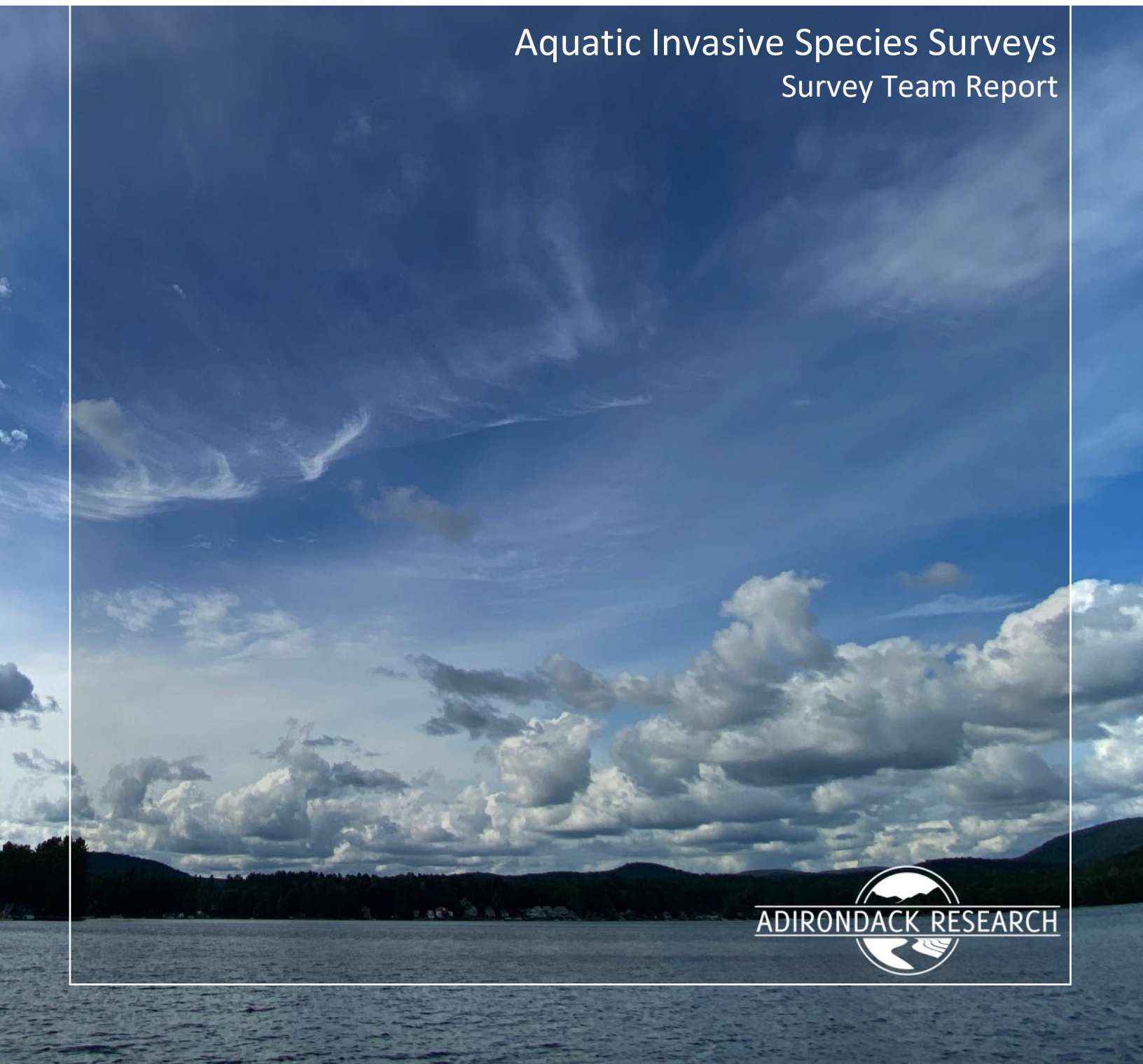
2023
West Caroga Lake AIS Survey

Aquatic Invasive Species Surveys
Survey Team Report



ADIRONDACK RESEARCH

2023 West Caroga Lake Aquatic Invasive Species Survey

Written by:
Ezra Schwartzberg, Ph.D. and Justin Wolford
Adirondack Research
October 2023

Surveyed by:
Gage Root, Julia Luna, Tucker Wells, and Tucker Jakobe

Client:
Scott Horton, Town Supervisor
Town of Caroga
Office: (518) 835-4211 ext. 110
Cell: (518) 469-8000
Email: supervisor@caroga.town

Grantee:
Walter Hogan, Director
Invasive Species Program, Town of Caroga

Consultant:
Dr. Ezra Schwartzberg, Director
Adirondack Research, LLC
73 Church Street, Suite 2
Saranac Lake, NY 12983
Office: (518) 278-6070
Email: ezra@adkres.org.org
Website: www.adkres.org

Cover image: East Caroga Lake. Photo by Julia Luna

Executive Summary

The purpose of this effort was to perform a point intercept survey in preparation for submitting a permit to the Adirondack Park Agency (APA) for management of Eurasian watermilfoil using the herbicide ProcellaCOR EC.

We surveyed 43 stations (sample points). Seventeen points were surveyed within the proposed treatment area and 26 points were surveyed outside of the proposed treatment area. Our survey design and methodologies followed the APA requirements for permit submission.

Our team documented aquatic plant species occurrence, species cover class, overall plant cover class, depth, and species richness at each of the 43 stations.

Eurasian watermilfoil was documented at a total of 12 of the 43 stations (27.91%); within the proposed treatment area, it was recorded at 11 stations, and at 1 location outside the proposed treatment area. Eleven other native species were documented in this survey.

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Overview

We performed an aquatic invasive species (AIS) and native aquatic plant species survey for West Caroga Lake in Fulton County on the dates of August 15th and 16th 2023. This survey was completed in preparation for The Town of Caroga applying to the Adirondack Park Agency for a permit to use the herbicide ProcellaCOR EC for the control of an aquatic pest (AQV). This survey was completed in accordance with all of the required parameters of the linked application requirements: https://www.dropbox.com/s/kn7c043b53k7wns/SIR-AquaticHerbicides.pdf?dl=0

The Town of Caroga is planning to apply for a permit to use ProcellaCOR EC in 2024 to manage Eurasian watermilfoil. We performed the surveys and created maps and data tables of the survey results per the requirements of the permit.

For more information on our qualifications and services, our Qualifications Packet can be accessed via this link: https://www.dropbox.com/s/2jc37h56z4jkb6i/Lake%20Surveys.pdf?dl=0 You can also learn more about Adirondack Research at www.adkres.org.

Adirondack Research was able to complete the following tasks as part of this project:

- Survey 43 stations in the entirety of the 275 -acre waterbody over a day with two crew members using a motorboat.
- Survey, identify, and photograph all native plant species at point intercept survey stations within a survey design to meet Adirondack Park Agency requirements for applying for the use of the herbicide ProcellaCOR EC.
- Draft maps showing survey locations, overall plant abundance, depth, species richness, and abundance for each of the 12 species recorded, in GIS.
- Create tables displaying station number, GPS coordinates, depth, species richness, and abundance of the target species; abundance of each species at all stations; the total count of station numbers each species is found, including overall percentages; and susceptibility of each species to herbicide ProcellaCOR EC.
- Drafted detailed descriptions of all 12 species including information of the impacts of each species on their environment.
- Produced this report of the described survey effort.

Methods

Below is a description of the survey methods used while surveying your lake. We've included a brief description of the equipment used, our cleaning procedure for all of our equipment before accessing the lake, and a description of our survey techniques.

Equipment

Equipment used while completing the Aquatic Invasive Species (AIS) survey of the lake consisted of double-sided rakes for collecting plant samples from under the water, and an iPad 4 mini for data collection. All data and observations were recorded using ESRI's Survey123 for ArcGIS application. Surveys were conducted via motorboat.

Cleaning

As our team is frequently moving from one water body to another, specific precautionary measures were taken to ensure that all equipment used was decontaminated and free of AIS. To ensure that all equipment was free of AIS, we thoroughly washed and decontaminated all of our equipment at one of the Adirondack AIS Prevention Program's free boat wash and decontamination stations. High pressure hot water was used at these sites to ensure that no AIS spread via equipment.

Monitoring Techniques

While out on the waterbody, we surveyed plants at survey stations, or sites, that were predetermined prior to performing the on-the-water survey. These survey stations were selected based on criteria outlined by the Adirondack Park Agency as requirements for applying for a permit application to perform management using the herbicide ProcellaCOR EC. Specifically, we established a sampling design based on the following APA requirements:

1. Perform survey at height of growing season.
2. Establish point intercept survey points (stations/Sites) based on a grid size one acre or less.
3. Survey area must include the entire littoral zone (buffer zone) within 0.3 miles of the edge of the proposed treatment area.
4. Perform point intercept surveys at a minimum of 12 sites within the proposed treatment area and at least 24 sites outside of the proposed treatment area and within the 0.3-mile buffer zone.
5. Perform rake toss surveys at each site or sample point by throwing as many rake tosses as needed to find all plants at or near the sample point or site. This method is biased towards finding every plant species that may exist within the vicinity of a sampling location.
6. Record each species along with the following parameters (water depth, overall rake plant abundance, abundance of each species)
7. Additionally, photograph one example of each species identified during the survey.

The littoral zone typically encompasses the area from shoreline to a depth of about 15 feet. We utilized publicly available bathymetric maps of the proposed treatment areas as well as the surrounding area within 0.3 miles to determine the survey extent. We then evenly distributed roughly 24 survey points outside of the proposed treatment areas, for a total of 43 points across the entirety of the lake. We then shifted points to distribute our sampling locations across different habitat types, locations around shorelines, and to be within the water depths of the littoral zones based on maps and aerial imagery.

The team surveyed the area by navigating to each survey point, tossing the rake and by performing visual surveys where possible. All plants retrieved by rake toss or seen by visual inspection were identified to the best of our abilities (usually to the species level, but sometimes to genus). Both native and invasive plants found were identified using the "Maine Field Guide to Invasive Aquatic Plants and their common native look-alikes" by Lake Stewards of Maine.

Based upon how much plant material was observed on the rake toss, we assigned a percent cover for the entire rake and for each species on the rake. Plants that were observed visually and not collected on a rake toss were estimated based on their appearance from the water surface. Based on plant abundance, we used the following density classes:

Density Class	Class Description		Coverage Class (plant density)
T	Trace	1-2 stems	Less than 5%
S	Sparse	3-10 stems	5 - 25%
M	Moderate	Rakeful; no empty tines	26 - 50%
D	Dense	Rakeful; no visible tines	51 - 75%
HD	High Density	Difficult to bring on boat	76 - 100%

Table 1: Note we collect two density classes between 51-100% (51-75% and 75-100%) while some studies combine the two. Colors in the density class correspond to their relative abundance markers on maps (3 and 5-32).

