

# Lower Chateaugay Lake Survey Site Numbers

County: Franklin

Date Surveyed: 7/26/2021-  
8/3/2021

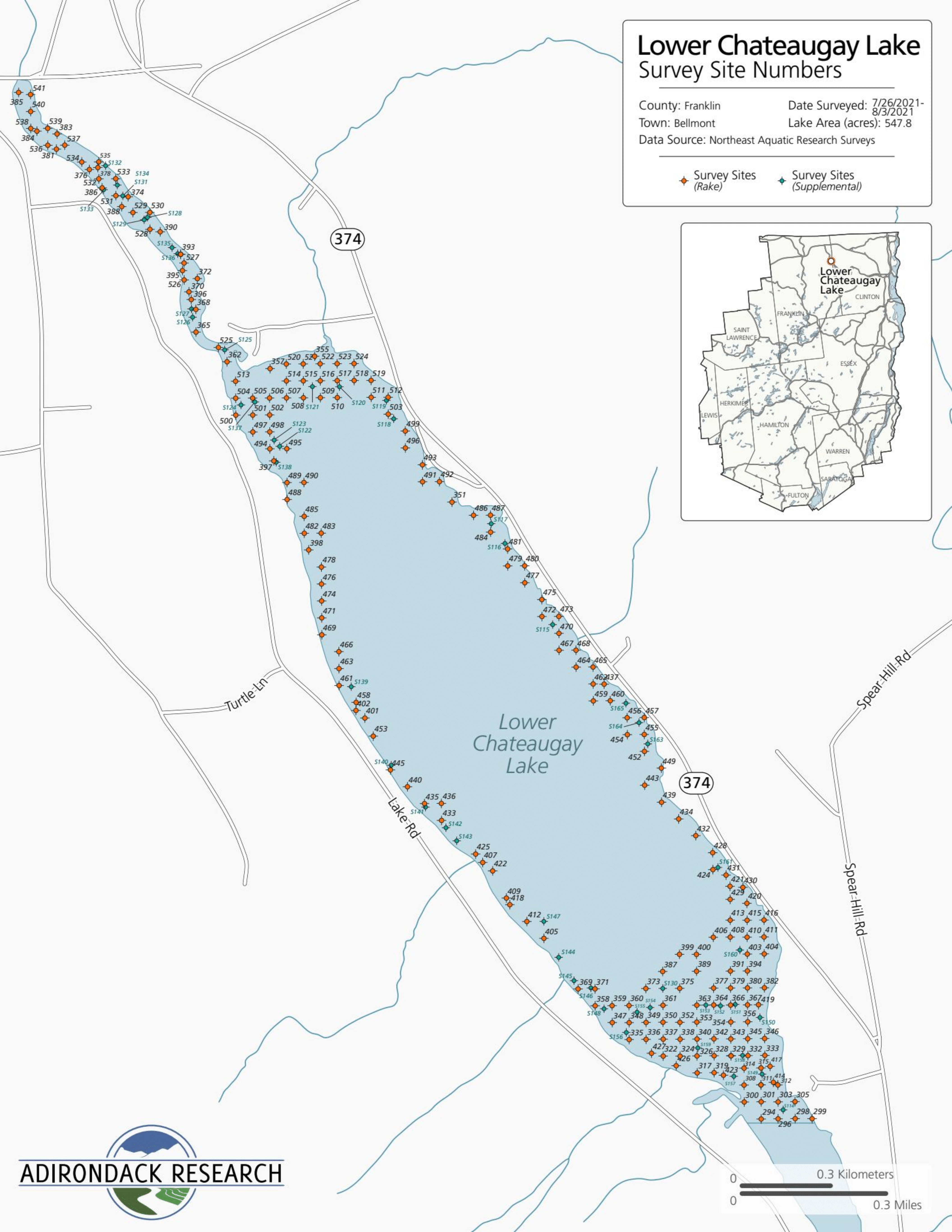
Town: Bellmont

Lake Area (acres): 547.8

Data Source: Northeast Aquatic Research Surveys

Survey Sites  
(Rake)

Survey Sites  
(Supplemental)



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0 0.3 Kilometers  
0 0.3 Miles

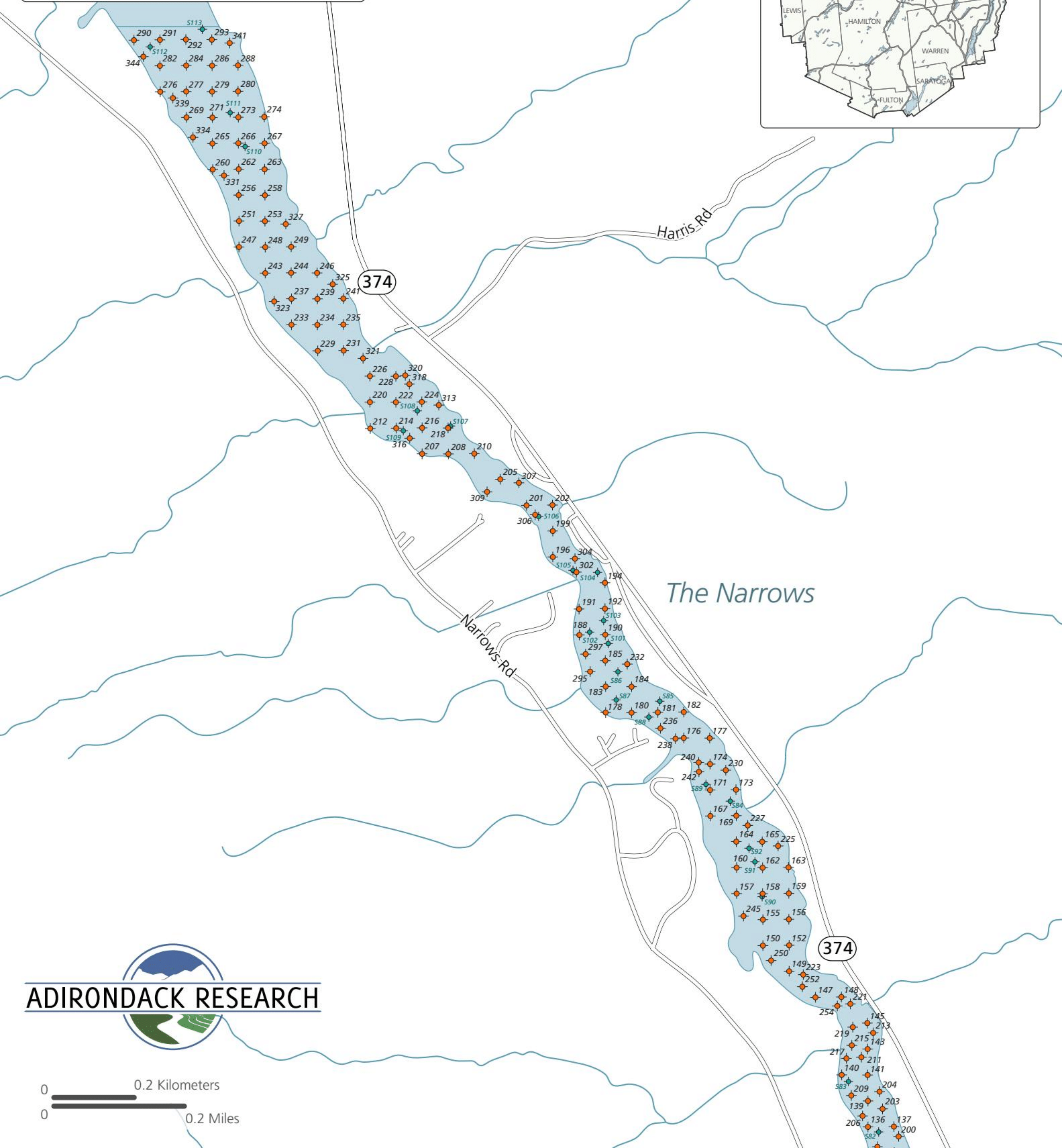
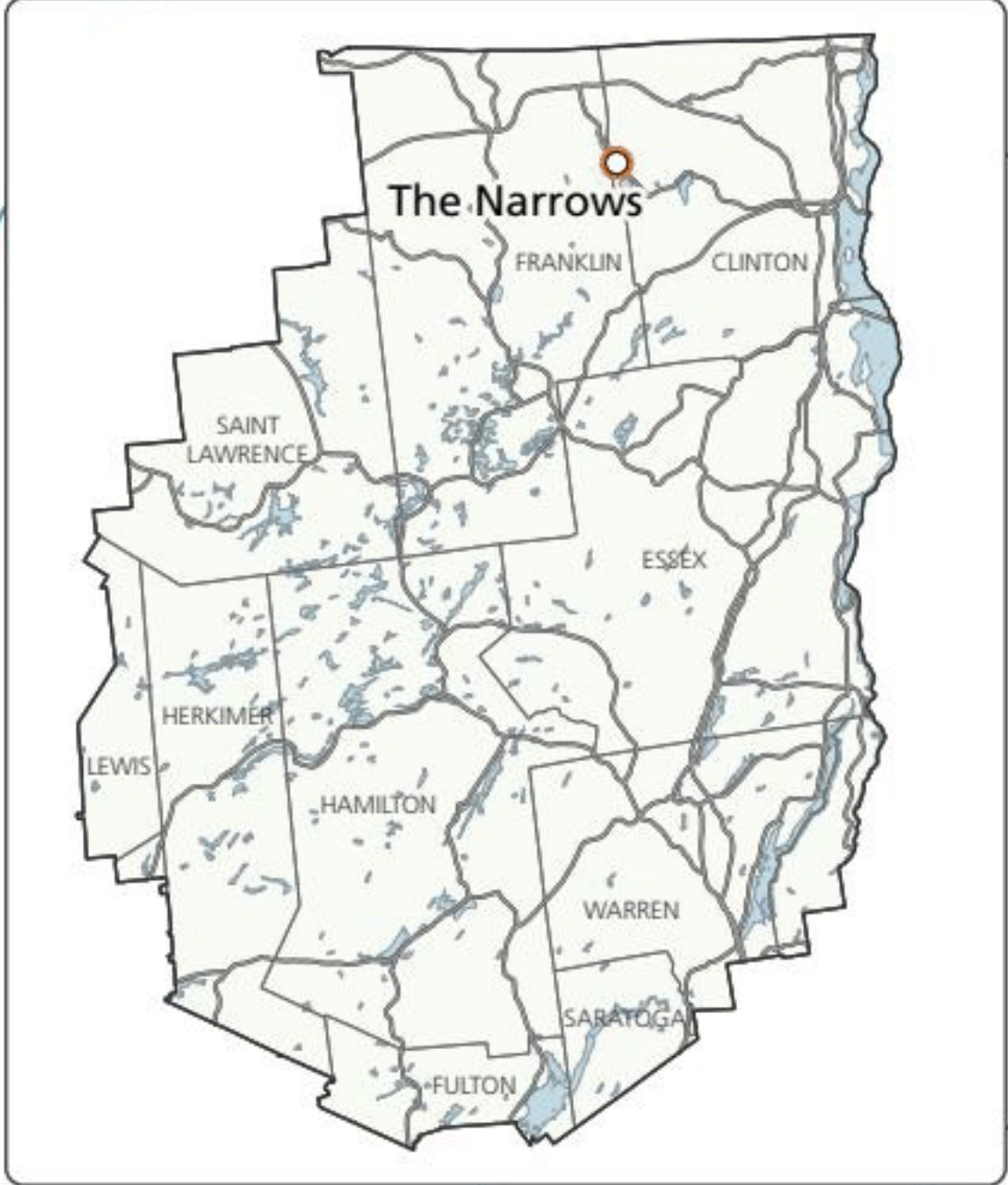


# The Narrows

## Survey Site Numbers (North)

County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys

Survey Sites (Rake)      Survey Sites (Supplemental)



0 0.2 Kilometers  
0 0.2 Miles

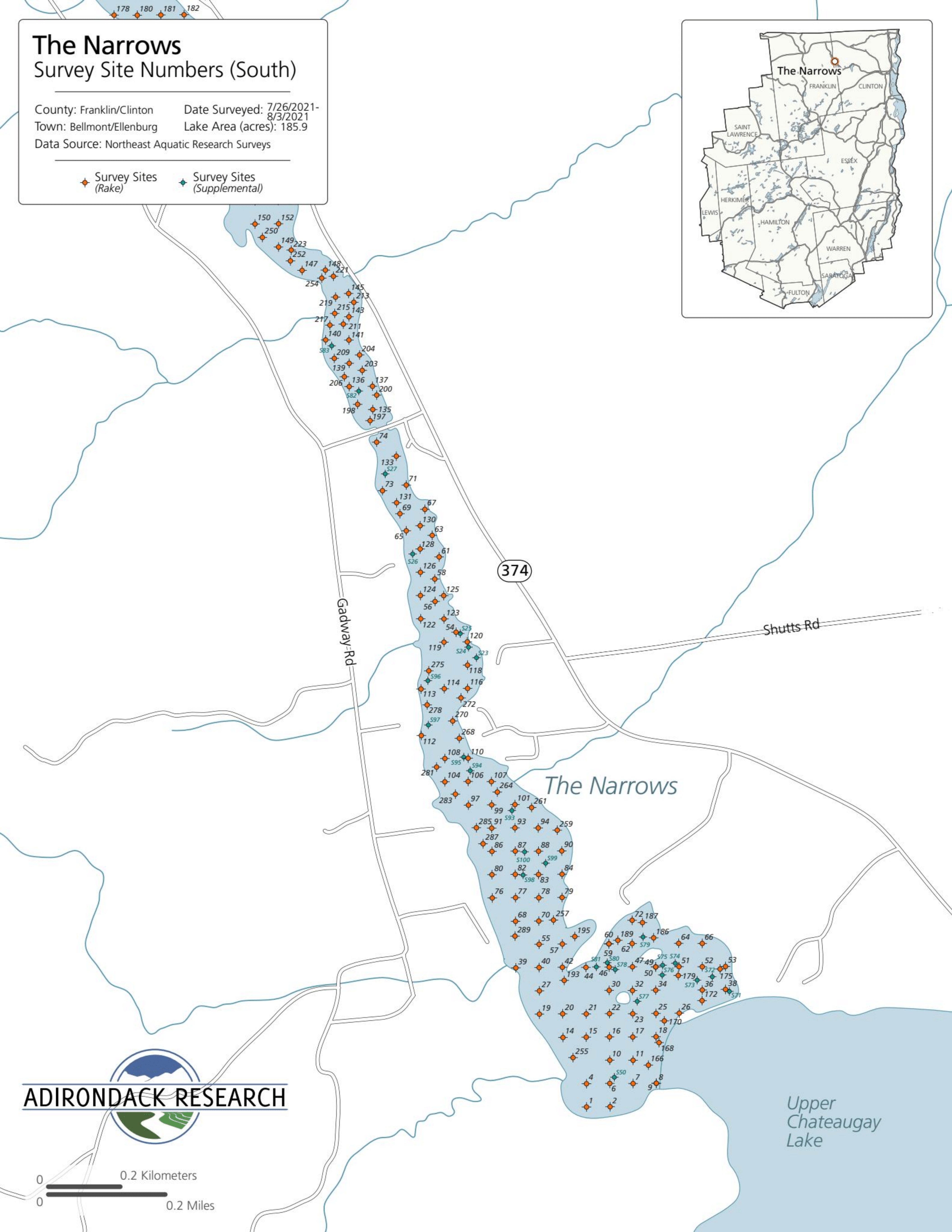
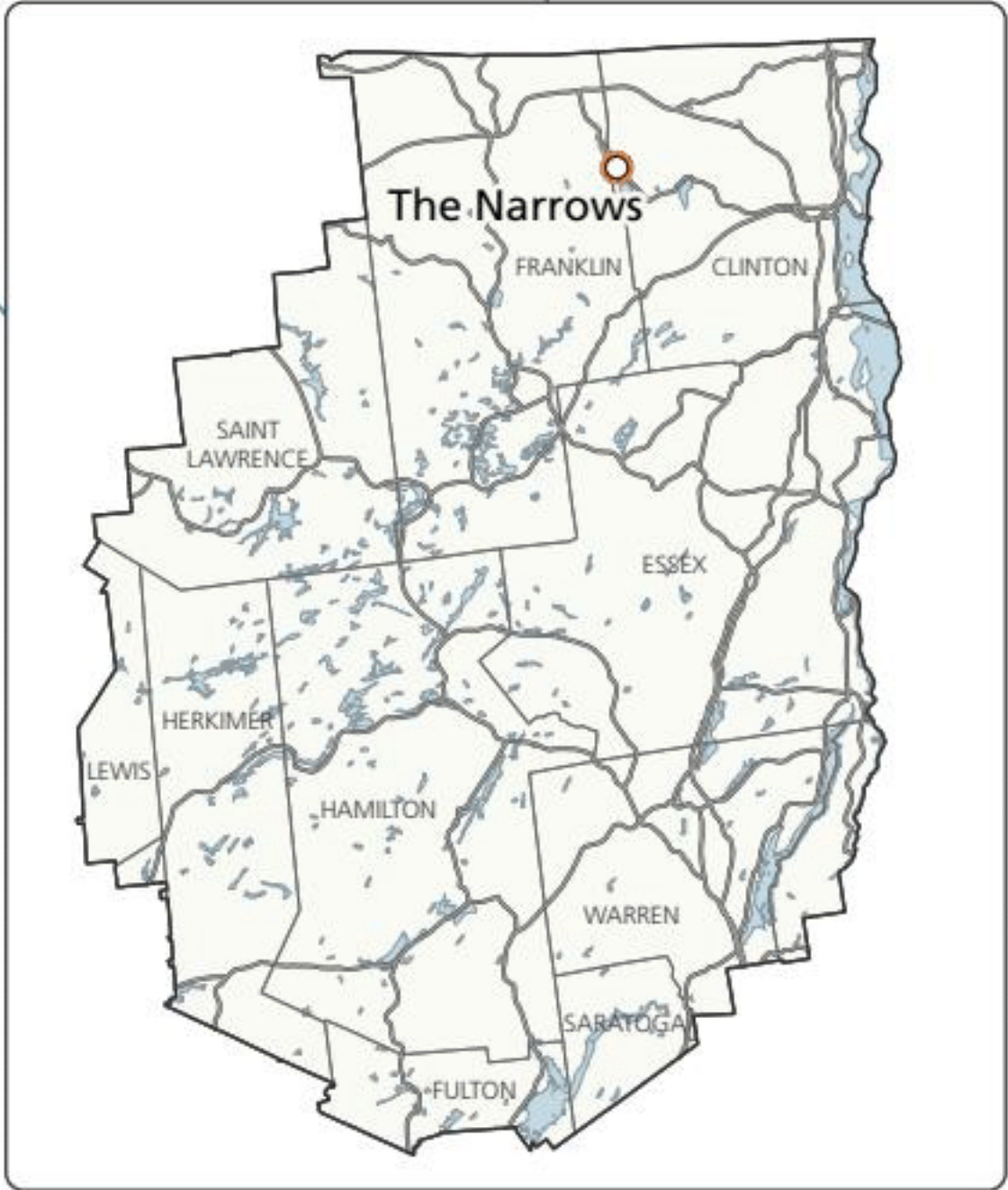


# The Narrows

## Survey Site Numbers (South)

County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys

- Survey Sites (Rake)
- Survey Sites (Supplemental)



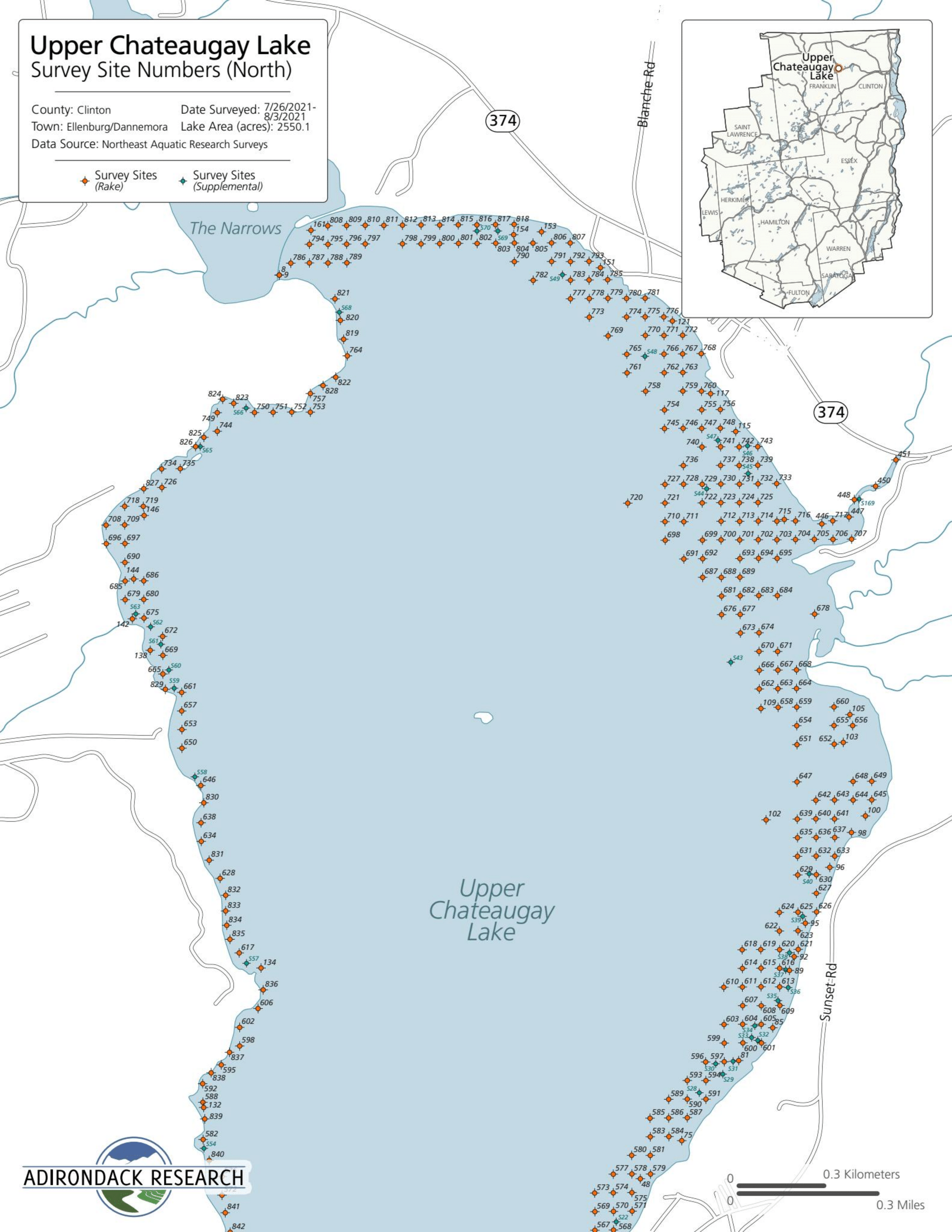


# Upper Chateaugay Lake

## Survey Site Numbers (North)

County: Clinton Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys

Survey Sites (Rake)      Survey Sites (Supplemental)

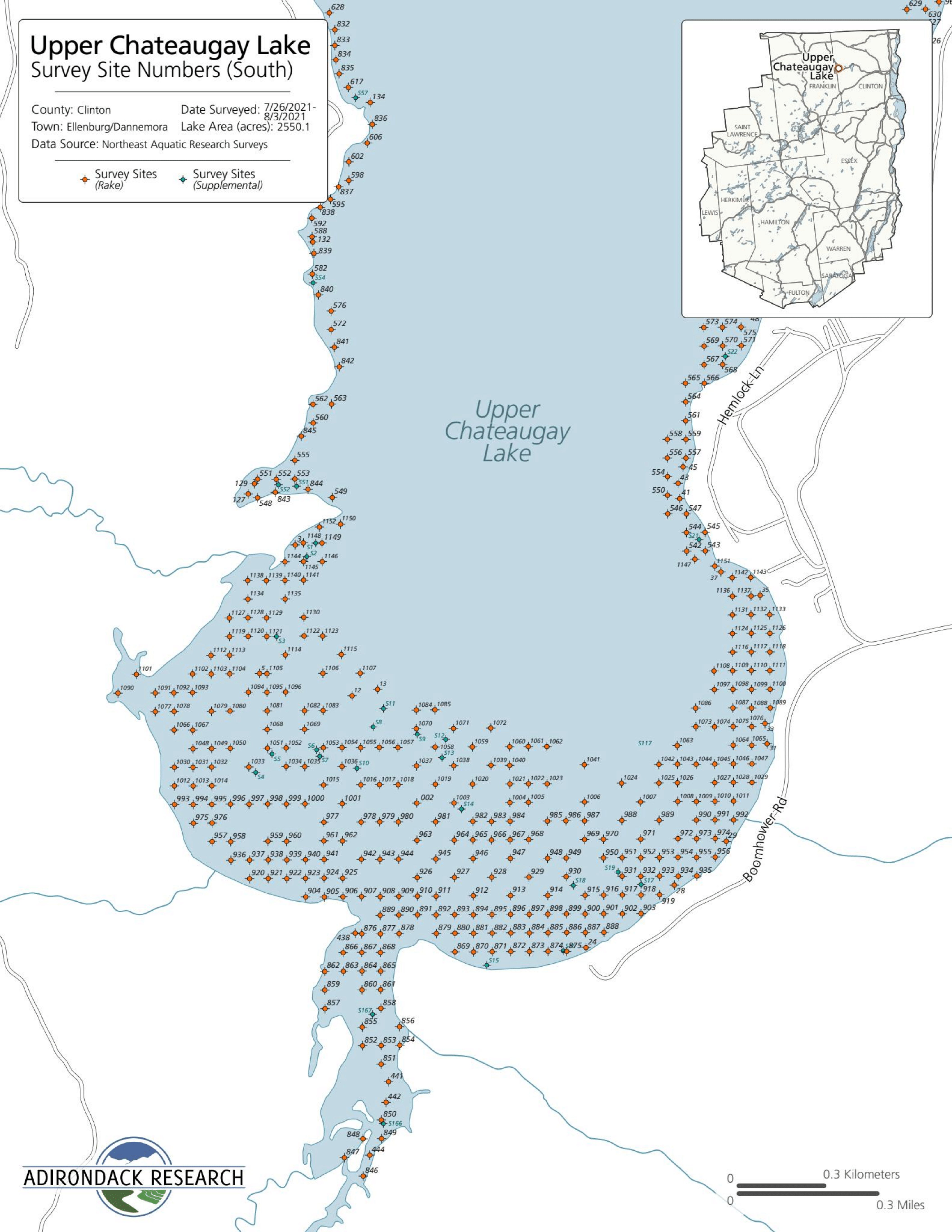




# Upper Chateaugay Lake Survey Site Numbers (South)

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys

- Survey Sites (Rake)
- Survey Sites (Supplemental)





# Lower Chateaugay Lake Survey Site Depth

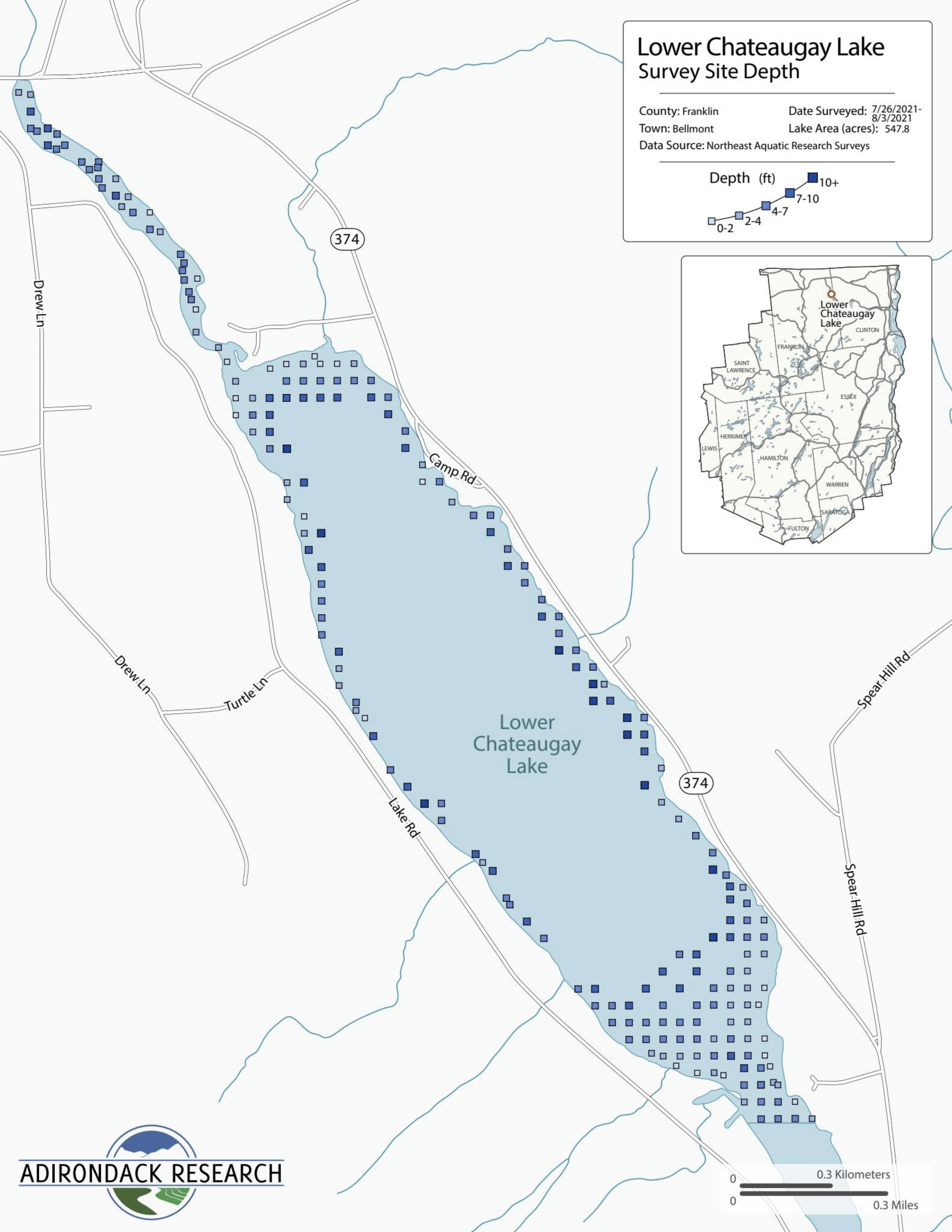
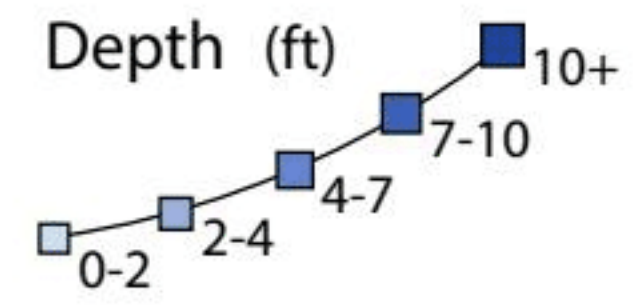
County: Franklin

Date Surveyed: 7/26/2021-  
8/3/2021

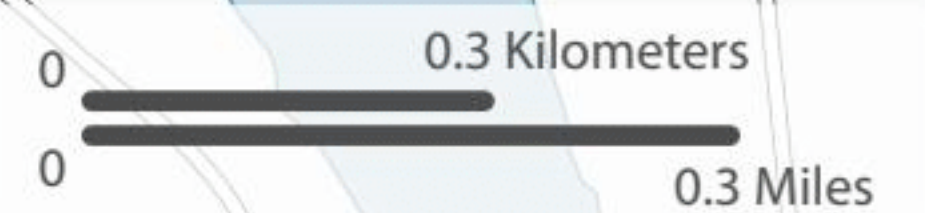
Town: Bellmont

Lake Area (acres): 547.8

Data Source: Northeast Aquatic Research Surveys



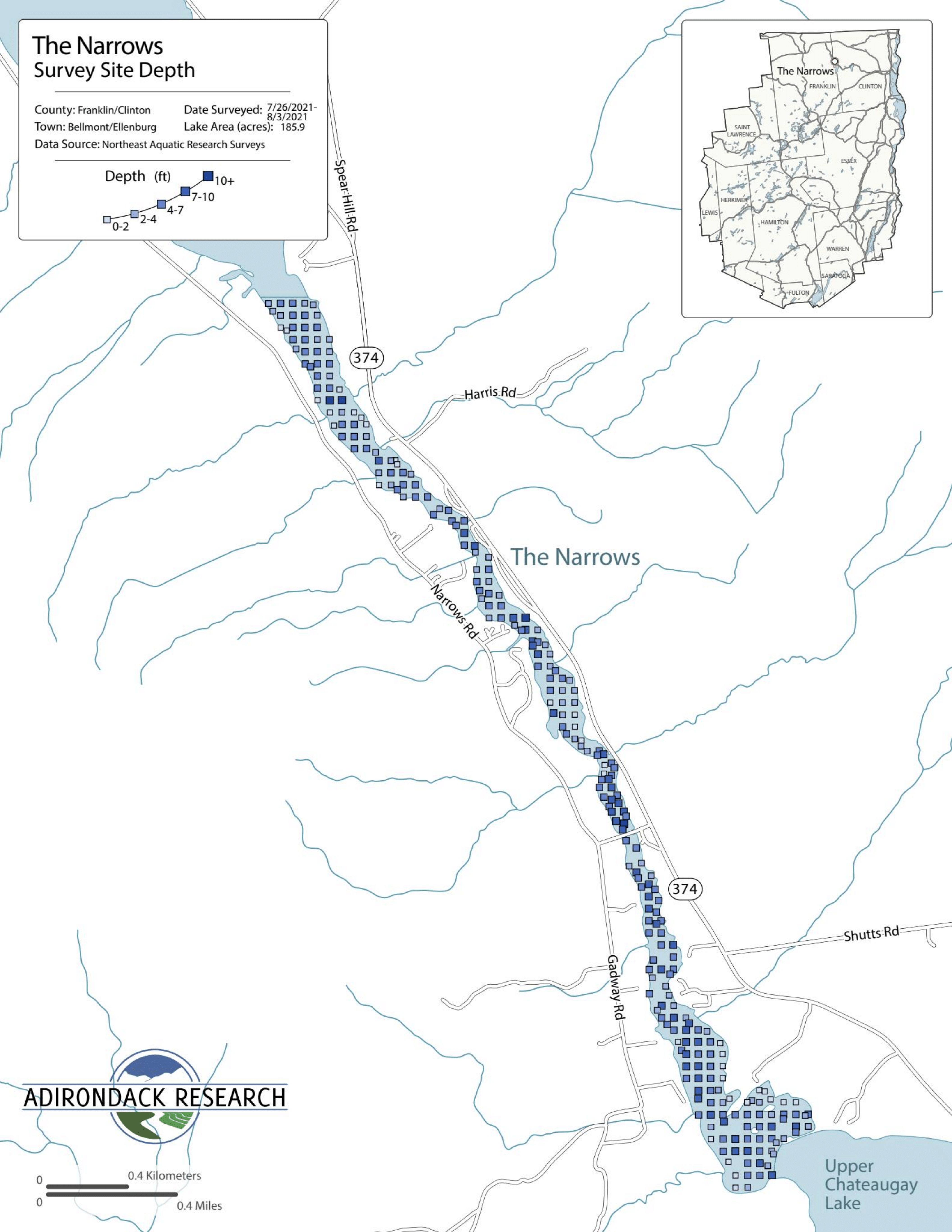
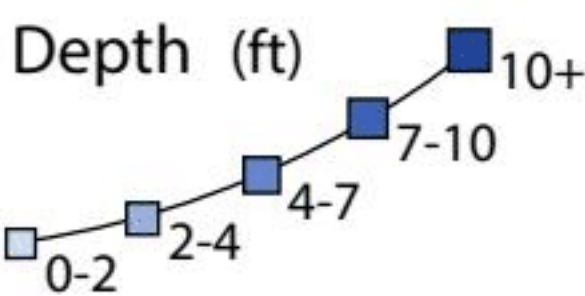
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# The Narrows Survey Site Depth

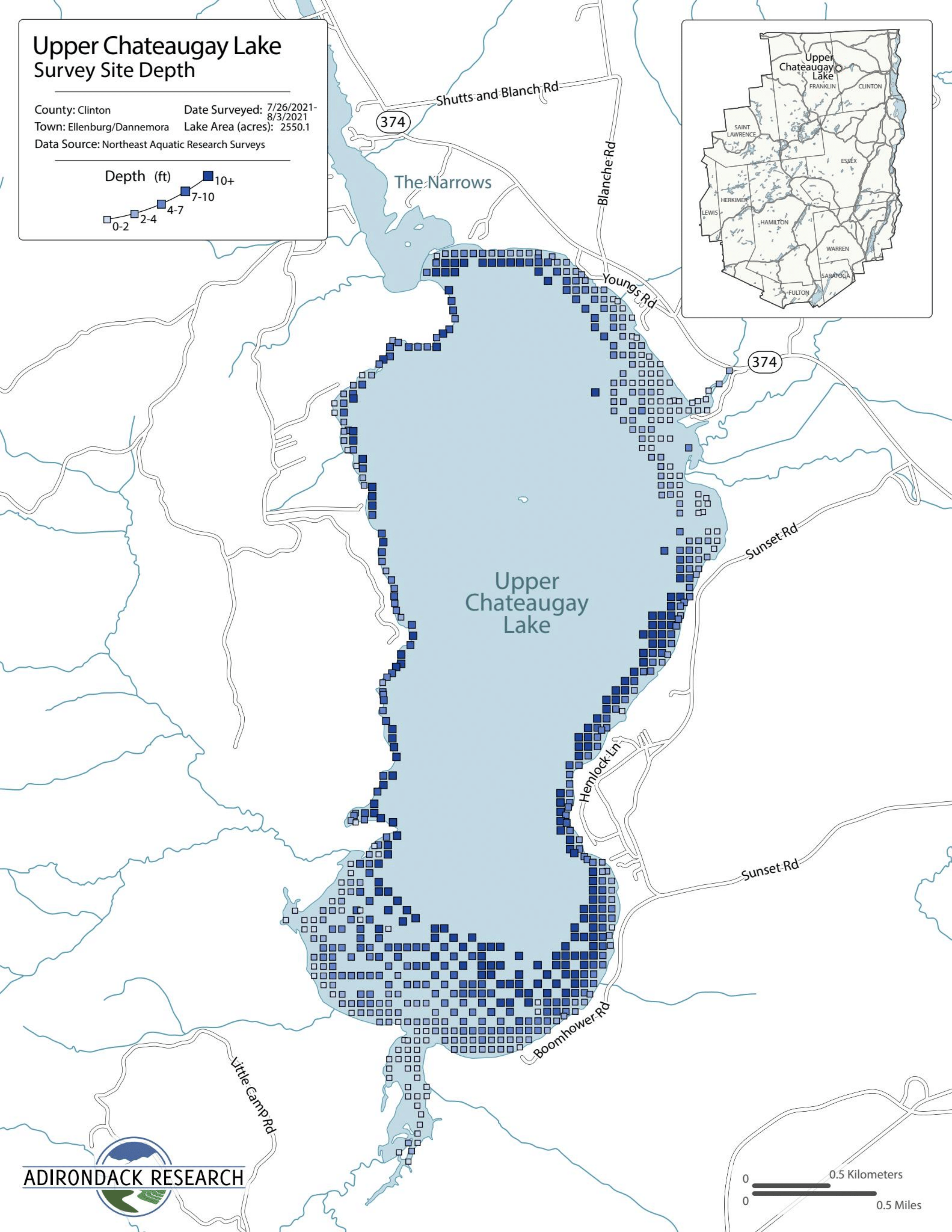
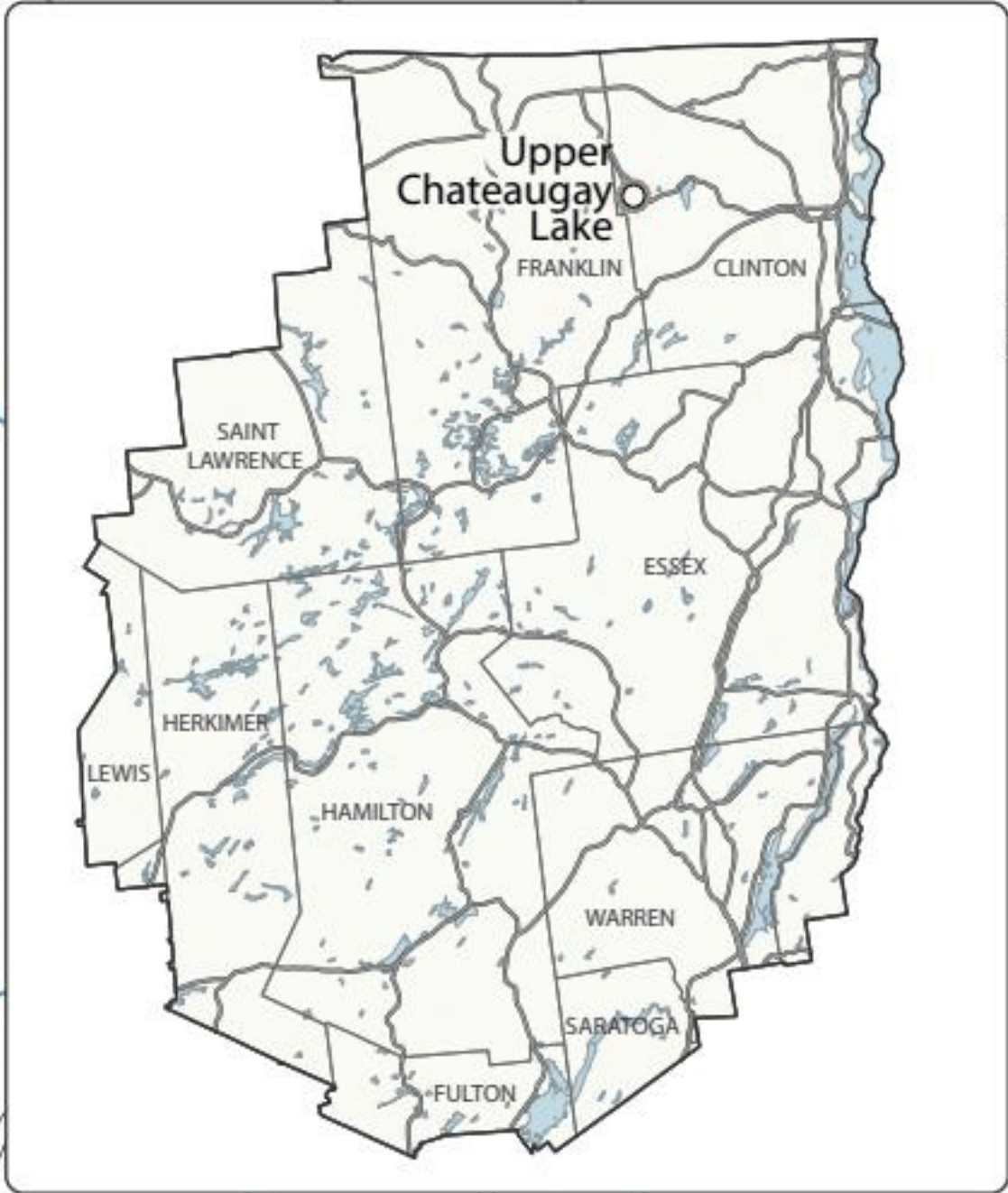
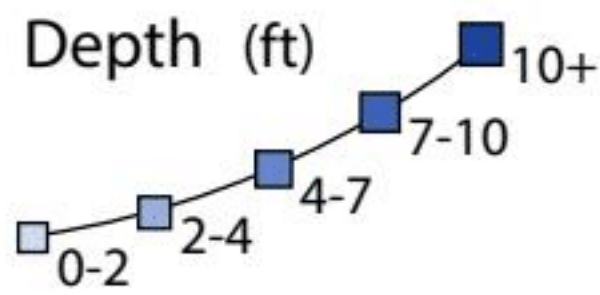
County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Bellmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys





# Upper Chateaugay Lake Survey Site Depth

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys





# Lower Chateaugay Lake Species Richness

County: Franklin

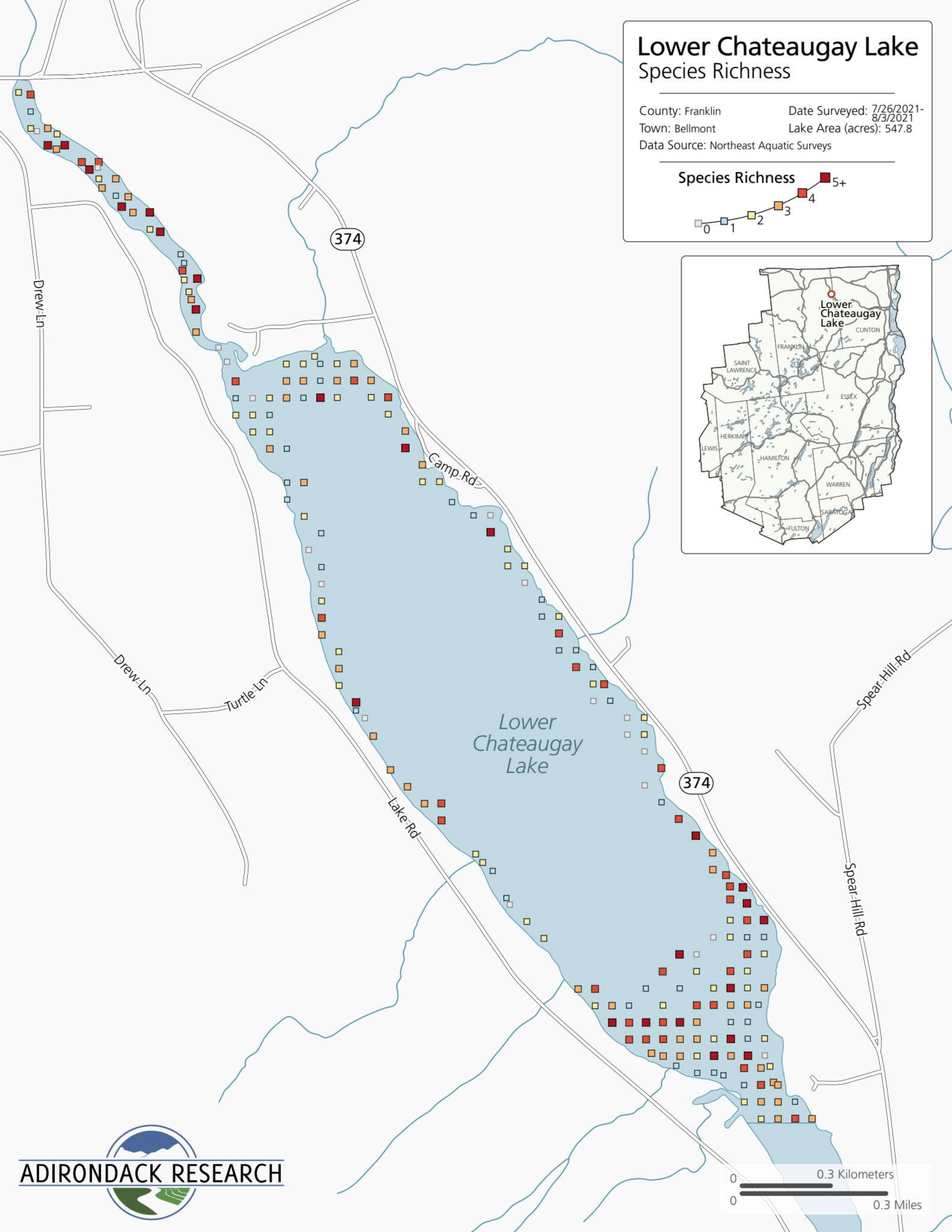
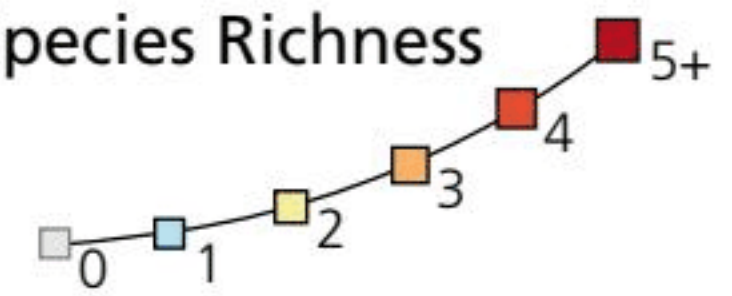
Date Surveyed: 7/26/2021-  
8/3/2021

Town: Bellmont

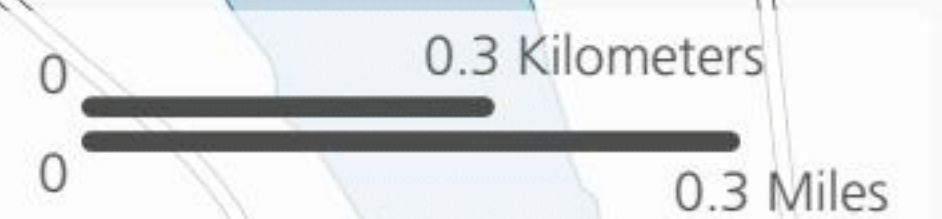
Lake Area (acres): 547.8

Data Source: Northeast Aquatic Surveys

## Species Richness



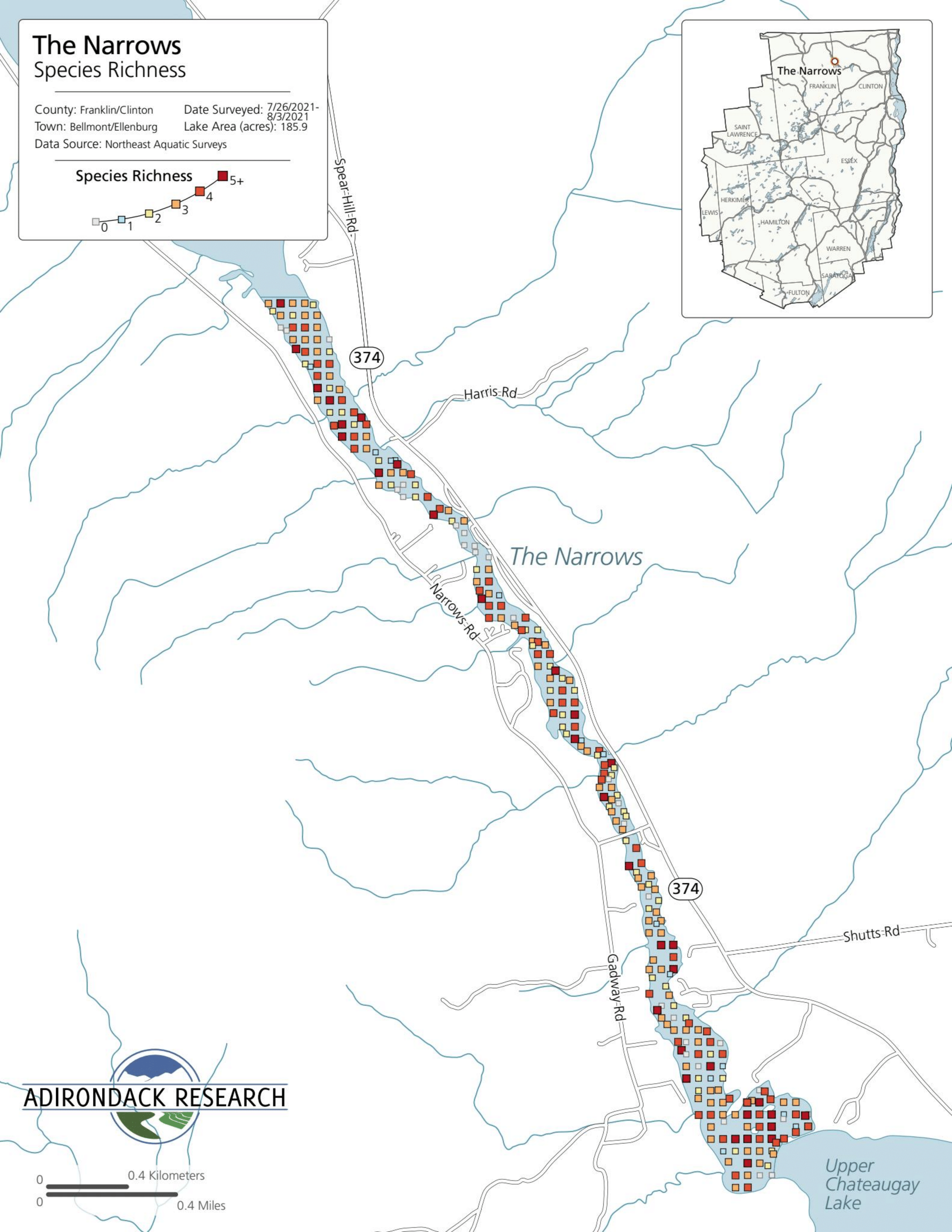
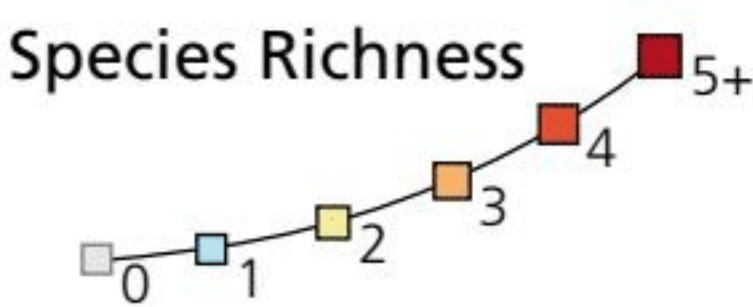
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# The Narrows Species Richness

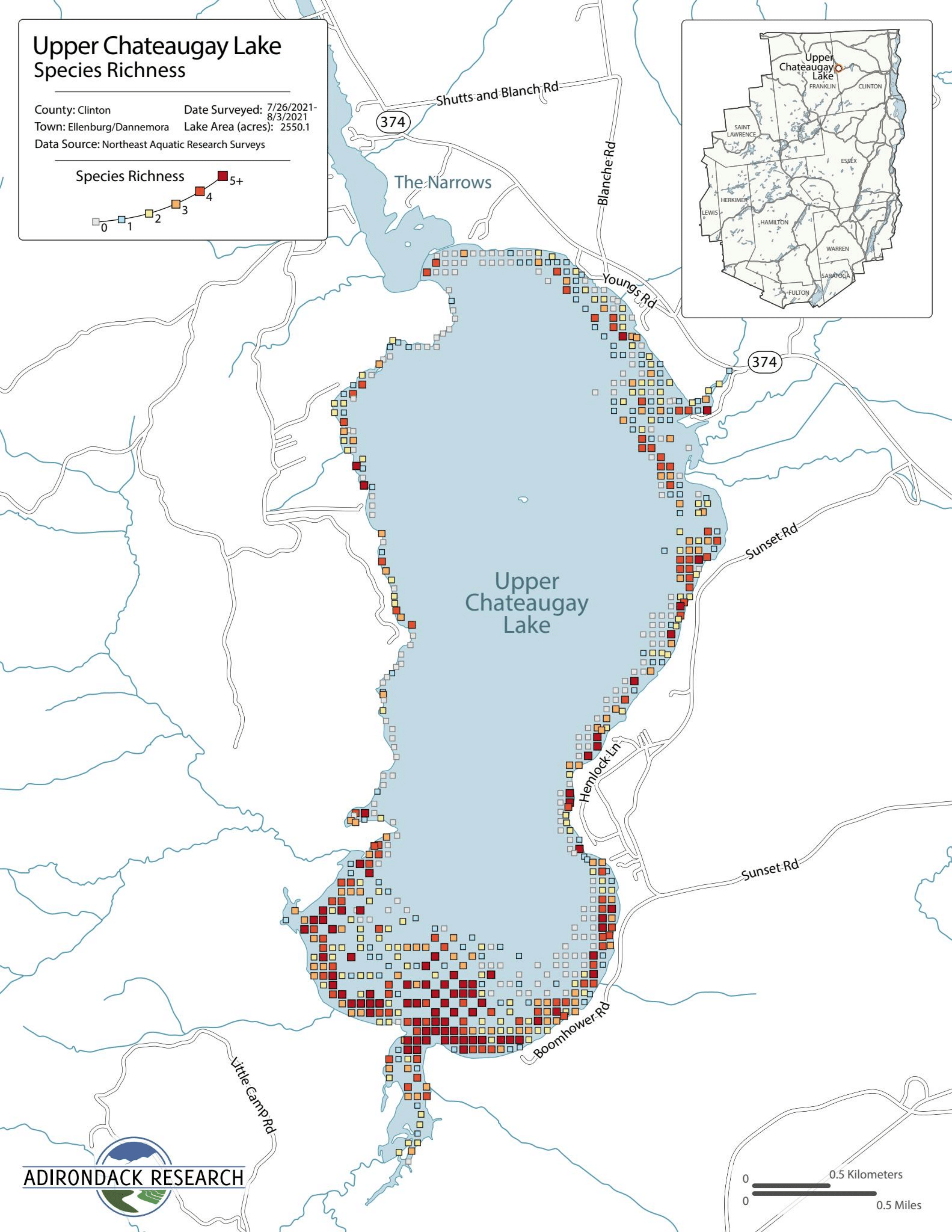
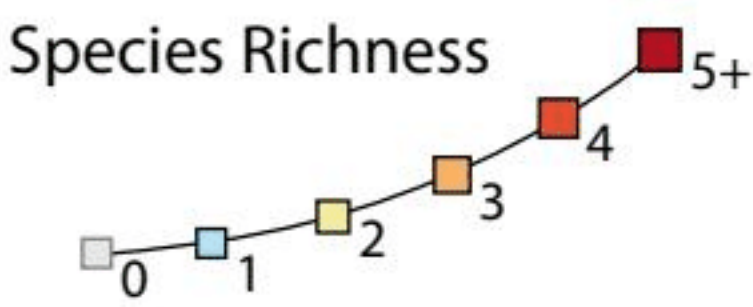
County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Bellmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Surveys





# Upper Chateaugay Lake Species Richness

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys





# Lower Chateaugay Lake Overall Plant Abundance

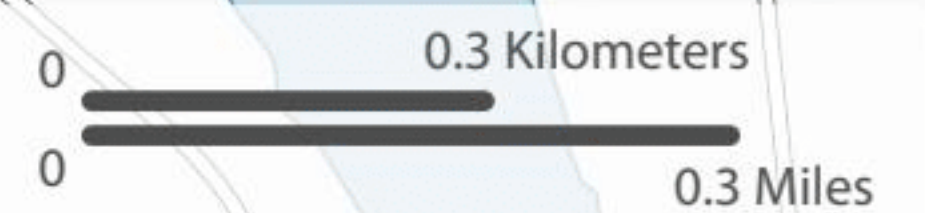
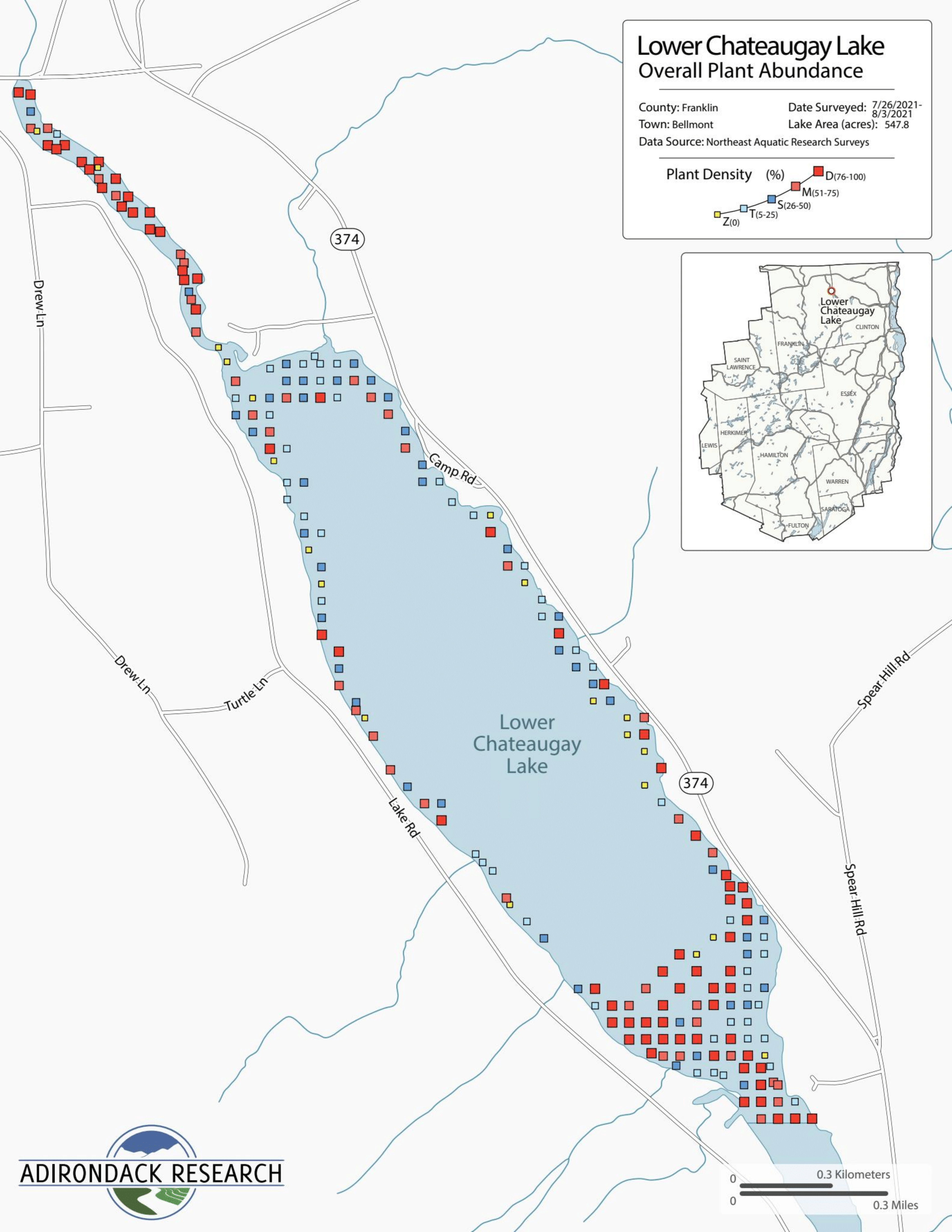
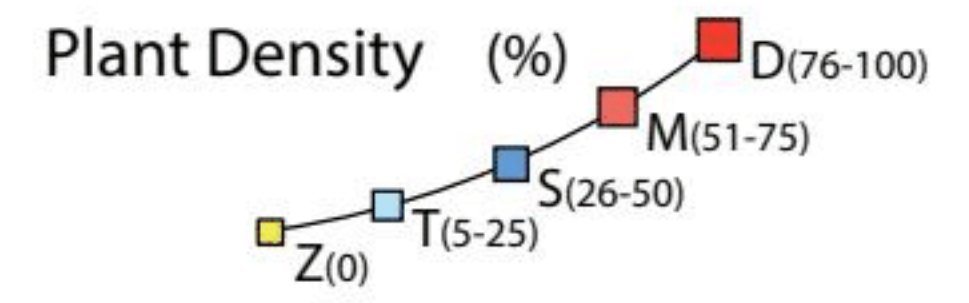
County: Franklin

Date Surveyed: 7/26/2021-  
8/3/2021

Town: Belmont

Lake Area (acres): 547.8

Data Source: Northeast Aquatic Research Surveys

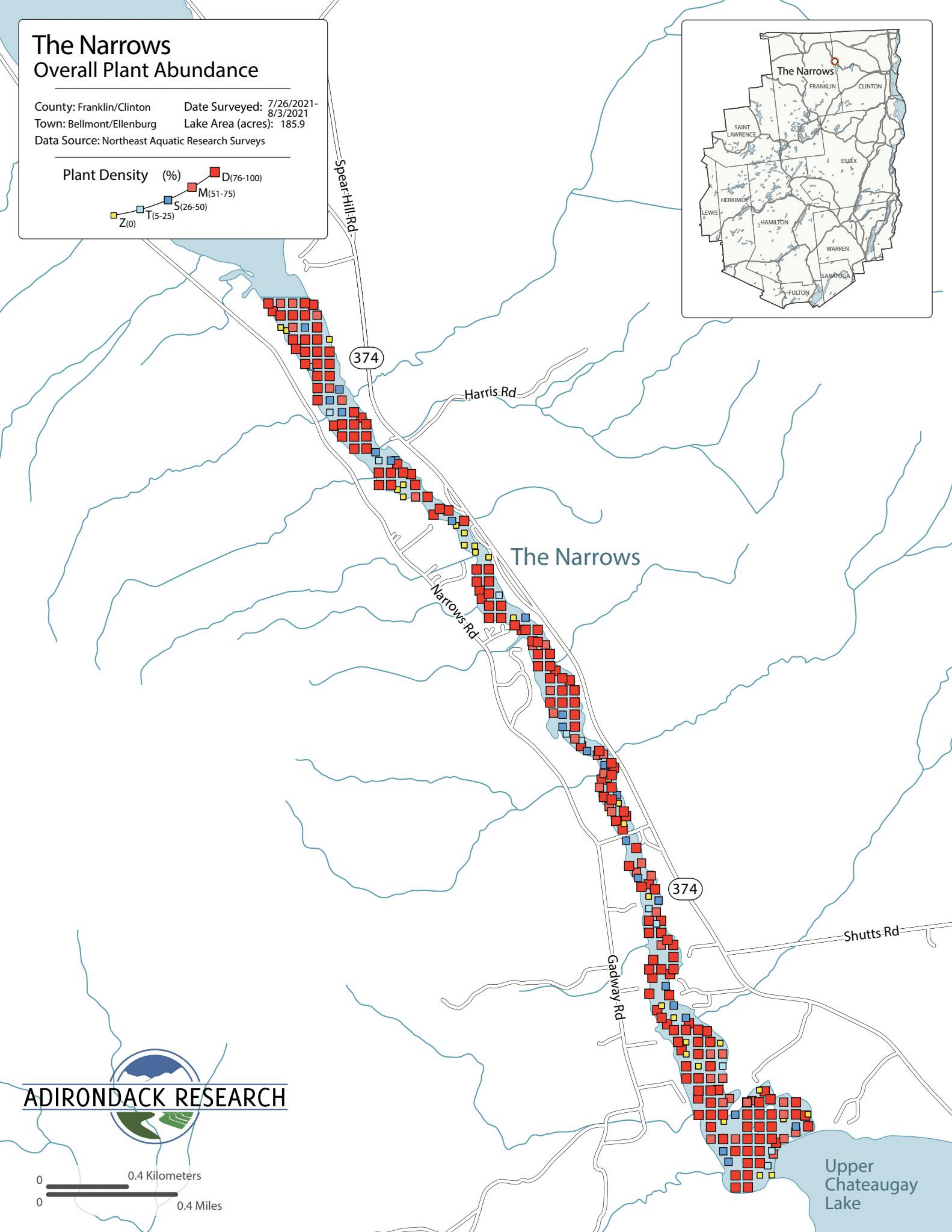
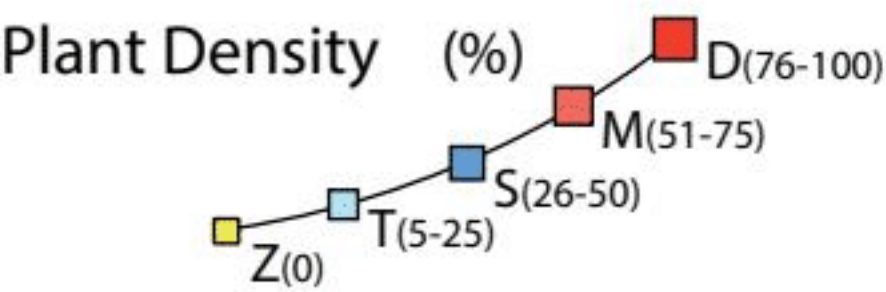




# The Narrows

## Overall Plant Abundance

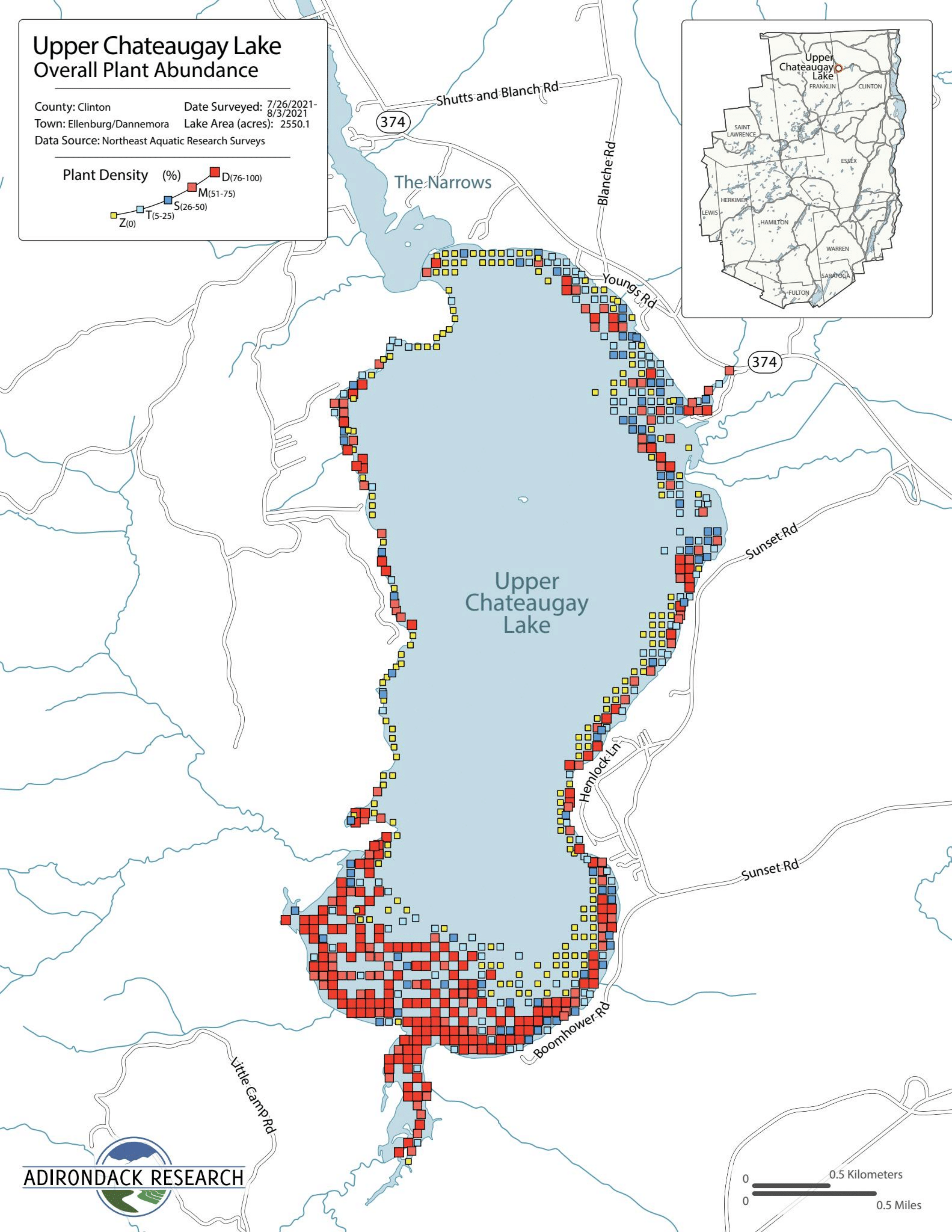
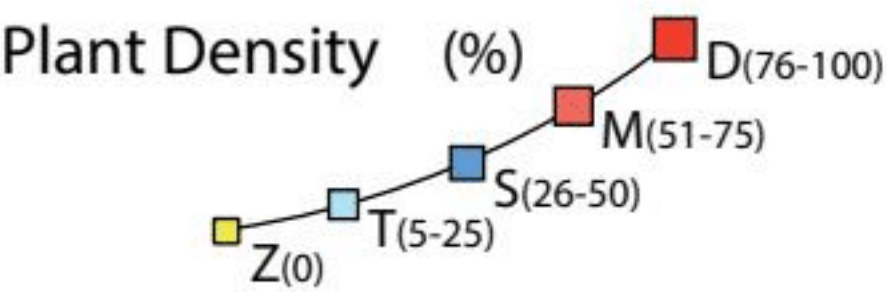
County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys





# Upper Chateaugay Lake Overall Plant Abundance

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys





# Lower Chateaugay Lake

## Eurasian Watermilfoil

*Myriophyllum spicatum*

County: Franklin

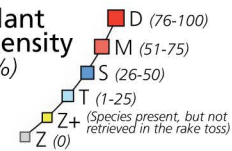
Date Surveyed: 7/26/2021-8/3/2021

Town: Belmont

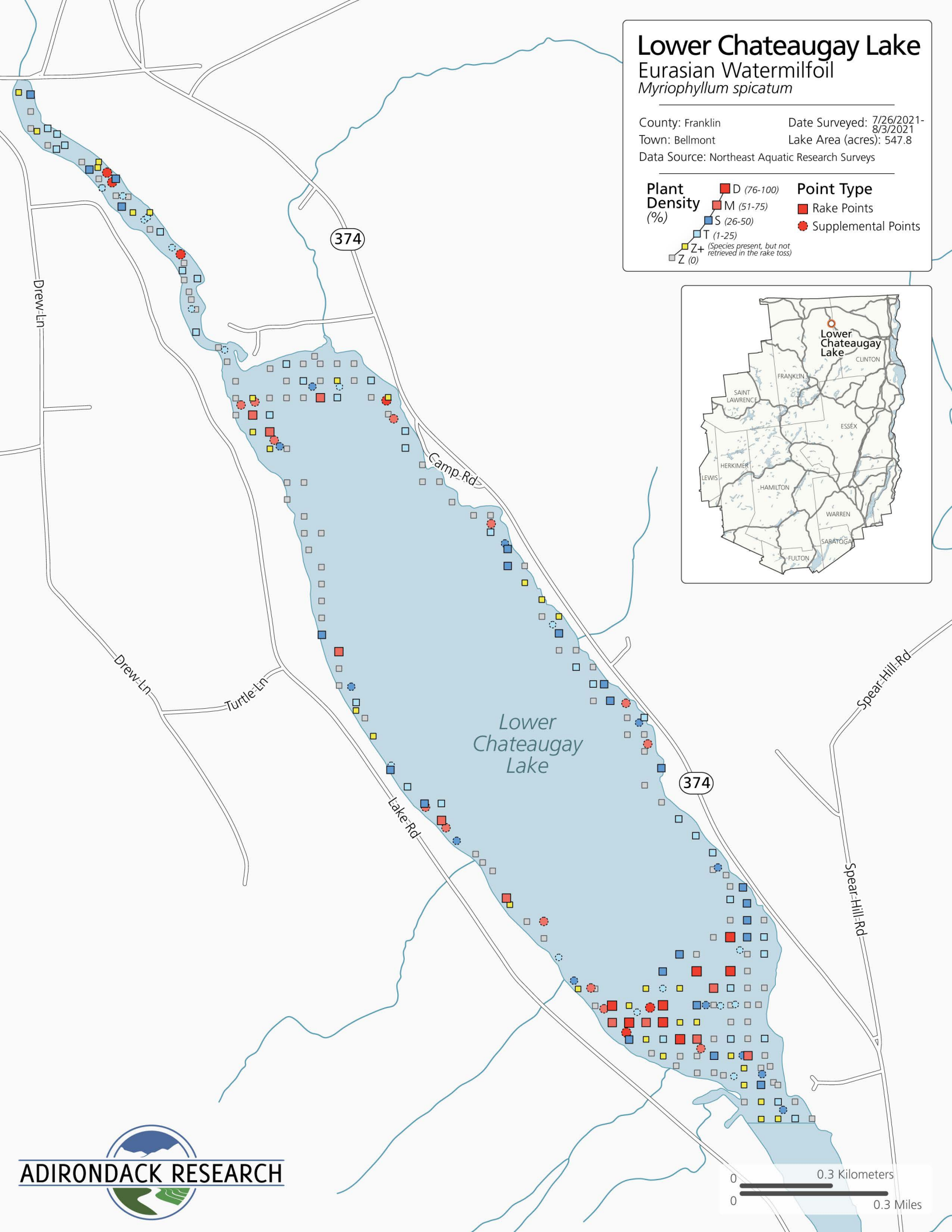
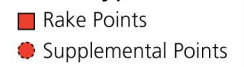
Lake Area (acres): 547.8

Data Source: Northeast Aquatic Research Surveys

### Plant Density (%)



### Point Type



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# The Narrows

## Eurasian Watermilfoil

*Myriophyllum spicatum*

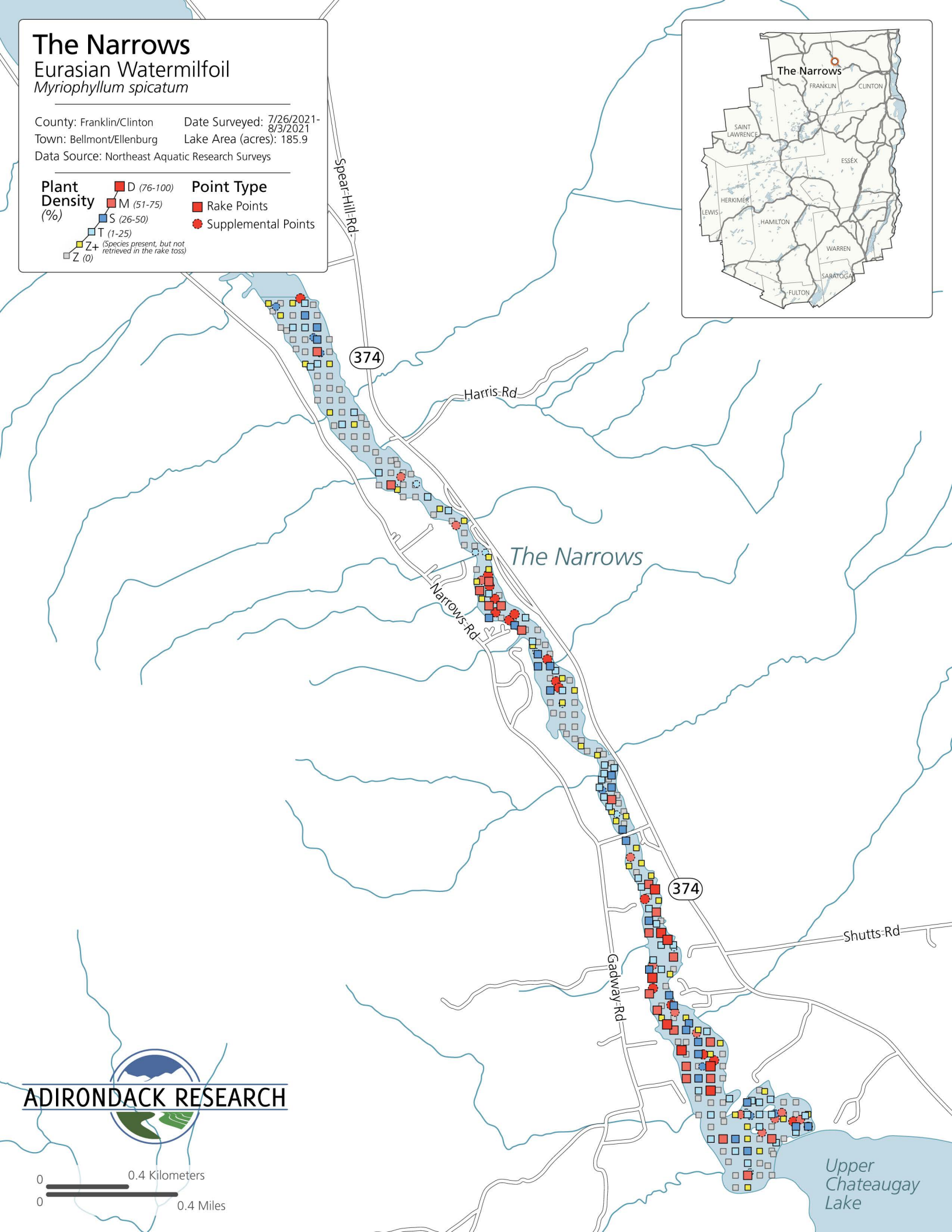
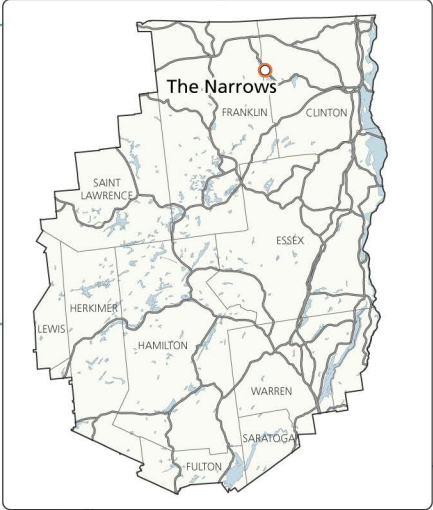
County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys

**Plant Density (%)**

- D (76-100)
- M (51-75)
- S (26-50)
- T (1-25)
- Z+ (Species present, but not retrieved in the rake toss)
- Z (0)

**Point Type**

- Rake Points
- Supplemental Points



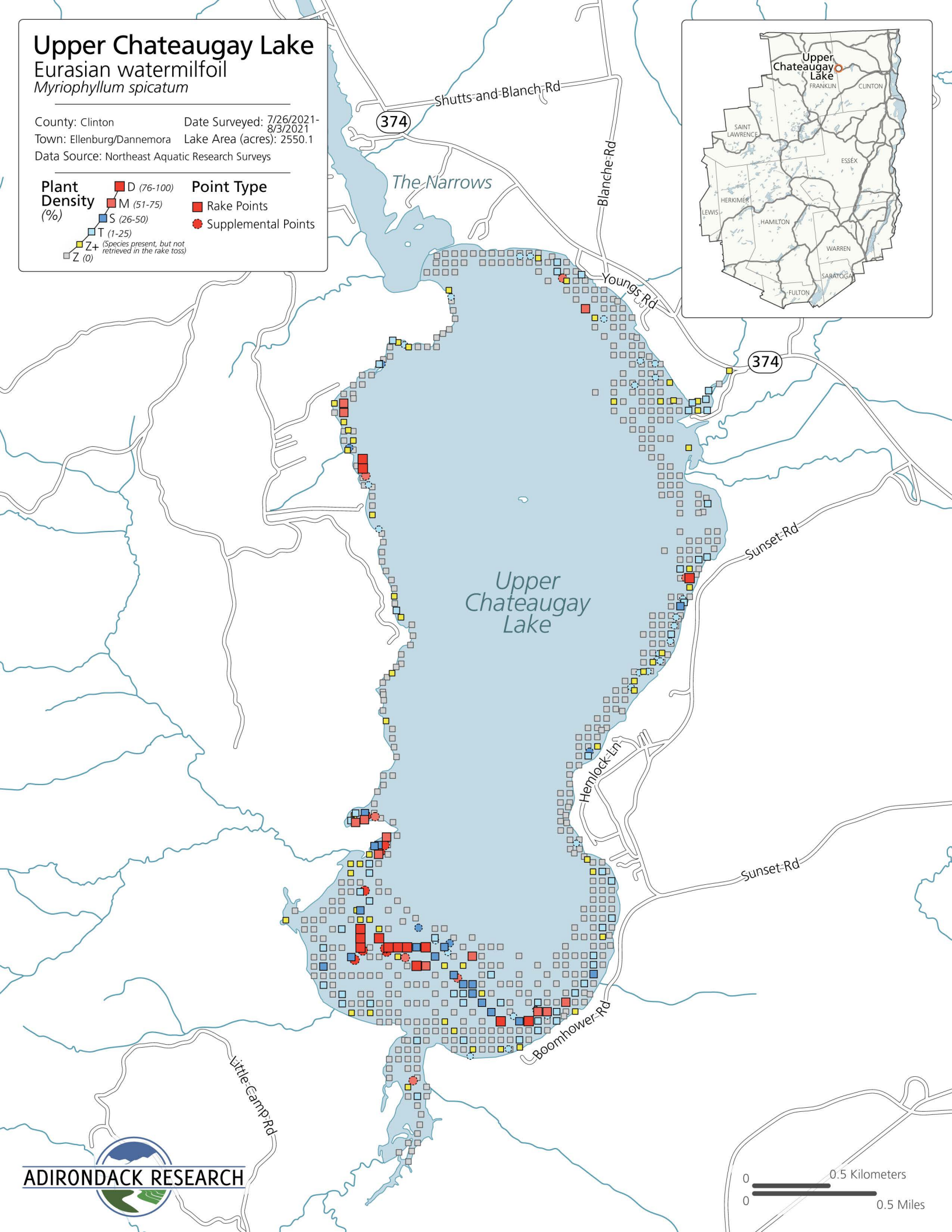
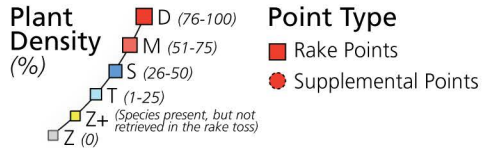


# Upper Chateaugay Lake

## Eurasian watermilfoil

### *Myriophyllum spicatum*

County: Clinton Date Surveyed: 7/26/2021-8/3/2021  
 Town: Ellenburg/Dannemora Lake Area (acres): 2550.1  
 Data Source: Northeast Aquatic Research Surveys



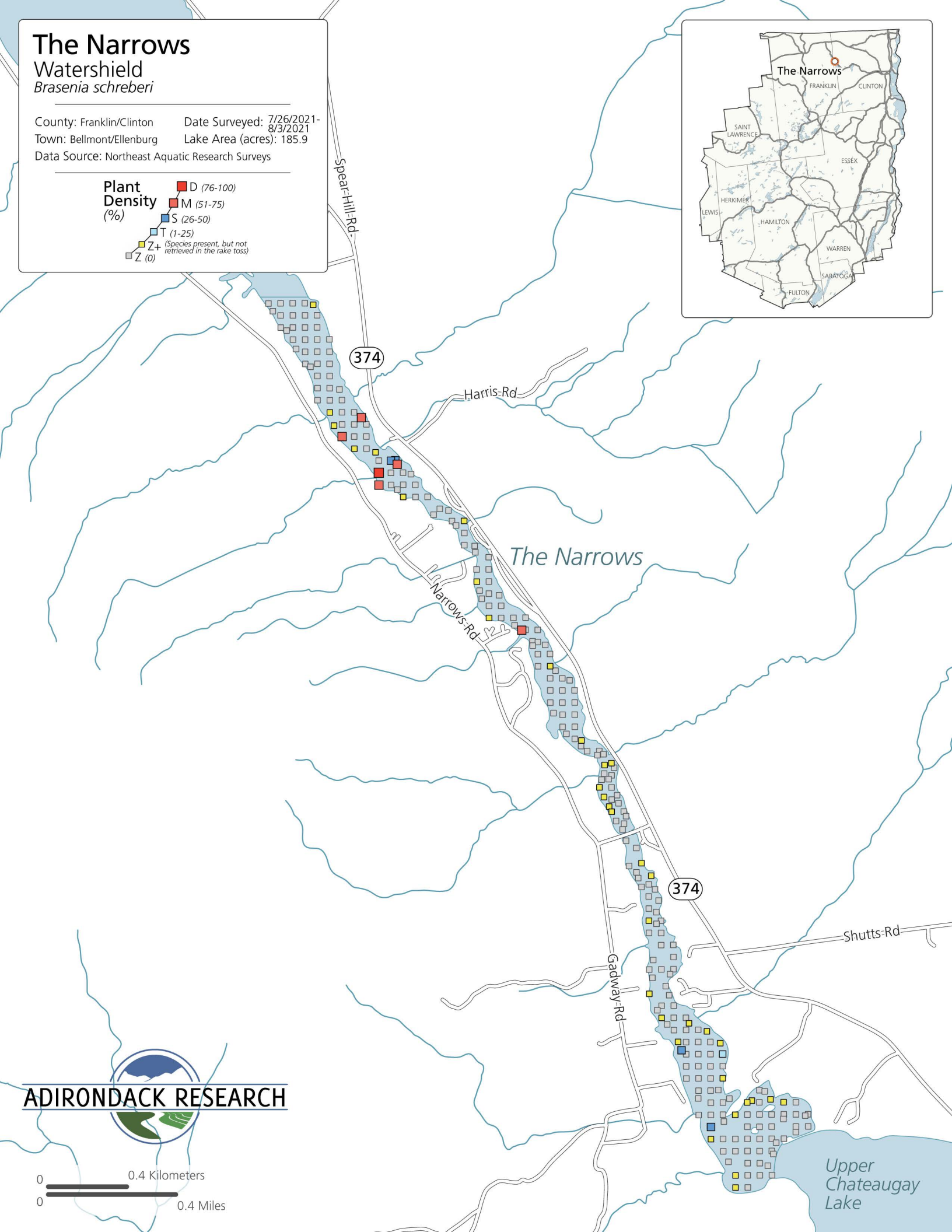
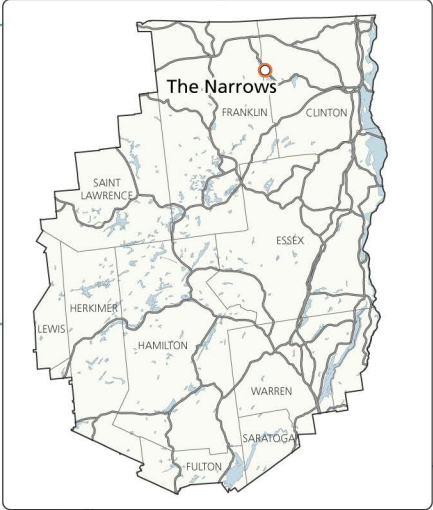
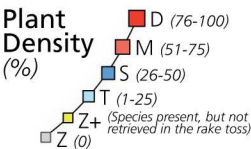


# The Narrows

## Watershed

*Brasenia schreberi*

County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys



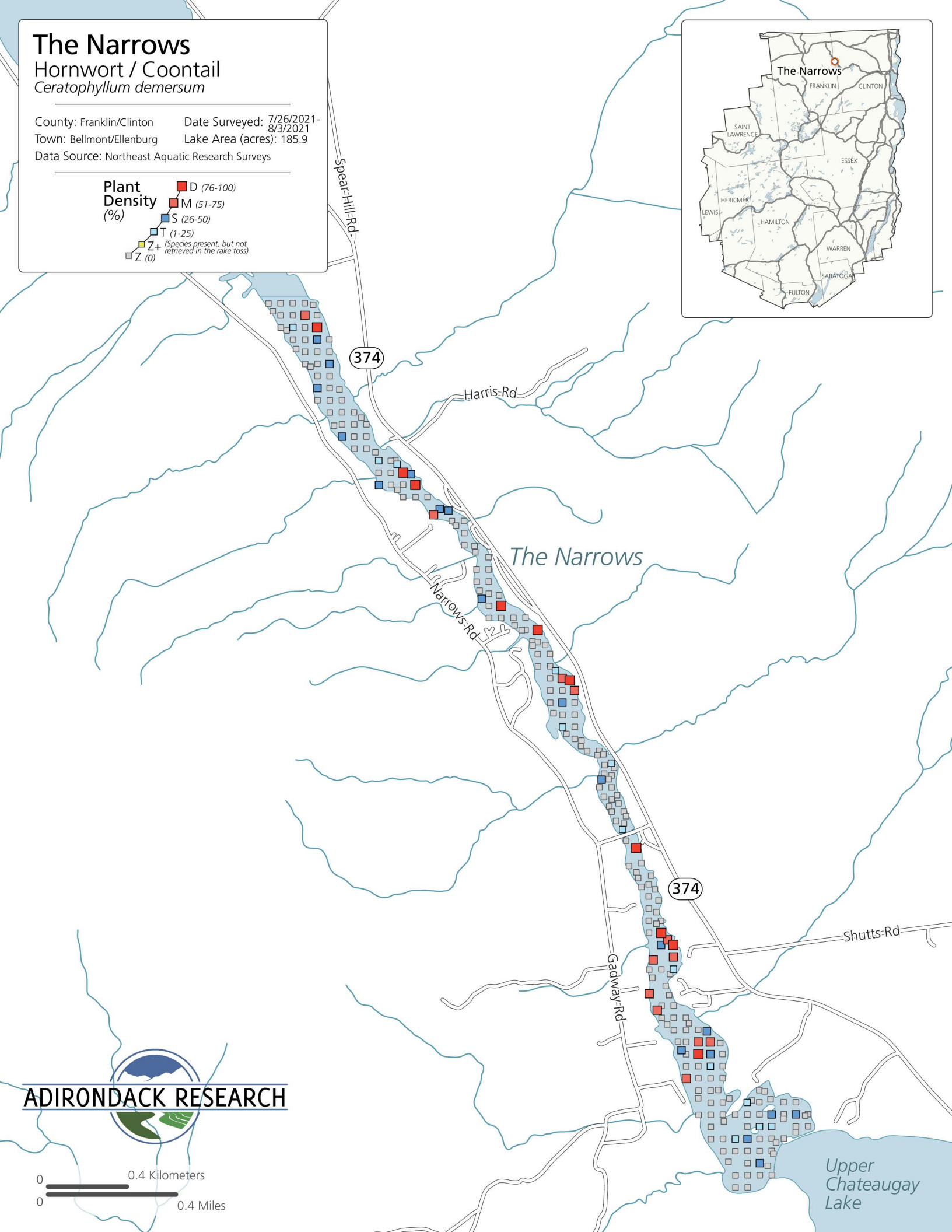
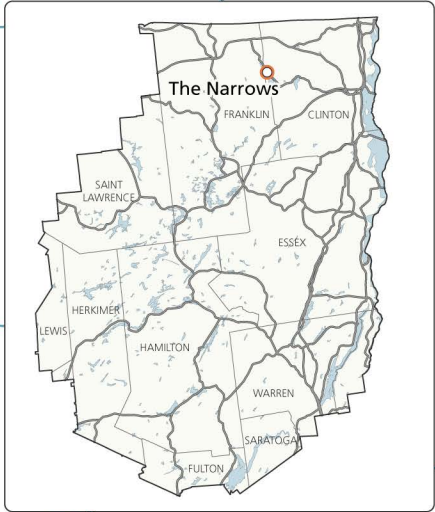
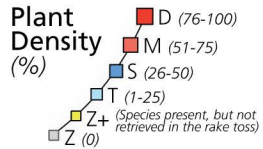


# The Narrows

## Hornwort / Coontail

*Ceratophyllum demersum*

County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys





# The Narrows

## Muskgrass

*Chara sp*

County: Franklin/Clinton

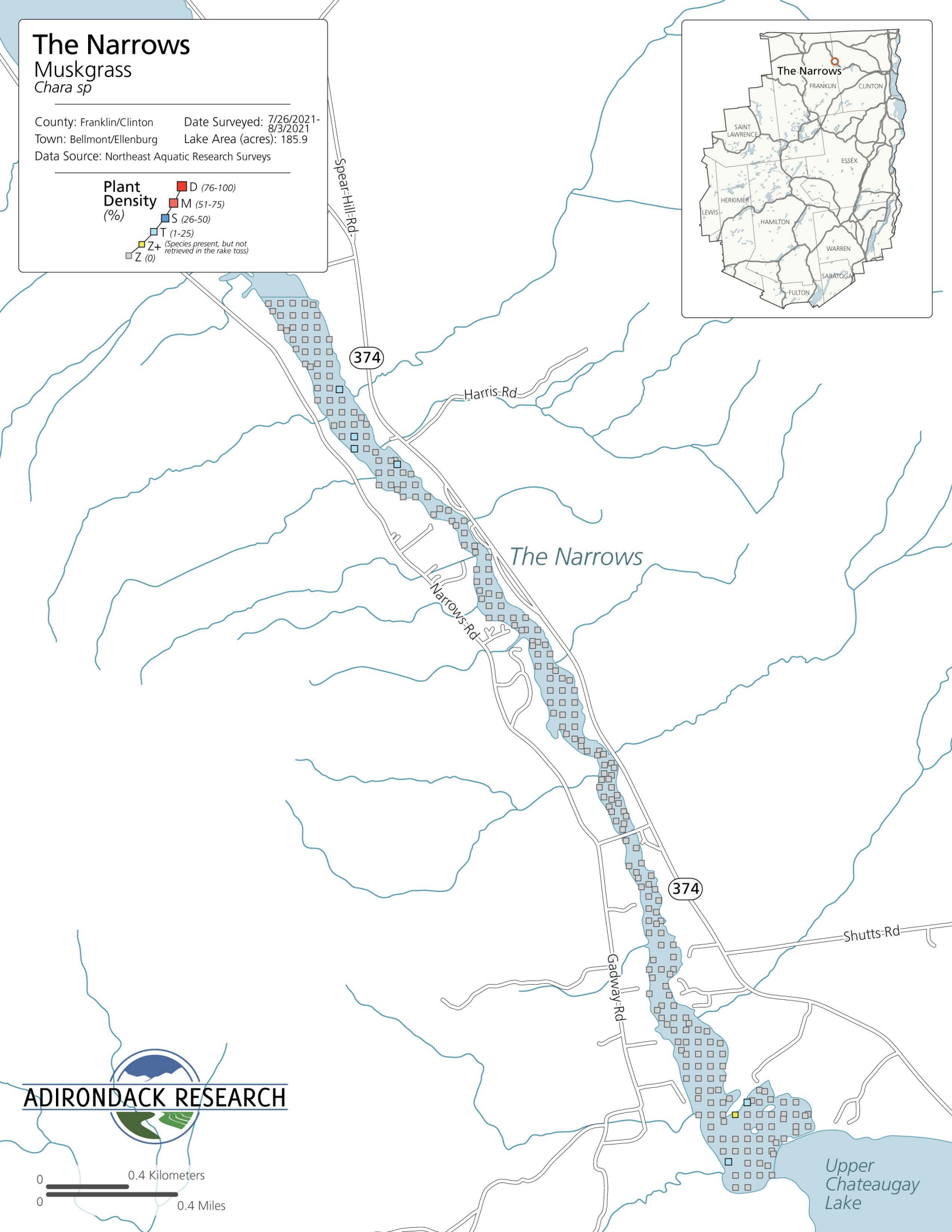
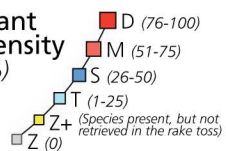
Date Surveyed: 7/26/2021-8/3/2021

Town: Belmont/Ellenburg

Lake Area (acres): 185.9

Data Source: Northeast Aquatic Research Surveys

### Plant Density (%)



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0 0.4 Kilometers  
0 0.4 Miles

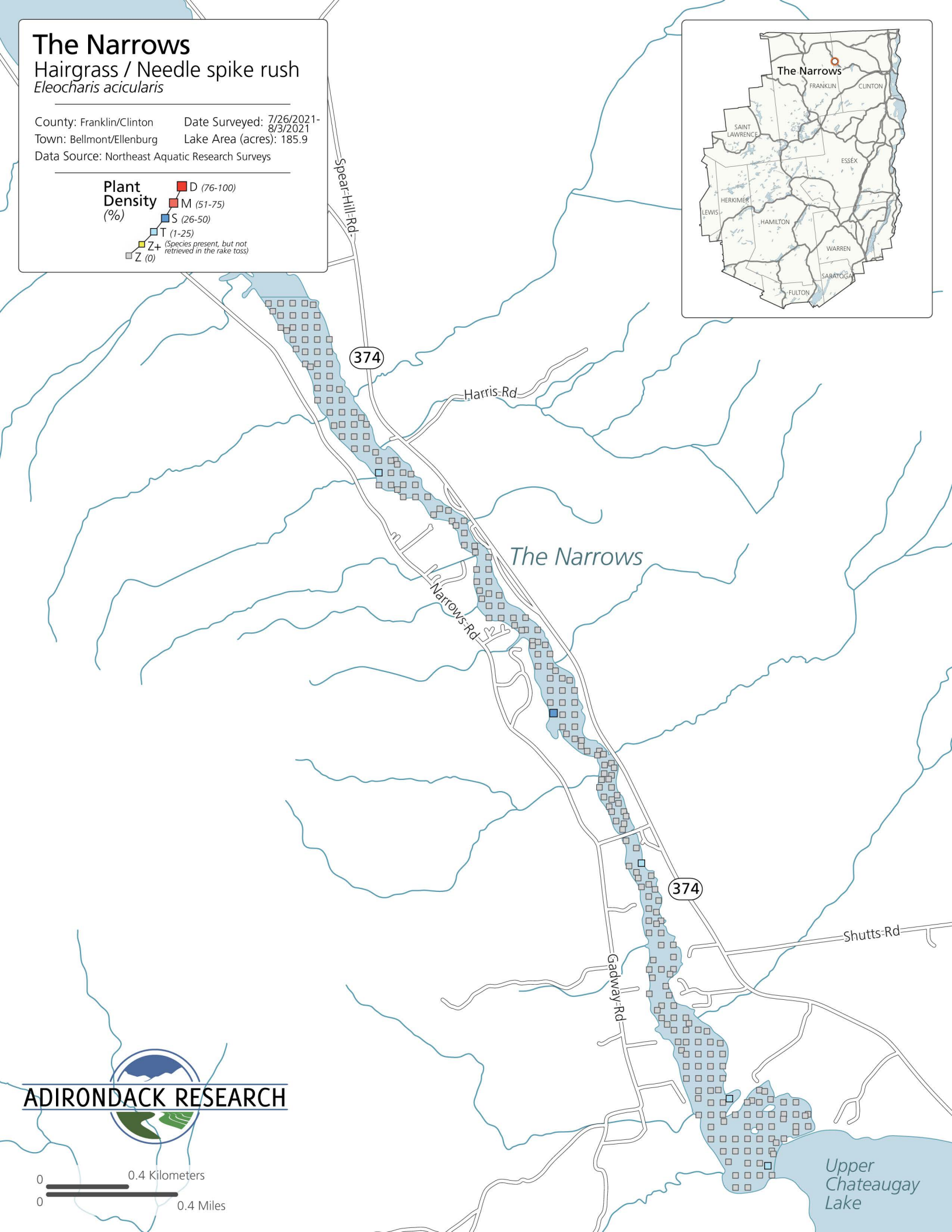
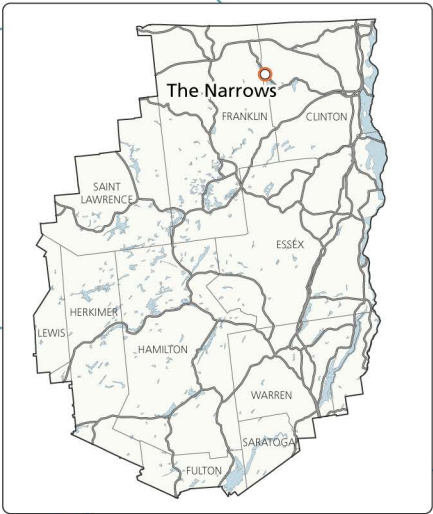
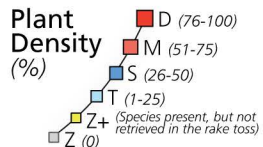


# The Narrows

## Hairgrass / Needle spike rush

*Eleocharis acicularis*

County: Franklin/Clinton Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg Lake Area (acres): 185.9  
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Upper  
Chateaugay  
Lake

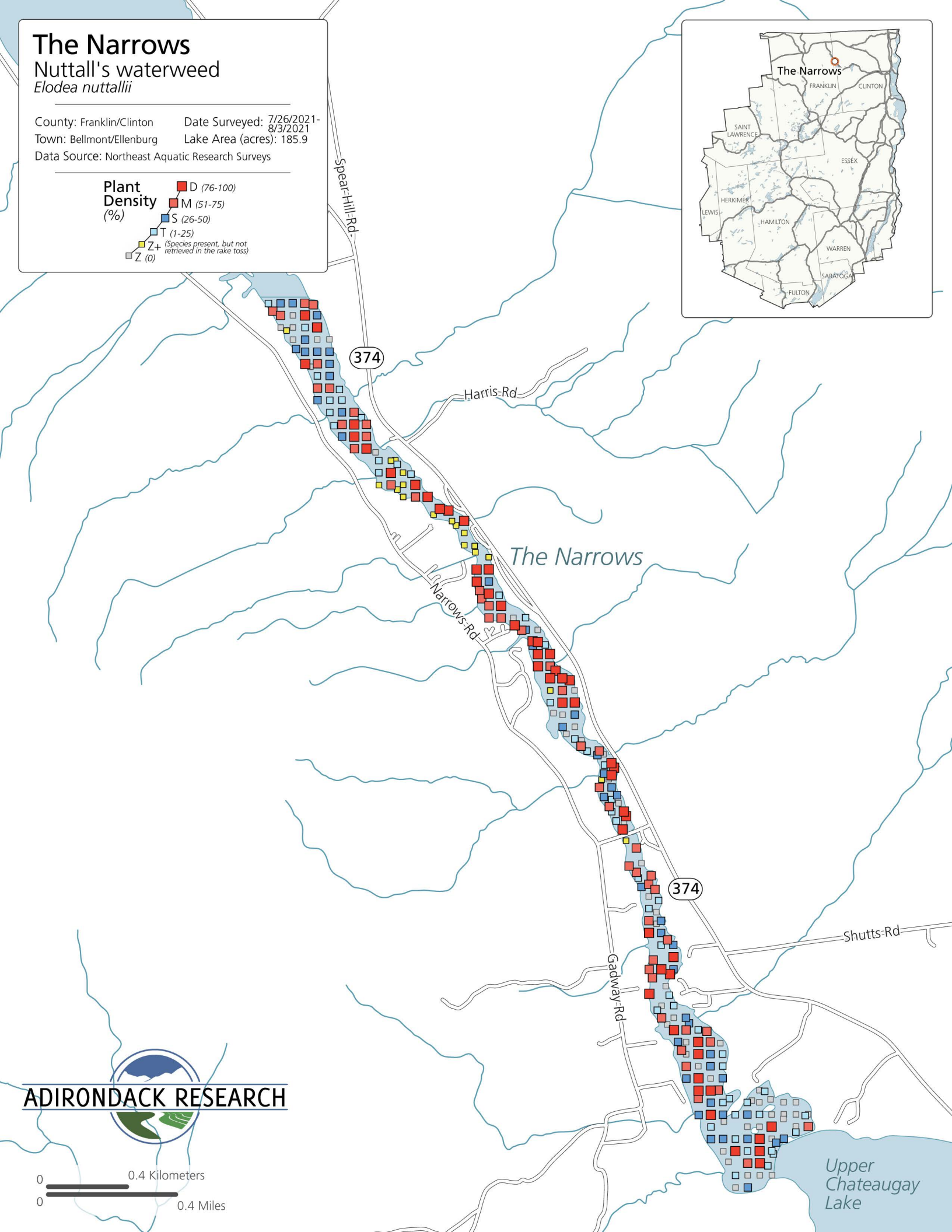
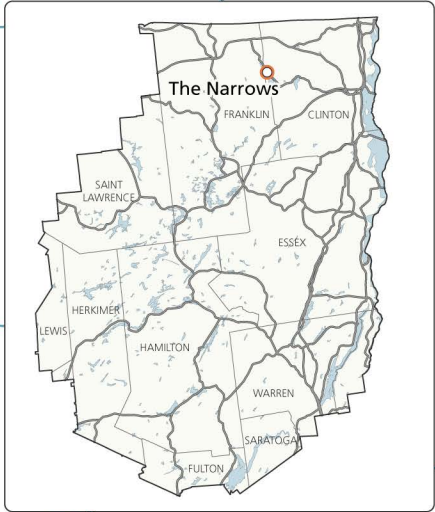
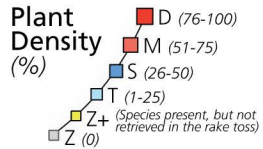


# The Narrows

## Nuttall's waterweed

*Elodea nuttallii*

County: Franklin/Clinton Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys



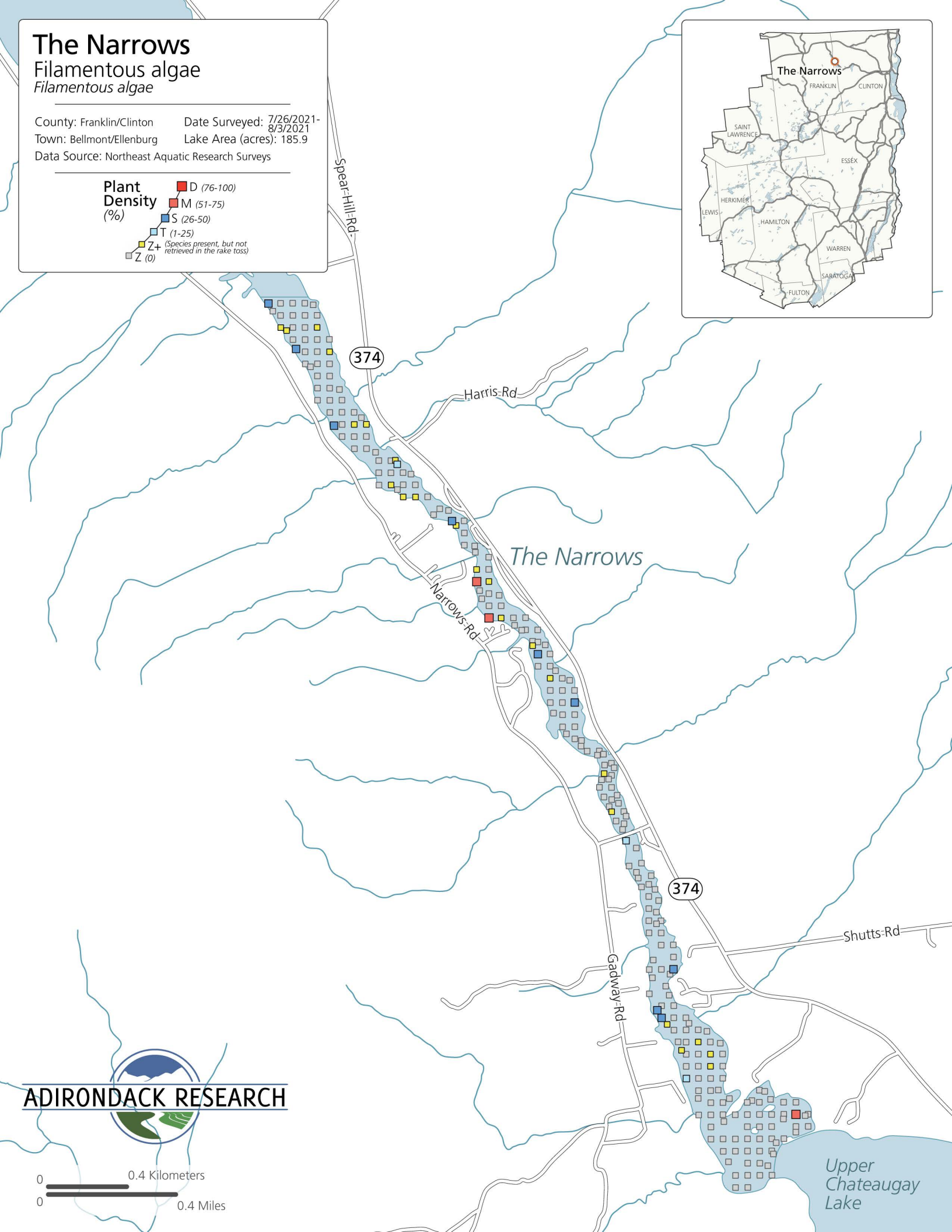
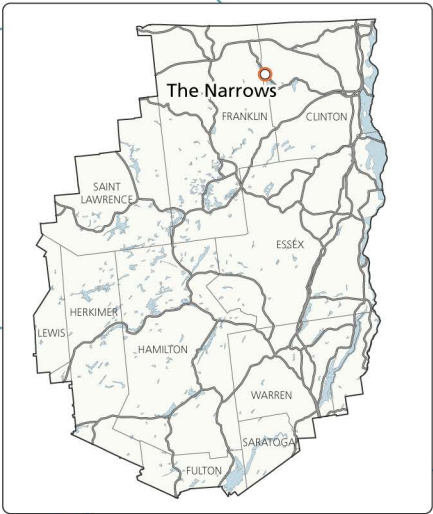
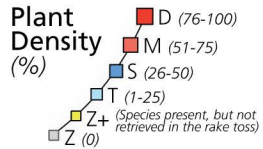


# The Narrows

## Filamentous algae

*Filamentous algae*

County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
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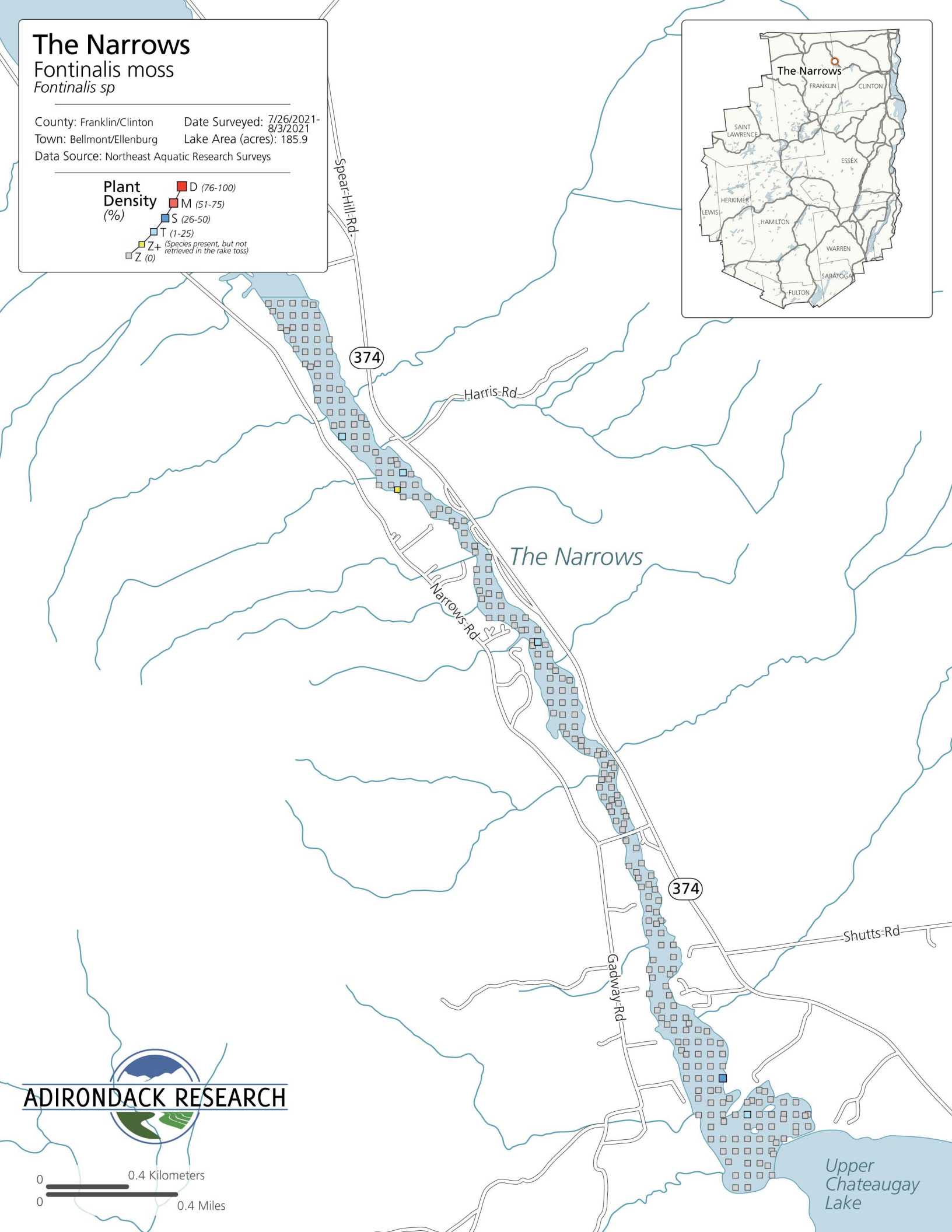
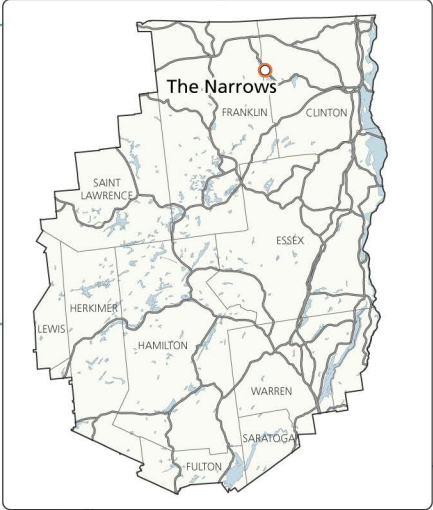
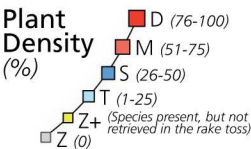




# The Narrows

Fontinalis moss  
*Fontinalis sp*

County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys





# The Narrows

## Isoetes

*Isoetes sp*

County: Franklin/Clinton

Date Surveyed: 7/26/2021-

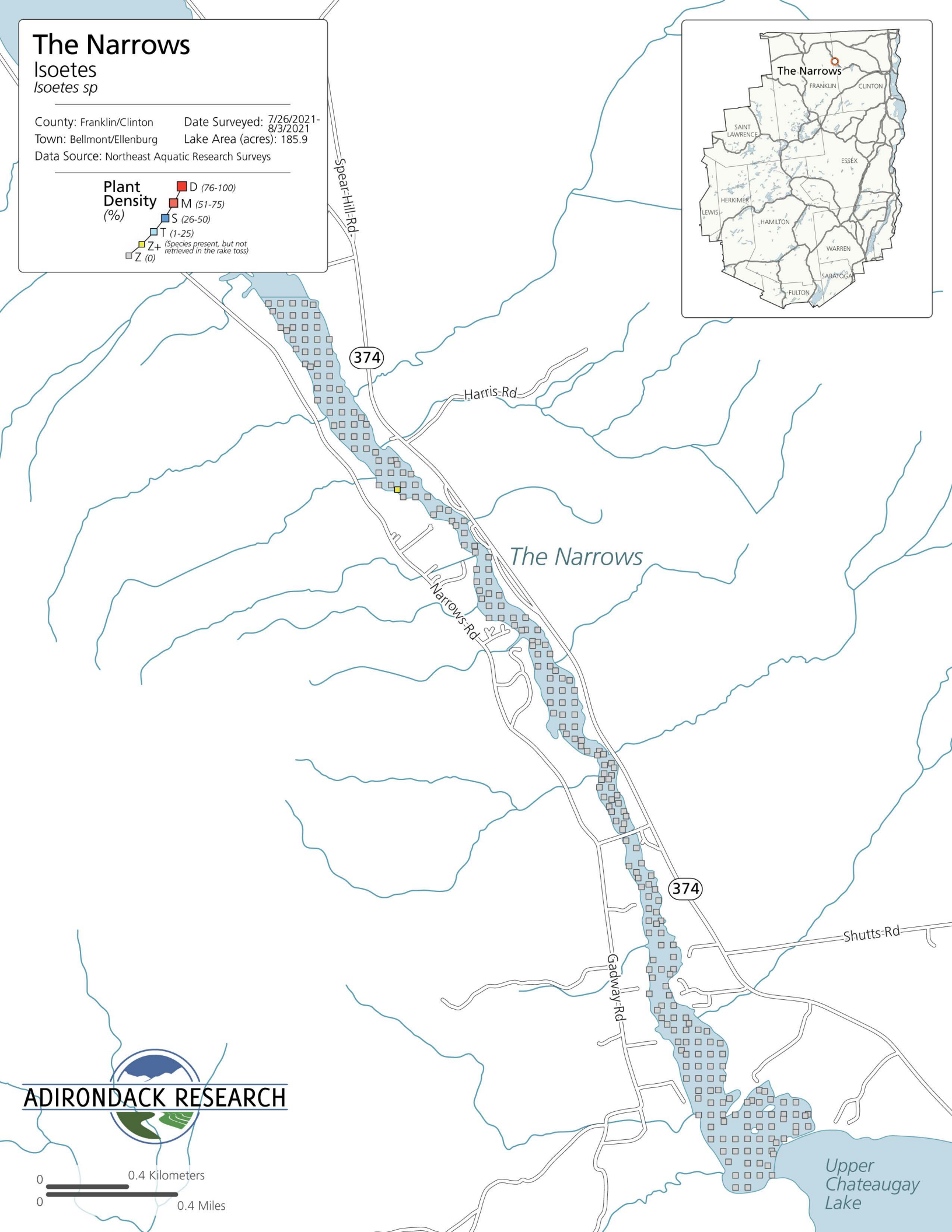
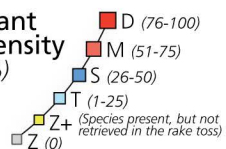
8/3/2021

