatine minima*	*Eleocharis species*	*Gratiola aurea*	*Isoetes species*	*Lemna minor*	*Ludwigia species*	*Myriophyllum heterophyllum*	*Nuphar variegata*	*Nymphaea odorata*	*Pontederia cordata*	*Potamogeton bicupulatus*	*Potamogeton crispus*	*Potamogeton epihydrus*	*Potamogeton pusillus*	*Sagittaria species*	*Sparganium species*	*Typha species*	*Utricularia gibba*	*Utricularia macrorhiza*	*Utricularia purpurea*	*Utricularia radiata*
6	7	50	Greg Bugbee	41.50918	-72.41707	7/26/2012	1.00	Muck		0	4	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0
6	8	60	Greg Bugbee	41.50921	-72.41696	7/26/2012	1.00	Muck		3	4	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	9	70	Greg Bugbee	41.50924	-72.41682	7/26/2012	1.80	Muck		2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	10	80	Greg Bugbee	41.5093	-72.41673	7/26/2012	1.80	Muck		2	4	0	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0
7	1	0.5	Greg Bugbee	41.51075	-72.41818	7/26/2012	0.20	Sand		0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	2	5	Greg Bugbee	41.51079	-72.41814	7/26/2012	1.00	Sand		2	2	2	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
7	3	10	Greg Bugbee	41.51092	-72.41805	7/26/2012	0.00	Silt		2	2	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
7	4	20	Greg Bugbee	41.5109	-72.41802	7/26/2012	2.00	Silt		3	2	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0
7	5	30	Greg Bugbee	41.511	-72.41801	7/26/2012	2.00	Silt		2	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
7	6	40	Greg Bugbee	41.51107	-72.41794	7/26/2012	2.00	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0
7	7	50	Greg Bugbee	41.51111	-72.4178	7/26/2012	2.00	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
7	8	60	Greg Bugbee	41.51119	-72.41771	7/26/2012	2.00	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	9	70	Greg Bugbee	41.51121	-72.41756	7/26/2012	3.50	Silt		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	10	80	Greg Bugbee	41.51134	-72.41759	7/26/2012	2.80	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	1	0.5	Jennifer Fanzutti	41.51305	-72.4207	7/18/2012	0.20	Sand		0	0	0	0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	2	5	Jennifer Fanzutti	41.5131	-72.42069	7/18/2012	2.10	Sand		0	3	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	1	2	0
8	3	10	Jennifer Fanzutti	41.51311	-72.4206	7/18/2012	1.70	Sand		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	3	0
8	4	20	Jennifer Fanzutti	41.51316	-72.42053	7/18/2012	1.80	Sand		0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
8	5	30	Jennifer Fanzutti	41.51322	-72.42044	7/18/2012	2.70	Sand		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	6	40	Jennifer Fanzutti	41.51334	-72.42047	7/18/2012	2.80	Sand		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	7	5	Jennifer Fanzutti	41.51339	-72.42031	7/18/2012	3.60	Sand		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	8	60	Jennifer Fanzutti	41.51343	-72.42021	7/18/2012	3.00	Sand		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	9	70	Jennifer Fanzutti	41.51351	-72.42017	7/18/2012	2.70	Sand		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	10	80	Jennifer Fanzutti	41.5136	-72.42005	7/18/2012	2.50	Sand		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	1	0.5	Greg Bugbee	41.51195	-72.42348	7/30/2012	0.20	Sand		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	2	5	Greg Bugbee	41.512	-72.42345	7/30/2012	1.30	Sand		3	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	3	10	Greg Bugbee	41.51202	-72.42351	7/30/2012	2.20	Silt		0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0
9	4	20	Greg Bugbee	41.51211	-72.42352	7/30/2012	2.20	Silt		0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix Lower Moodus Transect Data (4 of 5)

Transect	Point	Distance from shore (m)	Surveyor	Latitude	Longitude	Date	Depth (m)	Substrate	Notes	*Brasenia schreberi*	*Cabomba caroliniana*	*Ceratophyllum echinatum*	*Egeria densa*	*Elatine minima*	*Eleocharis species*	*Gratiola aurea*	*Isoetes species*	*Lemna minor*	*Ludwigia species*	*Myriophyllum heterophyllum*	*Nuphar variegata*	*Nymphaea odorata*	*Pontederia cordata*	*Potamogeton bicupulatus*	*Potamogeton crispus*	*Potamogeton epihydrus*	*Potamogeton pusillus*	*Sagittaria species*	*Sparganium species*	*Typha species*	*Utricularia gibba*	*Utricularia macrorhiza*	*Utricularia purpurea*	*Utricularia radiata*
9	5	30	Greg Bugbee	41.51221	-72.42345	7/30/2012	2.20	Silt		0	3	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0
