

Chautauqua Lake SAV Survey Results

Fall 2023

Figures and Tables

Table 1: *Relative abundance ratings assigned to retrieved rakes at survey points as described in previous survey reporting by Solitude Lake Management (2019):*

| Rating | Description |
|---------------|---|
| None (0) | No plants on rake |
| Trace (T) | Few plants on rake |
| Sparse (S) | Rake up to half full of plants |
| Moderate (M) | Rake more than half full of plants |
| Dense (D) | Rake at maximum capacity; difficult to retrieve |

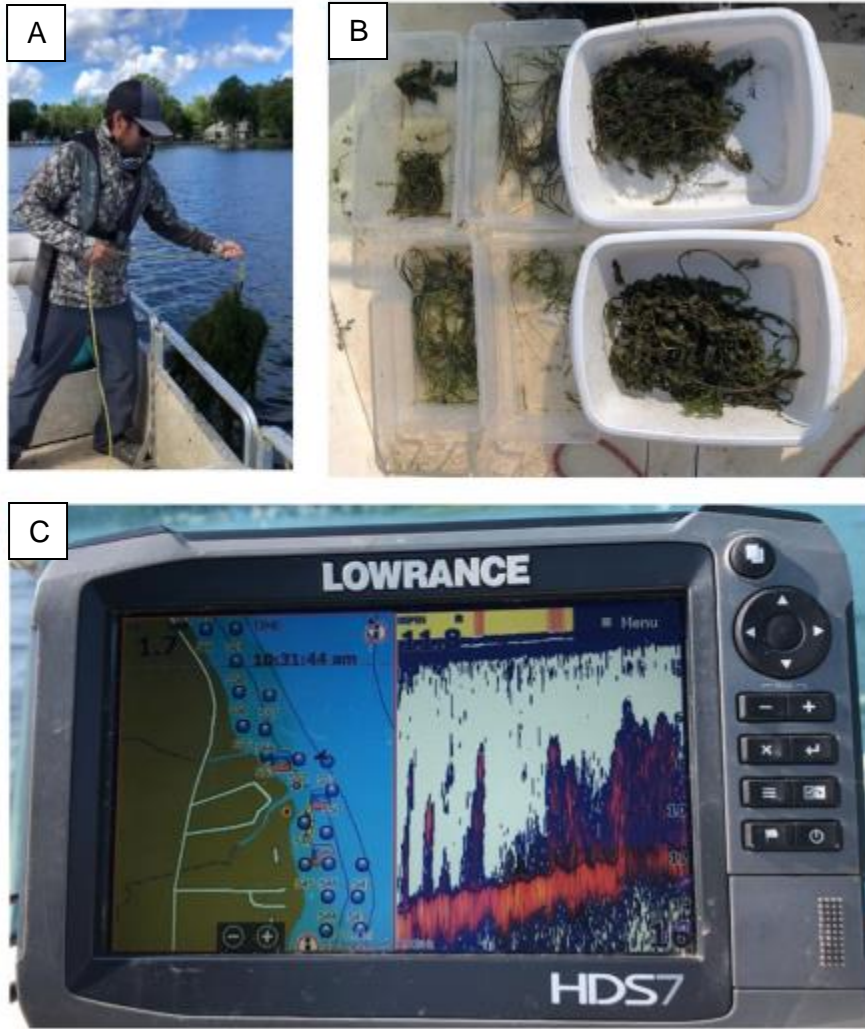


Figure 1: Retrieving and sorting SAV by species (A;B) while concurrently recording sonar/SAV biovolume data throughout the littoral zone of Chautauqua Lake (C).



Figure 2: Water quality sample sites during the Fall 2023 survey.

Table 2: SAV species recorded during the Fall 2023 survey of Chautauqua Lake. Non-native species are marked in red.

| Chautauqua Lake Fall 2023 SAV Survey Results | | | | | | | | | | | |
|--|---------------------------|-------|-----|-------|------|--------|-----|----------|-----|-------|----|
| Whole Lake | | | | | | | | | | | |
| SPECIES PRESENT | | TOTAL | | TRACE | | SPARSE | | MODERATE | | DENSE | |
| COMMON NAME | SCIENTIFIC NAME | # | % | # | % | # | % | # | % | # | % |
| TOTAL SURVEYED SITES | | 946 | | | | | | | | | |
| TOTAL VEGETATED SITES | | 822 | 87% | 250 | 30% | 425 | 52% | 126 | 15% | 21 | 3% |
| EURASIAN WATERMILFOIL | MYRIOPHYLLUM SPICATUM | 424 | 45% | 366 | 86% | 45 | 11% | 11 | 3% | 2 | 0% |
| WATER STARGRASS | HETERANTHERA DUBIA | 367 | 39% | 309 | 84% | 51 | 14% | 7 | 2% | 0 | 0% |
| WILD CELERY | VALISNERIA AMERICANA | 334 | 35% | 293 | 88% | 41 | 12% | 0 | 0% | 0 | 0% |
| COONTAIL | CERATOPHYLLUM DEMERSUM | 331 | 35% | 299 | 90% | 30 | 9% | 1 | 0% | 1 | 0% |
| SLENDER NAIAD | NAJAS FLEXILIS | 258 | 27% | 230 | 89% | 27 | 10% | 1 | 0% | 0 | 0% |
| WESTERN WATERWEED | ELODEA NUTTALII | 216 | 23% | 194 | 90% | 16 | 7% | 4 | 2% | 2 | 1% |
| COMMON WATERWEED | ELODEA CANADENSIS | 197 | 21% | 184 | 93% | 9 | 5% | 3 | 2% | 1 | 1% |
| WHITESTEM PONDWEED | POTAMOGETON PRAELONGUS | 172 | 18% | 148 | 86% | 22 | 13% | 2 | 1% | 0 | 0% |
| SOUTHERN NAIAD | NAJAS GUADALUPENSIS | 148 | 16% | 143 | 97% | 5 | 3% | 0 | 0% | 0 | 0% |
| CURLY-LEAF PONDWEED | POTAMOGETON CRISPUS | 136 | 14% | 135 | 99% | 1 | 1% | 0 | 0% | 0 | 0% |
| IVY-LEAVED DUCKWEED | LEMNA TRISULCA | 113 | 12% | 111 | 98% | 2 | 2% | 0 | 0% | 0 | 0% |
| LEAFY PONDWEED | POTAMOGETON FOLIOSUS | 89 | 9% | 87 | 98% | 2 | 2% | 0 | 0% | 0 | 0% |
| FLATSTEM PONDWEED | POTAMOGETON ZOSTERIFORMIS | 80 | 8% | 80 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| BRITTLE NAIAD | NAJAS MINOR | 43 | 5% | 33 | 77% | 6 | 14% | 2 | 5% | 2 | 5% |
| MACROALGAE (NATIVE) | CHARA/NITELLA | 30 | 3% | 27 | 90% | 3 | 10% | 0 | 0% | 0 | 0% |
| WATER PLANTAIN | ALISMA SUBCORDATUM | 28 | 3% | 27 | 96% | 1 | 4% | 0 | 0% | 0 | 0% |
| SMALL PONDWEED | POTAMOGETON PUSILLUS | 26 | 3% | 26 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| STARRY STONEWORT | NITELLOPSIS OBTUSA | 24 | 3% | 21 | 88% | 3 | 13% | 0 | 0% | 0 | 0% |
| RICHARDSON'S PONDWEED | POTAMOGETON RICHARDSONII | 6 | 1% | 6 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| SAGO PONDWEED | STUCKENIA PECTINATA | 5 | 1% | 5 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| ROBBINS PONDWEED | POTAMOGETON ROBBINSII | 2 | 0% | 2 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| LARGELEAF PONDWEED | POTAMOGETON AMPLIFOLIUS | 1 | 0% | 1 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| BLADDERWORT | UTRICULARIA SP. | 1 | 0% | 1 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| BENTHIC FILAMENTOUS ALGAE | MICROSERIA SP. | 134 | 14% | | | | | | | | |
| WHITE WATER LILY | NYMPHAEA ODORATA | 55 | 6% | | | | | | | | |
| YELLOW WATER LILY | NUPHAR VARIGATA | 30 | 3% | | | | | | | | |
| WATER WILLOW | JUSTICIA AMERICANA | 12 | 1% | | | | | | | | |
| CATTAIL | TYPHA LATIFOLIA | 12 | 1% | | | | | | | | |
| JAPANESE KNOTWEED | FALLOPIA JAPONICA | 6 | 1% | | | | | | | | |
| PICKERELWEED | PONTEDERIA CORDATA | 3 | 0% | | | | | | | | |
| SMALL DUCKWEED | LEMNA MINOR | 2 | 0% | | | | | | | | |
| BULRUSH | SCIRPUS SP. | 1 | 0% | | | | | | | | |

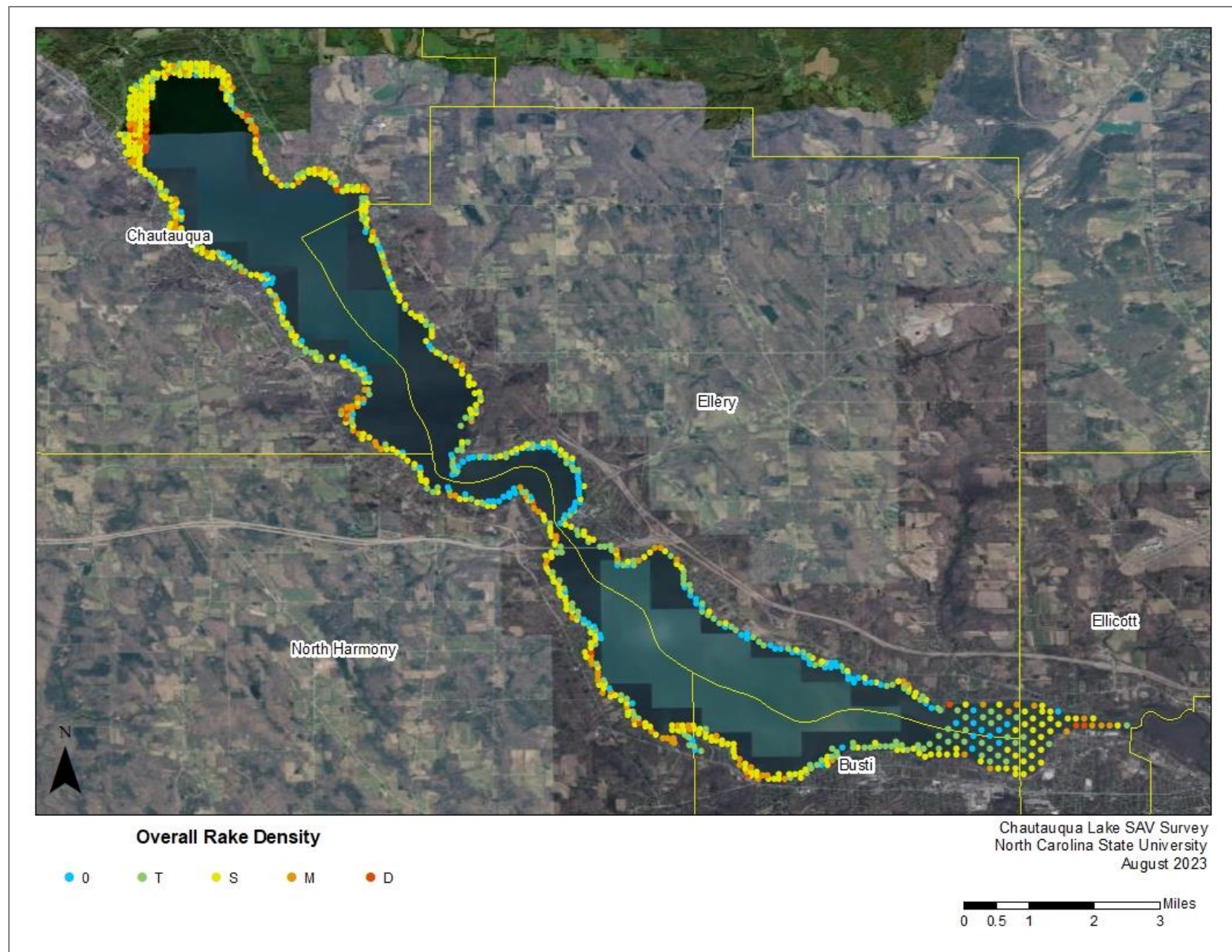


Figure 3: Overall rake density of surveyed points during Fall 2023 SAV Survey at Chautauqua Lake.
'0': No SAV; 'T': Trace SAV; 'S': Sparse SAV; 'M': Moderate SAV; 'D': Dense SAV

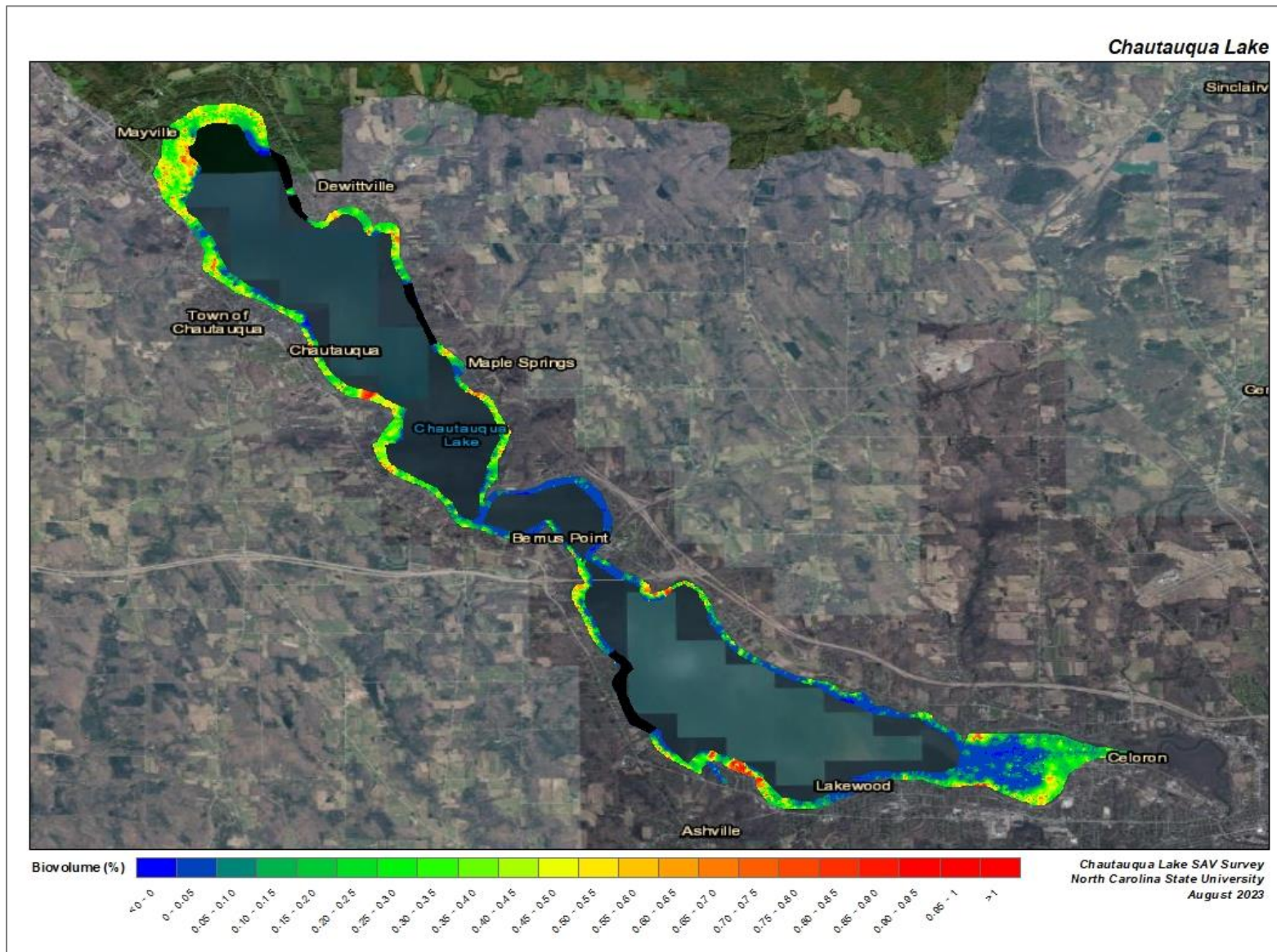


Figure 4: Lake-wide SAV biovolume estimates constructed from echosounding data. Warmer color areas represent greater water column occupancy (0-100% occupied). Regions marked black contained inconclusive data likely due to windy weather conditions during time of survey.