Town: Belmont/Ellenburg

Lake Area (acres): 185.9

Data Source: Northeast Aquatic Research Surveys

### Plant Density (%)



ADIRONDACK RESEARCH



0 0.4 Kilometers  
0 0.4 Miles

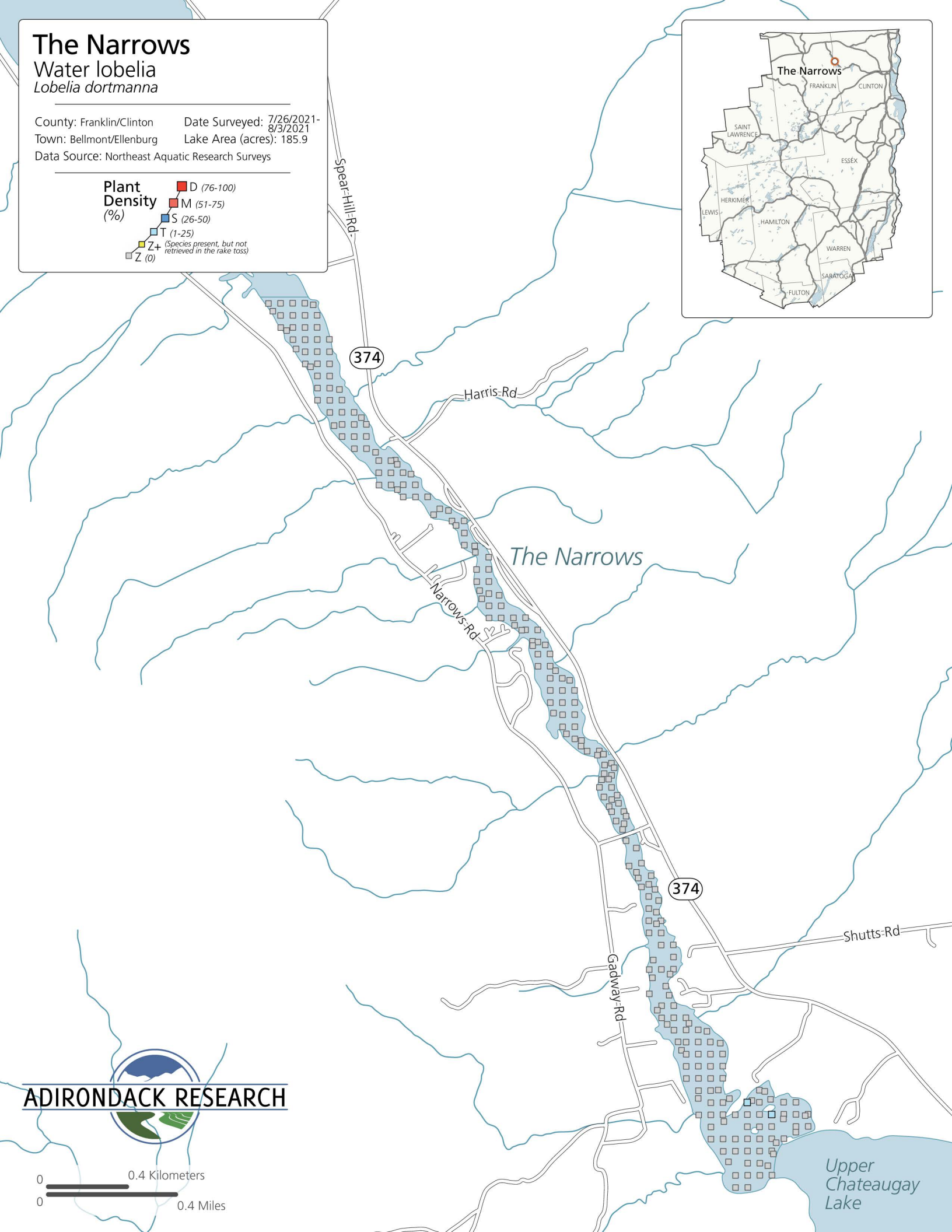
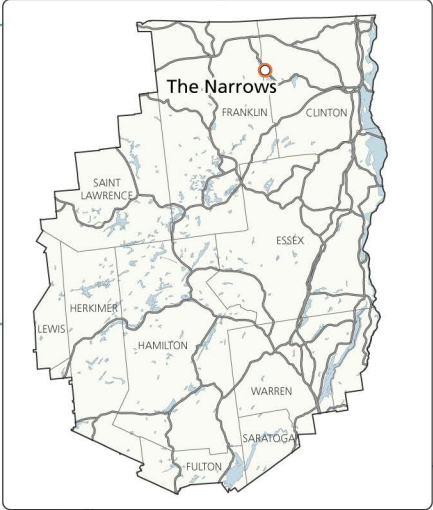
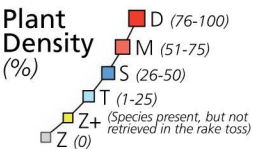


# The Narrows

## Water lobelia

*Lobelia dortmanna*

County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys





# The Narrows

Soft watermilfoil / Slender watermilfoil  
*Myriophyllum tenellum*

County: Franklin/Clinton

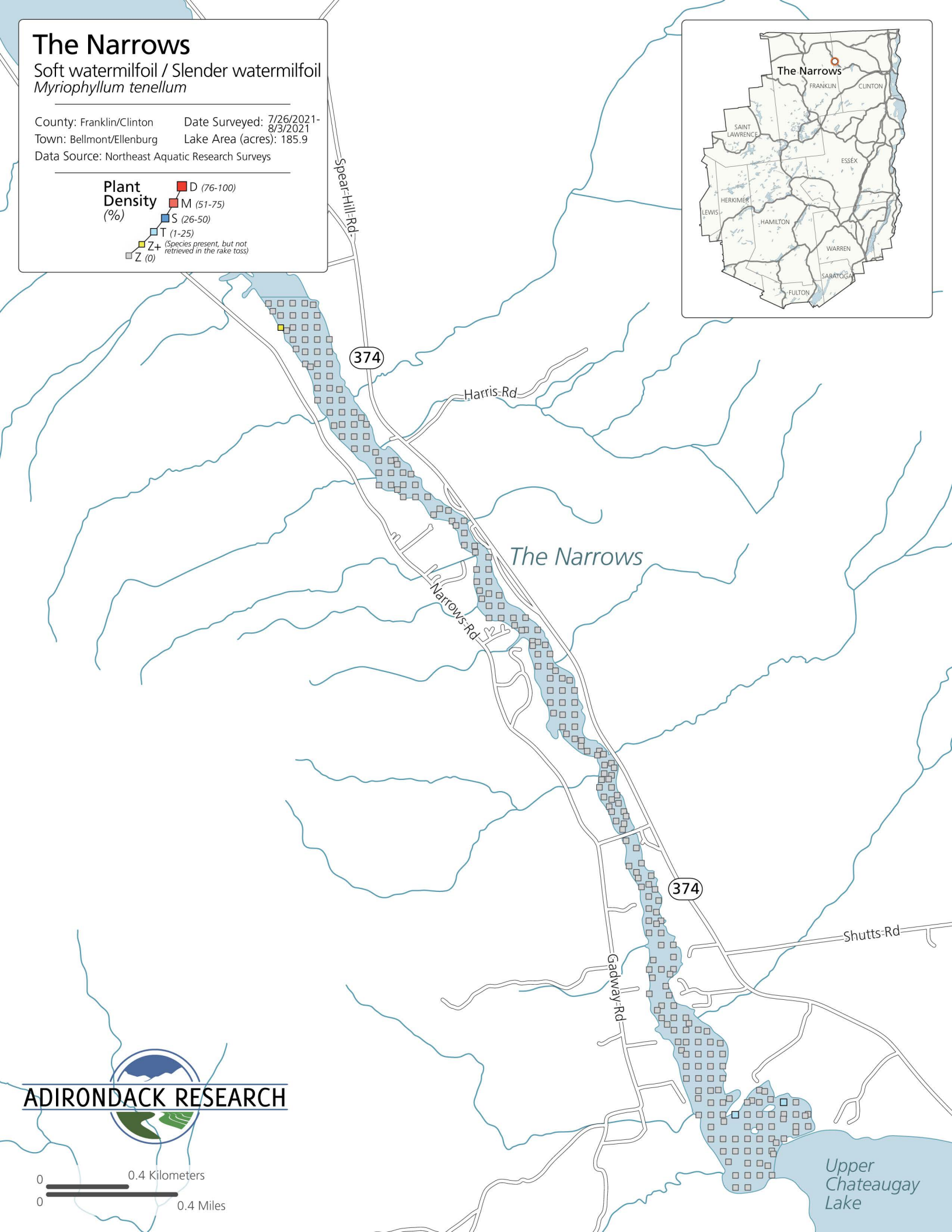
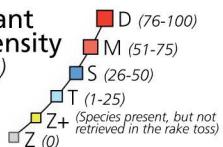
Date Surveyed: 7/26/2021-8/3/2021

Town: Belmont/Ellenburg

Lake Area (acres): 185.9

Data Source: Northeast Aquatic Research Surveys

## Plant Density (%)



ADIRONDACK RESEARCH



0 0.4 Kilometers  
0 0.4 Miles



# The Narrows

Common naiad

*Najas flexilis*

County: Franklin/Clinton

Date Surveyed: 7/26/2021-

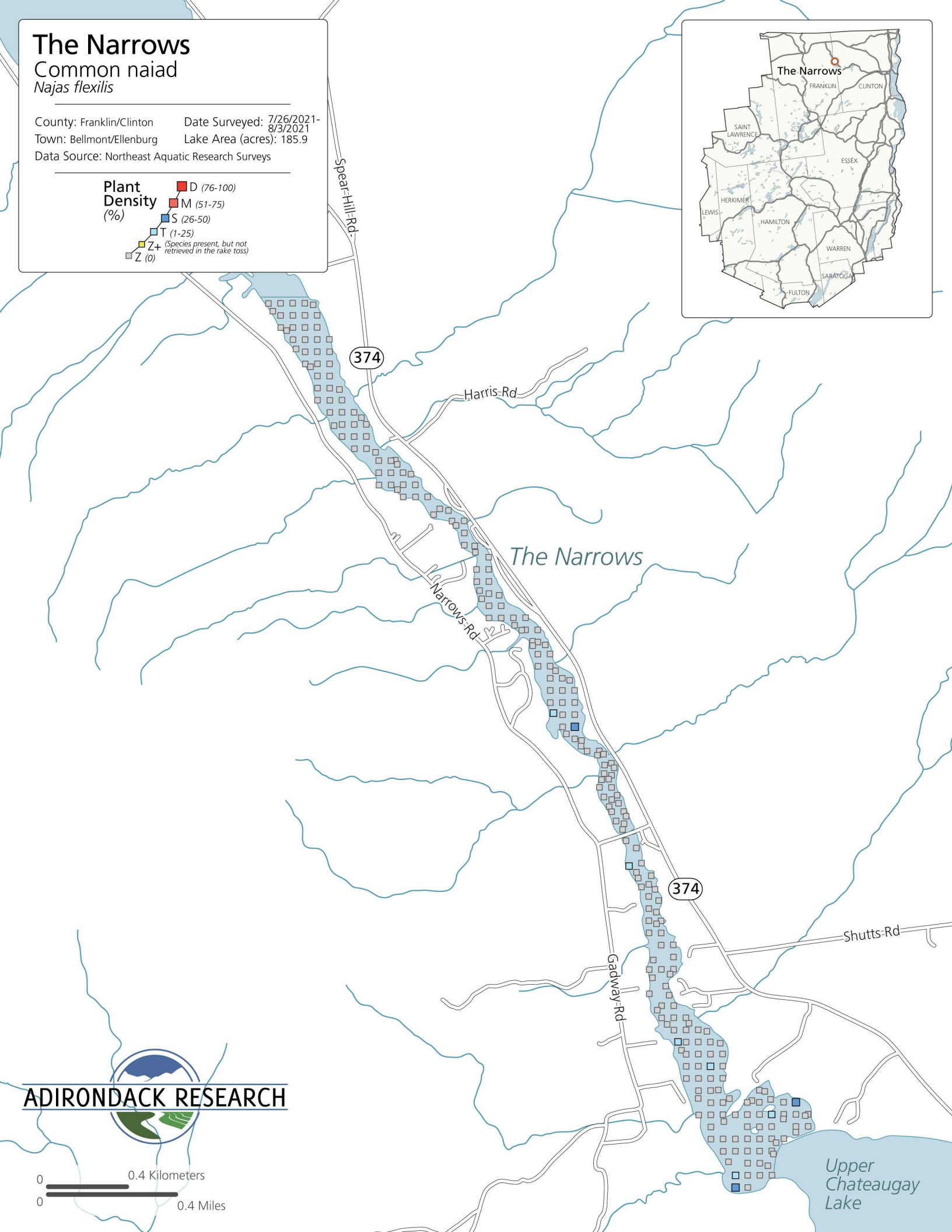
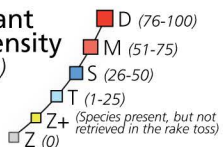
8/3/2021

Town: Belmont/Ellenburg

Lake Area (acres): 185.9

Data Source: Northeast Aquatic Research Surveys

## Plant Density (%)



ADIRONDACK RESEARCH

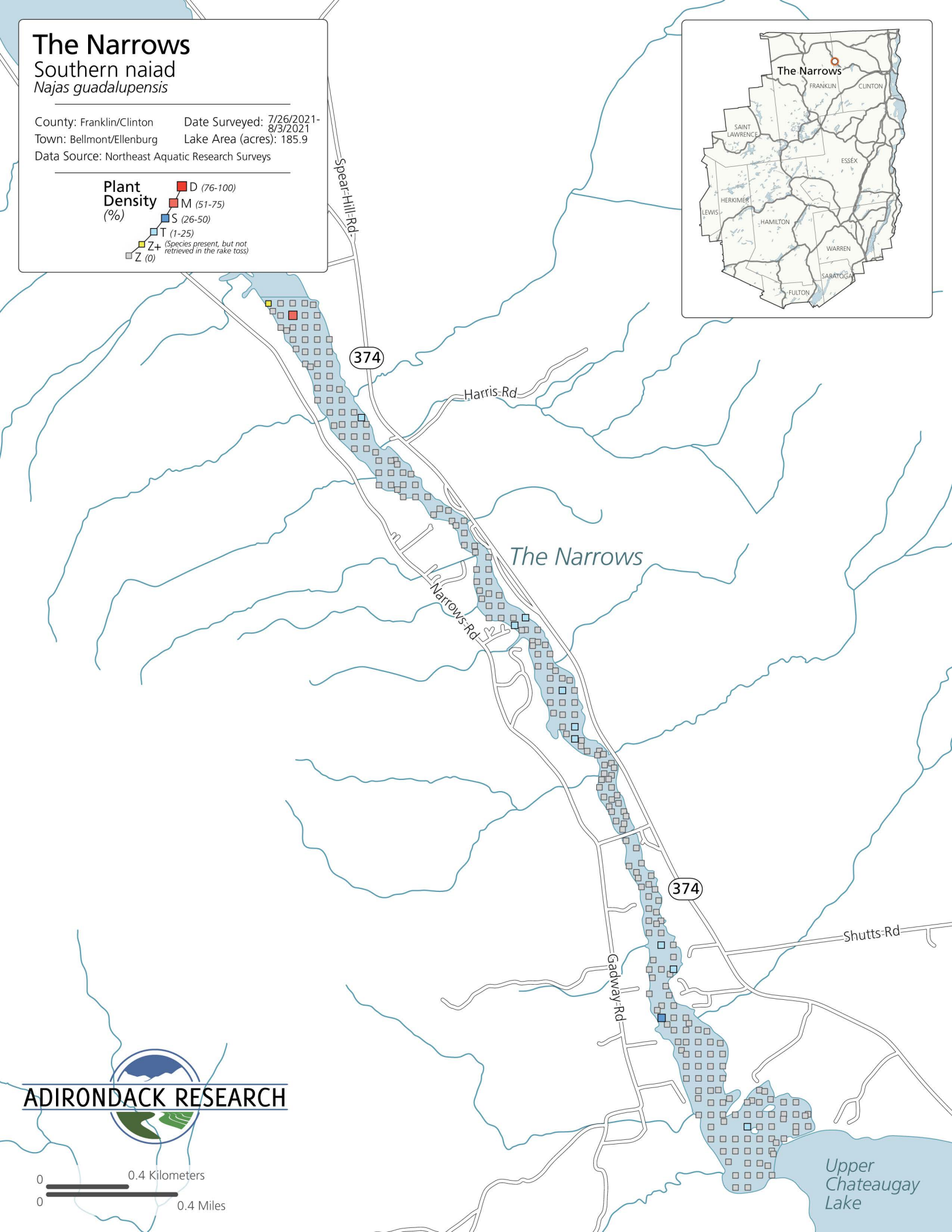
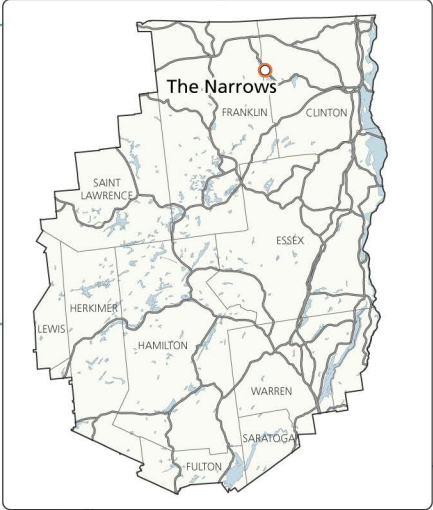
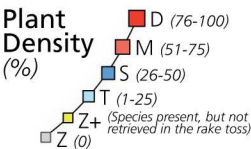




# The Narrows

Southern naiad  
*Najas guadalupensis*

County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys





# The Narrows

## Stonewort

*Nitella sp*

County: Franklin/Clinton

Date Surveyed: 7/26/2021-

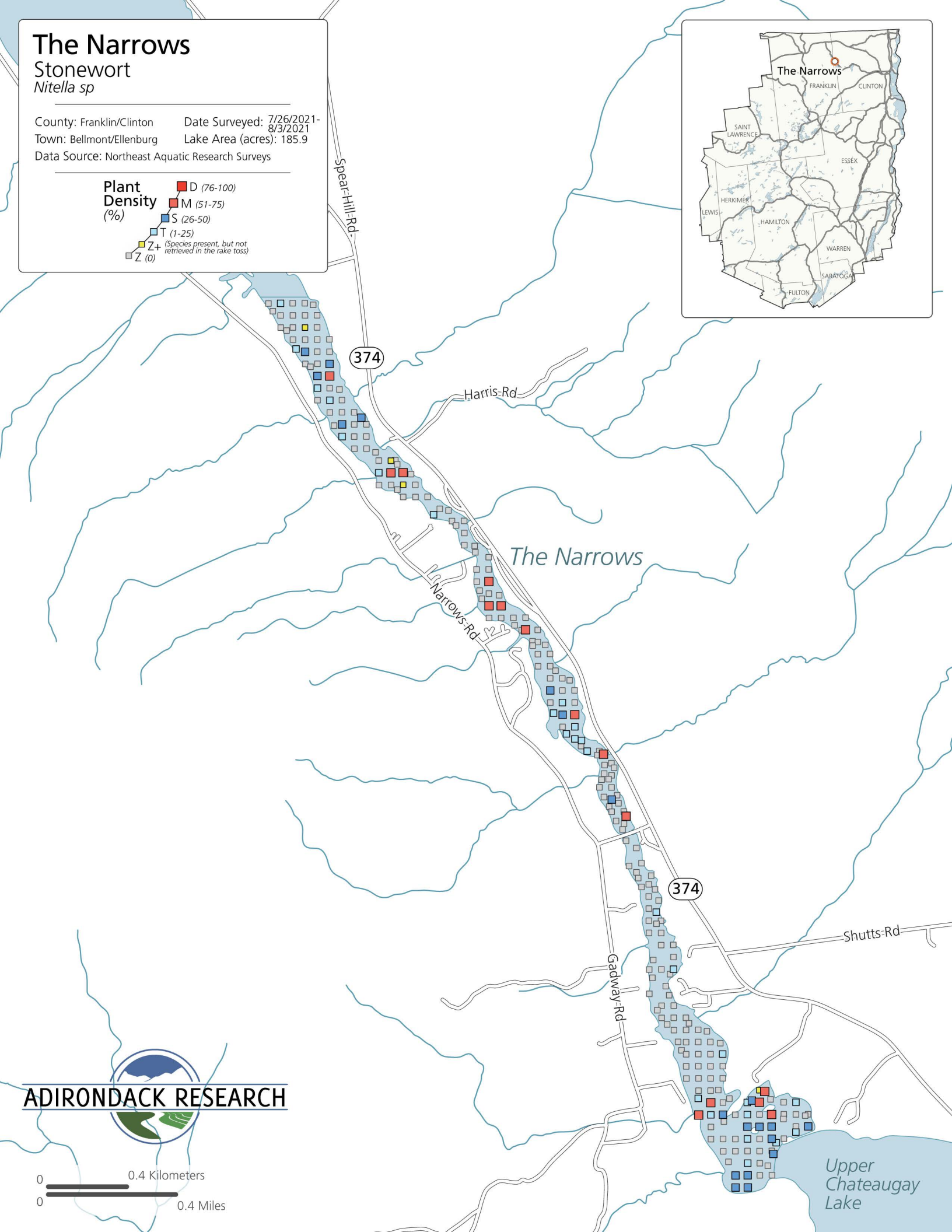
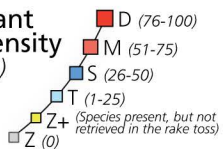
8/3/2021

Town: Belmont/Ellenburg

Lake Area (acres): 185.9

Data Source: Northeast Aquatic Research Surveys

### Plant Density (%)



ADIRONDACK RESEARCH



0 0.4 Kilometers  
0 0.4 Miles

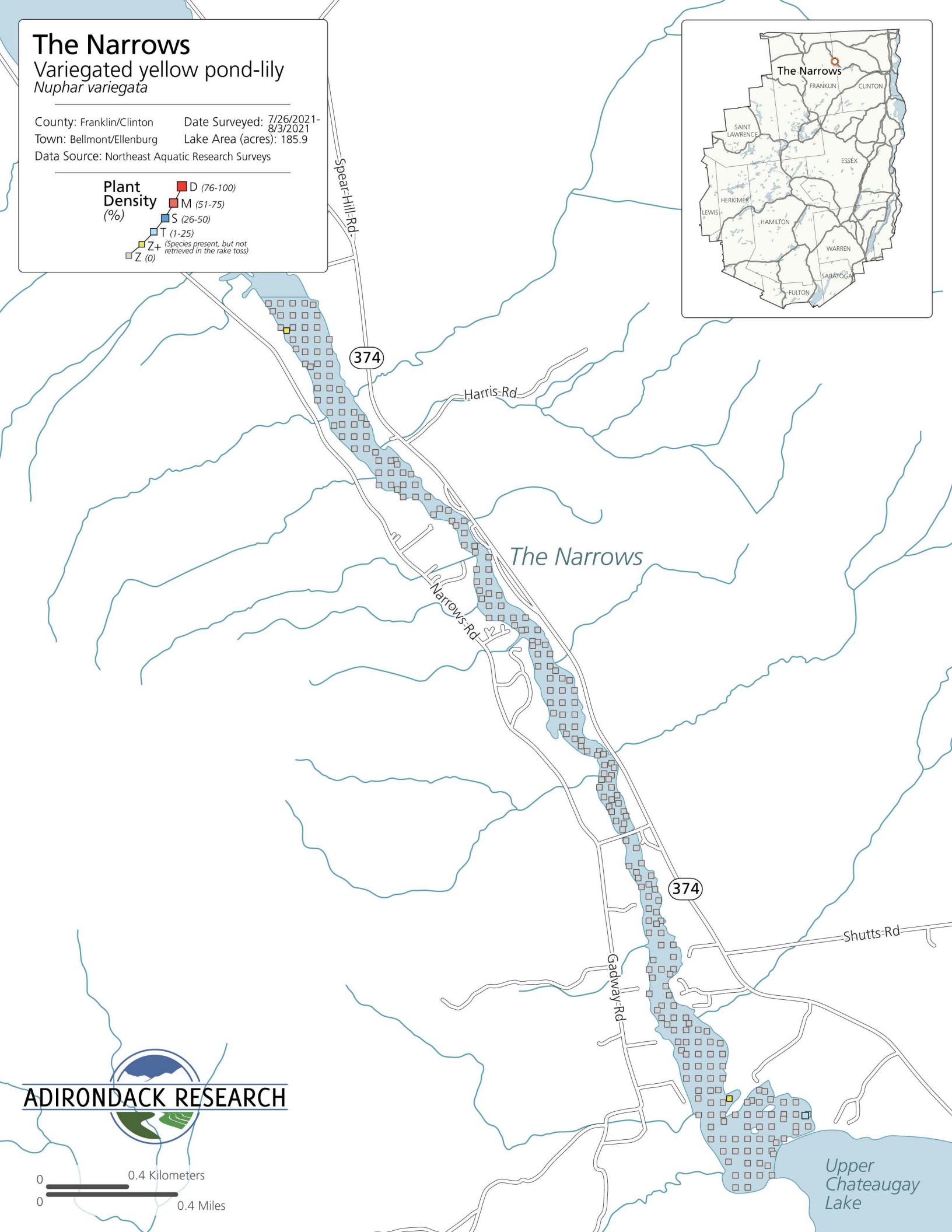
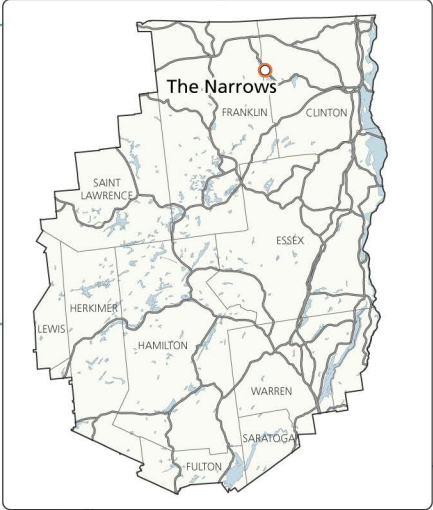
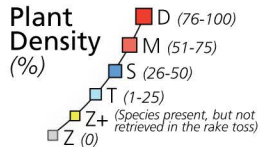
Upper Chateaugay Lake



# The Narrows

Variegated yellow pond-lily  
*Nuphar variegata*

County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys



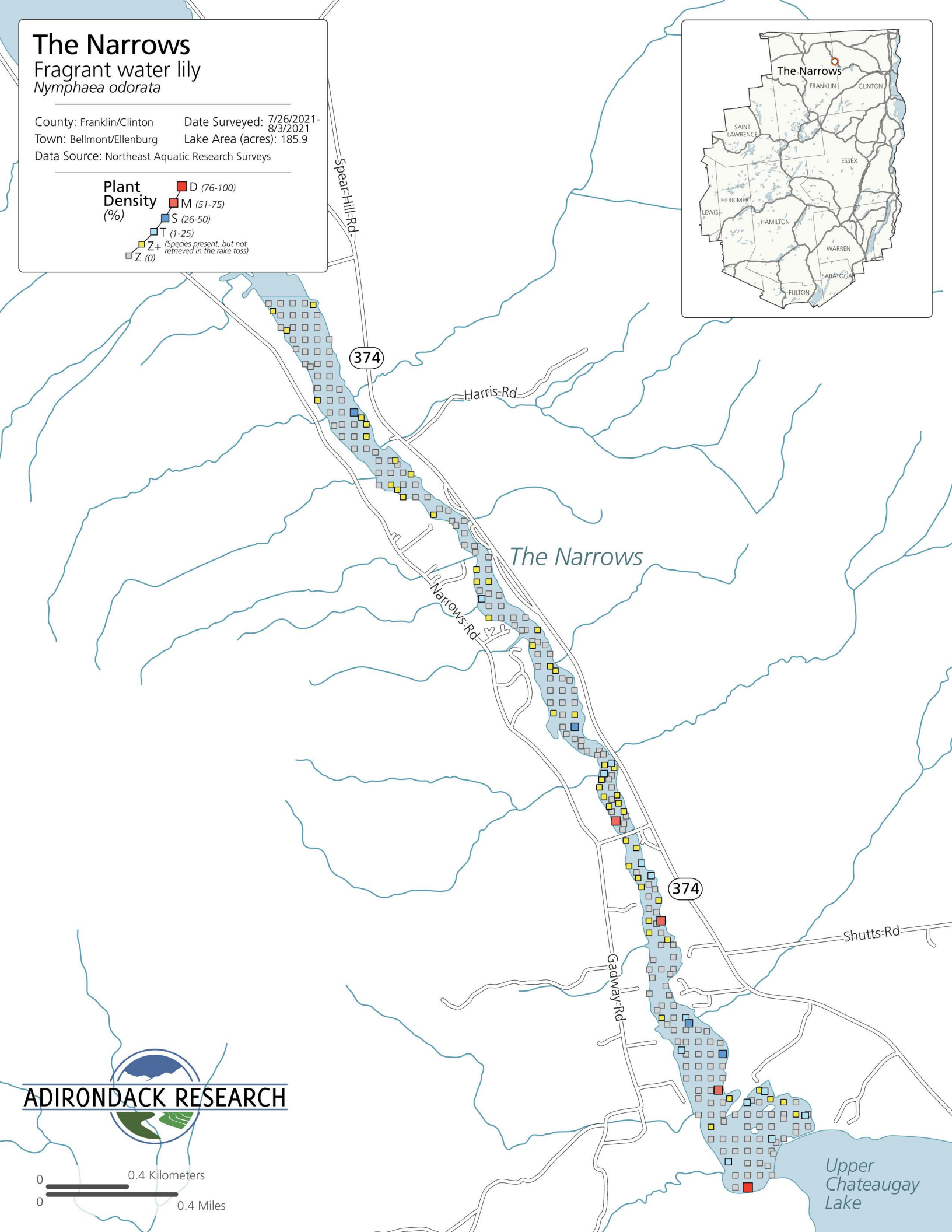
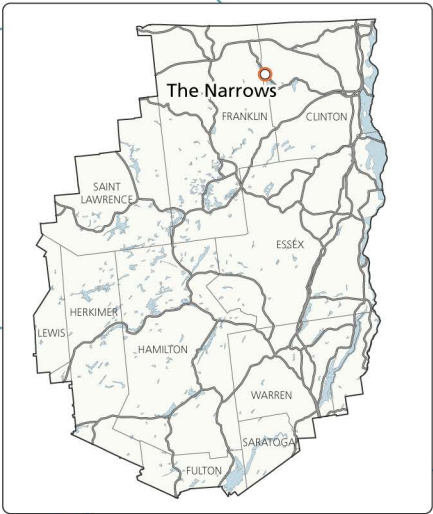
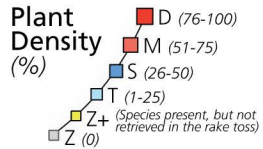


# The Narrows

## Fragrant water lily

### *Nymphaea odorata*

County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
 Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
 Data Source: Northeast Aquatic Research Surveys





# The Narrows

Amphibious bistort / Smartweed  
*Persicaria amphibia*

County: Franklin/Clinton

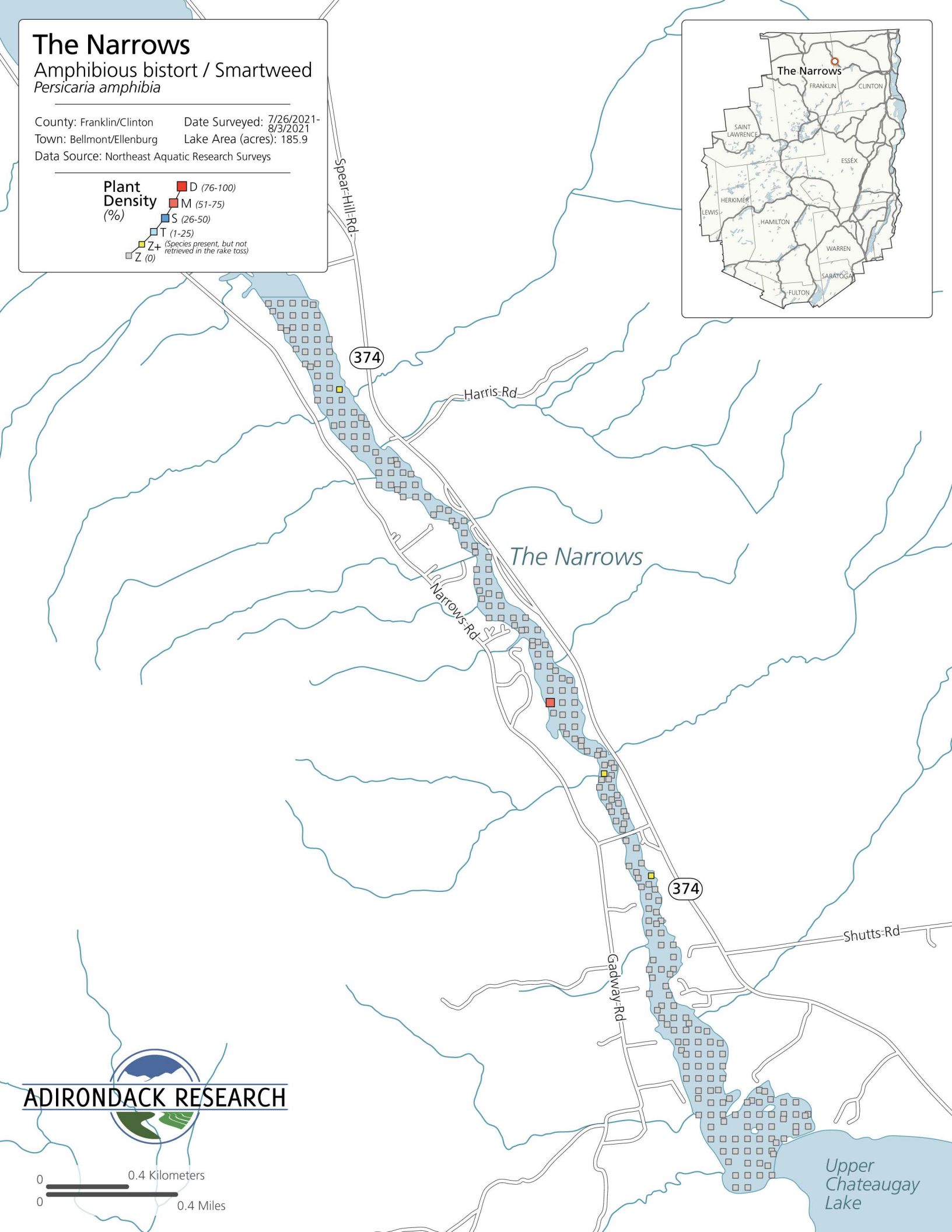
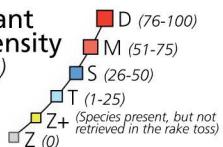
Date Surveyed: 7/26/2021-8/3/2021

Town: Belmont/Ellenburg

Lake Area (acres): 185.9

Data Source: Northeast Aquatic Research Surveys

## Plant Density (%)



ADIRONDACK RESEARCH



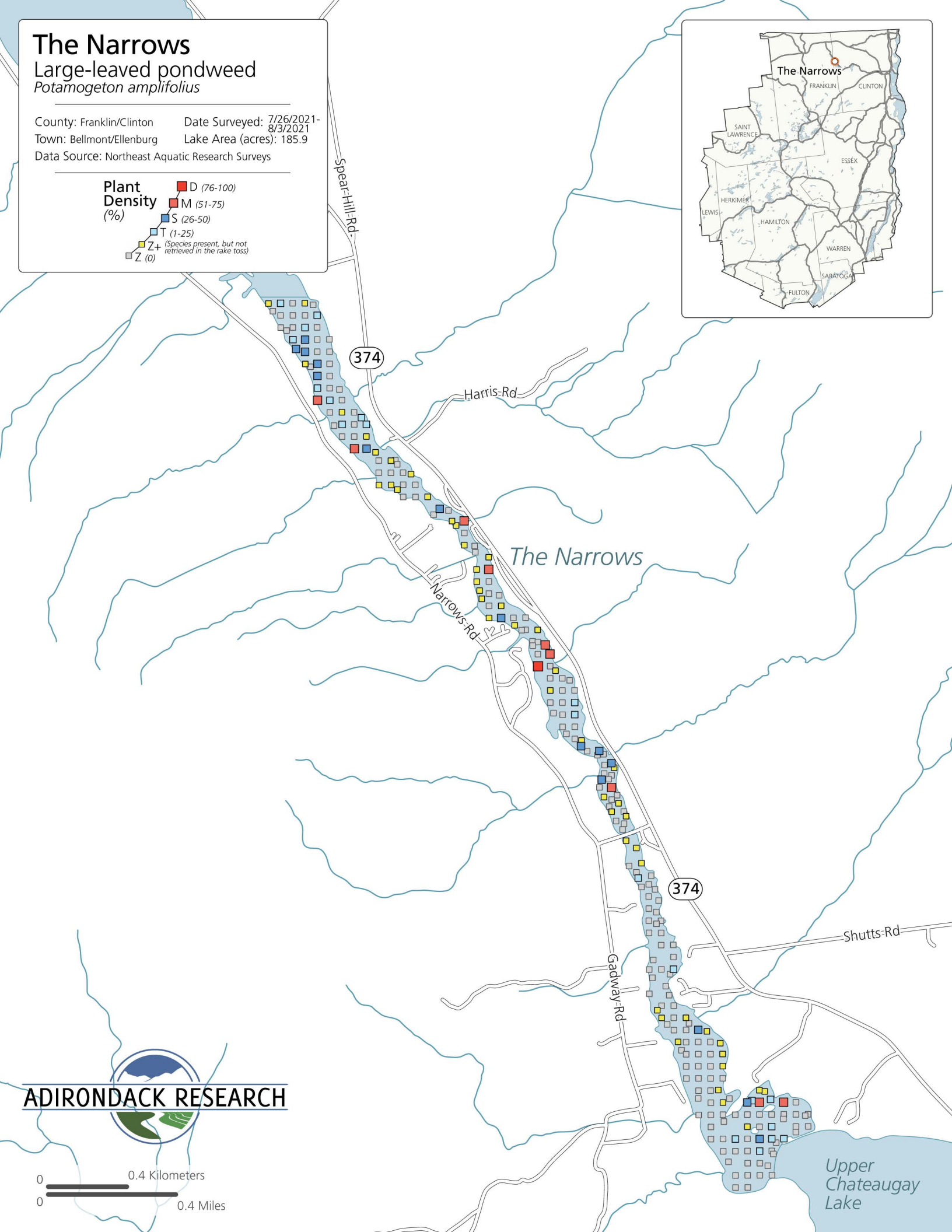
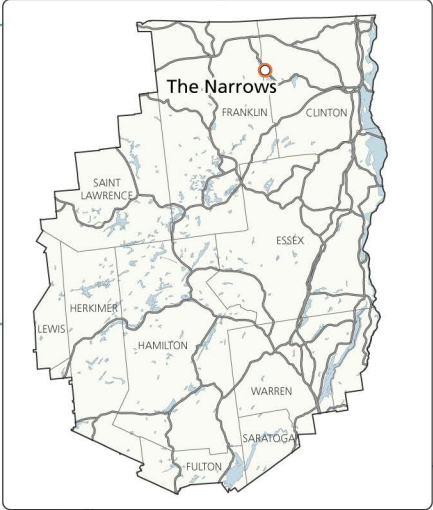
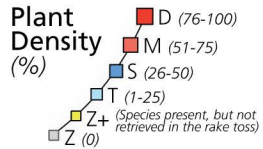


