SOLITUDE
LAKE MANAGEMENT

Mountain Lake

2016 Aquatic Vegetation Survey Report

Liberty Township, NJ

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Aquatic Vegetation Survey Report 2016
Mountain Lake

Mountain Lake, located in Liberty, New Jersey is a 117 surface acre lake with a maximum depth of 38 feet and an average depth of approximately 20 feet. Approximately one third of the basin is less than 12 feet deep, which is considered the littoral zone. The littoral zone is the region of the lake bottom that routinely receives light penetration, and thus can support aquatic vegetation growth. SŌLitude Lake Management has been providing lake management services to The Mountain Lake Community Association for several years. In 2016, the Mountain Lake Community Association and the Water Advisory Group was seeking a repeatable scientific study of the submersed aquatic plant community to establish baseline data and complement the existing Lake Management Plan.

On September 26th, Solitude Lake Management conducted a detailed GPS-referenced Point Intercept aquatic plant mapping survey at Mountain Lake. Two biologists spent nearly six hours on the water logging 85 GPS-referenced stations and conducted weed rake tosses at each station. This report includes highlights of the aquatic vegetation survey procedures, a discussion of the results and information on the aquatic plants documented this season. Along with a compendium of maps, recommendations for the continual stewardship of Mountain Lake are included in this report.

Aquatic Macrophyte Summary

Procedures

In 2016, 85 sample stations were surveyed throughout the littoral zone of Mountain Lake. The sample locations are depicted on maps in the Appendix of this report. The survey boat was piloted to the first sample station, and GPS coordinates were recorded using a Trimble GeoXH 2008 series (sub-foot accuracy following post processing) handheld GPS unit. The water depth was measured, using a boat mounted depth finder, a handheld depth gun (HawkEye digital sonar system, or equivalent), or a calibrated metal pole, as appropriate to the conditions. The water depth was recorded on a field log, and is depicted on the water depth maps in the Appendix of this report. Please note that our field depth measurements were only conducted in

the littoral zone of the lake, and thus are not suitable to determine an overall average depth for the entire basin. Also note that our boat-mounted depth finder malfunctioned about halfway through the survey (sample station 46). Since we did not have a calibrated pole with us, the remaining water depths were estimated. Any other pertinent field notes regarding the sample location were also recorded on a field log.

The total number of sample locations is typically based on the total acreage of the lake. As a rule of thumb, one sample location per acre (minimum 50 sample locations) is surveyed. If the lake is over 100 acres in size, the number of sample locations is generally reduced to about 100, which is the reasonable effort conducted in one day. Since every lake is different, the survey can focus on problematic locations according to the client's instructions. It should also be noted that deeper water areas (total depth greater than 15 feet) are generally not surveyed due to the lack of aquatic macrophyte growth determined by poor light penetration. Vegetation growth is effected by a number of factors including water clarity and time of the year. Water clarity is often better early in the season allowing for plant growth in deeper areas of the basin, but as water clarity decreases vegetation in deeper areas is often limited due to lack of light penetration. Before the survey began, random sample stations were plotted on a grid overlay map of the lake focusing on the littoral areas to use as a guide in navigation.

Next, a weed rake attached to a 10-meter-long piece of rope is tossed from a random side of the boat. It is important to toss the weed rake the full 10 meters (a loop at the end of the rope is attached to the boat to prevent losing the rake). The weed rake is slowly retrieved along the bottom, and carefully hoisted into the boat. This survey was conducted utilizing one rake toss per site. To determine the overall submersed vegetation amount, the weed mass is assigned one of five densities, based on semi-quantitative metrics developed by Cornell University (Lord, et al, 2005). These densities are: **No Plants** (empty rake), **Trace** (one or two stems per rake, or the amount that can be held between two fingers), **Sparse** (three to 10 stems, but lightly covering the rake, or about a handful), **Medium** (more than 10 stems, and covering all the tines of the rake), or **Dense** (entire rake full of stems, and one has trouble getting the mass into the boat). See the Appendix of this report for pictures of these representative densities. These densities are abbreviated in the field notes as 0, T, S, M, and D. Next the submersed weed mass is sorted by genus (or species if possible) and one of the five densities (as described above) is assigned to each genus and/or species. Finally, overall floating macrophyte density within a 10-meter diameter of the survey boat is assigned a density, as well as an estimated density for each separate genus (or species) observed. This data is recorded in the field notes. This procedure is then repeated for the remaining sample points.

A sample of each different macrophyte is collected and placed in a bottle or Ziploc bag with a letter or number code (A, B, 1, 2, etc.). If possible, these samples included both submersed and floating leaves (if any), seeds, and flowers (if present), to facilitate identification. These bottles are placed in a cooler stocked with blue-ice packs or ice, and returned to Solitude Lake Management's lab for positive identification and photographing. Regionally appropriate taxonomic keys are used to identify the aquatic macrophytes (a list of references is included in the Appendix) to the lowest practical taxa, typically to species.

The weed rake used for aquatic macrophyte surveys has a specific design. It is constructed with two 13.5-inch wide metal garden rakes attached back to back with several hose clamps. The wooden handles are removed and a 10-meter-long nylon rope is attached to the rake heads.

Aquatic Macrophyte Results Summary

At Mountain Lake during the 2016 survey, 85 sites were assessed to determine the abundance and distribution of submersed and floating vegetation. Over the past several years "spot" treatment herbicide applications of aquatic plants has been conducted to control nuisance growth of invasive species. It is our hope that this survey can be used by the client to direct future aquatic macrophyte management efforts.

Table 1: 2016 Summary of Aquatic Macrophyte Percent Occurrence at Mountain Lake

Aquatic Macrophyte	Scientific Name	Type	Total Percent Abundance (%)
Eurasian Water Milfoil	*Myriophyllum spicatum*	**S**	75.3%
White Water Lily	*Nymphaea odorata*	**F**	76.4%
Coontail	*Ceratophyllum demersum*	**S**	45.8%
Illinois Pondweed	*Potamogeton illinoensis*	**S**	33.0%
Muskgrass	*Chara sp.*	**A**	31.8%
Benthic Filamentous Algae		**A**	20.0%
Watershield	*Brasenia schreberi*	**F**	13.0%
Bassweed	*Potamogeton amplifolius*	**S**	10.6%
Southern Naiad	*Najas guadalupensis*	**S**	10.6%
Creeping Bladderwort	*Utricularia gibba*	**S**	9.4%
Spatterdock	*Nuphar variegata*	**F**	8.2%
Brittle Naiad	*Najas minor*	**S**	5.9%
Floating Filamentous Algae		**A**	4.7%
Small Duckweed	*Lemna minor*	**F**	2.4%
Pondweed Species	*Potamogeton spp.*	**S**	1.2%
Leafy Pondweed	*Potamogeton foliosus*	**S**	1.2%
Quillwort	*Isoetes spp.*	**S**	1.2%

Table 1, above is a summary of the aquatic macrophyte species collected/observed during the 2016 survey. The Type column is a quick classification macrophyte. Abbreviations are as follows: **A-Algae, E-Emergent, S-Submersed, F-Floating leaf or Free Floating.** Entries in red indicate an invasive species. In the Appendix of this report are a total of 21 maps representing the distribution and abundance of the aquatic macrophyte (plant) species observed (plus filamentous algae), the sample points utilized, and water depth at each sample station.

Submersed aquatic macrophytes were collected at all 71 (or 84%) of the sites surveyed. Most sites were observed at nuisance densities. At 21 (or 30%) of the sites, medium abundances of

macrophytes were collected, and 22 (or 31%) of the sites were considered dense growth. Therefore, 61% of the littoral zone sites supported what we would consider to be nuisance submersed aquatic vegetation abundance. Only 11 sites (or 15%) supported trace density macrophytes, while 17 sites (or 24%) were considered to be sparse abundance. Submersed aquatic macrophytes occurred throughout the entire littoral zone. Reduced abundance was generally observed in areas of deeper water, and sites that supported increased floating-leaf abundance. This is typical for most lakes, as light penetration restricts established aquatic plant growth in deeper water, and increased floating-leaf aquatic plant coverage (i.e. water lilies) tends to restrict submersed aquatic plant growth. In general, the heaviest submersed macrophyte sites occurred mostly throughout the southern end of lake and along the main shorelines. On the date of the survey, the region was in a prolonged dry period, and water levels were down at least 1 foot from full pool level. This prevented us from accessing a few interior shoreline sites, especially in the southern part of the basin. A brief description of each observed aquatic plant is provided in Appendix B of this report.

Aquatic Macrophyte Summary Findings

Fifteen different submersed aquatic plant species (plus filamentous algae) were observed throughout Mountain Lake in 2016. Increased species richness was observed throughout the majority of the shallow basin. The most abundant submerged aquatic macrophyte species was the invasive Eurasian water milfoil. It was observed at 64 (or 75%) of the sites surveyed. Two other invasive species, southern naiad (see below for additional information on the range of this species) and brittle naiad, were also observed. Southern naiad was observed at 11% of the surveyed sites, while brittle naiad was observed at 6% of the sites. Figure 1 shows the percent abundance distribution of invasive aquatic plant species.

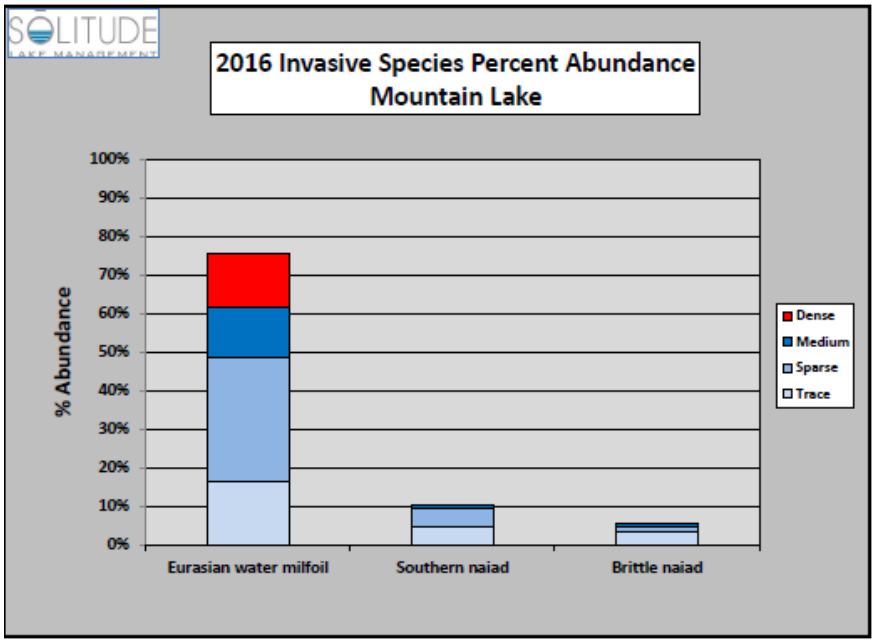


Figure 1. Mountain Lake 2016 Percent Abundance of Invasive Aquatic Macrophyte Species.

Eurasian water milfoil was the dominant aquatic macrophyte collected in 2016, and been the target of control throughout the basin. Eurasian water milfoil occurred at 64 (or 75%) of the sites surveyed. Most of the Eurasian water milfoil was observed at nuisance level (medium or dense) densities; 19% of the sites that had Eurasian water milfoil were observed at dense abundances and 17% of the sites contained medium abundances. At 27 sites (or 42%) we observed sparse Eurasian water milfoil, while at 14 sites (or 22%) we observed trace abundances. The majority of the Eurasian water milfoil was observed along all shorelines of Mountain Lake. As shown in the picture is a typical bed of Eurasian water milfoil observed at Mountain Lake.