Results

The team surveyed 43 sites on August 15th and 16th 2023: detecting one invasive species (Eurasian watermilfoil) and 11 natives. Table 2 provides a summary of all aquatic vegetation detected in West Caroga Lake, in addition to their count and frequency of occurrence relative to the 43 points surveyed, invasive species are dictated in red. Full descriptions for each of these species and impacts on their environment are attached in the appendix.

Table 2. Summary of Aquatic Vegetation Occurrences and Frequency – W. Caroga Lake 2023

Lake	Common Name	*Latin Name*	# of Stations	% Occurrence
West Caroga	Common elodea	*Elodea canadensis*	1	2.33
West Caroga	Eel grass	*Vallisneria americana*	10	23.26
West Caroga	Eurasian watermilfoil	*Myriophyllum spicatum*	12	27.91
West Caroga	Large-leaf pondweed	*Potamogeton amplifolius*	14	32.56
West Caroga	Little floating heart	*Nymphoides cordata*	5	11.63
West Caroga	Muskgrass	*Chara sp.*	1	2.33
West Caroga	Nitella	Nitella sp.	7	16.28
West Caroga	Slender naiad	*Najas flexilis*	3	6.98
West Caroga	Small pondweed	*Potamogeton berchtoldii*	1	2.33
West Caroga	Variable-leaf pondweed	*Potamogeton gramineus*	4	9.30
West Caroga	Water nymph	*Najas spp.*	3	6.98
West Caroga	White-stemmed pondweed	*Potamogeton praelongus*	8	18.60

Coverage class was recorded for each of the individual plant records recorded at every station in 2023 and are displayed in Table 4.

Species Distributions

Common elodea *(Elodea canadensis):* This plant was found at a total of 1 out of 43 stations resulting in 2.33% of occurrences. It was most commonly found growing at less than 5% levels, (n=1, 100.00%).

Eel grass *(Vallisneria americana):* This plant was found at a total of 10 out of 43 stations resulting in 23.26% of occurrences. It was most commonly found growing at less than 5% levels, (n=10, 100.00%).

Eurasian watermilfoil *(Myriophyllum spicatum):* This plant was found at a total of 12 out of 43 stations resulting in 27.91% of occurrences. It was most commonly found growing at 5% - 25% levels, (n=8, 66.67%) followed by less than 5% levels, (n=4, 33.33%).

Large-leaf pondweed *(Potamogeton amplifolius):* This plant was found at a total of 14 out of 43 stations resulting in 32.56% of occurrences. It was most commonly found growing at less than 5% levels, (n=7, 50.00%) followed by 5% - 25% levels, (n=7, 50.00%).

Little floating heart *(Nymphoides cordata):* This plant was found at a total of 5 out of 43 stations resulting in 11.63% of occurrences. It was most commonly found growing at less than 5% levels, (n=4, 80.00%) followed by 5% - 25% levels, (n=1, 20.00%).

Muskgrass *(Chara sp.):* This plant was found at a total of 1 out of 43 stations resulting in 2.33% of occurrences. It was most commonly found growing at 5% - 25% levels, (n=1, 100.00%).

Nitella sp.: This plant was found at a total of 7 out of 43 stations resulting in 16.28% of occurrences. It was most commonly found growing at less than 5% levels, (n=4, 57.14%) followed by 5% - 25% levels, (n=3, 42.86%).

Slender naiad *(Najas flexilis):* This plant was found at a total of 3 out of 43 stations resulting in 6.98% of occurrences. It was most commonly found growing at less than 5% levels, (n=3, 100.00%).

Small pondweed *(Potamogeton berchtoldii):* This plant was found at a total of 1 out of 43 stations resulting in 2.33% of occurrences. It was most commonly found growing at less than 5% levels, (n=1, 100.00%).

Variable-leaf pondweed *(Potamogeton gramineus):* This plant was found at a total of 4 out of 43 stations resulting in 9.30% of occurrences. It was most commonly found growing at less than 5% levels, (n=2, 50.00%) followed by 51% - 75% levels, (n=1, 25.00%) followed by 5% - 25% levels, (n=1, 25.00%).

Water nymph *(Najas sp.):* This plant was found at a total of 3 out of 43 stations resulting in 6.98% of occurrences. It was most commonly found growing at less than 5% levels, (n=2, 66.67%).

White stemmed pondweed *(Potamogeton praelongus):* This plant was found at a total of 8 out of 43 stations resulting in 18.60% of occurrences. It was most commonly found growing at 5% - 25% levels, (n=6, 75.00%) followed by less than 5% levels, (n=2, 25.00%).

Eurasian watermilfoil distribution

Of the 12 stations Eurasian watermilfoil was documented, 11 were recorded in the proposed treatment area, and 1 was located outside the proposed treatment area. The majority of occurrences were recorded at the northern portion of the lake. Of the 12 points recorded most found were growing at Sparse levels, (n=8, 66.67%) followed by Trace levels, (n=4, 33.33%). Table 3 displays the station number, respective GPS coordinates and depth that Eurasian watermilfoil was recorded, along with its abundance and the total species richness at that point.

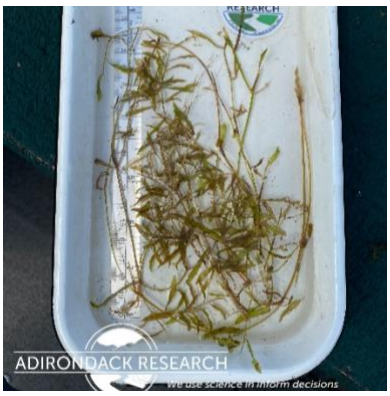
Table 3. Eurasian watermilfoil Presence – West Caroga Lake 2023

Station Number	X	Y	Depth (ft.)	Abundance of Target Species	Total Species Richness
13	-74.49046929	43.14028561	4.9	less than 5%	4
17	-74.49015535	43.14038712	3.0	5% - 25%	6
20	-74.48996679	43.1401008	18.6	5% - 25%	3
21	-74.48967299	43.1404978	3.2	5% - 25%	3
22	-74.48954328	43.1403902	7.5	5% - 25%	4
23	-74.48950227	43.1402933	7.8	5% - 25%	3
24	-74.4892971	43.14043359	4.0	5% - 25%	3
25	-74.48932156	43.14013034	19.8	5% - 25%	3
26	-74.4890304	43.14021495	5.5	less than 5%	2
29	-74.48894446	43.1400782	8.1	less than 5%	2
30	-74.48872897	43.14012938	5.5	less than 5%	3
42	-74.48631496	43.13727677	8.2	5% - 25%	3

Table 4. Abundance of Species by Site – West Caroga Lake 2023

Lake	Survey Station	Depth (ft)	Bladderwort	Clasping-Leaf Pondweed	Common Elodea	Eel Grass	Eurasian Watermilfoil	Floating-Leaf Pondweed	Horsetail	Large-Leaf Pondweed	Little Floating Heart	Muskgrass	Naiad Spp	Nitella Sp.	None	Northern Milfoil	Pickerelweed	Pipewort	Quillwort Sp.	Robbins Pondweed	Slender Naiad	Slender-Leaf Pondweed	Small Pondweed	Variable-Leaf Pondweed	Water Bulrush	Water Nymph	Watershield	White Stemmed Pondweed	White Waterlily	Richness	Overall Plant Density
West Caroga	1	4.0							HD																					1	less than 5%
West Caroga	2	3.6												HD																1	less than 5%
West Caroga	3	2.8								T																				1	5% - 25%
West Caroga	4	9.2							HD																					1	5% - 25%
West Caroga	6	3.1				HD			HD				HD																	3	5% - 25%
West Caroga	7	2.0								HD																				1	5% - 25%
West Caroga	8	2.0							T				HD																	2	less than 5%
West Caroga	9	5.0									T											HD					HD			3	5% - 25%
West Caroga	10	4.8											HD																	1	76% - 100%
West Caroga	12	41.3											T																	1	5% - 25%
West Caroga	13	4.9				HD	HD		T														M							4	76% - 100%
West Caroga	17	3.0			HD	HD	T			HD			T										T							6	26% - 50%
West Caroga	18	2.2								HD													HD							2	26% - 50%
West Caroga	19	5.1							HD				T																	2	less than 5%
West Caroga	20	18.6				HD	T																HD							3	5% - 25%
West Caroga	21	3.2				HD	T		T																					3	5% - 25%
West Caroga	22	7.5				HD	T						HD							HD										4	26% - 50%
West Caroga	23	7.8				HD	T																		HD					3	5% - 25%
West Caroga	24	4.0					T			HD																T				3	5% - 25%
West Caroga	25	19.8					T																			T				3	5% - 25%
West Caroga	26	5.5					HD																			T				2	5% - 25%
West Caroga	28	2.2				HD													HD											2	26% - 50%
West Caroga	29	8.1					HD		T																					2	5% - 25%
West Caroga	30	5.5					HD		HD										HD											3	5% - 25%
West Caroga	31	5.0				HD			T																					2	5% - 25%
West Caroga	33	2.1				HD																								1	less than 5%
West Caroga	34	10.0																								T				1	5% - 25%
West Caroga	35	17.0																								T				1	5% - 25%
West Caroga	36	7.7																								T				1	5% - 25%
West Caroga	37	3.8							HD																					1	less than 5%
West Caroga	38	3.8							HD																					1	less than 5%
West Caroga	39	4.8							T																					1	5% - 25%
West Caroga	40	14.0							T																					1	less than 5%
West Caroga	42	8.2					T																		HD		HD			3	5% - 25%

Photos:



Caption: Variable-leaf pondweed *(Potamogeton gramineus)*

Caption: *Nitella sp*

Caption: Slender naiad *(Najas flexilis)*

Caption: Common elodea *(Elodea canadensis)*

Caption: Eel grass *(Vallisneria americana)*

Caption: Large-leaf pondweed *(Potamogeton amplifolius)*

Caption: Eurasian watermilfoil *(Myriophyllum spicatum)*

Caption: Small pondweed *(Potamogeton berchtoldii)*

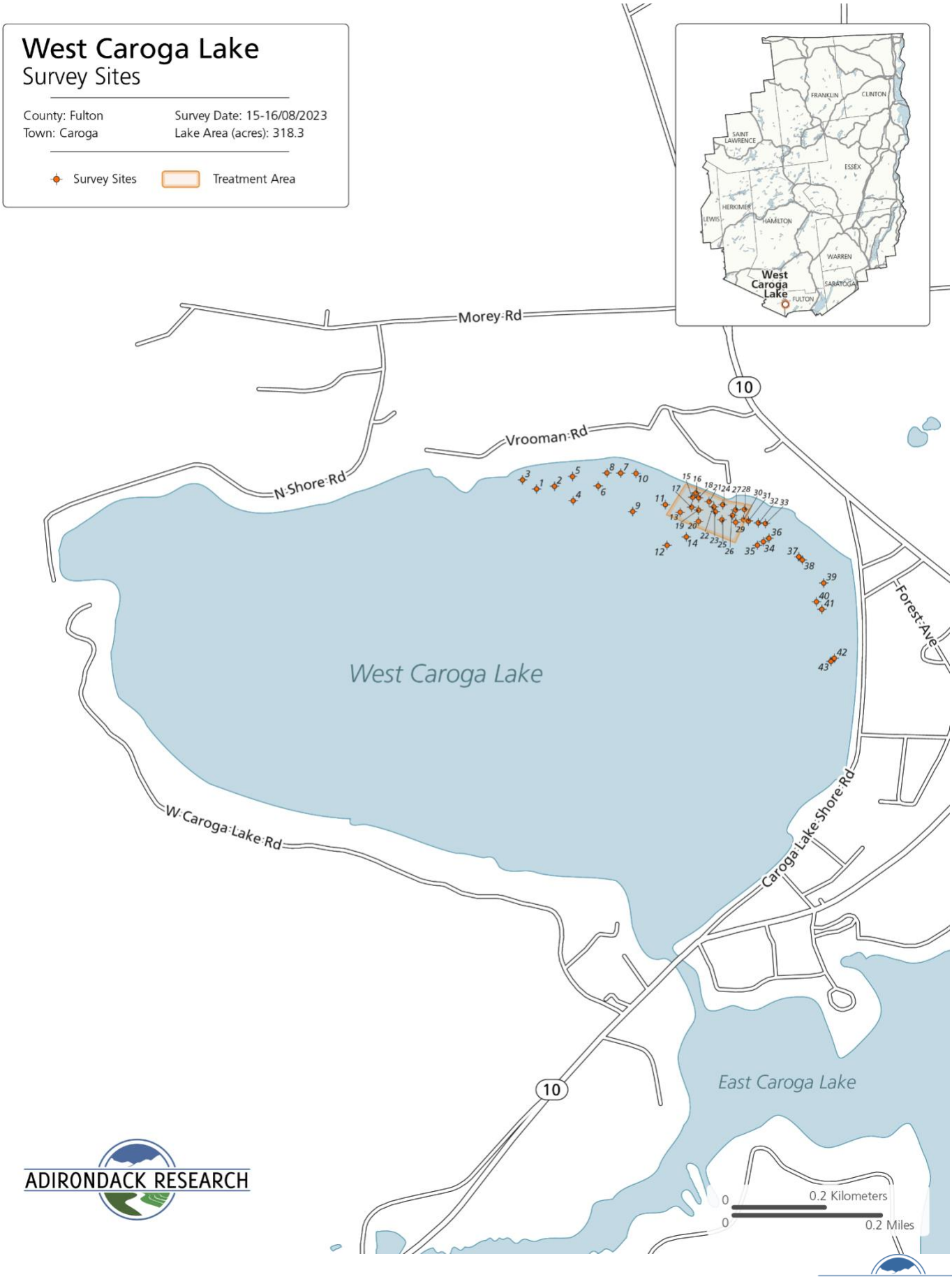
Caption: Little floating heart *(Nymphoides cordata)*

Caption: Muskgrass *(Chara spp.)*

Caption: White stemmed pondweed *(Potamogeton praelongus)*

Maps

Maps 5-15 display the plant abundance for each species across all survey points. Map 1 marks the numbered station points, Map 2 displays depth at each station point, Map 3 displays overall plant abundance, and Map 4 displays species richness per site.



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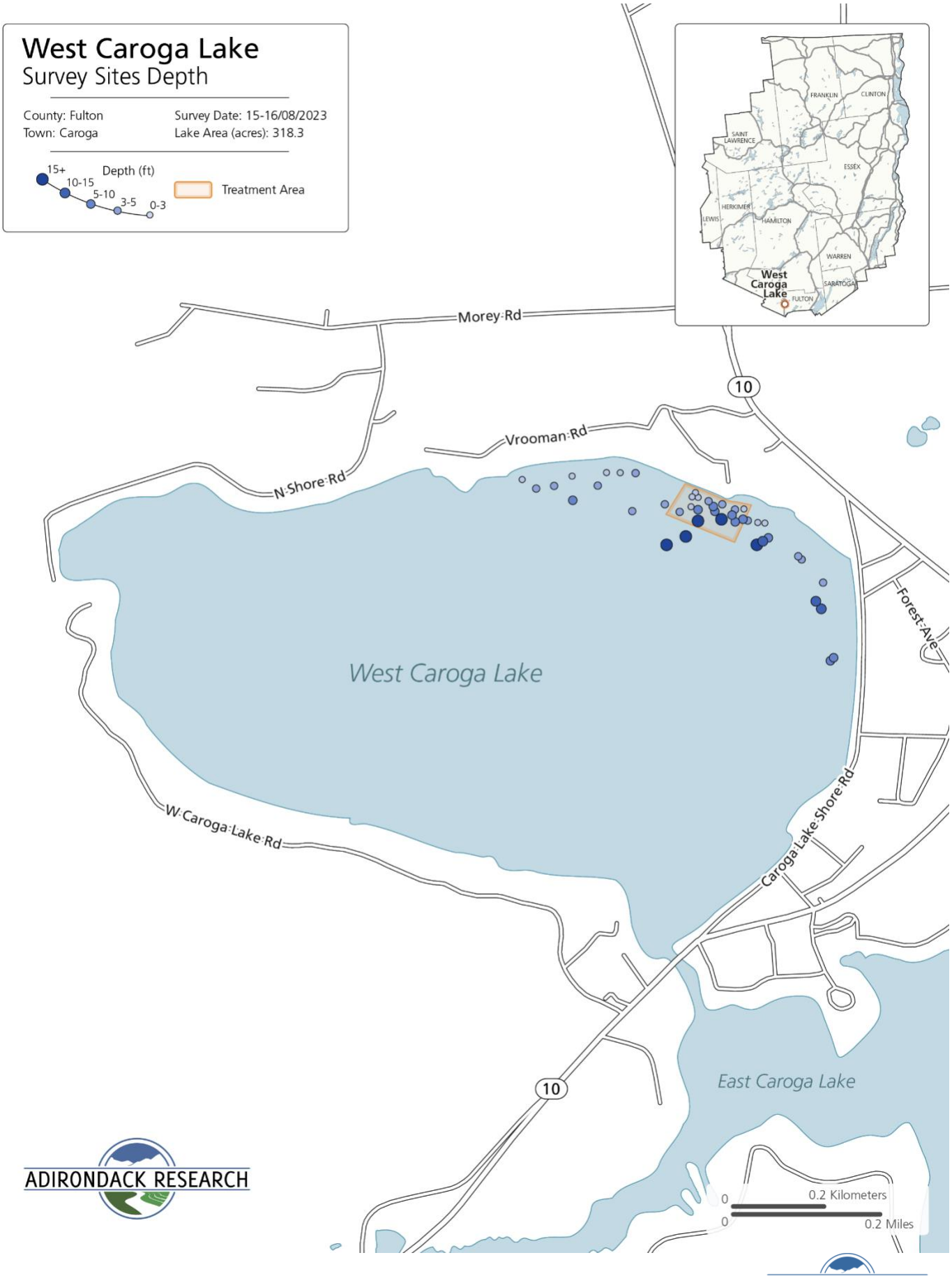