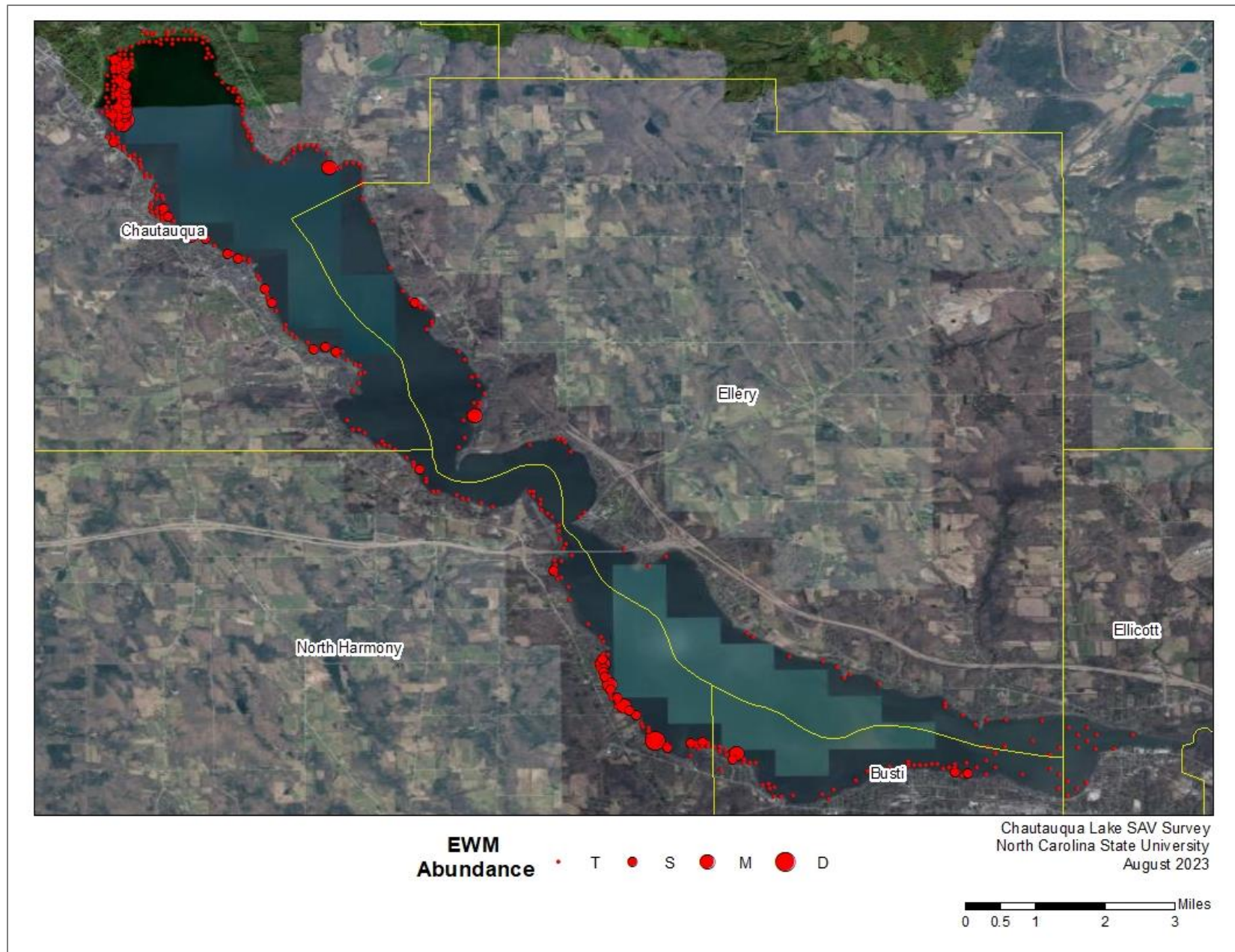


Figure 5: Distribution and abundance of Eurasian watermilfoil (EWM) in Chautauqua Lake during Fall 2023 SAV survey. 'T': Trace EWM; 'S': Sparse EWM; 'M': Moderate EWM; 'D': Dense EWM

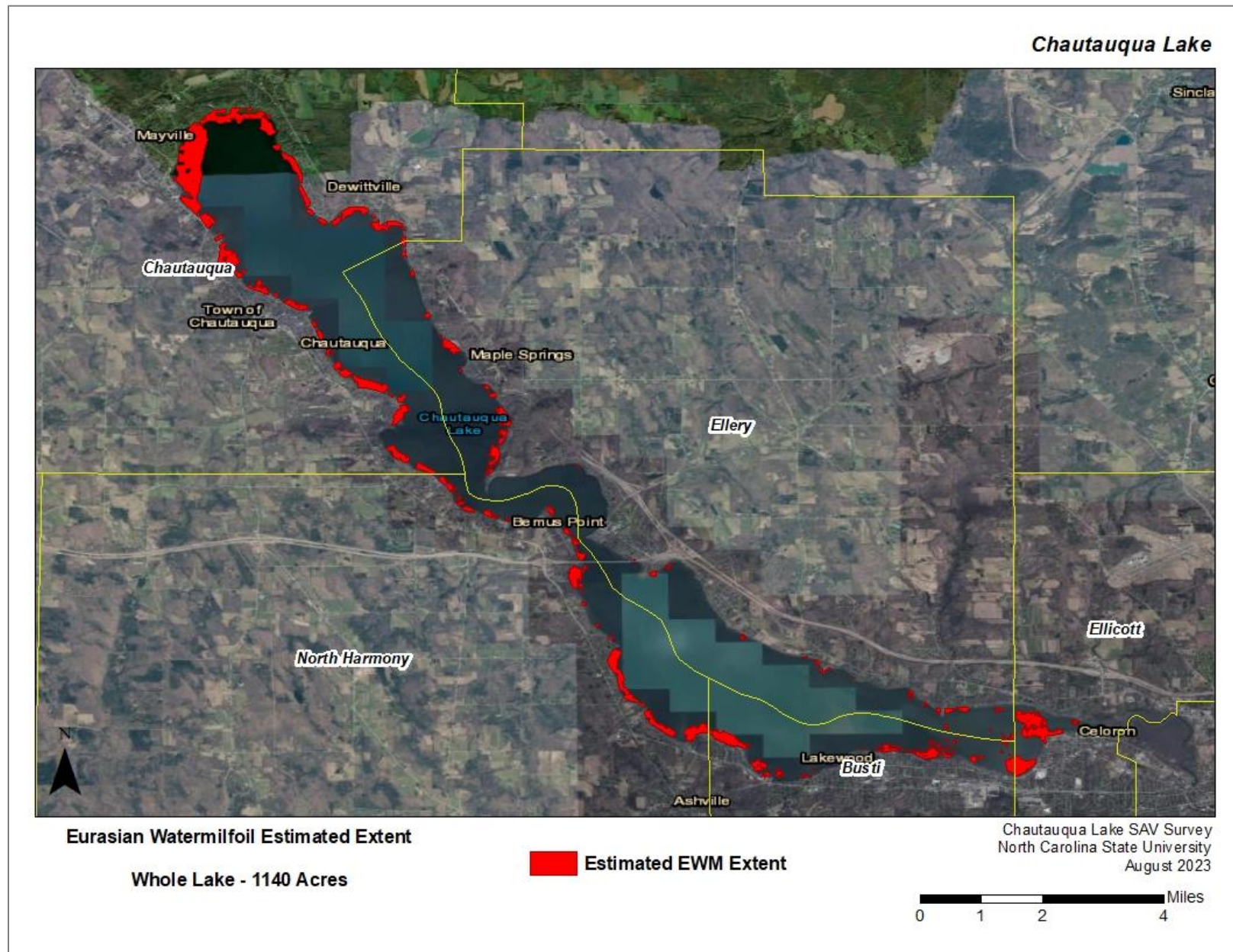


Figure 6: Interpolated estimate of Eurasian watermilfoil (EWM) found throughout Chautauqua Lake.

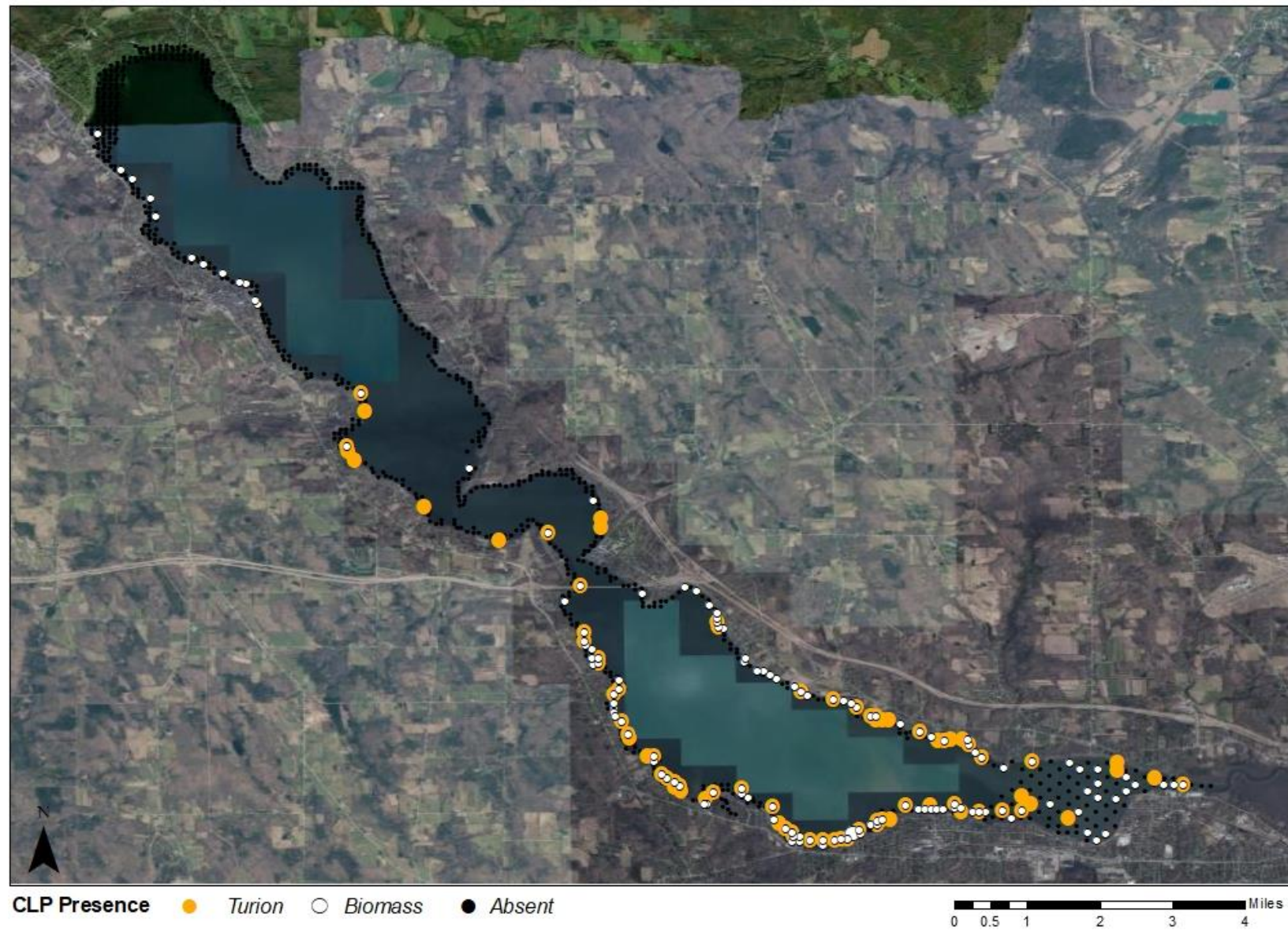


Figure 7: Distribution of curly-leaf pondweed (CLP; *Potamogeton crispus*) biomass and turions during the Fall 2023 survey.

Chautauqua Lake

Starry Stonewort Estimated Acreage - Fall 2023

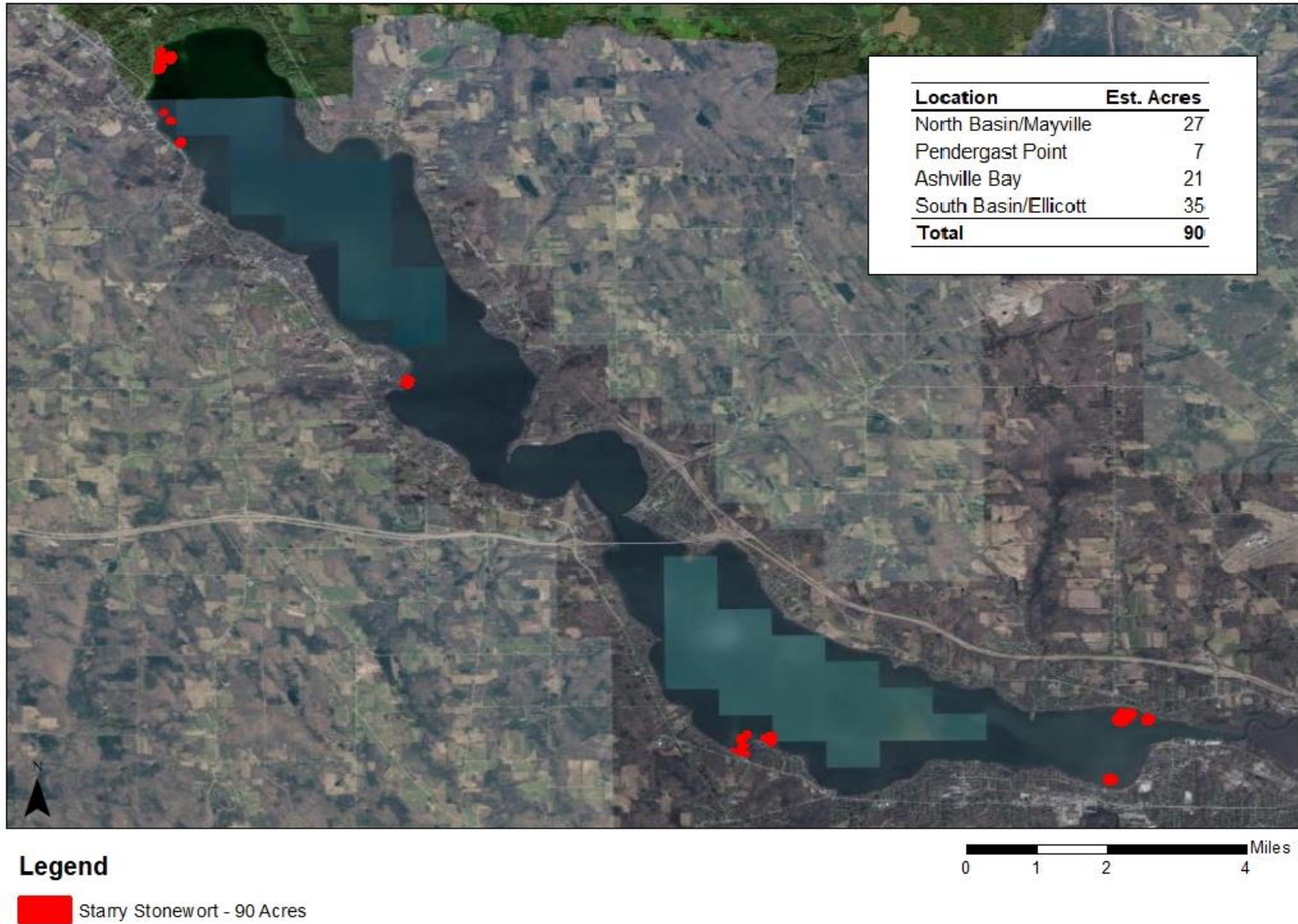


Figure 8: Distribution of starry stonewort (*Nitellopsis obtusa*) interpolated acreage from the Chautauqua Lake during Fall 2023 survey.