# The Narrows

## Large-leaved pondweed

*Potamogeton amplifolius*

County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys



ADIRONDACK RESEARCH



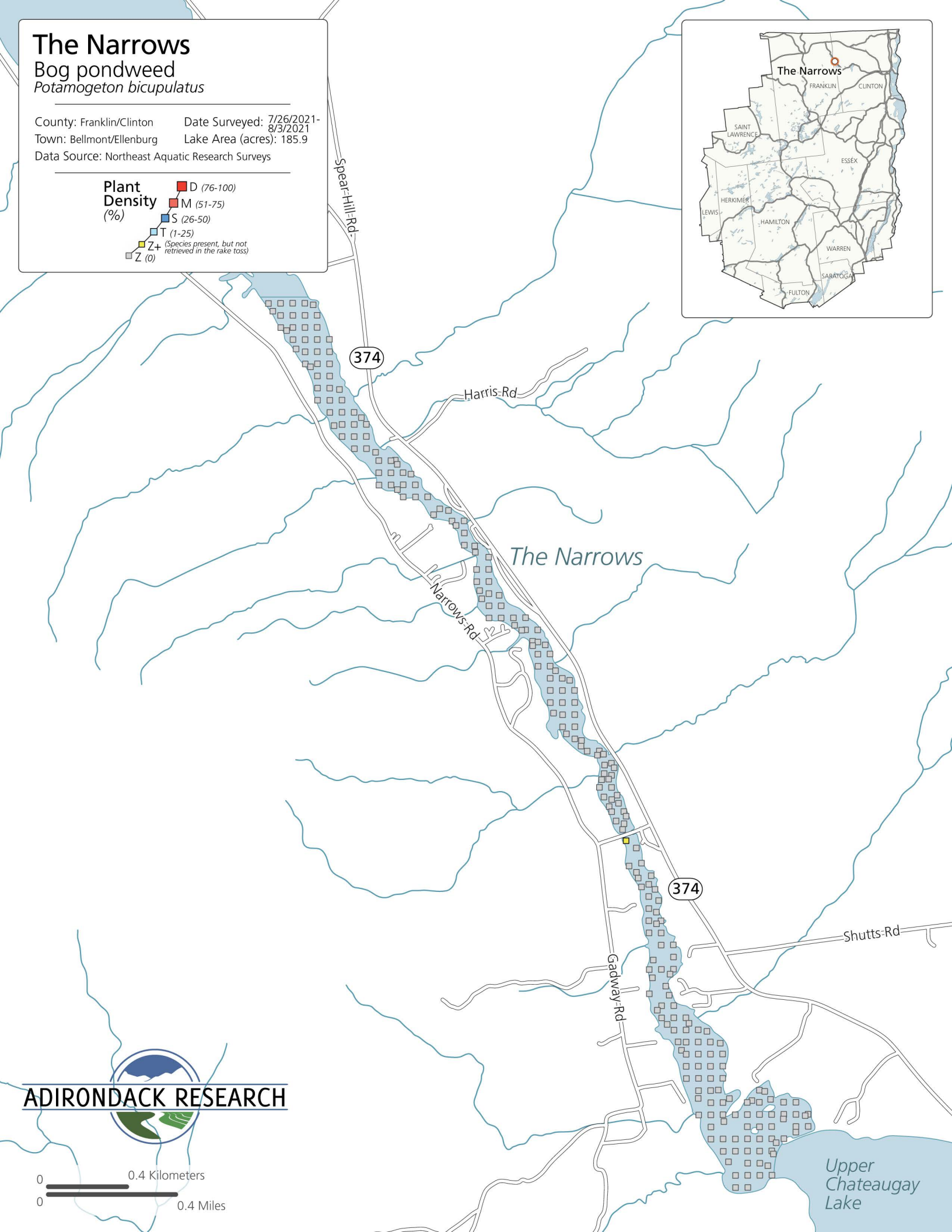
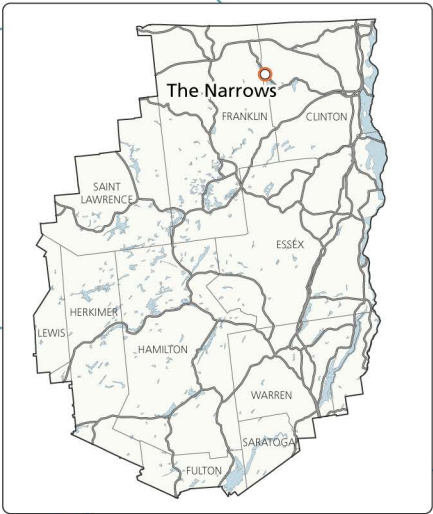
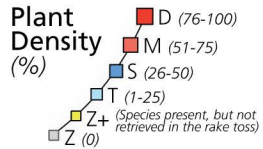


# The Narrows

## Bog pondweed

*Potamogeton bicupulatus*

County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys





# The Narrows

Nuttall's pondweed /  
Ribbon-leaved pondweed  
*Potamogeton epihydrus*

County: Franklin/Clinton

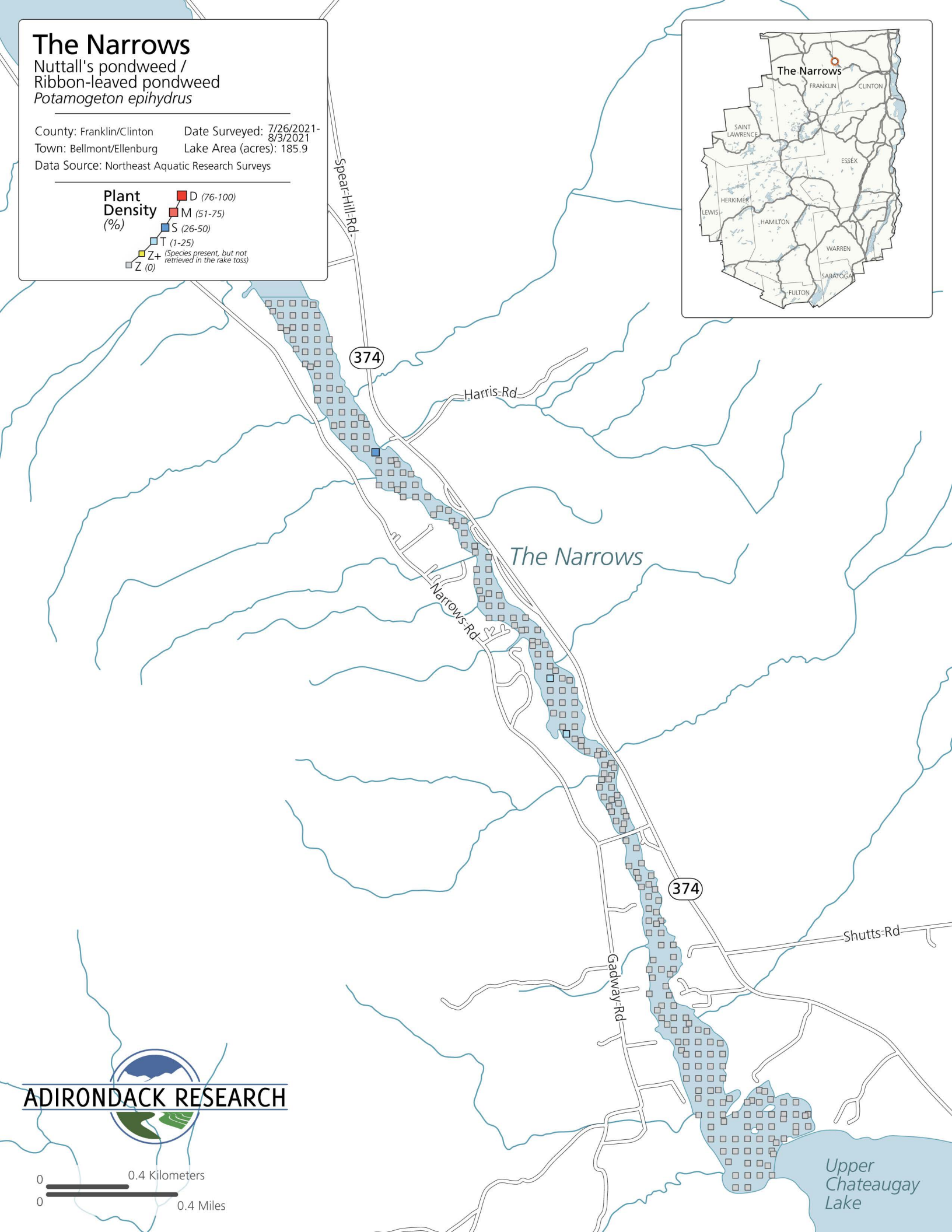
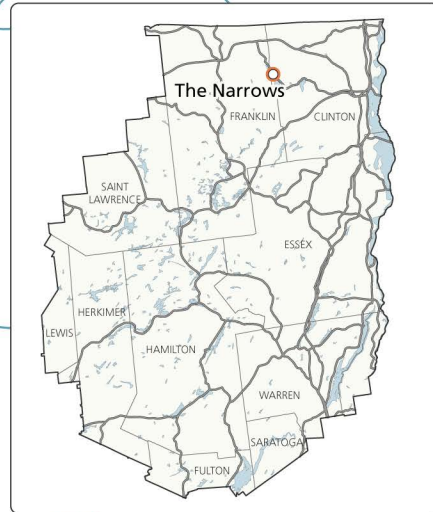
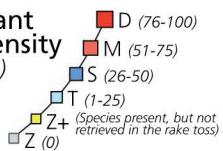
Date Surveyed: 7/26/2021-  
8/3/2021

Town: Belmont/Ellenburg

Lake Area (acres): 185.9

Data Source: Northeast Aquatic Research Surveys

## Plant Density (%)



ADIRONDACK RESEARCH



0 0.4 Kilometers  
0 0.4 Miles

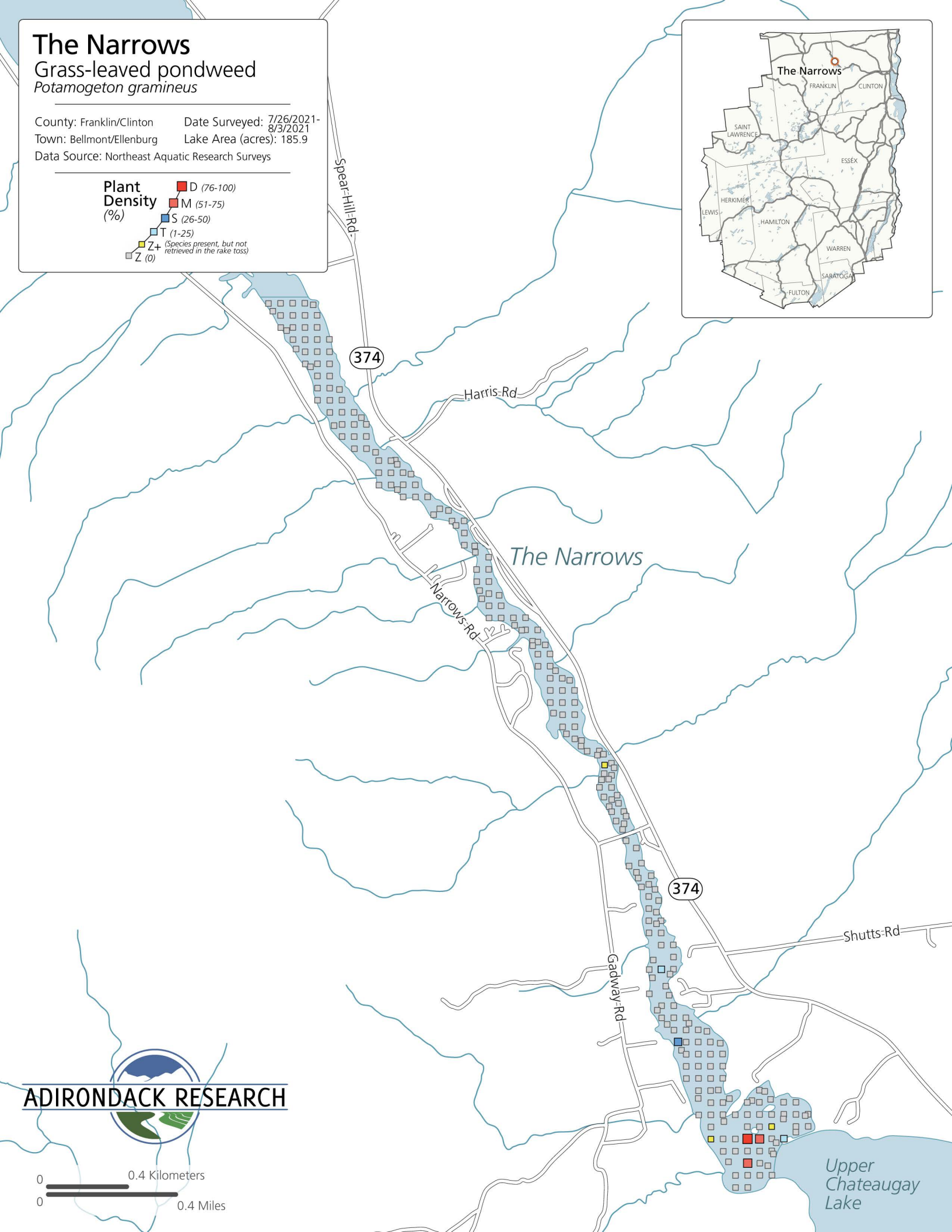
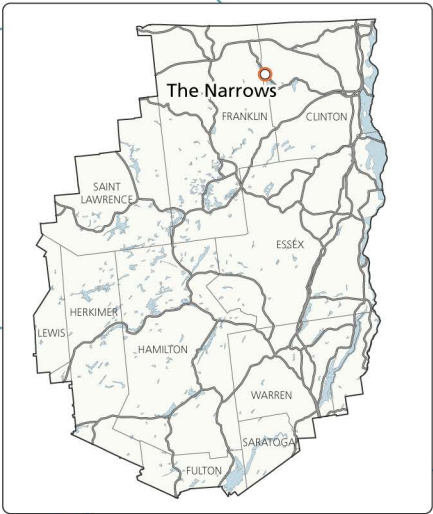
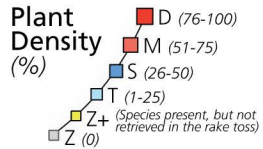


# The Narrows

## Grass-leaved pondweed

*Potamogeton gramineus*

County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys



ADIRONDACK RESEARCH



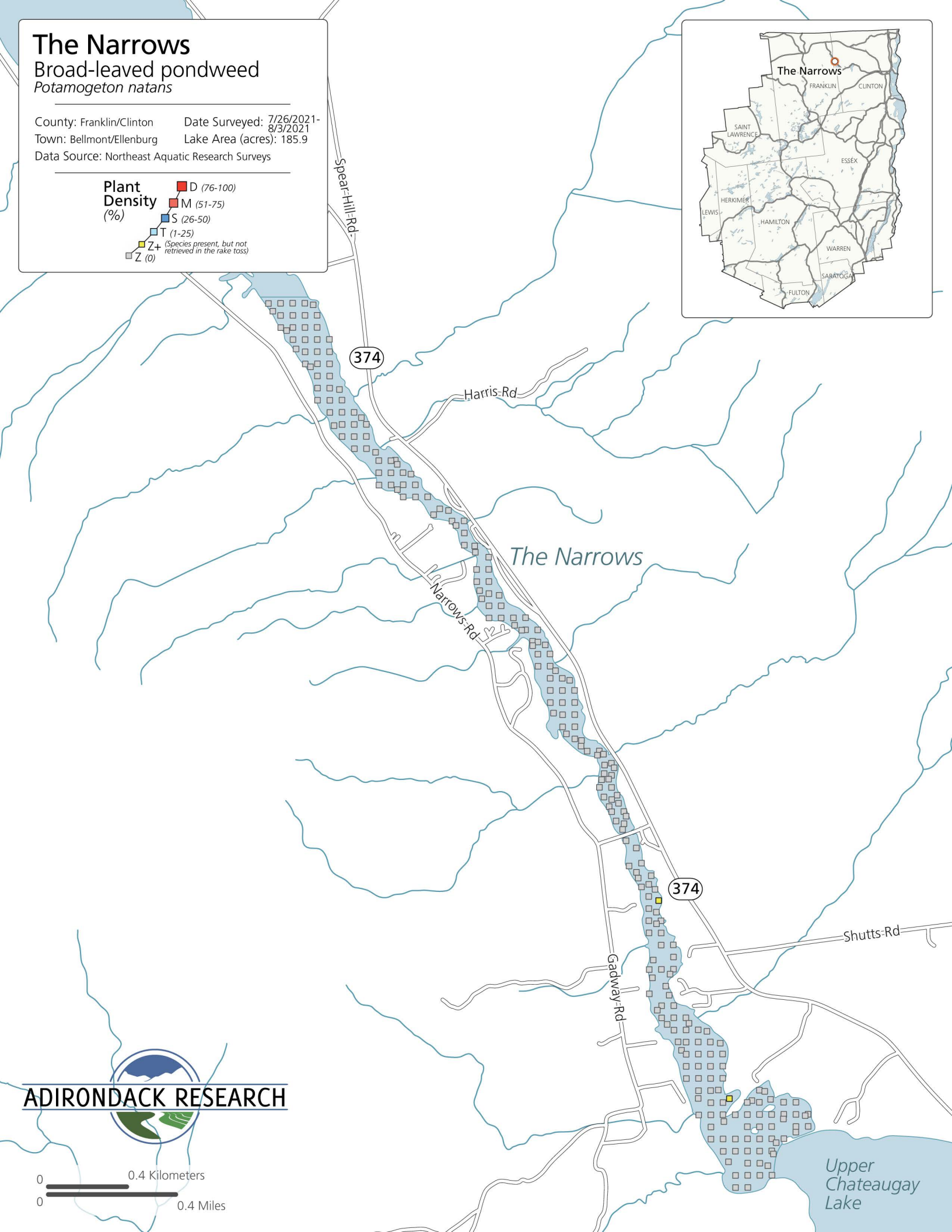
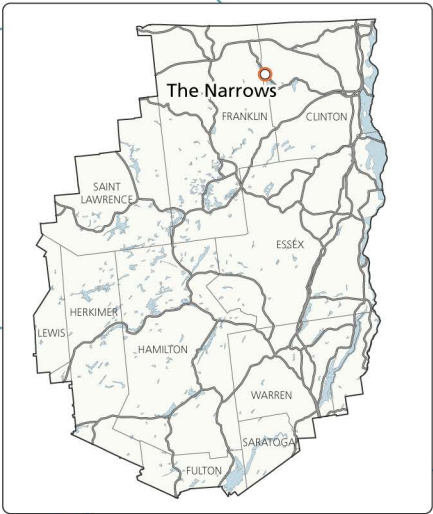
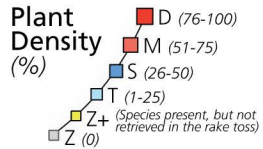


# The Narrows

## Broad-leaved pondweed

*Potamogeton natans*

County: Franklin/Clinton Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys

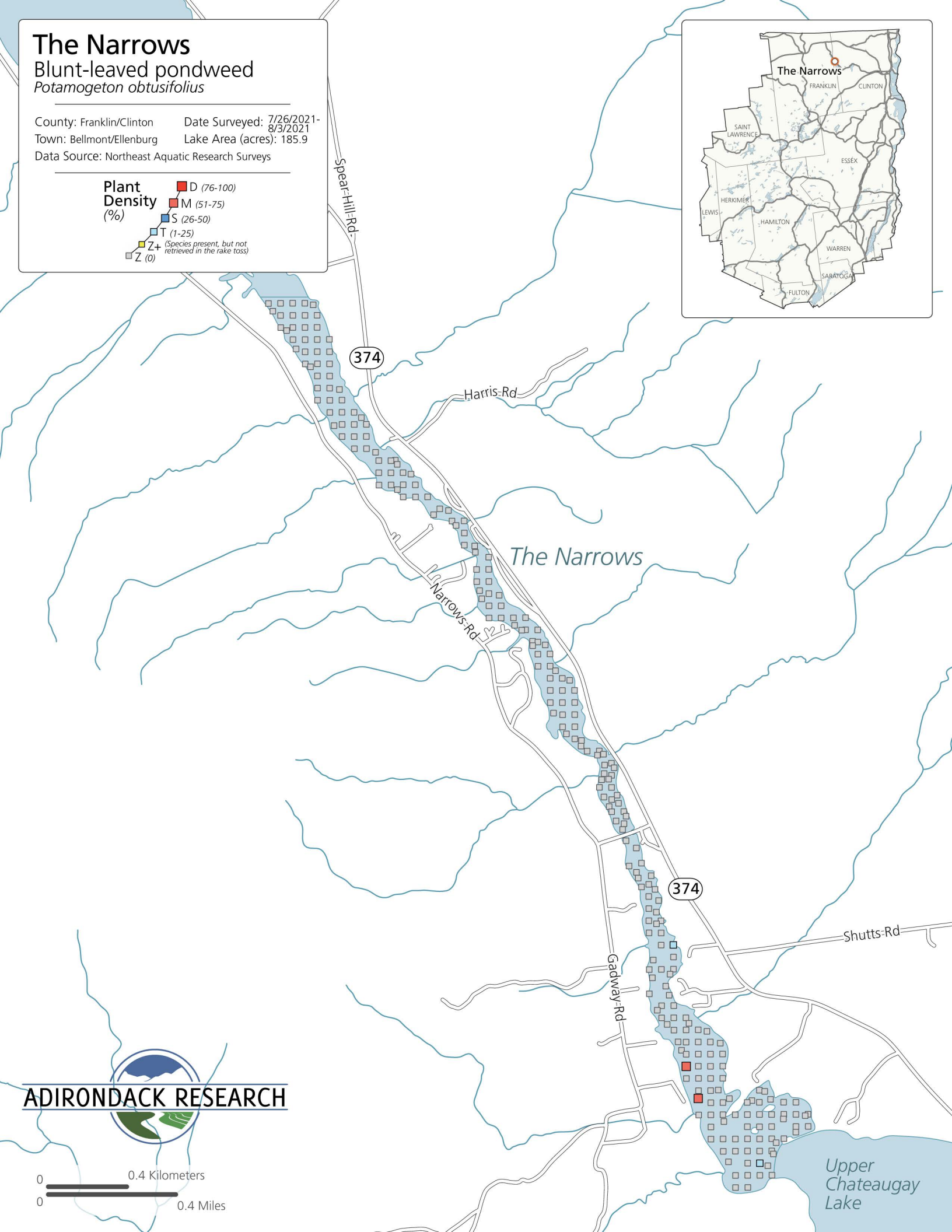
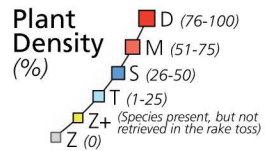




# The Narrows

Blunt-leaved pondweed  
*Potamogeton obtusifolius*

County: Franklin/Clinton Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys



# ADIRONDACK RESEARCH



Upper  
Chateaugay  
Lake

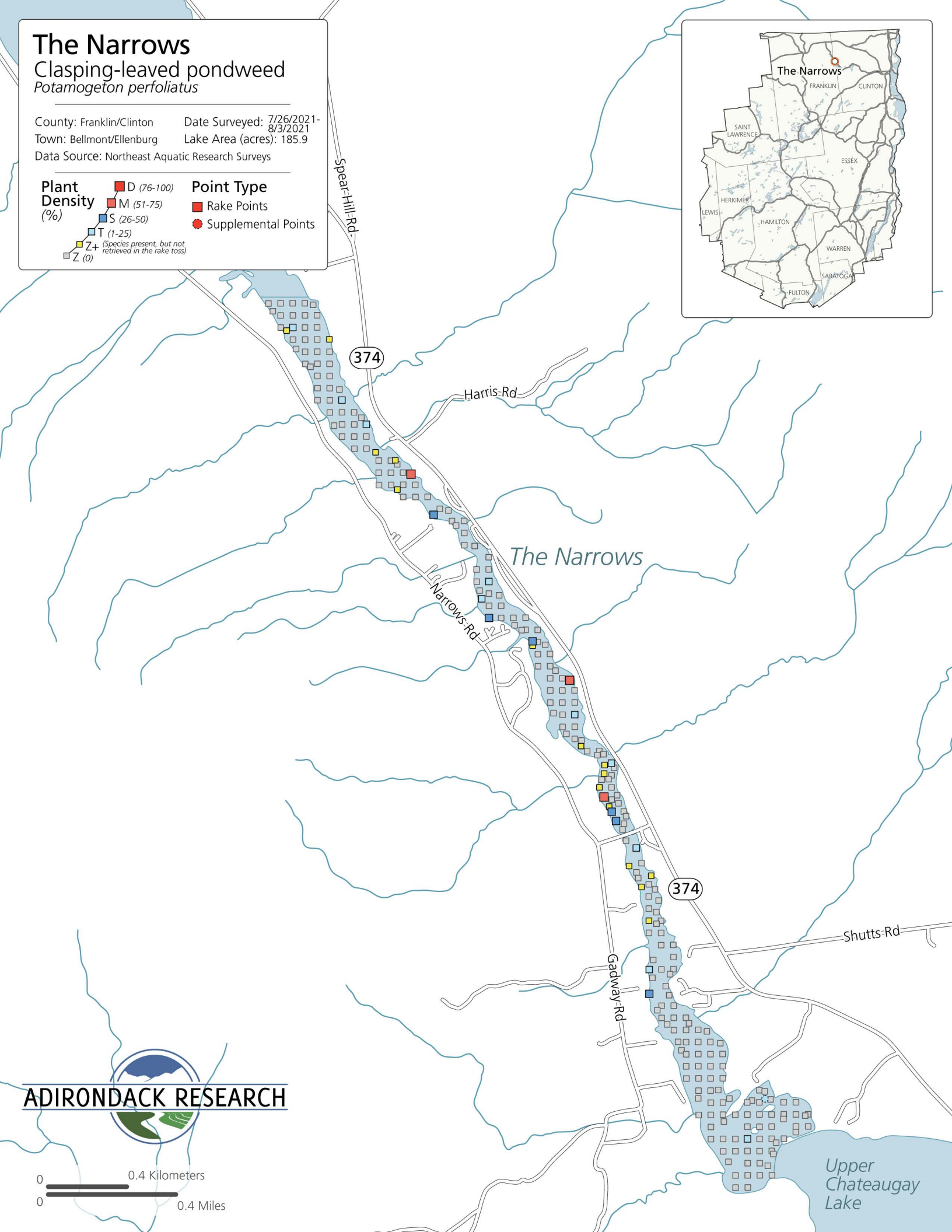
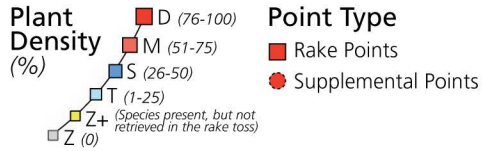


# The Narrows

## Clasping-leaved pondweed

*Potamogeton perfoliatus*

County: Franklin/Clinton Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys





# The Narrows

## Small pondweed

*Potamogeton pusillus*

County: Franklin/Clinton

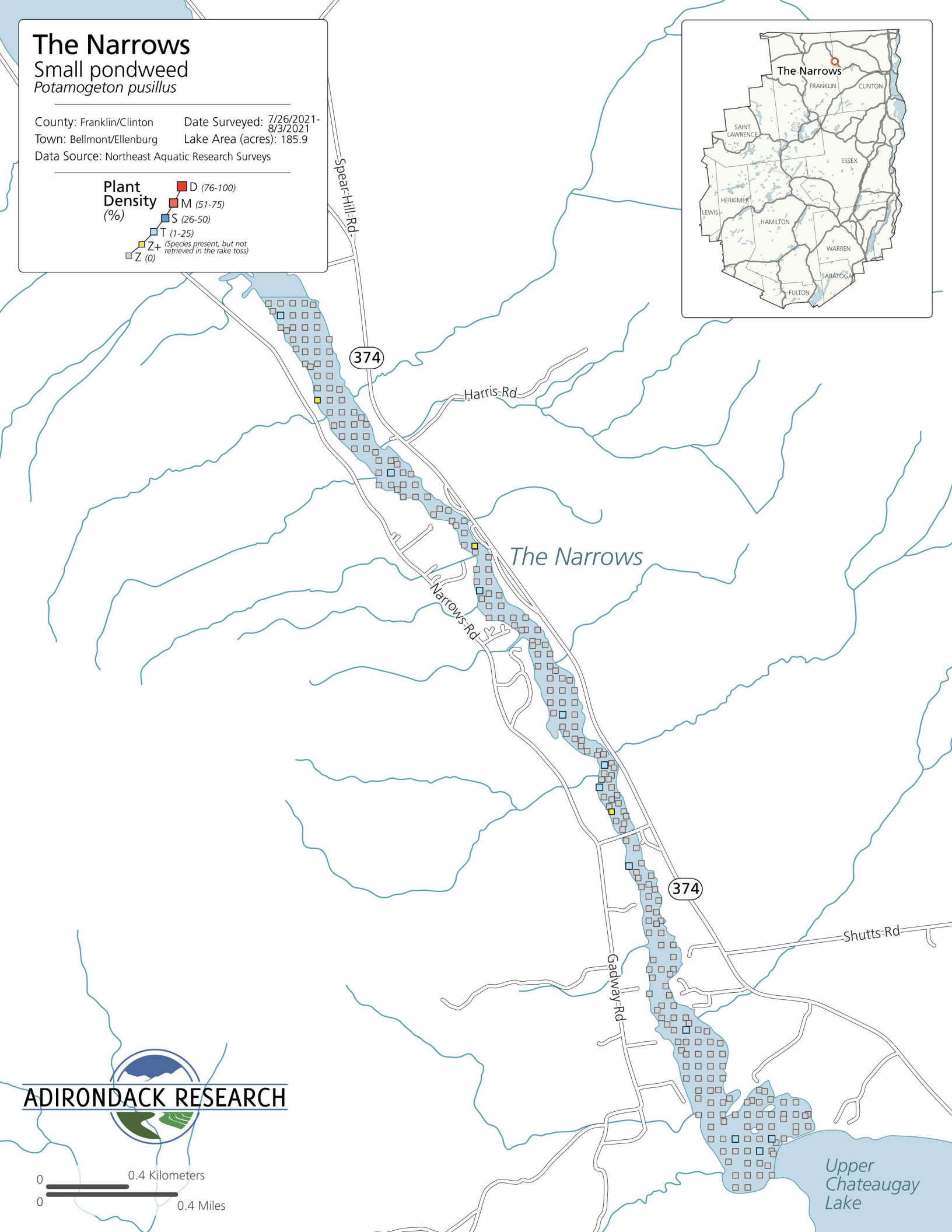
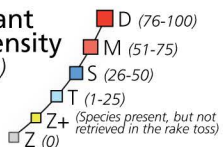
Date Surveyed: 7/26/2021-8/3/2021

Town: Belmont/Ellenburg

Lake Area (acres): 185.9

Data Source: Northeast Aquatic Research Surveys

### Plant Density (%)



ADIRONDACK RESEARCH



0 0.4 Kilometers  
0 0.4 Miles

Upper  
Chateaugay  
Lake

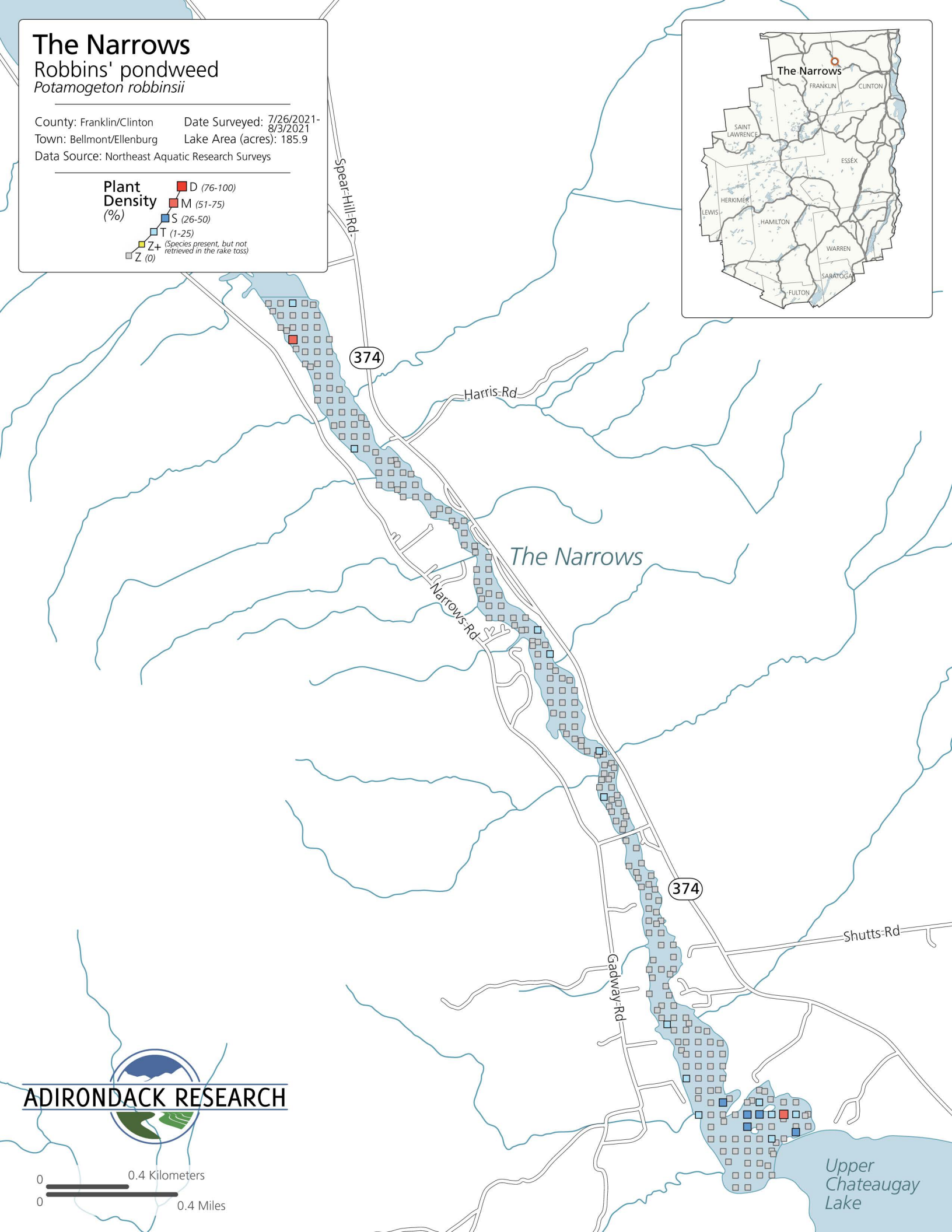
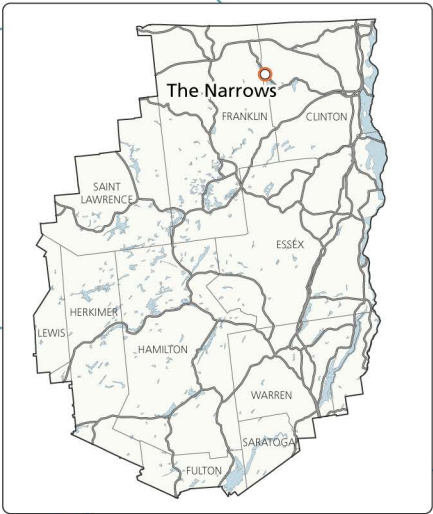
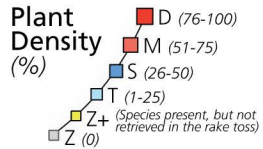


# The Narrows

## Robbins' pondweed

*Potamogeton robbinsii*

County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys





# The Narrows

Coiled pondweed / Spiral pondweed  
*Potamogeton spirillus*

County: Franklin/Clinton

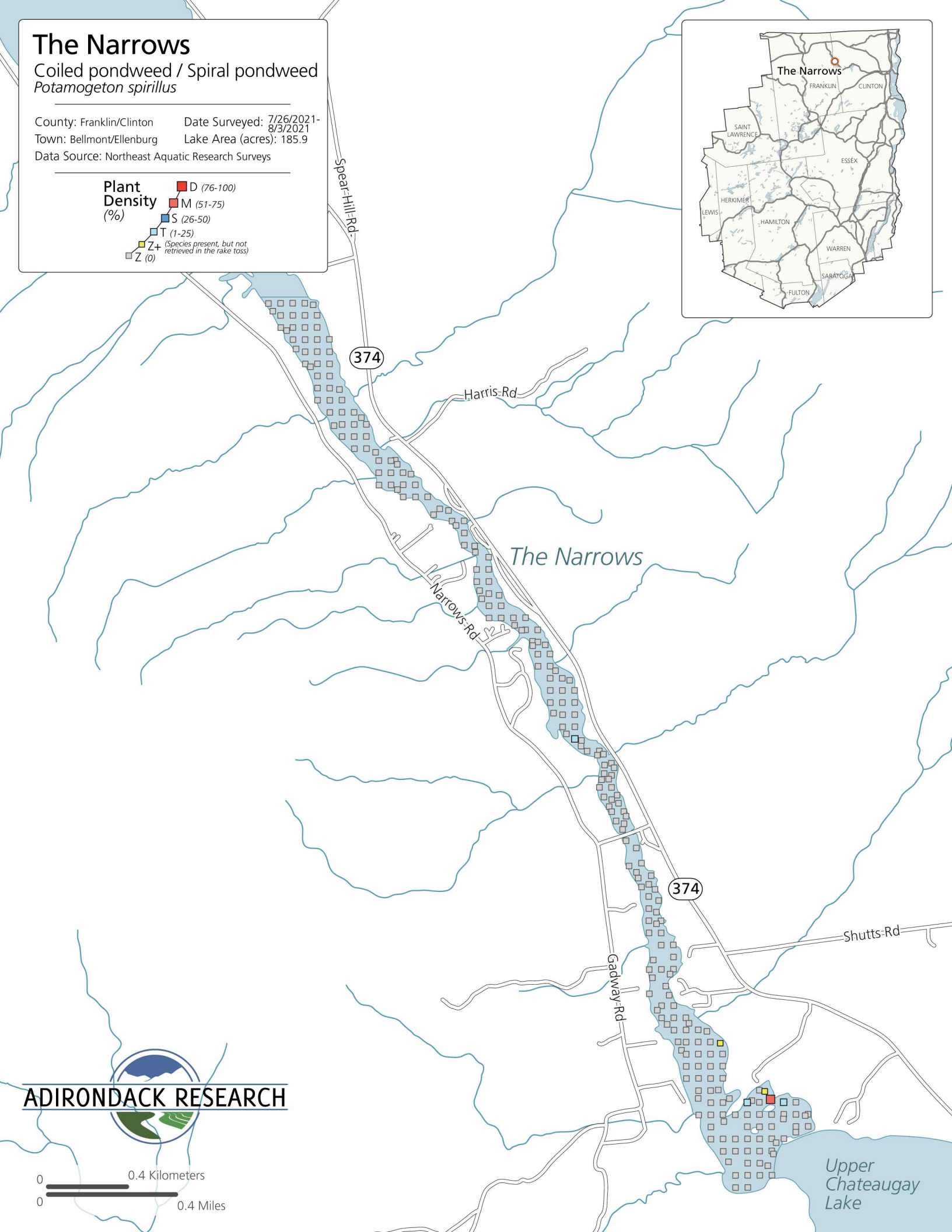
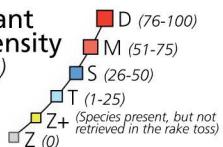
Date Surveyed: 7/26/2021-8/3/2021