9	6	40	Greg Bugbee	41.5123	-72.42353	7/30/2012	2.00	Silt		0	3	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	2	0	0
9	7	50	Greg Bugbee	41.51241	-72.42343	7/30/2012	2.00	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
9	8	60	Greg Bugbee	41.51247	-72.42349	7/30/2012	2.00	Silt		0	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0
9	9	70	Greg Bugbee	41.51258	-72.42355	7/30/2012	2.00	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
9	10	80	Greg Bugbee	41.51265	-72.4235	7/30/2012	2.10	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
10	1	0.5	Greg Bugbee	41.51369	-72.42558	7/30/2012	0.20	Gravel		2	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	2	0
10	2	5	Greg Bugbee	41.51374	-72.42555	7/30/2012	1.80	Silt		0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	3	10	Greg Bugbee	41.51378	-72.42553	7/30/2012	2.20	Silt		0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0
10	4	20	Greg Bugbee	41.51384	-72.42545	7/30/2012	2.00	Silt		1	2	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0
10	5	30	Greg Bugbee	41.51387	-72.42536	7/30/2012	2.30	Silt		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	6	40	Greg Bugbee	41.51396	-72.42524	7/30/2012	3.20	Silt		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	7	50	Greg Bugbee	41.51399	-72.42512	7/30/2012	3.20	Silt		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	8	60	Greg Bugbee	41.51405	-72.42508	7/30/2012	3.30	Silt		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	9	70	Greg Bugbee	41.51417	-72.42498	7/30/2012	3.30	Silt		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	10	80	Greg Bugbee	41.51421	-72.42491	7/30/2012	3.30	Silt		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	1	0.5	Greg Bugbee	41.51736	-72.42309	7/30/2012	0.20	Muck		2	3	0	0	0	0	0	0	0	1	2	2	3	3	0	0	0	0	0	2	0	0	0	2	1
11	2	5	Greg Bugbee	41.51732	-72.4231	7/30/2012	1.20	Muck		2	3	0	0	0	0	0	0	0	0	2	3	3	0	2	0	0	0	2	0	0	2	0	2	0
11	3	10	Greg Bugbee	41.51728	-72.42312	7/30/2012	1.20	Muck		3	3	0	0	0	0	0	0	0	0	2	2	2	0	0	0	0	0	0	0	0	2	0	2	0
11	4	10	Greg Bugbee	41.5172	-72.42317	7/30/2012	1.80	Muck		2	3	0	0	0	0	0	0	0	0	2	0	3	0	2	0	0	0	0	0	0	0	0	2	0
11	5	30	Greg Bugbee	41.5171	-72.42316	7/30/2012	1.30	Muck		0	2	0	0	0	0	0	0	0	0	0	0	5	0	2	0	0	0	0	0	0	0	0	2	0
11	6	40	Greg Bugbee	41.517	-72.42322	7/30/2012	1.20	Muck		0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
11	7	50	Greg Bugbee	41.51692	-72.42322	7/30/2012	1.80	Silt		0	4	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0
11	8	60	Greg Bugbee	41.51683	-72.42324	7/30/2012	1.80	Silt		0	3	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	2	0
11	9	70	Greg Bugbee	41.51674	-72.42322	7/30/2012	2.00	Silt		0	3	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0
11	10	80	Greg Bugbee	41.51665	-72.42328	7/30/2012	2.00	Silt		0	3	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	2	2
12	1	0.5	Greg Bugbee	41.51575	-72.42084	7/30/2012	0.20	Muck		2	3	0	0	0	0	0	0	0	2	2	1	2	2	0	0	0	0	0	2	0	0	0	0	0
12	2	5	Greg Bugbee	41.51574	-72.42089	7/30/2012	1.00	Muck		0	2	0	0	0	0	0	0	0	1	4	2	4	3	0	0	0	0	0	1	0	2	0	0	0

Appendix Lower Moodus Transect Data (5 of 5)

Transect	Point	Distance from shore (m)	Surveyor	Latitude	Longitude	Date	Depth (m)	Substrate	Notes	*Brasenia schreberi*	*Cabomba caroliniana*	*Ceratophyllum echinatum*	*Egeria densa*	*Elatine minima*	*Eleocharis species*	*Gratiola aurea*	*Isoetes species*	*Lemna minor*	*Ludwigia species*	*Myriophyllum heterophyllum*	*Nuphar variegata*	*Nymphaea odorata*	*Pontederia cordata*	*Potamogeton bicupulatus*	*Potamogeton crispus*	*Potamogeton epihydrus*	*Potamogeton pusillus*	*Sagittaria species*	*Sparganium species*	*Typha species*	*Utricularia gibba*	*Utricularia macrorhiza*	*Utricularia purpurea*	*Utricularia radiata*
12	3	10	Greg Bugbee	41.51573	-72.42095	7/30/2012	1.20	Muck		2	3	0	0	0	0	0	0	0	2	3	3	2	2	0	0	0	0	0	2	0	0	0	0	0
12	4	20	Greg Bugbee	41.51566	-72.42105	7/30/2012	1.30	Muck		4	4	0	0	0	0	0	0	0	0	0	2	2	2	0	0	0	0	0	0	0	0	0	0	0
12	5	30	Greg Bugbee	41.51558	-72.42113	7/30/2012	1.50	Muck		4	4	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0
12	6	40	Greg Bugbee	41.51552	-72.42122	7/30/2012	1.80	Muck		3	5	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0
12	7	50	Greg Bugbee	41.51544	-72.42127	7/30/2012	2.00	Silt		3	4	0	0	0	0	0	0	0	0	2	1	2	0	0	0	0	0	0	0	0	0	0	2	0
12	8	60	Greg Bugbee	41.51534	-72.42135	7/30/2012	2.00	Silt		0	4	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0