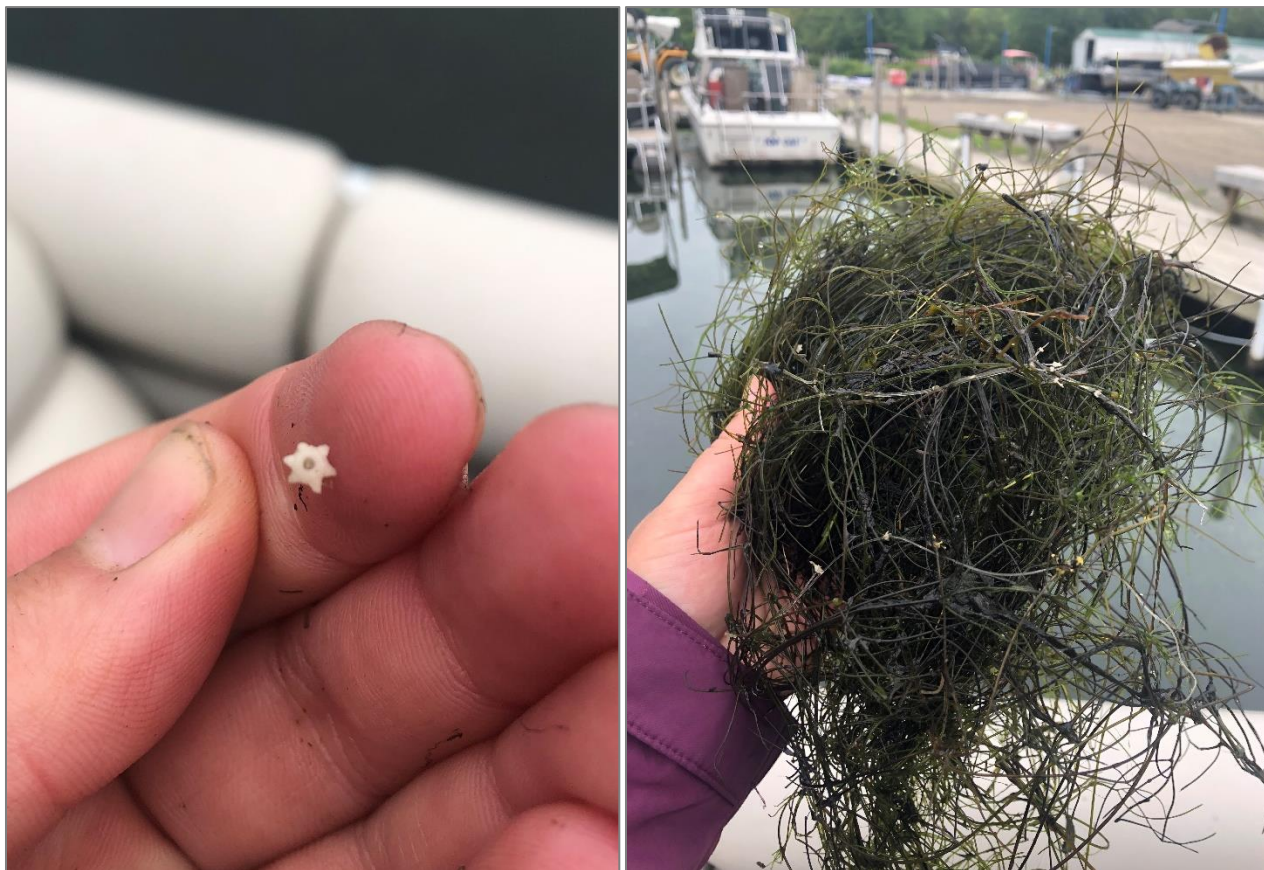


Figure 9: Example of starry stonewort (*Nitellopsis obtusa*) bulbil (left) and biomass (right) documented during the Fall 2023 survey.



Figure 10: Example of dense brittle naiad (*Najas minor*) biomass documented during the Fall 2023 survey.

Table 3: Basic water quality measurements recorded at Chautauqua Lake at the time of survey. ‘*’ indicates parameters that significantly differ ($p < 0.05$) between North and South basins according to a Student’s *t* test.

| Parameter | Whole Lake | Lake Region | |
|--|------------|-------------|-------------|
| | | North Basin | South Basin |
| <i>n</i> Sites | 30 | 16 | 14 |
| Site Depth (<i>m</i>) | 1.9 | 2.1 | 1.7 |
| Temperature (°C)* | 23.51 | 23.26 | 23.81 |
| pH* | 6.79 | 6.33 | 7.35 |
| Specific Conductivity (<i>uS/cm</i>) | 0.22 | 0.22 | 0.22 |
| Dissolved Oxygen (<i>mg/L</i>) | 14.81 | 14.44 | 15.27 |
| Dissolved Oxygen (% Sat) | 175.23 | 171.88 | 179.35 |
| Secchi Depth (<i>m</i>)* | 1.21 | 1.59 | 0.75 |

Table 4: SAV species recorded in the Town of Chautauqua during the Fall 2023 survey of Chautauqua Lake. Non-native species are marked in red.

| Chautauqua Lake Fall 2023 SAV Survey Results | | | | | | | | | | | |
|--|---------------------------|-------|-----|-------|------|--------|-----|----------|-----|-------|----|
| Town of Chautauqua | | | | | | | | | | | |
| SPECIES PRESENT | | TOTAL | | TRACE | | SPARSE | | MODERATE | | DENSE | |
| COMMON NAME | SCIENTIFIC NAME | # | % | # | % | # | % | # | % | # | % |
| TOTAL SURVEYED SITES | | 364 | | | | | | | | | |
| TOTAL VEGETATED SITES | | 342 | 94% | 66 | 19% | 202 | 59% | 60 | 18% | 14 | 4% |
| EURASIAN WATERMILFOIL | MYRIOPHYLLUM SPICATUM | 220 | 60% | 185 | 84% | 28 | 13% | 6 | 3% | 1 | 0% |
| COONTAIL | CERATOPHYLLUM DEMERSUM | 175 | 48% | 152 | 87% | 22 | 13% | 1 | 1% | 0 | 0% |
| WATER STARGRASS | HETERANTHERA DUBIA | 161 | 44% | 142 | 88% | 18 | 11% | 1 | 1% | 0 | 0% |
| WILD CELERY | VALISNERIA AMERICANA | 160 | 44% | 139 | 87% | 21 | 13% | 0 | 0% | 0 | 0% |
| WHITESTEM PONDWEED | POTAMOGETON PRAELONGUS | 120 | 33% | 101 | 84% | 17 | 14% | 2 | 2% | 0 | 0% |
| COMMON WATERWEED | ELODEA CANADENSIS | 100 | 27% | 90 | 90% | 6 | 6% | 3 | 3% | 1 | 1% |
| WESTERN WATERWEED | ELODEA NUTTALII | 72 | 20% | 66 | 92% | 5 | 7% | 1 | 1% | 0 | 0% |
| FLATSTEM PONDWEED | POTAMOGETON ZOSTERIFORMIS | 69 | 19% | 69 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| SLENDER NAIAD | NAJAS FLEXILIS | 64 | 18% | 62 | 97% | 2 | 3% | 0 | 0% | 0 | 0% |
| IVY-LEAVED DUCKWEED | LEMNA TRISULCA | 63 | 17% | 61 | 97% | 2 | 3% | 0 | 0% | 0 | 0% |
| SOUTHERN NAIAD | NAJAS GUADALUPENSIS | 62 | 17% | 61 | 98% | 1 | 2% | 0 | 0% | 0 | 0% |
| LEAFY PONDWEED | POTAMOGETON FOLIOSUS | 30 | 8% | 30 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| WATER PLANTAIN | ALISMA SUBCORDATUM | 17 | 5% | 16 | 94% | 1 | 6% | 0 | 0% | 0 | 0% |
| CURLY-LEAF PONDWEED | POTAMOGETON CRISPUS | 14 | 4% | 14 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| MACROALGAE (NATIVE) | CHARA/NITELLA | 14 | 4% | 13 | 93% | 1 | 7% | 0 | 0% | 0 | 0% |
| STARRY STONEWORT | NITELLOPSIS OBTUSA | 12 | 3% | 9 | 75% | 3 | 25% | 0 | 0% | 0 | 0% |
| RICHARDSON'S PONDWEED | POTAMOGETON RICHARDSONII | 6 | 2% | 6 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| SMALL PONDWEED | POTAMOGETON PUSILLUS | 5 | 1% | 5 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| SAGO PONDWEED | STUCKENIA PECTINATA | 3 | 1% | 3 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| ROBBINS PONDWEED | POTAMOGETON ROBBINSII | 2 | 1% | 2 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| BLADDERWORT | UTRICULARIA SP. | 1 | 0% | 1 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| BENTHIC FILAMENTOUS ALGAE | MICROSERIA SP. | 46 | 13% | | | | | | | | |
| WHITE WATER LILY | NYMPHAEA ODORATA | 17 | 5% | | | | | | | | |
| YELLOW WATER LILY | NUPHAR VARIGATA | 15 | 4% | | | | | | | | |
| WATER WILLOW | JUSTICIA AMERICANA | 12 | 3% | | | | | | | | |
| CATTAIL | TYPHA LATIFOLIA | 5 | 1% | | | | | | | | |
| PICKERELWEED | PONTEDERIA CORDATA | 3 | 1% | | | | | | | | |
| SMALL DUCKWEED | LEMNA MINOR | 2 | 1% | | | | | | | | |

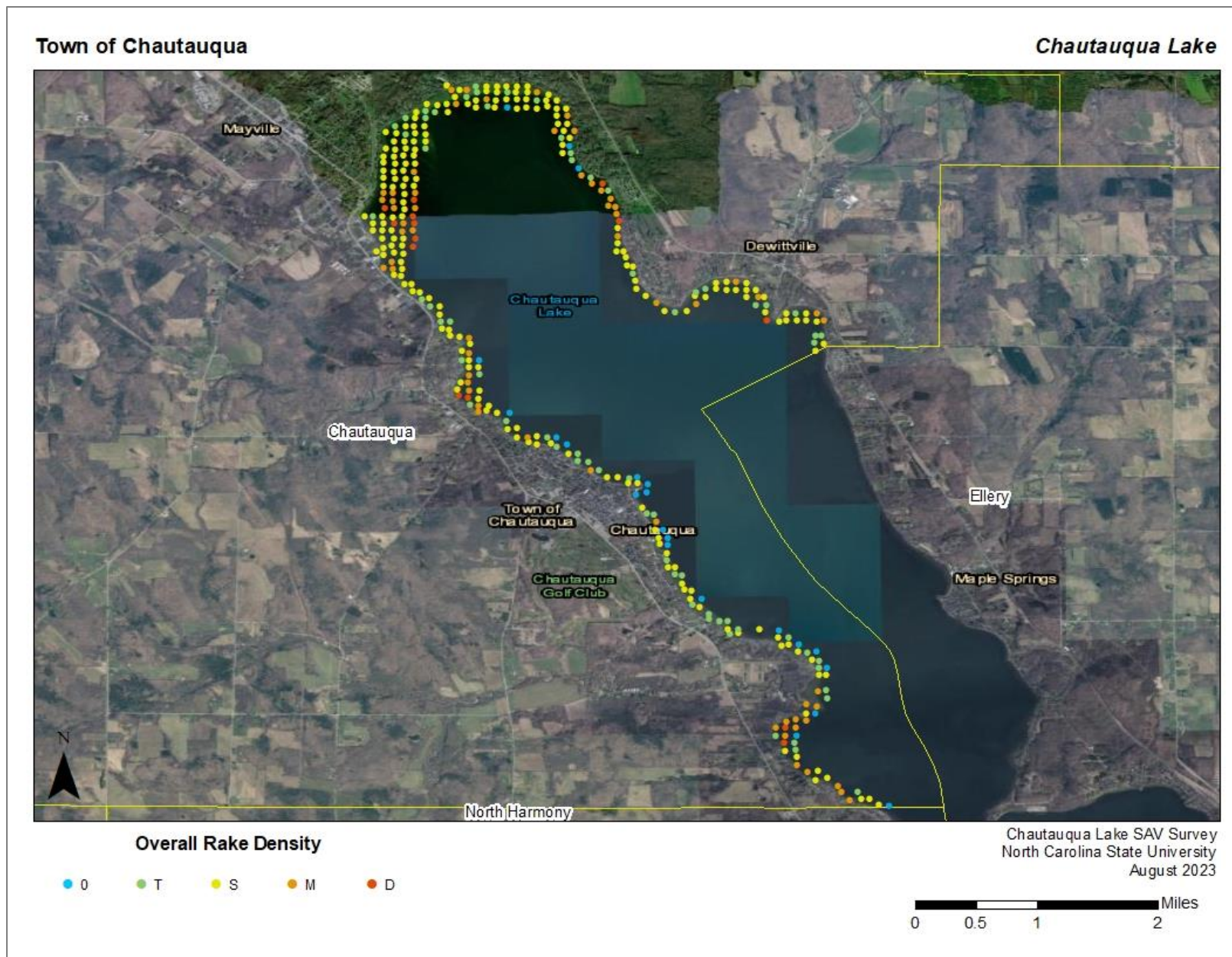


Figure 11: Overall rake density of surveyed points in the Town of Chautauqua during Fall 2023 SAV Survey at Chautauqua Lake.
'0': No SAV; 'T': Trace SAV; 'S': Sparse SAV; 'M': Moderate SAV; 'D': Dense SAV

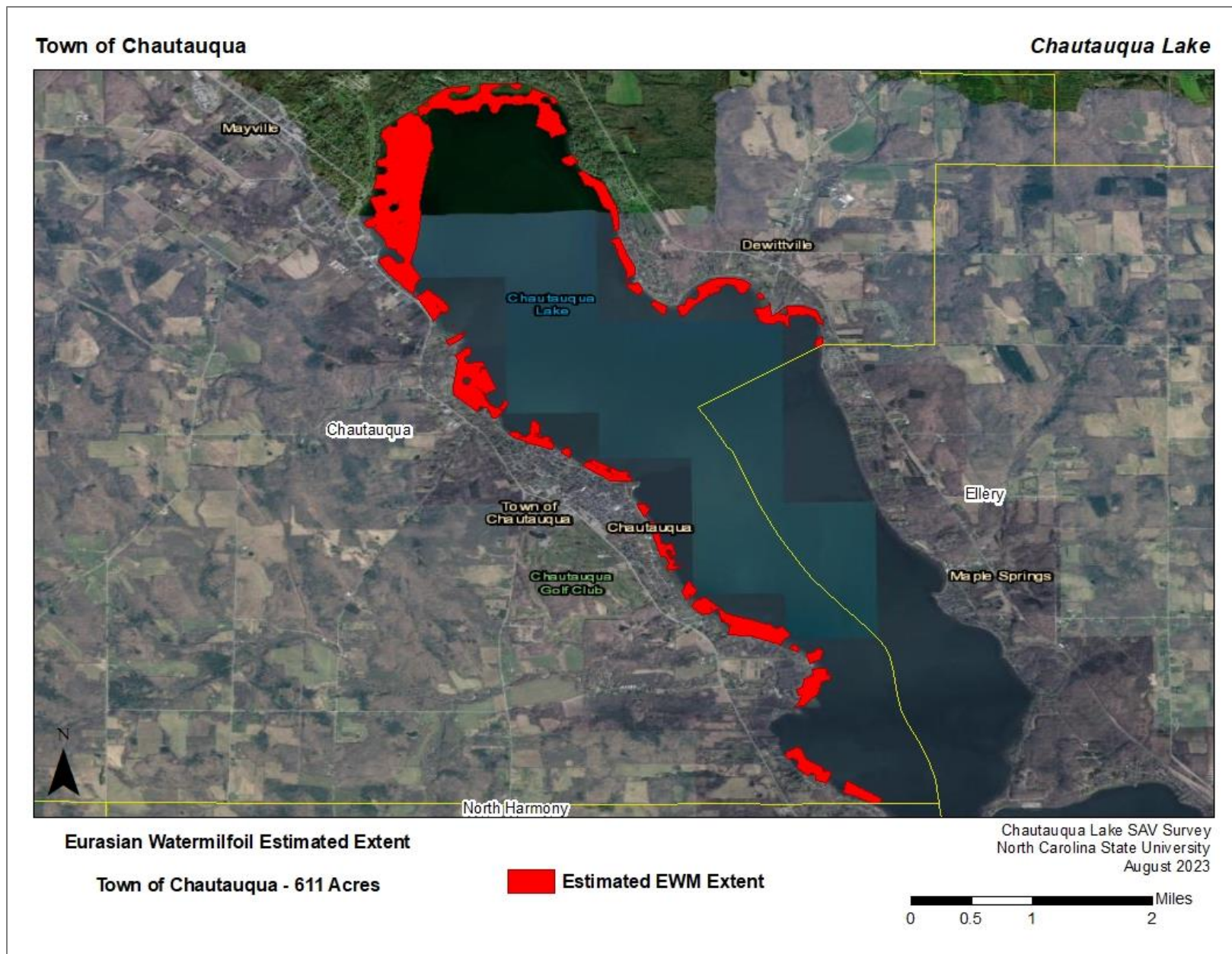


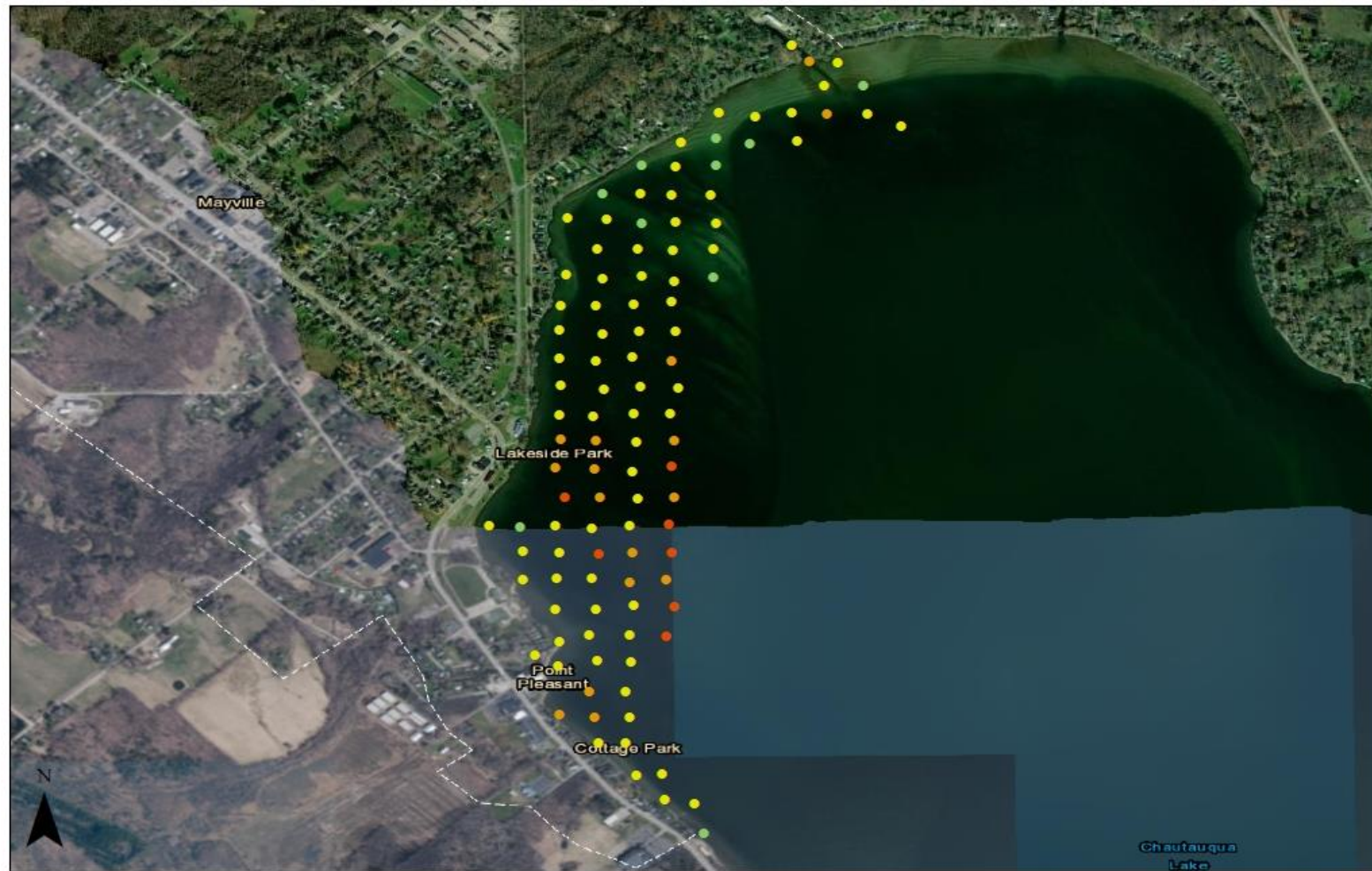
Figure 12: *Interpolated estimates of Eurasian watermilfoil (EWM) distribution within the Town of Chautauqua*