Coontail can survive in low light conditions and it can over winter as a green plant under the ice. Its leaves appear in a whorl, similar to the tail of a raccoon, therefore the giving it its name "coontail". This species was observed at 39 (or 46%) of the sites at various abundances. The majority of the sites were at trace (17, or 44%) or sparse (six, or 15%) densities. Medium and dense abundances of coontail were observed at eight (or 21%) of the surveyed sites. respectively. Therefore, 42% of the coontail sites were considered nuisance density. Coontail was located from the northern end of the lake and continued along the western shoreline to the southern end. The southern end of the basin contained the majority of the dense abundances of coontail.

Illinois pondweed is a native New Jersey plant species considered endangered that carries a state ranking of S1 (critically imperiled due to extreme rarity). It tends to grow in shallow water up to depths of 3 meters, and prefers water with high clarity. The identification of this pondweed was confirmed with seed examination, swollen seed stalk structure and the number of veins present on the submerged leaves. Illinois pondweed was observed at 28 (or 33%) of the sites surveyed at Mountain Lake in 2016. Trace abundances occurred at 11 sites (39%), while 13 sites (46%) were observed at sparse abundance. Medium abundance Illinois pondweed was observed at four sites (14%). Illinois pondweed was absent from the shallow, southern cove, and instead seemed to prefer the eastern shoreline and continued up north. Others sites were also observed along the northern part of the western shoreline.

Muskgrass is actually a macroscopic algae, but since it occupies a similar ecological niche as submersed aquatic macrophytes, it is considered during Point Intercept surveys. Muskgrass was observed at 27 (or 32%) of the sites surveyed. Trace densities were observed at four sites (15%). Sparse amounts of muskgrass were observed at 15 sites (56%). Medium abundance

muskgrass was present at six sites (or 22%), whereas only two sites (7%) contained dense amounts of muskgrass. The muskgrass was fairly consistent along the eastern shoreline towards the northern end of the lake. Its presence was further observed scattered along the western shoreline.

Benthic filamentous algae occurred at various abundances throughout Mountain Lake. It was often covering other submersed plants, but mats were also observed growing on the bottom of the lake in locations. It was collected at 17 (or 20%) of the surveyed sites in 2016. The majority of the sites were at trace (six, or 35%) or sparse (eight, or 47%) density. Nuisance levels of benthic filamentous algae were observed at three sites (18%) at medium abundance. Most of the benthic filamentous algae was observed scattered along most of the shorelines throughout the lake.

Bassweed is a highly desirable native pondweed that provides excellent fish habitat. Bassweed was observed at only nine (or 11%) of the sites surveyed in 2016. Sparse and medium abundances were observed at two (22%) sites each. Meanwhile, five (56%) sites were observed with trace densities. Areas containing bassweed were scattered at both the southern and northern ends of the basin. Medium and sparse sites were observed near the boat launch and beach area.

Southern naiad was one of two naiads collected during our survey. It was present at nine (or 11%) of the sites surveyed. Trace and sparse densities were observed at four sites each (44%). Medium abundance southern naiad was observed at one site (11%). Areas containing southern naiad were observed scattered along the northeastern shoreline. Its presence was also observed scattered along the western shoreline.

The free floating creeping bladderwort can be easily overlooked during a survey due to its fine, delicate stems. It was observed at eight (or 9%) of the total sites surveyed, but typically at reduced densities. Trace amounts were observed at six sites (75%) and sparse abundances was observed at two sites (25%). Creeping bladderwort was observed along the western shoreline, beginning at the launch and extending into the southern end of the lake. It's likely there is much more creeping bladderwort present at the southern end of the lake, but boat movement was restricted by the reduced water levels and abundance surface water lily growth.

Brittle naiad is the second naiad species we collected, although slightly less common than southern naiad. Brittle naiad is considered an invasive species. Brittle naiad was observed at five sites (6%) at low abundances throughout the lake. Trace abundances of brittle naiad were observed at three sites (60%), while sparse and medium abundances were observed at one site (20%) each. Brittle naiad was restricted to the eastern shoreline and one site was observed at northern end of the lake.

Leafy pondweed is a fine-leaved pondweed that is commonly found in the Northeast. One trace site contained leafy pondweed, although it lacked seeds to positively identify it to species.

Instead, leaf structures were used to identify it, although there is some uncertainty. The single trace site was observed along the northeastern shoreline.

Another thin-leaved pondweed species was collected (and labeled as Pondweed sp.), but due to a lack of distinguishing characteristics we were unable to identify it to species. We are confident (based on stem and leaf morphology) that this specimen is not leafy pondweed, and could be either small pondweed (P. pusillus) or perhaps waterthread pondweed (P. diversifolius). The pondweed species was observed at one site (1%) at trace abundances along the eastern shoreline.

Quillwort was observed at one trace site (or 1%) located along the northwestern shoreline. The quillwort could not be identified to species. To identify quillworts to species, one needs to dissect the base of the plant and examine spores microscopically. This was performed in our laboratory, but we could not recover any viable spores.

Mountain Lake supports a well-established population of floating-leaf macrophytes (which includes water lily species and duckweeds). Floating-leaf macrophytes were observed at 67 (or 79%) of the sites surveyed in 2016. At 20 (or 30%) of the sites floating-leaf macrophytes were considered trace density, while 15 (or 22%) of the sites were considered sparse. Medium abundance sites were observed at 14 (or 21%) of the sites, while dense sites accounted for an additional 18 (or 27%) of the sites surveyed. Therefore, floating-leaf macrophytes were at nuisance abundance at 58% of the sites that contained them. Floating-leaf macrophytes occurred along the shorelines throughout the lake. The heaviest areas were the southern coves of the basin, although other isolated areas, such as the northeastern shoreline and scattered concentrated areas were also observed. Figure 3 shows the distribution of floating vegetation below by species.

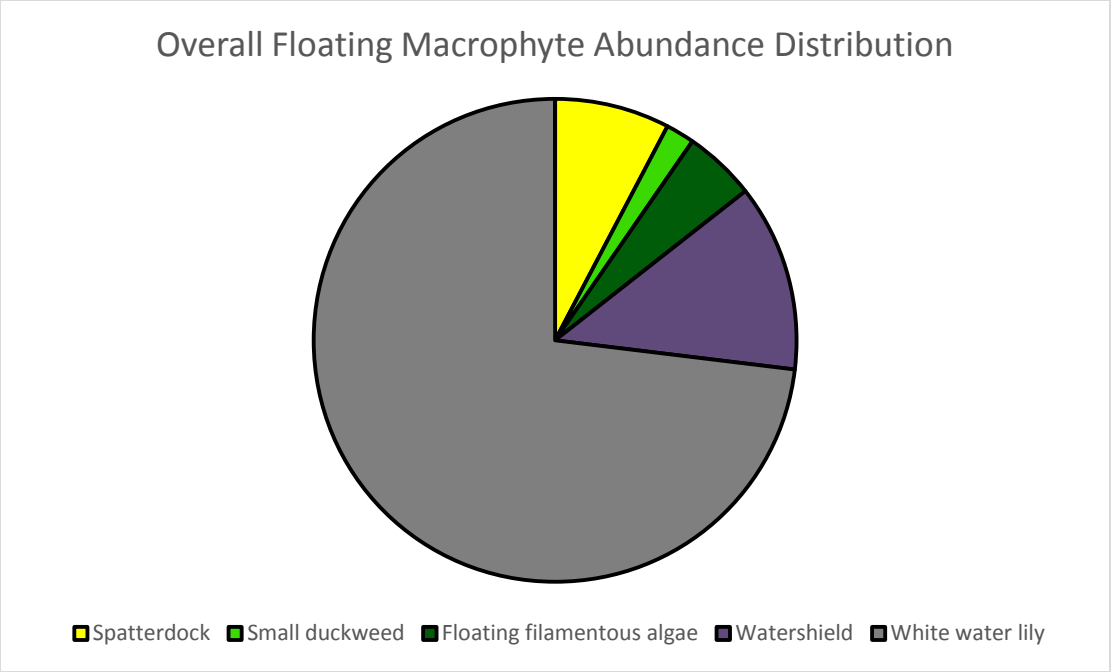


Figure 3. 2016 Abundance Distribution of floating macrophytes at Mountain Lake.

By far, white water lilies were the most common floating leaf macrophyte we observed in 2016. White water lilies occurred at 65 (or 76%) of the sites surveyed. At 21 sites (or 32%) white water lilies were considered trace, while 15 sites (or 23%) were considered sparse abundance. Medium sites accounted for 17% (or 11 sites), while dense sites accounted for 28% of the sites. White lilies occurred throughout much of the basin along the main shorelines, but generally were elevated in abundance located at southern end of the lake. Lighter, non nuisance densities of white lilies occurred along the east and west shorelines of the lake.

Watershield was the second most common water lily we collected, and but was observed at only 11 (or 13%) of the sites surveyed. Mostly occurring at non nuisance levels, watershield was observed at four sites (36%) at trace densities, and sparse abundances were observed at six sites (or 55%). Medium abundance watershield was observed at one site (9%). The majority of the watershield was located along the eastern shoreline near the Lodge Restaurant. Additional areas with watershield were observed at the northern end of the lake.

Spatterdock (often referred to as yellow lily) occurred at Mountain Lake at seven (or 8%) of the sites surveyed. Most sites (six, or 86%) were considered sparse abundance, with one additional site (or 14%) which was observed at trace abundance. The distribution of spatterdock was limited to the southern end of the basin mixed in with the white lilies.

Floating filamentous algae was observed at four sites (or 5%) overall. Mostly occurring in sparse densities (three, or 75%) located at the northern end of the lake and along the western shoreline. One site was observed at medium abundance (or 25%) located at the northern end of the basin.

Small duckweed was observed along the western shoreline of the lake. Small duckweed occurred at two (2%) of the sites surveyed. One site (50%) was observed at trace density, while the other site (50%) was observed at sparse abundance. It's likely that more duckweed (maybe even additional species) occurs at Mountain Lake, but it was difficult to assess some of the interior locations in the southern part of the basin due to reduced water level and heavy water lily coverage. It's likely the duckweed in this basin is not at nuisance abundances.

Summary of Findings

- A GPS logged Point Intercept survey of the littoral zone of Mountain Lake was conducted on September 26, 2016.
- The invasive species Eurasian water milfoil is the dominant submersed species we collected. It occurred at 64 (or 75%) of the sites surveyed, with 23 sites being considered nuisance abundance. This is despite recent (limited) herbicide use in this basin targeting this species.
- White water lily was the dominant floating leaf species. It occurred at 65 (or 76%) of the sites surveyed, with 29 sites (or 45%) of them being considered nuisance abundance.
- Coontail was the second most dominant submersed plant we collected, occurring at 46% of the sites.
- Illinois pondweed is considered endangered in New Jersey, with a state rank of S1. Illinois pondweed was collected at 33% of the sites we surveyed in 2016.
- Two species of naiads were collected. One naiad species is considered invasive.

Recommendations

Mountain Lake has two aquatic macrophytes that should be the target for control efforts. These include the invasive submersed Eurasian water milfoil, and the native (but at nuisance abundance in many locations) white water lily. Both of these species have been managed previous at this site, but based on our detailed 2016 survey there is room for improvement in the management of these plants for the benefit of all the residents at Mountain Lake. Two other factors should be considered before conducting aquatic plant management at this site. This includes the health of the fishery, and the presence of Illinois pondweed, which is considered protected in New Jersey.