Town: Belmont/Ellenburg

Lake Area (acres): 185.9

Data Source: Northeast Aquatic Research Surveys

## Plant Density (%)



ADIRONDACK RESEARCH



0 0.4 Kilometers  
0 0.4 Miles

Upper Chateaugay Lake

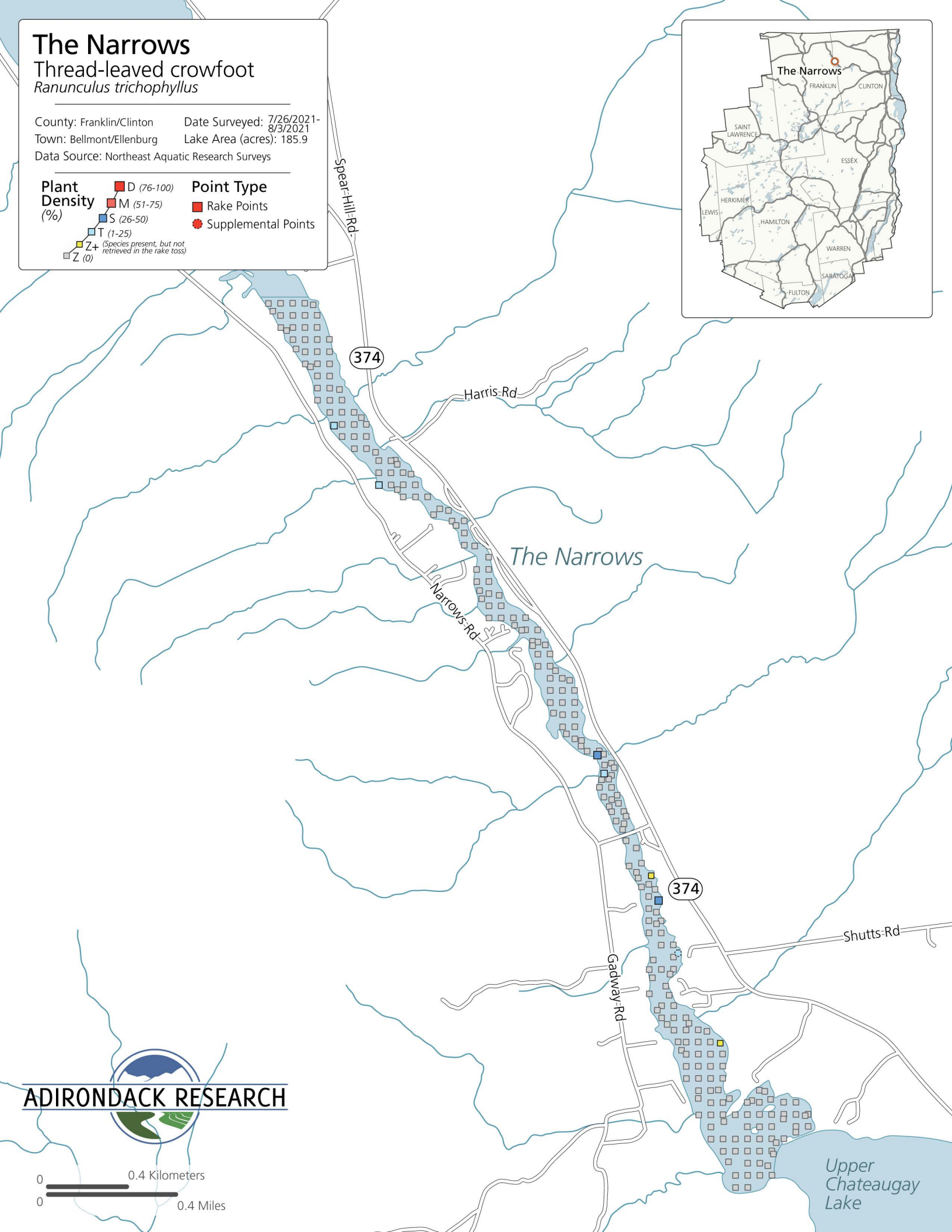
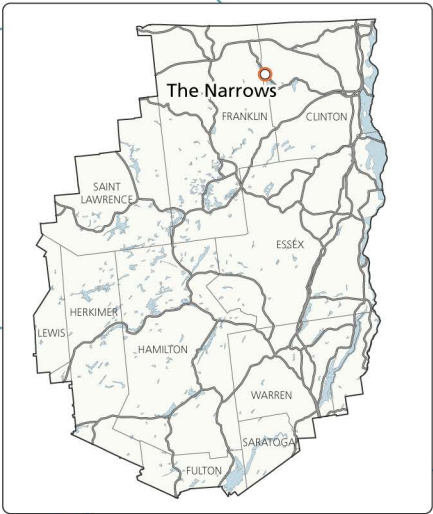
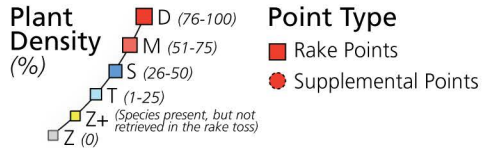


# The Narrows

## Thread-leaved crowfoot

*Ranunculus trichophyllus*

County: Franklin/Clinton Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys



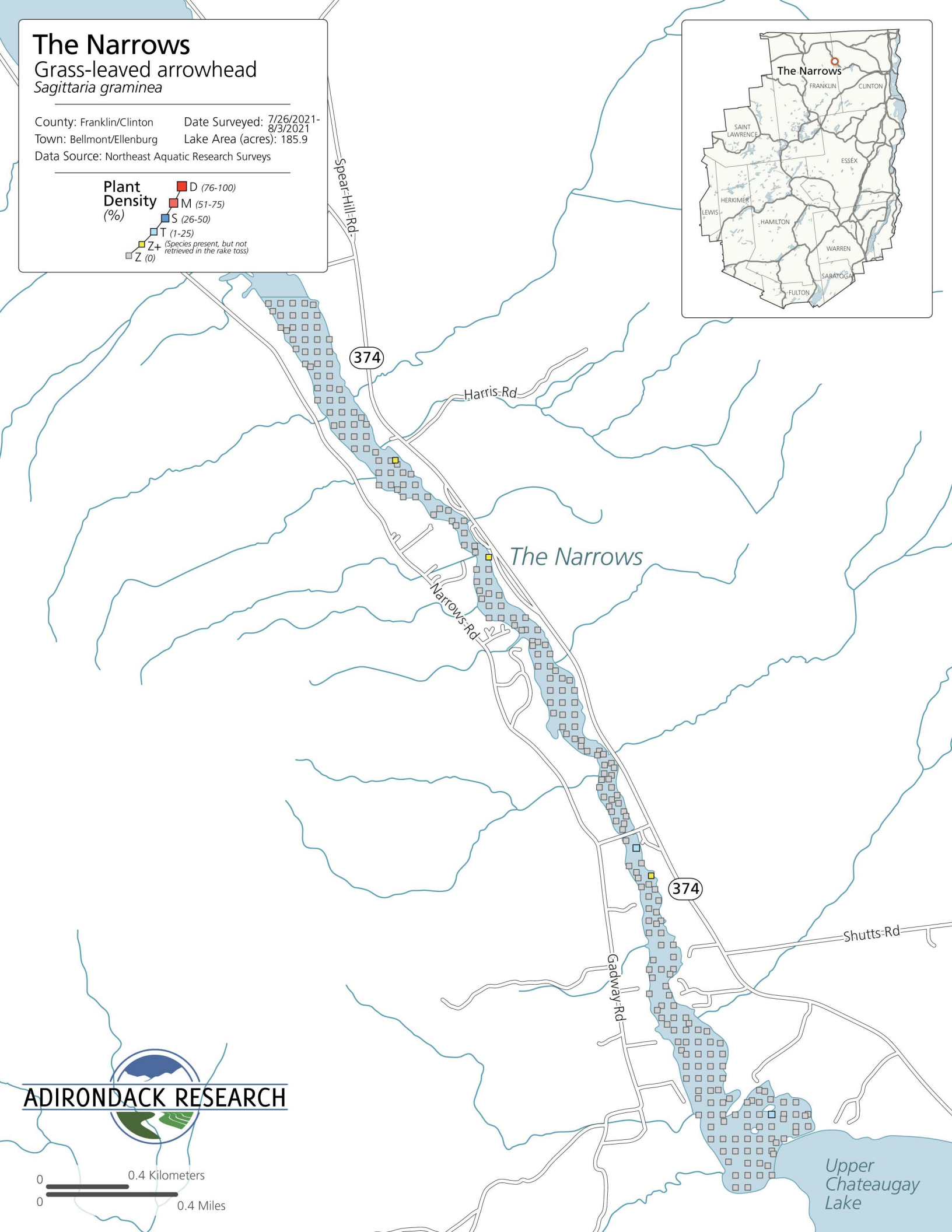
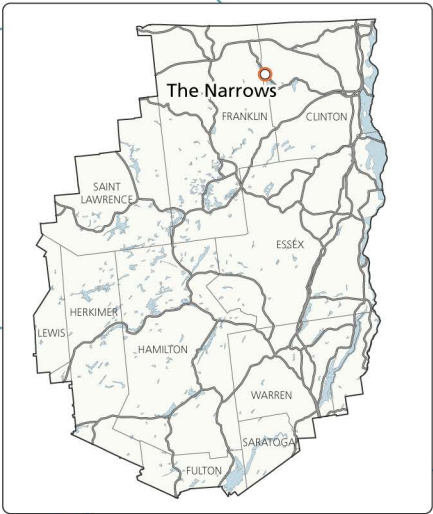
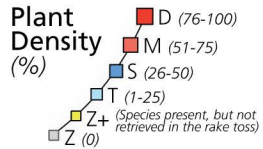


# The Narrows

## Grass-leaved arrowhead

*Sagittaria graminea*

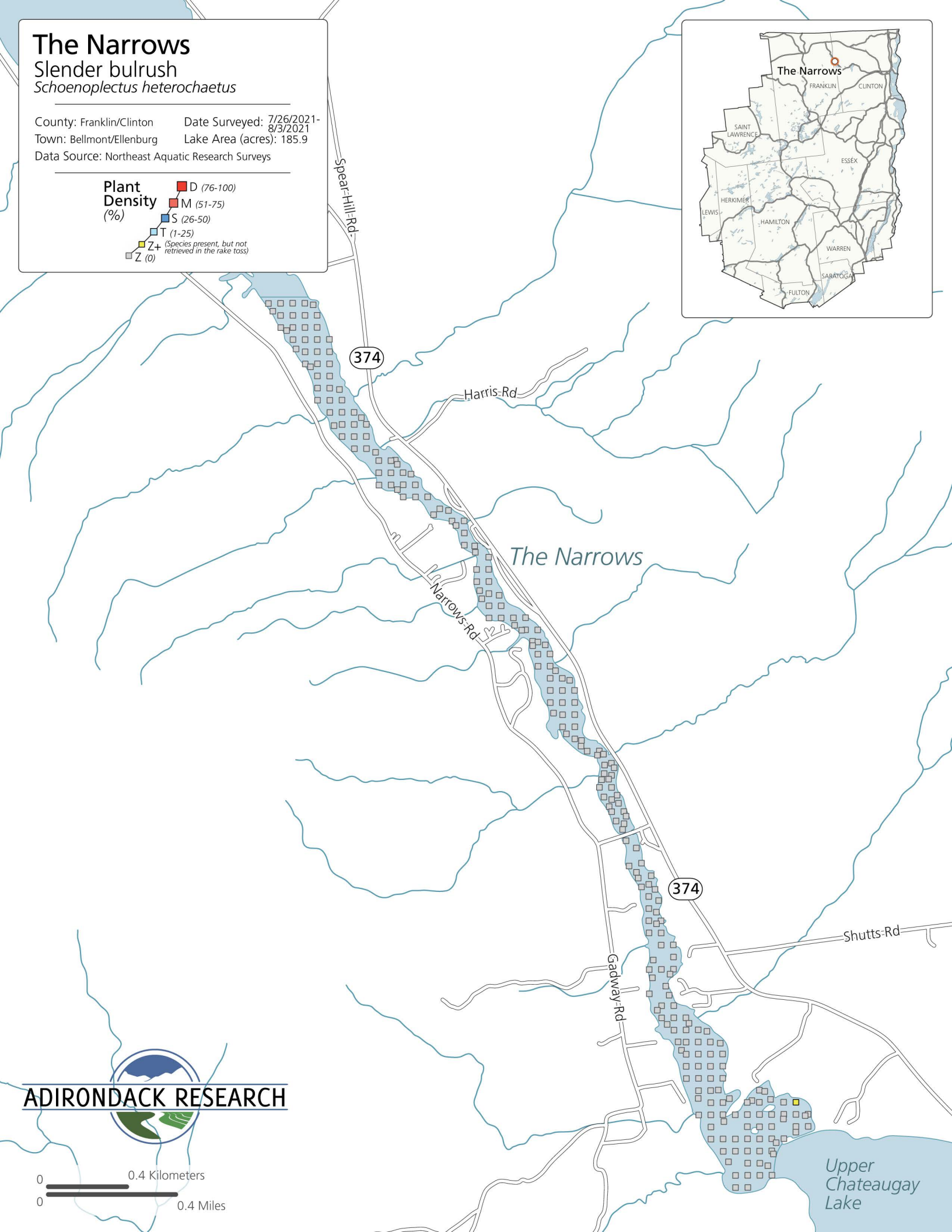
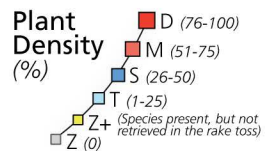
County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys





Slender bulrush  
*Schoenoplectus heterochaetus*

County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys



ADIRONDACK RESEARCH

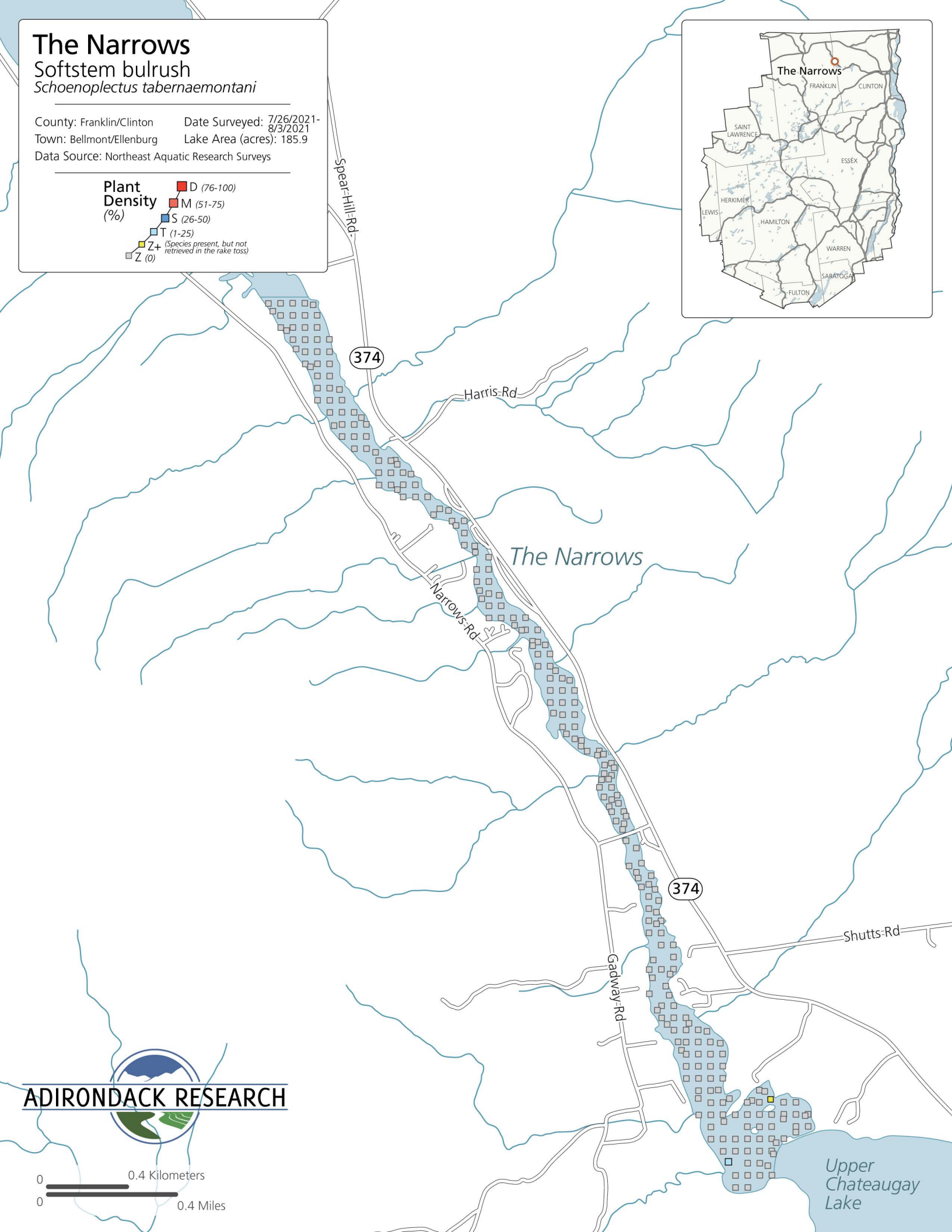
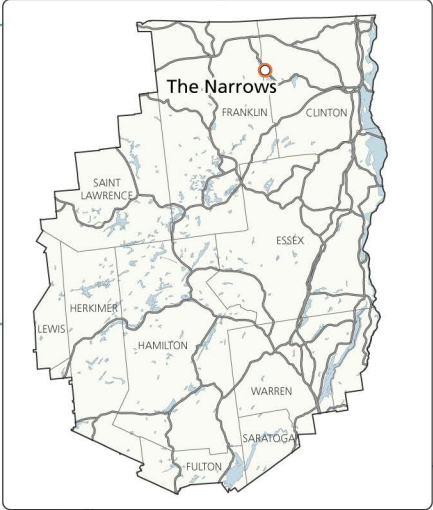
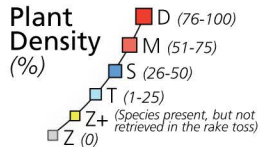




# The Narrows

Softstem bulrush  
*Schoenoplectus tabernaemontani*

County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys



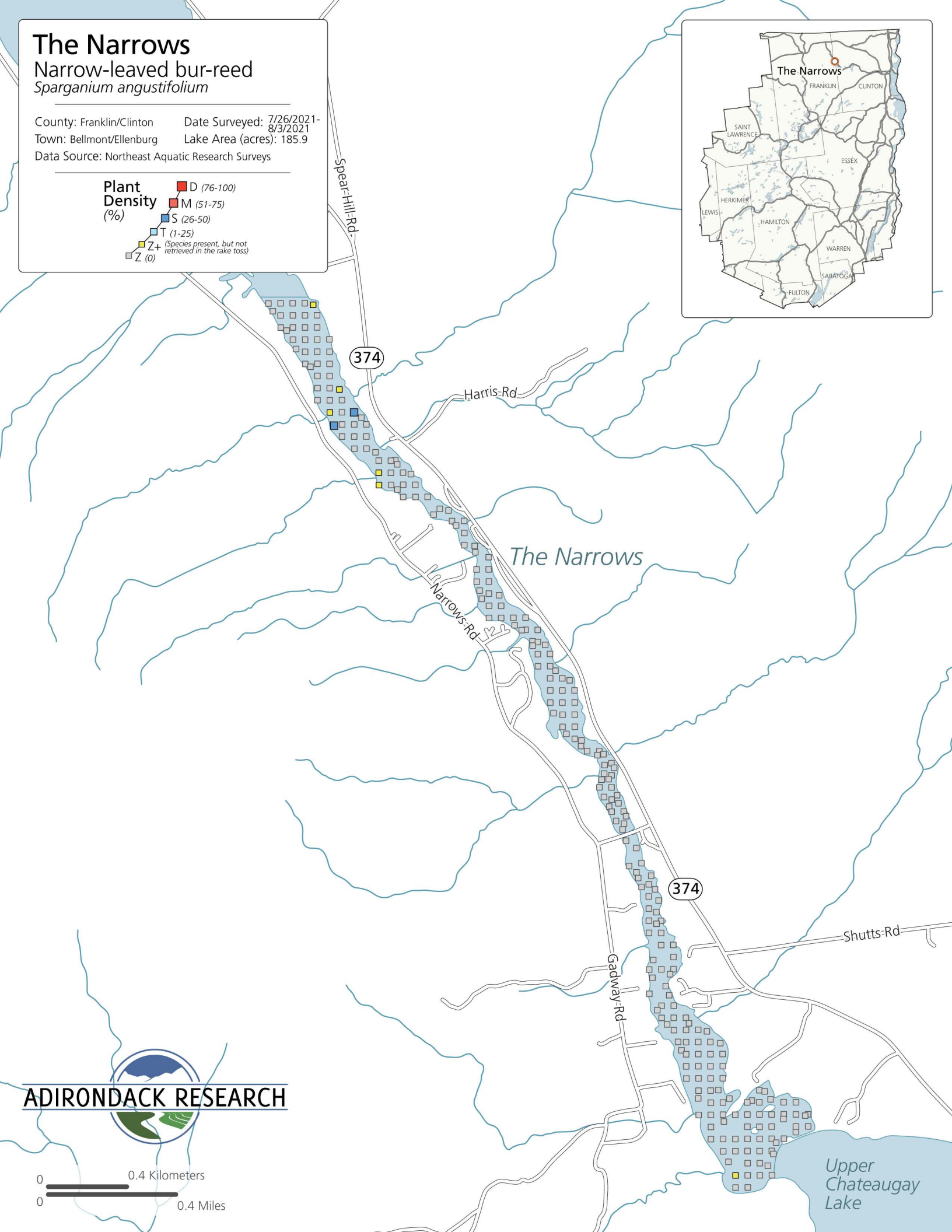
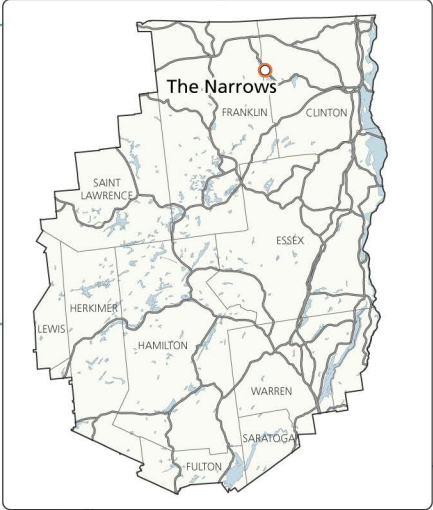
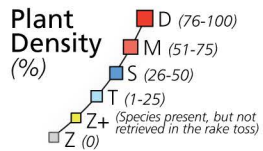


# The Narrows

## Narrow-leaved bur-reed

*Sparganium angustifolium*

County: Franklin/Clinton Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys



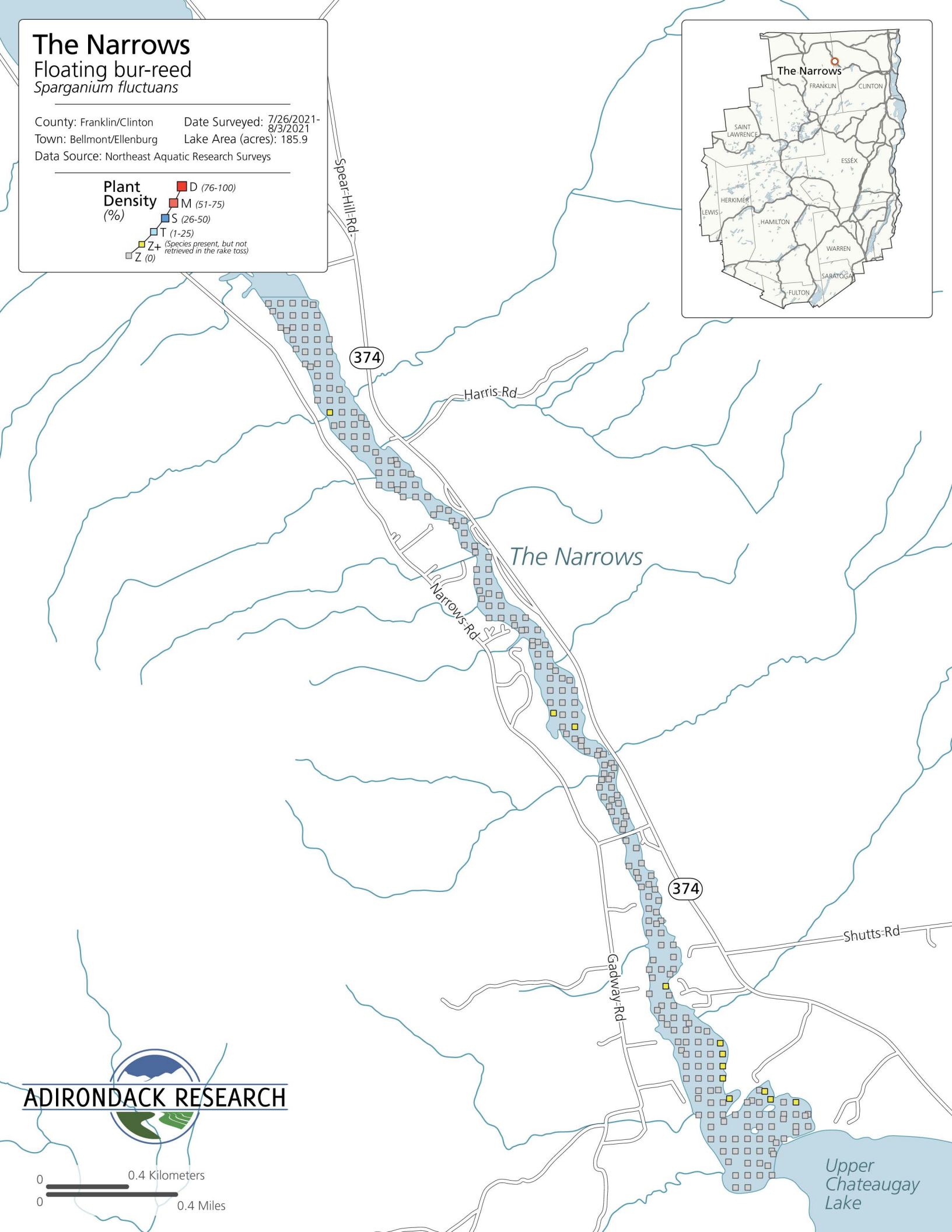
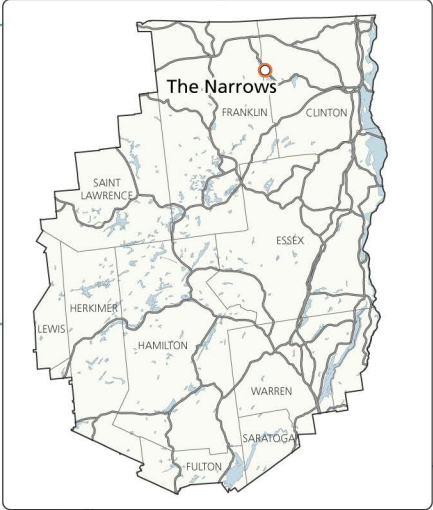
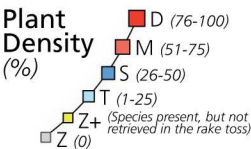


# The Narrows

## Floating bur-reed

*Sparganium fluctuans*

County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys





# The Narrows

## Greater duckweed

*Spirodela polyrhiza*

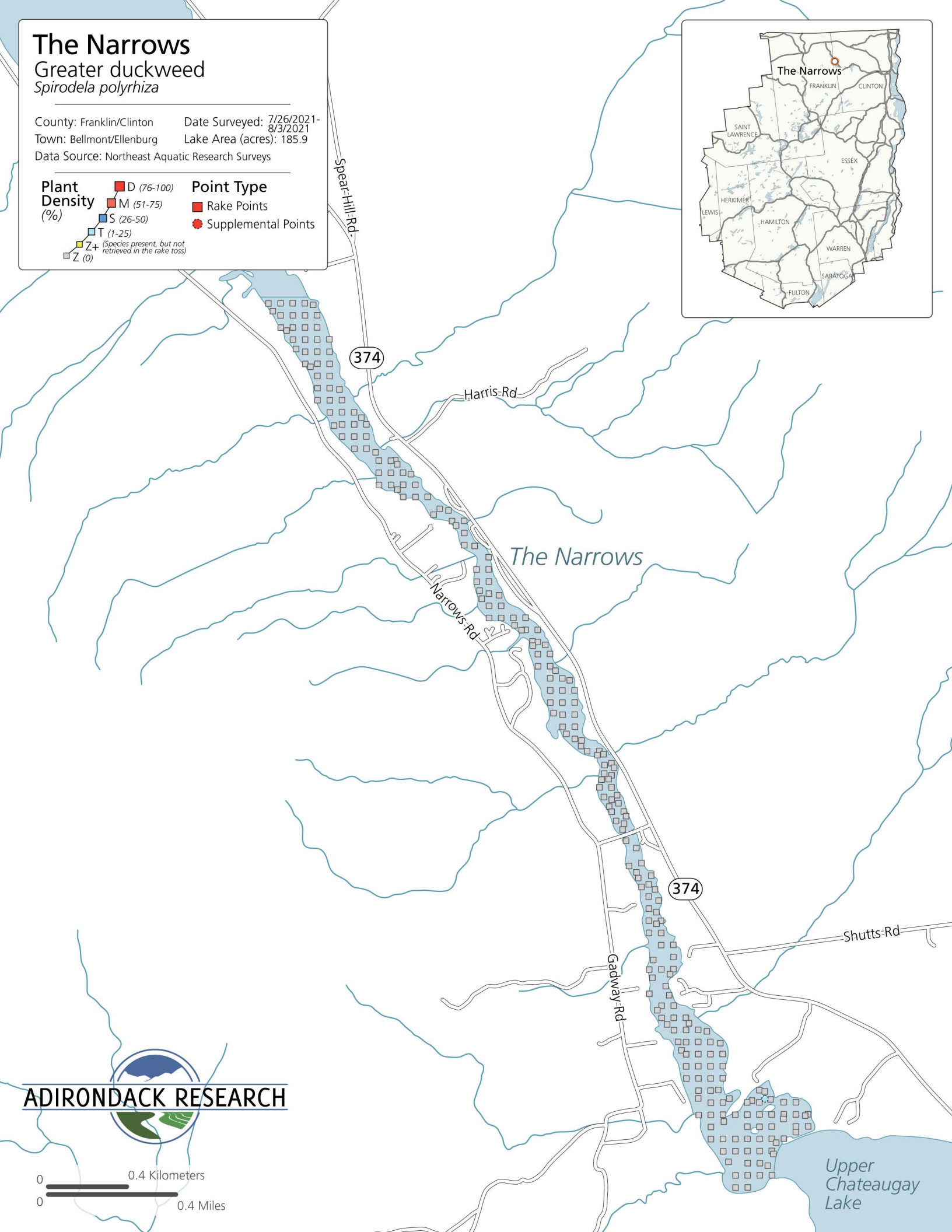
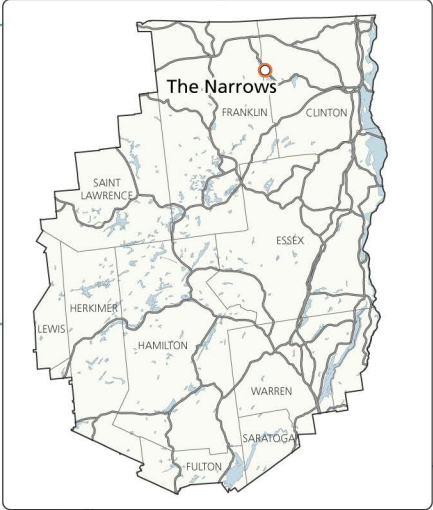
County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys

**Plant Density (%)**

- D (76-100)
- M (51-75)
- S (26-50)
- T (1-25)
- Z+ (Species present, but not retrieved in the rake toss)
- Z (0)

**Point Type**

- Rake Points
- Supplemental Points





# The Narrows

## Cattail

*Typha sp*

County: Franklin/Clinton

Date Surveyed: 7/26/2021-

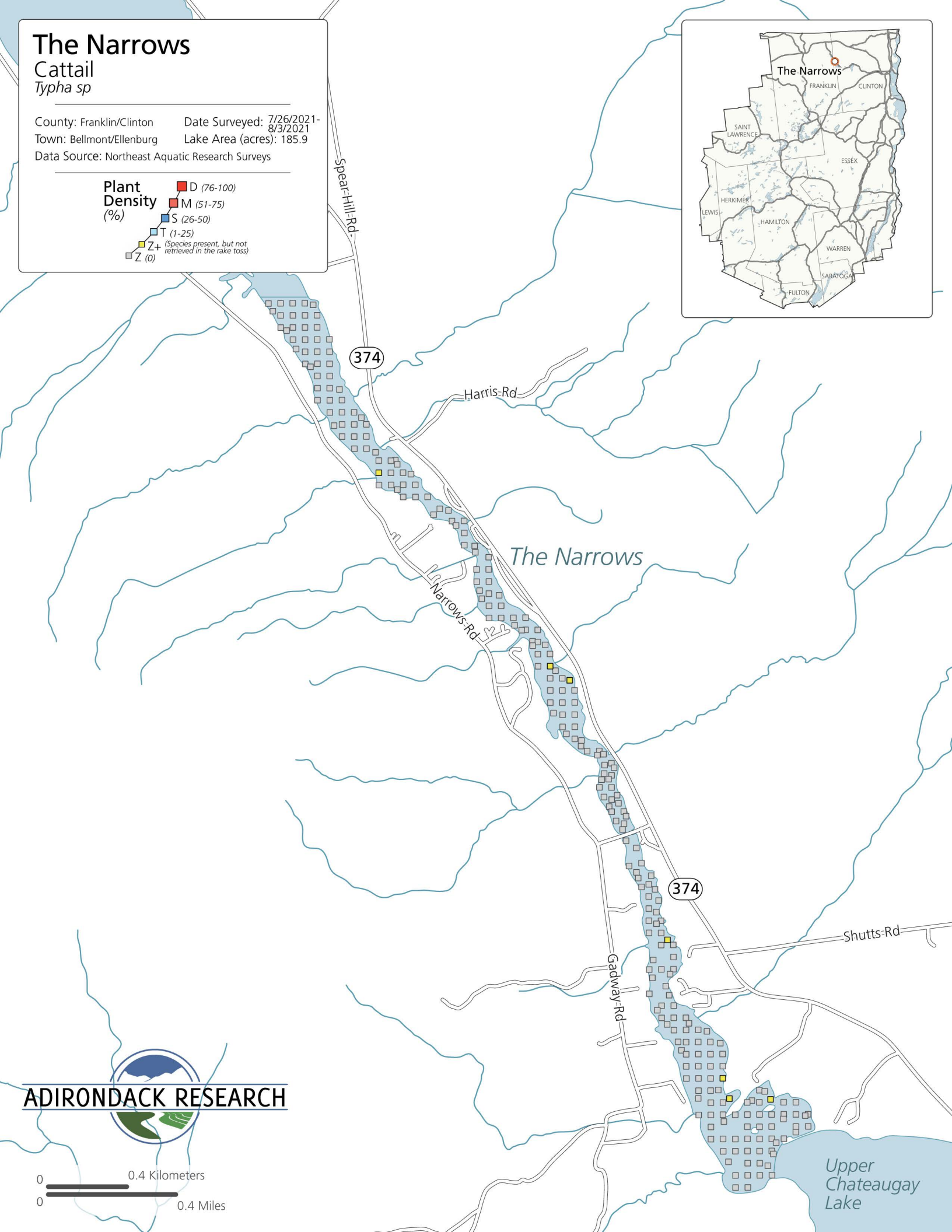
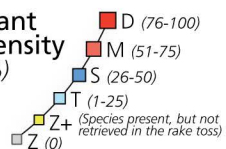
8/3/2021

Town: Belmont/Ellenburg

Lake Area (acres): 185.9

Data Source: Northeast Aquatic Research Surveys

### Plant Density (%)



ADIRONDACK RESEARCH



0 0.4 Kilometers  
0 0.4 Miles



# The Narrows

Michigan bladderwort /  
Hidden fruit bladderwort  
*Utricularia geminiscapa*

County: Franklin/Clinton

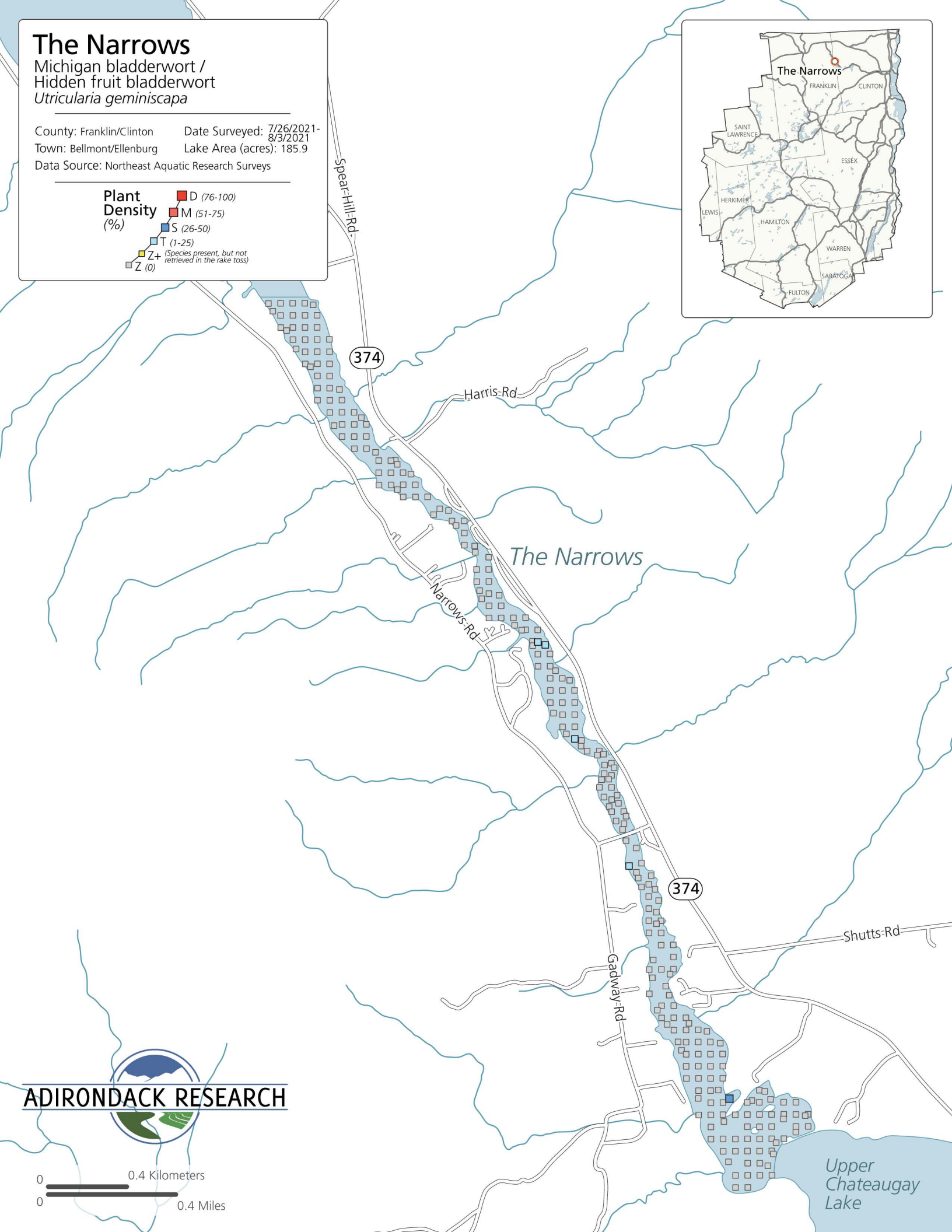
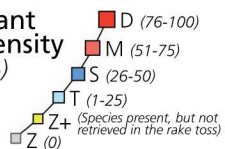
Date Surveyed: 7/26/2021-  
8/3/2021