Table 5: SAV species recorded in the Village of Mayville during the Fall 2023 survey of Chautauqua Lake. Non-native species are marked in red.

| Chautauqua Lake Fall 2023 SAV Survey Results | | | | | | | | | | | |
|--|---------------------------|-------|------|-------|------|--------|-----|----------|-----|-------|----|
| Village of Mayville | | | | | | | | | | | |
| SPECIES PRESENT | | TOTAL | | TRACE | | SPARSE | | MODERATE | | DENSE | |
| COMMON NAME | SCIENTIFIC NAME | # | % | # | % | # | % | # | % | # | % |
| TOTAL SURVEYED SITES | | 108 | | | | | | | | | |
| TOTAL VEGETATED SITES | | 108 | 100% | 10 | 9% | 75 | 69% | 16 | 15% | 7 | 6% |
| EURASIAN WATERMILFOIL | MYRIOPHYLLUM SPICATUM | 85 | 79% | 62 | 73% | 17 | 20% | 5 | 6% | 1 | 1% |
| WATER STARGRASS | HETERANTHERA DUBIA | 67 | 62% | 63 | 94% | 4 | 6% | 0 | 0% | 0 | 0% |
| COONTAIL | CERATOPHYLLUM DEMERSUM | 63 | 58% | 52 | 83% | 10 | 16% | 1 | 2% | 0 | 0% |
| WILD CELERY | VALISNERIA AMERICANA | 38 | 35% | 34 | 89% | 4 | 11% | 0 | 0% | 0 | 0% |
| WESTERN WATERWEED | ELODEA NUTTALII | 38 | 35% | 34 | 89% | 3 | 8% | 1 | 3% | 0 | 0% |
| SOUTHERN NAIAD | NAJAS GUADALUPENSIS | 31 | 29% | 31 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| WHITESTEM PONDWEED | POTAMOGETON PRAELONGUS | 28 | 26% | 27 | 96% | 1 | 4% | 0 | 0% | 0 | 0% |
| COMMON WATERWEED | ELODEA CANADENSIS | 23 | 21% | 23 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| FLATSTEM PONDWEED | POTAMOGETON ZOSTERIFORMIS | 15 | 14% | 15 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| IVY-LEAVED DUCKWEED | LEMNA TRISULCA | 13 | 12% | 13 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| LEAFY PONDWEED | POTAMOGETON FOLIOSUS | 11 | 10% | 11 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| STARRY STONEWORT | NITELLOPSIS OBTUSA | 11 | 10% | 9 | 82% | 2 | 18% | 0 | 0% | 0 | 0% |
| SLENDER NAIAD | NAJAS FLEXILIS | 9 | 8% | 8 | 89% | 1 | 11% | 0 | 0% | 0 | 0% |
| WATER PLANTAIN | ALISMA SUBCORDATUM | 9 | 8% | 9 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| SMALL PONDWEED | POTAMOGETON PUSILLUS | 3 | 3% | 3 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| CURLY-LEAF PONDWEED | POTAMOGETON CRISPUS | 2 | 2% | 2 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| MACROALGAE (NATIVE) | CHARA/NITELLA | 2 | 2% | 2 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| RICHARDSON'S PONDWEED | POTAMOGETON RICHARDSONII | 2 | 2% | 2 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| SAGO PONDWEED | STUCKENIA PECTINATA | 1 | 1% | 1 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| BENTHIC FILAMENTOUS ALGAE | MICROSERIA SP. | 14 | 13% | | | | | | | | |
| SMALL DUCKWEED | LEMNA MINOR | 1 | 1% | | | | | | | | |
| WHITE WATER LILY | NYMPHAEA ODORATA | 1 | 1% | | | | | | | | |

Village of Mayville

Chautauqua Lake



Overall Rake Density

0 T S M D

Chautauqua Lake SAV Survey
North Carolina State University
August 2023

0 0.25 0.5 1 Miles

Figure 13: Overall rake density of surveyed points in the Village of Mayville during Fall 2023 SAV Survey at Chautauqua Lake.
'0': No SAV; 'T': Trace SAV; 'S': Sparse SAV; 'M': Moderate SAV; 'D': Dense SAV

Table 6: SAV species recorded in the Town of Ellery during the Fall 2023 survey of Chautauqua Lake. Non-native species are marked in red.

| Chautauqua Lake Fall 2023 SAV Survey Results | | | | | | | | | | | |
|--|----------------------------------|-------|-----|-------|------|--------|-----|----------|----|-------|----|
| Town of Ellery | | | | | | | | | | | |
| SPECIES PRESENT | | TOTAL | | TRACE | | SPARSE | | MODERATE | | DENSE | |
| COMMON NAME | SCIENTIFIC NAME | # | % | # | % | # | % | # | % | # | % |
| TOTAL SURVEYED SITES | | 275 | | | | | | | | | |
| TOTAL VEGETATED SITES | | 202 | 73% | 102 | 50% | 82 | 41% | 17 | 8% | 1 | 0% |
| WATER STARGRASS | <i>HETERANTHERA DUBIA</i> | 85 | 31% | 71 | 84% | 12 | 14% | 2 | 2% | 0 | 0% |
| WILD CELERY | <i>VALISNERIA AMERICANA</i> | 74 | 27% | 64 | 86% | 10 | 14% | 0 | 0% | 0 | 0% |
| SLENDER NAIAD | <i>NAJAS FLEXILIS</i> | 73 | 27% | 56 | 77% | 16 | 22% | 1 | 1% | 0 | 0% |
| EURASIAN WATERMILFOIL | <i>MYRIOPHYLLUM SPICATUM</i> | 57 | 21% | 55 | 96% | 1 | 2% | 1 | 2% | 0 | 0% |
| WHITESTEM PONDWEED | <i>POTAMOGETON PRAELONGUS</i> | 43 | 16% | 38 | 88% | 5 | 12% | 0 | 0% | 0 | 0% |
| WESTERN WATERWEED | <i>ELODEA NUTTALII</i> | 41 | 15% | 38 | 93% | 1 | 2% | 1 | 2% | 1 | 2% |
| SOUTHERN NAIAD | <i>NAJAS GUADALUPENSIS</i> | 40 | 15% | 37 | 93% | 3 | 8% | 0 | 0% | 0 | 0% |
| CURLY-LEAF PONDWEED | <i>POTAMOGETON CRISPUS</i> | 39 | 14% | 39 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| COONTAIL | <i>CERATOPHYLLUM DEMERSUM</i> | 38 | 14% | 37 | 97% | 1 | 3% | 0 | 0% | 0 | 0% |
| COMMON WATERWEED | <i>ELODEA CANADENSIS</i> | 25 | 9% | 23 | 92% | 2 | 8% | 0 | 0% | 0 | 0% |
| LEAFY PONDWEED | <i>POTAMOGETON FOLIOSUS</i> | 18 | 7% | 17 | 94% | 1 | 6% | 0 | 0% | 0 | 0% |
| IVY-LEAVED DUCKWEED | <i>LEMNA TRISULCA</i> | 10 | 4% | 10 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| WATER PLANTAIN | <i>ALISMA SUBCORDATUM</i> | 10 | 4% | 10 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| FLATSTEM PONDWEED | <i>POTAMOGETON ZOSTERIFORMIS</i> | 8 | 3% | 8 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| MACROALGAE (NATIVE) | <i>CHARA/NITELLA</i> | 7 | 3% | 6 | 86% | 1 | 14% | 0 | 0% | 0 | 0% |
| BRITTLE NAIAD | <i>NAJAS MINOR</i> | 6 | 2% | 6 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| SAGO PONDWEED | <i>STUCKENIA PECTINATA</i> | 1 | 0% | 1 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| BENTHIC FILAMENTOUS ALGAE | <i>MICROSERIA SP.</i> | 43 | 16% | | | | | | | | |
| YELLOW WATER LILY | <i>NUPHAR VARIGATA</i> | 4 | 1% | | | | | | | | |
| CATTAIL | <i>TYPHA LATIFOLIA</i> | 4 | 1% | | | | | | | | |
| WHITE WATER LILY | <i>NYMPHAEA ODORATA</i> | 1 | 0% | | | | | | | | |
| JAPANESE KNOTWEED | <i>FALLOPIA JAPONICA</i> | 1 | 0% | | | | | | | | |

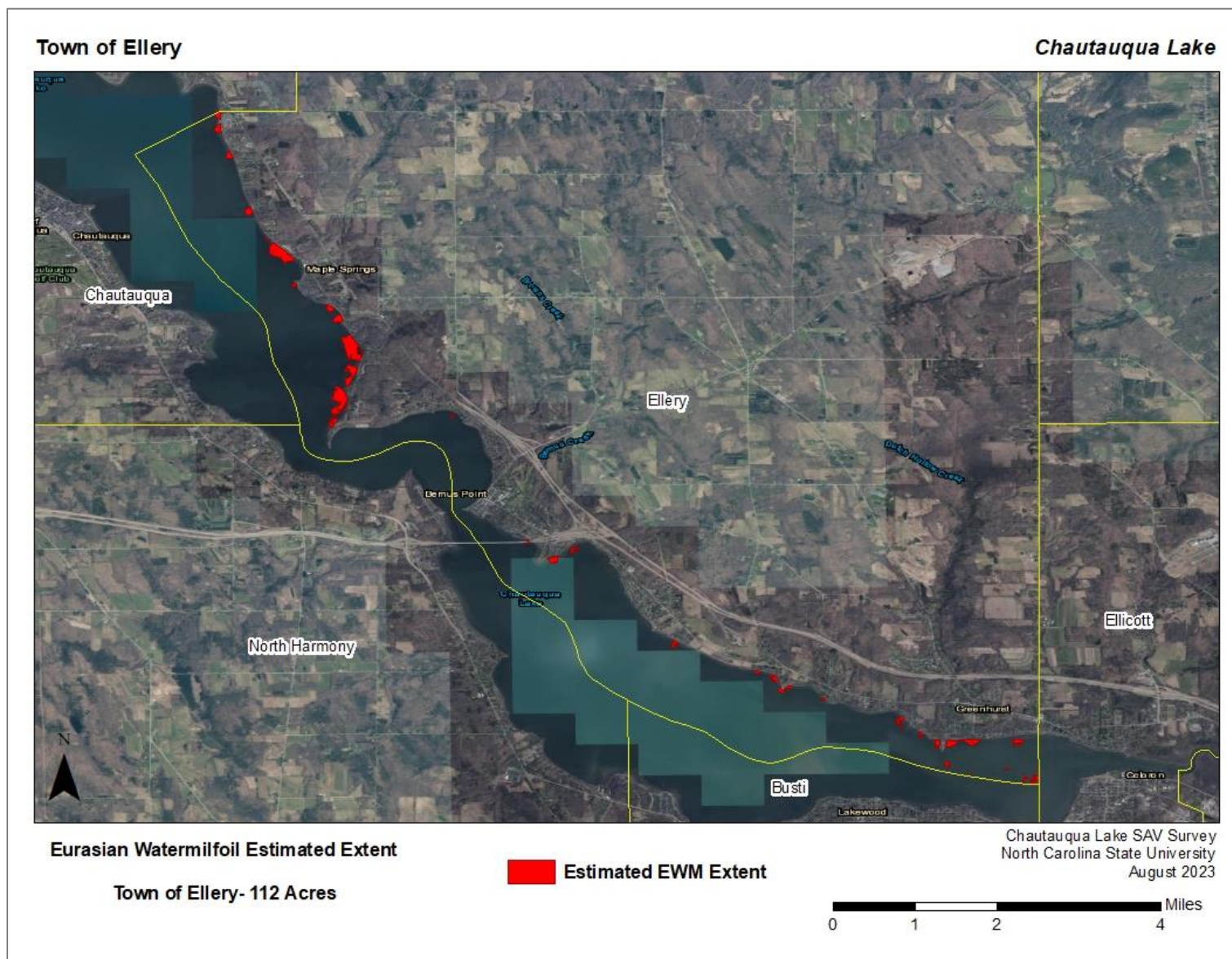
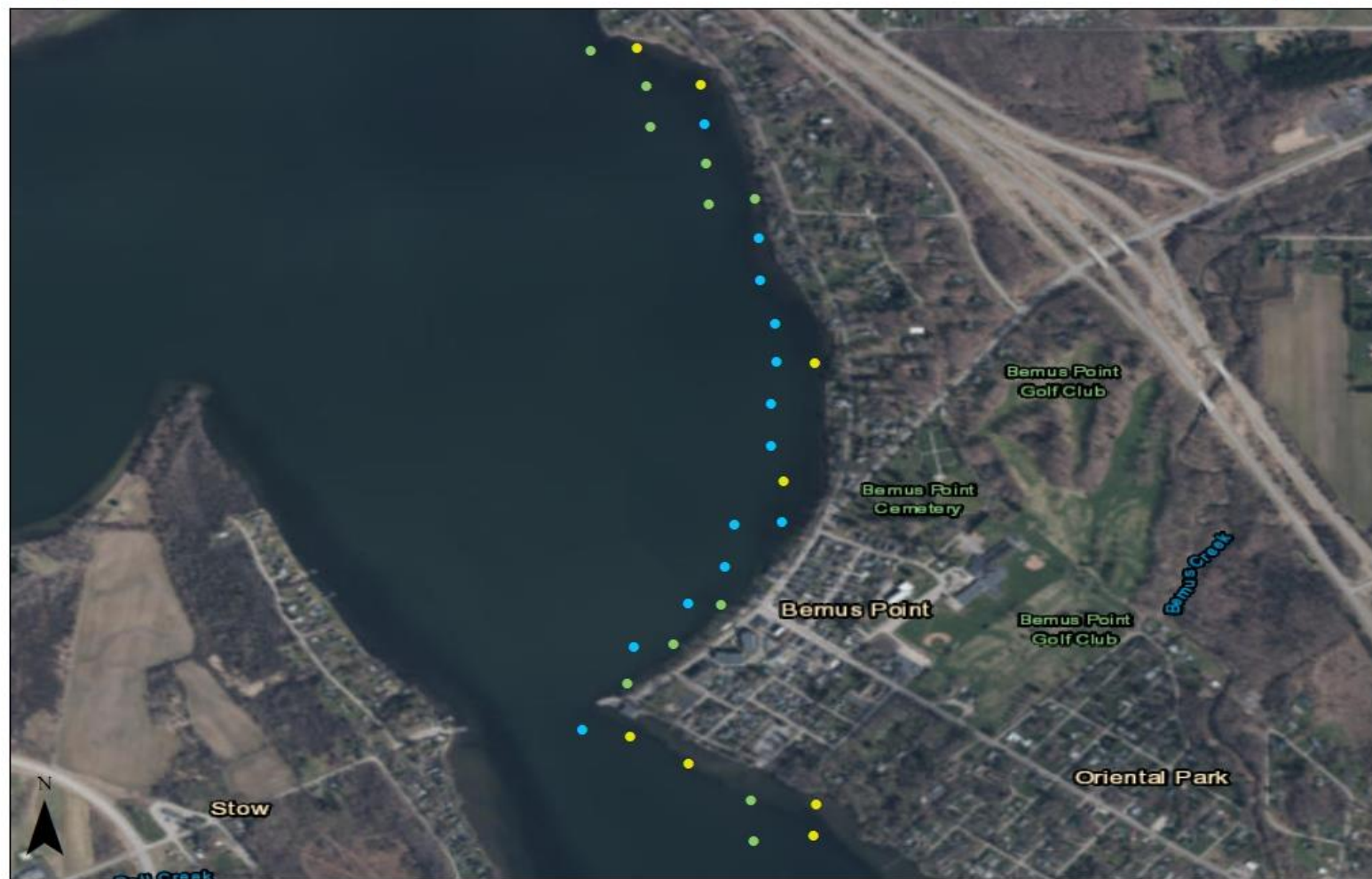