In the past, limited use of contact herbicides have been employed to control Eurasian water milfoil. The results of these treatments have been less than ideal, as our survey revealed that Eurasian water milfoil is by far still the dominant submersed aquatic plant, and occurs

throughout much of the littoral zone, save for shallow areas with very heavy water lily coverage. We recommend continuing the herbicide treatment program for Eurasian water milfoil, since it fits the current budget, and is generally accepted by the Association and the residents. But there is certainly room for improvement through increased target acreage, potential product alterations, and an increase in visual lake surveys (to a monthly program) to decrease response time. We understand that these are radical changes to the lake management program at this site and will require strong Association leadership and an increase in budget.

White water lilies have been controlled on a limited scale with the use of herbicides. At this time, the southern portion of the lake is all but unusable for recreation with a prop boat. Although an increase in herbicide use here is certainly an option, the benefits of mechanical removal of water lily biomass (see below) should be considered. At the very least, the Association should consider opening up paths through the water lilies to allow the residents that live in the southern cove more of an opportunity to utilize the recreational capacity of the water body.

Increased management of nuisance aquatic plants could result in a significant loss of fish habitat at Mountain Lake. Depending on the priority for a balanced fishery, additional management techniques such as a water quality monitoring program, a fishery population study, and/or artificial habitat enhancements might be a required component for this overall program.

In addition, protecting the Illinois pondweed located in the basin should be considered regardless of the other aquatic plant management performed. Examination of the Illinois pondweed distribution map reveals this protected species prefers the eastern and northwestern shorelines, and not the southern coves (which support much of the nuisance target plants). Using the GPS-referenced data collected during this survey, we will be able to design control areas to minimize the impacts to Illinois pondweed. It is even possible that increased target plant management in the southern coves would create additional suitable Illinois pondweed habitat and thus it would increase its distribution.

The Association should strongly consider the mechanical removal of water lily biomass and unconsolidated organic debris in the southern coves of the basin. This would be accomplished by a hydro-rake, a floating paddlewheel vessel with a York rake attachment suitable to pull water lilies (and the extensive rhizome systems) out of the lake. This is a costly management technique that would likely require several years effort to realize management goals. At the very least, the hydro-rake could be used to open up boat paths from the southern cove

shoreline to the open water for the benefit of the residents in that area. A suitable disposal site (and transportation) for the organic material needs to be considered when contemplating this program.

We understand that the Mountain Lake Community Association is currently considering such alterations to the methods used to responsibly manage the delicate ecological resource that is Mountain Lake. We believe funding this detailed aquatic plant survey is the first step in undertaking these changes. SŌLitude Lake Management would be willing to attend an Association meeting in the future to expand on these recommendations, the results of this survey, and answer any general lake management questions applicable to the stewardship of Mountain Lake. SŌLitude Lake Management genuinely appreciates the opportunity to assist in the lake management efforts at Mountain Lake and looks forward to being of service for the 2017 season.

Appendix A

Eurasian Water Milfoil (*Myriophyllum spicatum*. Common Names: Asian Water milfoil. **Aggressive, Exotic, Invasive**.): Eurasian water milfoil has long (2 meters or more) spaghetti-like stems that grow from submerged rhizomes. The stems often branch repeatedly at the water's surface creating a canopy that can crowd out other vegetation, and obstruct recreation and navigation. The leaves are arranged in whorls of 4 to 5, and spread out along the stem. The leaves are divided like a feather, resembling the bones on a fish spine. Eurasian water milfoil is an exotic originating in Europe and Asia, but its range now includes most of the United States. It's ability to grow in cool water and at low light conditions gives it an early season advantage over other native submersed plants. In addition to reproducing via fruit production, it can also reproduce via fragmentation. Waterfowl graze on Eurasian water milfoil, and its vegetation provides habitat for invertebrates. However, studies have determined mixed beds of pondweeds and wild celery can support more diverse invertebrate populations

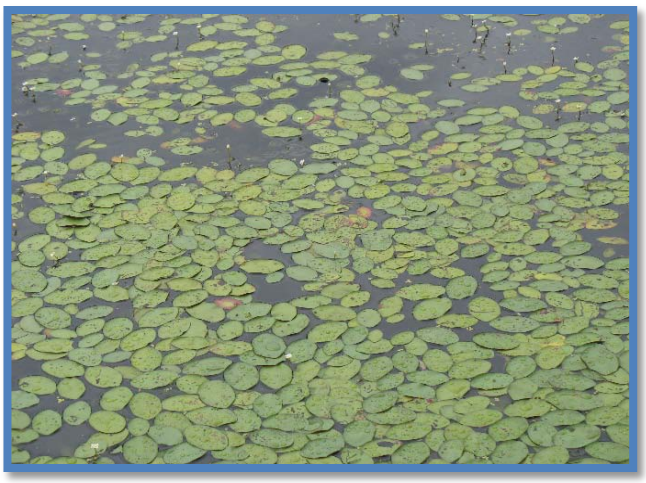
Coontail (*Ceratophyllum demersum*. Common Names: coontail, hornwort. **Native**.): Coontail has long trailing stems that lack true roots, although it can become loosely anchored to sediment by modified leaves. The leaves are stiff, and arranged in whorls of 5-12 at each node. Each leaf is forked once or twice, and has teeth along the margins. The whorls of leaves are spaced closer at the end of the stem, creating a raccoon tail appearance. Coontail is tolerant of low light conditions, and since it is not rooted, it can drift into different depth zones. Coontail can also tolerate cool water and can over winter as a green plant under the ice. Typically, it reproduces via fragmentation. Bushy stems of

coontail provide valuable habitat for invertebrates and fish (especially during winter), and the leaves are grazed on by waterfowl.

White Water Lily (*Nymphaea* sp. Common Name: white water lily, fragrant water lily. **Native**.): White water lily leaf stalks emerge directly from a submerged fleshy rhizome. White water lilies have round floating leaves. Flowering occurs during the summer, and the flowers open during the day, and close during the night. Water lilies typically inhabit quiet water less than two meters deep, such as ponds, shallow lakes and slow-moving streams. The leaves offer shade and protection for fish, and the leaves, stems, and flowers are grazed upon by muskrats, beaver, and sometimes even deer.

Spatterdock (*Nuphar variegata*. Common Name: yellow lily, yellow pond lily, bullhead pond lily. **Native.**): Spatterdock leaf stalks emergedirectly from a submerged fleshy rhizome. The leaf stalk has a winged margin, which is a distinguishing characteristic. Spatterdock has heart-shaped leaves with a prominent notch. Flowers are globular in shape with five to six yellow sepals. Flowering occurs in the summer and the flowers open during the day and close at night. Water lilies typically inhabit quiet water less than two meters deep, such as ponds, shallow lakes and slow-moving streams. The leaves offer shade and protection for fish, and the leaves, stems, and flowers are grazed upon by muskrats, beaver, and sometimes, even deer.

Watershield (*Brasenia schreberi*. Common Names: common water shield, water target. **Native**.): Watershield is a floating-leaf aquatic plant similar to water lilies. Its stem and leaves are elastic, and are attached to a rooted rhizome that acts as an anchor and source of stored nutrients. The leaf stalks are attached to the middle of the leaf, creating a bull's eye effect, hence its name water target. The leaves are green on the upper surface, and purple underneath. Maroon to purple flowers peak above the water's surface on short, stout stalks. Watershield is usually coated with a clear gelatinous slime on the stem and underside of the leaves. Watershield prefers soft-water lakes and ponds in sediments containing decomposing organic matter. The whole plant is consumed by waterfowl, and the floating leaves provide shade and cover for fish.



Benthic and Floating Filamentous Algae: Filamentous algae is a chain or series of similar algae cells arranged in an end to end manner. Benthic filamentous algae is attached to a hard substrate, such as logs, rocks, a lake bottom, or even other aquatic plants. When growing in heavy densities, benthic filamentous algae can appear as brown or green mats of vegetation that can reach the surface. When large pieces break off the bottom substrate they become floating filamentous algae patches. Benthic filamentous algae can comprise an entire range of morphologies, but flagellated taxa are far less common.

Creeping Bladderwort (*Utricularia gibba*. Common Names: creeping bladderwort, humped bladderwort, cone-spur bladderwort. **Native**.). Creeping bladderwort is a small (usually less than 10 cm long), delicate, free-floating stem. It often forms tangled mats in quiet shallow waters, often associated with bogs, or stranded on soil. It is sometimes mistaken for algae. It has short side braches that fork once or twice, a defining characteristic. Small bladders, used to capture live prey, are situated on these

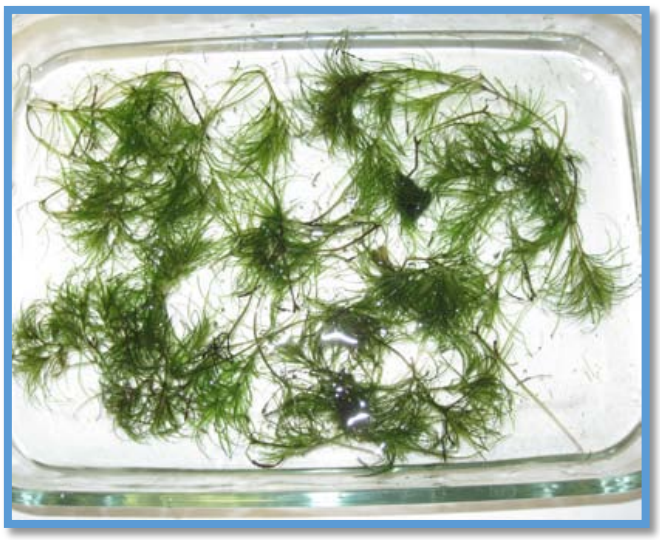
side branches. Small yellow snap-dragon-like flowers are produce on a short stalk. Mats of creeping bladderwort offer limited cover and foraging opportunities for fish.

Leafy Pondweed (*Potamogeton foliosus*: Common Name: leafy pondweed. **Native**.): Leafy pondweed has freely branched stems that hold slender submersed leaves that become slightly more narrow as they approach the stem. The leaf contains 3-5 veins and often tapers to a point. No floating leaves are produced. It produces early season fruits in tight clusters on short stalks in the leaf axils. These early season fruits are often the first grazed upon by waterfowl during the season. Muskrat, beaver, deer and even moose also graze on the fruit. It inhabits a wide range of habitats, but usually prefers shallow water. It has a high tolerance for eutrophic conditions, allowing it to even colonize secondary water treatment ponds.

Small Duckweed (*Lemna minor.* Common Names: Small duckweed, water lentil, lesser duckweed. **Native.**). Small duckweed is a free floating plant, with round to oval-shaped leaf bodies typically referred to as fronds. The fronds are small (typically less than 0.5 cm in diameter), and it can occur in large densities that can create a dense mat on the water's surface. Each frond contains three faint nerves, a single root (a characteristic used to distinguish it from other duckweeds), and no stem. Although it can produce flowers, it usually reproduces via budding at a tremendous rate. Its population can double in three to five days. Since it is free floating, it drifts with the wind or water current, and is often found intermixed with other duckweeds. Since it's not attached to the sediment, it derives nutrients directly from the water, and is often associated with eutrophic conditions. It over winters by producing turions late in the season. Small duckweed is extremely nutritious and can provide up to 90% of the dietary needs for waterfowl. It's also consumed by muskrat, beaver and fish, and dense mats of duckweed can actually inhibit mosquito breeding.