12	9	70	Greg Bugbee	41.51531	-72.42146	7/30/2012	2.00	Silt		0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
12	10	80	Greg Bugbee	41.51523	-72.42154	7/30/2012	2.00	Silt		0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix Upper Moodus Reservoir Transect Data (1 of 6)

Transect	Point	Distance From Shore (m)	Surveyor	Latitude	Longitude	Date	Depth (m)	Substrate	Notes	*Brasenia schreberi*	*Cabomba caroliniana*	*Callitriche species*	*Ceratophyllum demersum*	*Ceratophyllum echinatum*	*Elatine minima*	*Eleocharis species*	*Eriocaulon aquaticum*	*Gratiola aurea*	*Isoetes species*	*Lemna minor*	*Ludwigia species*	*Myriophyllum heterophyllum*	*Nuphar variegata*	*Nymphaea odorata*	*Pontederia cordata*	*Potamogeton amplifolius*	*Potamogeton bicupulatus*	*Potamogeton crispus*	*Potamogeton epihydrus*	*Potamogeton pulcher*	*Potamogeton pusillus*	*Potamogeton robbinsii*	*Sagittaria species*	*Sparganium species*	*Utricularia gibba*	*Utricularia macrorhiza*	*Utricularia purpurea*	*Utricularia radiata*	*Vallisneria americana*	*Wolffia species*
1	1	0.5	Greg Bugbee	41.50893	-72.40174	7/5/2012	0.3	Muck		0	3	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
1	2	5.0	Greg Bugbee	41.50889	-72.40177	7/5/2012	0.8	Muck		0	3	0	2	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
1	3	10.0	Greg Bugbee	41.50885	-72.40178	7/5/2012	0.9	Muck		2	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1
1	4	20.0	Greg Bugbee	41.50876	-72.40185	7/5/2012	1.5	Muck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	5	30.0	Greg Bugbee	41.50868	-72.40187	7/5/2012	1.5	Muck	Algae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	6	40.0	Greg Bugbee	41.5086	-72.40195	7/5/2012	1.5	Muck	Algae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	7	50.0	Greg Bugbee	41.5085	-72.40189	7/5/2012	2.0	Muck	Algae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	8	60.0	Greg Bugbee	41.5084	-72.40197	7/5/2012	2.0	Muck	Algae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	9	70.0	Greg Bugbee	41.50836	-72.40211	7/5/2012	2.3	Muck	Algae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	10	80.0	Greg Bugbee	41.5083	-72.40216	7/5/2012	2.3	Muck	Algae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	1	0.5	Greg Bugbee	41.50833	-72.40336	7/5/2012	0.3	Sand		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0
2	2	5.0	Greg Bugbee	41.50829	-72.40333	7/5/2012	0.7	Muck		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
2	3	10.0	Greg Bugbee	41.50825	-72.4033	7/5/2012	1.0	Muck	Algae	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	4	20.0	Greg Bugbee	41.50815	-72.40329	7/5/2012	1.8	Muck	Algae	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	5	30.0	Greg Bugbee	41.50809	-72.40321	7/5/2012	1.8	Muck	Algae	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
2	6	40.0	Greg Bugbee	41.50802	-72.40312	7/5/2012	2.0	Muck		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0
2	7	50.0	Greg Bugbee	41.50793	-72.40308	7/5/2012	2.5	Muck		0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
2	8	60.0	Greg Bugbee	41.50782	-72.40314	7/5/2012	2.8	Muck		0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	9	70.0	Greg Bugbee	41.50774	-72.40303	7/5/2012	2.8	Muck		0	3	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	10	80.0	Greg Bugbee	41.50763	-72.40308	7/5/2012	2.9	Muck		0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
3	1	0.5	Greg Bugbee	41.50721	-72.41012	7/5/2012	0.3	Muck		0	2	0	2	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
3	2	5.0	Greg Bugbee	41.50723	-72.41006	7/5/2012	2.9	Muck		0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	3	10.0	Greg Bugbee	41.50729	-72.41	7/5/2012	2.3	Muck		3	4	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	4	20.0	Greg Bugbee	41.50732	-72.40993	7/5/2012	2.0	Muck		3	3	0	0	2	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	5	30.0	Greg Bugbee	41.50735	-72.40982	7/5/2012	2.0	Muck		3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	6	40.0	Greg Bugbee	41.50741	-72.40969	7/5/2012	1.5	Muck		3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	7	50.0	Greg Bugbee	41.50749	-72.40965	7/5/2012	1.2	Muck		3	3	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
3	8	60.0	Greg Bugbee	41.50751	-72.40949	7/5/2012	1.5	Muck		3	3	0	0	2	0	0	0	0	0	0	0	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	9	70.0	Greg Bugbee	41.50759	-72.40947	7/5/2012	1.5	Muck		2	3	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	10	80.0	Greg Bugbee	41.50771	-72.40946	7/5/2012	2.0	Muck		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
