Lake Oscaleta + Lake Rippowam

2024 Aquatic Macrophyte Surveys at Three Lakes

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2024 Aquatic Macrophyte Surveys at Lake Oscaleta and Lake Rippowam

The Three Lakes Council
Lewisboro, New York

Introduction

In 2008, the discovery of Brazilian elodea (*Egeria densa*) in Lake Waccabuc, rose concerns of potential infestations present in the other two waterbodies in the interconnected lake system (Lakes Oscaleta and Rippowam). In order to address these concerns, aquatic macrophyte surveys have been periodically performed at all three lakes over the past ten years. This report will include the following: aquatic macrophyte abundance, distribution, as well as a discussion. Maps from the aquatic macrophyte survey will also be included in the appendix of this report.

SŌLitude Lake Management was pleased to conduct a detailed aquatic macrophyte survey at Lake Oscaleta on August 7th and Lake Rippowam on August 12th, 2024. Two aquatic biologists utilized the Point Intercept Method (PIM) to determine the aquatic macrophyte community at Lakes Oscaleta and Lake Rippowam. This survey method was also used to identify changes to the community structures based on the previous five years of collected data.

Methodology

The Point Intercept Method (PIM) of sampling macrophytes is designed to determine the extent of submersed aquatic plant growth within an area of concern. The total number of sample locations is typically based on the total acreage of a waterbody, where one sample location per acre is surveyed at a given site. At Lake Oscaleta, 88 sites were sampled in early August while 60 sites were sampled in mid-August at Lake Rippowam. At each point, the real-time GPS coordinates of the sample location were recorded using a Trimble Geo 7X, a handheld GNSS system. Due to the characteristics of the aquatic system, visual documentation was also used to augment this survey.

The Point Intercept Methodology, developed by the US Army Corps of Engineers and modified by Cornell University, was utilized for this survey (Lord and Johnson 2006). However, the referred methodology only requires one rake toss. At Lakes Oscaleta and Rippowam **two rake tosses** were conducted at each site, as historically performed before. The tosses were conducted from opposite sides of the boat, labeled, and recorded as A and B. The following data was collected for each rake toss: overall abundance of floating and submersed macrophyte growth, relative abundance of each species, and any other pertinent field notes regarding the sample location. The abundance scale, Table 1 below, defined by this methodology was used to categorize the observed macrophyte growth for each rake toss:

Table 1: PIM Abundance Descriptions

Abundance	**Description**
Z: Zero	No plants on rake
T: Trace	Fingerful on rake
S: Sparse	Handful on rake
M: Medium	Rakeful of plants
D: Dense	Difficult to bring into boat

The overall and relative abundance values from the two rake tosses were translated into a numeric value before further data analysis: 0 for no plants, 1 for trace, 2 for sparse, 3 for medium, and 4 for dense plants. For example, if toss A was Dense (4) and toss B was Sparse (2) for the same macrophyte, the mean abundance would be Medium (4+2=6/2=3). Raw abundance data with mean calculations can be found in the Appendix.

Any macrophyte specimen requiring further identification was collected and placed in a Ziploc-type bag with a reference to the sampled location. Regionally appropriate taxonomic keys were used for identification.

Macrophyte Abundance and Discussion

Lake Oscaleta

Table 2 displays the presence of all Lake Oscaleta species from each survey year starting in 2008 and ending with 2024. The percent change from 2022 to 2024 per species is also displayed in Table 2 below. Graphs displaying the abundance and distribution from year to year for each macrophyte are in the Appendix. Maps displaying the location and abundance for each aquatic species are also located in the Appendix.

The number of survey sites that each species was recorded at are displayed in Table 2 as well. The X's in Table 2 indicate the presence of the listed species during the 2008 survey. The percent change represents whether a shift in plant abundance occurred from the previous year (2022) to the current year (2024). Change is represented in a positive (+) or negative (-) shift. No change is indicated by 0.0%.

Three invasive macrophytes were present during the 2024 survey which include Eurasian water milfoil, brittle naiad, and curly-leaf pondweed. All three invasive aquatic macrophytes found in Lake Oscaleta this year were submersed species. Throughout the five-year data set, a range of one to three invasive macrophytes have been observed.

Table 2: 2008-2024 Aquatic Plant Abundance Summary for Lake Oscaleta

Common Name	Scientific Name	2008	2016 # of Sites	2018 # of Sites	2020 # of Sites	2022 # of Sites	2024 # of Sites	% Change 2022 – 2024
Arrowhead	*Sagittaria sp.*	X	9	9	2		6	+100.0%
Bassweed	*Potamogeton amplifolius*	X	43	47	37	21	19	-9.52%
Benthic Filamentous Algae		X	16	14	8	16	19	+18.75%
Brittle Naiad	*Najas minor*		2	4	3		1	+100.0%
Cattail sp.	*Typha* sp.					1	3	+200.0%
Clasping-leaf Pondweed	*Potamogeton richardsonii*					2		-100.0%
Common Waterweed	*Elodea canadensis*	X	8	3	2	2	1	-50.0%
Coontail	*Ceratophyllum demersum*	X	41	35	21	33	21	-36.36%
Creeping Bladderwort	*Utricularia gibba*	X	30	32	19			0.0%
Curly-Leaf Pondweed	*Potamogeton crispus*			3			1	+100.0%
Eurasian Water Milfoil	*Myriophyllum spicatum*	X	66	58	59	55	58	+5.45%
Floating Bur-reed	*Sparganium fluctuans*		1	1		1	12	+1,100.0%
Floating Filamentous Algae			9	4	5	20	3	-85.0%
Leafy Pondweed	*Potamogeton foliosus*	X	5	2	2		6	+100.0%
Many-Flower Marsh Pennywort	*Hydrocotyle umbellata*						4	+100.0%
Mermaid Weed	*Proserpinaca pectinata*					1		-100.0%
Pickerelweed	*Pontederia cordata*					16	42	+162.5%
Pondweed Species	*Potamogeton sp.*			1				0.0%
Ribbon-leaf Pondweed	*Potamogeton epihydrus*	X	4	10				0.0%
Robbin's Pondweed	*Potamogeton robbinsii*	X	32	20	24	22	13	-40.91%
Sago Pondweed	*Potamogeton pectinatus*						1	+100.0%
Small Bladderwort	*Utricularia minor*					29	45	+55.17%
Small Duckweed	*Lemna minor*		6	2	2	4	3	-25.0%
Southern Naiad	*Najas guadalupensis*		1					0.0%
Spatterdock	*Nuphar variegata*	X	33	37	37	29	34	+17.24%
Spiral Fruited Pondweed	*Potamogeton spirillus*				2			0.0%
Stonewort	*Nitella sp.*	X						0.0%
Water Bulrush	*Schoenoplectus subterminalis*			2	2	4		-100.0%
Watershield	*Brasenia schreberi*	X	33	39	44	23	25	+8.69%
Water-Thread Pondweed	*Potamogeton diversifolius*		1					0.0%
White Water Lily	*Nymphaea odorata*	X	63	66	65	66	65	-1.51%
Wild Celery	*Vallisneria americana*		2	2				0.0%

Red entries indicate invasive species. Green entries indicate algal species. X = presence of species.

Comparing the data from 2022 to 2024, floating bur-reed in Lake Oscaleta increased the most with a percent change of +1,100.0%. A total of 13 other aquatic species exhibited a positive percent change in abundance. A couple new native aquatic species were observed for the first time including many-flower marsh pennywort and sago pondweed. Nine (9) aquatic macrophyte species displayed a negative percent change during the 2024 vegetation surveys.

During the 2024 Lake Oscaletta vegetation survey, submersed vegetation was collected at 74 sites or at 84% abundance in the basin. Overall, a total of 12 different submersed aquatic plants (including benthic and filamentous algae) were observed. Dense abundance of submersed macrophytes were recorded at 11 (or 15%) sites. Medium abundances were observed at 19 (or 26%) sites, while sparse amounts were present at 22 (or 30%) sites. Trace abundances of submersed plant species were also observed at 22 sites (or 30%).

The invasive aquatic plant Eurasian water milfoil was the most observed submersed species at 58 (or 66%) survey sites. This is a 5.45% increase in abundance when compared to the survey results from 2022. Dense amounts of the macrophyte were only observed at one (1, or 2%) site, while 11 (or 19%) sites were observed at medium abundance. These two amounts are considered nuisance levels of growth. Non-nuisance levels of Eurasian water milfoil were also observed. Sparse levels of abundance were present at 18 (or 31%) sites and trace abundances were observed at 28 (or 48%) sites. This invasive species was observed lining most of the basin with a few heavier densities located along the northwestern shoreline and eastern cove.

Small bladderwort was the second most abundant submersed macrophyte at Lake Oscaleta in 2024. The aquatic plant was documented at 45 (or 51%) sites with the most abundant populations located in the western inlet. When compared to the data from 2022, this is a 55.17% increase. Dense abundances were only recorded at three (3, or 7%) sampling sites, while medium abundance was supported at eight (8, or 18%) sites. Out of the recorded 45 sites, sparse abundance was observed at 10 (or 22%) survey sites. Trace amounts of small bladderwort were observed at 24 (or 53%) sites.

Coontail was the third most abundant species and was present at 21 (or 24%) of the sites surveyed. This is a 36.36% decrease when compared to the results from 2022. Only two (2, or 10%) sample stations were considered dense, while six (6, or 29%) stations supported medium densities. Sparse abundances were observed at four (4, or 19%) stations and nine (9, or 43%) sampling stations recorded trace amounts. All of the recorded coontail patches were observed within and around the western inlet cove.

Benthic filamentous algae (BFA) were observed at 19 (or 22%) survey sites in 2024, which is a 18.75% increase when compared to 2022. No dense populations of BFA were observed. However, two (2, or 11%) survey sites supported medium abundance which is still considered nuisance levels of growth. Sparse abundance was observed at four (4, or 21%) sites and trace abundances were recorded at 13 (or 68%) sites. The majority of the patches of benthic filamentous algae were recorded mostly in the western inlet while the rest were observed along the southern, northern, and eastern shorelines. Increasing densities of algae continue to be a concern in New York and the surrounding region as Northeastern summers increase in temperature.

Bassweed was observed at 19 (or 22%) sites at Lake Oscaleta in 2024, which is a 9.52% decrease when compared to 2022. The most abundant populations of this macrophyte were recorded

within the western and eastern coves with a few more patches located along the northern shoreline. Out of the sites observed, both dense and medium abundances were documented at six (6, or 32%) sampling stations. Sparse abundances only occurred at one (1, or 5%) site, while trace abundances were recorded at six (6, or 32%) sites.

Robbin's pondweed, a desirable native, was observed at 13 (or 15%) survey sites throughout the basin this year. When compared to the results from 2022, Robbin's pondweed decreased in abundance by 40.91%. Dense abundances were observed at two (2, or 15%) sites, while only one (1, or 8%) site supported medium abundance. Sparse abundances were recorded at six (6, or 46%) sampling sites and trace abundances were observed at four (4, or 31%) sites. The densest populations of Robbin's pondweed were reported in the western part of the basin, near and within the inlet. A single patch of the submersed plant was also observed along the southern shoreline and within the eastern cove.

Nine (9) floating macrophyte species were observed at Lake Oscaleta in 2024. A total of 75 (or 85%) survey sites supported floating aquatic plant growth. At nuisance levels of growth, dense abundances of floating macrophytes were present at 29 (or 39%) sites. Medium abundances were observed at 24 (or 32%) survey sites. Non-nuisance levels of floating macrophytes were observed at 19 (or 25%) sites in sparse amounts and three (3, or 4%) sites in trace amounts.

The most abundant floating aquatic plant in Lake Oscaleta in 2024, as well as the most dominant overall, was white water lily. This native species was observed at 65 (or 74%) survey sites throughout the basin, which is a 1.51% decrease when compared to 2022. The densest patches of white water lily were recorded within the entire western and eastern coves. Less abundant clusters of the floating-leaf species were documented along the entire northern shoreline and some of the southern shoreline. Dense abundances were observed at 25 (or 38%) sites, while medium abundances occurred at 23 (or 35%) survey sites. Sparse amounts were observed at 12 (or 18%) sites and trace abundances were recorded at 5 (or 8%) sites.

Pickerelweed was the second most abundant floating-leaf macrophyte recorded during the 2024 vegetation survey. This native plant was documented at 42 (or 48%) survey stations, which is a 162.5% increase when compared to 2022. Pickerelweed is a positive aquatic species to have as it provides habitat for smaller organisms and prevents shoreline erosion. The macrophyte was only observed at non-nuisance levels of abundance even though it increased in distribution. Trace amounts were reported at 39 (or 93%) of the 42 stations while sparse amounts were observed at the other three (3, or 7%). Pickerelweed was documented within the western inlet and eastern cove. Other trace patches were observed along most of the northern shoreline and half of the southern shoreline.

Spatterdock was the third most abundant floating macrophyte within Lake Oscaletta and was frequently observed among the other lily species during the 2024 survey. This floating aquatic plant occurred at 34 (or 39%) survey sites with the most abundant populations located within the western inlet and along the eastern shoreline. A few less abundant patches were also observed along the southern shoreline. When compared to the results from 2022, spatterdock increased in total abundance by 17.24%. Dense abundances were reported at ten (10, or 29%) sites and medium amounts were documented at five (5, or 15%) sites. Sparse abundances were also recorded at 15 (or 44%) sites and trace amounts were observed at four (4, or 12%) sites.

Watershield occurred at 25 (or 28%) survey sites throughout the basin in 2024, which is an 8.69% increase from 2022. The floating-leaf species was scattered along most shorelines of Lake Oscaleta with the most abundant populations located in the western half of the basin. Nuisance levels of abundance were only observed at seven (7, or 28%) sites in medium amounts. Sparse amounts were reported at 12 (or 48%) survey stations and trace abundances were documented at six (6, or 24%) stations.

Arrowhead was another lily species that was observed along the shorelines of Lake Oscaletta in 2024. Most of the recorded arrowhead patches were mapped along the southern shoreline while one patch was observed on the northern shoreline. The macrophyte was documented at six (6, or 7%) total survey sites within the basin. Arrowhead that was observed during the survey was only observed in trace amounts.

Aquatic macrophytes that were observed at 5% total abundance or less include the following: many-flower marsh pennywort (4 sites), floating filamentous algae (3 sites), small duckweed (3 sites), and cattail sp. (3 sites).

Lake Rippowam

Table 3 displays the presence of all Lake Rippowam macrophytes from each survey year starting in 2008 and ending with 2024. The percent change from 2022 to 2024 per species is also displayed below. Graphs displaying the abundance and distribution from year to year for each macrophyte are in the Appendix. Maps displaying the location and abundance for each aquatic species are also located in the Appendix as well. Only one invasive macrophyte was present during the 2024 survey which was Eurasian water milfoil.

Table 3: 2008-2024 Aquatic Plant Abundance Summary for Lake Rippowam

Common Name	Scientific Name	2008	2016 # of Sites	2018 # of Sites	2020 # of Sites	2022 # of Sites	2024 # of Sites	% Change 2022-2024
Arrowhead	*Sagittaria sp.*		1	3			5	+100.0%
Bassweed	*Potamogeton amplifolius*		2	2	2	1	6	+500.0%
Benthic Filamentous Algae		X	5			2	2	0.0%
Coontail	*Ceratophyllum demersum*		3	1			5	+100.0%
Eurasian Water Milfoil	*Myriophyllum spicatum*	X	29	35	30	31	27	-12.9%
Floating Filamentous Algae		X	2	5	1	20	3	-85.0%
Pickerelweed	*Pontederia cordata*					12	16	+33.33%
Small Bladderwort	*Utricularia minor*						2	+100.0%
Small Duckweed	*Lemna minor*		1					0.0%
Spatterdock	*Nuphar variegata*	X	8	8	7	10	12	+20.0%
Watermoss	*Fontinalis sp.*		2					0.0%
White Water Lily	*Nymphaea odorata*	X	21	21	27	28	25	-10.71%

Red entries indicate invasive species. Green entries indicate algal species. X = presence of species.

In Table 3 above, details each year the species that were or were not found compared to the previous survey years. The percent change represents whether a shift in plant abundance occurred from the previous year (2022) to the current year (2024). Change is represented in a positive (+) or negative (-) shift. No change is indicated by 0.0%.

Since the last survey in 2022, bassweed has shown the highest positive percent change (500%) in Lake Rippowam. Arrowhead, coontail, pickerelweed, small bladderwort, and spatterdock also reported positive percent change in 2024. Conversely, Eurasian water milfoil, floating filamentous algae, and white water lily all reported negative percent changes. All other species showed no shift in percent change.

Biologists surveyed 60 sites at Lake Rippowam to determine the abundance and distribution of aquatic vegetation on August 12, 2024. Submersed vegetation was collected at 29 sites which is equivalent to 48% abundance in the lake. Floating vegetation was also collected at 34 (or 57%) survey sites. Overall, ten (10) different aquatic plants (including benthic and floating filamentous algae) were observed. Only one invasive species, Eurasian water milfoil, was documented in Lake Rippowam.

For overall submersed aquatic vegetation in Lake Rippowam, dense abundances were not reported at all in 2024. Medium densities were only observed at three (or 10%) survey sites. Sparse densities were observed at nine (9, or 31%) sites and trace densities were recorded at 17 (or 59%) sites.

A total of five (5) submersed macrophyte species were observed at Lake Rippowam this year. Out of the five (5) observed species, Eurasian water milfoil was the most abundant submersed plant as well as the dominant macrophyte of the entire basin. This milfoil was recorded at 27 (or 45%) of the 60 sites surveyed, which is a 12.9% decrease from 2022. Nuisance levels of growth were documented at three (3, or 11%) medium sites. Non-nuisance levels of growth were recorded in sparse abundances at seven (7, or 26%) sites and trace abundances at 17 (or 63%) sites. The densest concentration of Eurasian water milfoil was observed along the western shoreline while smaller patches dotted the southern and eastern shorelines.

Bassweed increased significantly in abundance from the last vegetation survey. This native macrophyte was reported at six (6, or 10%) stations, which is a 500% increase from 2022. Out of those six (6) survey stations, only one (1, or 17%) was recorded at nuisance levels of abundance in medium amounts. Two (2, or 33%) stations were documented at sparse amounts while the other three (3, or 50%) were observed at trace amounts. The patches of bassweed were mostly observed along the western shoreline with two patches located along the southern shoreline.

Coontail, another native macrophyte, was documented in the basin again after it was last reported in 2018. The submersed plant was observed at five (5, or 8%) survey sites in Lake Rippowam. All of the coontail that was recorded in the basin was documented at trace amounts. This submersed plant was mostly observed along the western shoreline with one patch near the connecting inlet stream.

The other two submersed aquatic species were observed at less than 5% abundance within Lake Rippowam: benthic filamentous algae (2 sites) and small bladderwort (2 sites). Small bladderwort was reported for the first time in 2024.

Five (5) floating macrophyte species were observed at Lake Rippowam in 2024. Of the 34 (or 57%) sites supporting floating plant growth, eight (8, or 24%) survey sites supported dense abundances. Medium abundances were observed at ten (10, or 29%) survey sites. Sparse abundances were not reported at all during the visit. However, trace abundances were observed at 16 (or 47%) survey sites.

White water lilies were the most abundant floating plant observed during the 2024 vegetation survey. This macrophyte was reported at 25 (or 42%) sites, which is a 10.71% decrease from 2022. Dense abundances were recorded at seven (7, or 28%) sites, while medium densities were recorded at ten (10, or 40%) sites. Sparse abundances were observed at only one (1, or 4%) survey station and seven (7, or 28%) sites supported trace abundance. Heavy concentrations of white water lilies were located along the western shoreline, with patches

decreasing in abundance along the southern and southeastern shorelines.

Pickerelweed is a native macrophyte that was observed for the first time at Lake Rippowam in 2022. Pickerelweed was observed again in 2024 at 25 (or 42%) sites along the shorelines of the basin, which is a 33.33% increase from the previous survey. All the documented pickerelweed was recorded at trace amounts. The patches were scattered along the southern, northwest, and northeast shorelines.

Spatterdock was observed at 12 (or 20%) survey sites along the shorelines of Lake Rippowam, which is a 20% increase when compared to 2022. Only one (1, or 8%) site supported dense abundance while the other four (4, or 33%) nuisance sites reported medium abundances. Sparse amounts of the native plant were recorded at three (3, or 25%) survey stations while the remaining four (4, or 33%) stations were observed at trace abundance. The densest patches of spatterdock were observed along the eastern shoreline while the trace to sparse patches were recorded on the western shoreline.

Arrowhead was observed again in Lake Rippowam for the first time since 2018. The floating leaf species was recorded at five (5, or 8%) of the survey sites and all were observed at trace abundance. Most of the observed arrowhead was recorded along the northern shoreline while one patch was along the southern shoreline. Additionally, floating filamentous algae was the least abundant aquatic species reported in 2024. Floating filamentous algae was only observed at three (3, or 5%) sites within the basin, which is an 85% decrease from 2022. Two (2, or 67%) of the FFA patches were recorded at trace abundance while only one (1, or 33%) station was reported at sparse amounts. The algal patches were observed dotting the southern shoreline.

Summary of Findings

Lake Oscaleta:

- Eurasian watermilfoil, an invasive species, continues to be the most dominant submersed macrophyte within Lake Oscaleta.
- **No Brazilian elodea or water chestnut were found in 2024.**
- Sago pondweed, a native submersed plant, was observed for the first time in Lake Oscaleta.
- White water lily, a native species, continues to be the dominant floating-leaf macrophyte within Lake Oscaleta.
- Three plants found in 2022 were not observed in 2024: clasping-leaf pondweed, mermaid weed, and water bulrush.
- The number of invasive species reported has increased from one to three since 2022. Brittle naiad, curly-leaf pondweed, and Eurasian water milfoil were all observed this year.
- The total number of aquatic macrophyte species observed increased from 18 in 2022 to 21 in 2024.

Lake Rippowam:

- Invasive Eurasian water milfoil continues to be the most dominant macrophyte within Lake Rippowam.
- **No Brazilian elodea or water chestnut were found in 2024.**
- White water lily, a native species, continues to be the dominant floating-leaf macrophyte within Lake Rippowam.
- Compared to 2022, three macrophyte species decreased in abundance: Eurasian water milfoil, floating filamentous algae, and white water lily.
- Macrophyte species diversity increased from seven in 2022 to ten in 2024.
- Throughout the dataset, Eurasian water milfoil was the only invasive species consistently found each survey year.
- Arrowhead and coontail returned in 2024 while small bladderwort was observed for the first time.

Recommendations

We highly recommend a repetition of the SAV mapping in 2026. Monitoring is important for examining and understanding the abundance and distribution of non-native and native macrophytes throughout the aquatic systems.

The point-intercept methodology continues to work well in monitoring and quantifying the growth of aquatic macrophytes in Lake Oscaleta and Lake Rippowam. If Brazilian elodea or water chestnut should re-infest Lake Waccabuc, this will pose a threat to the other two systems for infestation and create a need for more intensive effort for surveys. The point-intercept survey is ideal to direct short- or long-term management efforts in a cost-effective manner. We should increase the frequency of surveys yearly if this situation occurs. Since Lake Waccabuc was not

surveyed in the 2024 season, we recommend that it be surveyed in the next season, 2025.

However, it is possible that other infestations (such as hydrilla or water hyacinth, as they are becoming more established in the region) could appear or may not be within the boundaries of the survey. Non-native growth can be overlooked, especially when an infestation is small or intermittent. While not a priority, the growth of Eurasian water milfoil is concerning as it continues to dominate in all three systems. The Eurasian water milfoil population of both lake systems appears to be stable and local management via hand-pulling is likely enough to reduce impacts to recreational activity.