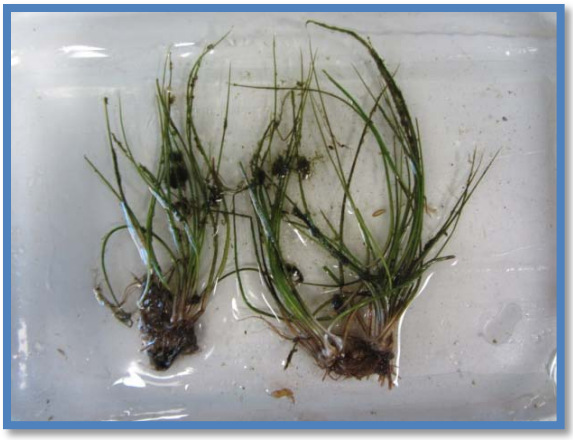
Bass Weed (*Potamogeton amplifolius*. Common Names: Large-leaf Pondweed, Bass Weed, Musky Weed. **Native.**): Bass weed has robust stems that originate from black-scaled rhizomes. The submersed leaves of bass weed are among the broadest in the region. The submersed leaves are arched and slightly folded, attached to stems via stalks, and possess many (25-37 veins). Floating leaves are produced on long stalks (8-30 cm). Stipules are large, free and taper to a sharp point. Flowers, and later in the season fruit are densely packed onto a spike. Bass weed prefers soft sediments in water one to 4 meters deep. This plant is sensitive to increased turbidity and also has difficulty recovering from top-cutting, from such devices as boat propellers and aquatic plant harvesters. As its name implies the broad leaves of this submersed plant provides abundant shade, shelter and foraging opportunities for fish. The high number of nutlets produced per plant makes it an excellent waterfowl food source.

Brittle Naiad (*Najas minor*. Common Names: brittle water nymph, European naiad. **Exotic, Invasive**): Brittle naiad is a submersed annual that flowers in August to October. It resembles other naiads, except its leaves are highly toothed with 6-15 spinules on each side of the leaf, visible without the aid of magnification. The leaves are opposite, simple, thread-like, and usually lime-green in color, often with a "brittle" feel to them. Brittle naiad fruit are narrow, slightly curved, and marked with 10-18 longitudinal ribs, resembling a ladder. Brittle Naiad has been introduced from Europe in the early 1900's, and can be found in most of the northeastern states. Brittle naiad prefers sandy and gravel substrates, but can tolerate a wide range of bottom types. It's tolerant of turbid and eutrophic conditions. Waterfowl graze on the fruit.



Southern Naiad (*Najas guadalupensis*. Common Names: Southern water nymph, bushy pondweed. **Native**.): Southern naiad is an annual aquatic plant that can form dense stands of rooted vegetation. Its ribbon-like leaves are dark-green to greenish-purple, and are wider and less pointed than slender naiad. Flowers occur at the base of the leaves, but are so small; they usually require magnification to detect. Southern naiad is widely distributed, but is less common than slender naiad in northern zones. Southern naiad reproduces by seeds and fragmentation.

Lake Quillwort (*Isoetes lacustris*, = *I. macrospora*. Common Name: Quillwort. **Native**.): Lake quillwort leaves grow from a fleshly, lobed underground stem adorned with forked roots. The green, often firm, leaves are arranged in a rosette, radiating from the base of the plant. Each leaf has a central vein and four longitudinal air chambers visible in cross-section. Spores form inside sacks located on the spoon-like bases of the leaves. Examining the megaspores is required to positively identify quillworts to species. Lake quillwort has pale unspotted spore sacks, and the megaspores have a convoluted network of ridges on their surface. Lake quillwort usually inhabits quiet lake waters ranging from a few centimeters deep to 1 to 3 meters deep. Most species of quillwort prefer low-nutrient, soft water habitats. Quillwort foliage is sometimes consumed by waterfowl.



Muskgrass (*Chara* sp. Common Names: muskgrass, stonewort, chara. **Native**.): Chara is actually a multi-branched algae that appears as a higher plant. It is simple in structure and has rhizoids instead of true roots. The branches of chara have ridges that are often encrusted with calcium carbonate. This grants the entire plant a “crusty” feel and appearance. The side branches develop in whorls that look like the spoke in a wheel. Chara is easily identified by a pungent, skunky odor. It prefers softer sediments, and can often be found in deeper water than other

plants. As such, it's considered an early pioneer, the first species to colonize a disturbed lakebed.

Illinois Pondweed (*Potamogeton illinoesis*. Common Name: Illinois pondweed. **Native**.). Illinois pondweed has stout stems up to 2 meters long that emerge from thick rhizomes. The submerged leaves are lance-shaped with a needlelike point, attached directly to the stem or on a short stalk. The stipules are free, and have two prominent ridges called keels. Sometimes ellipse shaped floating leaves are produced on a thick stalk usually shorter than the blade. Flower and fruit are arranged in a tight cylindrical spike on a stalk thicker than the stem. It tends to grow inshallow water up to depths of 3 meters, and prefers water with high clarity. Illinois pondweed fruit is valuable as waterfowl food, and the large leaves create suitable shade and cover for many fish and invertebrates.

APPENDIX B

2016 Mountain Lake Aquatic Plant Distribution Chart
2016 Mountain Lake Aquatic Plant Data Tables
2016 Mountain Lake Aquatic Plant Map Compendium

Mountain Lake
Aquatic Macrophyte Abundance Distribution
September 26, 2016

	Total		Trace		Sparse		Medium		Dense	
	Sites	%	Sites	%	Sites	%	Sites	%	Sites	%
Total Sites	85									
Total Submersed Vegetation	71	84%	11	15%	17	24%	21	30%	22	31%
Eurasian Water Milfoil	64	75%	14	22%	27	42%	11	17%	12	19%
Coontail	39	46%	17	44%	6	15%	8	21%	8	21%
Illinois Pondweed	28	33%	11	39%	13	46%	4	14%	0	0%
Muskgrass	27	32%	4	15%	15	56%	6	22%	2	7%
Benthic Filamentous Algae	17	20%	6	35%	8	47%	3	18%	0	0%
Bassweed	9	11%	5	56%	2	22%	2	22%	0	0%
Southern Naiad	9	11%	4	44%	4	44%	1	11%	0	0%
Creeping Bladderwort	8	9%	6	75%	2	25%	0	0%	0	0%
Brittle Naiad	5	6%	3	60%	1	20%	1	20%	0	0%
Pondweed Species	1	1%	1	100%	0	0%	0	0%	0	0%
Leafy Pondweed	1	1%	1	100%	0	0%	0	0%	0	0%
Quillwort	1	1%	1	100%	0	0%	0	0%	0	0%
Total Floating Vegetation	67	79%	20	30%	15	22%	14	21%	18	27%
White Water Lily	65	76%	21	32%	15	23%	11	17%	18	28%
Watershield	11	13%	4	36%	6	55%	1	9%	0	0%
Spatterdock	7	8%	1	14%	6	86%	0	0%	0	0%
Floating Filamentous Algae	4	5%	0	0%	3	75%	1	25%	0	0%
Small Duckweed	2	2%	1	50%	1	50%	0	0%	0	0%

Mountain Lake
Aquatic Vegetation Survey
September 26, 2016

	Latitude (NAD83)	Longitude (NAD83)	Water Depth (ft)	Total Submersed Vegetation	Total Floating Vegetation	Bass Weed	Benthic Filamentous Algae	Brittle Naiad	Coontail	Creeping Bladderwort	Eurasian Water Milfoil	Floating Filamentous Algae	Illinois Pondweed	Leafy Pondweed	Muskgrass	Pondweed Species	Quillwort	Small Duckweed	Southern Naiad	Spatterdock	Watershield	White Water Lily
1	40.859482°	-74.986893°	5.4	D		S			S		D											
2	40.858946°	-74.987205°	2	D	T	M			T		M											T
3	40.858559°	-74.987544°	2	D	S	T			S		D				S							S
4	40.858271°	-74.987838°	1.5	S	M	T			T	T	S											M
5	40.857916°	-74.987559°	6	M					S		M											
6	40.857761°	-74.987923°	1.5	D	D				M		D											D
7	40.858043°	-74.988439°	1.5		D																	D
8	40.857709°	-74.988812°	1.5		D																	D
9	40.856743°	-74.98919°	1.5		D																	D
10	40.857312°	-74.988219°	1.5	S	D		S			S	T											D
11	40.856991°	-74.98863°	1	T	S		M				T				T			S				S
12	40.857369°	-74.987521°	7	D					M		D											
13	40.856762°	-74.9875°	3	D	M						T				D							M
14	40.856496°	-74.986925°	5	D					D		D											
15	40.856074°	-74.987313°	4	M	S	T			S		S				M				S	T		S
16	40.85643°	-74.987918°	1		D																	D
17	40.85676°	-74.988367°	1		D																	D
18	40.856447°	-74.988749°	0.5		D																	D
19	40.856122°	-74.988327°	0.5		D																	D
20	40.855823°	-74.987067°	5	D	S						D											S
21	40.855145°	-74.986991°	5	D	M				D		S				S							M
22	40.855584°	-74.986571°	1		D																	D
23	40.854891°	-74.987411°	14	T			T															
24	40.854855°	-74.986482°	10	D					D		S											
25	40.855307°	-74.986209°	10	T			T															
26	40.854553°	-74.987001°	1		D																	D
27	40.854789°	-74.985814°	12.5	M					M		T											
28	40.854427°	-74.986035°	8	D	S				D		S											S
29	40.854243°	-74.986561°	1.5		S																	S
30	40.853888°	-74.986987°	1.5		S															S		S
31	40.854578°	-74.985222°	7	D	M		M		D		S											M
32	40.854138°	-74.985726°	1.5	S	D				T	S	T									S		D
33	40.853939°	-74.986147°	1																			
34	40.853584°	-74.986565°	1	T	D					T										S		D
35	40.853328°	-74.986035°	1	T	D					T										S		D
36	40.853615°	-74.985689°	1		M																	M
37	40.853936°	-74.985289°	1		M																	M
38	40.854248°	-74.984915°	1	T	D					T										S		D
39	40.853297°	-74.985249°	1	T	D					T										S		D
40	40.854869°	-74.984933°	5.5	D	M				D		S											M
41	40.85548°	-74.984523°	1.5	D	T		M		T		D				S							T
42	40.85585°	-74.984321°	1.5	D	S	T			D		S		T		S							S
43	40.856221°	-74.984094°	2.5	M					T		M		M		T							
44	40.856423°	-74.983681°	1.5	D	T				T		D		S		T				S			T
45	40.856607°	-74.983353°	1.5	M	M				T		S		M		S						S	S
46	40.85697°	-74.983055°	5	M	S						M										S	
47	40.857231°	-74.982681°	4.5	S	S						T		S		S							S
48	40.857473°	-74.982357°	4	M	S						S		S		M						S	T
49	40.857675°	-74.981906°	3.5	T	S			T	T		T										S	T
50	40.858063°	-74.981531°	4	S	T						T		S								T	T
51	40.858315°	-74.981283°	4	D	T						S		T		D							T
52	40.858688°	-74.98089°	4	S	T			S			S		S			T					T	T
53	40.85887°	-74.980626°	5	S	T			T			T		S		S						S	T
54	40.859211°	-74.980475°	2.5	M	M		S				M		T									M
55	40.859568°	-74.980487°	1.5	M	T						S		M		M							T
56	40.859925°	-74.980492°	2	M	T						S		M		S							T
57	40.860223°	-74.980663°	3	S							S		S		S							
58	40.860491°	-74.980957°	1.5	M							M		S		S							
59	40.860719°	-74.981279°	4	S							S		S		T							
60	40.861222°	-74.981408°	4	M	T						S		S		M				M			T
61	40.861495°	-74.981244°	3	S	T		T	T	T		T		T	T	S							T
62	40.861825°	-74.9813°	3.5	M	M	M			T		S				M				T			M