4	1	0.5	Greg Bugbee	41.50591	-72.40844	7/10/2012	0.2	Sand		0	0	0	0	0	3	3	0	0	0	0	1	0	0	0	2	0	0	0	2	0	0	0	2	0	0	0	0	0	0
4	2	5.0	Greg Bugbee	41.5059	-72.40839	7/10/2012	1.1	Sand		0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
4	3	10.0	Greg Bugbee	41.50591	-72.40832	7/10/2012	2.5	Silt		0	2	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0
4	4	20.0	Greg Bugbee	41.50593	-72.40822	7/10/2012	2.5	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
4	5	30.0	Greg Bugbee	41.50588	-72.40807	7/10/2012	2.5	Silt		0	3	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0

Appendix Upper Moodus Reservoir Transect Data (2 of 6)

Transect	Point	Distance From Shore (m)	Surveyor	Latitude	Longitude	Date	Depth (m)	Substrate	Notes	*Brasenia schreberi*	*Cabomba caroliniana*	*Callitriche species*	*Ceratophyllum demersum*	*Ceratophyllum echinatum*	*Elatine minima*	*Eleocharis species*	*Eriocaulon aquaticum*	*Gratiola aurea*	*Isoetes species*	*Lemna minor*	*Ludwigia species*	*Myriophyllum heterophyllum*	*Nuphar variegata*	*Nymphaea odorata*	*Pontederia cordata*	*Potamogeton amplifolius*	*Potamogeton bicupulatus*	*Potamogeton crispus*	*Potamogeton epihydrus*	*Potamogeton pulcher*	*Potamogeton pusillus*	*Potamogeton robbinsii*	*Sagittaria species*	*Sparganium species*	*Utricularia gibba*	*Utricularia macrorhiza*	*Utricularia purpurea*	*Utricularia radiata*	*Vallisneria americana*	*Wolffia species*
4	6	40.0	Greg Bugbee	41.50587	-72.40797	7/10/2012	2.5	Silt		0	3	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	7	50.0	Greg Bugbee	41.50593	-72.40786	7/10/2012	2.5	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	8	60.0	Greg Bugbee	41.50597	-72.4077	7/10/2012	2.8	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0
4	9	70.0	Greg Bugbee	41.50591	-72.40761	7/10/2012	2.5	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	10	80.0	Greg Bugbee	41.50587	-72.40745	7/10/2012	2.8	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1	0.5	Greg Bugbee	41.50288	-72.40791	7/10/2012	0.2	Sand		0	0	0	0	0	3	3	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	2	5.0	Greg Bugbee	41.50284	-72.40786	7/10/2012	0.9	Sand		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	3	10.0	Greg Bugbee	41.50283	-72.40782	7/10/2012	1.5	Silt		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	4	20.0	Greg Bugbee	41.50278	-72.4077	7/10/2012	2.0	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	5	30.0	Greg Bugbee	41.5027	-72.40761	7/10/2012	2.0	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	6	40.0	Greg Bugbee	41.50267	-72.40742	7/10/2012	2.2	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	7	50.0	Greg Bugbee	41.50267	-72.40738	7/10/2012	2.3	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	8	60.0	Greg Bugbee	41.50262	-72.40725	7/10/2012	3.3	Silt		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	9	70.0	Greg Bugbee	41.50261	-72.40713	7/10/2012	3.8	Silt		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	10	80.0	Greg Bugbee	41.50261	-72.40696	7/10/2012	3.3	Silt		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	1	0.5	Greg Bugbee	41.50134	-72.41186	7/10/2012	0.3	Sand		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	2	5.0	Greg Bugbee	41.5013	-72.41186	7/10/2012	1.5	Sand		0	2	0	0	0	0	0	0	0	0	0	0	0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	3	10.0	Greg Bugbee	41.50125	-72.41188	7/10/2012	2.2	Silt		0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
6	4	20.0	Greg Bugbee	41.50115	-72.41183	7/10/2012	2.5	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	5	30.0	Greg Bugbee	41.50107	-72.41185	7/10/2012	2.4	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	6	40.0	Greg Bugbee	41.50099	-72.41195	7/10/2012	2.5	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	7	50.0	Greg Bugbee	41.50089	-72.4119	7/10/2012	2.4	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	8	60.0	Greg Bugbee	41.50081	-72.41183	7/10/2012	2.4	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	9	70.0	Greg Bugbee	41.50073	-72.4119	7/10/2012	2.4	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	10	80.0	Greg Bugbee	41.50062	-72.41186	7/10/2012	3.0	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	1	0.5	Greg Bugbee	41.49973	-72.41587	7/10/2012	0.2	Muck		0	3	0	0	0	0	0	0	0	0	0	2	3	0	0	2	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0