As always, SŌLitude Lake Management would like to take this opportunity to thank you for allowing us to be of service to the 3LC. We look forward to working with you in the 2025 season.

Sincerely,

Vicky Thiel

Vicky Thiel
Aquatic Biologist

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LAKE MANAGEMENT

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Appendix

Aquatic Macrophyte Library

Aquatic Plant Density Keys

2024 Lake Oscaleta Aquatic Macrophyte Abundance and Distribution Tables

2024 Lake Oscaleta Aquatic Macrophyte Survey Maps

2008 – 2024 Lake Oscaleta Aquatic Macrophyte Percent Abundance Graphs

2024 Lake Rippowam Aquatic Macrophyte Abundance and Distribution Tables

2024 Lake Rippowam Aquatic Macrophyte Survey Maps

2008 – 2024 Lake Rippowam Aquatic Macrophyte Percent Abundance Graphs

Aquatic Macrophyte Library

Arrowhead (*Sagittaria* sp.)

Arrowhead Native: This is the submersed rosette of a species of arrowhead. The submersed rosette lacks both flowers and seeds, so further identification is not possible. Arrowhead has emergent leaves and usually inhabits shallow waters at pond or lake edges, or along sluggish streams. It can tolerate a wide variety of sediment types and pH ranges. Arrowhead is very suitable for constructed wetland development due to its tolerance of habitats, and ability to function as a nutrient sink for phosphorus. Typical arrowhead reproduction is via rhizomes and tubers although seed production is possible if conditions are ideal. Arrowhead has high wildlife value, providing high-energy food sources for waterfowl, muskrats, and beavers. Arrowhead beds provide suitable shelter and forage opportunities for juvenile fish as well.

Bassweed (*Potamogeton amplifolius*)

Large-leaf pondweed, Musky weed

Bass 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 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 make it an excellent waterfowl food source.

Brazilian Elodea (*Egeria densa*)

Egeria, Anacharis, Brazilian waterweed

Brazilian Elodea Invasive: Brazilian elodea is an aggressive exotic invasive submersed plant that originated from South America. It was introduced via the aquarium hobby trade and is a top selling plant used as an oxygenator. The stems can be several meters long, and the strap-like leaves are situated in whorls of three to six, but usually four. The leaves are finely serrated and are tightly packed together near the end of the stem. Brazilian elodea can be rooted or free floating, and due to its highly branching nature, can quickly reach nuisance densities and crowd out or block light penetration for desirable native submersed plants. Although it can be confused with *Hydrilla*, another invasive submersed plant, its lack of tuber production and leaf structure differentiates it. Although it can produce white flowers, it reproduces vegetatively in the United States. Waterfowl consume Brazilian elodea, and fish and invertebrates use the stems for refuge and habitat.

Brittle Naiad (*Najas minor*)

Brittle water nymph, European naiad

Brittle Naiad 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 fruits 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 is tolerant of turbid and eutrophic conditions. Waterfowl graze on the fruit.

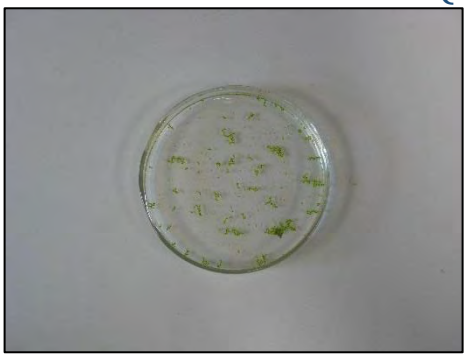
Cattail sp. (*Typha sp.*)

Cattail sp. Native: Cattails emerge from a robust, spreading rhizome that lies within the sediment. The leaves of the plant are sheathed around one another at the base. Depending on the species of cattail, the structure at the junction of the leaf sheath and blade can differ. The sheath either has membranous ear-shaped lobes called auricles or is tapered. The flower of a cattail looks like a hotdog on a stick. The lower portion of the flower is a cylindrical spike of thousands of tightly packed female flowers. The shape and color of these flowers can vary depending on the species. The top of the female spike is separated from the male spike which contains hundreds of anthers that shed pollen to the wind. Cattails provide nesting habitat for many marsh birds ranging from small to large. Shoots and rhizomes are food for muskrats and geese. The submersed stalks also provide habitat for sunfish and shelter for young fish.

Clasping-Leaf Pondweed (*Potamogeton richardsonii*)

Clasping-Leaf Pondweed Native: Clasping-leaf pondweed has sinuous stems that emerge from a spreading rhizome. The leaves are oval to almost lance-shaped that clasp to the stem of the plant. The leaf base is heart-shaped and covers one half to three-quarters of the stem circumference. 13-21 veins run through each leaf. At the axil of each leaf is a fibrous stipule that disintegrates, leaving behind a beard of white fibers at each node. No floating leaves are produced. Clasping-leaf pondweed can grow in a variety of sediment types in water up to four meters deep. It can tolerate sediment disturbance and is often found growing with coontail or small pondweed. The fruit of clasping-leaf pondweed is an important food source for a variety of ducks and geese. Grazers such as muskrat, deer and beaver also consume this pondweed. The leaves and stem are colonized by invertebrates and create foraging opportunities as well as cover for fish.

Common Watermeal (*Wolffia columbiana*)



Common Watermeal Native: Common watermeal appears as pale green globes of vegetative matter without roots, stems or true leaves. It is one of the world's smallest flowering plants, but flowers are rarely found and require magnification to see. Watermeal usually reproduces by budding. Watermeal is typically found on the surface, intermingled with duckweeds. It drifts with the water's current or wind, and therefore it grows independent of water depth, clarity, or sediment type. In the fall it produces winter buds that sink to the bottom. In the spring, the buds become buoyant and float to the surface. Waterfowl, fish, and muskrats all include watermeal in their diets.

Common Waterweed (*Elodea canadensis*)

Elodea

Common Waterweed Native: Common waterweed has slender stems that can reach a meter in length, and a shallow root system. The stem is adorned with lance-like leaves that are attached directly to the stalk that tend to congregate near the stem tip. The leaves are populated by a variety of aquatic invertebrates. Male and female flowers occur on separate plants, but it can also reproduce via stem fragmentation. Since common waterweed is disease resistant, and tolerant to low-light conditions, it can reach nuisance levels, creating dense mats that can obstruct fish movement, and the operation of boat motors.

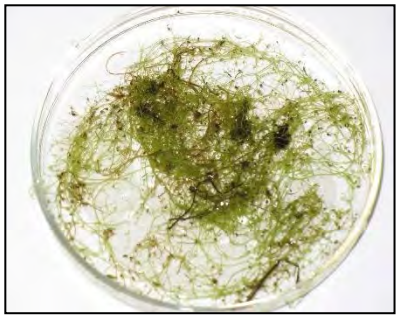
Coontail (Ceratophyllum demersum)

Hornwort

Coontail 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.

Creeping Bladderwort (*Utricularia gibba*)

Humped bladderwort, Cone-Spur Bladderwort



Creeping 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 branches 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 produced on a short stalk. Mats of creeping bladderwort offer limited cover and foraging opportunities for fish.

Curly-leaf Pondweed (*Potamogeton crispus*)

Curly-leaf Pondweed Invasive: Curly-leaf pondweed has spaghetti-like stems that often reach the surface by mid- June. Its submersed leaves are oblong and attached directly to the stem in an alternate pattern. The margins of the leaves are wavy and finely serrated, hence its name. No floating leaves are produced. Curly-leaf pondweed can tolerate turbid water conditions better than most other macrophytes. In late summer, Curly-leaf pondweed enters its summer dormancy stage. It naturally dies off (often creating a sudden loss of habitat and releasing nutrients into the water to fuel algae growth) and produces vegetative buds called turions. These turions germinate when the water gets cooler in the autumn and give way to a winter growth form that allows it to thrive under ice and snow cover, providing habitat for fish and invertebrates.

Dwarf Water Milfoil (*Myriophyllum tenellum*)

Dwarf Water Milfoil Native: Dwarf milfoil, which does not look anything like other milfoil species, has slender unbranched stems ranging from 2 cm to 15 cm in height. The leaves are reduced to scales or “bumps.” If the tips rise out of the water, they can produce pale flowers and nut-like fruits. The toothpick-like stems arise from rhizomes in a chain. Dwarf milfoil is often small and overlooked, preferring sandy bottoms in waters up to four meters deep. Dwarf water milfoil provides suitable spawning habitat for panfish and adequate shelter for small invertebrates. The rhizome networks also help stabilize bottom sediments.

Eurasian Watermilfoil (*Myriophyllum spicatum*)

Asian Water Milfoil

Eurasian Watermilfoil 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 watermilfoil 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 in 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 watermilfoil, and its vegetation provides habitat for invertebrates. However, studies have determined mixed beds of pondweeds and wild celery can support more diverse invertebrate populations.

Filamentous Algae

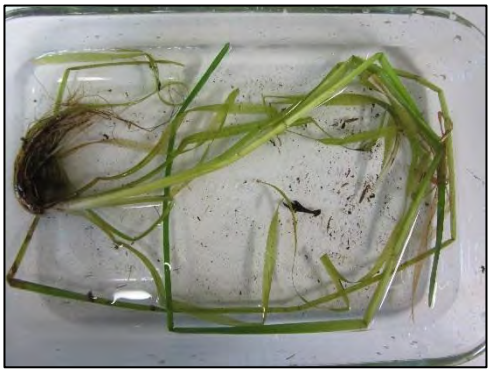
Floating Filamentous Algae, Benthic Filamentous Algae

Filamentous Algae: Filamentous algae are a chain or series of similar algae cells arranged in an end-to-end manner. Benthic filamentous algae is often 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.

Flat-stem Pondweed (*Potamogeton zosteriformis*)

Flat-stem Pondweed Native: Flat-stem pondweed branches freely, emerging from a delicate rhizome system. The stems are strongly flattened with an angled appearance. The long leaves are stiff and linear with a prominent midvein, and numerous fine parallel veins. This prominent midvein distinguishes this pondweed from water stargrass. The stipules are firm and free situated in the leaf axils. Flat-stem pondweed lacks floating leaves. Flat-stem pondweed inhabits a variety of water depths from shallow water to water several meters deep. It prefers soft sediment types. Although it produces nut-like fruits, it grows over winters primarily by rhizomes and winter buds. It can be a locally important food source to fauna, such as waterfowl, muskrat, deer, beaver, and moose. It also provides suitable habitat and food for fish and aquatic invertebrates.

Floating Bur-reed (*Sparganium fluctuans*)



Floating Bur-reed Native: Floating bur-reed is an aquatic perennial that grows along rhizomes in static or slow- moving water. The leaves are limp, strap-shaped, float on the water's surface, often growing in the direction of any flow. At maturity (July-September), the floating bur-reed produce an emergent flowering spike that supports few white flowers with an appearance of small, fluffy cotton balls. From the flowers, floating bur-reed produces spiky fruits (seed heads) that are primarily dispersed by water. The fruits are water-repellent and can remain floating for several months. Various species of bur- reed display the floating leaves.

Great Duckweed (*Spirodela polyrhiza)*

Large Duckweed

Great Duckweed Native: Great duckweed is the largest of the duckweeds, but it is still very small compared to other aquatic macrophytes. It has simple flattened fronds with irregular oval shapes, often up to 1 cm in length and 2.5 to 8.0 mm long. The frond surface is usually green with a conspicuous purple dot. The underside of the frond is magenta with a cluster of 5-12 roots that dangle into the water. Indeed, peering at great duckweed from under the water grants it the appearance a tiny jellyfish. Although great duckweed produces flowers, it usually reproduces via budding, and like other duckweeds, it is capable of rapid growth. It often occurs with other duckweeds, and since it is free floating, it can be moved via the wind or water currents. It derives its nutrients from the water column and often occurs in eutrophic systems. It is an excellent food source for waterfowl and is also used by muskrat and fish. The dense mats offer shade and cover for fish.

Leafy Pondweed (*Potamogeton foliosus*)

Leafy Pondweed Native: Leafy pondweed has freely branched stems that hold slender submersed leaves that become slightly narrower 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.

Many Flower Marsh Pennywort (*Hydrocotyle umbellata*)

Many-Flowered Marsh Pennywort

Many Flower Marsh Pennywort Native: Many flower marsh pennywort is a small plant with floating leaves. The stems of the macrophyte are either floating or creeping with roots at the nodes. The leaves grow one per node with thick, green, round-shaped blades (1 - 4 cm wide) that have round-toothed margins. The leaf stalks grow long (up to 20 cm) and connect to the underside of the leaf blade at the central point. The flower clusters (1 - 3 cm wide) also grow one per node. The flower stalks grow equal to or longer than the leaf stalks. The flowers (10 - 100 per cluster) connect at the same point on the stalk and are small with a whitish color. Many Flower Marsh Pennywort are often observed along pond shorelines, marshes, bogs, and ditches.

Mermaid Weed (*Proserpinaca pectinata*)

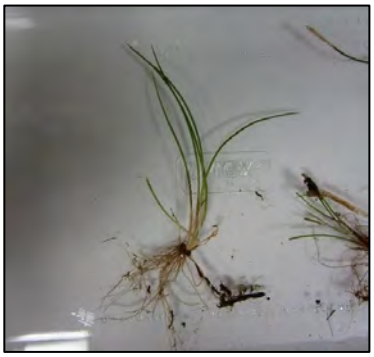
Comb-Leaved Mermaid Weed

Mermaid Weed Native: Mermaid weed is a small plant that is typically found along shorelines. A member of the water milfoil family, it is often confused with the invasive species known as parrotfeather. The whitish to green stems are often sprawling while the upper parts are erect. Unlike most milfoil species, mermaid weed leaves are alternate on the stem and feathery in appearance. The flowers are tiny, greenish white and typically bloom in the spring or early summer. The fruit of the plant are three-angled nutlets that are attached at the leaf axils.

Pickerelweed (*Pontedaria cordata*)

Pickerelweed Native: Pickerelweed is a native emergent plant that inhabits lake margins and sluggish stream from ankle deep to several meters deep. It was glossy heart-shaped leaves that originate from a sprawling rhizome. The leaf blade is adorned with numerous parallel veins. The flower spike is crammed with small blue flowers, a distinguishing characteristic. Pickerelweed is very common in the Northeast. Reproduction is by rhizome spread and late season seed dispersal. The flowering stalk plays host to a myriad of insect species, while the seeds are often consumed by waterfowl. The rhizomes and stems offer shade and habitat for fish. Another ecological benefit of pickerelweed is shoreline stabilization and established beds help to dampen wave action.

Quillwort (*Isoetes sp.*)



Quillwort Native: Quillwort is a low growing, submersed aquatic plant with many leaves forming from a basal structure called a corm. The size of the hollow leaves is dependent on the species. Quillwort is actually a lycopod and does not have 'true' rhizomes or seeds. Instead, quillwort has pseudo-rhizomes and megaspores. The megaspores act like seeds and are found in the expanded bases of each leaf; the megaspores are the primary method for species identification of quillwort genus.

Ribbon-Leaf Pondweed (*Potamogeton epihydrus*)

Ribbon-leaf Pondweed Native: Ribbon-leaf pondweed has flattened stems and two types of leaves. The submersed leaves are alternate on the stem, lack a leaf stalk, and are long tape-like in shape. Each leaf, which can reach lengths up to 2 meters long, has a prominent stripe of pale green hollow cells flanking the midvein, and 5 to 13 other veins. Stipules are not fused to the leaf. Floating leaves are egg or ellipse-shaped and supported by a leaf stalk about as long as the leaf itself. Fruiting stalks are located at the top of the stem and packed with flattened disk-shaped fruits. It is typically found growing in low alkalinity environments, and in a variety of substrates. Seeds are highly sought after by all manner of waterfowl.

Robbins Pondweed (*Potamogeton robbinsii*)

Fern Pondweed

Robbins Pondweed Native: Robbins pondweed has robust stems that emerge from spreading rhizomes. The leaves are strongly ranked creating a fern-like appearance most clearly seen while still submerged. Its distinct closely spaced fern-like leaves give it a unique appearance among the pondweeds of our region. Each leaf is firm and linear, with a base that wraps around the stem. At the stem it has ear-like lobes fused with a fibrous stipule. No floating leaves are produced. Robbins pondweed thrives in deeper water, and under some circumstances, it can remain green over winter. Robbins pondweed creates suitable invertebrate habitat, and cover for lie-in-wait predaceous fish, such as pickerel and pike.

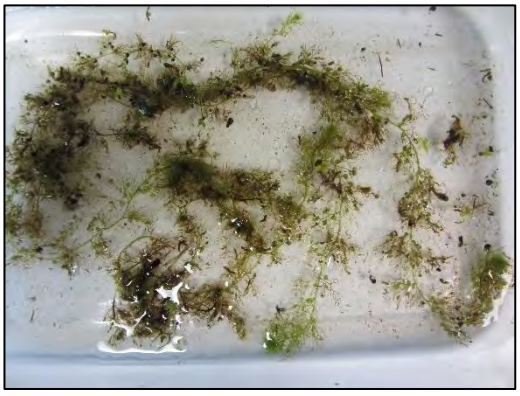
Slender Naiad (*Najas flexilis*)

Bushy Pondweed

Slender Naiad Native: Slender naiad has fine-branched stems that can taper to lengths of one meter, originating from delicate rootstalks. Plant shape varies; sometimes compact and bushy, other times long and slender, depending on growing conditions. The leaves are short (1-4 cm long) and finely serrated, tapering to a point. It is found in a variety of habitats and can colonize sandy or gravelly substrates. If conditions are ideal, it can reach nuisance densities. It is a true annual, and dies off in the fall, relying on seed dispersal to return the next year. It is an important food source for waterfowl.

Small Bladderwort (*Utricularia minor*)

Lesser Bladderwort



Small Bladderwort Native: Small bladderwort is a free-floating aquatic perennial herb. The stems are both floating and creeping, usually no more than 75 cm long. The stem is densely lined with leaves bearing the bladders. The bladders are used to capture prey, such as protozoa, zooplankton, and even small insect larvae. The leaves are linear, flat, and bristle-tipped, generally three parted at the base and forked 1 to 3 times. Small yellow snap dragon-like flowers are produced. Since it is free floating, and it derives nutrients from captured prey, it can inhabit low nutrient waters. It is not limited to substrate type, water clarity, or water depth, due to its lack of roots, but it is at the mercy of wind or water currents.

Small Duckweed (*Lemna minor*)

Water Lentil, Lesser Duckweed

Small 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 overwinters 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 is also consumed by muskrat, beaver and fish, and dense mats of duckweed can inhibit mosquito breeding.

Southern Naiad (*Najas guadalupensis*)

Southern Water Nymph, Bushy Pondweed

Southern Naiad Native (*Najas guadalupensis*. Common Names: Southern water nymph, bushy pondweed.): 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. The leaves are also 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.

Spatterdock (*Nuphar variegata*)

Yellow Pond Lily, Bullhead Pond Lily

Spatterdock Native: Spatterdock leaf stalks emerge directly from a submerged fleshy rhizome. Spatterdock has heart-shaped leaves with a prominent notch. Depending on the habitat, these leaves can be held aloft via erect stems. A distinguishing characteristic of spatterdock is the leaf stalk, which bears a winged margin. Flowering occurs in the summer and the flowers open during the day and close at night. Spatterdock typically inhabits quiet water less than two meters deep with a soft substrate, 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.

Spiral-Fruited Pondweed (*Potamogeton spirillus*)

Spiral-Fruited Pondweed Native: Spiral-fruited pondweed has slender stems that originate from a delicate, spreading rhizome. The stems tend to be compact and have numerous branches. Submersed leaves are linear with a curved appearance. Floating leaves are delicate, ellipse-shaped and range from 7 to 35 mm long and two to 13 mm wide. Stipules are fused to the leaf blade for more than half of their length. Nut-like fruits are produced on stalks of varies lengths. Shorter stalks tend to be on lower axils with fruit arranged in a compact head, while longer stalks tend to appear on upper axils, with fruit arranged in a cylindrical head. The fruit itself is a flattened disc with a sharply toothed margin. Its smooth sides appear like a tightly coiled embryo, a distinguishing characteristic. Spiral-fruited pondweed prefers shallow water with sandy substrate but can inhabit a wide range of bottom substrates. It serves as an important stabilizer and cover for fish fry and invertebrates.

Water Bulrush (*Scirpus subterminalis, Schoenoplectus subterminalis)*

Bulrush

Water Bulrush Native (*Scirpus subterminalis*; *Schoenoplectus subterminalis*). Common names: water bulrush, bulrush. Water bulrush is a truly aquatic bulrush, with only the tips of fertile stems poking above the water's surface, if any. The slender, limp stems originate from a delicate rhizome, typically less than 2.0 mm diameter. The hair-like stems can reach lengths up to 1.0 meter and occur in flowing or still-water environments. The leaves are sheathed at the base and become crescent-shaped above the sheath. This basal sheathing is a distinct characteristic that sets water bulrush apart from spikerush species. The leaves have one to five lengthwise veins and scattered cross-veins. The leaves are often covered with a fine coating of algae in nutrient-poor environments. Researchers believe the bulrush plants are a phosphorus source for the algae. When nutlets are produced, they are three-angled with a slender beak. Water bulrush prefers shallow water but can become established in depths exceeding 1.0 meter. Water bulrush stands produce grass-like meadows which provide suitable habitat for invertebrates and juvenile fish.

Water Chestnut (*Trapa natans*)

Water Nut

Water Chestnut Invasive: Water chestnut is native to Europe and Asia and was first observed in the United States in the late 1800's in Massachusetts. Water chestnut has two types of leaves, submerged and floating rosettes. The submersed leaves are delicate, opposite and have numerous adventitious roots. Floating leaves are strongly toothed triangular leaves displayed in a rosette fashion, supported by long petioles with spongy inflated bladders for buoyancy. These petioles can reach lengths of up to 16 feet. Water chestnut prefers to inhabit nutrient-rich slow-moving waters in lakes, ponds, or streams. Although water chestnut can reproduce via fragmented rosettes, the plant produces numerous single-seeded horned nuts armed with sharp half-inch barbs. After maturation, these nuts fall off the plant and over winter, producing 10-15 new rosettes the following season. These nuts can inflict painful wounds to swimmers if stepped on. Studies have shown a water chestnut can lie dormant on a lake bottom for up to 12 years and still germinate. Water chestnut is a poor source of food for waterfowl. High densities of water chestnut can inhibit boating and fishing.

Water Stargrass (*Zosterella dubia*)

Water Stargrass Native: Water stargrass has slender free-branched stems that originate from rhizomes. The leaves are narrow and alternate, attaching directly to the stem. Leaves can be up to 15 cm long, and lack a prominent midvein, a distinguishing characteristic. Water stargrass can inhabit a wide range of water depths and sediment types. This macrophyte can also tolerate reduced clarity environments. Yellow star-shaped flowers are produced by midsummer, but reproduction is usually via over wintering rhizomes. Water stargrass is a locally important waterfowl food source and provides suitable cover and foraging for fish.