Mountain Lake
Aquatic Vegetation Survey
September 26, 2016

	Latitude (NAD83)	Longitude (NAD83)	Water Depth (ft)	Total Submersed Vegetation	Total Floating Vegetation	Bass Weed	Benthic Filamentous Algae	Brittle Naiad	Coontail	Creeping Bladderwort	Eurasian Water Milfoil	Floating Filamentous Algae	Illinois Pondweed	Leafy Pondweed	Muskgrass	Pondweed Species	Quillwort	Small Duckweed	Southern Naiad	Spatterdock	Watershield	White Water Lily
63	40.862153°	-74.981634°	4	M	T		S		M		M				S				T			T
64	40.862374°	-74.981811°	3.5	D	T				T		D		T									T
65	40.862825°	-74.982132°	4	D	T	T			M		D		S		S				T			T
66	40.862854°	-74.982513°	6	M					M		S											
67	40.863182°	-74.982415°	1.5	S	M						S		T		S							M
68	40.863014°	-74.983079°	5	D					D													
69	40.863222°	-74.983031°	1	T	D				T		T	S									T	D
70	40.863105°	-74.983686°	5.5	S			S		T		S											
71	40.863469°	-74.983571°	0.5	M	M			M	T		M	M	T								S	S
72	40.863217°	-74.984094°	1	M	M	S	S		M		S	S									T	M
73	40.862662°	-74.984549°	2	T	T						T		T									T
74	40.862409°	-74.984853°	6.5	S	S		T		T		S		T									S
75	40.862095°	-74.985241°	6	T	T						T											T
76	40.861871°	-74.985574°	7	S	T		S				S		T									T
77	40.861649°	-74.986054°	5.5	M	T				T		T		S		M				S			
78	40.861392°	-74.986363°	5	S	M						S	S	S								M	S
79	40.861022°	-74.986546°	4	M	S						M											S
80	40.860748°	-74.986829°	5.5	M	T		T		T		M						T		T			T
81	40.860429°	-74.986982°	3.5	S	S		S				S											S
82	40.860051°	-74.98704°	3	M	T		T		M		M		T		S				S			T
83	40.85976°	-74.987123°	2	D	D				S	T	D							T				D
84	40.859162°	-74.986419°	7	D			S				D											
85	40.858631°	-74.986819°	6.5	S					S		S											