7	2	5.0	Greg Bugbee	41.49976	-72.41582	7/10/2012	1.0	Muck		0	2	0	0	0	0	0	0	0	0	0	3	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	3	10.0	Greg Bugbee	41.49979	-72.41577	7/10/2012	1.5	Silt		0	0	0	0	0	0	0	0	0	0	0	4	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	4	20.0	Greg Bugbee	41.49981	-72.41564	7/10/2012	1.3	Silt		0	2	0	0	0	0	0	0	0	0	0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	5	30.0	Greg Bugbee	41.49982	-72.41555	7/10/2012	2.0	Silt		0	1	0	0	0	0	0	0	0	0	0	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	6	40.0	Greg Bugbee	41.49983	-72.41543	7/10/2012	2.0	Silt	Charaphyte	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
7	7	50.0	Greg Bugbee	41.4999	-72.41529	7/10/2012	1.8	Silt	Charaphyte	0	2	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
7	8	60.0	Greg Bugbee	41.49994	-72.41518	7/10/2012	1.6	Silt		0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	9	70.0	Greg Bugbee	41.50003	-72.41514	7/10/2012	2.0	Silt		0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
7	10	80.0	Greg Bugbee	41.50005	-72.41502	7/10/2012	1.6	Silt		2	2	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0

Appendix Upper Moodus Reservoir Transect Data (3 of 6)

Transect	Point	Distance From Shore (m)	Surveyor	Latitude	Longitude	Date	Depth (m)	Substrate	Notes	*Brasenia schreberi*	*Cabomba caroliniana*	*Callitriche species*	*Ceratophyllum demersum*	*Ceratophyllum echinatum*	*Elatine minima*	*Eleocharis species*	*Eriocaulon aquaticum*	*Gratiola aurea*	*Isoetes species*	*Lemna minor*	*Ludwigia species*	*Myriophyllum heterophyllum*	*Nuphar variegata*	*Nymphaea odorata*	*Pontederia cordata*	*Potamogeton amplifolius*	*Potamogeton bicupulatus*	*Potamogeton crispus*	*Potamogeton epihydrus*	*Potamogeton pulcher*	*Potamogeton pusillus*	*Potamogeton robbinsii*	*Sagittaria species*	*Sparganium species*	*Utricularia gibba*	*Utricularia macrorhiza*	*Utricularia purpurea*	*Utricularia radiata*	*Vallisneria americana*	*Wolffia species*
8	1	0.5	Greg Bugbee	41.49969	-72.41041	7/10/2012	0.2	Sand		0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	2	5.0	Greg Bugbee	41.49972	-72.41035	7/10/2012	1.2	Silt		2	0	0	2	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
8	3	10.0	Greg Bugbee	41.49975	-72.41034	7/10/2012	1.6	Silt		3	0	0	0	0	0	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	4	20.0	Greg Bugbee	41.49981	-72.41022	7/10/2012	2.3	Silt		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	5	30.0	Greg Bugbee	41.49989	-72.41013	7/10/2012	2.5	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	6	40.0	Greg Bugbee	41.49994	-72.41004	7/10/2012	2.4	Silt		0	3	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
8	7	50.0	Greg Bugbee	41.49998	-72.40995	7/10/2012	2.4	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
8	8	60.0	Greg Bugbee	41.49996	-72.40976	7/10/2012	2.3	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
8	9	70.0	Greg Bugbee	41.50006	-72.40974	7/10/2012	2.5	Silt		0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
8	10	80.0	Greg Bugbee	41.50013	-72.40961	7/10/2012	2.5	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
9	1	0.5	Greg Bugbee	41.49744	-72.40916	7/11/2012	0.2	Sand		0	2	0	0	0	0	3	0	0	0	0	0	0	2	2	2	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
9	2	5.0	Greg Bugbee	41.49747	-72.40914	7/11/2012	0.5	Sand		0	2	0	0	0	0	3	0	0	0	0	2	3	2	2	2	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
9	3	10.0	Greg Bugbee	41.49753	-72.40913	7/11/2012	1.0	Muck		0	3	0	0	0	0	2	0	0	0	0	2	3	2	3	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
9	4	20.0	Greg Bugbee	41.49761	-72.40909	7/11/2012	1.2	Muck		0	3	0	0	0	0	0	0	0	0	0	0	3	2	4	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
9	5	30.0	Greg Bugbee	41.4977	-72.40907	7/11/2012	1.2	Muck		2	3	0	0	0	0	0	0	0	0	0	0	3	2	2	0	2	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0
9	6	40.0	Greg Bugbee	41.49779	-72.40905	7/11/2012	2.2	Silt		2	3	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	7	50.0	Greg Bugbee	41.49786	-72.40894	7/11/2012	2.2	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
9	8	60.0	Greg Bugbee	41.49795	-72.40895	7/11/2012	3.0	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
9	9	70.0	Greg Bugbee	41.49804	-72.40887	7/11/2012	2.5	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0
9	10	80.0	Greg Bugbee	41.4981	-72.40885	7/11/2012	3.1	Silt		0	3	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0
10	1	0.5	Greg Bugbee	41.49777	-72.40613	7/11/2012	0.2	Muck		2	0	0	0	0	0	2	0	0	0	0	3	3	3	2	2	0	2	0	0	1	0	0	0	2	1	0	0	0	0	0	0