Figure 15: *Interpolated estimates of Eurasian watermilfoil (EWM) distribution within the Town of Ellery*

Table 7: SAV species recorded in the Village of Bemus Point during the Fall 2023 survey of Chautauqua Lake. Non-native species are marked in red.

| Chautauqua Lake Fall 2023 SAV Survey Results | | | | | | | | | | | |
|--|------------------------------------|-------|-----|-------|------|--------|-----|----------|----|-------|----|
| Village of Bemus Point | | | | | | | | | | | |
| COMMON NAME | SPECIES PRESENT SCIENTIFIC NAME | TOTAL | | TRACE | | SPARSE | | MODERATE | | DENSE | |
| | | # | % | # | % | # | % | # | % | # | % |
| TOTAL SURVEYED SITES | | 32 | | | | | | | | | |
| TOTAL VEGETATED SITES | | 19 | 59% | 11 | 58% | 8 | 42% | 0 | 0% | 0 | 0% |
| WATER STARGRASS | <i>HETERANTHERA DUBIA</i> | 9 | 28% | 7 | 78% | 2 | 22% | 0 | 0% | 0 | 0% |
| WILD CELERY | <i>VALISNERIA AMERICANA</i> | 8 | 25% | 4 | 50% | 4 | 50% | 0 | 0% | 0 | 0% |
| SOUTHERN NAIAD | <i>NAJAS GUADALUPENSIS</i> | 5 | 16% | 5 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| COONTAIL | <i>CERATOPHYLLUM DEMERSUM</i> | 4 | 13% | 4 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| EURASIAN WATERMILFOIL | <i>MYRIOPHYLLUM SPICATUM</i> | 3 | 9% | 3 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| WESTERN WATERWEED | <i>ELODEA NUTTALII</i> | 3 | 9% | 3 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| SLENDER NAIAD | <i>NAJAS FLEXILIS</i> | 2 | 6% | 2 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| COMMON WATERWEED | <i>ELODEA CANADENSIS</i> | 1 | 3% | 1 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| CURLY-LEAF PONDWEED | <i>POTAMOGETON CRISPUS</i> | 1 | 3% | 1 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| BENTHIC FILAMENTOUS ALGAE | <i>MICROSERIA SP.</i> | 17 | 53% | | | | | | | | |



Overall Rake Density

0 T S M D

Chautauqua Lake SAV Survey
North Carolina State University
August 2023

0 0.1 0.2 0.4 Miles

Figure 16: Overall rake density of surveyed points in the Village of Bemus Point during Fall 2023 SAV Survey at Chautauqua Lake.
'0': No SAV; 'T': Trace SAV; 'S': Sparse SAV; 'M': Moderate SAV; 'D': Dense SAV

Table 8: SAV species recorded in the Town of Busti during the Fall 2023 survey of Chautauqua Lake. Non-native species are marked in red.

| Chautauqua Lake Fall 2023 SAV Survey Results | | | | | | | | | | | |
|--|------------------------------------|-------|-----|-------|------|--------|-----|----------|-----|-------|----|
| Town of Busti | | | | | | | | | | | |
| COMMON NAME | SPECIES PRESENT SCIENTIFIC NAME | TOTAL | | TRACE | | SPARSE | | MODERATE | | DENSE | |
| | | # | % | # | % | # | % | # | % | # | % |
| TOTAL SURVEYED SITES | | 114 | | | | | | | | | |
| TOTAL VEGETATED SITES | | 107 | 94% | 41 | 38% | 53 | 50% | 12 | 11% | 1 | 1% |
| EURASIAN WATERMILFOIL | MYRIOPHYLLUM SPICATUM | 52 | 46% | 48 | 92% | 3 | 6% | 1 | 2% | 0 | 0% |
| WESTERN WATERWEED | ELODEA NUTTALLII | 51 | 45% | 45 | 88% | 5 | 10% | 1 | 2% | 0 | 0% |
| SLENDER NAIAD | NAJAS FLEXILIS | 50 | 44% | 48 | 96% | 2 | 4% | 0 | 0% | 0 | 0% |
| COONTAIL | CERATOPHYLLUM DEMERSUM | 46 | 40% | 40 | 87% | 5 | 11% | 0 | 0% | 1 | 2% |
| CURLY-LEAF PONDWEED | POTAMOGETON CRISPUS | 42 | 37% | 41 | 98% | 1 | 2% | 0 | 0% | 0 | 0% |
| WATER STARGRASS | HETERANTHERA DUBIA | 40 | 35% | 34 | 85% | 5 | 13% | 1 | 3% | 0 | 0% |
| COMMON WATERWEED | ELODEA CANADENSIS | 37 | 32% | 36 | 97% | 1 | 3% | 0 | 0% | 0 | 0% |
| WILD CELERY | VALISNERIA AMERICANA | 31 | 27% | 29 | 94% | 2 | 6% | 0 | 0% | 0 | 0% |
| LEAFY PONDWEED | POTAMOGETON FOLIOSUS | 20 | 18% | 19 | 95% | 1 | 5% | 0 | 0% | 0 | 0% |
| SOUTHERN NAIAD | NAJAS GUADALUPENSIS | 19 | 17% | 19 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| SMALL PONDWEED | POTAMOGETON PUSILLUS | 11 | 10% | 11 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| MY-LEAVED DUCKWEED | LEMNA TRISULCA | 9 | 8% | 9 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| BRITTLE NAIAD | NAJAS MINOR | 8 | 7% | 7 | 88% | 1 | 13% | 0 | 0% | 0 | 0% |
| STARRY STONEWORT | NITELLOPSIS OBTUSA | 4 | 4% | 4 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| FLATSTEM PONDWEED | POTAMOGETON ZOSTERIFORMIS | 2 | 2% | 2 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| MACROALGAE (NATIVE) | CHARA/NITELLA | 1 | 1% | 1 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| SAGO PONDWEED | STUCKENIA PECTINATA | 1 | 1% | 1 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| WHITESTEM PONDWEED | POTAMOGETON PRAELONGUS | 1 | 1% | 1 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| BENTHIC FILAMENTOUS ALGAE | MICROSERIA SP. | 19 | 17% | | | | | | | | |
| WHITE WATER LILY | NYMPHAEA ODORATA | 8 | 7% | | | | | | | | |
| CATTAIL | TYPHA LATIFOLIA | 1 | 1% | | | | | | | | |
| JAPANESE KNOTWEED | FALLOPIA JAPONICA | 1 | 1% | | | | | | | | |

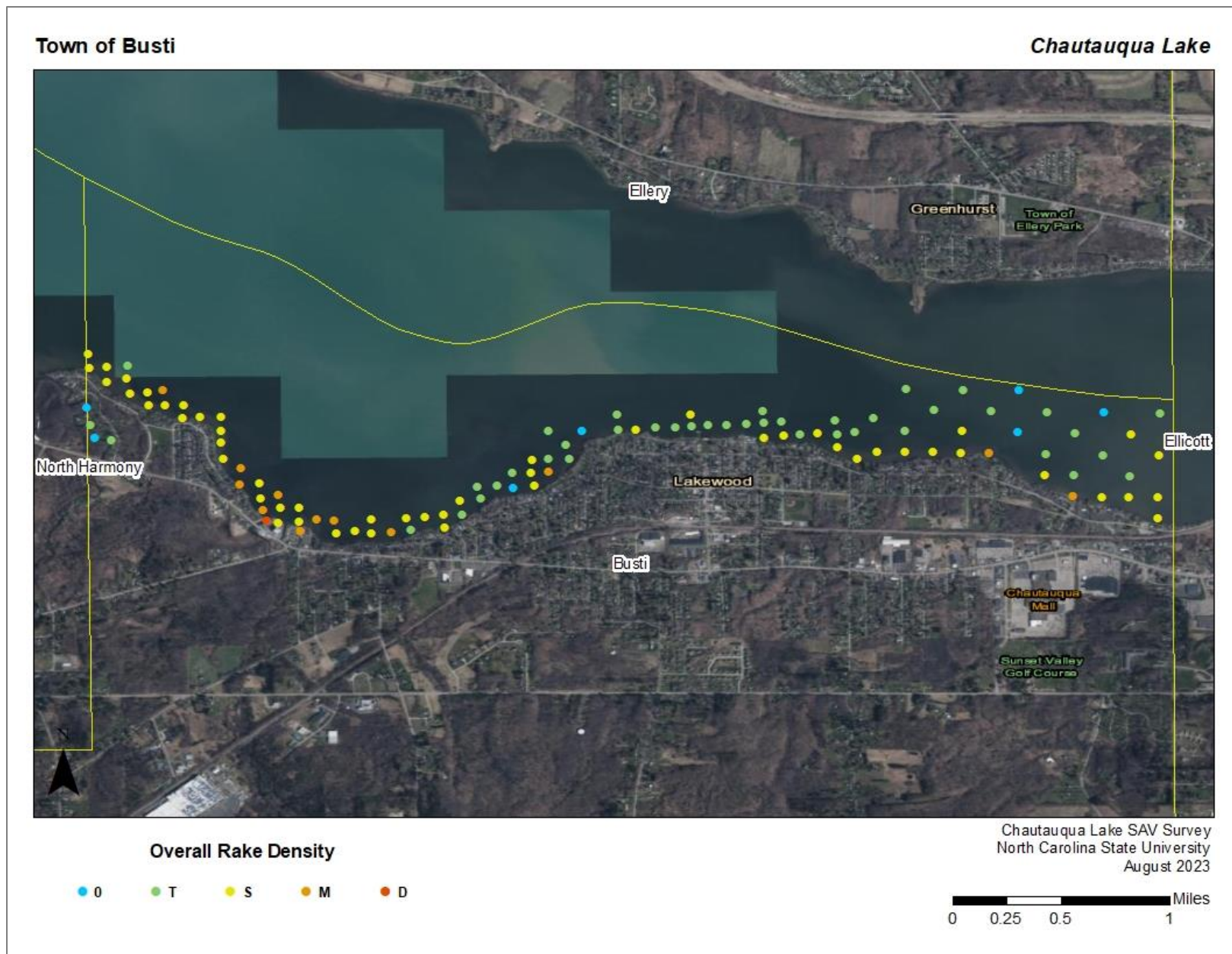


Figure 17: Overall rake density of surveyed points in the Town of Busti during Fall 2023 SAV Survey at Chautauqua Lake.
 '0': No SAV; 'T': Trace SAV; 'S': Sparse SAV; 'M': Moderate SAV; 'D': Dense SAV

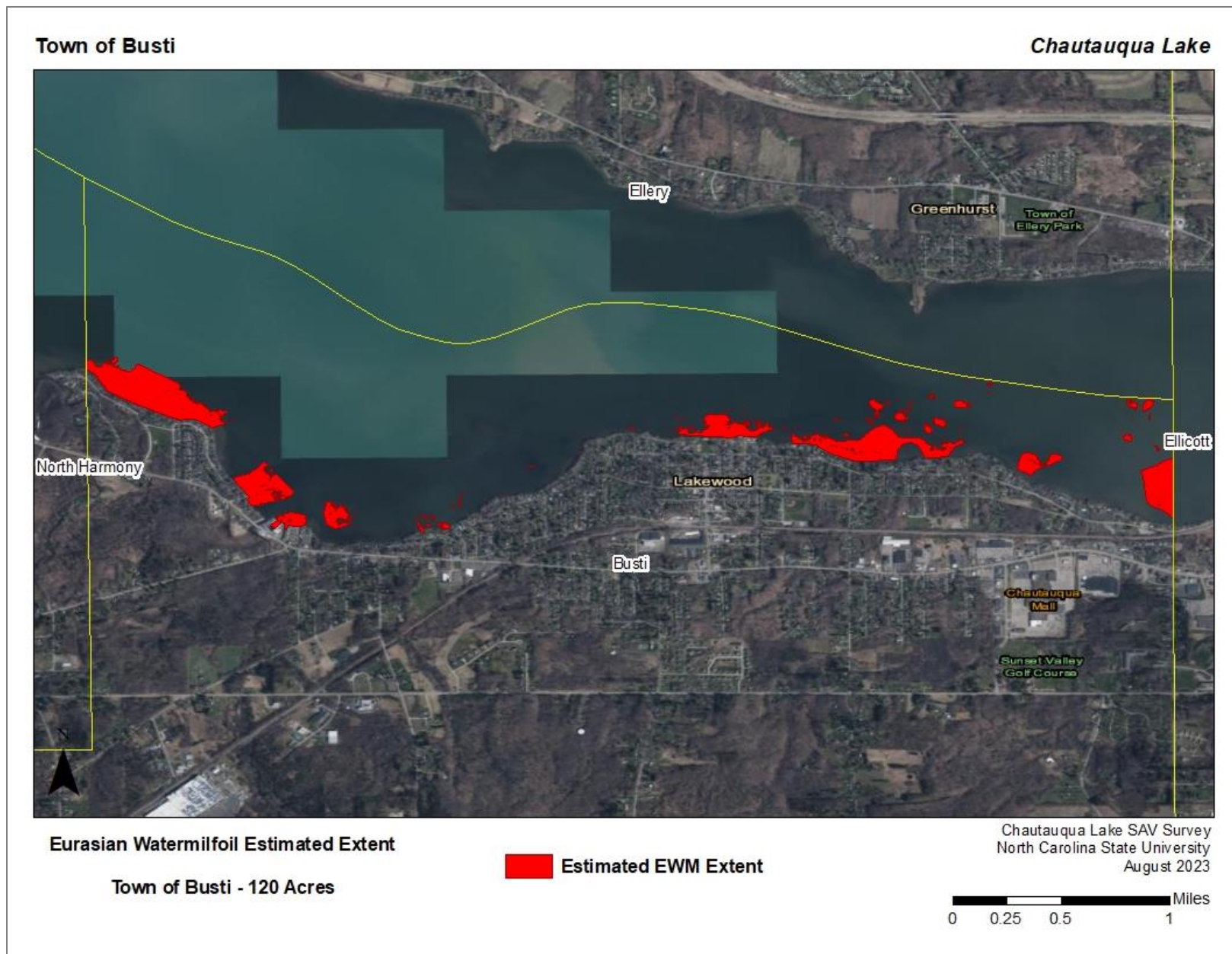


Figure 18: *Interpolated estimates of Eurasian watermilfoil (EWM) distribution within the Town of Busti*

Table 9: SAV species recorded in the Village of Lakewood during the Fall 2023 survey of Chautauqua Lake. Non-native species are marked in red.

| Chautauqua Lake Fall 2023 SAV Survey Results | | | | | | | | | | | |
|--|------------------------------------|-------|-----|-------|------|--------|-----|----------|----|-------|----|
| Village of Lakewood | | | | | | | | | | | |
| COMMON NAME | SPECIES PRESENT SCIENTIFIC NAME | TOTAL | | TRACE | | SPARSE | | MODERATE | | DENSE | |
| | | # | % | # | % | # | % | # | % | # | % |
| TOTAL SURVEYED SITES | | 60 | | | | | | | | | |
| TOTAL VEGETATED SITES | | 57 | 95% | 31 | 54% | 23 | 40% | 3 | 5% | 0 | 0% |
| SLENDER NAIAD | <i>NAJAS FLEXILIS</i> | 28 | 47% | 27 | 96% | 1 | 4% | 0 | 0% | 0 | 0% |
| EURASIAN WATERMILFOIL | <i>MYRIOPHYLLUM SPICATUM</i> | 27 | 45% | 25 | 93% | 2 | 7% | 0 | 0% | 0 | 0% |
| CURLY-LEAF PONDWEED | <i>POTAMOGETON CRISPUS</i> | 24 | 40% | 23 | 96% | 1 | 4% | 0 | 0% | 0 | 0% |
| WESTERN WATERWEED | <i>ELODEA NUTTALII</i> | 19 | 32% | 16 | 84% | 2 | 11% | 1 | 5% | 0 | 0% |
| COONTAIL | <i>CERATOPHYLLUM DEMERSUM</i> | 18 | 30% | 15 | 83% | 3 | 17% | 0 | 0% | 0 | 0% |
| WATER STARGRASS | <i>HETERANTHERA DUBIA</i> | 15 | 25% | 13 | 87% | 1 | 7% | 1 | 7% | 0 | 0% |
| LEAFY PONDWEED | <i>POTAMOGETON FOLIOSUS</i> | 14 | 23% | 13 | 93% | 1 | 7% | 0 | 0% | 0 | 0% |
| COMMON WATERWEED | <i>ELODEA CANADENSIS</i> | 13 | 22% | 13 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| WILD CELERY | <i>VALISNERIA AMERICANA</i> | 11 | 18% | 10 | 91% | 1 | 9% | 0 | 0% | 0 | 0% |
| SMALL PONDWEED | <i>POTAMOGETON PUSILLUS</i> | 10 | 17% | 10 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| BRITTLE NAIAD | <i>NAJAS MINOR</i> | 5 | 8% | 4 | 80% | 1 | 20% | 0 | 0% | 0 | 0% |
| SOUTHERN NAIAD | <i>NAJAS GUADALUPENSIS</i> | 3 | 5% | 3 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| NY-LEAVED DUCKWEED | <i>LEMNA TRISULCA</i> | 2 | 3% | 2 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| SAGO PONDWEED | <i>STUCKENIA PECTINATA</i> | 1 | 2% | 1 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| STARRY STONEWORT | <i>NITELLOPSIS OBTUSA</i> | 1 | 2% | 1 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| BENTHIC FILAMENTOUS ALGAE | <i>MICROSERIA SP.</i> | 11 | 18% | | | | | | | | |