Submersed Aquatic Plant Density

Trace

Medium

Sparse

Dense

SOLITUDE LAKE MANAGEMENT

Floating Aquatic Plant Density

Trace

Medium

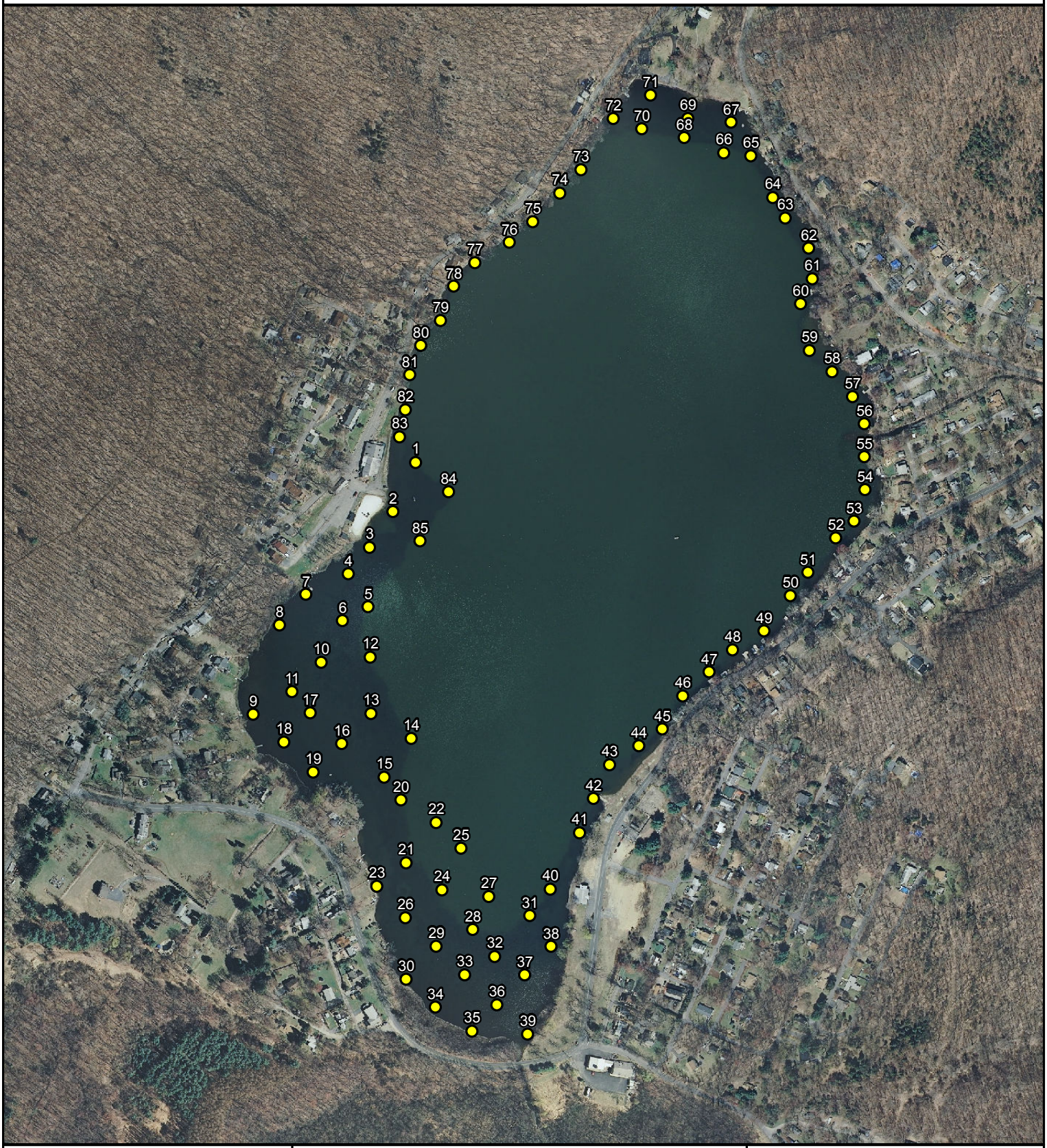
Sparse

Dense

SOLITUDE
LAKE MANAGEMENT

SAMPLE POINT LOCATION

SOLITUDE LAKE MANAGEMENT



MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

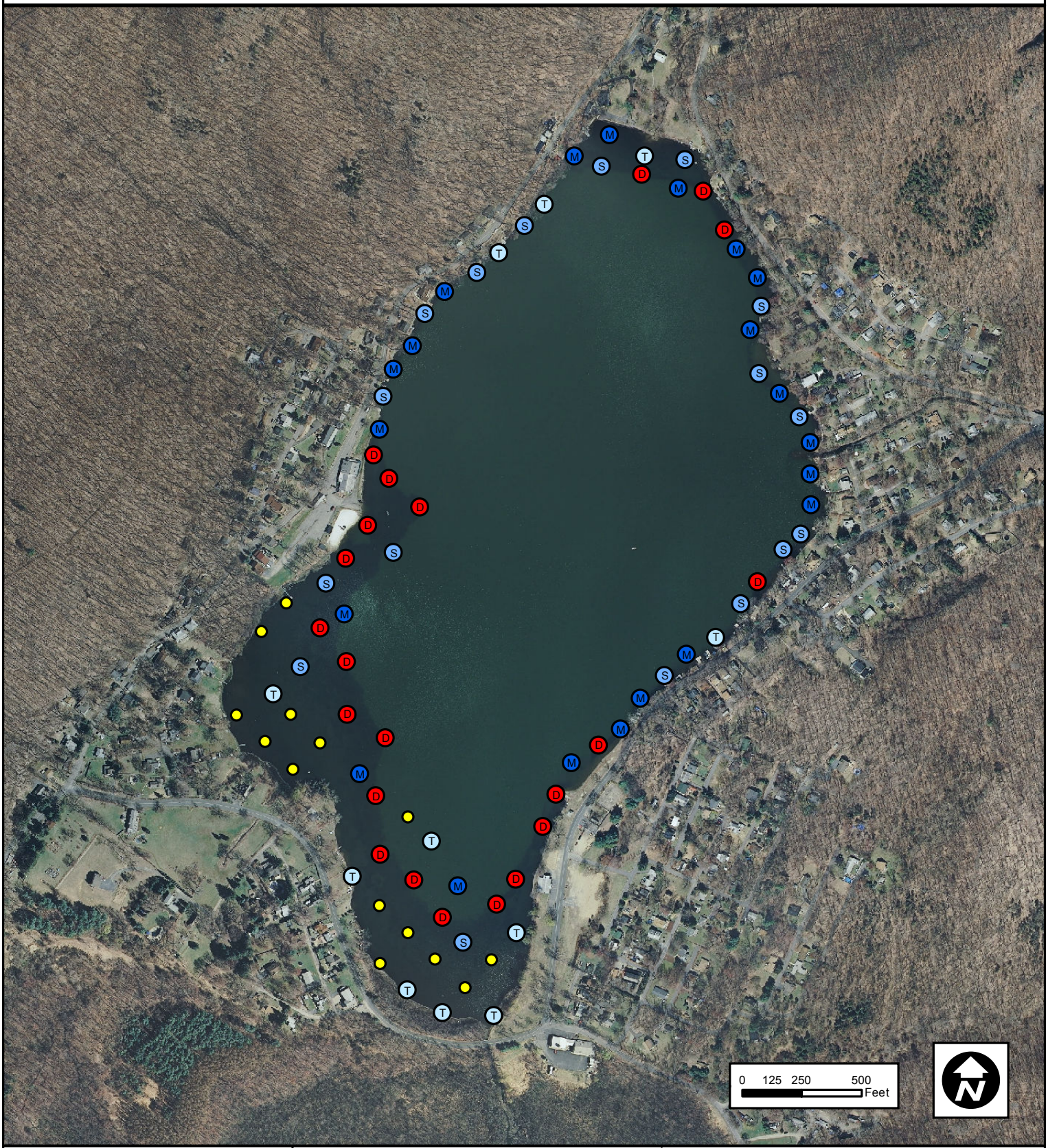
Points: 85

Sample Point

0 115 230 460
Feet

TOTAL SUBMERSED VEGETATION

SŌLITUDE LAKE MANAGEMENT



MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Plant Density

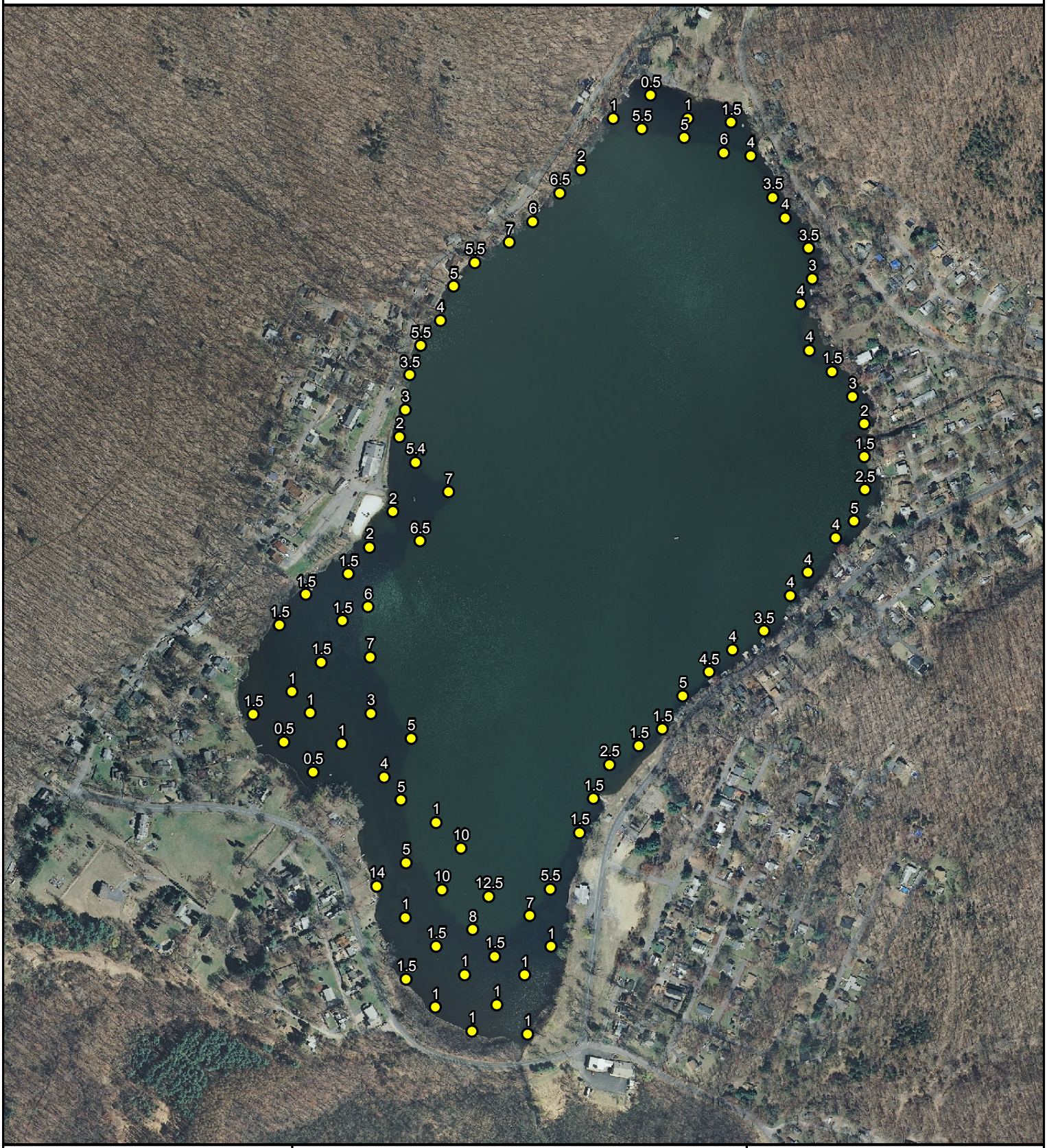
- = No Plants
- = Trace Plants
- = Sparse Plants
- = Medium Plants
- = Dense Plants

Percent Distribution

Abundance	Sites	Percent
Total	71	84%
Trace	11	15%
Sparse	17	24%
Medium	21	30%
Dense	22	31%

WATER DEPTH

SOLITUDE LAKE MANAGEMENT



MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Depth in feet

0 115 230 460
Feet

EURASIAN WATER MILFOIL (*Myriophyllum spicatum*) DISTRIBUTION

SOLITUDE LAKE MANAGEMENT

MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Plant Density

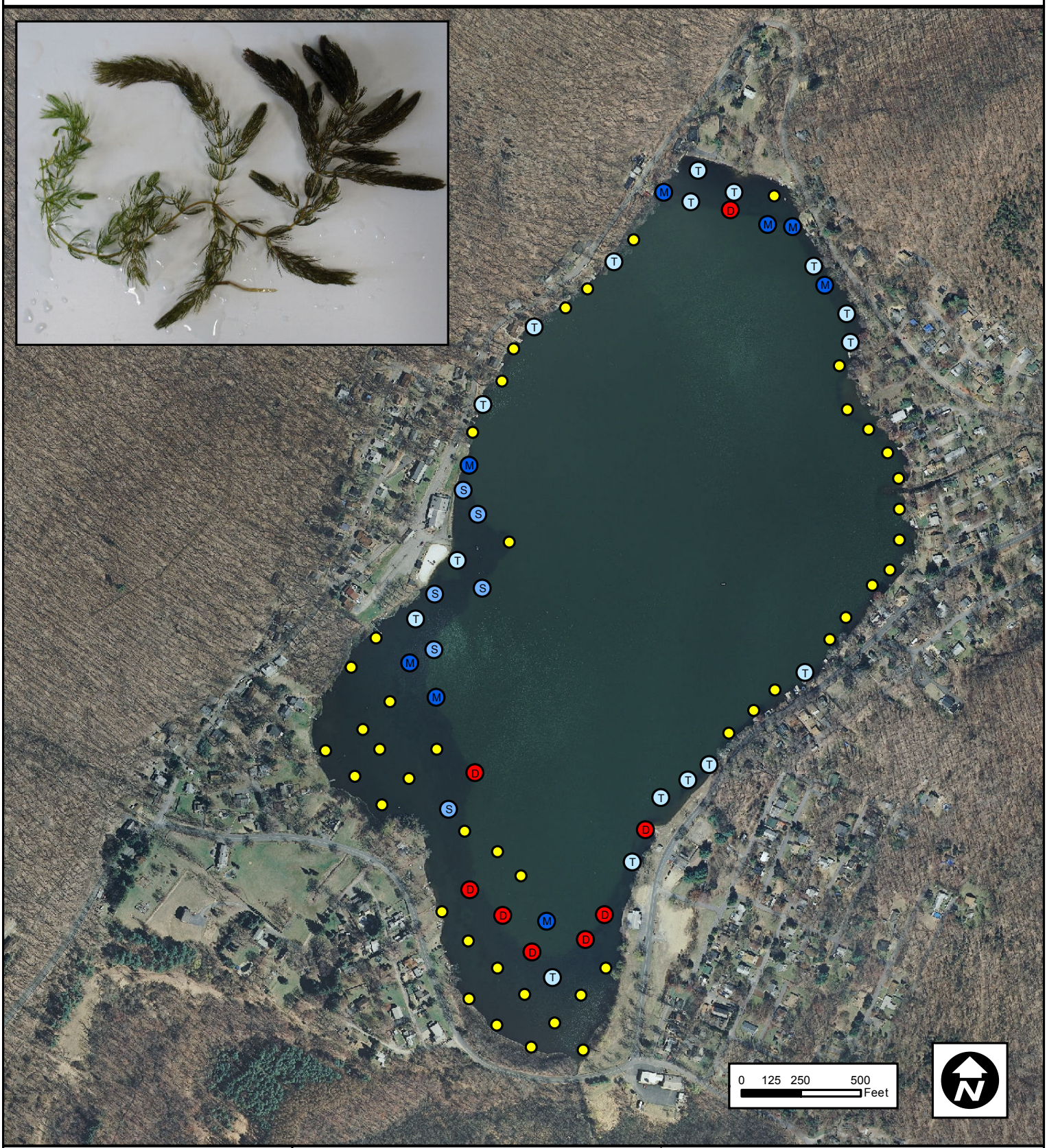
- = No Plants
- = Trace Plants
- = Sparse Plants
- = Medium Plants
- = Dense Plants

Percent Distribution

Abundance	Sites	Percent
Total	64	75%
Trace	14	22%
Sparse	27	42%
Medium	11	17%
Dense	12	19%

COONTAIL (*Ceratophyllum demersum*) DISTRIBUTION

SOLITUDE LAKE MANAGEMENT



MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Plant Density

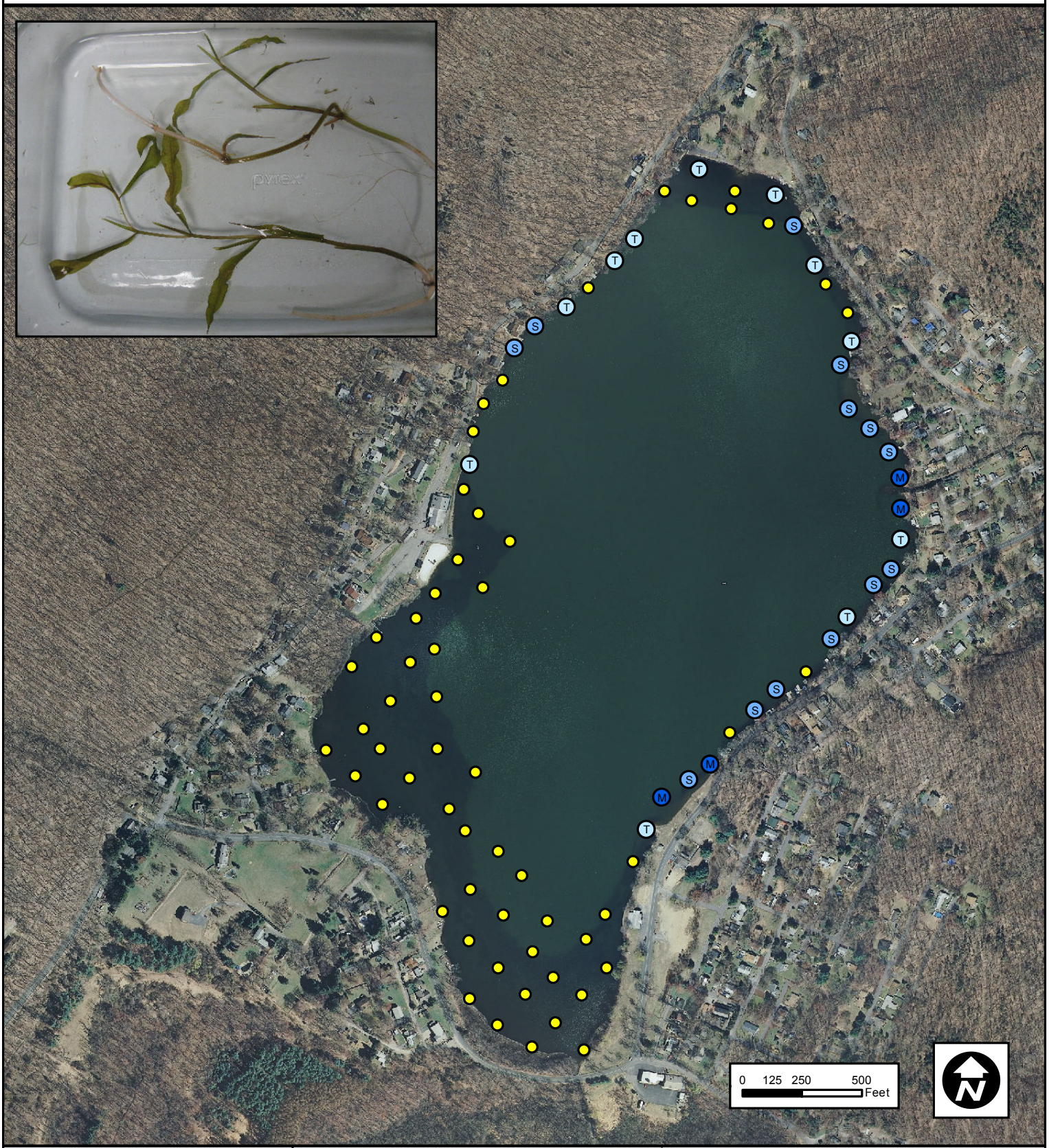
- = No Plants
- T = Trace Plants
- S = Sparse Plants
- M = Medium Plants
- D = Dense Plants