10	2	5.0	Greg Bugbee	41.49783	-72.40614	7/11/2012	0.5	Muck		2	0	0	0	0	0	3	0	0	0	0	3	2	2	2	2	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0
10	3	10.0	Greg Bugbee	41.49787	-72.4062	7/11/2012	1.0	Muck		2	0	0	0	0	0	3	0	0	0	0	4	3	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
10	4	20.0	Greg Bugbee	41.49796	-72.40622	7/11/2012	1.0	Muck		0	2	0	0	0	0	3	2	0	0	0	2	4	2	3	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
10	5	30.0	Greg Bugbee	41.49805	-72.40625	7/11/2012	1.2	Muck		2	0	0	0	0	0	0	0	0	0	0	0	2	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	6	40.0	Greg Bugbee	41.4981	-72.40637	7/11/2012	1.5	Muck		2	3	0	0	0	0	0	0	0	0	0	0	2	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	7	50.0	Greg Bugbee	41.4982	-72.40635	7/11/2012	1.6	Muck		0	3	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	8	60.0	Greg Bugbee	41.49826	-72.40643	7/11/2012	1.6	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
10	9	70.0	Greg Bugbee	41.49834	-72.40653	7/11/2012	2.0	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0
10	10	80.0	Greg Bugbee	41.49842	-72.40655	7/11/2012	2.0	Silt		1	3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
11	1	0.5	Greg Bugbee	41.50161	-72.40332	7/11/2012	0.2	Sand		0	0	0	0	0	2	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0
11	2	5.0	Greg Bugbee	41.50165	-72.40333	7/11/2012	0.4	Muck		0	0	0	0	0	2	3	0	2	0	0	2	2	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
11	3	10.0	Greg Bugbee	41.5017	-72.40337	7/11/2012	0.8	Muck		0	0	0	0	0	0	3	0	0	0	0	2	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
11	4	20.0	Greg Bugbee	41.5018	-72.40338	7/11/2012	0.8	Muck		2	0	0	0	0	0	4	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
11	5	30.0	Greg Bugbee	41.50186	-72.4034	7/11/2012	1.1	Muck		3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0

Appendix Upper Moodus Reservoir Transect Data (4 of 6)

Transect	Point	Distance From Shore (m)	Surveyor	Latitude	Longitude	Date	Depth (m)	Substrate	Notes	*Brasenia schreberi*	*Cabomba caroliniana*	*Callitriche species*	*Ceratophyllum demersum*	*Ceratophyllum echinatum*	*Elatine minima*	*Eleocharis species*	*Eriocaulon aquaticum*	*Gratiola aurea*	*Isoetes species*	*Lemna minor*	*Ludwigia species*	*Myriophyllum heterophyllum*	*Nuphar variegata*	*Nymphaea odorata*	*Pontederia cordata*	*Potamogeton amplifolius*	*Potamogeton bicupulatus*	*Potamogeton crispus*	*Potamogeton epihydrus*	*Potamogeton pulcher*	*Potamogeton pusillus*	*Potamogeton robbinsii*	*Sagittaria species*	*Sparganium speckes*	*Utricularia gibba*	*Utricularia macrorhiza*	*Utricularia purpurea*	*Utricularia radiata*	*Vallisneria americana*	*Wolffia species*
11	6	40.0	Greg Bugbee	41.50195	-72.40348	7/11/2012	1.0	Silt		0	0	0	0	0	0	4	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	2	0	0	0	0
11	7	50.0	Greg Bugbee	41.50205	-72.40349	7/11/2012	1.0	Silt		0	1	0	0	0	0	2	0	0	0	0	0	0	0	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0
11	8	60.0	Greg Bugbee	41.50216	-72.40346	7/11/2012	2.0	Silt		0	0	0	2	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	9	70.0	Greg Bugbee	41.50224	-72.40346	7/11/2012	2.0	Silt		0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
11	10	80.0	Greg Bugbee	41.50233	-72.40334	7/11/2012	2.0	Silt		0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	1	0.5	Greg Bugbee	41.5009	-72.39943	7/11/2012	0.3	Sand		0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	2	0	2	0	0	0	1	0	0	0	0	0
12	2	5.0	Greg Bugbee	41.50087	-72.39945	7/11/2012	0.5	Sand		0	0	0	0	0	0	3	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
12	3	10.0	Greg Bugbee	41.50094	-72.39945	7/11/2012	1.0	Sand		0	0	0	0	0	0	0	0	0	0	0	0	4	0	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0
12	4	20.0	Greg Bugbee	41.50103	-72.39939	7/11/2012	1.5	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0
12	5	30.0	Greg Bugbee	41.50112	-72.39947	7/11/2012	1.9	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2	2	0	0
12	6	40.0	Greg Bugbee	41.50125	-72.3994	7/11/2012	2.0	Muck		0	3	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0
12	7	50.0	Greg Bugbee	41.50133	-72.39941	7/11/2012	2.1	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0
12	8	60.0	Greg Bugbee	41.5014	-72.39939	7/11/2012	2.1	Silt		2	3	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	2	0	0	0	0	2	2	0	0
12	9	70.0	Greg Bugbee	41.50152	-72.39946	7/11/2012	2.1	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	2	0	2	0	0