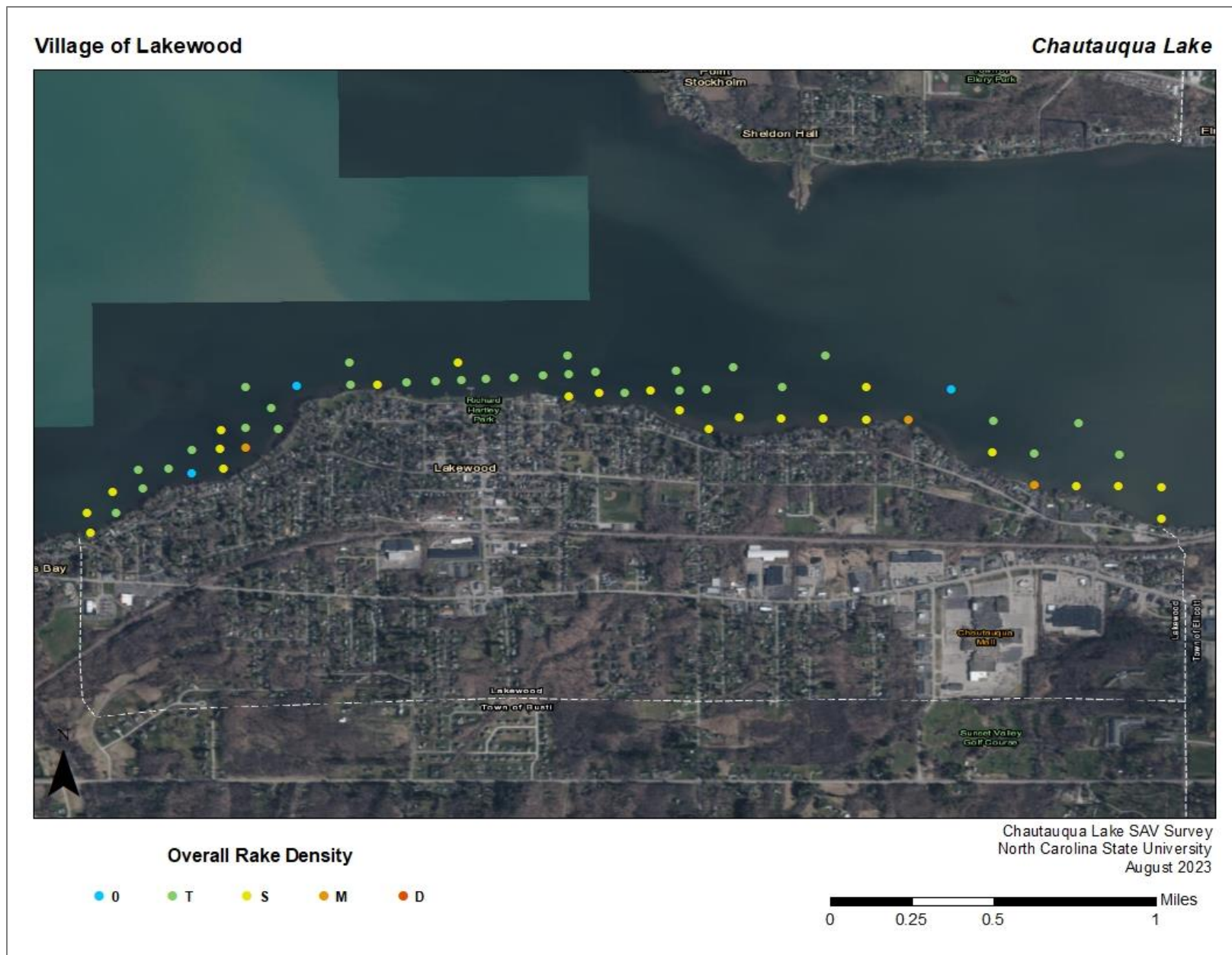


Figure 19: Overall rake density of surveyed points in the Village of Lakewood during Fall 2023 SAV Survey at Chautauqua Lake.
 '0': No SAV; 'T': Trace SAV; 'S': Sparse SAV; 'M': Moderate SAV; 'D': Dense SAV

Table 10: SAV species recorded in the Town of Ellicott during the Fall 2023 survey of Chautauqua Lake. Non-native species are marked in red.

| Chautauqua Lake Fall 2023 SAV Survey Results | | | | | | | | | | | |
|--|-------------------------------|-------|-----|-------|------|--------|-----|----------|-----|-------|----|
| Town of Ellicott | | | | | | | | | | | |
| SPECIES PRESENT | | TOTAL | | TRACE | | SPARSE | | MODERATE | | DENSE | |
| COMMON NAME | SCIENTIFIC NAME | # | % | # | % | # | % | # | % | # | % |
| TOTAL SURVEYED SITES | | 36 | | | | | | | | | |
| TOTAL VEGETATED SITES | | 35 | 97% | 4 | 11% | 23 | 66% | 6 | 17% | 2 | 6% |
| SLENDER NAIAD | <i>NAJAS FLEXILIS</i> | 32 | 89% | 27 | 84% | 5 | 16% | 0 | 0% | 0 | 0% |
| BRITTLE NAIAD | <i>NAJAS MINOR</i> | 29 | 81% | 20 | 69% | 5 | 17% | 2 | 7% | 2 | 7% |
| WATER STARGRASS | <i>HETERANTHERA DUBIA</i> | 16 | 44% | 15 | 94% | 1 | 6% | 0 | 0% | 0 | 0% |
| EURASIAN WATERMILFOIL | <i>MYRIOPHYLLUM SPICATUM</i> | 13 | 36% | 13 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| CURLY-LEAF PONDWEED | <i>POTAMOGETON CRISPUS</i> | 12 | 33% | 12 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| LEAFY PONDWEED | <i>POTAMOGETON FOLIOSUS</i> | 12 | 33% | 12 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| COONTAIL | <i>CERATOPHYLLUM DEMERSUM</i> | 7 | 19% | 7 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| WESTERN WATERWEED | <i>ELODEA NUTTALII</i> | 7 | 19% | 6 | 86% | 1 | 14% | 0 | 0% | 0 | 0% |
| SMALL PONDWEED | <i>POTAMOGETON PUSILLUS</i> | 7 | 19% | 7 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| SOUTHERN NAIAD | <i>NAJAS GUADALUPENSIS</i> | 5 | 14% | 5 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| WILD CELERY | <i>VALISNERIA AMERICANA</i> | 4 | 11% | 4 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| MACROALGAE (NATIVE) | <i>CHARA/NITELLA</i> | 4 | 11% | 3 | 75% | 1 | 25% | 0 | 0% | 0 | 0% |
| COMMON WATERWEED | <i>ELODEA CANADENSIS</i> | 3 | 8% | 3 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| STARRY STONEWORT | <i>NITELLOPSIS OBTUSA</i> | 3 | 8% | 3 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| YELLOW WATER LILY | <i>NUPHAR VARIGATA</i> | 1 | 3% | | | | | | | | |
| WHITE WATER LILY | <i>NYMPHAEA ODORATA</i> | 1 | 3% | | | | | | | | |

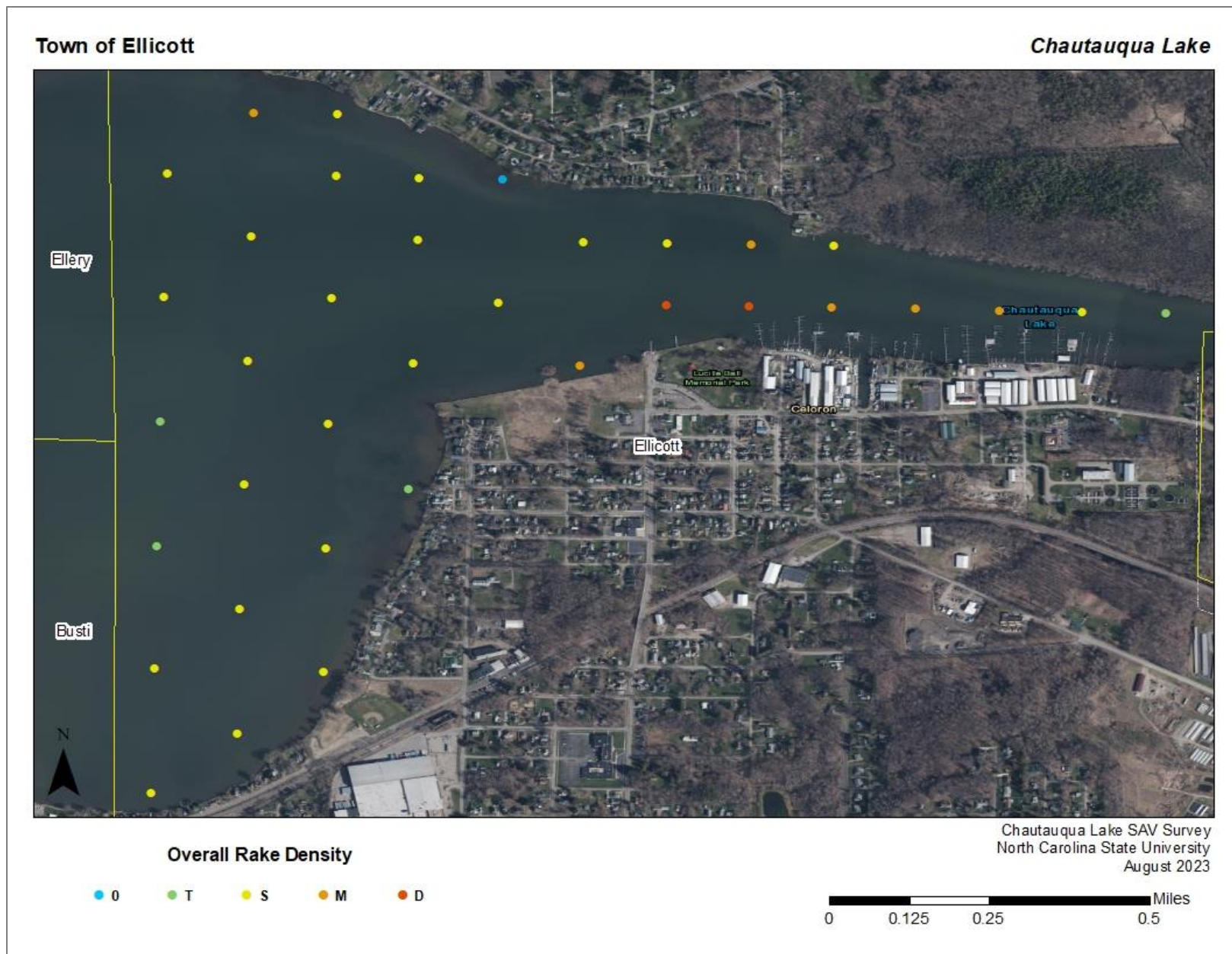


Figure 20: Overall rake density of surveyed points in the Town of Ellicott during Fall 2023 SAV Survey at Chautauqua Lake.
'0': No SAV; 'T': Trace SAV; 'S': Sparse SAV; 'M': Moderate SAV; 'D': Dense SAV

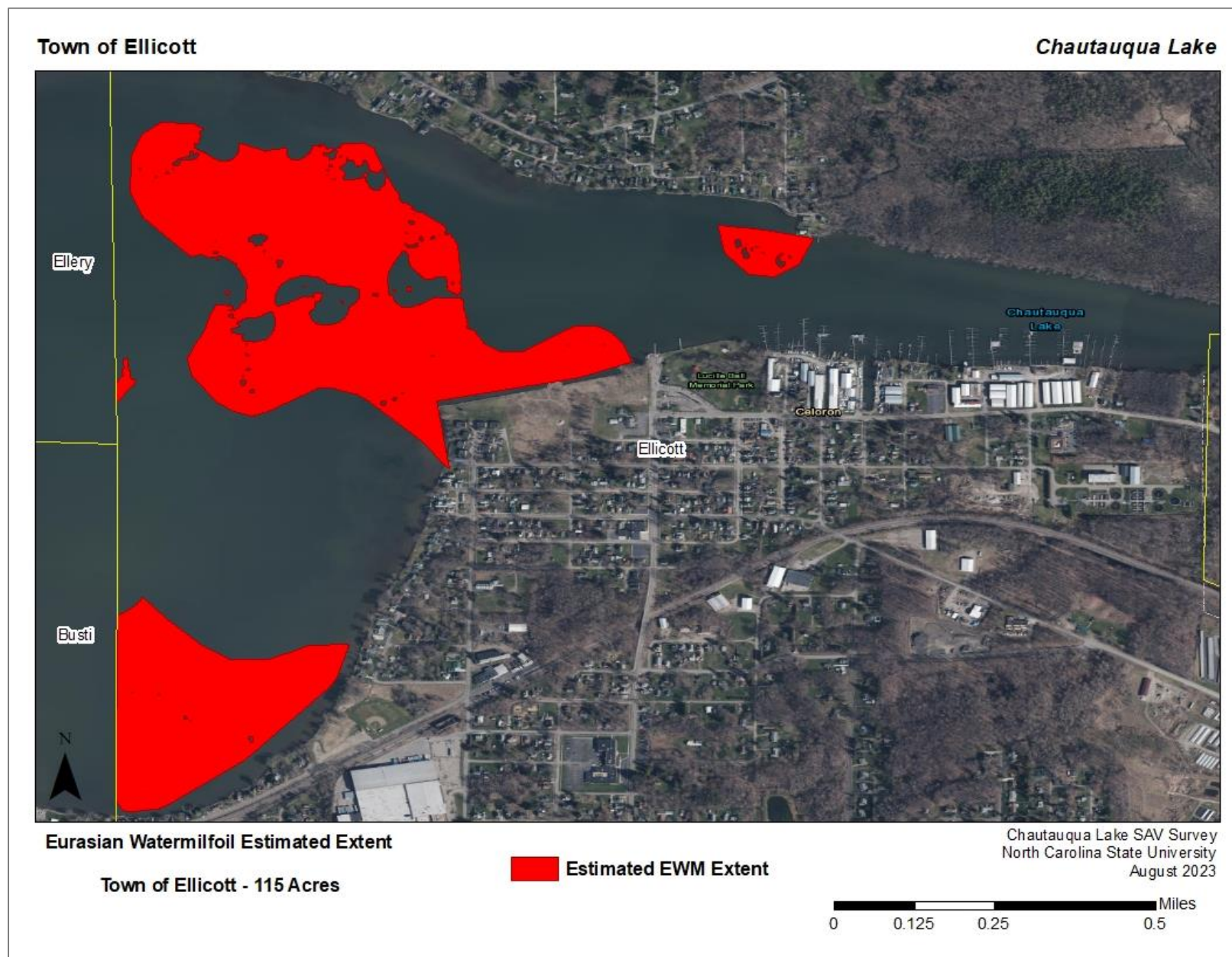


Figure 21: *Interpolated estimates of Eurasian watermilfoil (EWM) distribution within the Town of Ellicott*

Table 11: SAV species recorded in the Village of Celeron during the Fall 2023 survey of Chautauqua Lake. Non-native species are marked in red.