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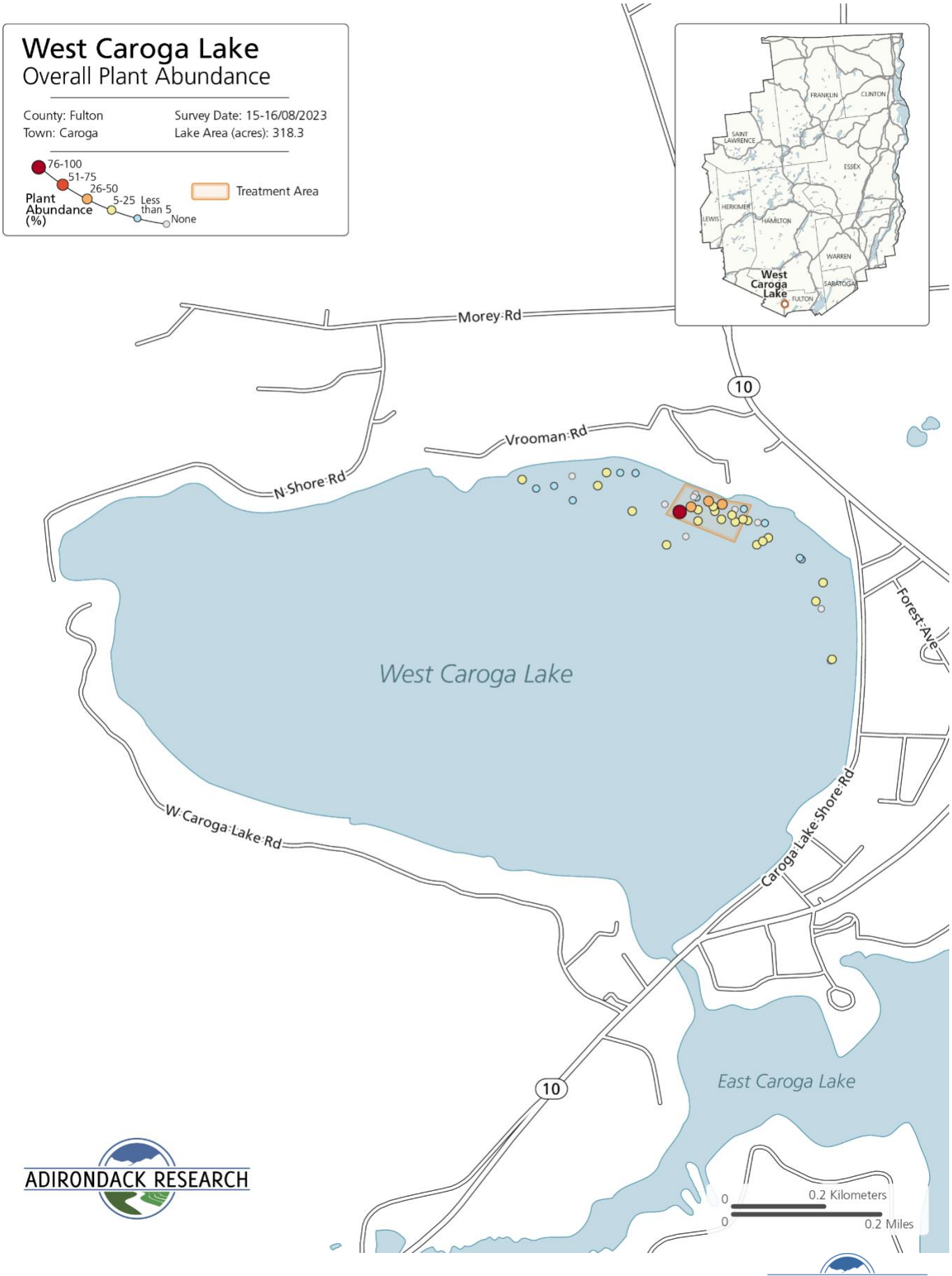
West Caroga Lake
Overall Plant Abundance
County: Fulton
Town: Caroga
Survey Date: 15-16/08/2023
Lake Area (acres): 318.3
Plant Abundance (%)
76-100
51-75
26-50
5-25
Less than 5
None
Treatment Area
FRANKLIN
CLINTON
SAINT LAWRENCE
ESSEX
HERKIMER
LEWIS
HAMILTON
WARREN
SARATOGA
FULTON
West Caroga Lake
Morey Rd
10
Vrooman Rd
N Shore Rd
Forest Ave
West Caroga Lake
W Caroga Lake Rd
Caroga Lake Shore Rd
East Caroga Lake
ADIRONDACK RESEARCH
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0.2 Kilometers
0
0.2 Miles
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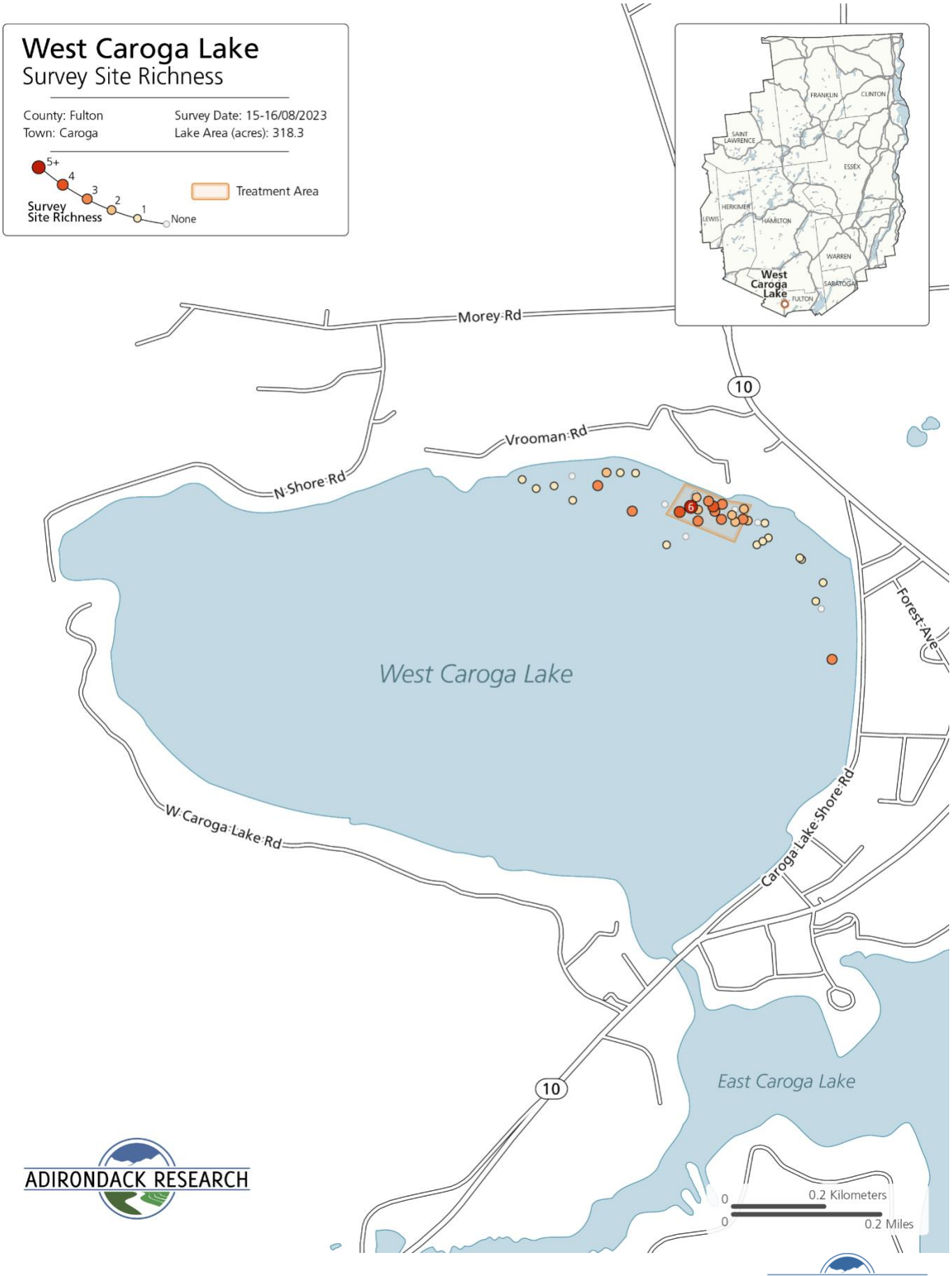

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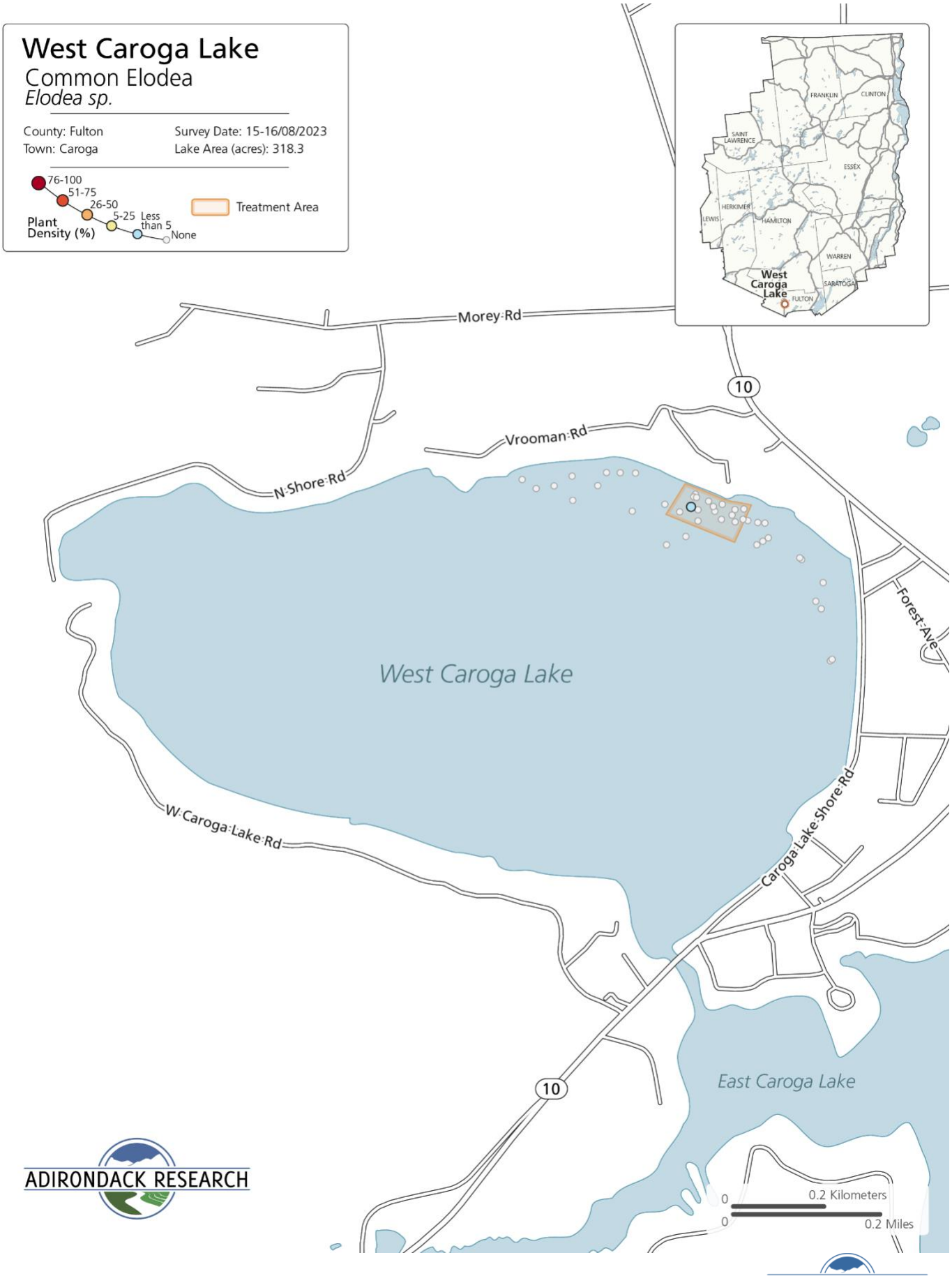

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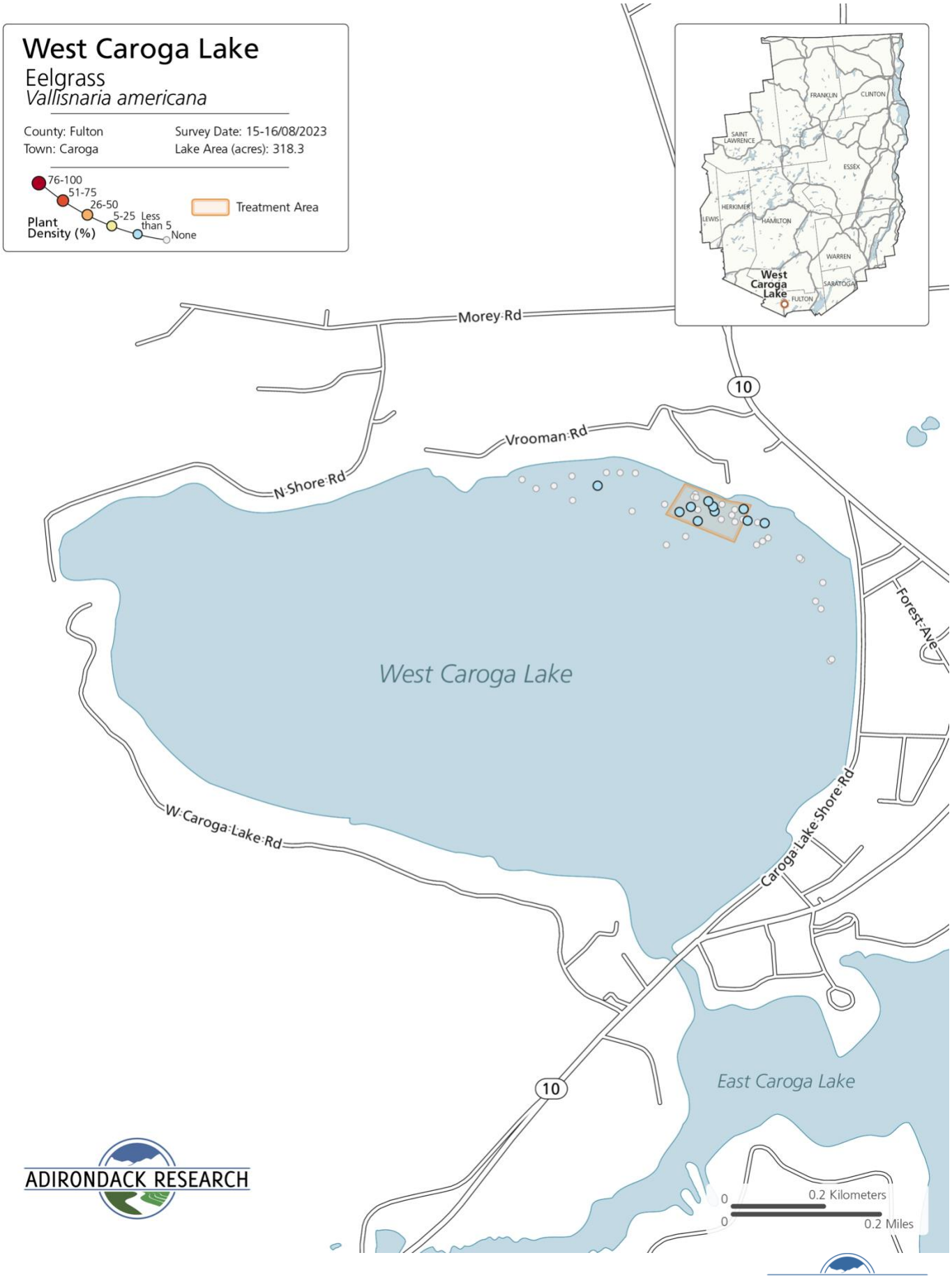