12	10	80.0	Greg Bugbee	41.50164	-72.39939	7/11/2012	2.2	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	2	0	0
13	1	0.5	Greg Bugbee	41.50218	-72.3945	7/16/2012	0.2	Muck		2	2	0	0	0	0	0	0	0	0	0	4	0	0	3	0	0	0	0	0	0	0	0	0	2	0	0	0	0
13	2	5.0	Greg Bugbee	41.50216	-72.39447	7/16/2012	0.5	Muck		2	0	2	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	2	2	0	0	0
13	3	10.0	Greg Bugbee	41.50211	-72.39443	7/16/2012	1.0	Muck		2	2	0	0	0	0	0	0	0	0	0	2	0	0	3	0	0	0	0	0	0	0	0	0	2	0	0	0	2
13	4	20.0	Greg Bugbee	41.50203	-72.39436	7/16/2012	1.2	Muck		3	2	0	0	0	0	0	0	0	0	0	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
13	5	30.0	Greg Bugbee	41.50199	-72.3942	7/16/2012	1.0	Muck		3	2	0	0	0	0	0	0	0	0	0	2	2	3	2	0	0	0	0	0	0	0	0	2	0	0	0	0	2
13	6	40.0	Greg Bugbee	41.50193	-72.39416	7/16/2012	1.0	Muck		5	2	0	0	0	0	0	0	0	0	0	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
13	7	50.0	Greg Bugbee	41.50189	-72.39404	7/16/2012	1.5	Muck		0	4	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0
13	8	60.0	Greg Bugbee	41.50174	-72.39408	7/16/2012	1.5	Muck		0	4	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
13	9	70.0	Greg Bugbee	41.5017	-72.39396	7/16/2012	1.8	Muck		0	4	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
13	10	80.0	Greg Bugbee	41.50165	-72.39388	7/16/2012	1.8	Muck		0	4	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0
14	1	0.5	Greg Bugbee	41.49945	-72.38593	7/16/2012	0.5	Muck	Floating Islands	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	2	5.0	Greg Bugbee	41.49948	-72.38598	7/16/2012	1.0	Muck		2	0	0	0	0	0	2	0	0	0	0	0	2	0	3	0	0	0	0	0	0	0	0	0	2	0	2	0	0
14	3	10.0	Greg Bugbee	41.49949	-72.38603	7/16/2012	1.0	Muck		2	0	0	0	0	0	2	0	0	0	0	0	4	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	4	20.0	Greg Bugbee	41.49953	-72.38612	7/16/2012	1.0	Muck		4	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	5	30.0	Greg Bugbee	41.49954	-72.38627	7/16/2012	1.2	Muck		3	3	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0
14	6	40.0	Greg Bugbee	41.49963	-72.38637	7/16/2012	1.5	Muck		2	4	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	7	50.0	Greg Bugbee	41.49967	-72.38646	7/16/2012	2.0	Muck	Floating Islands	2	2	0	0	0	0	0	0	0	0	0	0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	8	60.0	Greg Bugbee	41.4997	-72.38657	7/16/2012	2.0	Muck		2	2	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	9	70.0	Greg Bugbee	41.49977	-72.38667	7/16/2012	2.0	Muck	Floating Islands	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
14	10	80.0	Greg Bugbee	41.49977	-72.38681	7/16/2012	2.0	Muck		3	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0

Appendix Upper Moodus Reservoir Transect Data (5 of 6)

Transect	Point	Distance From Shore (m)	Surveyor	Latitude	Longitude	Date	Depth (m)	Substrate	Notes	*Brasenia schreberi*	*Cabomba caroliniana*	*Callitriche species*	*Ceratophyllum demersum*	*Ceratophyllum echinatum*	*Elatine minima*	*Eleocharis species*	*Eriocaulon aquaticum*	*Gratiola aurea*	*Isoetes species*	*Lemna minor*	*Ludwigia species*	*Myriophyllum heterophyllum*	*Nuphar variegata*	*Nymphaea odorata*	*Pontederia cordata*	*Potamogeton amplifolius*	*Potamogeton bicupulatus*	*Potamogeton crispus*	*Potamogeton epihydrus*	*Potamogeton pulcher*	*Potamogeton pusillus*	*Potamogeton robbinsii*	*Sagittaria species*	*Sparganium species*	*Utricularia gibba*	*Utricularia macrorhiza*	*Utricularia purpurea*	*Utricularia radiata*	*Vallisneria americana*	*Wolffia species*
15	1	0.5	Greg Bugbee	41.50281	-72.39503	7/16/2012	0.3	Muck		2	2	0	0	0	0	3	0	0	0	0	3	0	0	2	0	0	2	1	0	0	0	0	0	2	0	1	0	0	0	0
15	2	5.0	Greg Bugbee	41.50284	-72.39508	7/16/2012	0.8	Muck		0	2	0	0	0	0	0	0	0	0	0	2	4	2	3	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
15	3	10.0	Greg Bugbee	41.50286	-72.39512	7/16/2012	1.0	Muck		2	2	0	0	0	0	0	0	0	0	0	2	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
15	4	20.0	Greg Bugbee	41.50285	-72.39528	7/16/2012	2.0	Muck		2	4	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	5	30.0	Greg Bugbee	41.50288	-72.39539	7/16/2012	1.5	Muck		0	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0
15	6	40.0	Greg Bugbee	41.50286	-72.39551	7/16/2012	2.0	Muck		0	3	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	7	50.0	Greg Bugbee	41.50284	-72.39562	7/16/2012	2.0	Muck		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0
15	8	60.0	Greg Bugbee	41.50286	-72.39575	7/16/2012	2.0	Muck		0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