| Chautauqua Lake Fall 2023 SAV Survey Results | | | | | | | | | | | |
|--|------------------------------------|-------|------|-------|------|--------|-----|----------|-----|-------|-----|
| Village of Celeron | | | | | | | | | | | |
| COMMON NAME | SPECIES PRESENT SCIENTIFIC NAME | TOTAL | | TRACE | | SPARSE | | MODERATE | | DENSE | |
| | | # | % | # | % | # | % | # | % | # | % |
| TOTAL SURVEYED SITES | | 16 | | | | | | | | | |
| TOTAL VEGETATED SITES | | 16 | 100% | 2 | 13% | 7 | 44% | 5 | 31% | 2 | 13% |
| SLENDER NAIAD | NAJAS FLEXILIS | 16 | 100% | 12 | 75% | 4 | 25% | 0 | 0% | 0 | 0% |
| BRITTLE NAIAD | NAJAS MINOR | 15 | 94% | 9 | 60% | 2 | 13% | 2 | 13% | 2 | 13% |
| WATER STARGRASS | HETERANTHERA DUBIA | 6 | 38% | 5 | 83% | 1 | 17% | 0 | 0% | 0 | 0% |
| CURLY-LEAF PONDWEED | POTAMOGETON CRISPUS | 6 | 38% | 6 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| SMALL PONDWEED | POTAMOGETON PUSILLUS | 6 | 38% | 6 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| LEAFY PONDWEED | POTAMOGETON FOLIOSUS | 4 | 25% | 4 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| EURASIAN WATERMILFOIL | MYRIOPHYLLUM SPICATUM | 3 | 19% | 3 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| WESTERN WATERWEED | ELODEA NUTTALII | 3 | 19% | 3 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| WILD CELERY | VALISNERIA AMERICANA | 1 | 6% | 1 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| COONTAIL | CERATOPHYLLUM DEMERSUM | 1 | 6% | 1 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| SOUTHERN NAIAD | NAJAS GUADALUPENSIS | 1 | 6% | 1 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| YELLOW WATER LILY | NUPHAR VARIGATA | 1 | 6% | | | | | | | | |
| WHITE WATER LILY | NYMPHAEA ODORATA | 1 | 6% | | | | | | | | |



Figure 22: Overall rake density of surveyed points in the Village of Celeron during Fall 2023 SAV Survey at Chautauqua Lake.
'0': No SAV; 'T': Trace SAV; 'S': Sparse SAV; 'M': Moderate SAV; 'D': Dense SAV

Table 12: SAV species recorded in the Town of North Harmony during the Fall 2023 survey of Chautauqua Lake. Non-native species are marked in red.

| Chautauqua Lake Fall 2023 SAV Survey Results | | | | | | | | | | | |
|--|---------------------------|-------|-----|-------|------|--------|-----|----------|-----|-------|----|
| Town of North Harmony | | | | | | | | | | | |
| SPECIES PRESENT | | TOTAL | | TRACE | | SPARSE | | MODERATE | | DENSE | |
| COMMON NAME | SCIENTIFIC NAME | # | % | # | % | # | % | # | % | # | % |
| TOTAL SURVEYED SITES | | 157 | | | | | | | | | |
| TOTAL VEGETATED SITES | | 136 | 87% | 37 | 27% | 65 | 48% | 31 | 23% | 3 | 2% |
| EURASIAN WATERMILFOIL | MYRIOPHYLLUM SPICATUM | 82 | 52% | 65 | 79% | 13 | 16% | 3 | 4% | 1 | 1% |
| WATER STARGRASS | HETERANTHERA DUBIA | 65 | 41% | 47 | 72% | 15 | 23% | 3 | 5% | 0 | 0% |
| WILD CELERY | VALISNERIA AMERICANA | 65 | 41% | 57 | 88% | 8 | 12% | 0 | 0% | 0 | 0% |
| COONTAIL | CERATOPHYLLUM DEMERSUM | 65 | 41% | 63 | 97% | 2 | 3% | 0 | 0% | 0 | 0% |
| WESTERN WATERWEED | ELODEA NUTTALLII | 45 | 29% | 39 | 87% | 4 | 9% | 1 | 2% | 1 | 2% |
| SLENDER NAIAD | NAJAS FLEXILIS | 39 | 25% | 37 | 95% | 2 | 5% | 0 | 0% | 0 | 0% |
| COMMON WATERWEED | ELODEA CANADENSIS | 32 | 20% | 32 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| IVY-LEAVED DUCKWEED | LEMNA TRISULCA | 31 | 20% | 31 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| CURLY-LEAF PONDWEED | POTAMOGETON CRISPUS | 29 | 18% | 29 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| SOUTHERN NAIAD | NAJAS GUADALUPENSIS | 22 | 14% | 21 | 95% | 1 | 5% | 0 | 0% | 0 | 0% |
| LEAFY PONDWEED | POTAMOGETON FOLIOSUS | 9 | 6% | 9 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| WHITESTEM PONDWEED | POTAMOGETON PRAELONGUS | 8 | 5% | 8 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| STARRY STONEWORT | NITELLOPSIS OBTUSA | 5 | 3% | 5 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| MACROALGAE (NATIVE) | CHARA/NITELLA | 4 | 3% | 4 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| SMALL PONDWEED | POTAMOGETON PUSILLUS | 3 | 2% | 3 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| FLATSTEM PONDWEED | POTAMOGETON ZOSTERIFORMIS | 1 | 1% | 1 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| WATER PLANTAIN | ALISMA SUBCORDATUM | 1 | 1% | 1 | 100% | 0 | 0% | 0 | 0% | 0 | 0% |
| WHITE WATER LILY | NYMPHAEA ODORATA | 28 | 18% | | | | | | | | |
| BENTHIC FILAMENTOUS ALGAE | MICROSERIA SP. | 26 | 17% | | | | | | | | |
| YELLOW WATER LILY | NUPHAR VARIGATA | 10 | 6% | | | | | | | | |
| JAPANESE KNOTWEED | FALLOPIA JAPONICA | 4 | 3% | | | | | | | | |
| CATTAIL | TYPHA LATIFOLIA | 2 | 1% | | | | | | | | |
| BULRUSH | SCIRPUS SP. | 1 | 1% | | | | | | | | |

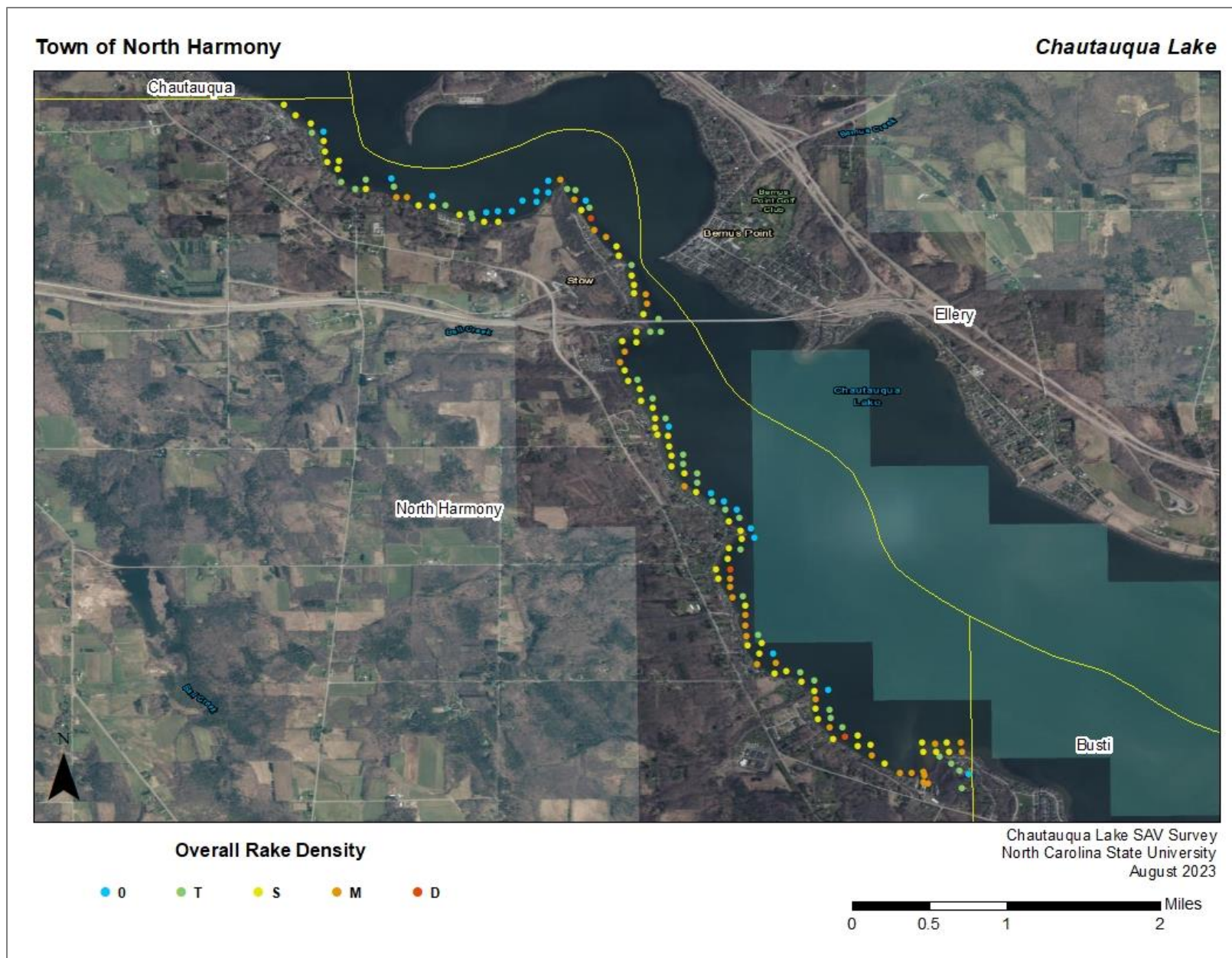


Figure 23: Overall rake density of surveyed points in the Town of North Harmony during Fall 2023 SAV Survey at Chautauqua Lake.
 '0': No SAV; 'T': Trace SAV; 'S': Sparse SAV; 'M': Moderate SAV; 'D': Dense SAV

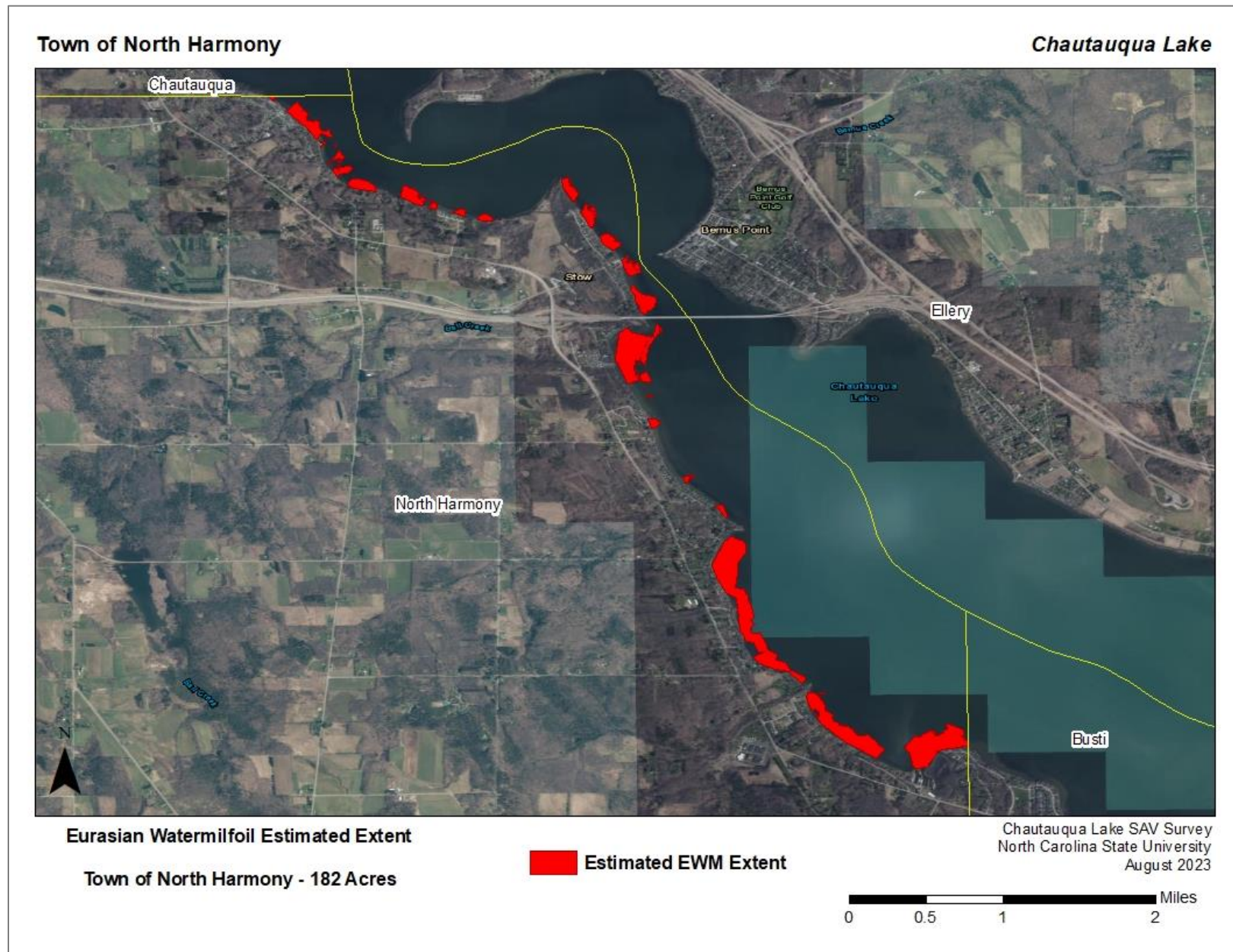


Figure 24: *Interpolated estimates of Eurasian watermilfoil (EWM) distribution within the Town of North Harmony*



Figure 25: *Examples of healthy Eurasian watermilfoil stems. Note the formation of adventitious roots (right) allowing fragments of this plant to recolonize new sites after fragmentation*

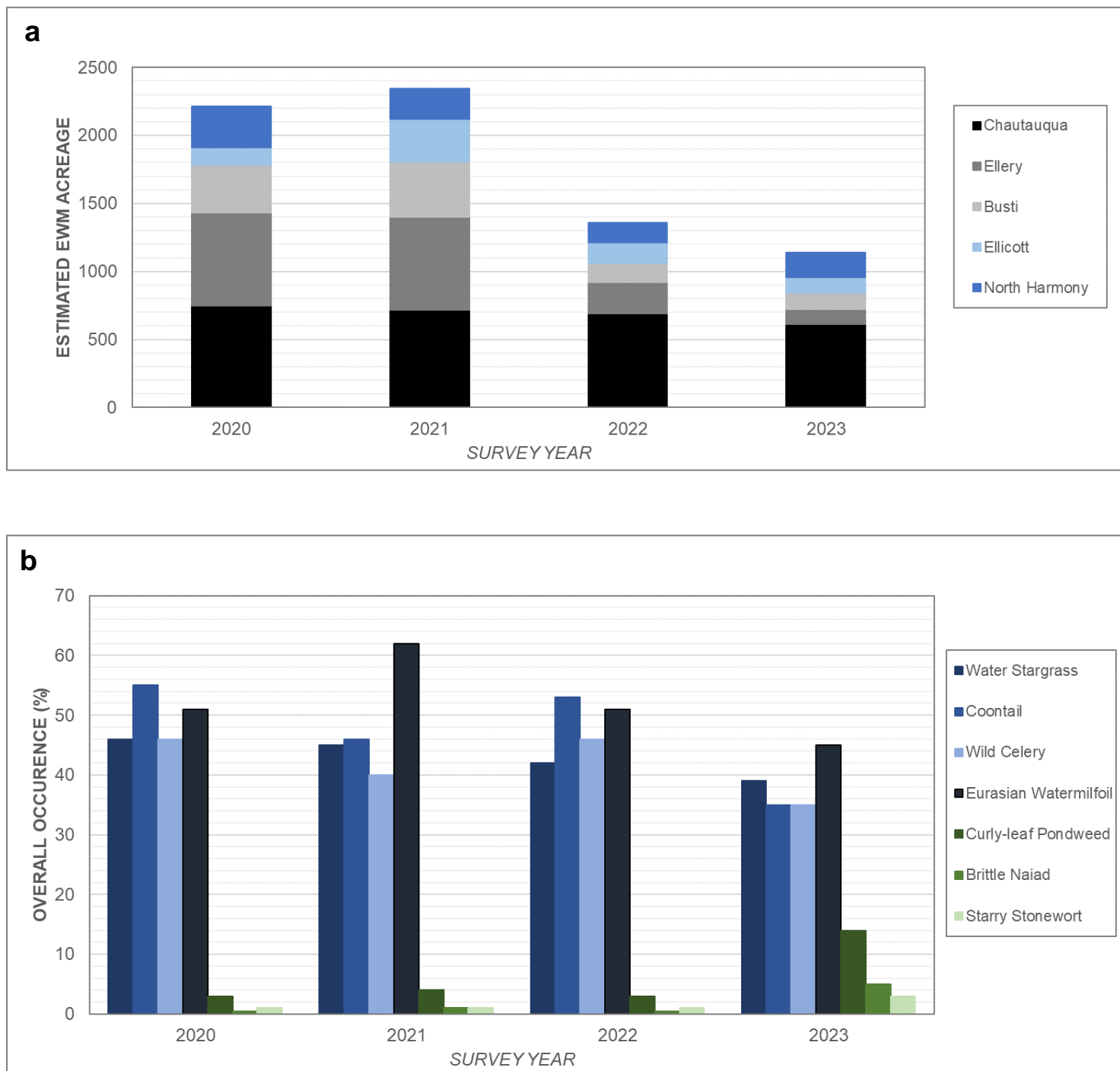


Figure 26: a: Estimated EWM acreage over time at Chautauqua Lake separated by Town, b: overall abundance (%) of SAV species at Chautauqua Lake at surveyed points over time