Water-Thread Pondweed (*Potamogeton diversifolius*)

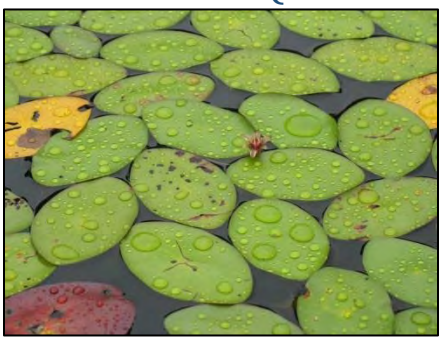
Variable-Leaf Pondweed, Snailseed Pondweed

Water-thread Pondweed Native (*Potamogeton diversifolius*. Common Names: Water-thread pondweed, variable-leaf pondweed, snailseed pondweed.): Variable-leaf pondweed have freely branched stems emerging from slender rhizomes. The submersed leaves are narrow and linear with one obvious midvein bordered by a row of hollow cells. The floating leaves are shaped like an ellipse, but are usually less than 4 cm long, Variable-leaf pondweed fruit spikes are produced in two distinct forms. It occurs in lakes, ponds, rivers and streams and prefers soft sediment and water less than 2 meters deep. Waterfowl graze on the fruit, and local fauna often graze on the stems and leaves.

Water Moss (*Fontinalis* sp.)

Water Moss Native: Water mosses are submerged mosses that are attached to rocks, trees, logs, and other hard substrates by false rootlets located at the base of their stems. The stems are dark green to brown, and about one foot long. The leaves share a similar color to the stems and are usually ovate with fine-toothed margins. Water moss is utilized by aquatic invertebrates, and as a breeding site for small fish. Water moss rarely reaches nuisance levels.

Watershield (*Brasenia schreberi*)



Watershield 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 as well as a source of stored nutrients. The leaf stalks are attached to the middle of the leaf, creating a bull's eye effect. 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. This plant prefers soft-water lakes and ponds with sediments containing decomposing organic matter. Waterfowl consumes the whole plant, and the floating leaves provide shade and cover for fish.

White Water Lily (*Nymphaea* odorata)

Fragrant Water Lily

White 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.

Wild Celery (*Vallisneria Americana*)

Eel-grass, Tape-grass

Tape-grass Native (*Vallisneria americana*. Common Names: Wild celery, eel-grass, tape-grass.): Tape-grass has long flowing ribbon-like leaves that have a basal arrangement from a creeping rhizome. The leaves can be up to two meters long, have a cellophane-like texture, with a prominent center stripe and finely serrated edges. The leaves are mostly submersed, although they can reach the surface allowing the tips to trail. Male and female flowers are produced on separate plants, but reproduction is usually via over wintering rhizomes and tubers. Tape-grass usually inhabits hard substrate bottoms in shallow to deep water. It can tolerate a wide variety of water conditions. Tape-grass is the premiere food source for waterfowl, which greedily consume all parts of the plant. Canvasback ducks (*Aythya valisneria*) enjoy a strong relationship with tape-grass, going so far to alter their migration routes based on tape-grass abundance. Extensive beds of tape-grass are considered good shade, habitat and feeding opportunities for fish.

Floating Aquatic Plant Density

Trace

Medium

Sparse

Dense

SOLITUDE
LAKE MANAGEMENT

Submersed Aquatic Plant Density

Trace

Medium

Sparse

Dense

SOLITUDE
LAKE MANAGEMENT

Lake Oscaleta

Aquatic Macrophyte Abundance Distribution

August 7, 2024

Aquatic Macrophyte	Total		Trace		Sparse		Medium		Dense	
	Sites	%	Sites	%	Sites	%	Sites	%	Sites	%
TOTAL SITES	88									
Total Submered Vegetation	74	84.09%	22	29.73%	22	29.73%	19	25.68%	11	14.86%
Eurasion Water Milfoil	58	65.91%	28	48.28%	18	31.03%	11	18.97%	1	1.72%
Small Bladderwort	45	51.14%	24	53.33%	10	22.22%	8	17.78%	3	6.67%
Coontail	21	23.86%	9	42.86%	4	19.05%	6	28.57%	2	9.52%
Benthic Filamentous Algae	19	21.59%	13	68.42%	4	21.05%	2	10.53%	0	0.00%
Bassweed	19	21.59%	6	31.58%	1	5.26%	6	31.58%	6	31.58%
Robbins Pondweed	13	14.77%	4	30.77%	6	46.15%	1	7.69%	2	15.38%
Floating Bur-reed	12	13.64%	4	33.33%	8	66.67%	0	0.00%	0	0.00%
Leafy Pondweed	6	6.82%	4	66.67%	1	16.67%	1	16.67%	0	0.00%
Brittle Naiad	1	1.14%	1	100.00%	0	0.00%	0	0.00%	0	0.00%
Common Waterweed	1	1.14%	1	100.00%	0	0.00%	0	0.00%	0	0.00%
Sago Pondweed	1	1.14%	0	0.00%	1	100.00%	0	0.00%	0	0.00%
Curly-Leaf Pondweed	1	1.14%	1	100.00%	0	0.00%	0	0.00%	0	0.00%
Total Floating Vegetation	75	85.23%	3	4.00%	19	25.33%	24	32.00%	29	38.67%
White Water Lily	65	73.86%	5	7.69%	12	18.46%	23	35.38%	25	38.46%
Pickrelweed	42	47.73%	39	92.86%	3	7.14%	0	0.00%	0	0.00%
Spatterdock	34	38.64%	4	11.76%	15	44.12%	5	14.71%	10	29.41%
Watershield	25	28.41%	6	24.00%	12	48.00%	7	28.00%	0	0.00%
Arrowhead sp.	6	6.82%	6	100.00%	0	0.00%	0	0.00%	0	0.00%
Many-Flowered Marsh Pennywort	4	4.55%	4	100.00%	0	0.00%	0	0.00%	0	0.00%
Floating Filimentous Algae	3	3.41%	2	66.67%	0	0.00%	1	33.33%	0	0.00%
Small Duckweed	3	3.41%	3	100.00%	0	0.00%	0	0.00%	0	0.00%
Cattail sp.	3	3.41%	3	100.00%	0	0.00%	0	0.00%	0	0.00%

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STATION	SAMPLE	LAT (NAD83)	LONG (NAD83)	DEPTH (FT)	Total Floating Vegetation	Total Submered Vegetation	Benthic Filamentous Algae	Floating Filimentous Algae	Eurasion Water Milfoil	Coontail	Brittle Naiad	Leafy Pondweed	Small Bladderwort	Bassweed	Robbins Pondweed	Common Waterweed	Sago Pondweed	Curly-Leaf Pondweed	Spatterdock	White Water Lily	Watershield	Small Duckweed	Many-Flower Marsh Pennywort	Floating Bur-reed	Cattail sp.	Pickrelweed	Arrowhead sp.
1	A			2.9	T	T				T		T								T	T	T					
1	B				T	S				S		T								T		T					
1	M	41.297586°	-73.571229°	3	T	S				S		T								T	T	T					
2	A			5.1	S	S		T		S			T	T					S	T					T	
2	B				S	S		T		S			T						S	T					S	
2	M	41.297525°	-73.570731°	5	S	S		T		S			T	T					S	T					S	
3	A			4.8	S	M	T		T	S			T	M					T	S					T	
3	B				S	M				M				M					S	S						
3	M	41.297462°	-73.57012°	5	S	M	T		T	M			T	M					S	S					T	
4	A			4.5	S	M			T	M		T	T						T	S		T			T	
4	B				M	M				M										M					S	
4	M	41.297135°	-73.569803°	5	M	M			T	M		T	T						T	M		T			S	
5	A			5.7	T	D	T		T	D	T		T						T			T			T	
5	B				S	D	T			D	T								S							
5	M	41.297044°	-73.56925°	6	S	D	T		T	D	T		T						S			T			T	
6	A			4.9	D	S	S			S			T	S	T					D					T	
6	B				D	M	S			M			T	S						D						
6	M	41.297279°	-73.56879°	5	D	M	S			M			T	S	T					D					T	
7	A			4.9	D	M	T		T	T		M	S						T	D						
7	B				D	M	T		T			M	M						T	D						
7	M	41.297378°	-73.568556°	5	D	M	T		T	T		M	M						T	D						
8	A			4.5	D	S	S	S	T	S			S						T	D					T	
8	B				D	M	M	M	T	M			M						T	D					T	
8	M	41.297579°	-73.568452°	5	D	M	M	M	T	M			M						T	D					T	
9	A			3.9	T	D	T		S	D		T	S						T	T					T	
9	B				S	D			M	D		S	S						S	S					S	
9	M	41.297539°	-73.568159°	4	S	D	T		M	D		S	S						S	S					S	
10	A			3.2	D	S	T		S	T		T	S	T					S	D	S					
10	B				D	S	T		S	T			S	T					S	D	M					
10	M	41.297388°	-73.568202°	3	D	S	T		S	T		T	S	T					S	D	M					
11	A			3.8	D	M	S			T			M						T	D	T				T	
11	B				D	M	M						M						S	D	T				T	
11	M	41.297161°	-73.568217°	4	D	M	M			T			M						S	D	T				T	
12	A			5	D	S	T		T				S						S	D						
12	B				D	S	T		T	T			S						S	D						
12	M	41.297059°	-73.567903°	5	D	S	T		T	T			S						S	D						
13	A			3.5	D	S			S			T	S						D	D	S				T	
13	B				D	S			S				S						S	D					T	
13	M	41.297313°	-73.567912°	4	D	S			S			T	S						M	D	T				T	
14	A			2.5		T			T				T		T	T	S						T			
14	B					T			T						T	T	S						T			
14	M	41.297393°	-73.567611°	3		T			T				T		T	T	S						T			
15	A			4.8	M	M				T			M		T				M	M						
15	B				D	M							M		S				M	D						
15	M	41.297155°	-73.567592°	5	D	M				T			M		S				M	D						
16	A			5.5	D	S				T			S	T					D							
16	B				D	M				S			M						D							
16	M	41.296912°	-73.567591°	6	D	M				S			M	T					D							
17	A			5.4	D	T			T	T			T						M	D	T					
17	B				D	T			T	T			S						M	D	T					
17	M	41.29651°	-73.567321°	5	D	T			T	T			S						M	D	T					
18	A			5.6	D	D			T	T			D		S				D	M	T					
18	B				D	D			T	T			D		S				D	M						
18	M	41.296715°	-73.567344°	6	D	D			T	T			D		S				D	M	T					
19	A			4.7	S	D			T	M			D	D					S	S						
19	B				S	D			T	M			D	D					S	S						
19	M	41.296962°	-73.56736°	5	S	D			T	M			D	D					S	S						
20	A			5.3		D			S				D	D	S											
20	B					D			M				D	D	S											
20	M	41.297163°	-73.567303°	5		D			M				D	D	S											
21	A			4	D	M							S	M						D	S		T	T		
21	B				D	M							S	M						D	S		T			
21	M	41.29735°	-73.5673°	4	D	M							S	M						D	S		T	T		
22	A			2	M	T	T		T				T					T		M	S			T		
22	B				M	S	S						T							M	S			S		
22	M	41.297541°	-73.56732°	2	M	S	S		T				T					T		M	S			S		
23	A			3.5	S															S	S					
23	B				S															S	S					
23	M	41.297488°	-73.567046°	4	S															S	S					
24	A			6	S	D			T				M	M	D				S							
24	B				S	D							M	D	D				S							
24	M	41.297128°	-73.567005°	6	S	D			T				M	D	D				S							

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25	A			7.5		M			T	M			T	S	M												
25	B					M			T	M				M	M												
25	M	41.296775°	-73.566993°	8		M			T	M			T	M	M												
26	A			2	D	S	S			T			T						S	D				T			
26	B				D	S	S			T			T						M	D							
26	M	41.296376°	-73.56707°	2	D	S	S			T			T						M	D				T			
27	A			2	D	T							T						S	D				T			
27	B				D	T							T						S	D							
27	M	41.2961°	-73.566986°	2	D	T							T						S	D				T			
28	A			0.5	D	T							T							D						T	
28	B				D															D							
28	M	41.29602°	-73.566691°	1	D	T							T							D						T	
29	A			5.5	D	M			M				S							D							
29	B				D	M			M				S							D							
29	M	41.296418°	-73.566728°	6	D	M			M				S							D							
30	A			6.5	M	T			T				T		T				S	M							
30	B				M	S			T				S		T				S	M							
30	M	41.296769°	-73.566724°	7	M	S			T				S		T				S	M							
31	A			7.3		D			T	T			M		D												
31	B					D			S	S			M		D												
31	M	41.297132°	-73.566736°	7		D			S	S			M		D												
32	A			7	T	D			D	T			T	S							T						
32	B				S	D			D					M							S						
32	M	41.297522°	-73.566698°	7	S	D			D	T			T	M							S						
33	A			1.5	T	T			T					T						T							
33	B				S	T			T											S							
33	M	41.297844°	-73.566285°	2	S	T			T					T						S							
34	A			11																							
34	B																										
34	M	41.297489°	-73.566213°	11																							
35	A			14																							
35	B																										
35	M	41.297123°	-73.566286°	14																							
36	A			6.5	M	T			T				T		T				S	M							
36	B				M	S			T				S		S				M	M							
36	M	41.296779°	-73.566256°	7	M	S			T				S		S				M	M							
37	A			4	D	S							S						M	D							
37	B				D	S							S						D	D							
37	M	41.296441°	-73.56629°	4	D	S							S						D	D							
38	A			0.5	D	T							T							D						T	
38	B				D															D							
38	M	41.296075°	-73.566266°	1	D	T							T							D						T	
39	A			3	M	T			T				T							M	S						
39	B				M	T			T											M	M						
39	M	41.296406°	-73.565762°	3	M	T			T				T							M	M						
40	A			17																							
40	B																										
40	M	41.296807°	-73.565833°	17																							
41	A			3	S	T	T		T				T							S						T	
41	B				M	S			S											M							
41	M	41.29634°	-73.565424°	3	M	S	T		S				T							M						T	
42	A			3	S	T			T											S	T		T		T	T	
42	B				S															S	T		T				
42	M	41.296091°	-73.564814°	3	S	T			T											S	T		T		T	T	
43	A			6.8	S	T							T							S						T	
43	B				S															S							
43	M	41.29589°	-73.564305°	7	S	T							T							S						T	
44	A			6.5	S	S	T		S											S						T	
44	B				S	S	T		S											S							
44	M	41.295591°	-73.563763°	7	S	S	T		S											S						T	
45	A			2	S	S	T		S						T				T	T	S					T	
45	B				S	S			S										T	S	S						
45	M	41.295243°	-73.563122°	2	S	S	T		S						T				T	S	S					T	
46	A			3.5	S	T			T											T	S					T	
46	B				S															T	S					T	
46	M	41.29505°	-73.562549°	4	S	T			T											T	S					T	
47	A			4																							T
47	B																										T
47	M	41.295012°	-73.561949°	4																							T
48	A			6																							T
48	B																										T
48	M	41.295024°	-73.561364°	6																							T

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49	A			6																							
49	B																										
49	M	41.295015°	-73.560731°	6																							
50	A			9																							
50	B																										
50	M	41.295026°	-73.56016°	9																							
51	A			4	T														T								T
51	B				S														S								
51	M	41.295112°	-73.559593°	4	S														S								T
52	A			3.8	T	T			T										T	T							T
52	B				S														S	T							
52	M	41.295189°	-73.558985°	4	S	T			T										S	T							T
53	A			2	S	S			S												S				T		
53	B				S	S			S												S				T		
53	M	41.295226°	-73.558394°	2	S	S			S												S				T		
54	A			5.5	S	S			S											S	T				T		
54	B				M	M			M											M	S				T		
54	M	41.295574°	-73.557844°	6	M	M			M											M	S				T		
55	A			2.5	T	T	T																		T		T
55	B																										
55	M	41.295506°	-73.557148°	3	T	T	T																		T		T
56	A			6	S	S			S										T	S	S			S		T	
56	B				M	M			M										S	S	M			S			
56	M	41.29559°	-73.55658°	6	M	M			M										S	S	M			S		T	
57	A			6	M	S			S											M				S		T	
57	B				M	S			S											M				S			
57	M	41.295689°	-73.556178°	6	M	S			S											M				S		T	
58	A			3.8	M	M		T	M										S	S	M					T	
58	B				M	M		T	M										S	M	M						
58	M	41.295832°	-73.555728°	4	M	M		T	M										S	M	M					T	
59	A			2.5	T	M	T		M											T						T	
59	B				S	M	T		M											S						T	
59	M	41.296023°	-73.555282°	3	S	M	T		M											S						T	
60	A			6	D	M	T		S				T	M						D						T	
60	B				D	D	T		S					D						D						T	
60	M	41.296293°	-73.555284°	6	D	D	T		S				T	D						D						T	
61	A			2.5	D	T			T				T						D	D						T	
61	B				D	S			S				T						D	D						T	
61	M	41.296665°	-73.555226°	3	D	S			S				T						D	D						T	
62	A			2	D	T			T				T						D	D						T	
62	B				D	S			S				T						D	D						T	
62	M	41.297036°	-73.555283°	2	D	S			S				T						D	D						T	
63	A			2.3	D	T			T				T						D	D						T	
63	B				D	S			S				T						D	D						T	
63	M	41.297015°	-73.554944°	2	D	S			S				T						D	D						T	
64	A			2.5	D	T			T				T						D	D						T	
64	B				D	S			S				T						D	D						T	
64	M	41.296658°	-73.554802°	3	D	S			S				T						D	D						T	
65	A			2	D	T			T				T						D	D						T	
65	B				D	S			S				T						D	D						T	
65	M	41.296271°	-73.554613°	2	D	S			S				T						D	D						T	
66	A			4	D	D			S					D	T				D								
66	B				D	D			M					D	S				D								
66	M	41.296637°	-73.555708°	4	D	D			M					D	S				D								
67	A			7	D	M			S					M	T				D								
67	B				D	M			M					M	S				D								
67	M	41.297023°	-73.55574°	7	D	M			M					M	S				D								
68	A			7	M	D			S					D						M							
68	B				M	D			S					D						M							
68	M	41.297017°	-73.556198°	7	M	D			S					D						M							
69	A			2	S															S				S		T	
69	B				M															M				S			
69	M	41.297236°	-73.556589°	2	M															M				S		T	
70	A			4	D															D	S						
70	B				D															D	S						
70	M	41.29724°	-73.557132°	4	D															D	S						
71	A			4	D	M			T				M							D	S						
71	B				D	M			S				M							D	S						
71	M	41.297543°	-73.557112°	4	D	M			S				M							D	S						
72	A			2	D	T	T													D	S			S			
72	B				D															D	S			S			
72	M	41.297322°	-73.557719°	2	D	T	T													D	S			S			

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73	A			3.5	S	T			T											S				T		T	
73	B				M															M				T			
73	M	41.297258°	-73.558357°	4	M	T			T											M				T		T	
74	A			5	S	T			T											S						T	T
74	B				M	T			T											M							
74	M	41.297336°	-73.558928°	5	M	T			T											M						T	T
75	A			4	T	T			T											T					T	T	
75	B				T	T			T											T						T	
75	M	41.297448°	-73.559598°	4	T	T			T											T					T	T	
76	A			2	T	T			T																	T	
76	B				S	T			S																	T	
76	M	41.297562°	-73.560125°	2	S	T			S																	T	
77	A			2.5	M	T							T	T						M	S		T	S		T	
77	B				M	T								T						M	S		T	S			
77	M	41.297667°	-73.560772°	3	M	T							T	T						M	S		T	S		T	
78	A			2	S															S							
78	B				M															M							
78	M	41.297877°	-73.561273°	2	M															M							
79	A			3.5	M	M			M					M						S	M						
79	B				S	M			M					M						S	S						
79	M	41.297987°	-73.561918°	4	M	M			M					M						S	M						
80	A			2	S	T	T		T											S				T			
80	B				M	S	S													M				S			
80	M	41.297993°	-73.562568°	2	M	S	S		T											M				S			
81	A			6	S	T			T											S						T	
81	B				M	T			T											M							
81	M	41.297813°	-73.563087°	6	M	T			T											M						T	
82	A			5.5	S	S			S											S						T	
82	B				M	S			S											M							
82	M	41.297885°	-73.563692°	6	M	S			S											M						T	
83	A			6	S	T			T											S						T	
83	B				M	T			T											M							
83	M	41.297815°	-73.564353°	6	M	T			T											M						T	
84	A			6	S	T			T				T	T						S	S					T	
84	B				M	T			T											M	M					T	
84	M	41.29794°	-73.564921°	6	M	T			T				T	T						M	M					T	
85	A			6	M	T			T											M				T	T	T	
85	B				M	T			T											M				S			
85	M	41.297898°	-73.565486°	6	M	T			T											M				S	T	T	
86	A			7	M	S			S											M	M					T	
86	B				M	M			M											M	S						
86	M	41.297833°	-73.565914°	7	M	M			M											M	M					T	
87	A			17																							
87	B																										
87	M	41.297497°	-73.565769°	17																							
88	A			17																							
88	B																										
88	M	41.297167°	-73.565834°	17																							

Figure 1. 2024 Point-Intercept Sample Locations

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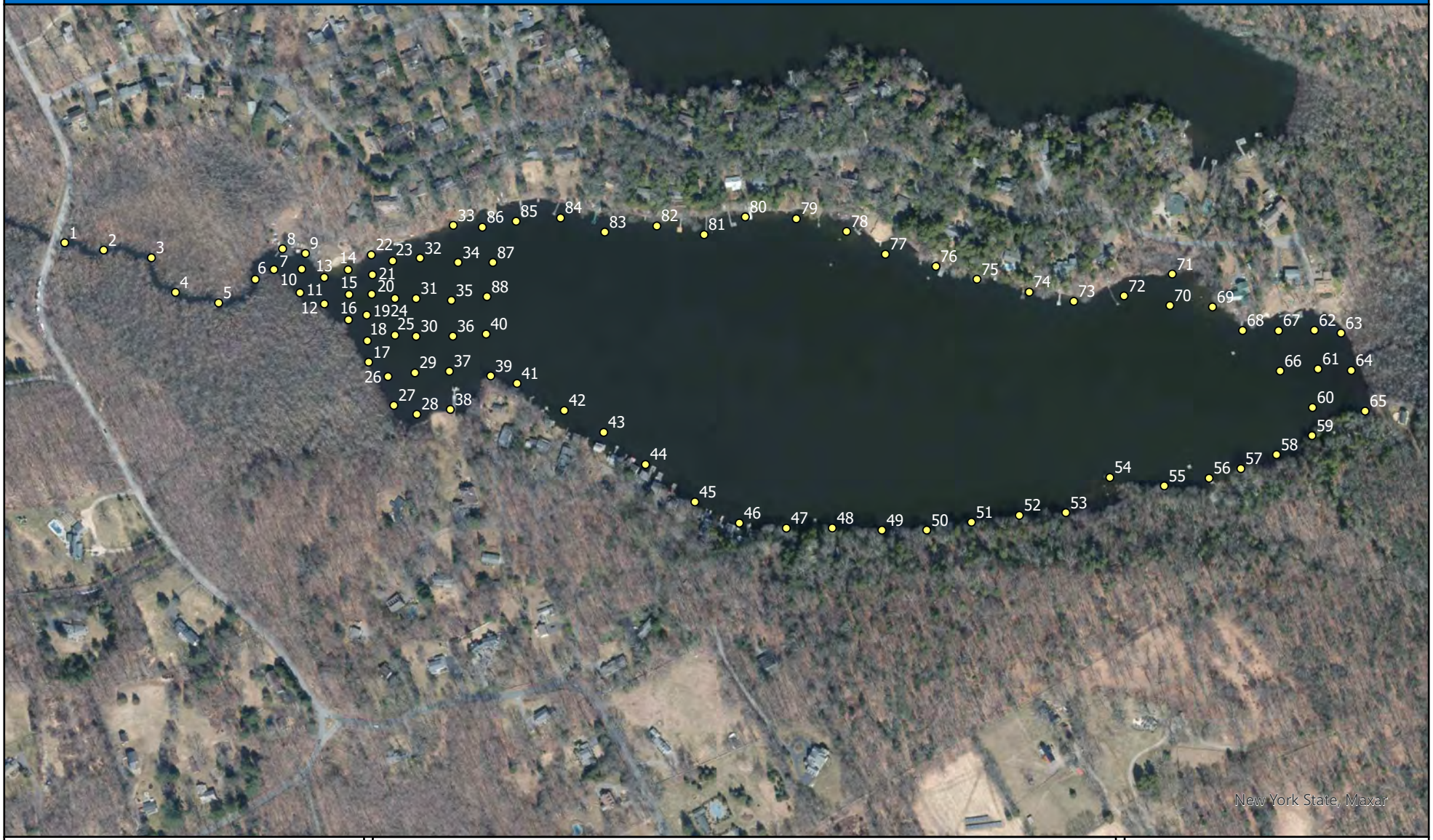

Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500
US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 2. 2024 Point-Intercept Depth

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Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 3. 2024 Point-Intercept Total Floating Vegetation

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Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 4. 2024 Point-Intercept Total Submersed Vegetation

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Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 5. 2024 Point-Intercept Distribution and Density
Benthic Filamentous Algae (Various Species)

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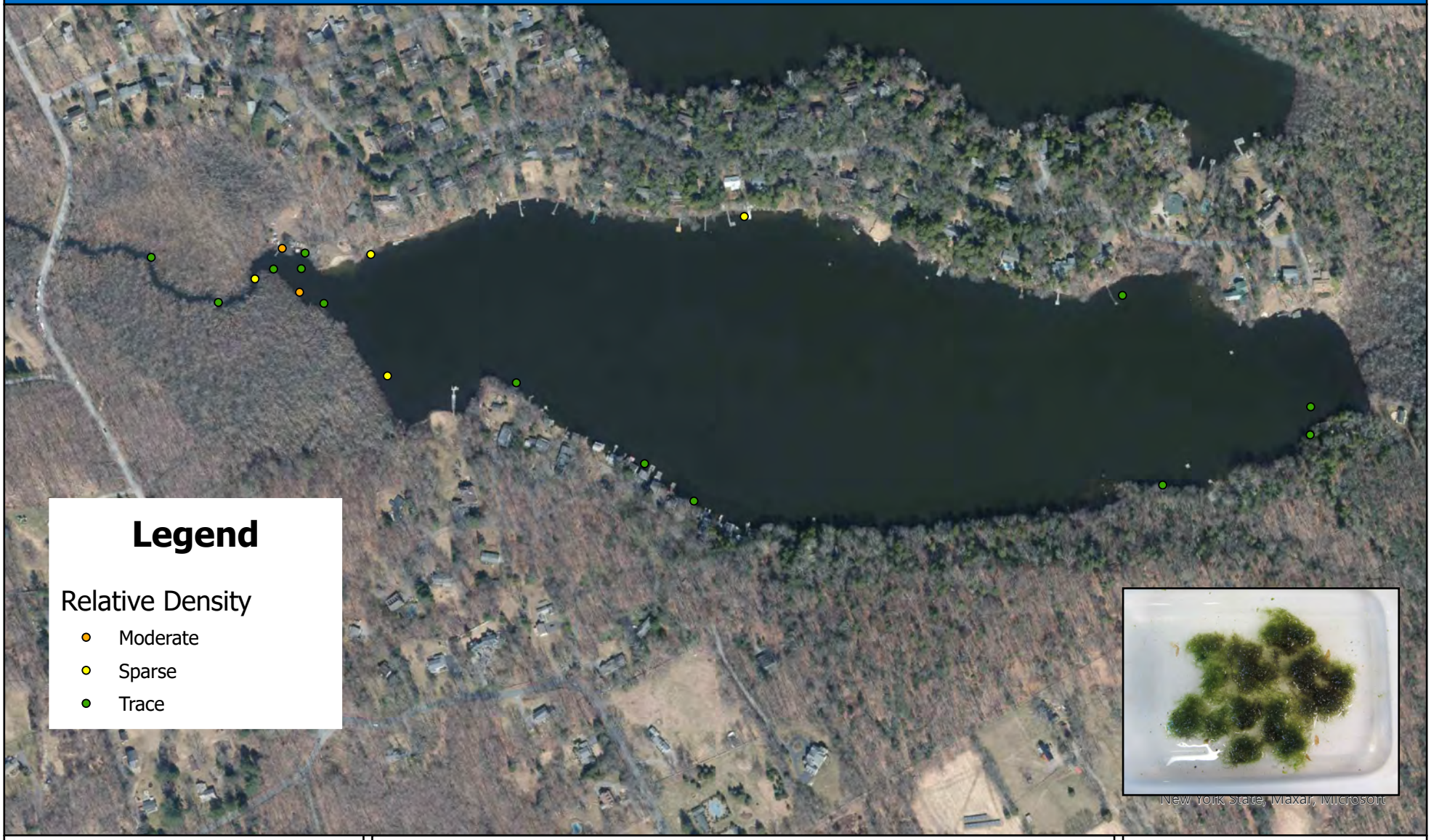

Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 6. 2024 Point-Intercept Distribution and Density
Floating Filamentous Algae (Various Species)

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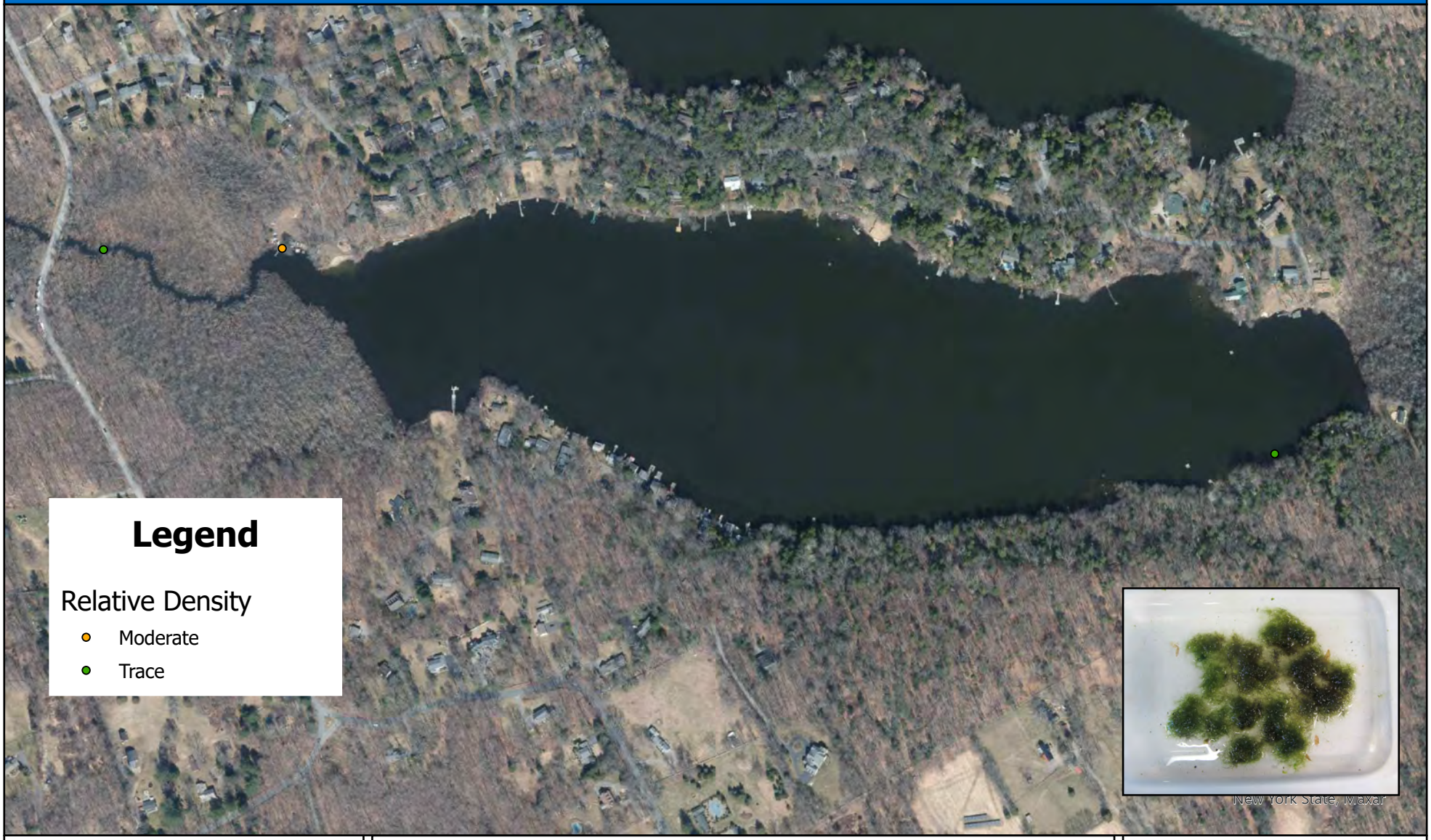

Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

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Figure 7. 2024 Point-Intercept Distribution and Density
Eurasian Watermilfoil (*Myriophyllum spicatum*)

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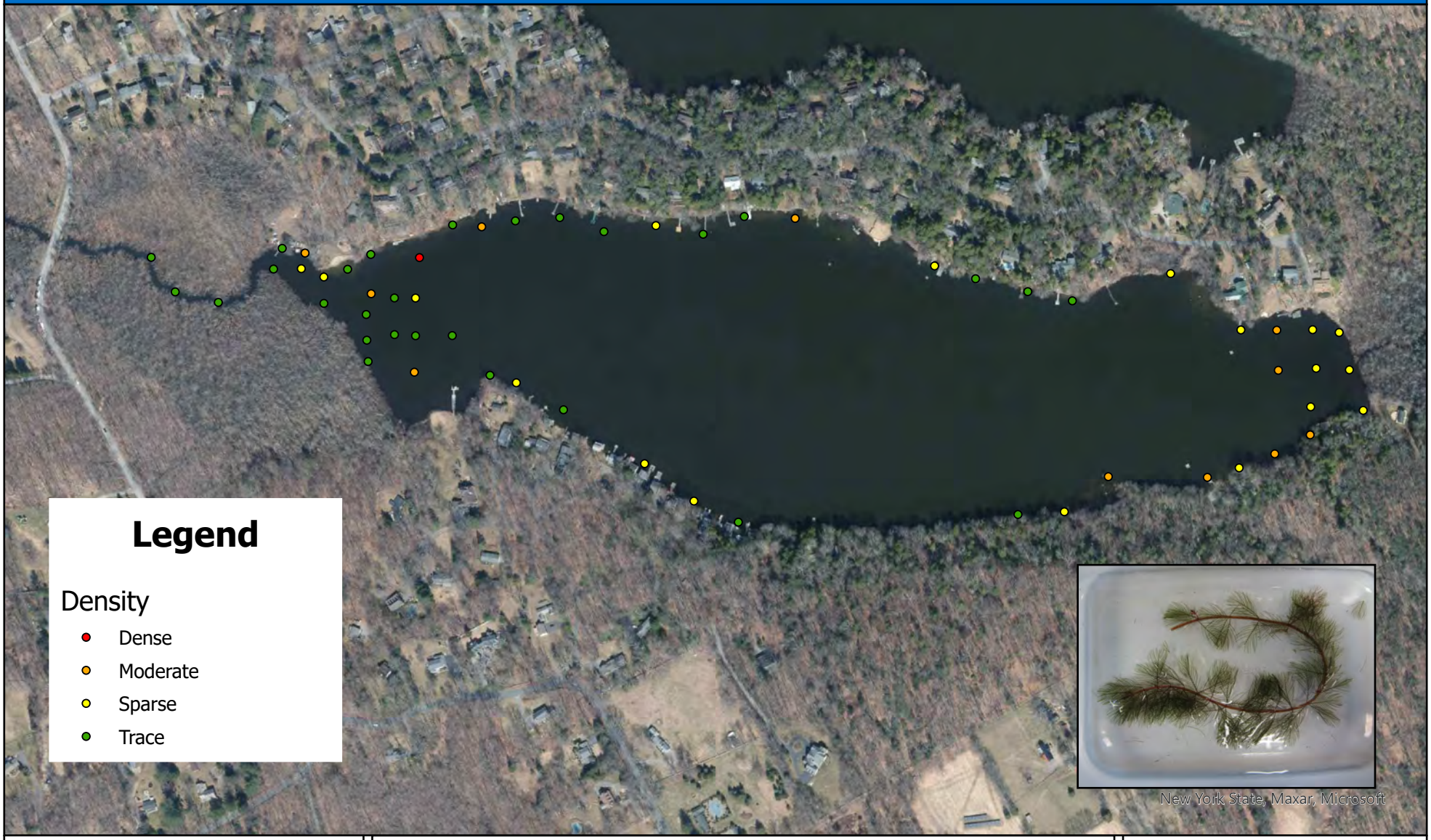

Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

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Figure 8. 2024 Point-Intercept Distribution and Density
Coontail (*Ceratophyllum demersum*)

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Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

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Figure 9. 2024 Point-Intercept Distribution and Density
Brittle Naiad (*Najas minor*

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Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500
US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

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Figure 10. 2024 Point-Intercept Distribution and Density
Leafy Pondweed (*Potamogeton foliosus*)

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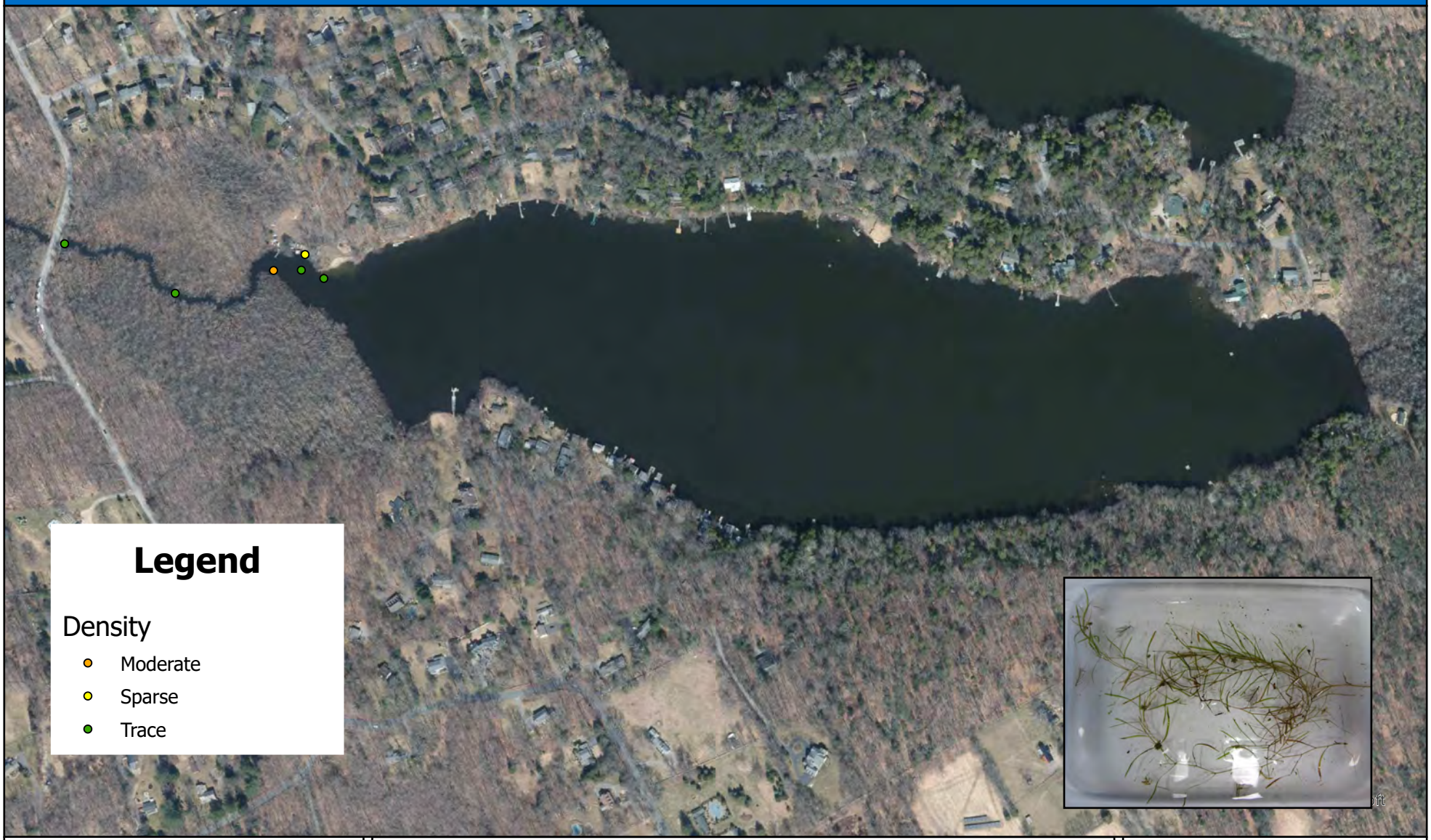

Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

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Figure 11. 2024 Point-Intercept Distribution and Density
Small Bladderwort (*Utricularia minor)*

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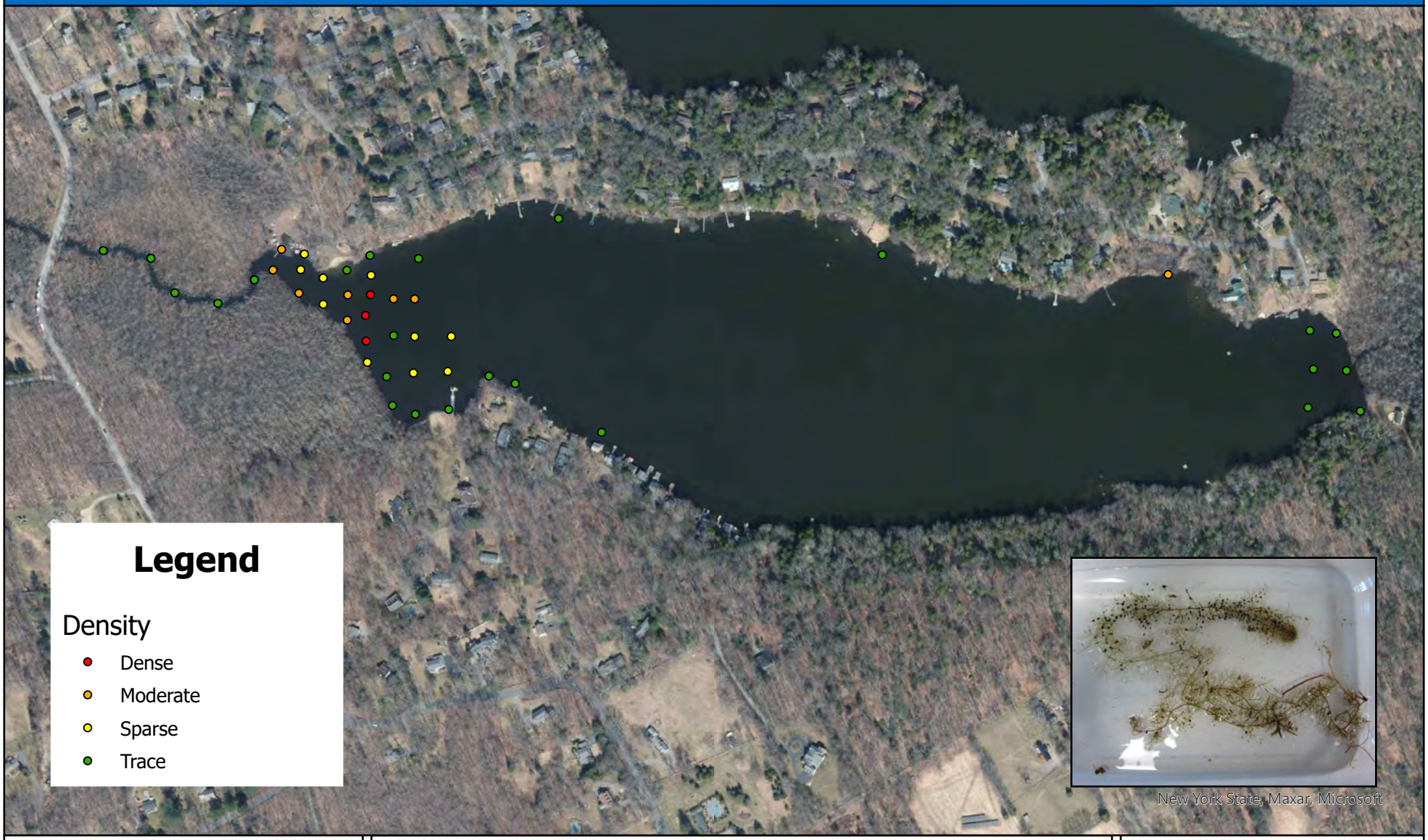

Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

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Figure 12. 2024 Point-Intercept Distribution and Density
Bassweed (*Potamogeton amplifolius*)

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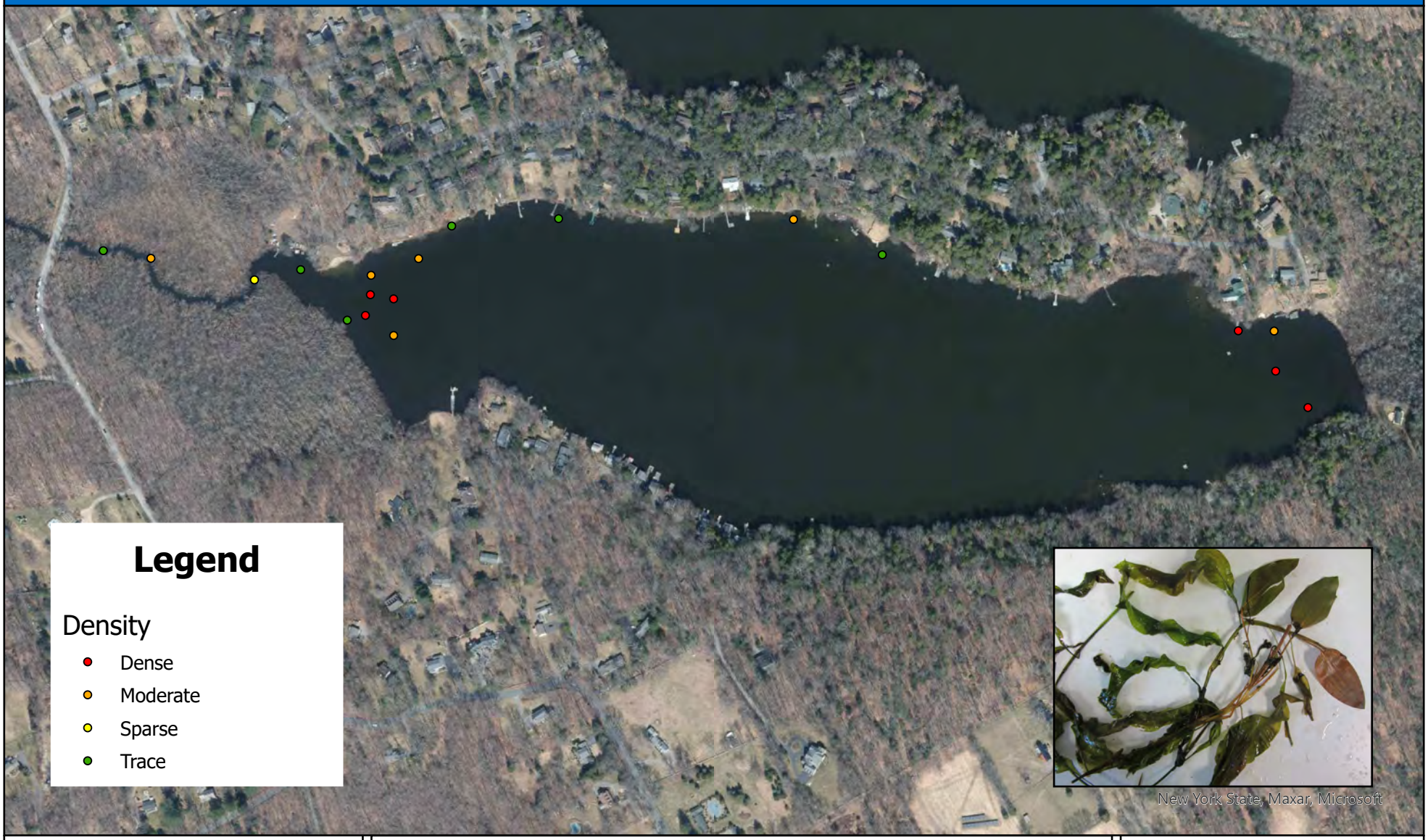

Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

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Figure 13. 2024 Point-Intercept Distribution and Density
Robbin's Pondweed (*Potamogeton robbinsii)*

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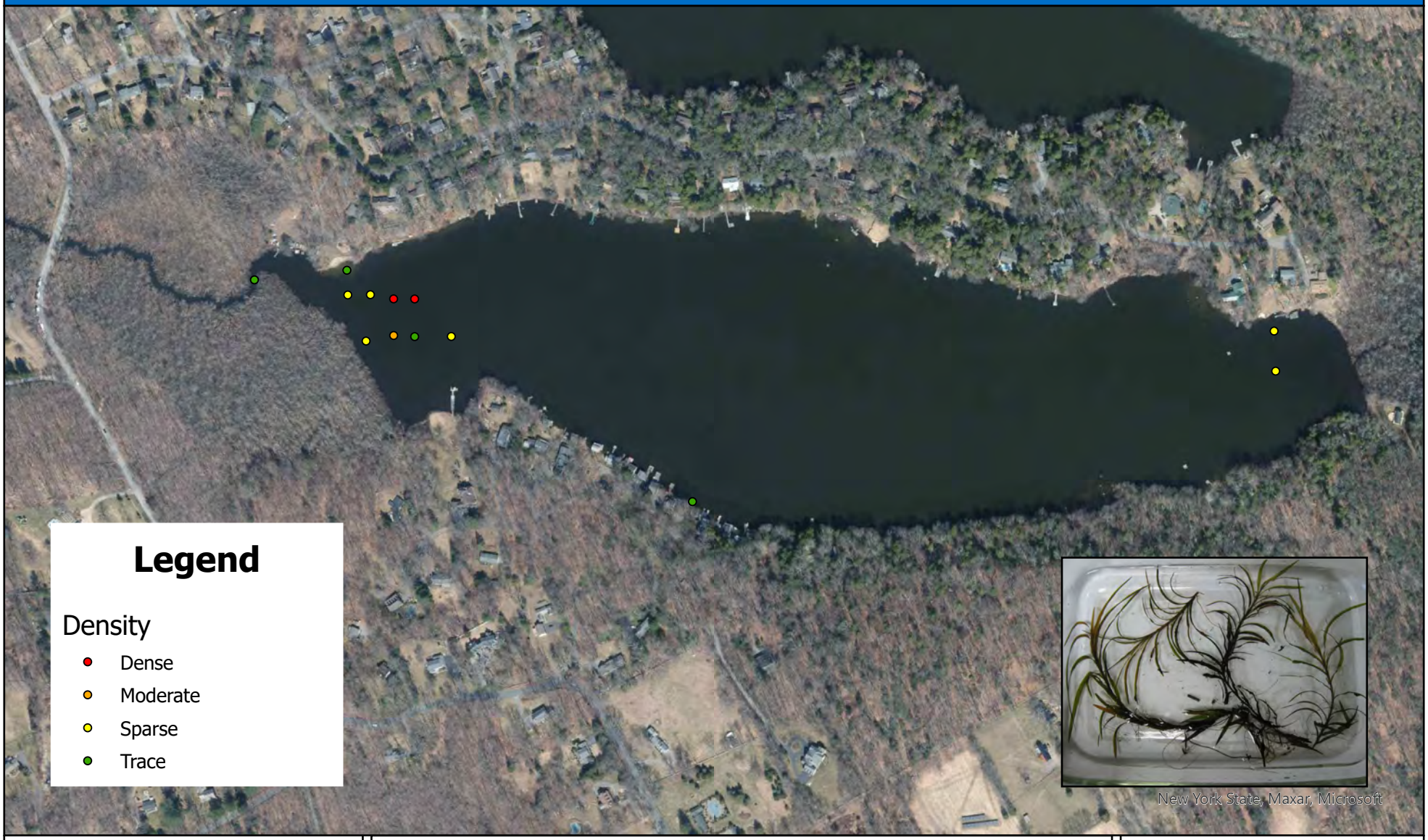

Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

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Figure 14. 2024 Point-Intercept Distribution and Density
Common Waterweed (*Elodea canadensis*)

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Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

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Figure 15. 2024 Point-Intercept Distribution and Density
Sago Pondweed (*Stuckenia pectinata*)

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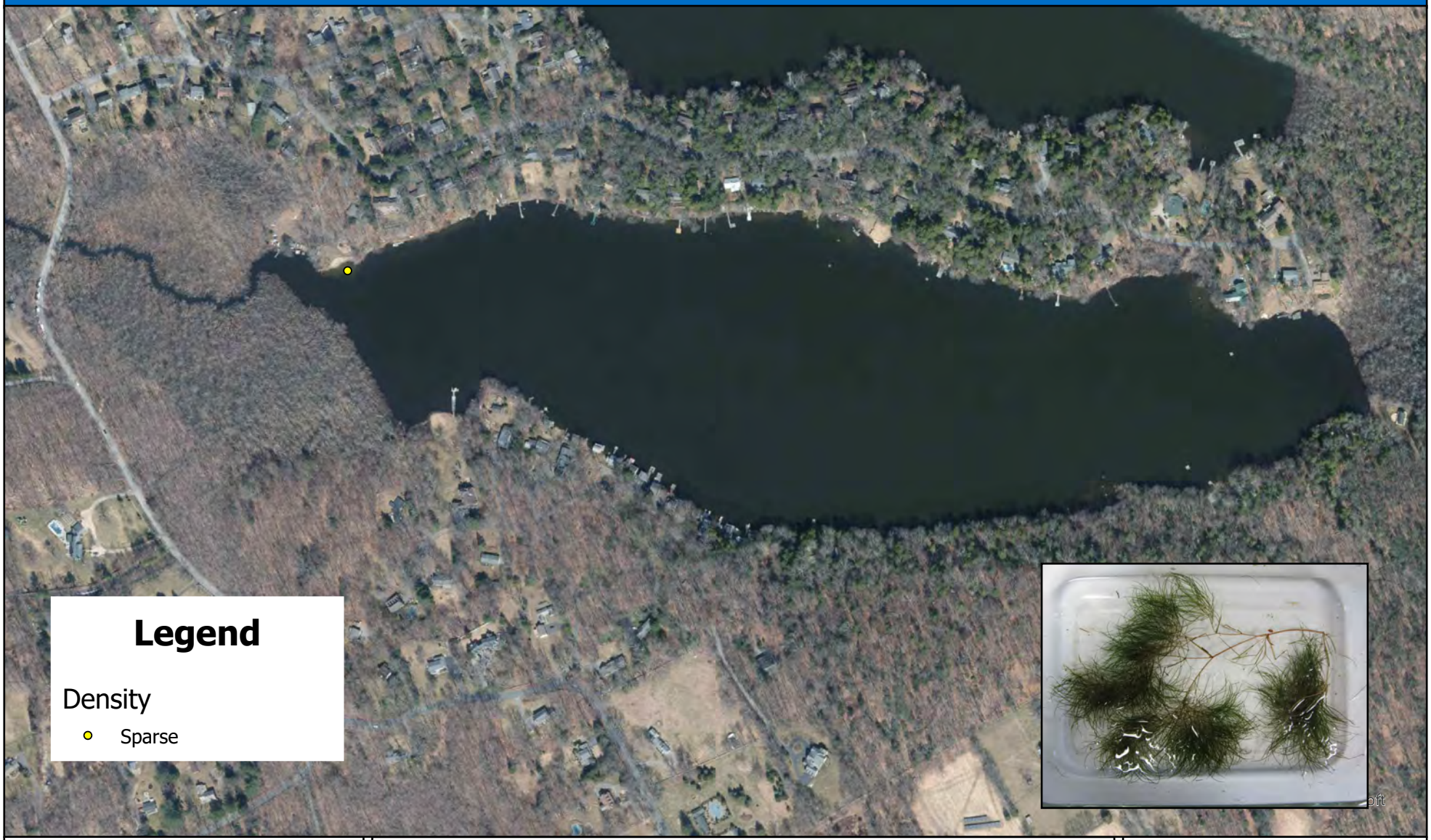

Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

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Figure 16. 2024 Point-Intercept Distribution and Density
Curly-leaf Pondweed (*Potamogeton crispus*)

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Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

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Figure 17. 2024 Point-Intercept Distribution and Density
Spatterdock (*Nuphar variegata)*

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Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

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Figure 18. 2024 Point-Intercept Distribution and Density
White Water Lily (*Nymphaea odorata*)

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Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

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Figure 19. 2024 Point-Intercept Distribution and Density
Watershield (*Brasenia schreberi)*

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Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 20. 2024 Point-Intercept Distribution and Density
Small Duckweed (*Lemna minor)*

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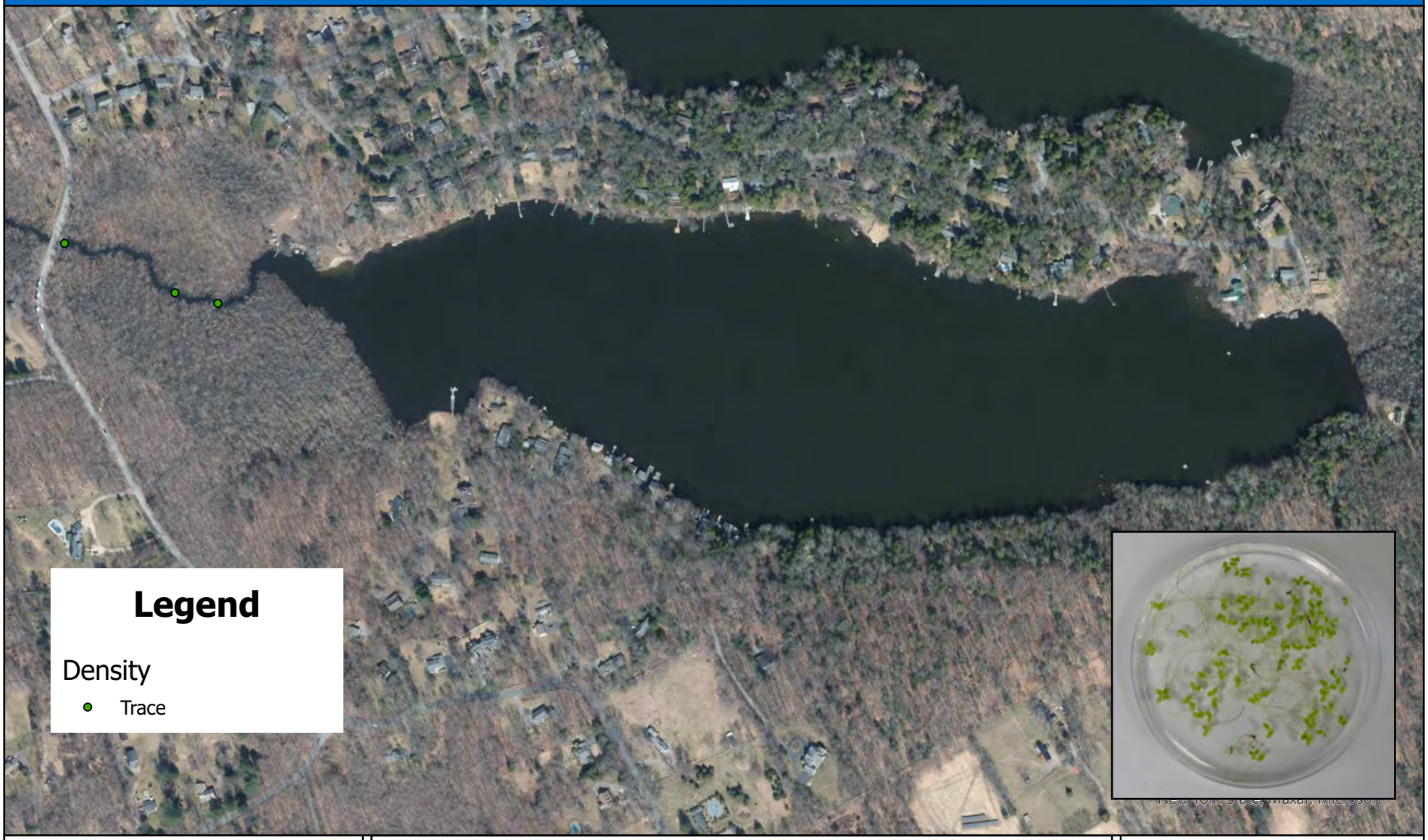

Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500
US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 21. 2024 Point-Intercept Distribution and Density
Pennywort (*Hydrocotyle spp.*)

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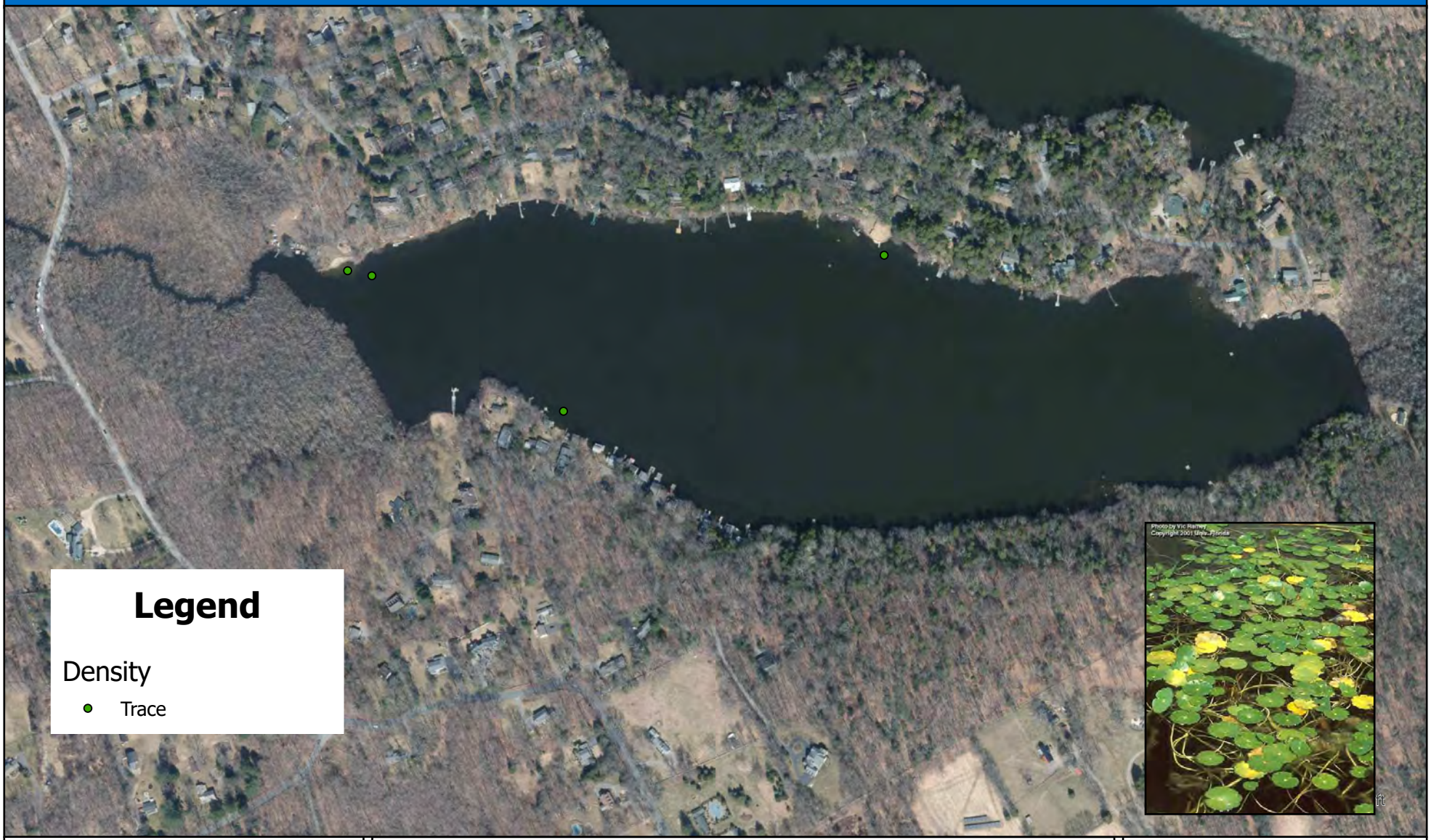

Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500
US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

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Figure 22. 2024 Point-Intercept Distribution and Density
Bur-reed (*Sparganium spp.)*

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Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
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Figure 23. 2024 Point-Intercept Distribution and Density
Cattail (*Typha spp.)*

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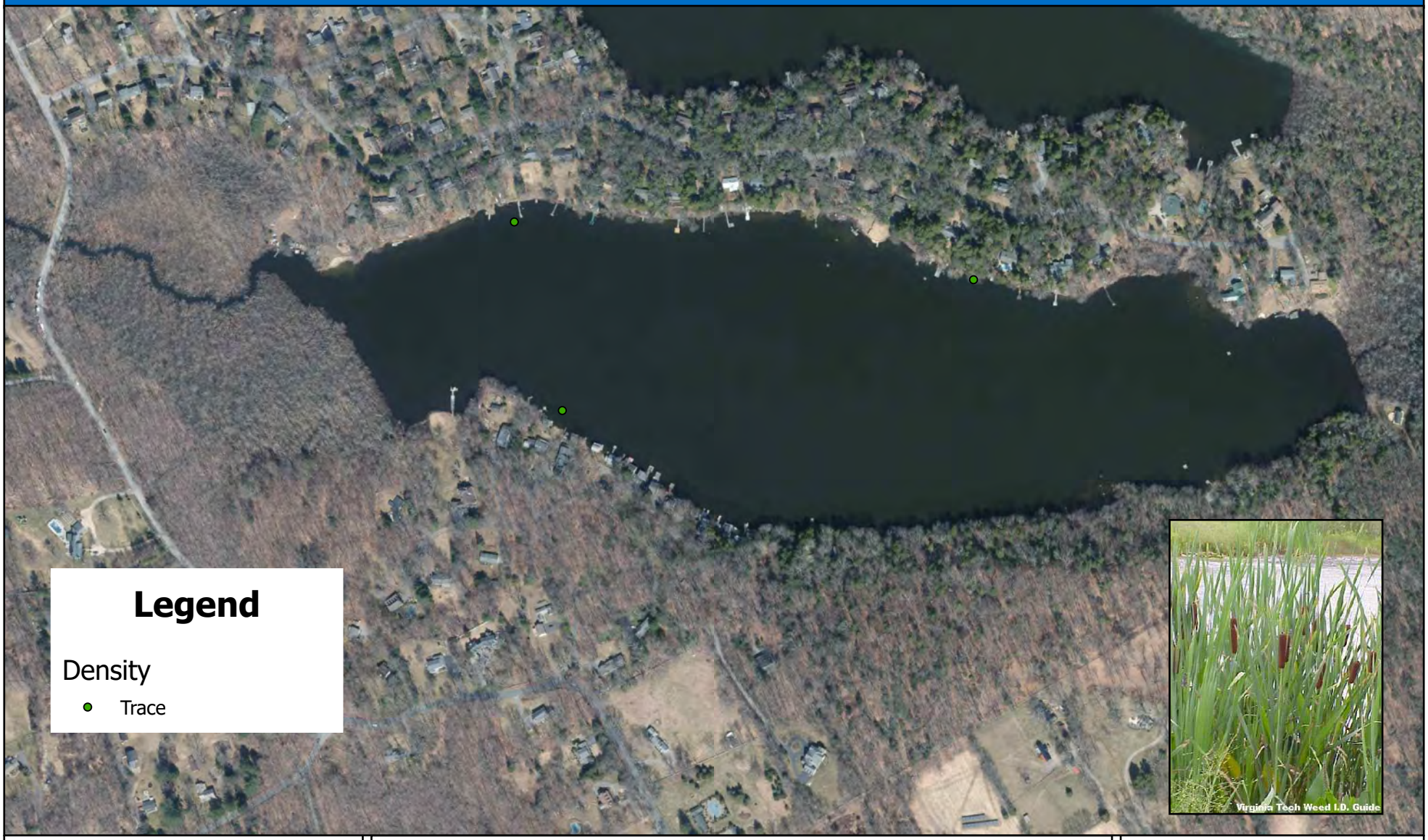

Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

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Figure 24. 2024 Point-Intercept Distribution and Density
Pickerelweed (*Pontederia cordata)*

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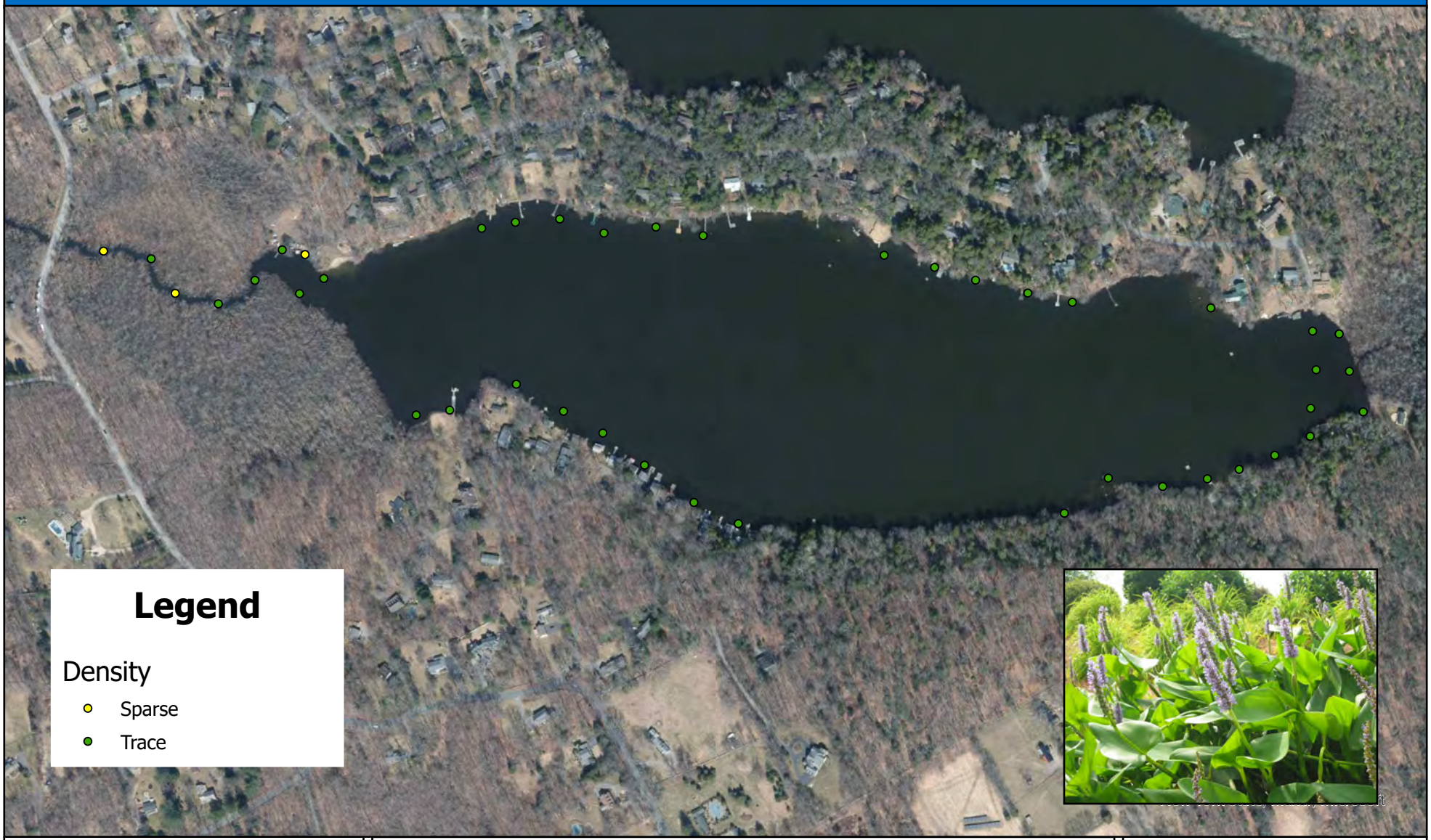

Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 25. 2024 Point-Intercept Distribution and Density
Arrowhead (*Sagittaria spp.)*

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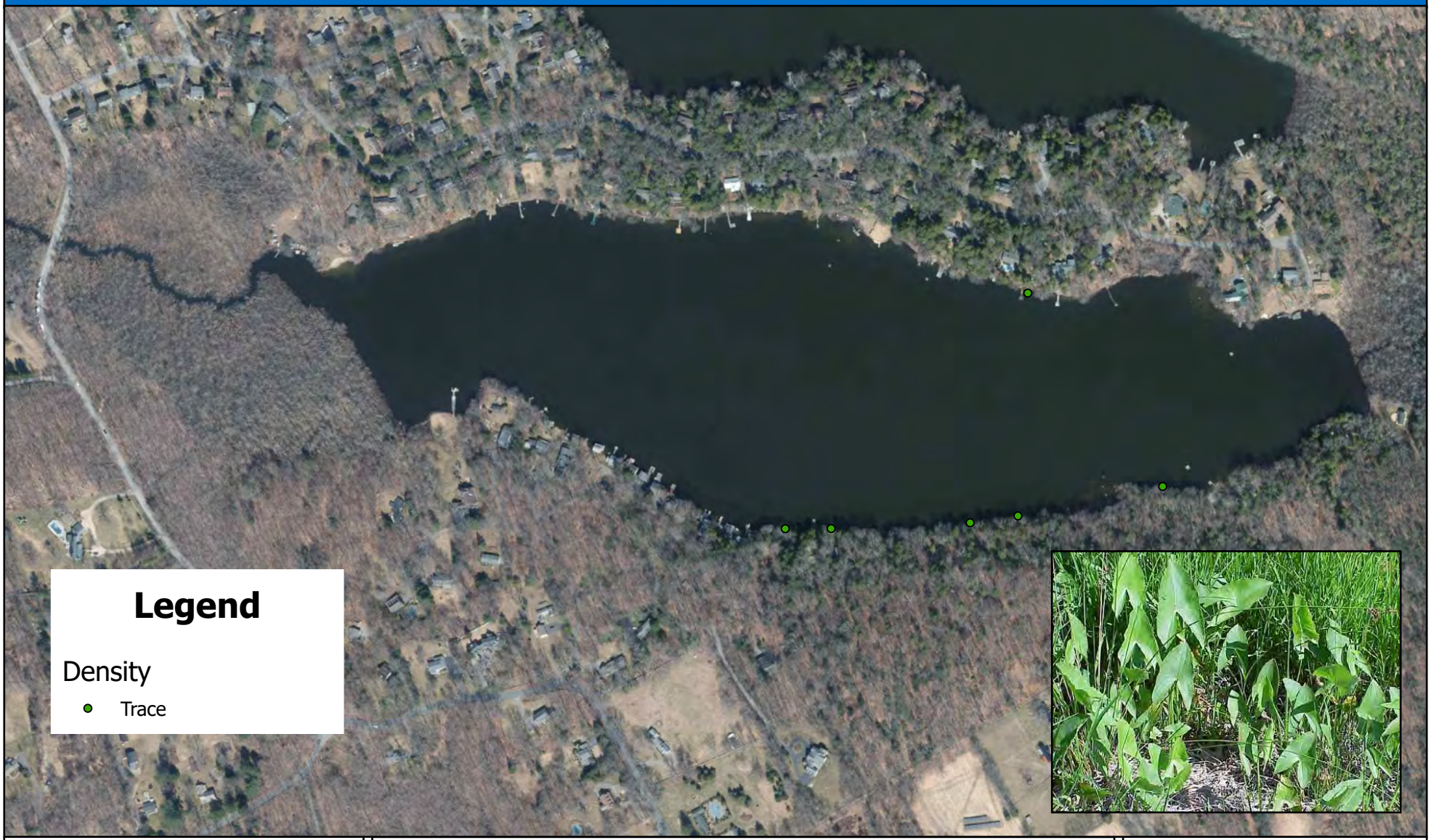
solitudelakemanagement.com



Lake Oscaleta
Lewisboro, New York

Center: 73°33'46"W 41°17'46"N
Scale: 1:5,869

N

LAKE OSCALETA

0 187.5 375 750 1,125 1,500 US Feet

Survey Date: August 7, 2024
Map Date: January 23, 2025

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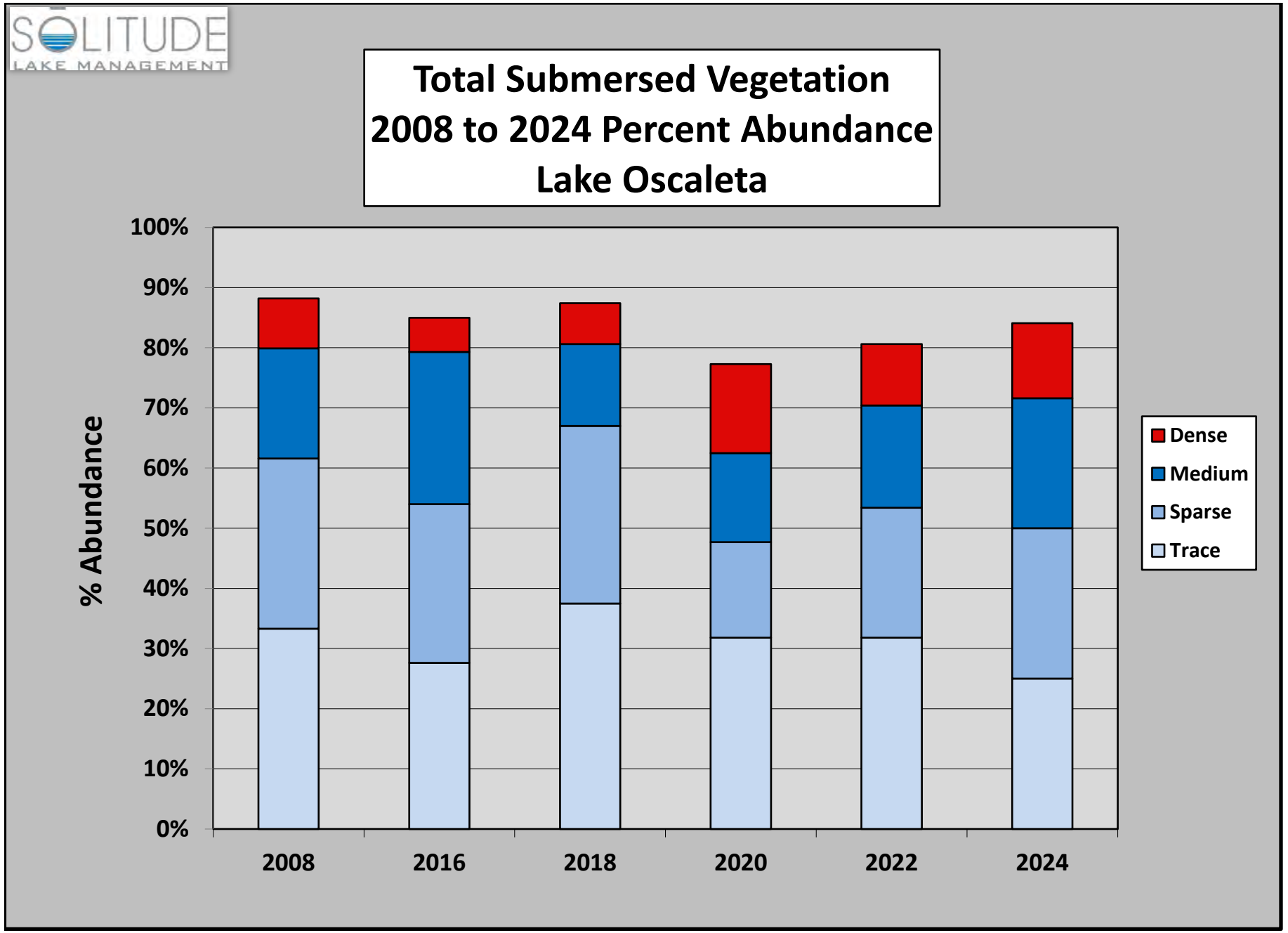
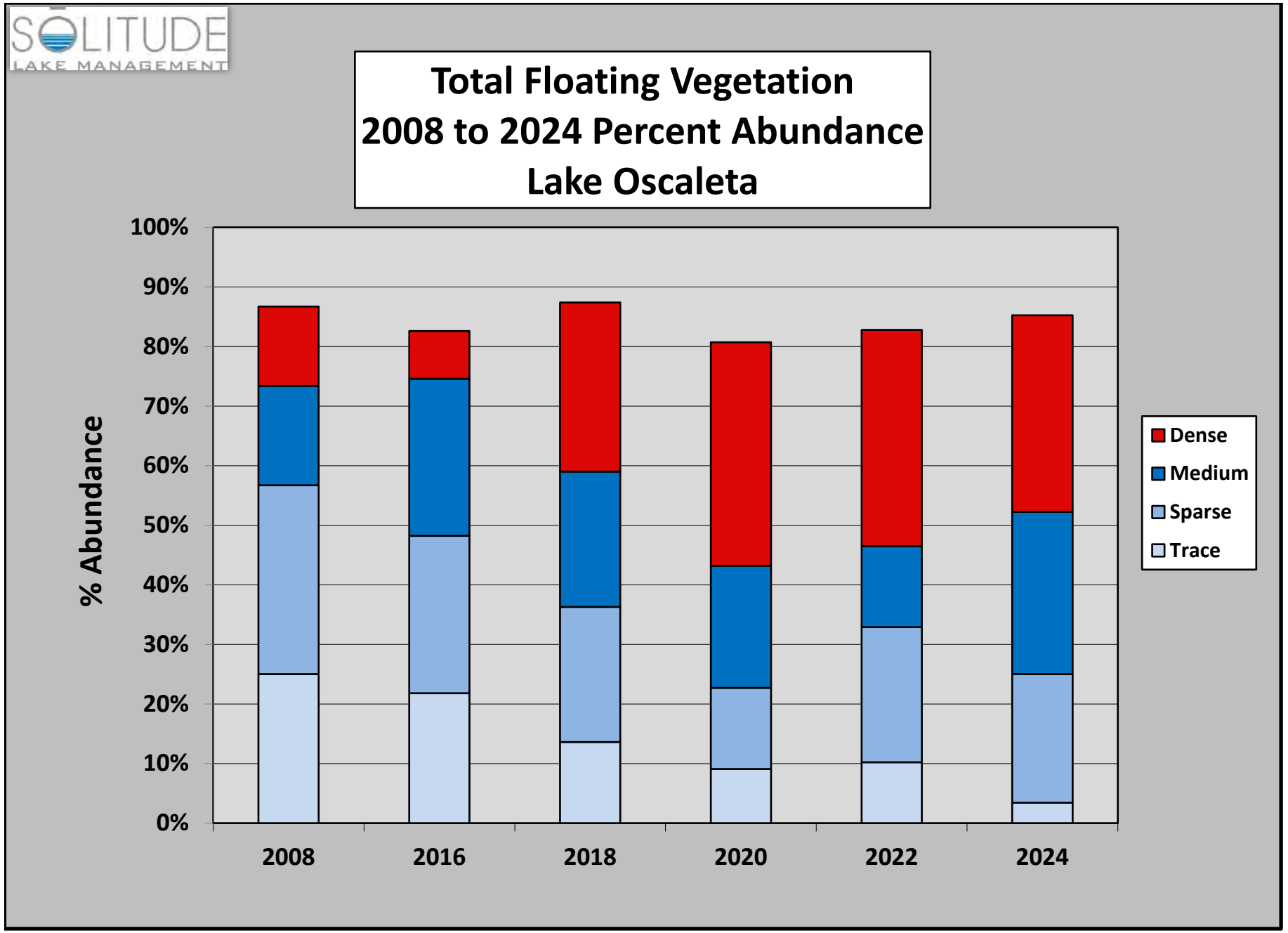
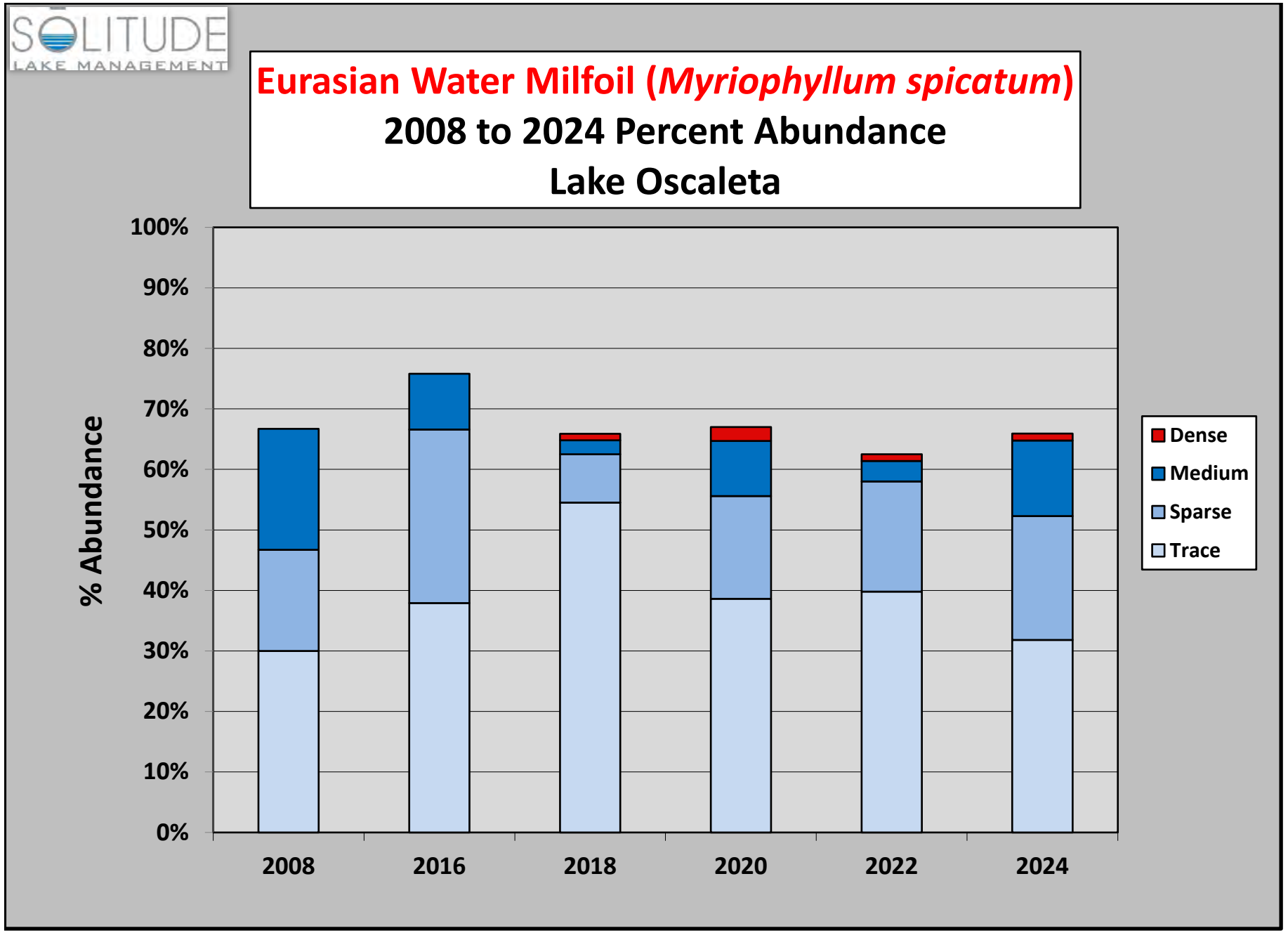
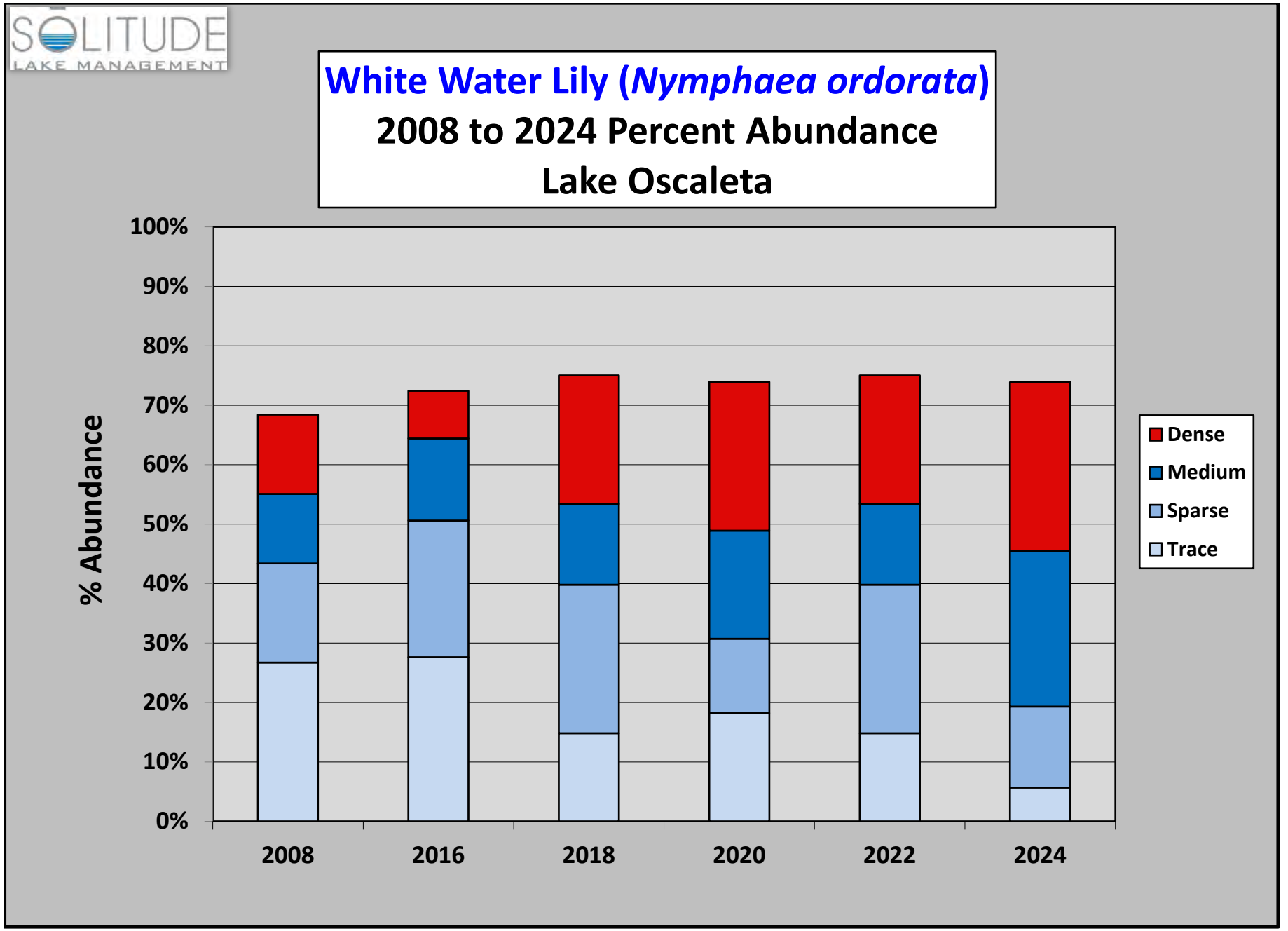
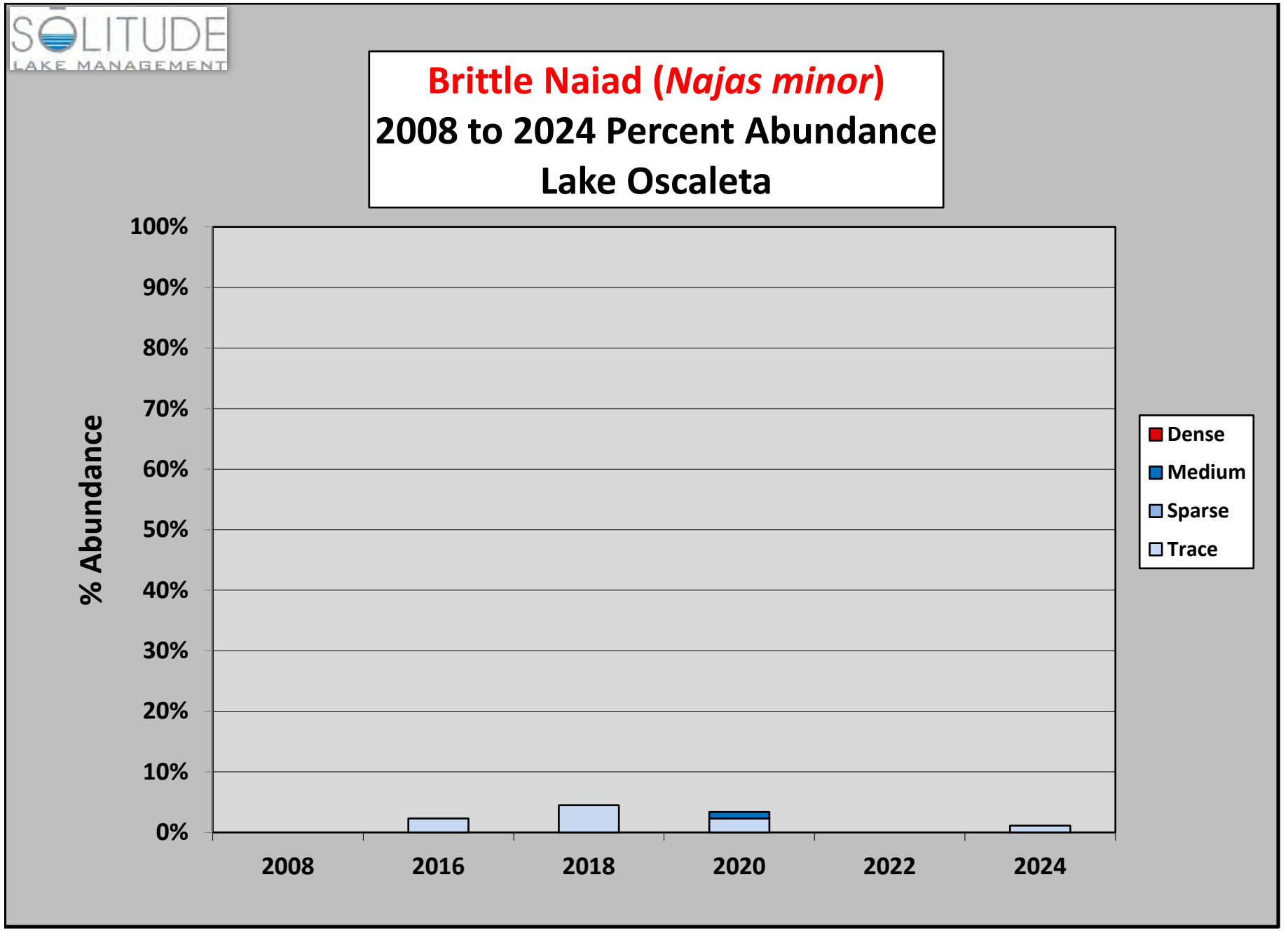
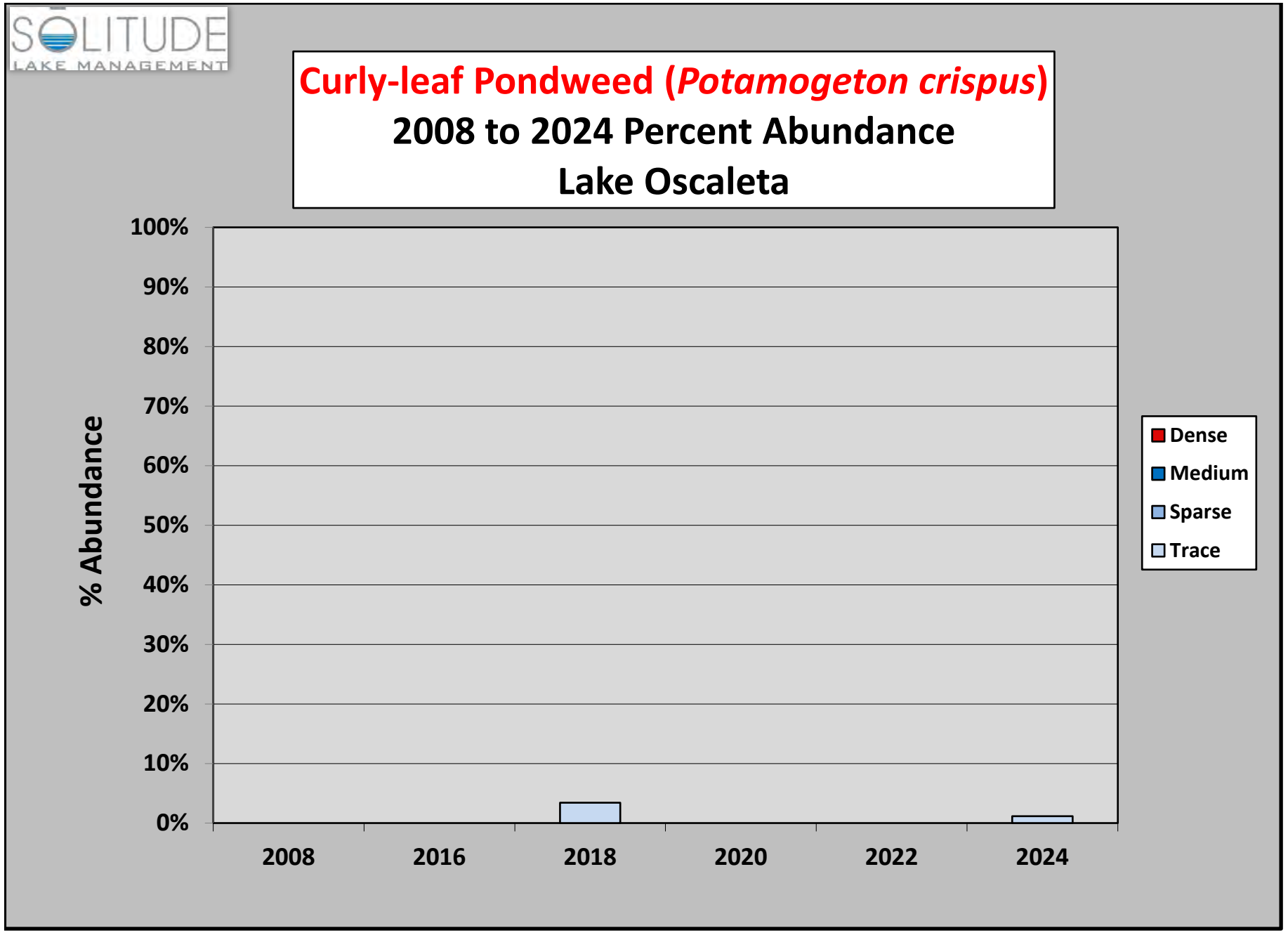