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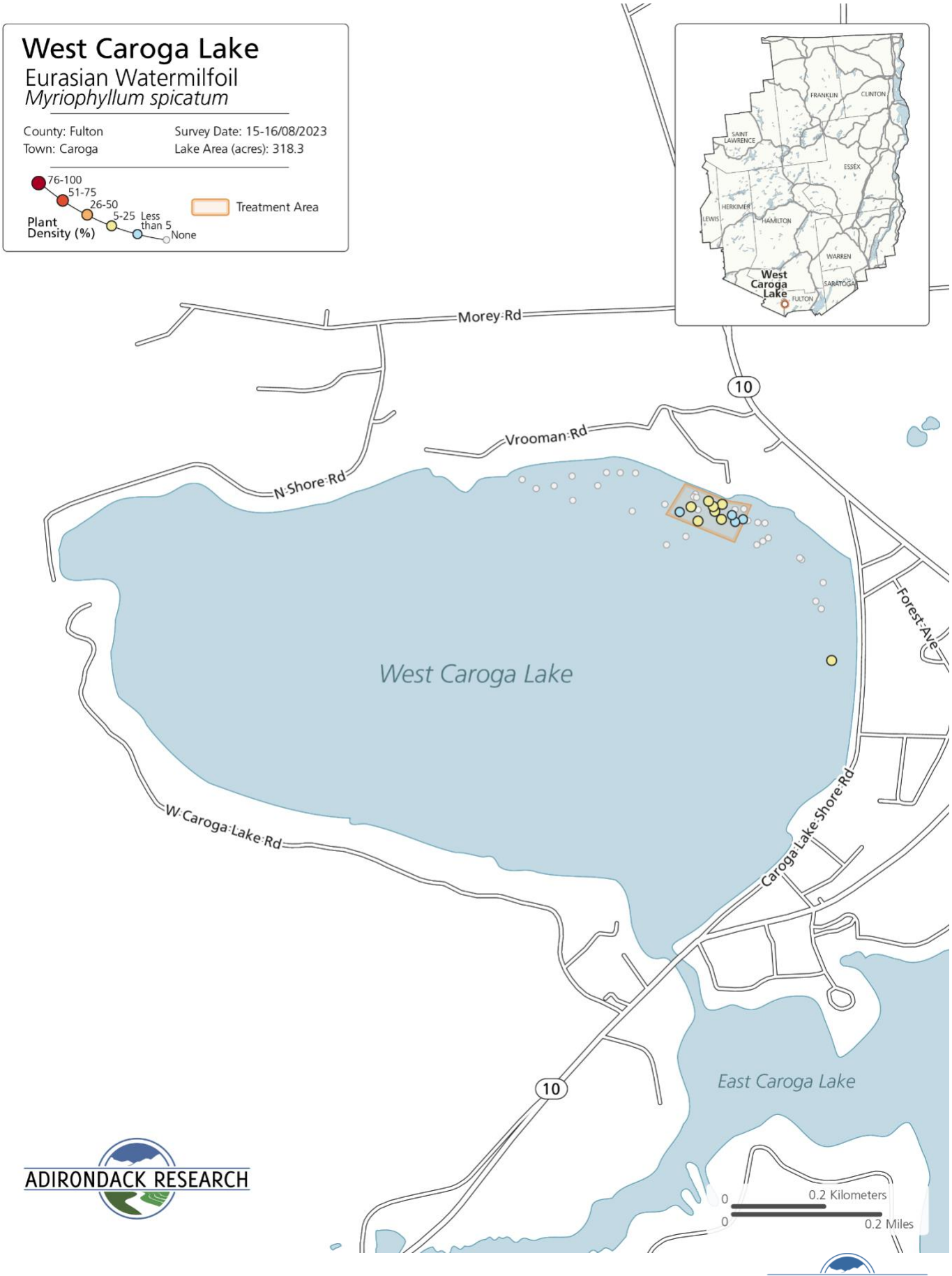

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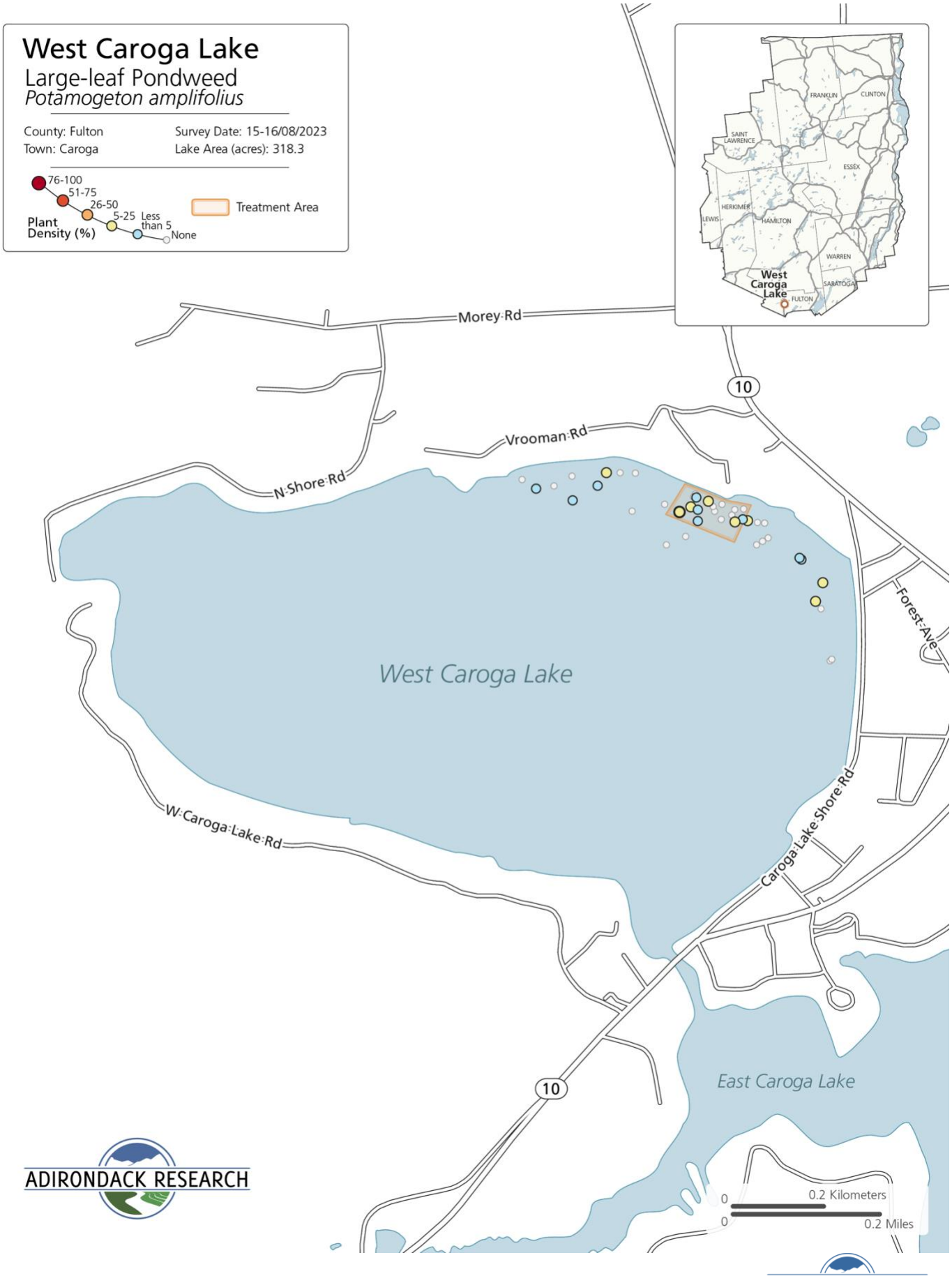