15	9	70.0	Greg Bugbee	41.50284	-72.39587	7/16/2012	2.0	Muck		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	2	0	0	0
15	10	80.0	Greg Bugbee	41.50282	-72.39603	7/16/2012	2.5	Muck		0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	1	0.5	Greg Bugbee	41.50515	-72.39887	7/16/2012	0.3	Sand		0	2	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	2	0	0	0
16	2	5.0	Greg Bugbee	41.50515	-72.39892	7/16/2012	1.0	Sand		0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	2	0	0	0
16	3	10.0	Greg Bugbee	41.5052	-72.39899	7/16/2012	1.5	Sand		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	3	0
16	4	20.0	Greg Bugbee	41.50523	-72.39909	7/16/2012	2.2	Silt		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	4	0	0	0	0	0	0	0
16	5	30.0	Greg Bugbee	41.5053	-72.39921	7/16/2012	2.5	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
16	6	40.0	Greg Bugbee	41.50527	-72.39933	7/16/2012	2.5	Silt		0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
16	7	50.0	Greg Bugbee	41.5052	-72.39947	7/16/2012	2.5	Silt		0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
16	8	60.0	Greg Bugbee	41.50521	-72.39958	7/16/2012	2.5	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0
16	9	70.0	Greg Bugbee	41.50526	-72.3997	7/16/2012	2.5	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0
16	10	80.0	Greg Bugbee	41.50524	-72.39984	7/16/2012	2.8	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	1	0.5	Greg Bugbee	41.50645	-72.4039	7/16/2012	0.3	Sand		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	2	5.0	Greg Bugbee	41.50645	-72.40384	7/16/2012	1.3	Sand		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	3	10.0	Greg Bugbee	41.50645	-72.40379	7/16/2012	1.8	Sand		0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	4	0.0	Greg Bugbee	41.50639	-72.40367	7/16/2012	2.0	Silt		0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
17	5	30.0	Greg Bugbee	41.50648	-72.40353	7/16/2012	2.3	Silt		0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0
17	6	40.0	Greg Bugbee	41.50642	-72.40344	7/16/2012	2.3	Silt		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
17	7	50.0	Greg Bugbee	41.5064	-72.40333	7/16/2012	2.3	Silt		0	3	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
17	8	60.0	Greg Bugbee	41.50641	-72.40318	7/16/2012	2.5	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0
17	9	70.0	Greg Bugbee	41.50637	-72.40306	7/16/2012	2.5	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	10	80.0	Greg Bugbee	41.50637	-72.40292	7/16/2012	2.5	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	1	0.5	Greg Bugbee	41.50677	-72.40488	7/16/2012	0.3	Gravel		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	2	5.0	Greg Bugbee	41.50681	-72.40491	7/16/2012	1.0	Gravel		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	3	10.0	Greg Bugbee	41.50685	-72.40493	7/16/2012	1.6	Sand		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
18	4	20.0	Greg Bugbee	41.50689	-72.40507	7/16/2012	1.8	Silt		0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
18	5	30.0	Greg Bugbee	41.5069	-72.40518	7/16/2012	2.5	Silt		0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0

Appendix Upper Moodus Reservoir Transect Data (6 of 6)

Transect	Point	Distance From Shore (m)	Surveyor	Latitude	Longitude	Date	Depth (m)	Substrate	Notes	*Brasenia schreberi*	*Cabomba caroliniana*	*Callitriche species*	*Ceratophyllum demersum*	*Ceratophyllum echinatum*	*Elatine minima*	*Eleocharis species*	*Eriocaulon aquaticum*	*Gratiola aurea*	*Isoetes species*	*Lemna minor*	*Ludwigia species*	*Myriophyllum heterophyllum*	*Nuphar variegata*	*Nymphaea odorata*	*Pontederia cordata*	*Potamogeton amplifolius*	*Potamogeton bicupulatus*	*Potamogeton crispus*	*Potamogeton epihydrus*	*Potamogeton pulcher*	*Potamogeton pusillus*	*Potamogeton robbinsii*	*Sagittaria species*	*Sparganium species*	*Utricularia gibba*	*Utricularia macrorhiza*	*Utricularia purpurea*	*Utricularia radiata*	*Vallisneria americana*	*Wolffia species*
18	6	40.0	Greg Bugbee	41.50703	-72.40518	7/16/2012	2.3	Silt		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
18	7	50.0	Greg Bugbee	41.5071	-72.40528	7/16/2012	2.5	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	8	60.0	Greg Bugbee	41.50722	-72.4053	7/16/2012	2.5	Silt		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	9	70.0	Greg Bugbee	41.50712	-72.40559	7/16/2012	2.5	Silt		0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0
18	10	80.0	Greg Bugbee	41.50711	-72.40574	7/16/2012	2.5	Silt		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0