SOLITUDE
LAKE MANAGEMENT
Total Submersed Vegetation
2008 to 2024 Percent Abundance
Lake Oscaleta
% Abundance
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2008
2016
2018
2020
2022
2024
Dense
Medium
Sparse
Trace

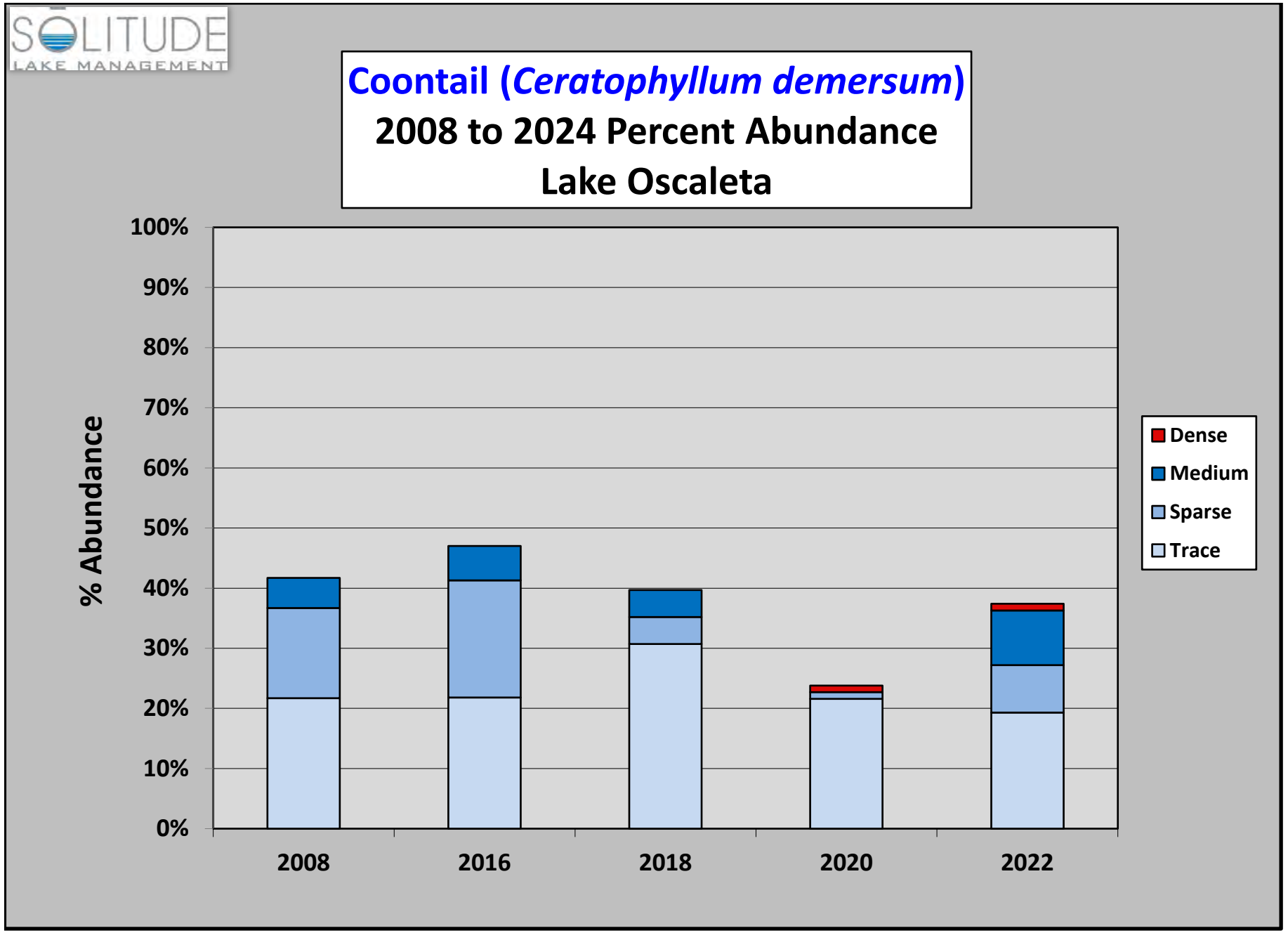

SOLITUDE
LAKE MANAGEMENT
Total Floating Vegetation
2008 to 2024 Percent Abundance
Lake Oscaleta
% Abundance
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2008
2016
2018
2020
2022
2024
Dense
Medium
Sparse
Trace


SOLITUDE
LAKE MANAGEMENT
Eurasian Water Milfoil (Myriophyllum spicatum)
2008 to 2024 Percent Abundance
Lake Oscaleta
% Abundance
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2008
2016
2018
2020
2022
2024
Dense
Medium
Sparse
Trace


SOLITUDE
LAKE MANAGEMENT
White Water Lily (Nymphaea ordorata)
2008 to 2024 Percent Abundance
Lake Oscaleta
% Abundance
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2008
2016
2018
2020
2022
2024
Dense
Medium
Sparse
Trace


SOLITUDE
LAKE MANAGEMENT
Brittle Naiad (*Najas minor*)
2008 to 2024 Percent Abundance
Lake Oscaleta
% Abundance
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2008
2016
2018
2020
2022
2024
Dense
Medium
Sparse
Trace


SOLITUDE
LAKE MANAGEMENT
Curly-leaf Pondweed (Potamogeton crispus)
2008 to 2024 Percent Abundance
Lake Oscaleta
% Abundance
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2008
2016
2018
2020
2022
2024
Dense
Medium
Sparse
Trace


SOLITUDE
LAKE MANAGEMENT
Coontail (Ceratophyllum demersum)
2008 to 2024 Percent Abundance
Lake Oscaleta
% Abundance
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2008
2016
2018
2020
2022
Dense
Medium
Sparse
Trace

Lake Rippowam
Aquatic Macrophyte Abundance Distribution
August 12, 2024

Aquatic Macrophyte	Total		Trace		Sparse		Medium		Dense	
	Sites	%	Sites	%	Sites	%	Sites	%	Sites	%
Total Submeresed Vegetation	29	48%	17	59%	9	31%	3	10%	0	0%
Eurasian Water Milfoil	27	45%	17	63%	7	26%	3	11%	0	0%
Pickerelweed	16	27%	16	100%	0	0%	0	0%	0	0%
Bassweed	6	10%	3	50%	2	33%	1	17%	0	0%
Benthic Filamentous Algae	2	3%	1	50%	1	50%	0	0%	0	0%
Small Blatterwort	2	3%	0	0%	2	100%	0	0%	0	0%
Total Floating Vegetation	34	57%	16	47%	0	0%	10	29%	8	24%
White Water Lilly	25	42%	7	28%	1	4%	10	40%	7	28%
Spatterdock	12	20%	4	33%	3	25%	4	33%	1	8%
Arrowhead	5	8%	5	100%	0	0%	0	0%	0	0%
Coontail	5	8%	5	100%	0	0%	0	0%	0	0%
Floating Filamentous Algae	3	5%	2	67%	1	33%	0	0%	0	0%

Lake Rippowam
Submersed Aquatic Vegetation Survey
August 12, 2024

STATION	SAMPLE	LATITUDE (NAD83)	LONGITUDE (NAD83)	DEPTH	Total Floating Vegetation	Total Submeresed Vegetation	Arrowhead	Bassweed	Benthic Filamentous Algae	Coontail	Eurasian Water Milfoil	Floating Filamentous Algae	Pickerelweed	Small Blatterwort	Spatterdock	White Water Lilly
1	A			1.5	T	T					T	T	T			T
1	B				T	S					S	T	T			
1	M	41.298832°	-73.556193°	2	T	S					S	T	T			T
2	A			7												
2	B															
2	M	41.299067°	-73.556191°	7												
3	A			8.5												
3	B															
3	M	41.299301°	-73.556172°	9												
4	A			7.5												
4	B															
4	M	41.299574°	-73.556189°	8												
5	A			2.5												
5	B															
5	M	41.299796°	-73.556151°	3												
6	A			3	T	T					T		T			
6	B															
6	M	41.299703°	-73.555894°	3	T	T					T		T			
7	A			6	T	T					T					T
7	B					T					T					
7	M	41.299543°	-73.555882°	6	T	T					T					T
8	A			6.5	T	T					T					T
8	B															
8	M	41.299302°	-73.555891°	7	T	T					T					T
9	A			7		T					T					
9	B															
9	M	41.299058°	-73.555933°	7		T					T					
10	A			2	M	T					T		T			M
10	B				M	S					S		T			M
10	M	41.29887°	-73.555941°	2	M	S					S		T			M
11	A			3.5	M	T					T				M	S
11	B				D	T					T				D	M
11	M	41.299072°	-73.555714°	4	D	T					T				D	M
12	A			4.5	D	T			T						M	D
12	B				D										M	D
12	M	41.299315°	-73.555614°	5	D	T			T						M	D
13	A			3	S										S	T
13	B				M										M	S
13	M	41.299545°	-73.555627°	3	M										M	S
14	A			3.5												
14	B															
14	M	41.299993°	-73.556752°	4												
15	A			3.5												
15	B															
15	M	41.300221°	-73.557345°	4												
16	A			4	T		T								T	
16	B															
16	M	41.300423°	-73.557925°	4	T		T								T	
17	A			4.5												
17	B															
17	M	41.300512°	-73.558576°	5												
18	A			5												
18	B															
18	M	41.300586°	-73.559155°	5												
19	A			5												
19	B															
19	M	41.300819°	-73.559771°	5												
20	A			4	T		T									
20	B															
20	M	41.300985°	-73.560373°	4	T		T									
21	A			4.5												
21	B															
21	M	41.301046°	-73.560899°	5												
22	A			6												
22	B															
22	M	41.301051°	-73.561577°	6												
23	A			6												
23	B															
23	M	41.301076°	-73.562171°	6												
24	A			6												
24	B															
24	M	41.301189°	-73.562701°	6												

Lake Rippowam
Submersed Aquatic Vegetation Survey
August 12, 2024

STATION	SAMPLE	LATITUDE (NAD83)	LONGITUDE (NAD83)	DEPTH	Total Floating Vegetation	Total Submeresed Vegetation	Arrowhead	Bassweed	Benthic filamentous Algae	Coontail	Eurasian Water Milfoil	Floating Filamentous Algae	Pickerelweed	Small Blatterwort	Spatterdock	White Water Lilly
25	A			3	T		T						T			T
25	B				T								T			
25	M	41.301221°	-73.563398°	3	T		T						T			T
26	A			4	T		T						T			
26	B															
26	M	41.301225°	-73.563956°	4	T		T						T			
27	A			3		T					T					
27	B					T					T					
27	M	41.30136°	-73.564581°	3		T					T					
28	A			7												
28	B															
28	M	41.301211°	-73.564572°	7												
29	A			8												
29	B															
29	M	41.300986°	-73.564585°	8												
30	A			13												
30	B															
30	M	41.300752°	-73.564585°	13												
31	A			14.5												
31	B															
31	M	41.30054°	-73.564566°	15												
32	A			10												
32	B															
32	M	41.300333°	-73.564581°	10												
33	A			8												
33	B															
33	M	41.300069°	-73.564593°	8												
34	A			4	S	S		S			S	T				S
34	B				M	M		M			M					M
34	M	41.299809°	-73.56464°	4	M	M		M			M	T				M
35	A			2	T	T					T		T			
35	B															
35	M	41.300062°	-73.564856°	2	T	T					T		T			
36	A			6.5		T					T					
36	B					T					T					
36	M	41.300272°	-73.56489°	7		T					T					
37	A			10												
37	B															
37	M	41.300488°	-73.56488°	10												
38	A			12												
38	B															
38	M	41.300741°	-73.564849°	12												
39	A			10		T					T					
39	B															
39	M	41.300919°	-73.564845°	10		T					T					
40	A			6	D	T					T				M	D
40	B				D	T					T				M	D
40	M	41.301181°	-73.564852°	6	D	T					T				M	D
41	A			1.5	D	M					M		T		S	D
41	B				D	M					M		T		M	D
41	M	41.301363°	-73.564813°	2	D	M					M		T		M	D
42	A			1	D	T		T		T	T		T	T	S	D
42	B				D	S		S			T		T	S	S	D
42	M	41.301205°	-73.565047°	1	D	S		S		T	T		T	S	S	D
43	A			1.75	D	T				T	T					D
43	B				D	T				T	T					D
43	M	41.300922°	-73.565138°	2	D	T				T	T					D
44	A			2	D	S					S				T	D
44	B				D	S					S				T	D
44	M	41.300742°	-73.565191°	2	D	S					S				T	D
45	A			1.5	D	S		T		T	S			T	T	D
45	B				D	S				T	S			S	S	D
45	M	41.300497°	-73.565262°	2	D	S		T		T	S			S	S	D
46	A			1.5	T	S		T		T	S		T			
46	B				T	S					S		T			
46	M	41.300248°	-73.565216°	2	T	S		T		T	S		T			
47	A			2.5	M								T			M
47	B				M								T			M
47	M	41.299366°	-73.564037°	3	M								T			M
48	A			3	M	T					T		T			M
48	B				M	T					T					M
48	M	41.299183°	-73.563376°	3	M	T					T		T			M

Lake Rippowam
Submersed Aquatic Vegetation Survey
August 12, 2024

STATION	SAMPLE	LATITUDE (NAD83)	LONGITUDE (NAD83)	DEPTH	Total Floating Vegetation	Total Submeresed Vegetation	Arrowhead	Bassweed	Benthic filamentous Algae	Coontail	Eurasian Water Milfoil	Floating Filamentous Algae	Pickerelweed	Small Blatterwort	Spatterdock	White Water Lilly
49	A			2	T	T					T					T
49	B				T											T
49	M	41.299277°	-73.562771°	2	T	T					T					T
50	A			2	S	S		T			S		T		T	S
50	B				M	S					S		T			M
50	M	41.299321°	-73.562111°	2	M	S		T			S		T		T	M
51	A			3	M	T							T			M
51	B				M	T							T			M
51	M	41.299524°	-73.561524°	3	M	T							T			M
52	A			4	T								T			
52	B															
52	M	41.299557°	-73.560975°	4	T								T			
53	A			6	T	T					T		T			
53	B															
53	M	41.299495°	-73.560397°	6	T	T					T		T			
54	A			7	T											T
54	B				T											T
54	M	41.29923°	-73.5598°	7	T											T
55	A			3	M	S					S		T			M
55	B				M	M					M		T			M
55	M	41.298902°	-73.559187°	3	M	M					M		T			M
56	A			4.5												
56	B															
56	M	41.298988°	-73.558609°	5												
57	A			2	T		T									
57	B															
57	M	41.299084°	-73.55796°	2	T		T									
58	A			2	S	T					T				T	S
58	B				M	S					S				T	M
58	M	41.299183°	-73.557414°	2	M	S					S				T	M
59	A			2	T	T					T					T
59	B															
59	M	41.298989°	-73.556814°	2	T	T					T					T
60	A			1.5	M	S		T	S	T	T	S			T	M
60	B				M	S		S	S	T	T	S			S	M
60	M	41.298625°	-73.556833°	2	M	S		S	S	T	T	S			S	M

Figure 1. 2024 Point-Intercept Sample Locations

SOLITUDE
LAKE MANAGEMENT
888.480.5253
solitudelakemanagement.com

Lake Rippowam
Lewisboro, New York

Center: 73°33'38"W 41°17'58"N
Scale: 1:3,396

N

LAKE RIPPOWAM

0 125 250 500 750 1,000 US Feet

Survey Date: August 12, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 2. 2024 Point-Intercept Depth

SOLITUDE
LAKE MANAGEMENT
888.480.5253
solitudelakemanagement.com

Lake Rippowam
Lewisboro, New York

Center: 73°33'38"W 41°17'58"N
Scale: 1:3,396

N

LAKE RIPPOWAM

0 125 250 500 750 1,000 US Feet

Survey Date: August 12, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 3. 2024 Point-Intercept Total Floating Vegetation

SOLITUDE
LAKE MANAGEMENT
888.480.5253
solitudelakemanagement.com

Lake Rippowam
Lewisboro, New York

Center: 73°33'38"W 41°17'58"N
Scale: 1:3,396

N

LAKE RIPPOWAM

0 125 250 500 750 1,000 US Feet

Survey Date: August 12, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 4. 2024 Point-Intercept Total Submersed Vegetation

SOLITUDE
LAKE MANAGEMENT
888.480.5253
solitudelakemanagement.com

Lake Rippowam
Lewisboro, New York

Center: 73°33'38"W 41°17'58"N
Scale: 1:3,396

N

LAKE RIPPOWAM

0 125 250 500 750 1,000 US Feet

Survey Date: August 12, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 5. 2024 Point-Intercept Distribution and Density
Pickerelweed (*Pontederia cordata*)

SOLITUDE
LAKE MANAGEMENT
888.480.5253
solitudelakemanagement.com

Lake Rippowam
Lewisboro, New York

Center: 73°33'38"W 41°17'58"N
Scale: 1:3,396

N

LAKE RIPPOWAM

0 125 250 500 750 1,000 US Feet

Survey Date: August 12, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 6. 2024 Point-Intercept Distribution and Density
Eurasian Watermilfoil (*Myriophyllum spicatum*)

SOLITUDE
LAKE MANAGEMENT
888.480.5253
solitudelakemanagement.com

Lake Rippowam
Lewisboro, New York

Center: 73°33'38"W 41°17'58"N
Scale: 1:3,396

N

LAKE RIPPOWAM

0 125 250 500 750 1,000 US Feet

Survey Date: August 12, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 7. 2024 Point-Intercept Distribution and Density
White Waterlily (*Nymphaea odorata)*

SOLITUDE
LAKE MANAGEMENT
888.480.5253
solitudelakemanagement.com

Legend

Density

- Dense
- Moderate
- Sparse
- Trace

New York State, Maxar

Lake Rippowam
Lewisboro, New York

Center: 73°33'38"W 41°17'58"N
Scale: 1:3,396

N

LAKE RIPPOWAM

0 125 250 500 750 1,000 US Feet

Survey Date: August 12, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 8. 2024 Point-Intercept Distribution and Density
Floating Filamentous Algae (Various Species)