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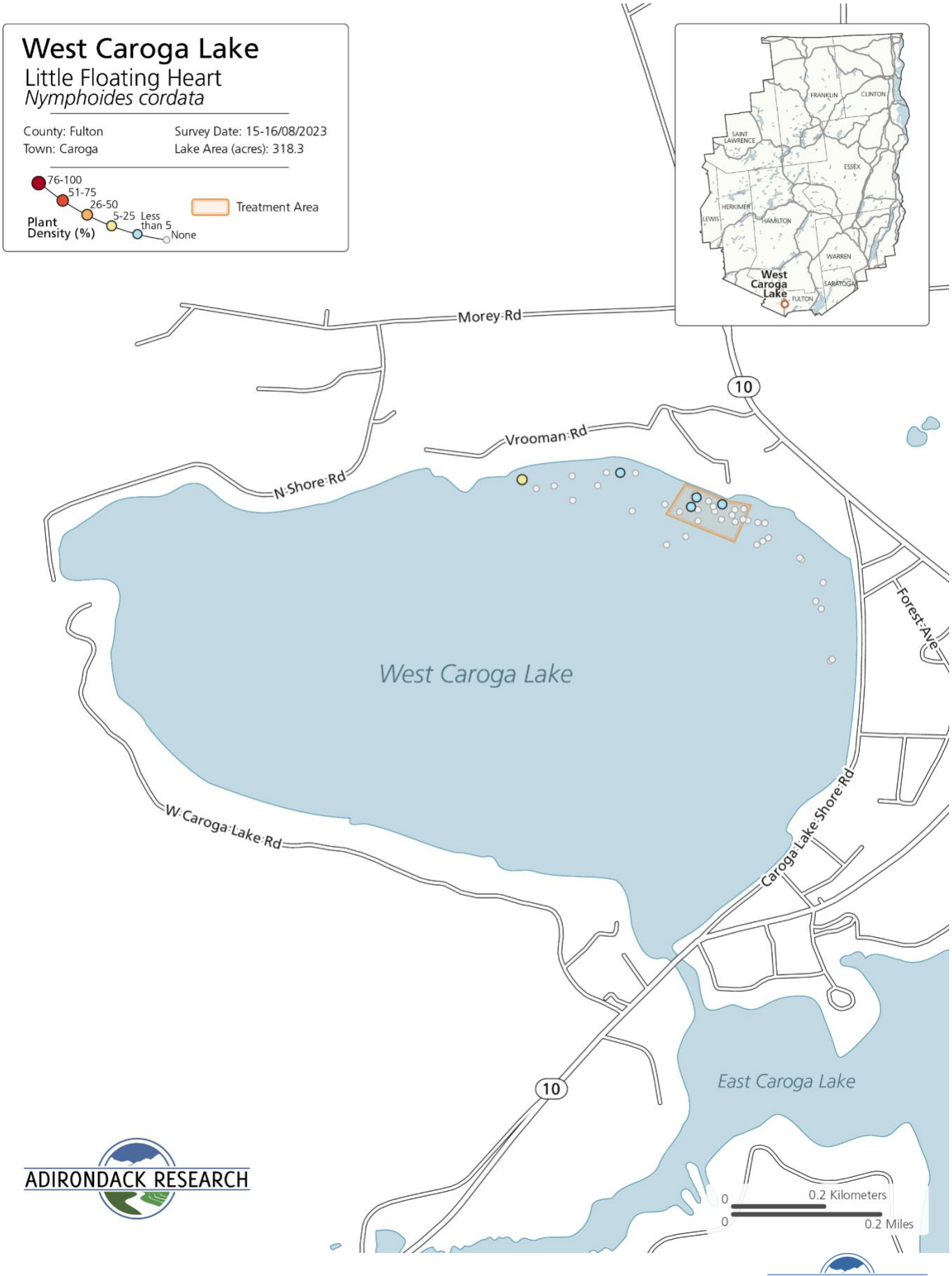
West Caroga Lake
Little Floating Heart
Nymphoides cordata
County: Fulton
Town: Caroga
Survey Date: 15-16/08/2023
Lake Area (acres): 318.3
76-100
51-75
26-50
5-25
Less than 5
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Plant Density (%)
Treatment Area
FRANKLIN
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LEWIS
HAMILTON
WARREN
SARATOGA
FULTON
West Caroga Lake
Morey Rd
10
Vrooman Rd
N Shore Rd
Forest Ave
West Caroga Lake
W Caroga Lake Rd
Caroga Lake Shore Rd
East Caroga Lake
ADIRONDACK RESEARCH
0
0.2 Kilometers
0
0.2 Miles
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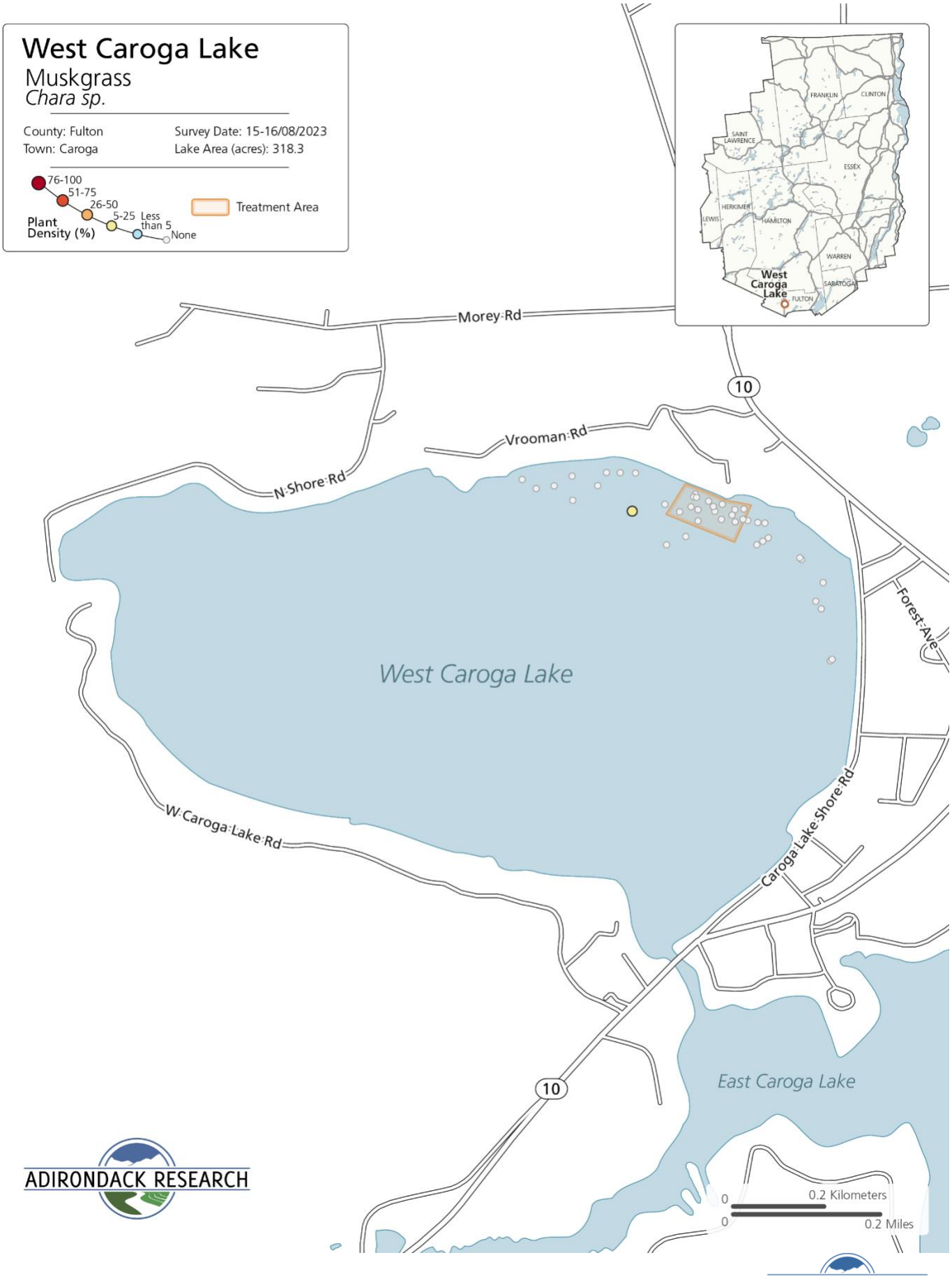

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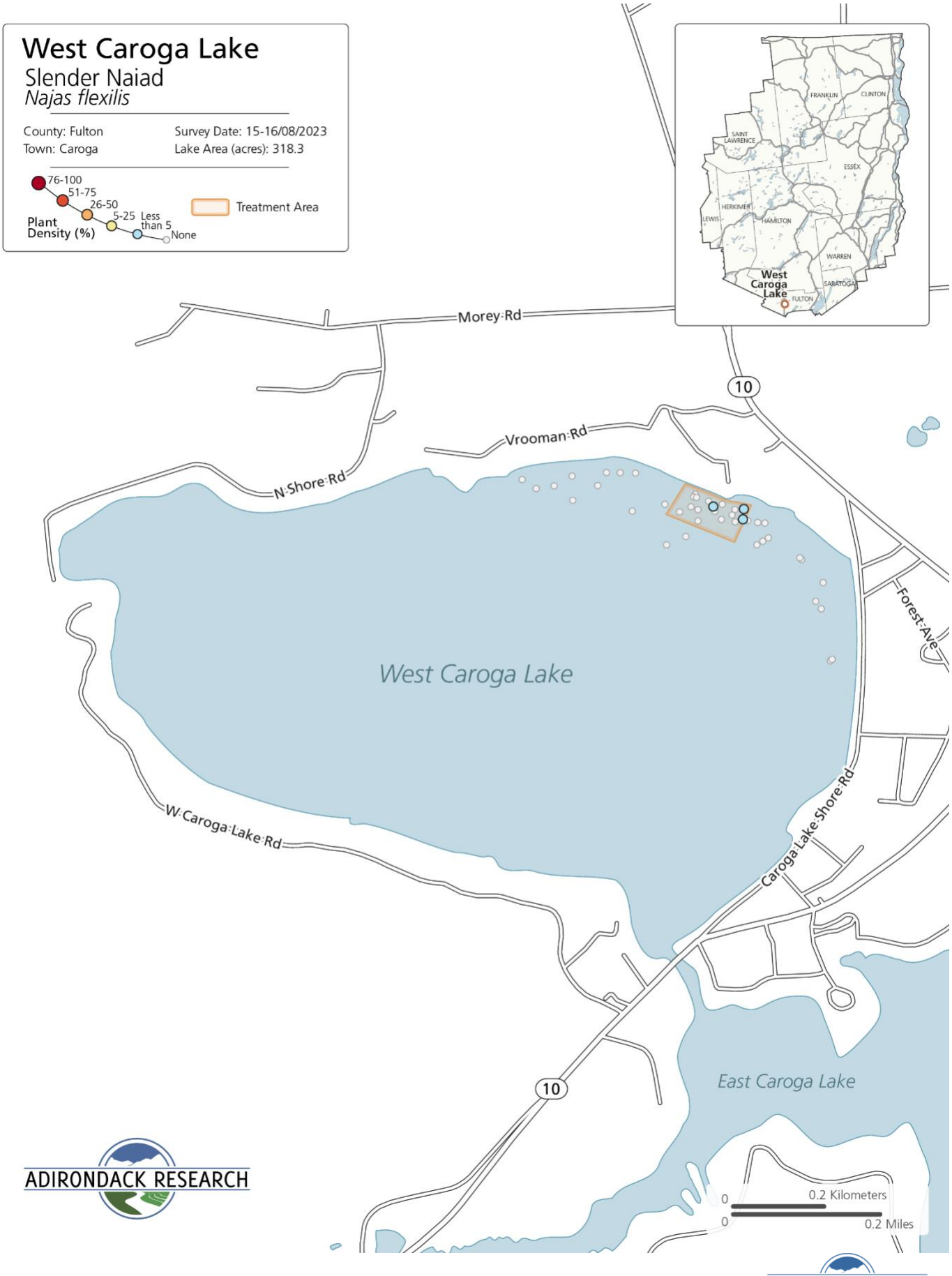