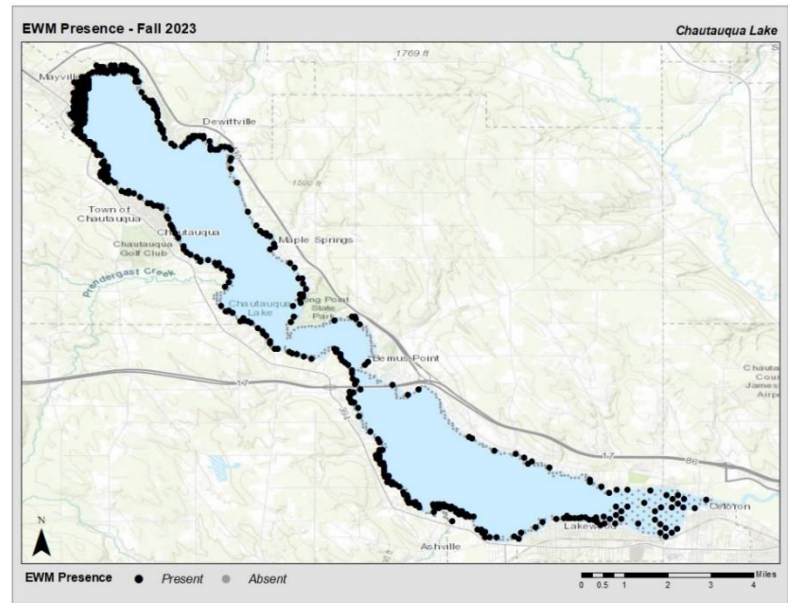
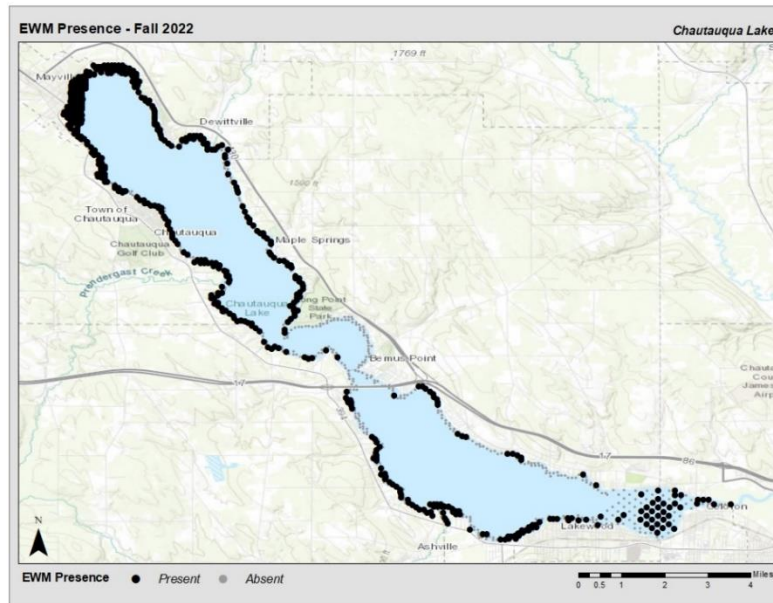
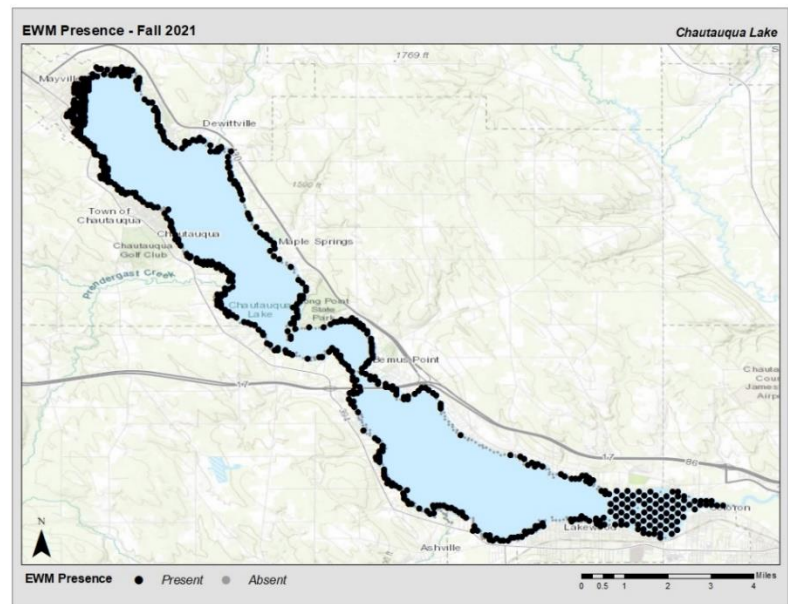
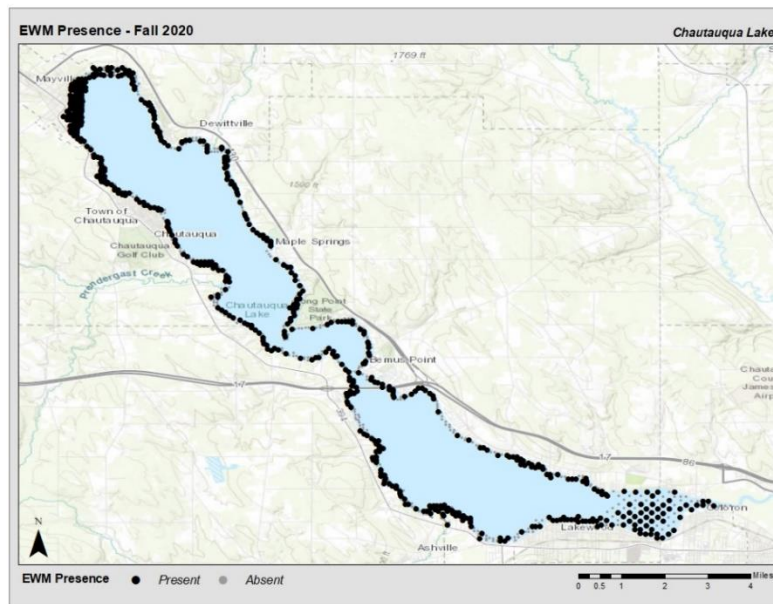


Figure 27: Presence of Eurasian watermilfoil (EWM) at survey points during Fall 2020 - Fall 2023 surveys.

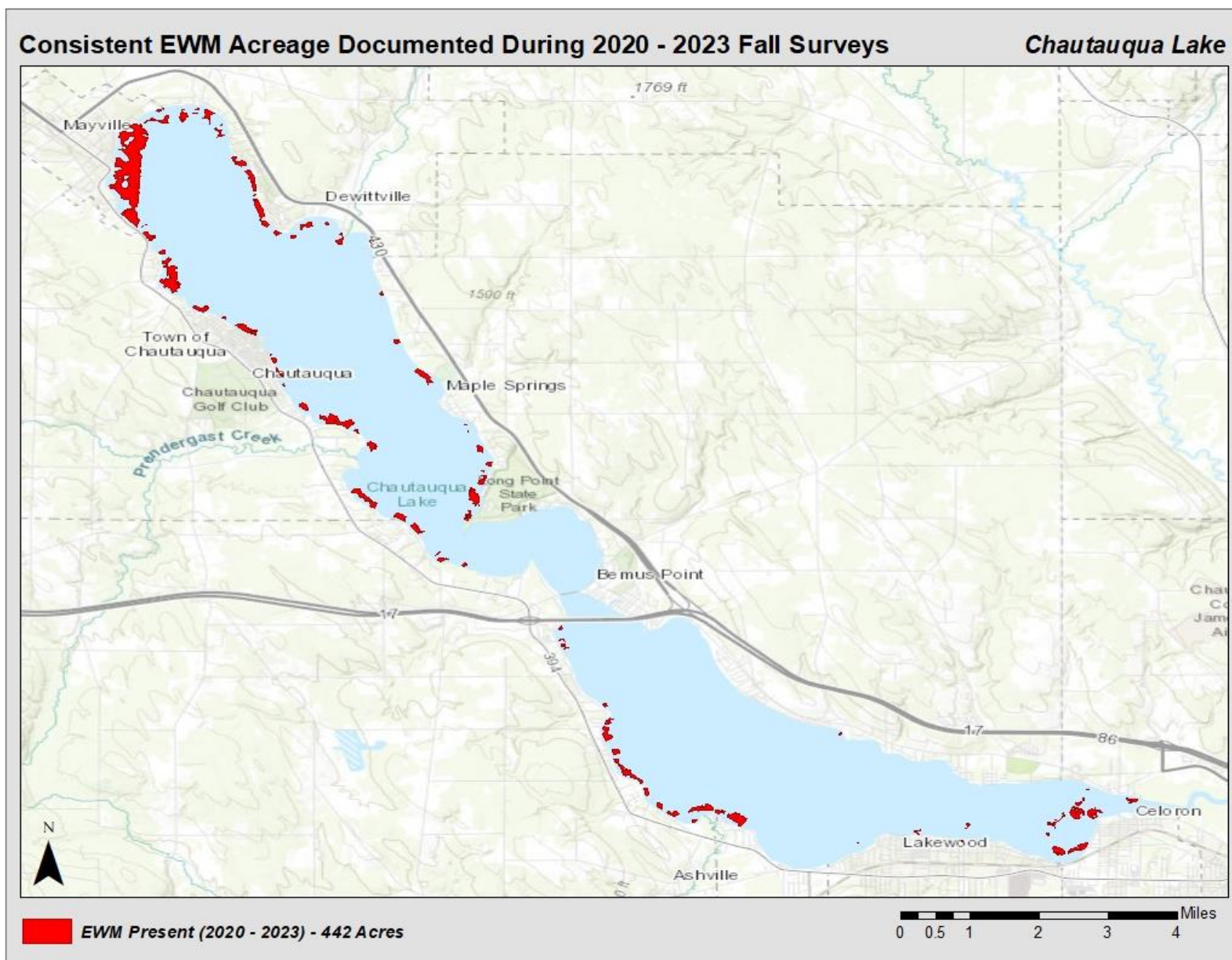


Figure 28: Areas of Chautauqua Lake where Eurasian watermilfoil (EWM) has been consistently delineated during 2020 – 2023 Fall surveys.

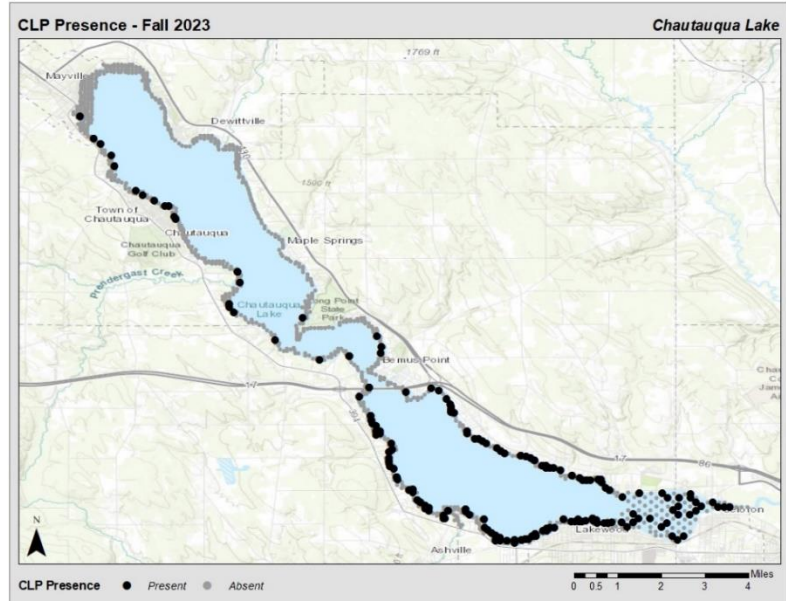
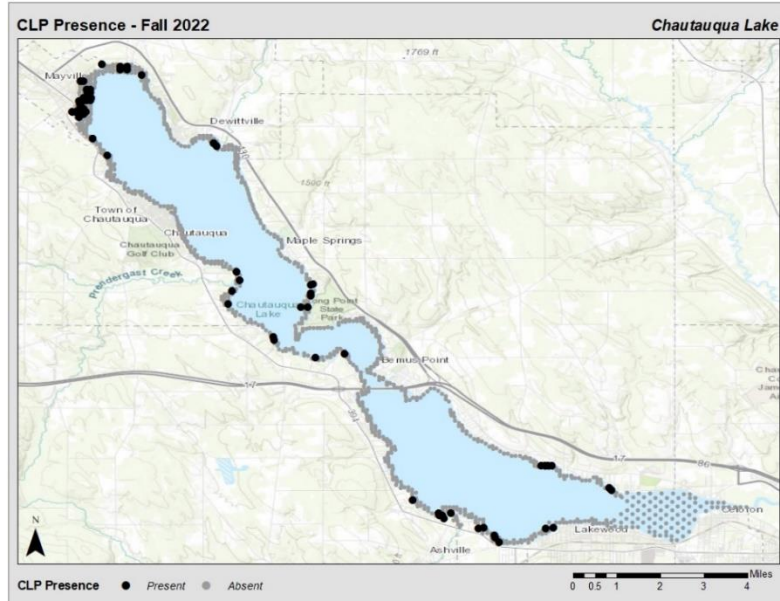
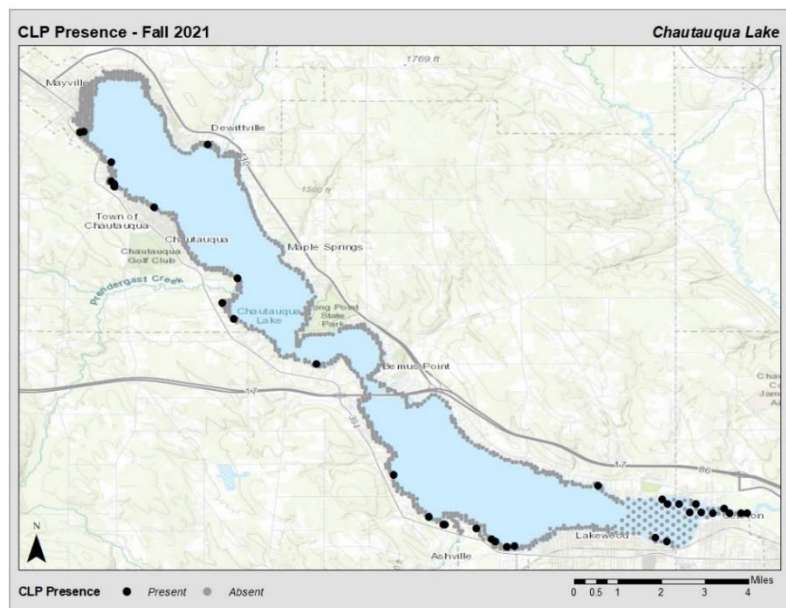
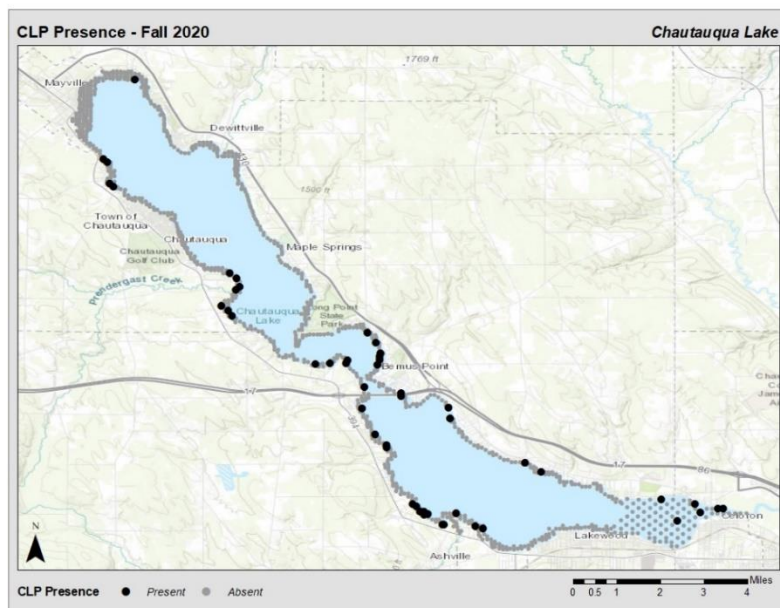


Figure 29: Presence of Curly-leaf pondweed (CLP) at survey points during Fall 2020 - Fall 2023 surveys.