Percent Distribution

Abundance	Sites	Percent
Total	39	46%
Trace	17	44%
Sparse	6	15%
Medium	8	21%
Dense	8	21%

ILLINOIS PONDWEED (*Potamogeton illineosis*) DISTRIBUTION

SOLITUDE LAKE MANAGEMENT



MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Plant Density

- = No Plants
- = Trace Plants
- = Sparse Plants
- = Medium Plants
- = Dense Plants

Percent Distribution

Abundance	Sites	Percent
Total	28	33%
Trace	11	39%
Sparse	13	46%
Medium	4	14%
Dense	0	0%

MUSKGRASS (*Chara* sp.) DISTRIBUTION

SOLITUDE LAKE MANAGEMENT

MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Plant Density

- = No Plants
- = Trace Plants
- = Sparse Plants
- = Medium Plants
- = Dense Plants

Percent Distribution

Abundance	Sites	Percent
Total	27	32%
Trace	4	15%
Sparse	15	56%
Medium	6	22%
Dense	2	7%

BENTHIC FILAMENTOUS ALGAE DISTRIBUTION

SOLITUDE LAKE MANAGEMENT

MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Plant Density

- = No Plants
- T = Trace Plants
- S = Sparse Plants
- M = Medium Plants
- D = Dense Plants

Percent Distribution

Abundance	Sites	Percent
Total	17	20%
Trace	6	35%
Sparse	8	47%
Medium	3	18%
Dense	0	0%

BASS WEED (*Potamogeton amplifolius*) DISTRIBUTION

SOLITUDE LAKE MANAGEMENT

MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Plant Density

- = No Plants
- = Trace Plants
- = Sparse Plants
- = Medium Plants
- = Dense Plants

Percent Distribution

Abundance	Sites	Percent
Total	9	11%
Trace	5	56%
Sparse	2	22%
Medium	2	22%
Dense	0	0%

SOUTHERN NAIAD (*Najas guadalupensis*) DISTRIBUTION

SŌLITUDE LAKE MANAGEMENT

MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Plant Density

- = No Plants
- T = Trace Plants
- S = Sparse Plants
- M = Medium Plants
- D = Dense Plants

Percent Distribution

Abundance	Sites	Percent
Total	9	11%
Trace	4	44%
Sparse	4	44%
Medium	1	11%
Dense	0	0%

CREEPING BLADDERWORT (*Utricularia gibba*) DISTRIBUTION

SOLITUDE LAKE MANAGEMENT

MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Plant Density

- = No Plants
- T = Trace Plants
- S = Sparse Plants
- M = Medium Plants
- D = Dense Plants

Percent Distribution

Abundance	Sites	Percent
Total	8	9%
Trace	6	75%
Sparse	2	25%
Medium	0	0%
Dense	0	0%

BRITTLE NAIAD (*Najas minor*) DISTRIBUTION

SOLITUDE LAKE MANAGEMENT

MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Plant Density

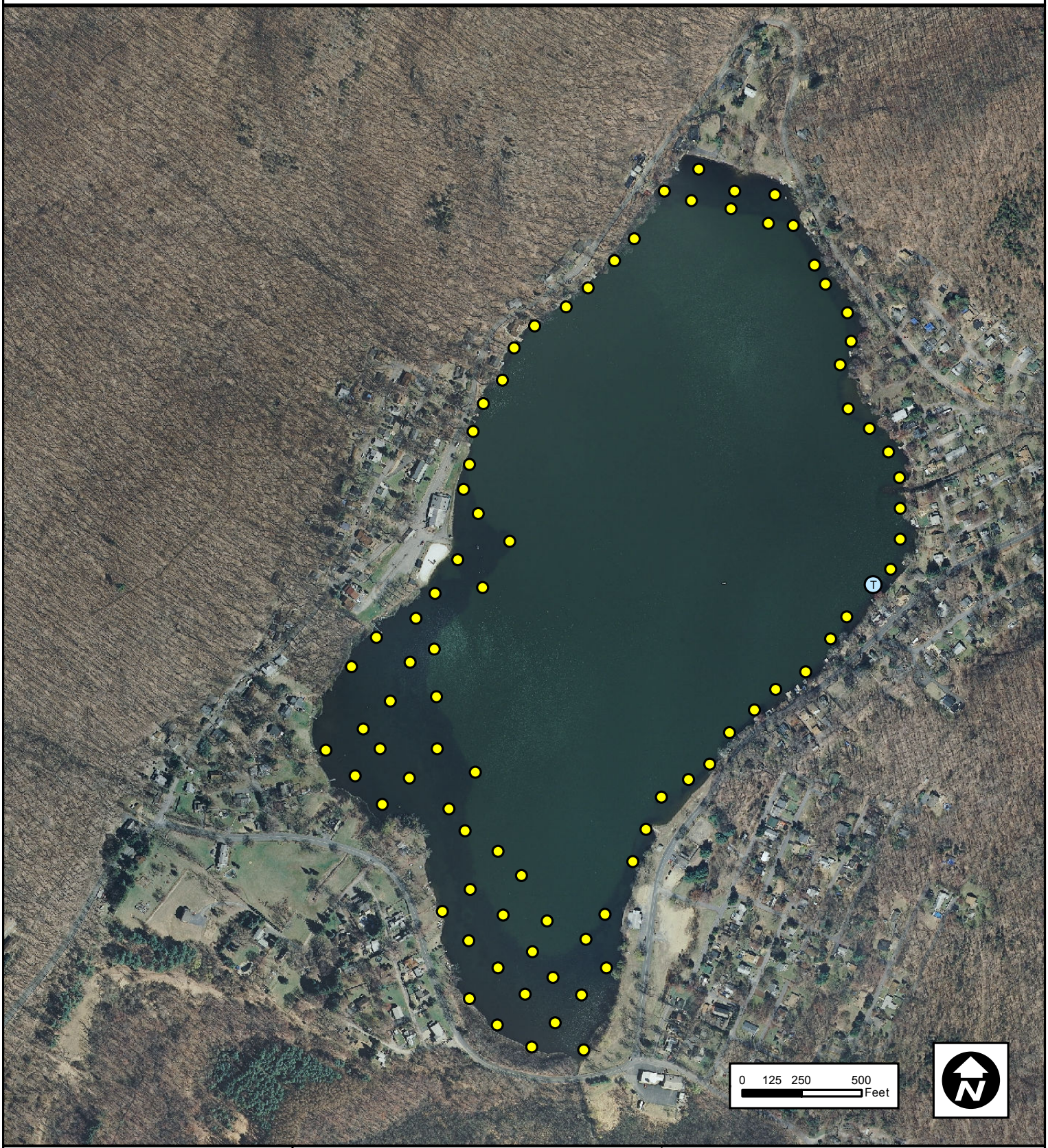
- = No Plants
- T = Trace Plants
- S = Sparse Plants
- M = Medium Plants
- D = Dense Plants

Percent Distribution

Abundance	Sites	Percent
Total	5	6%
Trace	3	60%
Sparse	1	20%
Medium	1	20%
Dense	0	0%

PONDWEED SPECIES (*Potamogeon* sp.) DISTRIBUTION

SOLITUDE LAKE MANAGEMENT



MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Plant Density

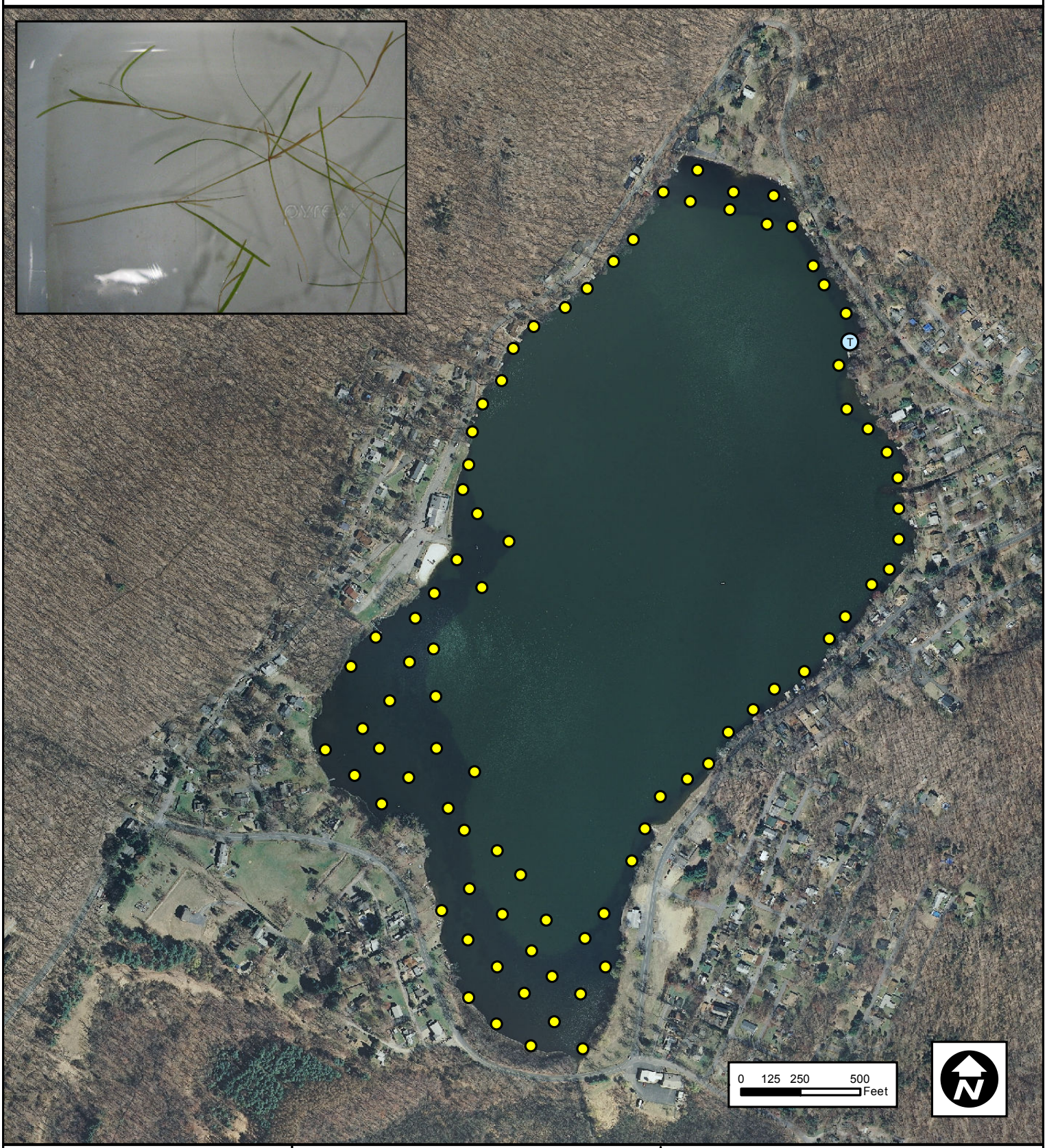
- = No Plants
- T = Trace Plants
- S = Sparse Plants
- M = Medium Plants
- D = Dense Plants