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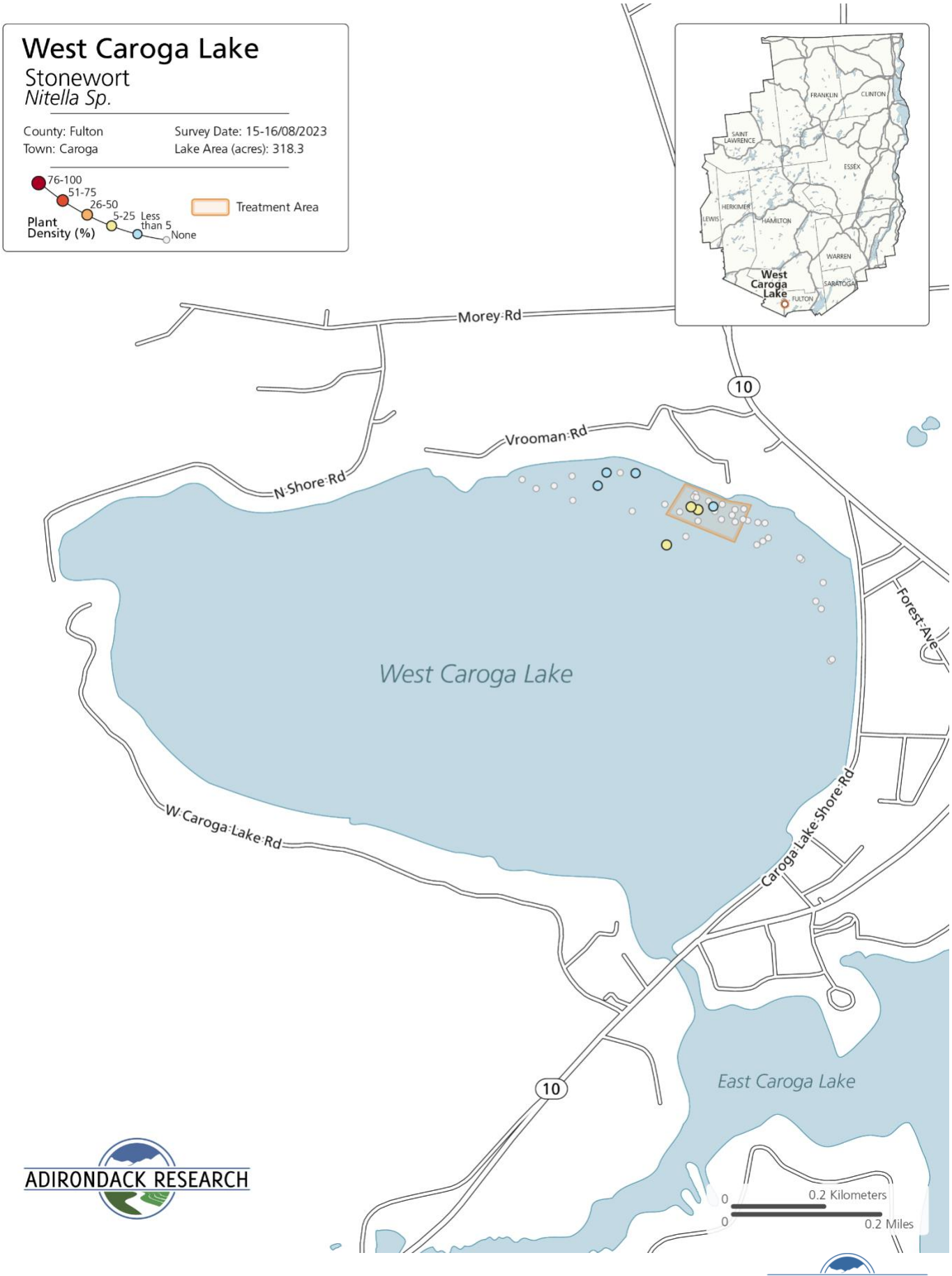
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Stonewort
Nitella Sp.
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Forest Ave
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W Caroga Lake Rd
Caroga Lake Shore Rd
East Caroga Lake
ADIRONDACK RESEARCH
0
0.2 Kilometers
0
0.2 Miles
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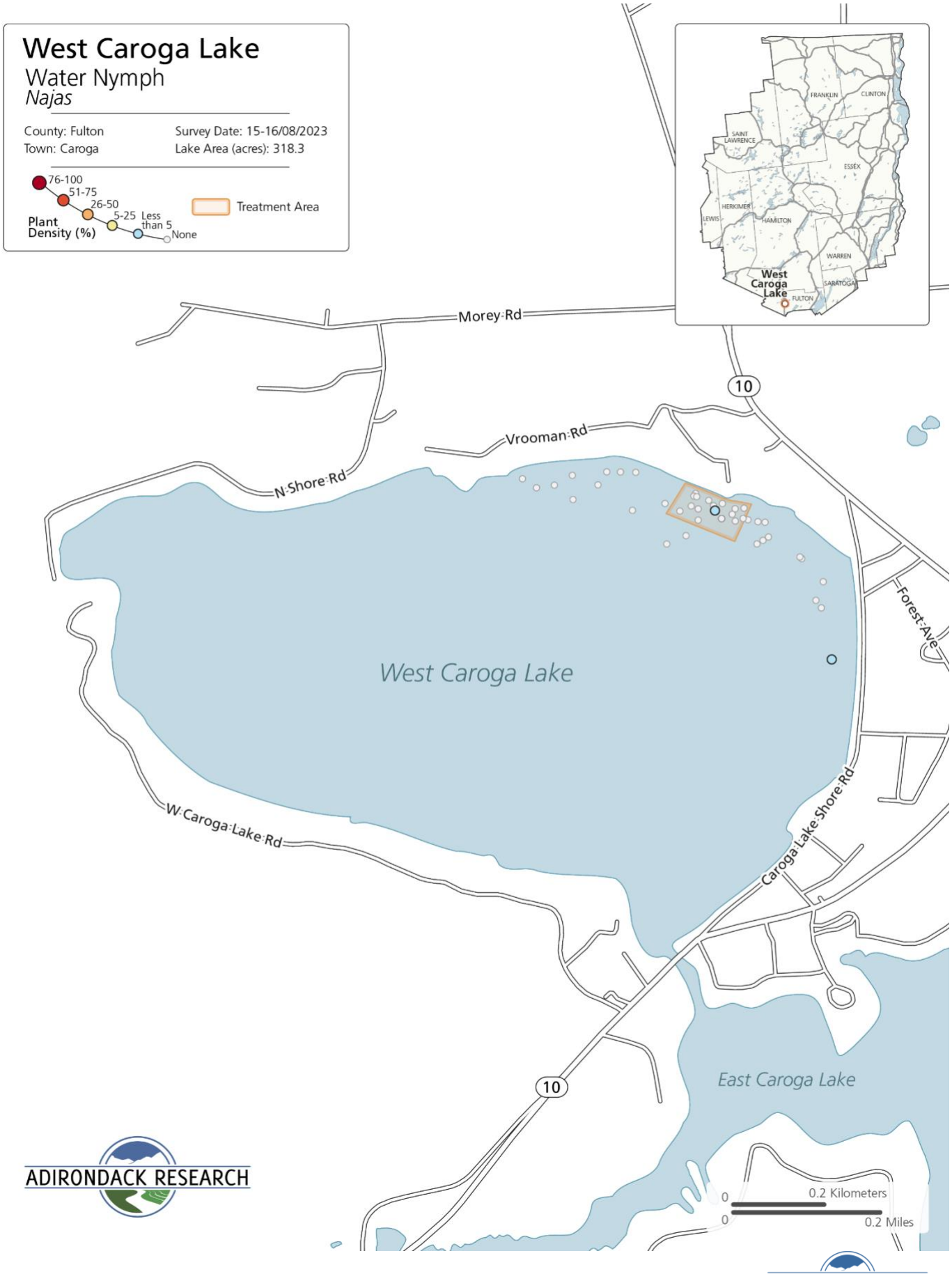
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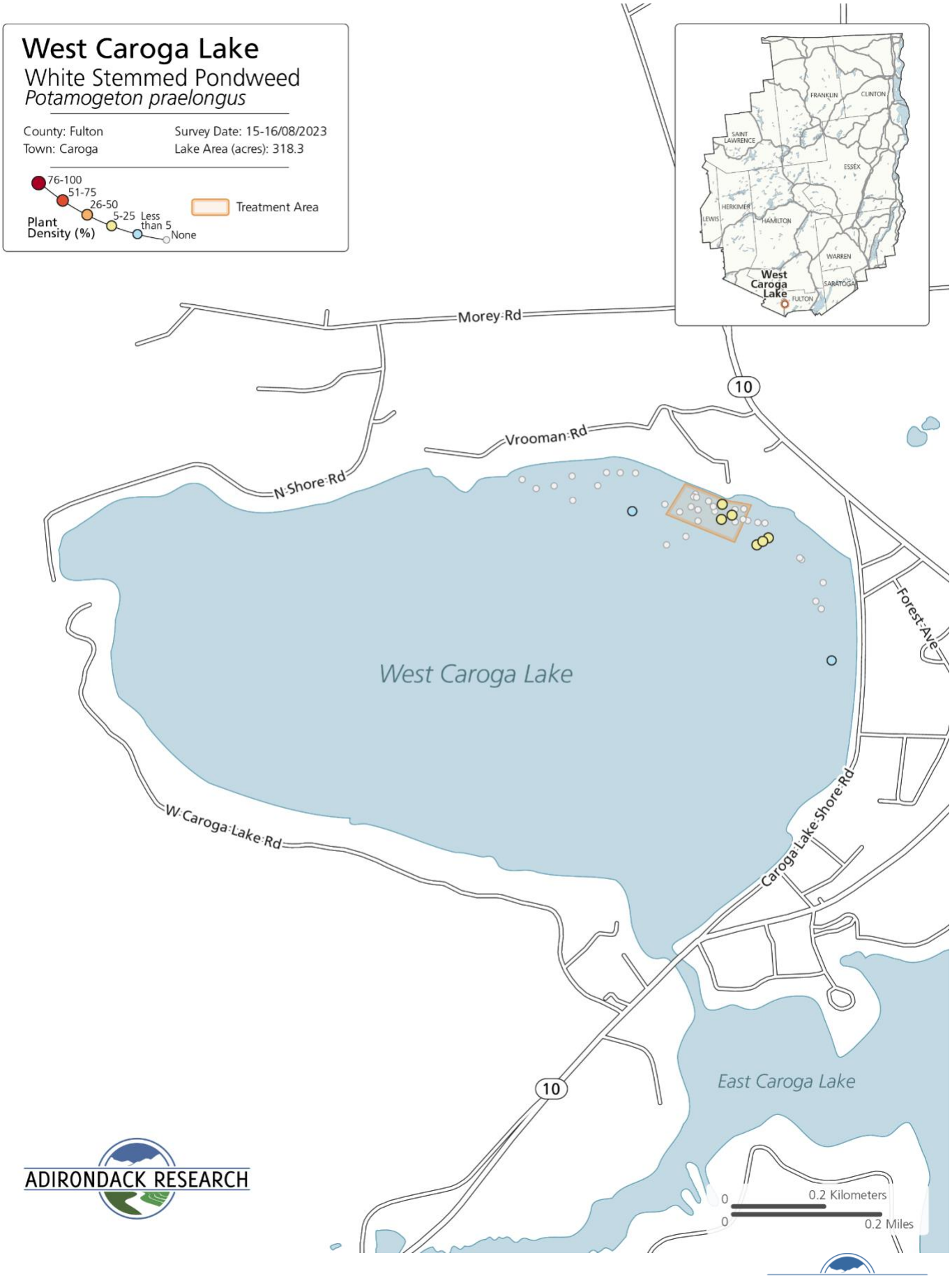
Forest Ave
West Caroga Lake
W Caroga Lake Rd
Caroga Lake Shore Rd
East Caroga Lake
ADIRONDACK RESEARCH
0
0.2 Kilometers
0
0.2 Miles
ADIRONDACK RESEARCH