Town: Belmont/Ellenburg

Lake Area (acres): 185.9

Data Source: Northeast Aquatic Research Surveys

## Plant Density (%)



ADIRONDACK RESEARCH

0 0.4 Kilometers  
0 0.4 Miles

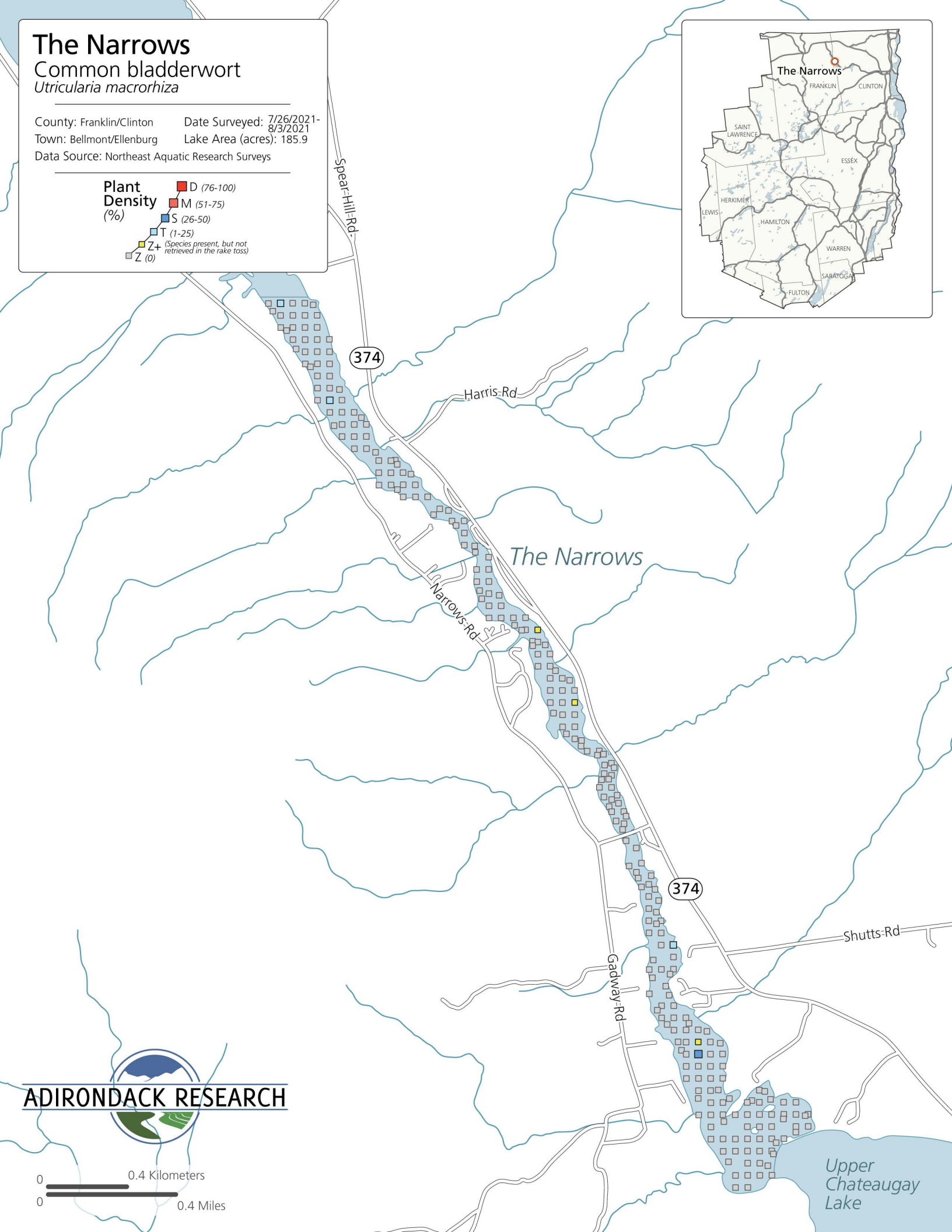
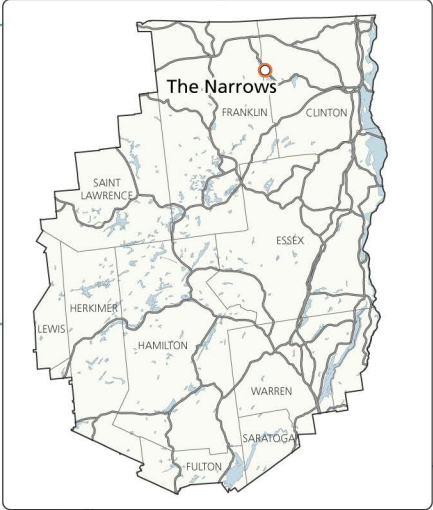
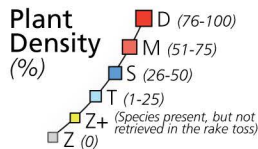
Upper  
Chateaugay  
Lake



# The Narrows

Common bladderwort  
*Utricularia macrorhiza*

County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys



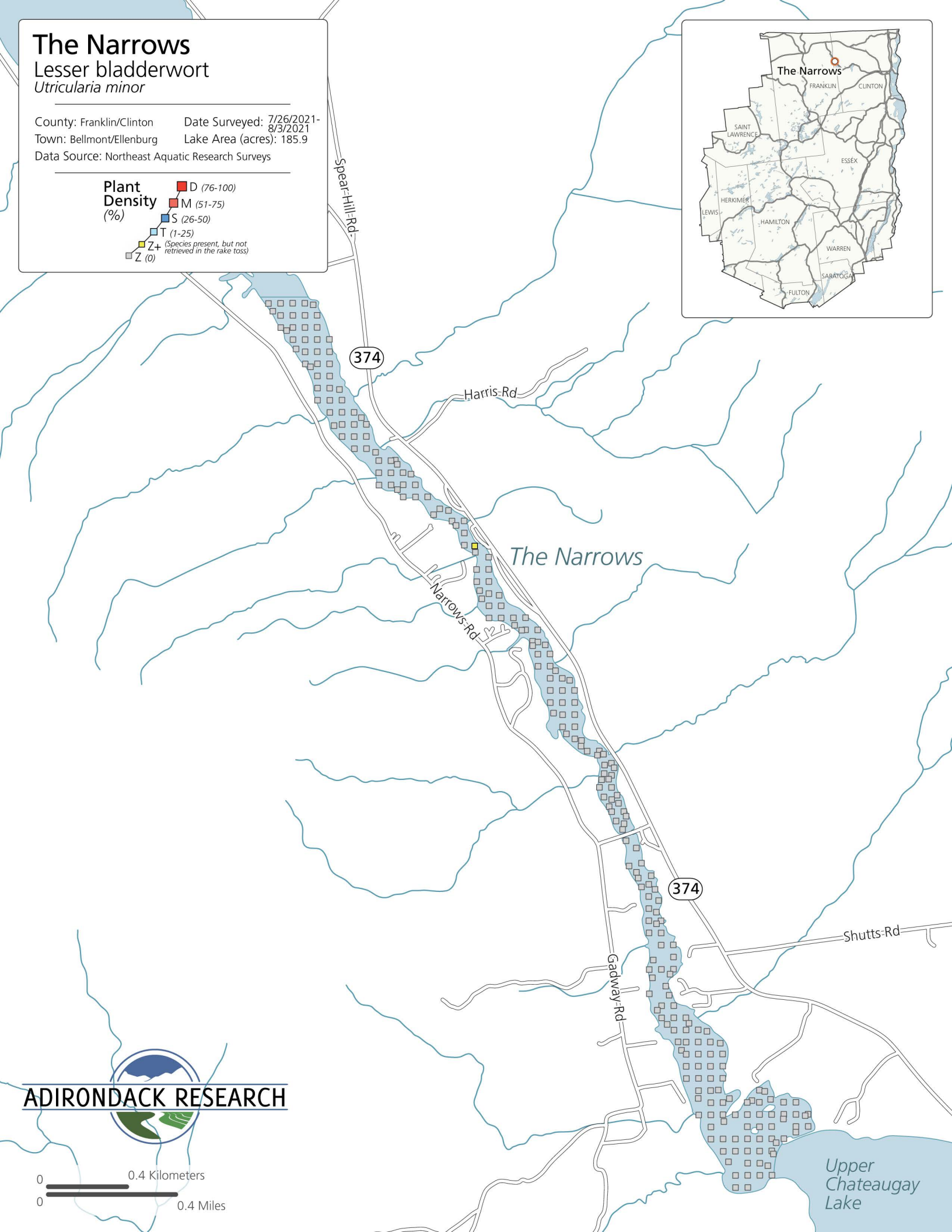
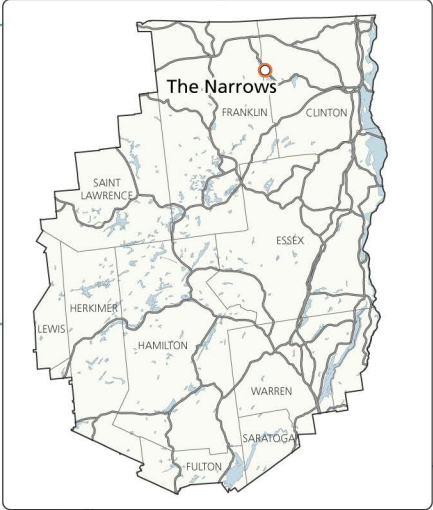
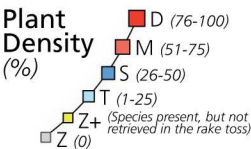


# The Narrows

## Lesser bladderwort

*Utricularia minor*

County: Franklin/Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg      Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys



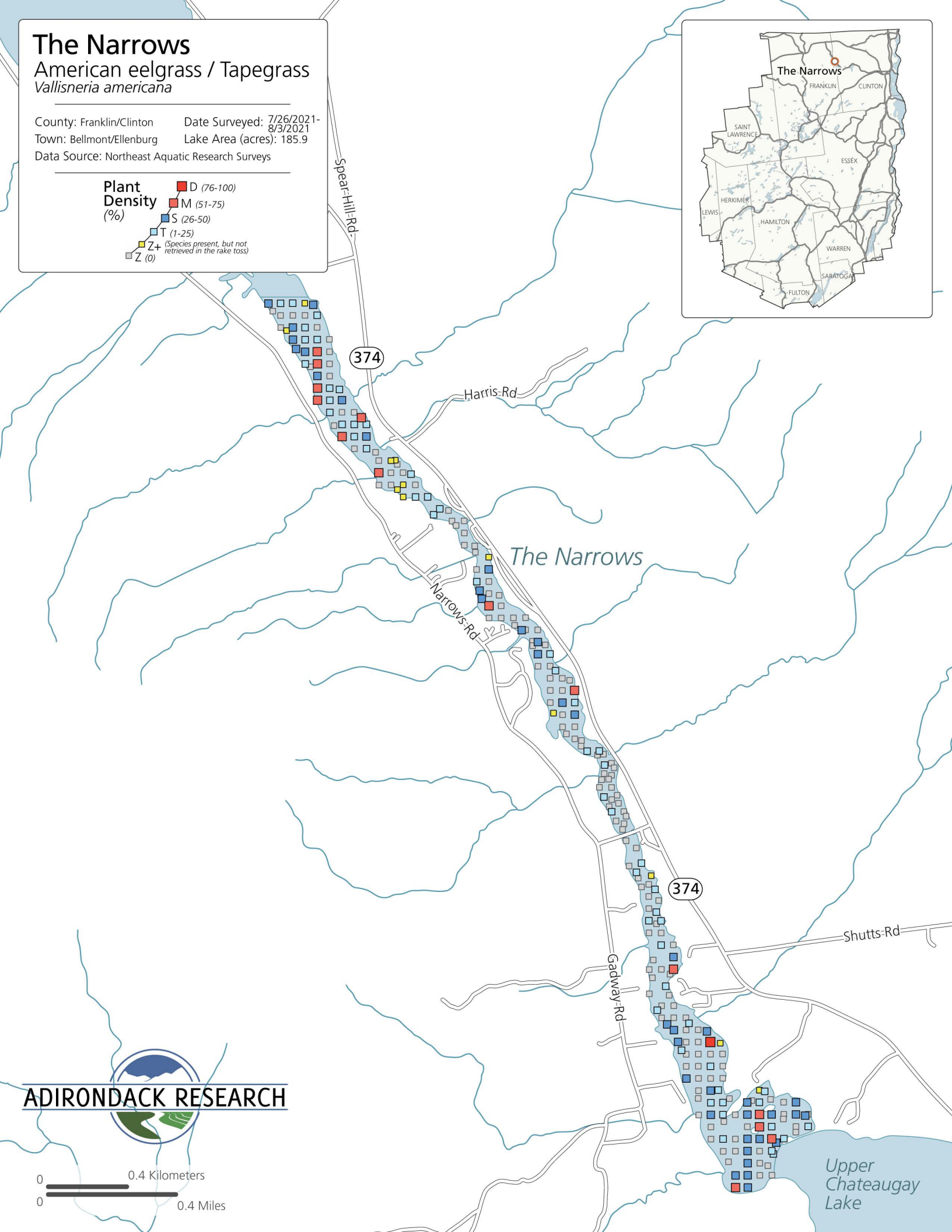
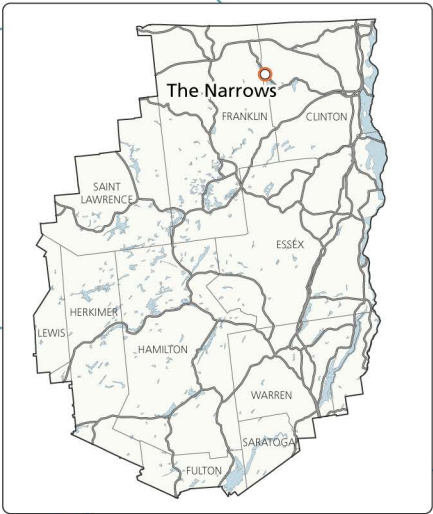
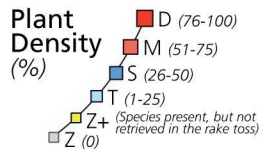


# The Narrows

## American eelgrass / Tapegrass

*Vallisneria americana*

County: Franklin/Clinton Date Surveyed: 7/26/2021-8/3/2021  
Town: Belmont/Ellenburg Lake Area (acres): 185.9  
Data Source: Northeast Aquatic Research Surveys





# The Narrows

## Water stargrass

*Zosterella dubia*

County: Franklin/Clinton

Date Surveyed: 7/26/2021-

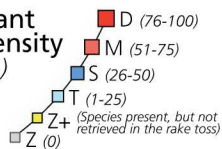
8/3/2021

Town: Belmont/Ellenburg

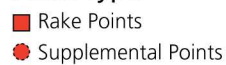
Lake Area (acres): 185.9

Data Source: Northeast Aquatic Research Surveys

### Plant Density (%)



### Point Type



Spears-Hill Rd.

374

Harris Rd.

The Narrows

Narrows Rd.

374

Gadway Rd.

Shutts Rd.

Upper Chateaugay Lake

ADIRONDACK RESEARCH





# Upper Chateaugay Lake Watershield

*Brasenia schreberi*

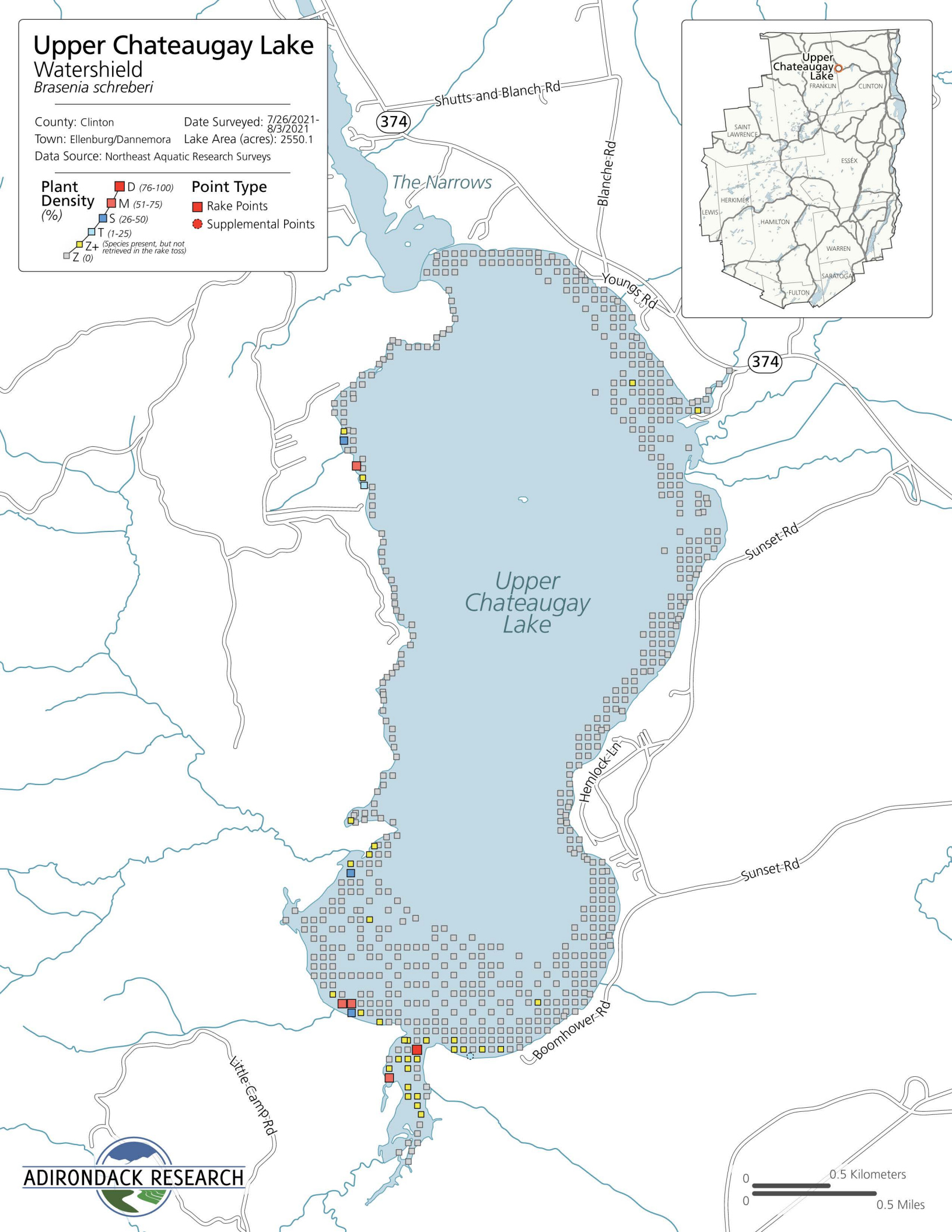
County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys

**Plant Density (%)**

- D (76-100)
- M (51-75)
- S (26-50)
- T (1-25)
- Z+ (Species present, but not retrieved in the rake toss)
- Z (0)

**Point Type**

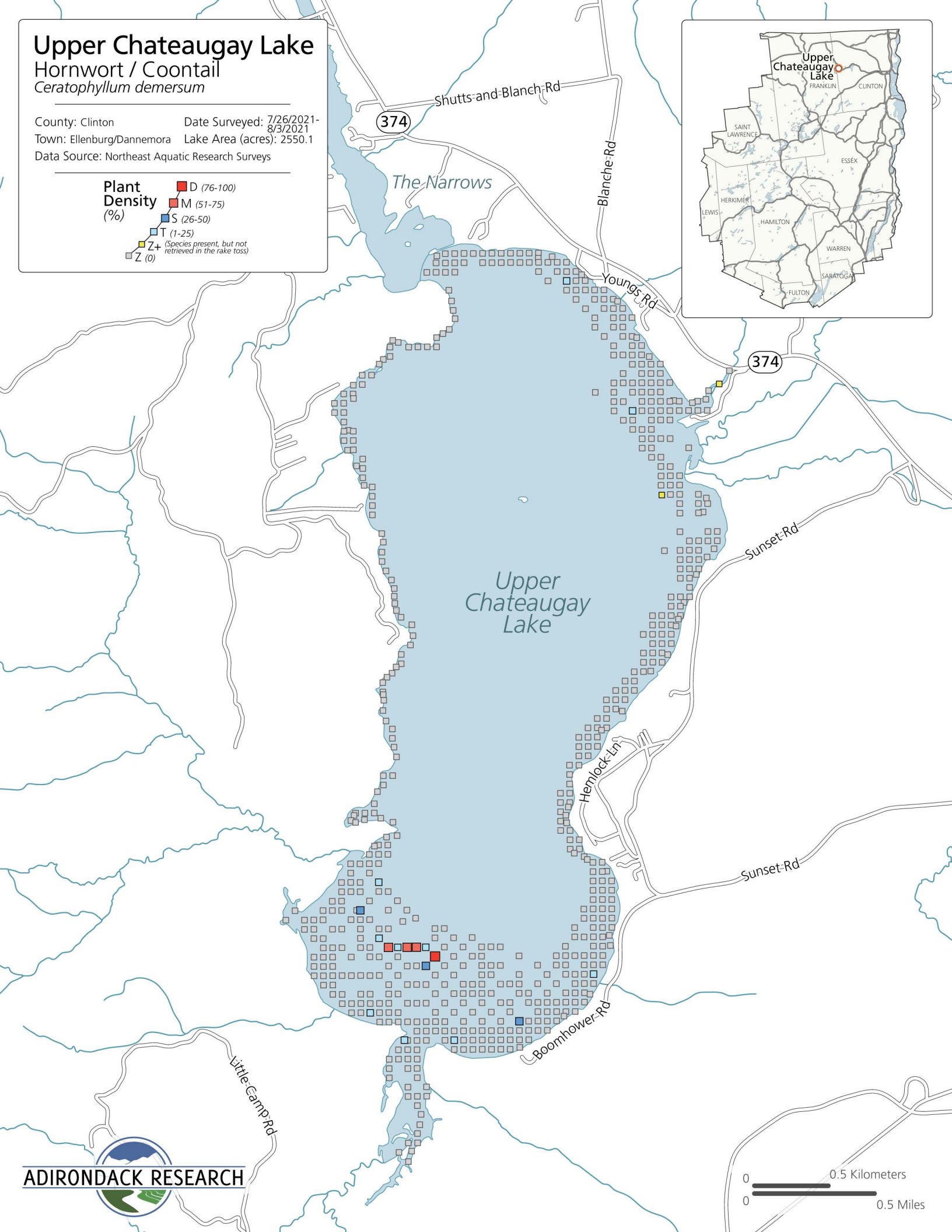
- Rake Points
- Supplemental Points





Upper Chateaugay Lake  
Hornwort / Coontail  
*Ceratophyllum demersum*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



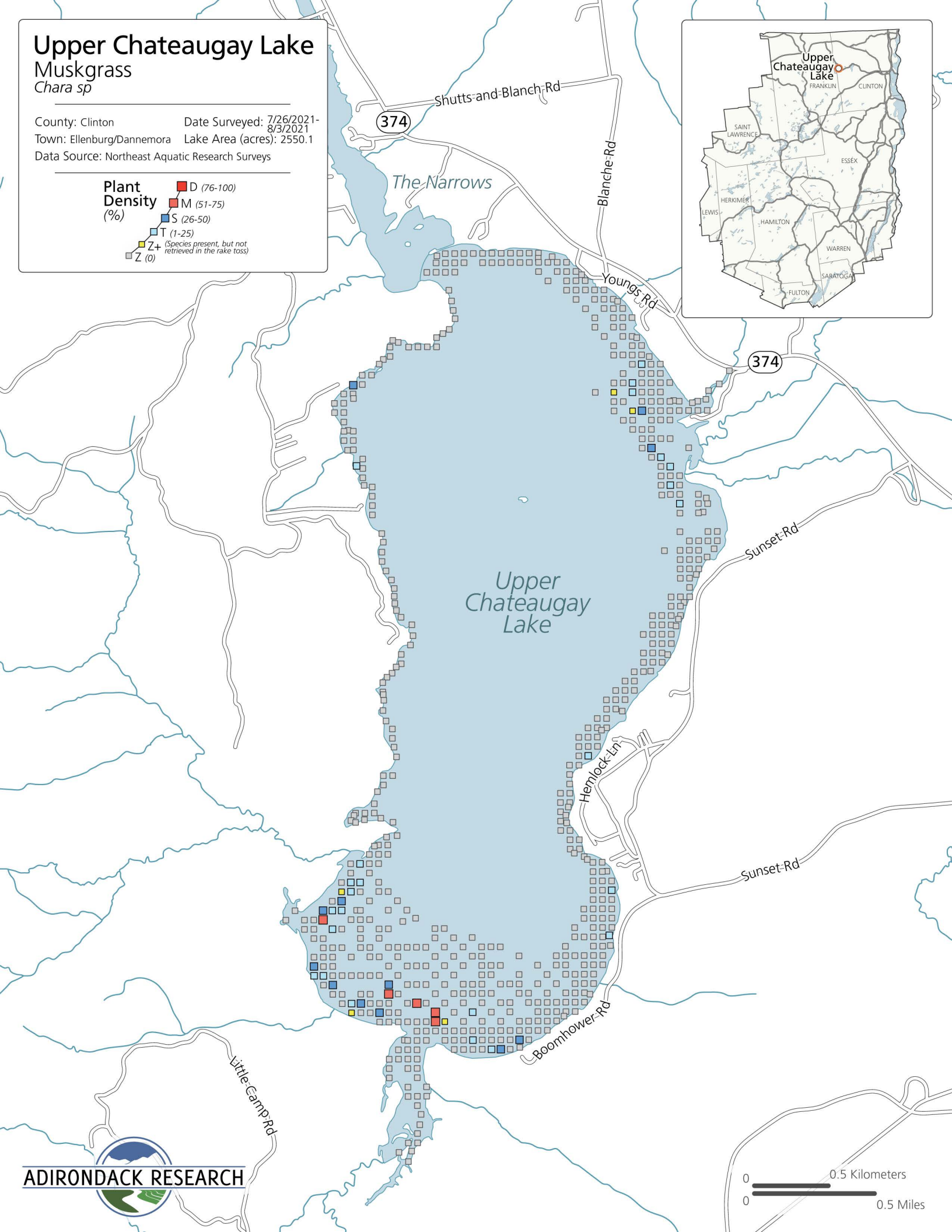


# Upper Chateaugay Lake

## Muskgrass

*Chara sp*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



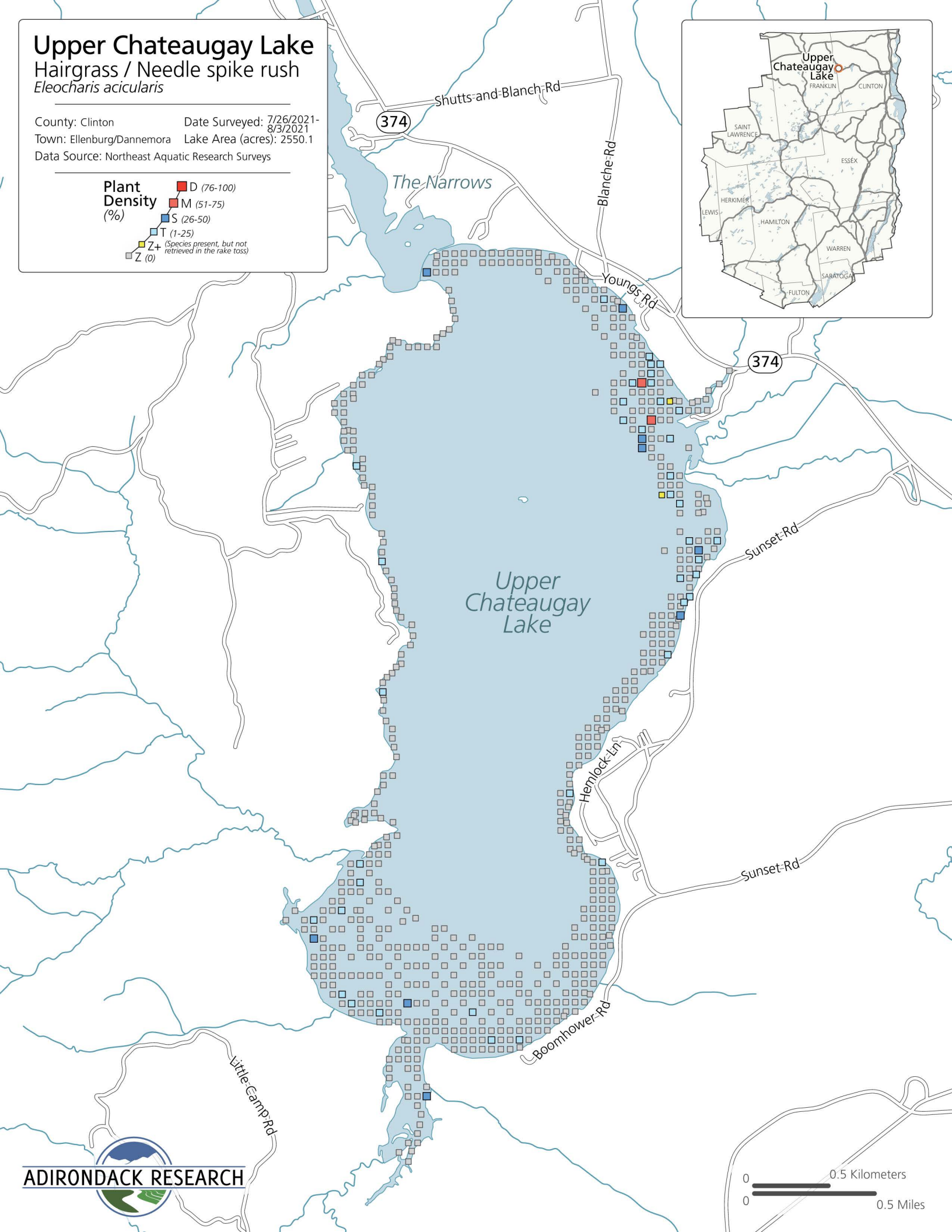
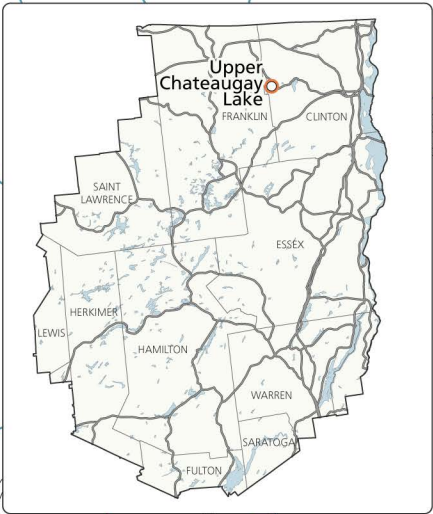
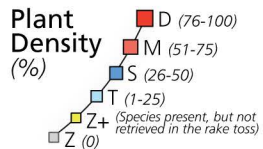


# Upper Chateaugay Lake

## Hairgrass / Needle spike rush

*Eleocharis acicularis*

County: Clinton Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



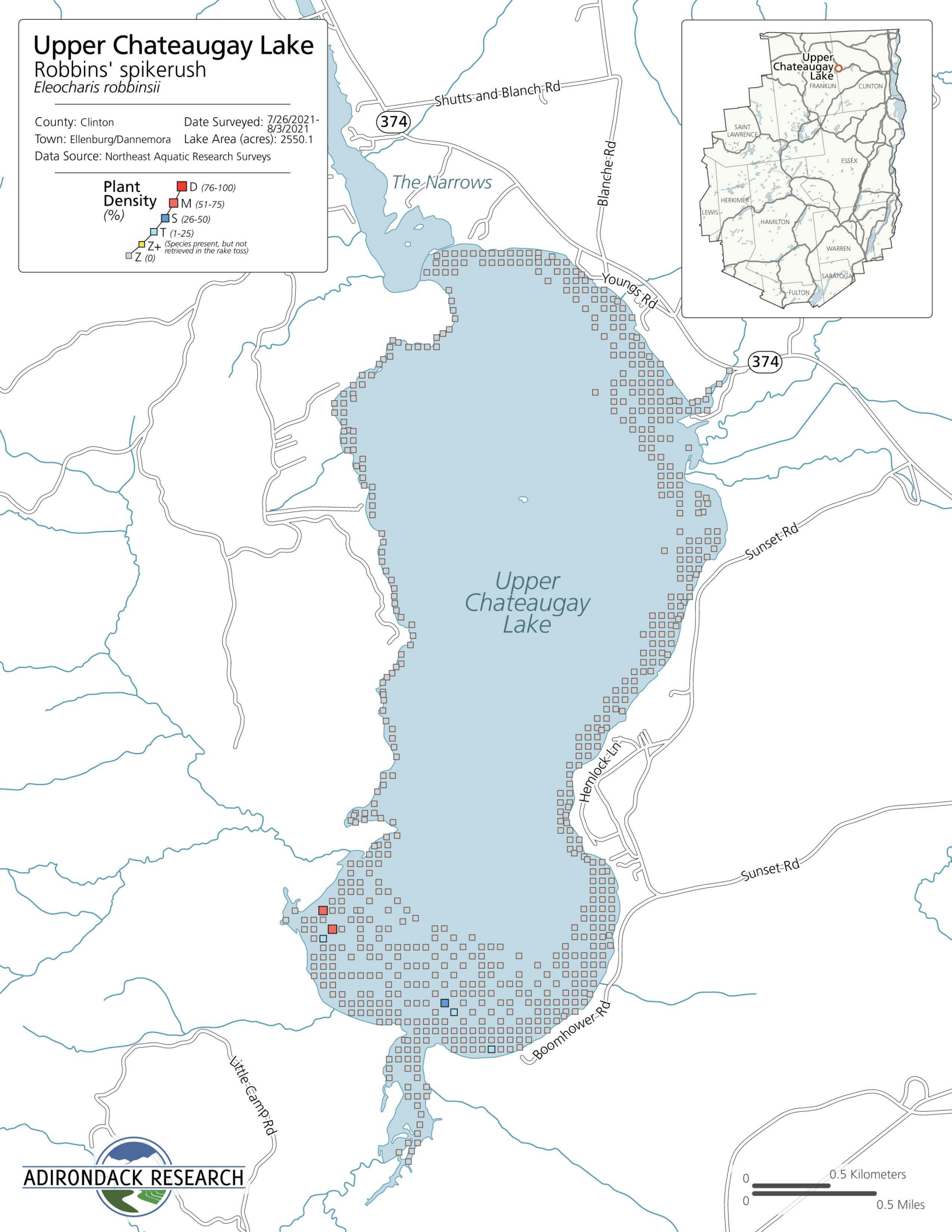


# Upper Chateaugay Lake

## Robbins' spikerush

*Eleocharis robbinsii*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys





# Upper Chateaugay Lake

## Nuttall's waterweed

*Elodea nuttallii*

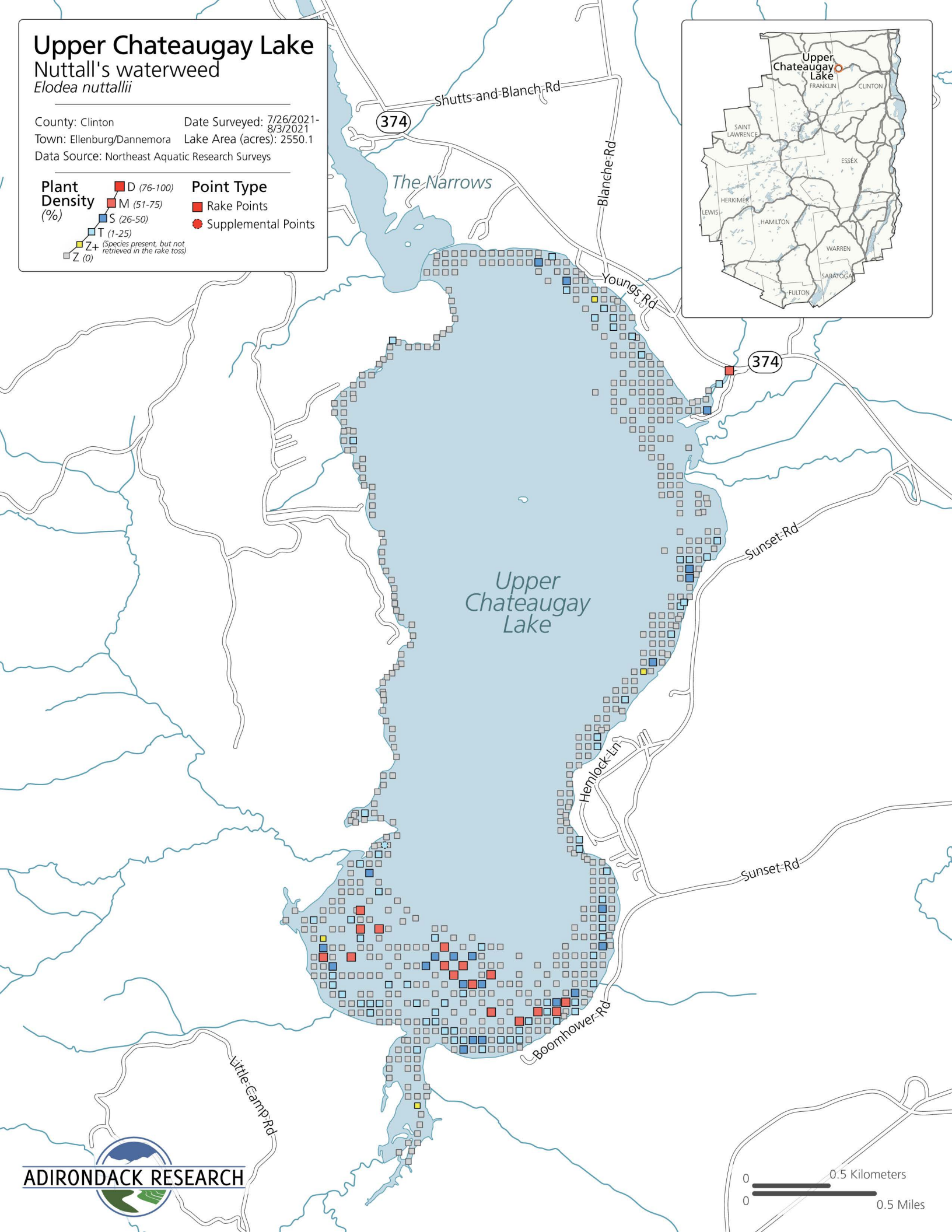
County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys

**Plant Density (%)**

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- T (1-25)
- Z+ (Species present, but not retrieved in the rake toss)
- Z (0)