SOLITUDE
LAKE MANAGEMENT
888.480.5253
solitudelakemanagement.com

Lake Rippowam
Lewisboro, New York

Center: 73°33'38"W 41°17'58"N
Scale: 1:3,396

N

LAKE RIPPOWAM

0 125 250 500 750 1,000 US Feet

Survey Date: August 12, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 9. 2024 Point-Intercept Distribution and Density
Spatterdock *(Nuphar variegata)*

SOLITUDE
LAKE MANAGEMENT
888.480.5253
solitudelakemanagement.com

Lake Rippowam
Lewisboro, New York

Center: 73°33'38"W 41°17'58"N
Scale: 1:3,396

N

LAKE RIPPOWAM

0 125 250 500 750 1,000 US Feet

Survey Date: August 12, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 10. 2024 Point-Intercept Distribution and Density
Benthic Filamentous Algae (Various Species)

SOLITUDE
LAKE MANAGEMENT
888.480.5253
solitudelakemanagement.com

Lake Rippowam
Lewisboro, New York

Center: 73°33'38"W 41°17'58"N
Scale: 1:3,396

N

LAKE RIPPOWAM

0 125 250 500 750 1,000 US Feet

Survey Date: August 12, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 11. 2024 Point-Intercept Distribution and Density
Arrowhead *(Sagittaria spp.)*

SOLITUDE
LAKE MANAGEMENT
888.480.5253
solitudelakemanagement.com

Lake Rippowam
Lewisboro, New York

Center: 73°33'38"W 41°17'58"N
Scale: 1:3,396

N

LAKE RIPPOWAM

0 125 250 500 750 1,000 US Feet

Survey Date: August 12, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 12. 2024 Point-Intercept Distribution and Density
Bassweed *(Potamogeton amplifolius)*

SOLITUDE
LAKE MANAGEMENT
888.480.5253
solitudelakemanagement.com

Legend

Density
- Moderate
- Sparse
- Trace

New York State, Maxar, Microsoft

Lake Rippowam
Lewisboro, New York

Center: 73°33'38"W 41°17'58"N
Scale: 1:3,396

N

LAKE RIPPOWAM

0 125 250 500 750 1,000 US Feet

Survey Date: August 12, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 13. 2024 Point-Intercept Distribution and Density
Small Bladderwort *(Utricularia minor)*

SOLITUDE
LAKE MANAGEMENT
888.480.5253
solitudelakemanagement.com

Legend

Density

- Sparse

New York State, Maxar

Lake Rippowam
Lewisboro, New York

Center: 73°33'38"W 41°17'58"N
Scale: 1:3,396

N

LAKE RIPPOWAM

0 125 250 500 750 1,000 US Feet

Survey Date: August 12, 2024
Map Date: January 23, 2025

Prepared by: E. Vulgamore

Office: Shrewsbury, Massachusetts

Figure 14. 2024 Point-Intercept Distribution and Density
Coontail *(Ceratophyllum demersum)*

SOLITUDE
LAKE MANAGEMENT
888.480.5253
solitudelakemanagement.com

Legend

Density

- Trace

New York State, Maxar, Microsoft

Lake Rippowam
Lewisboro, New York

Center: 73°33'38"W 41°17'58"N
Scale: 1:3,396

N

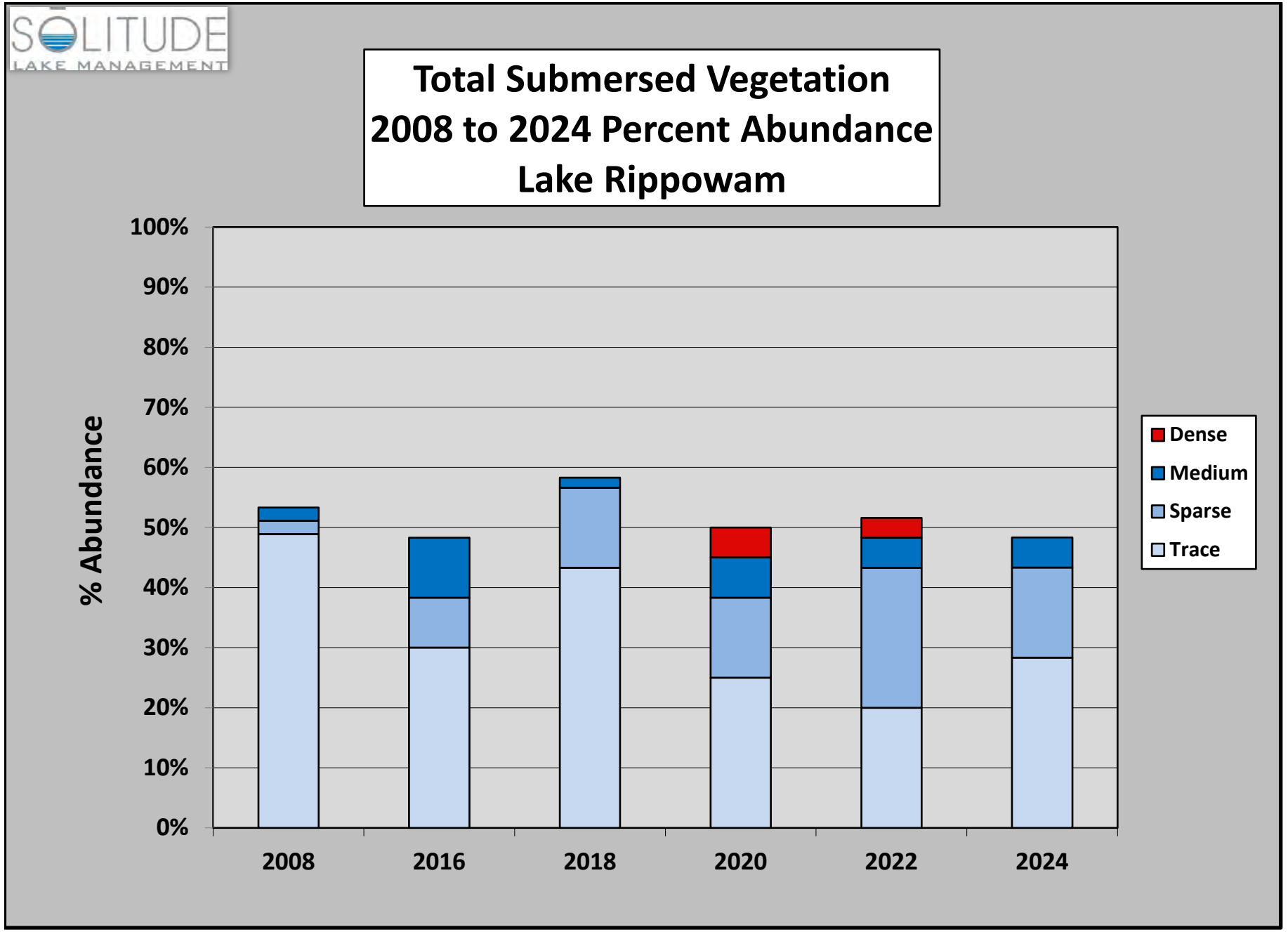
LAKE RIPPOWAM

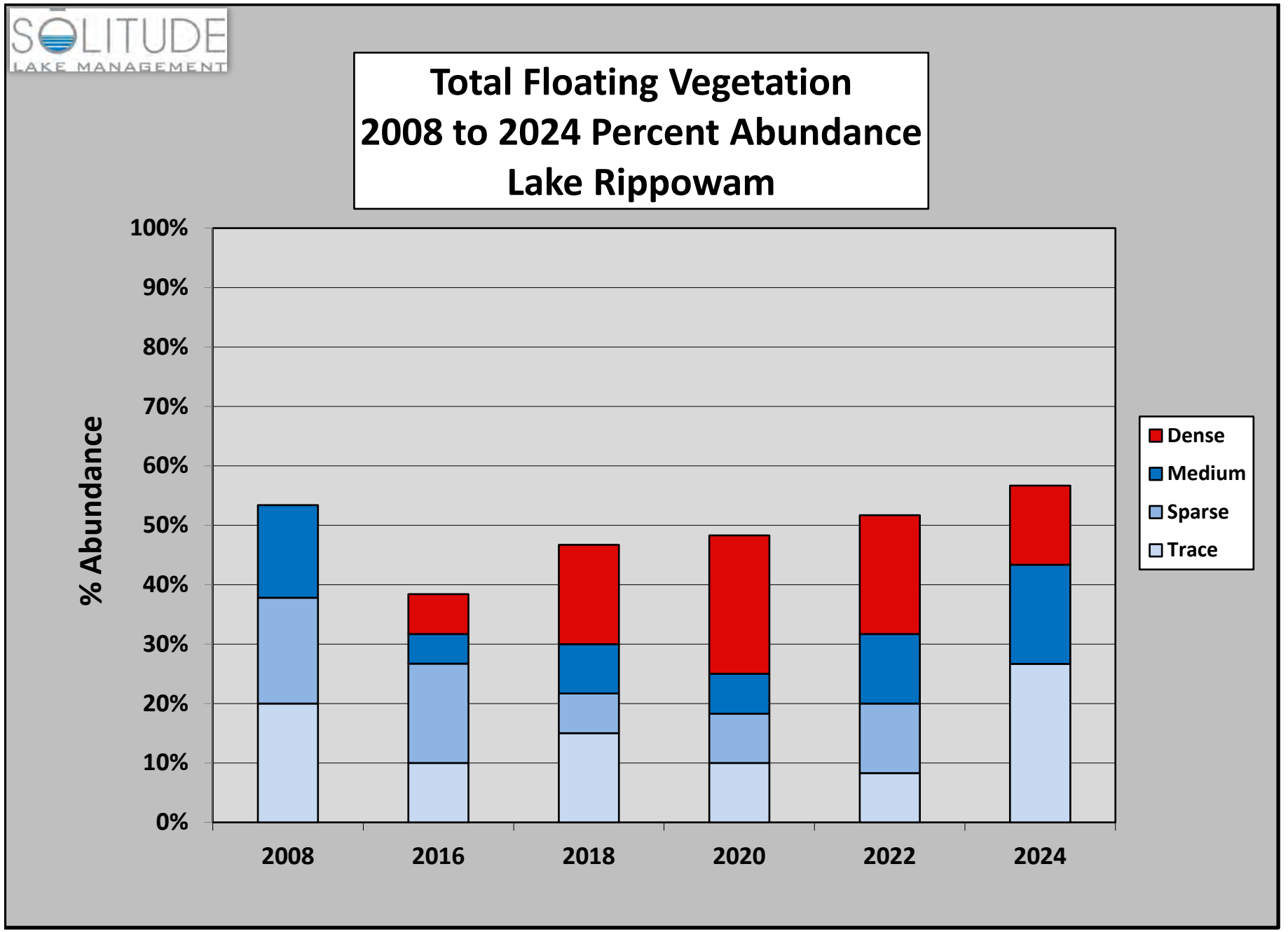
0 125 250 500 750 1,000 US Feet

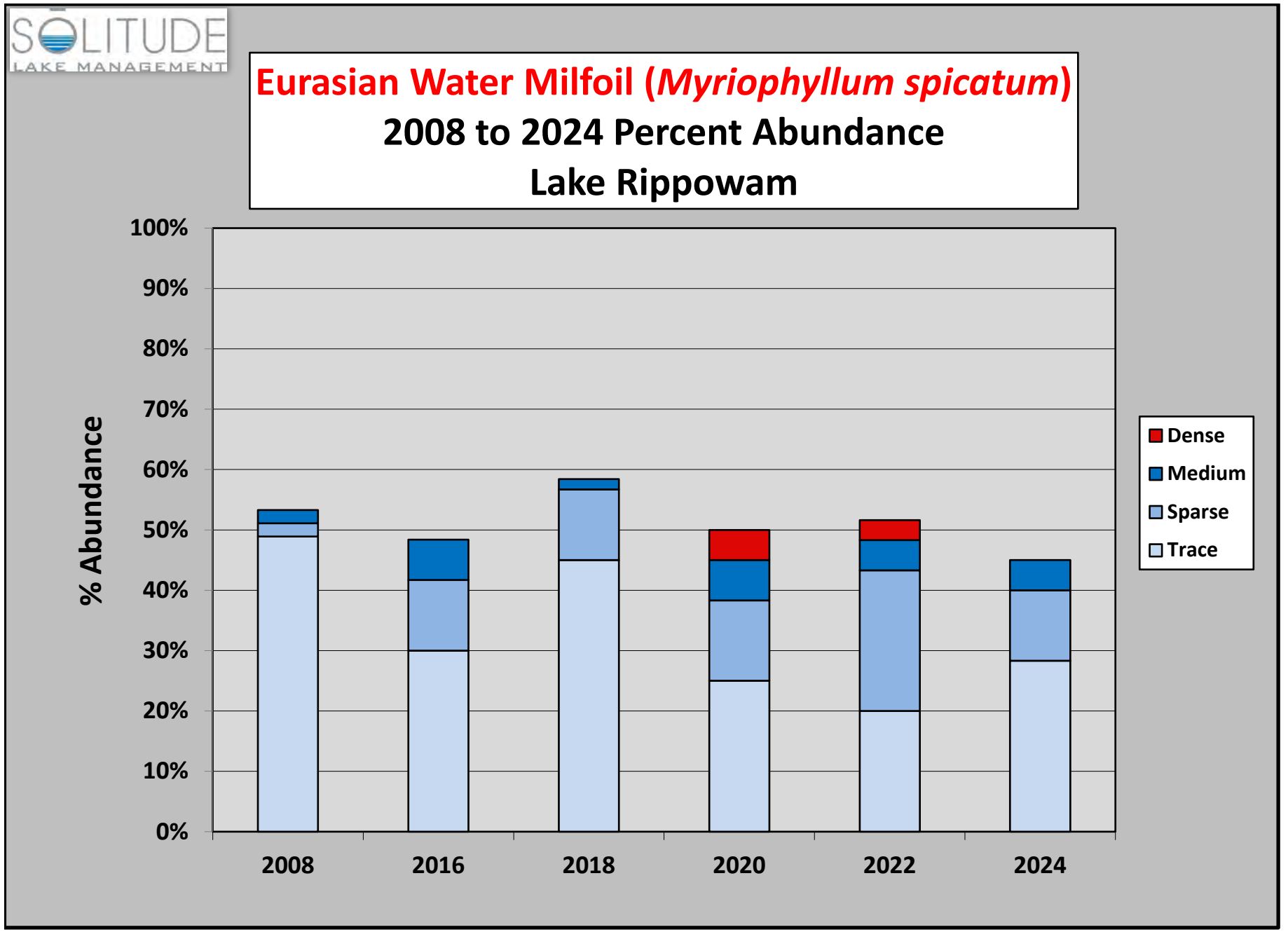
Survey Date: August 12, 2024
Map Date: January 23, 2025

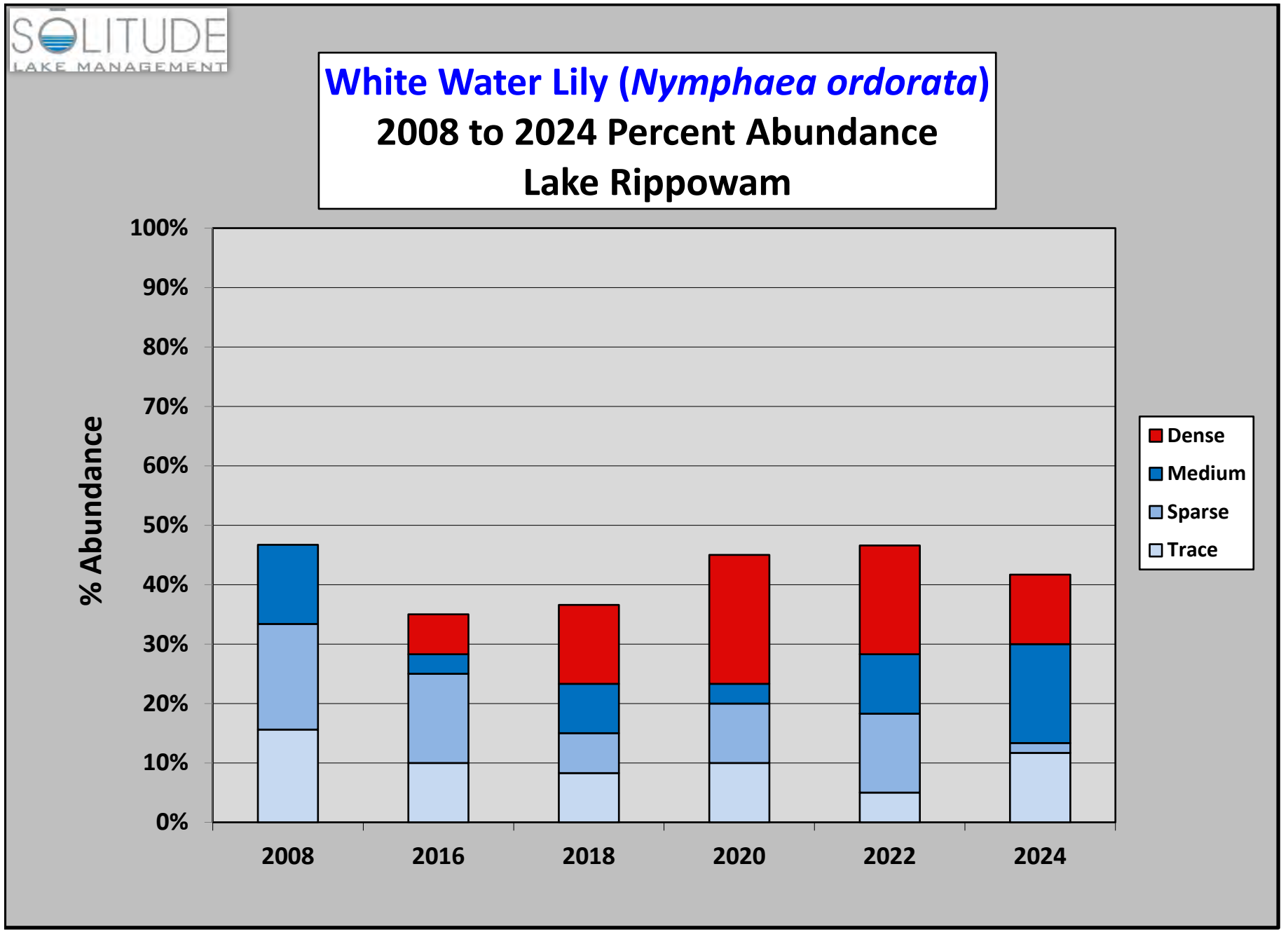
Prepared by: E. Vulgamore

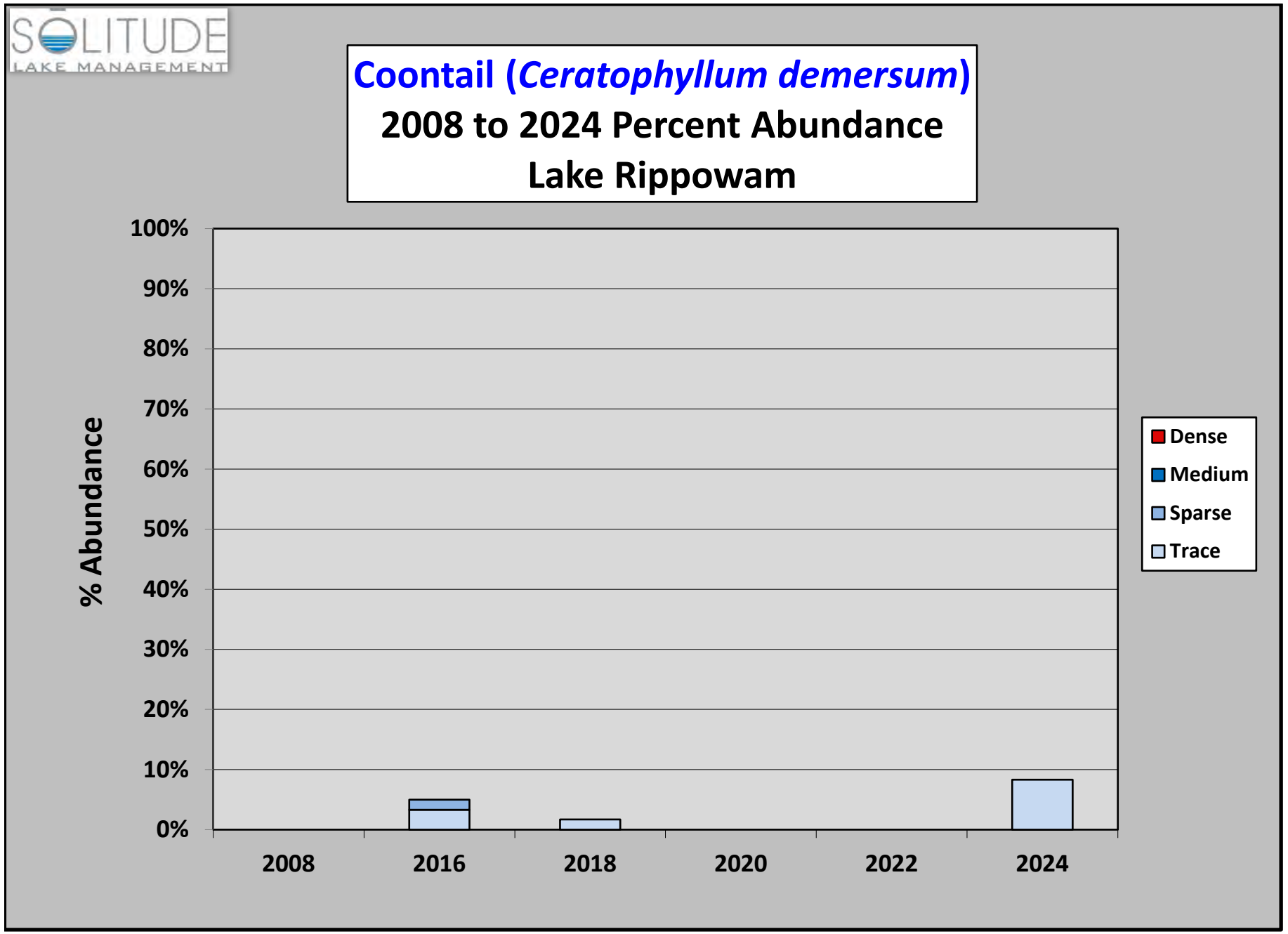
Office: Shrewsbury, Massachusetts


SOLITUDE
LAKE MANAGEMENT
Total Submersed Vegetation
2008 to 2024 Percent Abundance
Lake Rippowam
% Abundance
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2008
2016
2018
2020
2022
2024
Dense
Medium
Sparse
Trace


SOLITUDE
LAKE MANAGEMENT
Total Floating Vegetation
2008 to 2024 Percent Abundance
Lake Rippowam
% Abundance
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2008
2016
2018
2020
2022
2024
Dense
Medium
Sparse
Trace


SOLITUDE
LAKE MANAGEMENT
Eurasian Water Milfoil (*Myriophyllum spicatum*)
2008 to 2024 Percent Abundance
Lake Rippowam
% Abundance
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2008
2016
2018
2020
2022
2024
Dense
Medium
Sparse
Trace


SOLITUDE
LAKE MANAGEMENT
White Water Lily (*Nymphaea ordorata*)
2008 to 2024 Percent Abundance
Lake Rippowam
% Abundance
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2008
2016
2018
2020
2022
2024
Dense
Medium
Sparse
Trace


Coontail (*Ceratophyllum demersum*)
2008 to 2024 Percent Abundance
Lake Rippowam
% Abundance
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2008
2016
2018
2020
2022
2024
Dense
Medium
Sparse
Trace