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Plant Descriptions & ProcellaCOR Sensitivity

[1]Table 5. ProcellaCOR sensitivity

Common Name	Scientific Name	ProcellaCOR sensitivity	Source
Eurasian watermilfoil	Myriophyllum spicatum	High	1
Canadian water weed	Elodea sp.	low	1
Large leaf pondweed	Potamogeton amplifolius	Low	1
Little floating heart	Nympoides cordata	Moderate	1
Muskgrass	Chara spp.	Low	1
Stonewort	Nitella sp.	Low	2
Naiad	Najas	Low	1
Slender Naiad	Najas flexilis	Low	1
Variable-leaf pondweed	Potamogeton gramineus	Low	1
White stemmed pondweed	Potamogeton praelongus	Low	1
Small pondweed	Potamogeton pusillus	Low	1
Eelgrass	Vallisneria americana	Low	1

Table 5. ProcellaCOR sensitivity for all species detected in West Caroga Lake. Species with unavailable or unknown responses to ProcellaCOR are marked N/A

[1]**Source 1:** Heilman, M. (2019). "Selective Control of Invasive Watermilfoils with ProcellaCOR® Aquatic Herbicide and Response of Native Aquatic Plants." SePRO. https://lgpc.ny.gov/system/files/documents/2022/03/technical-summary-procellacor-selective-control-of-invasive-watermilfoils-plus-appendix-28jan2019.pdf
Source 2: Vermont Department of Environmental Conservation (2022), "ProcellaCOR EC Aquatic Macrophyte Species Frequency of Occurrence Pre-and Post-Treatment Statistical Analysis." https://dec.vermont.gov/sites/dec/files/wsm/lakes/ANC/docs/Procellacor%20Aquatic%20Macrophyte%20Species%20Frequency%20of%20Occurrence%20Pre-and%20Post-Treatment%20Statistical%20Analysis%204-12-22.pdf

Myriophyllum spicatum (Eurasian watermilfoil)

Originating in Europe and Asia, this is a rapidly spreading invasive milfoil species. Its ability to grow in cool water and at low light conditions, in addition to reproducing by fragmentation and fruit production; allows it to quickly overtake waterbodies and choke out native species. *Myriophyllum spicatum* (Eurasian watermilfoil) has feather-like leaves, arranged in whorls of 4 to 5 along the stem, and each leaf has a central axis with 12 to 21 leaflet pairs. It has relatively large spaces between each whorl, sometime greater than ½ inch. These leaves are attached to thin stems that can normally grow 3 to 10 feet but have been reported as long as 33 feet in length. The stem is typically light brown in color and the tips are occasionally red or pink in color. These stems branch off repetitively at the water's surface forming large, floating mats of vegetation that block light to native species and imped water traffic. It is extremely sensitive to ProcellaCOR treatment, completely wiping out exposed plant beds and resulting in severe browning to the extent the plant is no longer recognizable.

Elodea sp. (Canadian water weed)

Grows entirely underwater, except for a small white flower that blooms during the summer. Leafy shoots between 8 inches and 3.5 feet long are elongated, with slender, unbranched roots, and branched stems. Leaves are dark green, oval-shaped and arranged in clusters of 3-4. *Elodea sp.* (Canadian water weed) is an excellent oxygen producer and provides a habitat for many small aquatic animals, which fish and wildlife eat. However, dense growth of this plant can create a nuisance, and its closed, compact structure is not ideal fish habitat. Canadian water weed has been found to have a relatively low sensitivity to ProcellaCOR treatment, resulting in little to no response observed on the plants health after treatment.

Potamogeton amplifolius (Large-leaf pondweed)

is an aquatic plant of North America. It grows in water bodies such as lakes, ponds, and rivers, often in deep water. This perennial plant grows from rhizomes and produces a very slender, cylindrical, sometimes spotted stem up to a meter or so long. The leaves take two forms. Submersed leaves are up to 20 centimeters long by 7 wide and may be folded along their midribs. The submersed leaves have more veins than do those of other pondweed species, up to 49.[1] Floating leaves are up to 10 centimeters long by 5 wide, leathery in texture, and borne on long petioles. The inflorescence is a spike of many flowers rising above the water surface on a thick peduncle. *Potamogeton amplifolius* (Large-leaf pondweed) has been found to have a relatively low sensitivity to ProcellaCOR treatment, resulting in little to no response observed on the plants health after treatment.

Nymphoides cordata (Little floating heart)

Is in the genus of Nymphoides. Nymphoides, or floatingheart, is a genus of aquatic flowering plants in the family Menyanthaceae. The genus name refers to their resemblance to the water lily Nymphaea. Nymphoides are aquatic plants with submerged roots and floating leaves that hold the small flowers above the water surface. The floating leaves are 30–70 mm long and cordate (or heart-shaped), with smooth, purple lower surfaces. Little floatingheart grows in eastern North America, from the eastern

provinces of Canada down to Maryland, and then reoccurs from the Carolinas down to Louisiana. Nymphoides are known to be sensitive to ProcellaCOR.

Chara sp. (Muskgrass)

Is in the genus of charophyte green algae in the family Characeae. They are multicellular and superficially resemble land plants because of stem-like and leaf-like structures. They are found in freshwater, where they grow submerged, attached to the muddy bottom. The branching system of Chara species is complex with branches derived from apical cells which cut off segments at the base to form nodal and internodal cells alternately. The main axes bear whorls of branches in a superficial resemblance to Equisetum (a vascular plant). They are typically anchored to the littoral substrate by means of branching underground rhizoids. Chara plants are rough to the touch because of deposited calcium salts on the cell wall. The metabolic processes associated with this deposition often give Chara plants a distinctive and unpleasant smell of hydrogen sulfide. Chara has been found to have a relatively low sensitivity to ProcellaCOR treatment, resulting in little to no response observed on the plants health after treatment.

Nitella Sp.

Are branched multicellular algae, that may grow several feet long and resemble larger plants. Commonly light green to bright-green in color with forked, bushy branches 1/16 to 1/8 inches in diameter, and does not flower. Nitella sp. (Stonewort) grows entirely below the water surface, usually in deeper zones, to depths of 30 feet. The plant provides food for waterfowl and cover for fish and also supports insects and other small aquatic animals, which provide substance for trout, bluegills, small mouth bass, and largemouth bass. Stonewort has been found to have a relatively low sensitivity to ProcellaCOR treatment, resulting in little to no response observed on the plants health after treatment.

Najas sp.(water nymph)

Water-nymphs or naiads is a genus of aquatic plants. Often characterized by bushy, compact growth. Naiads have small leaves, usually stiff and curled. Naiads fragment easily. Naiad's have been found to have a relatively low sensitivity to ProcellaCOR treatment, resulting in little to no response observed on the plants health after treatment.

Najas flexilis (Slender naiad)

Is an annual submersed rooted or floating plant with slender, branching stems and fibrous roots. Growth is usually compact and relatively bushy; the highly branched stems can grow up to 4 feet in length and fragment easily. Leaves are commonly 1 mm wide and 0.5 to 3.5 cm long, and are typically stiff, curled and pointed, and have spines along the margins that are visible to the naked eye. Tiny flowers appear in the axil of the plant with separate male and female flowers on the same plant. *Najas flexilis* (Naiad sp.) can form dense surface mats of vegetation that inhibit growth of native plant species and reduce the water quality of habitat utilized by aquatic fauna. Naiad's have been found to have a relatively low sensitivity to ProcellaCOR treatment, resulting in little to no response observed on the plants health after treatment.

Potamogeton gramineus (Variable-leaf pondweed)

Also known as grassy pondweed, it is often found in less than 3 feet of water, it grows from a creeping rhizome that anchors in wet substrate, producing thin, cylindrical, heavily branching stems. Leaf appearance is variable depending on depth. Floating leaves are rounded at the base and can be rounded or pointed at the tip about 1½ inches long, and up to 2cm wide, while submersed leaves are narrowly elliptic and almost always pointed at the tip. This species hybridizes frequently, but can be recognized by its flower, a dense cylindrical spike with 5-10 whorls of flowers that just reaches above the surface of the water. *Potamogeton gramineus* (Variable-leaf pondweed) has been found to have a relatively low sensitivity to ProcellaCOR treatment, resulting in little to no response observed on the plants health after treatment.

Potamogeton praelongus (White stemmed pondweed)

Commonly found in quiet, clear waters up to 20 feet deep, it is recognized by its pale, zig-zag stem and large white stripules. Stalkless leaves grow to be 4 to 8 inches long, ¾ to 1½ inches (2 to 4 cm) wide, with wavy edges, and 11 to 35 veins and a boat-shaped tip that splits when pressed. Its leaves are all submersed and more or less spirally arranged along the stem. It produces a dense cylindrical spike held above the surface of the water, 1 to 3 long at the tip of the stem. Spikes have 6 to 12 whorls of flowers, with 4 pedals. Seeds and leaves provide a source of nutrients for waterfowl, muskrats, and deer. *Potamogeton praelongus* (White stemmed pondweed) has been found to have a relatively low sensitivity to ProcellaCOR treatment, resulting in little to no response observed on the plants health after treatment.

Potamogeton pusillus (Small pondweed)

A perennial submersed aquatic plant with slender, ribbon-like leaves alternate on the thin, green stems that can grow up to 3 feet long. At some of the leaf bases along the stems, there are pairs of translucent glands, differentiating it from its look-a-like *Potamogeton foliosu* (Leafy pondweed). It is common along shorelines in depths up to 8 feet and can form dense clumps that provide cover for invertebrates and small fish. Additionally, its flowers and fruits are produced in 1 to 4 whorls on a slender stalk. The fruit is plump with a smooth back and a short-hooked beak, and generally appears earlier in the season than most other aquatic fruits, providing a vital source of nutrition for waterfowl. Pondweeds have been found to have a relatively low sensitivity to ProcellaCOR treatment, resulting in little to no response observed on the plants health after treatment.

Vallisneria americana (Eelgrass)

A submerged, flowering seagrass that thrives in soft, sandy sediment in shallow bays and inlets. It is a grass-like plant with dark-green, narrow, ribbon shaped leaves with rounded tips, that grow 20 to 50 cm in length. These leaves shoot from rhizomes binding the plant to the sediment. *Vallisneria americana* (Eelgrass) form dense underwater meadows, that support a diversity of flora and fauna, and act as a nursery to fish and shellfish. Additionally, it adds structure to silty sands that would otherwise shift and erode. Eelgrass has been found to have a relatively low sensitivity to ProcellaCOR treatment, resulting in little to no response observed on the plants health after treatment.

73 Church Street, Suite 2, Saranac Lake, NY 12983 ▪ (518) 278-6070
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