Percent Distribution

Abundance	Sites	Percent
Total	1	1%
Trace	1	100%
Sparse	0	0%
Medium	0	0%
Dense	0	0%

LEAFY PONDWEED (*Potamogeon foliosus*) DISTRIBUTION

SOLITUDE LAKE MANAGEMENT



MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Plant Density

- = No Plants
- T = Trace Plants
- S = Sparse Plants
- M = Medium Plants
- D = Dense Plants

Percent Distribution

Abundance	Sites	Percent
Total	1	1%
Trace	1	100%
Sparse	0	0%
Medium	0	0%
Dense	0	0%

QUILLWORT (*Isoetes* sp.) DISTRIBUTION

SOLITUDE LAKE MANAGEMENT

MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Plant Density

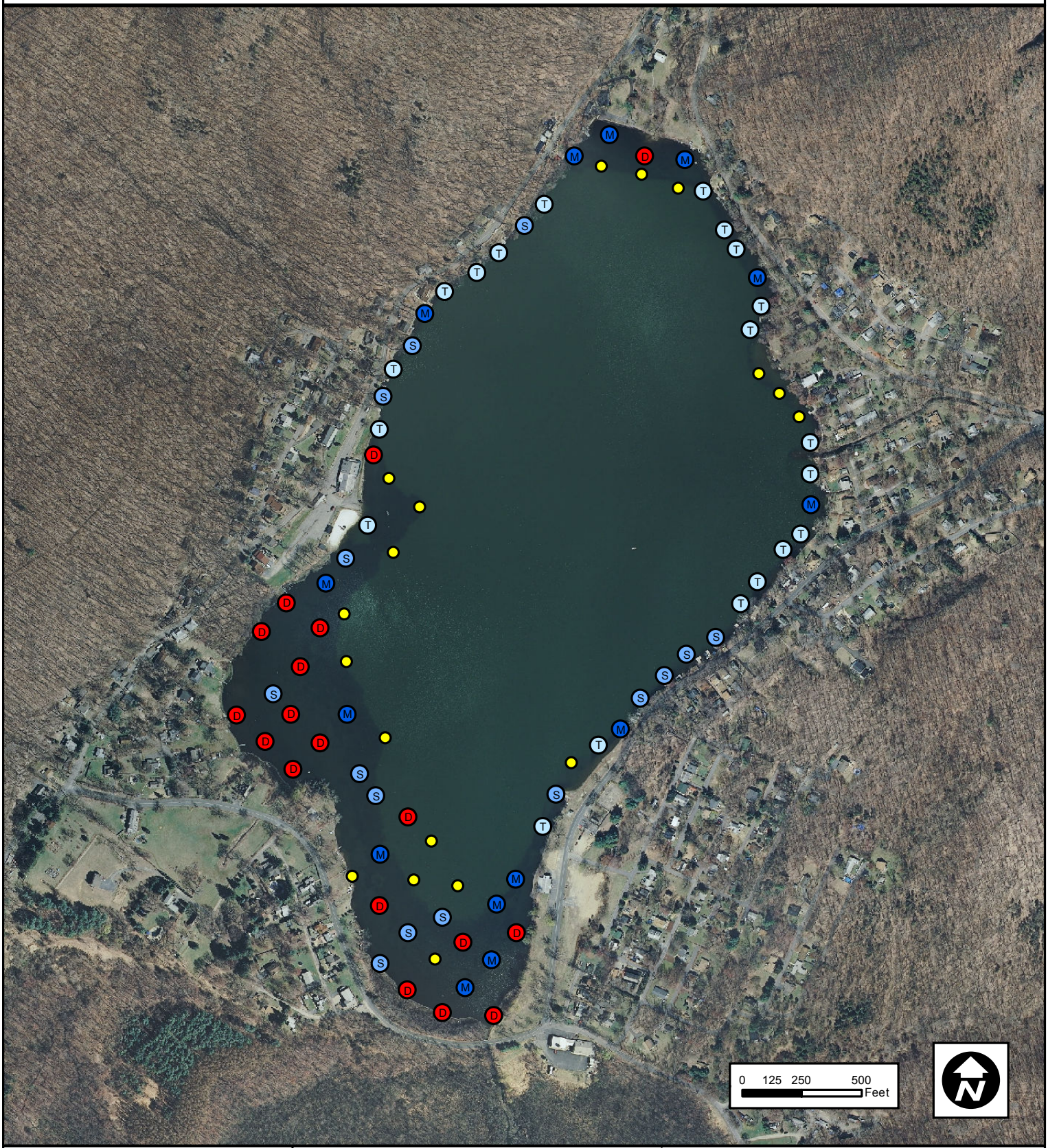
- = No Plants
- T = Trace Plants
- S = Sparse Plants
- M = Medium Plants
- D = Dense Plants

Percent Distribution

Abundance	Sites	Percent
Total	1	1%
Trace	1	100%
Sparse	0	0%
Medium	0	0%
Dense	0	0%

TOTAL FLOATING VEGETATION

SOLITUDE LAKE MANAGEMENT



MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Plant Density

- = No Plants
- = Trace Plants
- = Sparse Plants
- = Medium Plants
- = Dense Plants

Percent Distribution

Abundance	Sites	Percent
Total	67	79%
Trace	20	30%
Sparse	15	22%
Medium	14	21%
Dense	18	27%

WHITE WATER LILY (*Nymphaea odorata*) DISTRIBUTION

SOLITUDE LAKE MANAGEMENT

MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Plant Density

- = No Plants
- = Trace Plants
- = Sparse Plants
- = Medium Plants
- = Dense Plants

Percent Distribution

Abundance	Sites	Percent
Total	65	76%
Trace	21	32%
Sparse	15	23%
Medium	11	17%
Dense	18	28%

WATERSHIELD (*Brasenia schreberi*) DISTRIBUTION

SOLITUDE LAKE MANAGEMENT

MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Plant Density

- = No Plants
- T = Trace Plants
- S = Sparse Plants
- M = Medium Plants
- D = Dense Plants

Percent Distribution

Abundance	Sites	Percent
Total	11	13%
Trace	4	36%
Sparse	6	55%
Medium	1	9%
Dense	0	0%

SPATTERDOCK (*Nuphar variegata*) DISTRIBUTION

SOLITUDE LAKE MANAGEMENT

MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Plant Density

- = No Plants
- = Trace Plants
- = Sparse Plants
- = Medium Plants
- = Dense Plants

Percent Distribution

Abundance	Sites	Percent
Total	7	8%
Trace	1	14%
Sparse	6	86%
Medium	0	0%
Dense	0	0%

FLOATING FILAMENTOUS ALGAE DISTRIBUTION

SOLITUDE LAKE MANAGEMENT

MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Plant Density

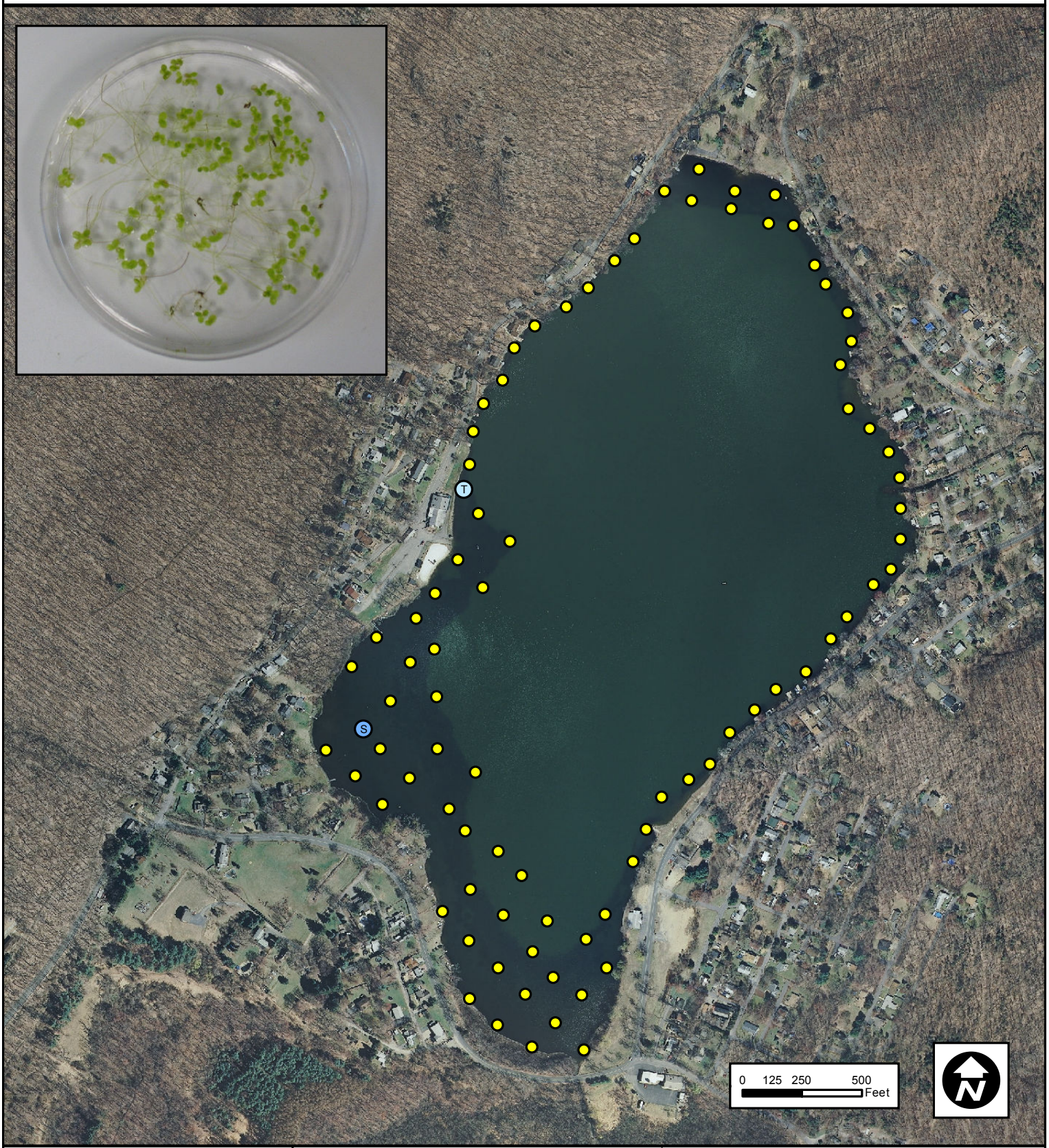
- = No Plants
- T = Trace Plants
- S = Sparse Plants
- M = Medium Plants
- D = Dense Plants

Percent Distribution

Abundance	Sites	Percent
Total	4	5%
Trace	0	0%
Sparse	3	75%
Medium	1	25%
Dense	0	0%

SMALL DUCKWEED (*Lemna minor*) DISTRIBUTION

SŌLITUDE LAKE MANAGEMENT



MOUNTAIN LAKE
Aquatic Vegetation Survey
September 26, 2016

Points: 85

Plant Density

- = No Plants
- T = Trace Plants
- S = Sparse Plants
- M = Medium Plants
- D = Dense Plants

Percent Distribution

Abundance	Sites	Percent
Total	2	2%
Trace	1	50%
Sparse	1	50%
Medium	0	0%
Dense	0	0%