**Point Type**

- Rake Points
- Supplemental Points



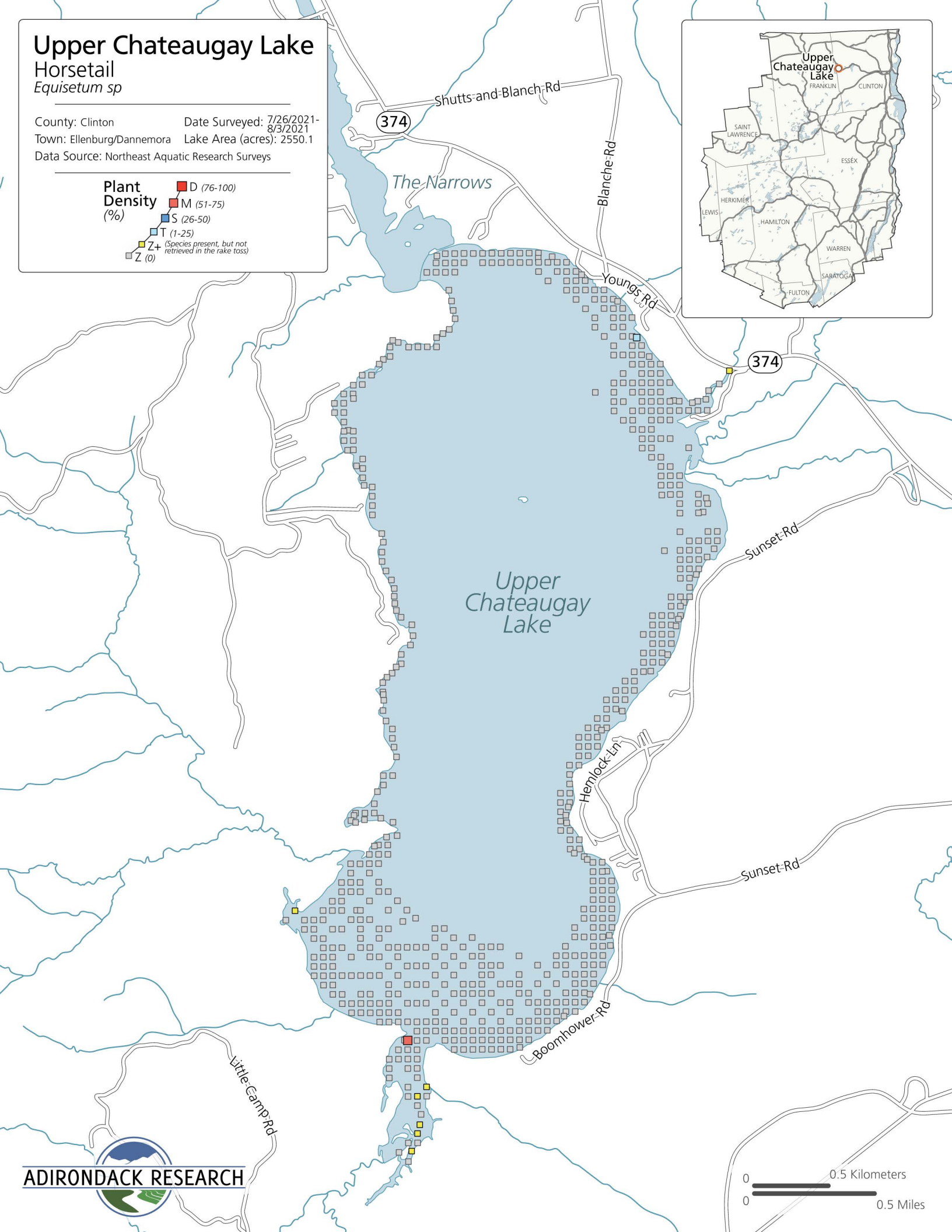
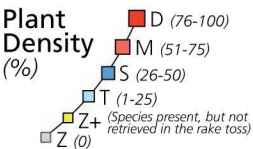


# Upper Chateaugay Lake

## Horsetail

*Equisetum sp*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys





# Upper Chateaugay Lake

## Filamentous algae

*Filamentous algae*

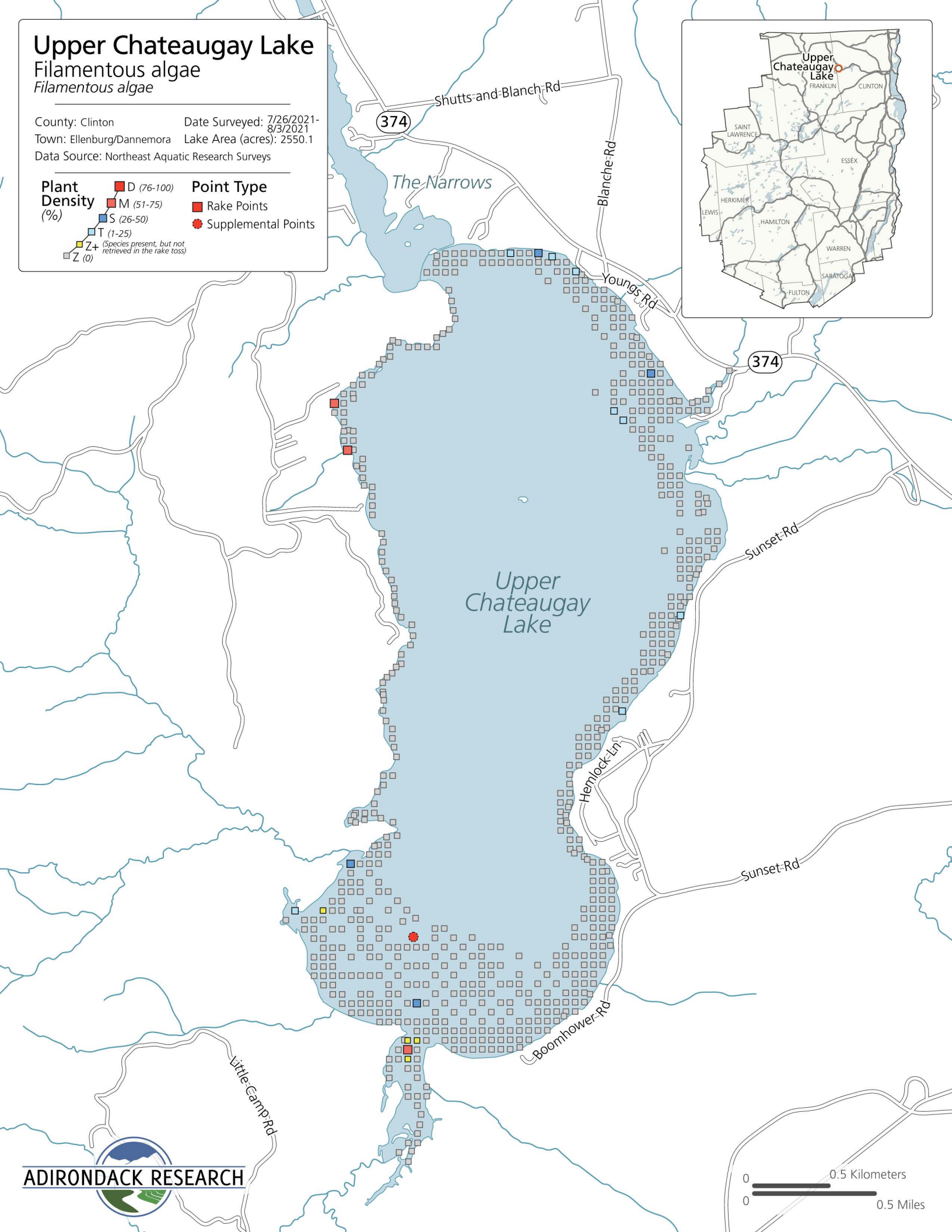
County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys

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- Z+ (Species present, but not retrieved in the rake toss)
- Z (0)

**Point Type**

- Rake Points
- Supplemental Points



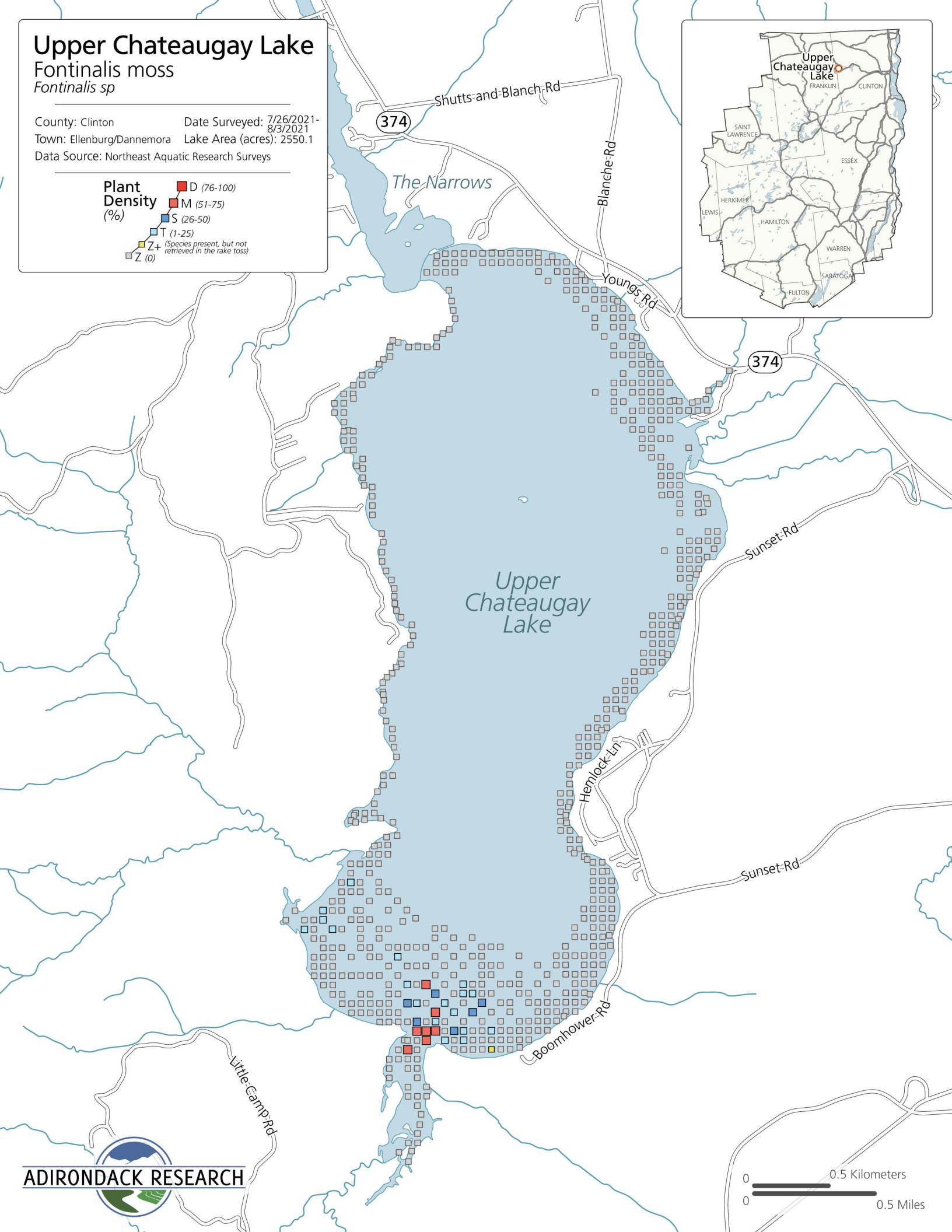
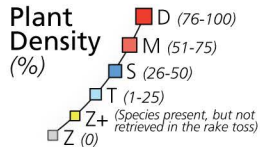


# Upper Chateaugay Lake

## Fontinalis moss

*Fontinalis sp*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



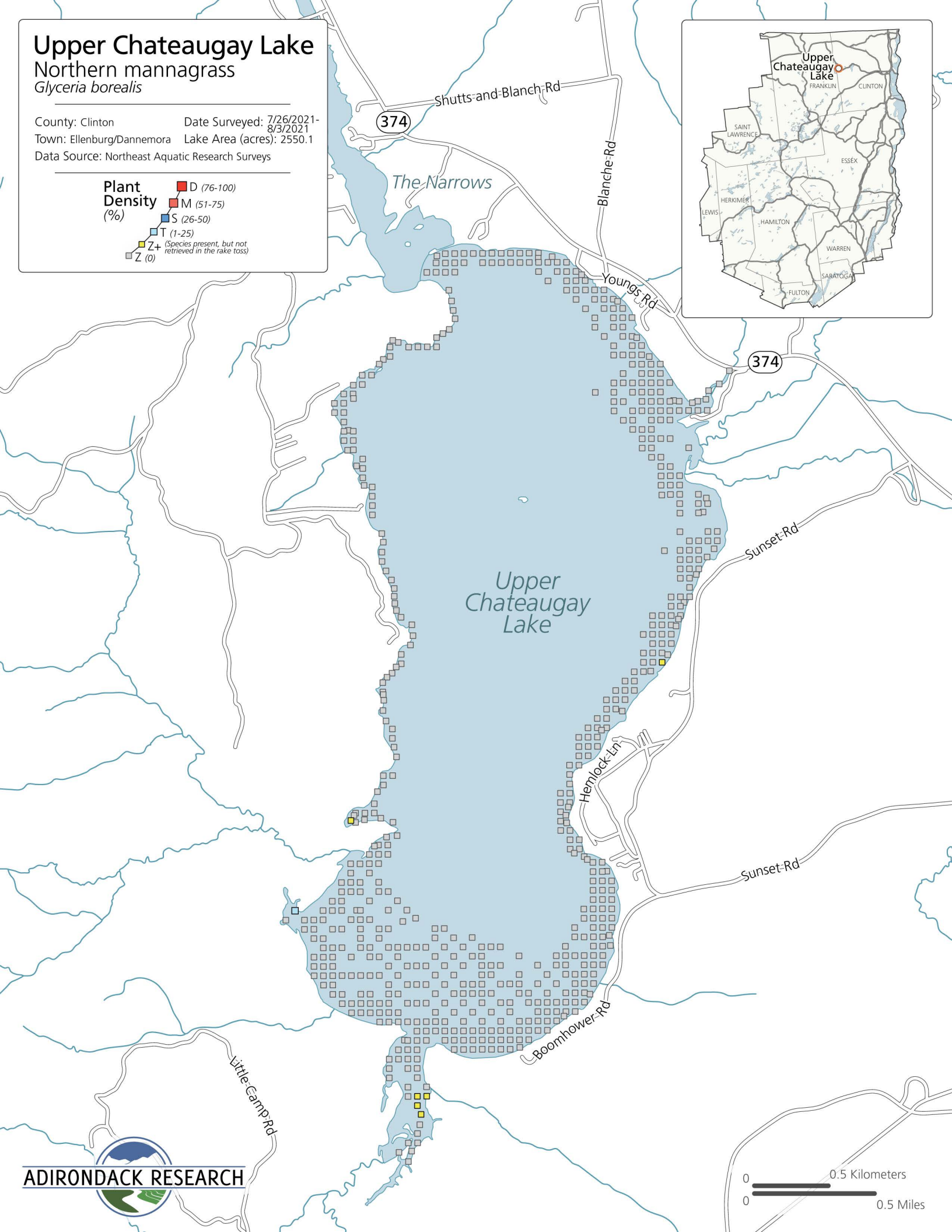


# Upper Chateaugay Lake

## Northern mannagrass

*Glyceria borealis*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



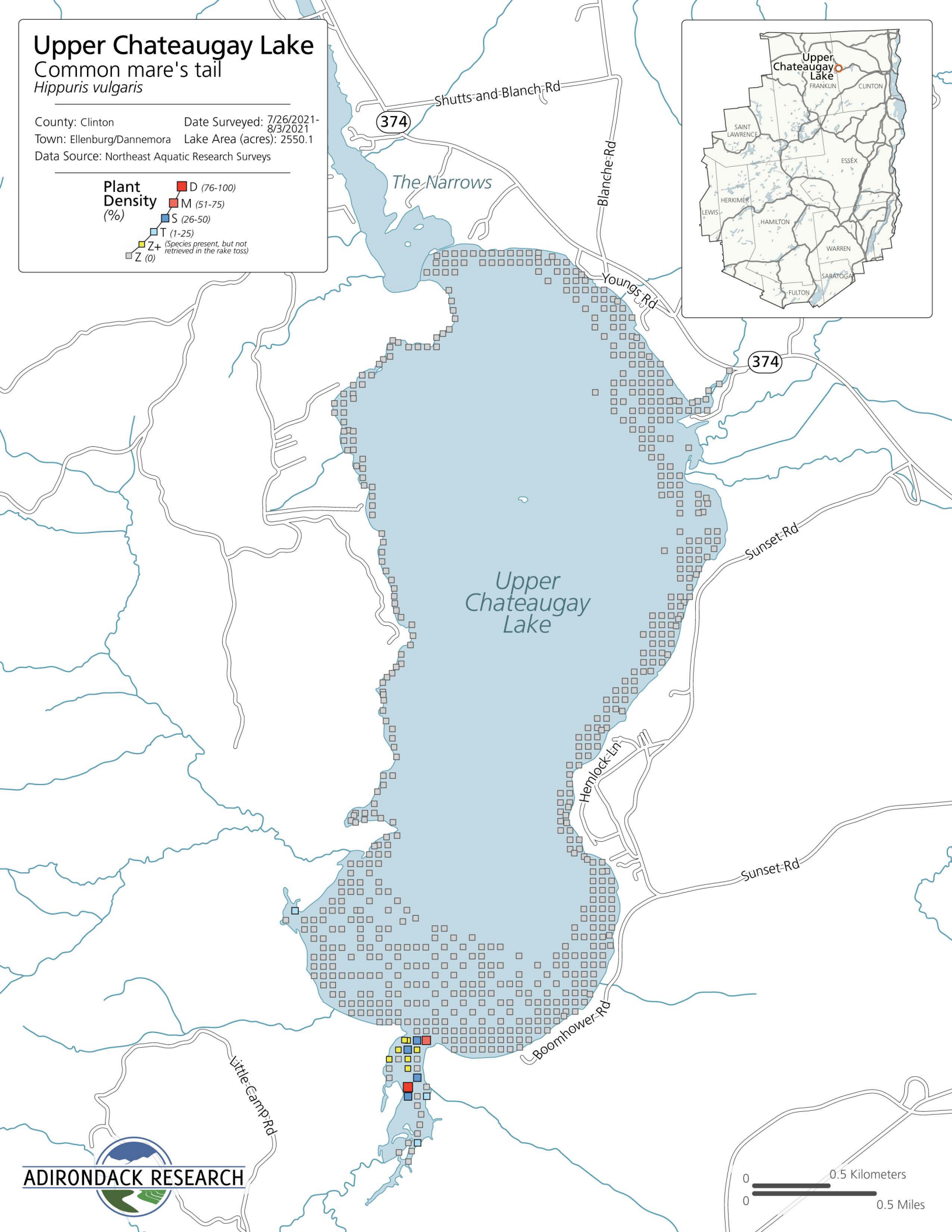


# Upper Chateaugay Lake

## Common mare's tail

*Hippuris vulgaris*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



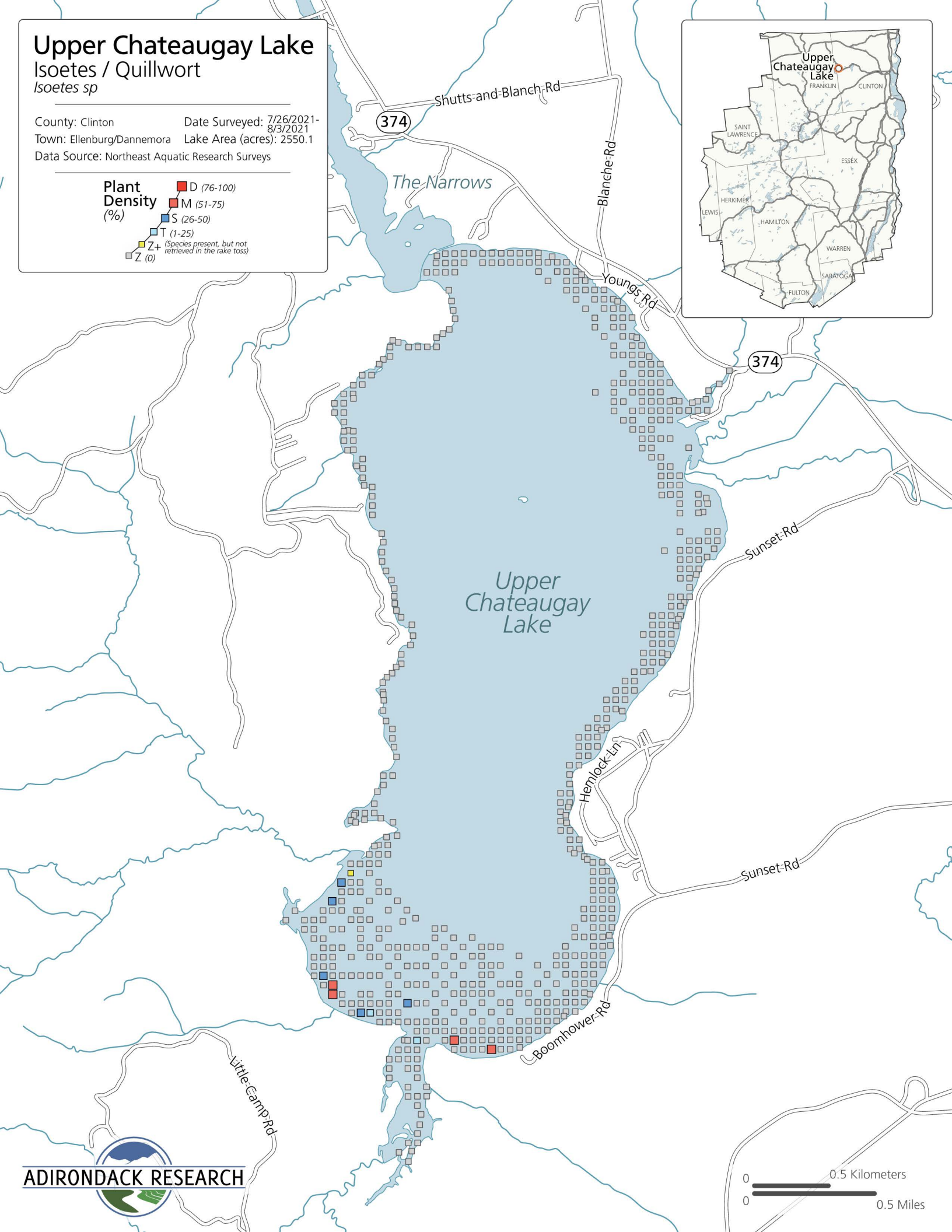


# Upper Chateaugay Lake

## Isoetes / Quillwort

*Isoetes sp*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys





# Upper Chateaugay Lake

## Common duckweed

*Lemna minor*

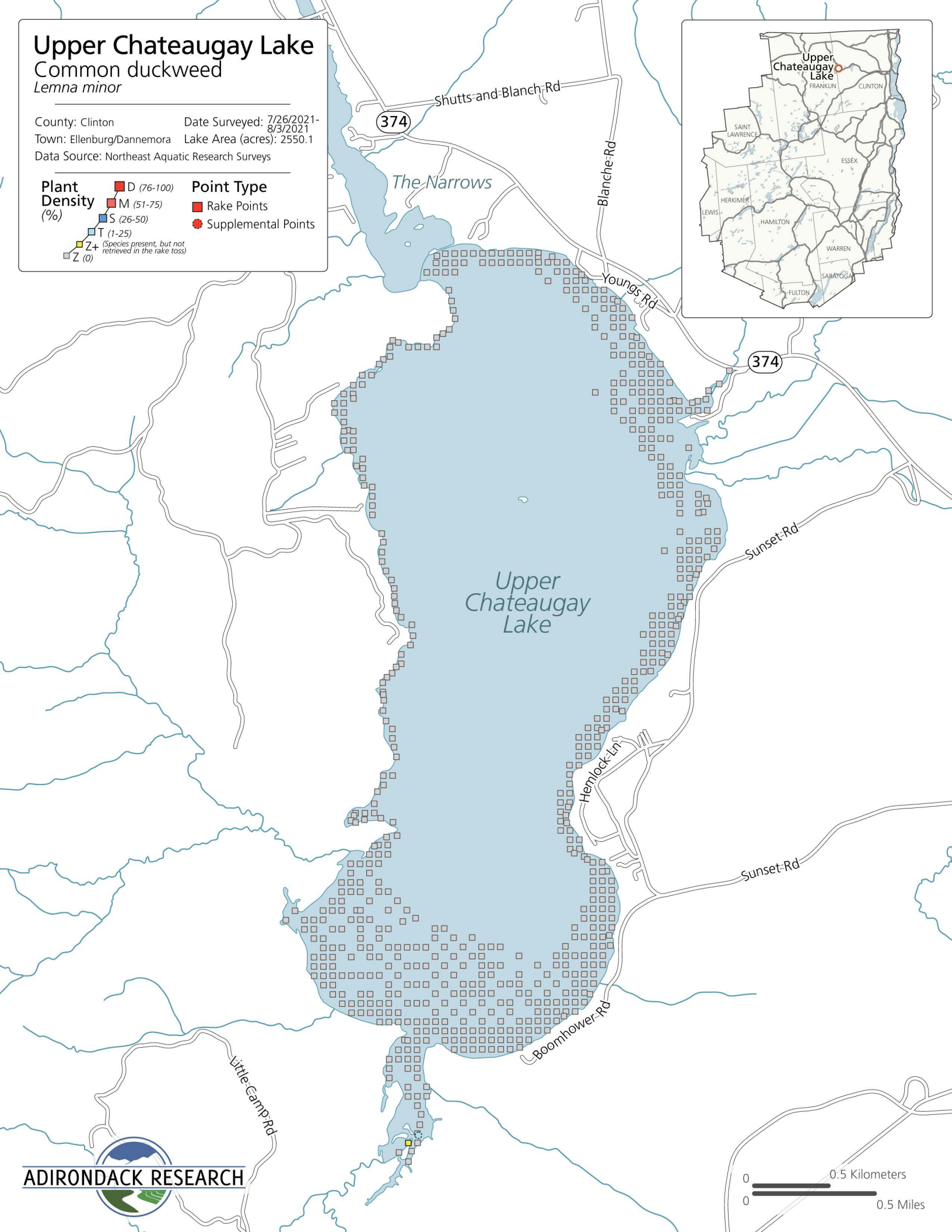
County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys

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- Z (0)

**Point Type**

- Rake Points
- Supplemental Points



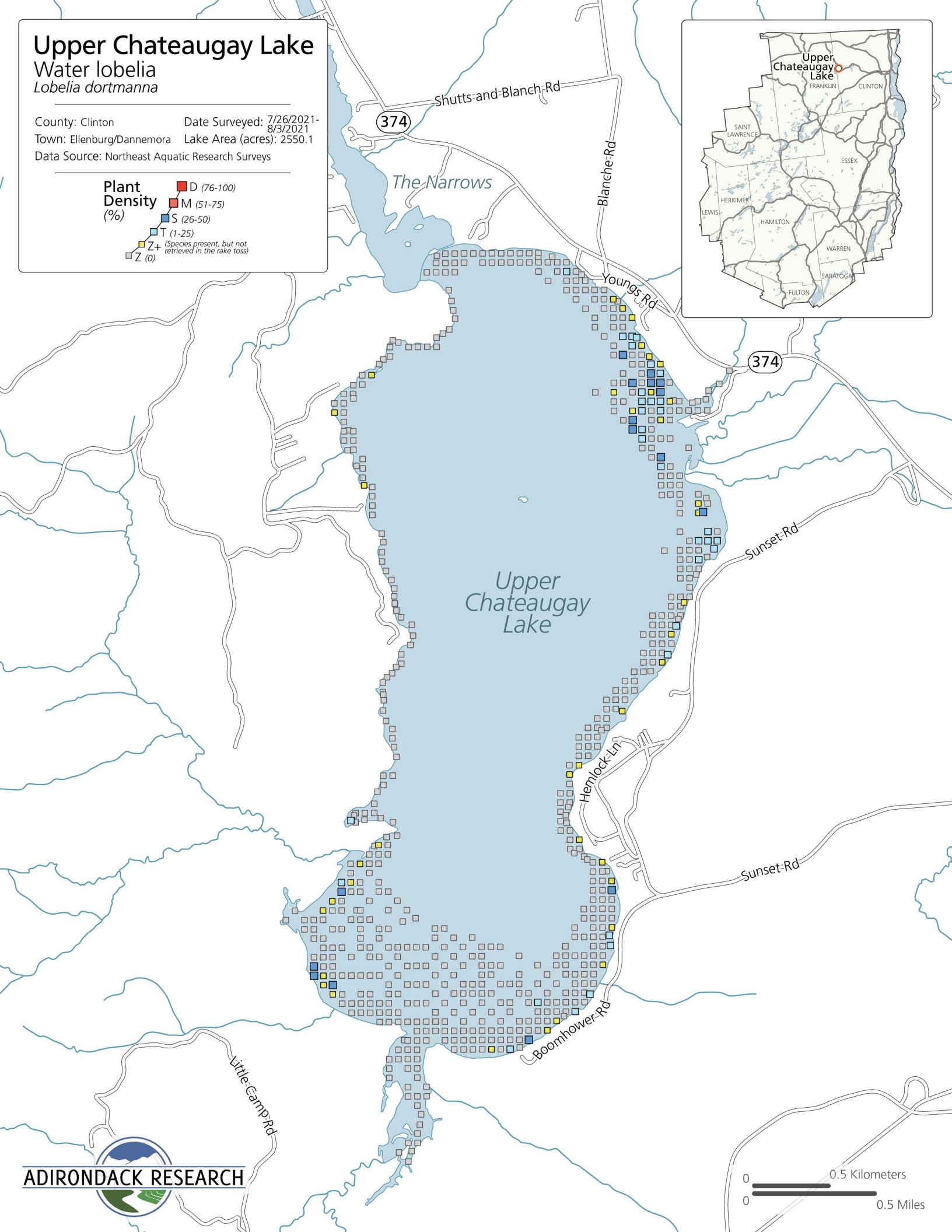


# Upper Chateaugay Lake

## Water lobelia

*Lobelia dortmanna*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys

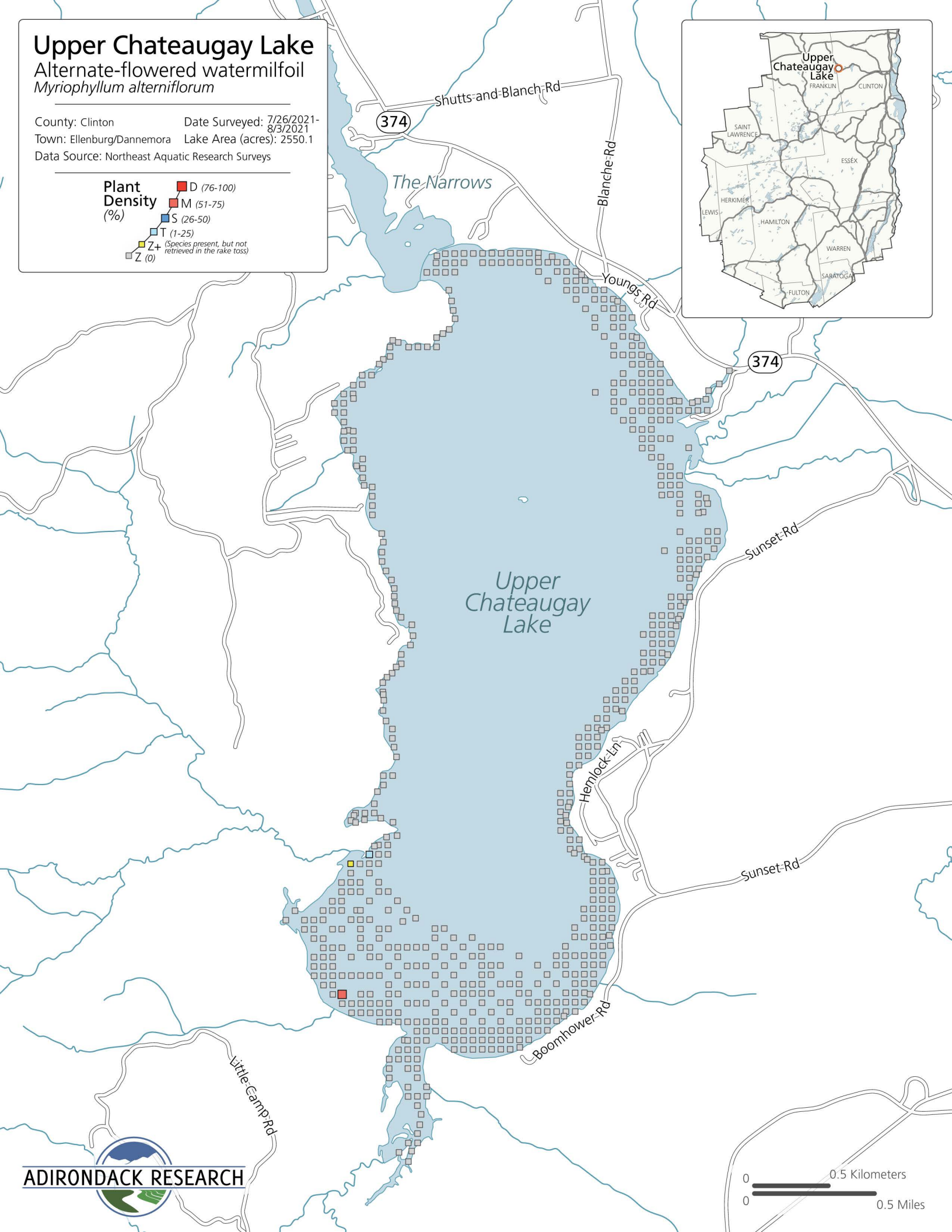




# Upper Chateaugay Lake

Alternate-flowered watermilfoil  
*Myriophyllum alterniflorum*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



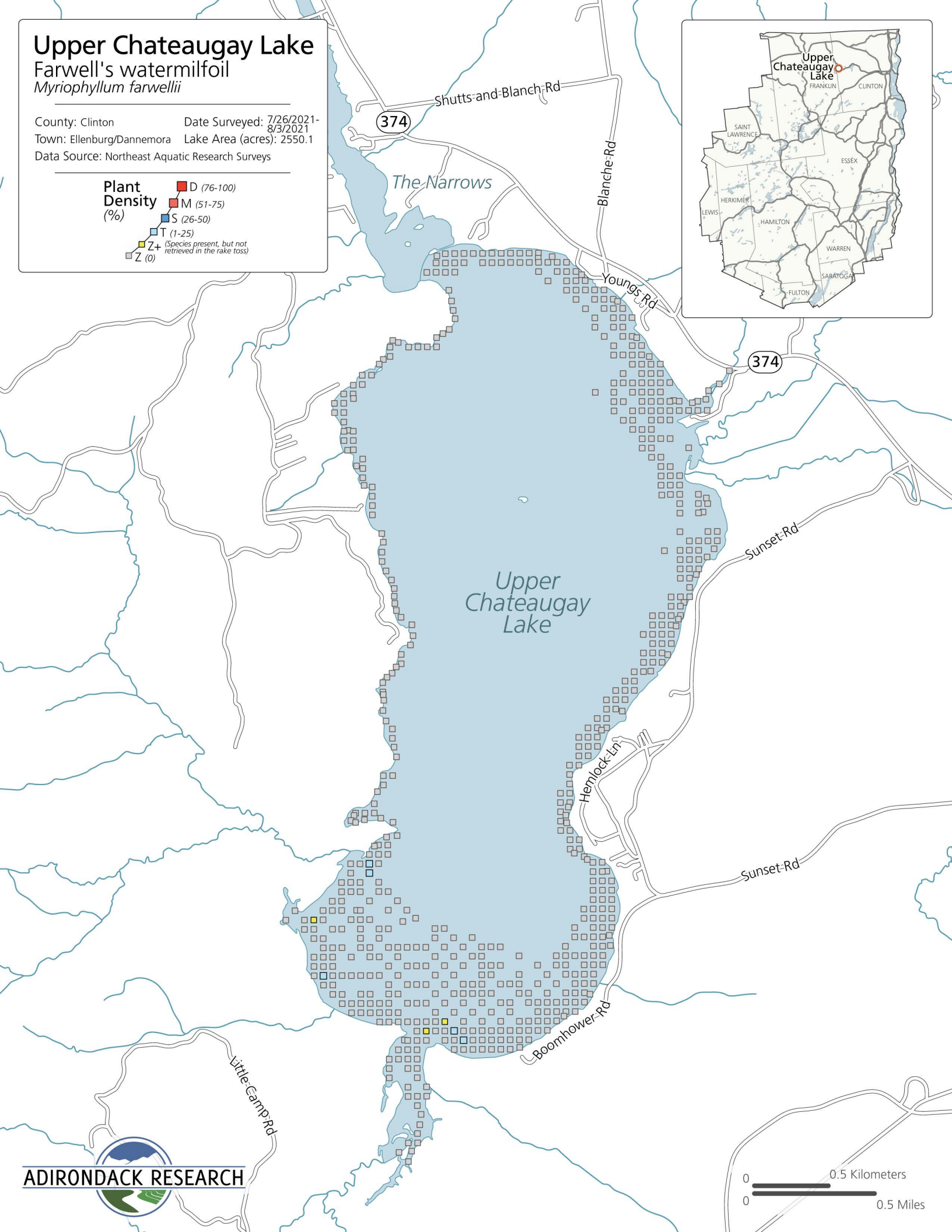
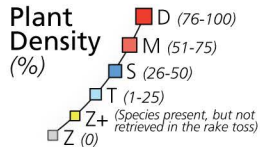


# Upper Chateaugay Lake

## Farwell's watermilfoil

*Myriophyllum farwellii*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



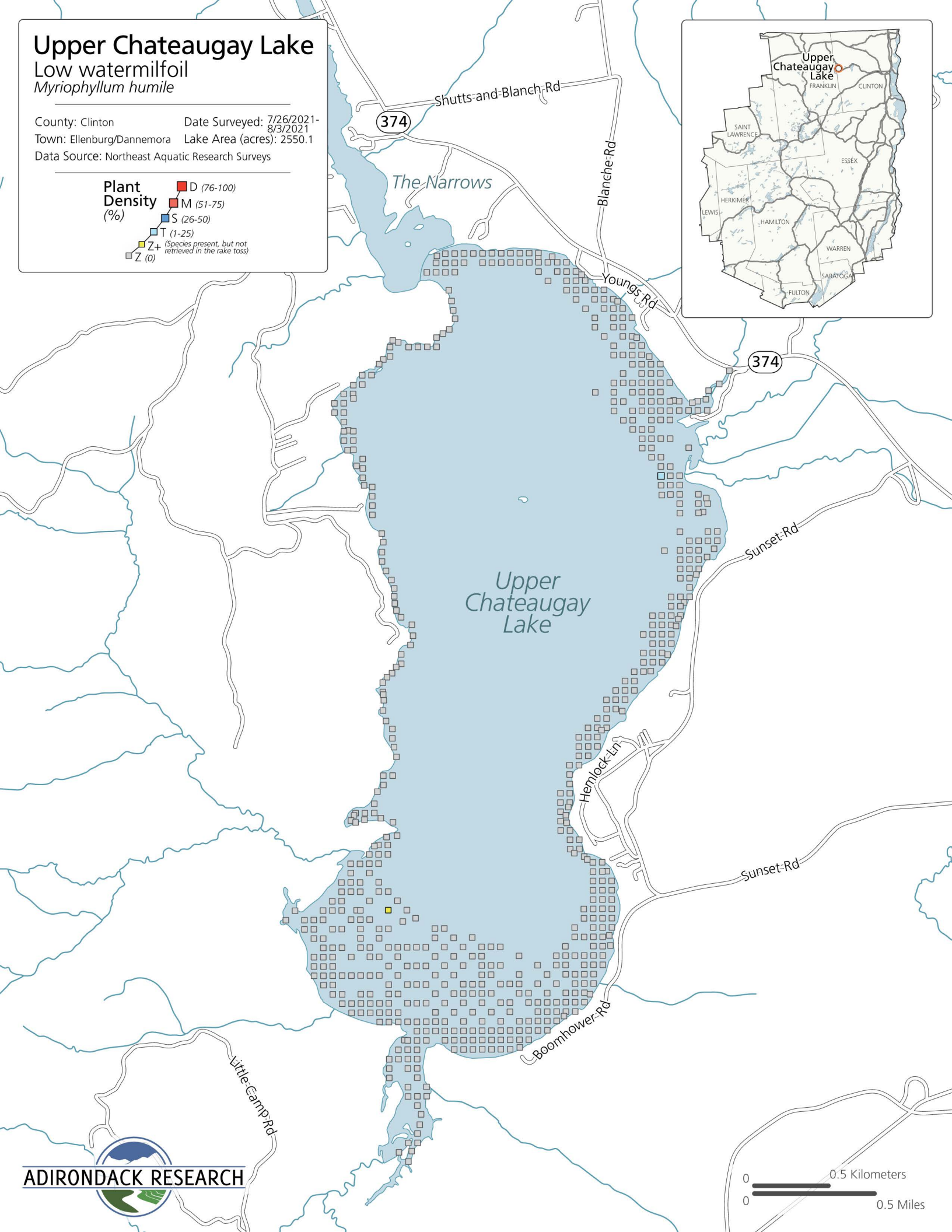


# Upper Chateaugay Lake

## Low watermilfoil

*Myriophyllum humile*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



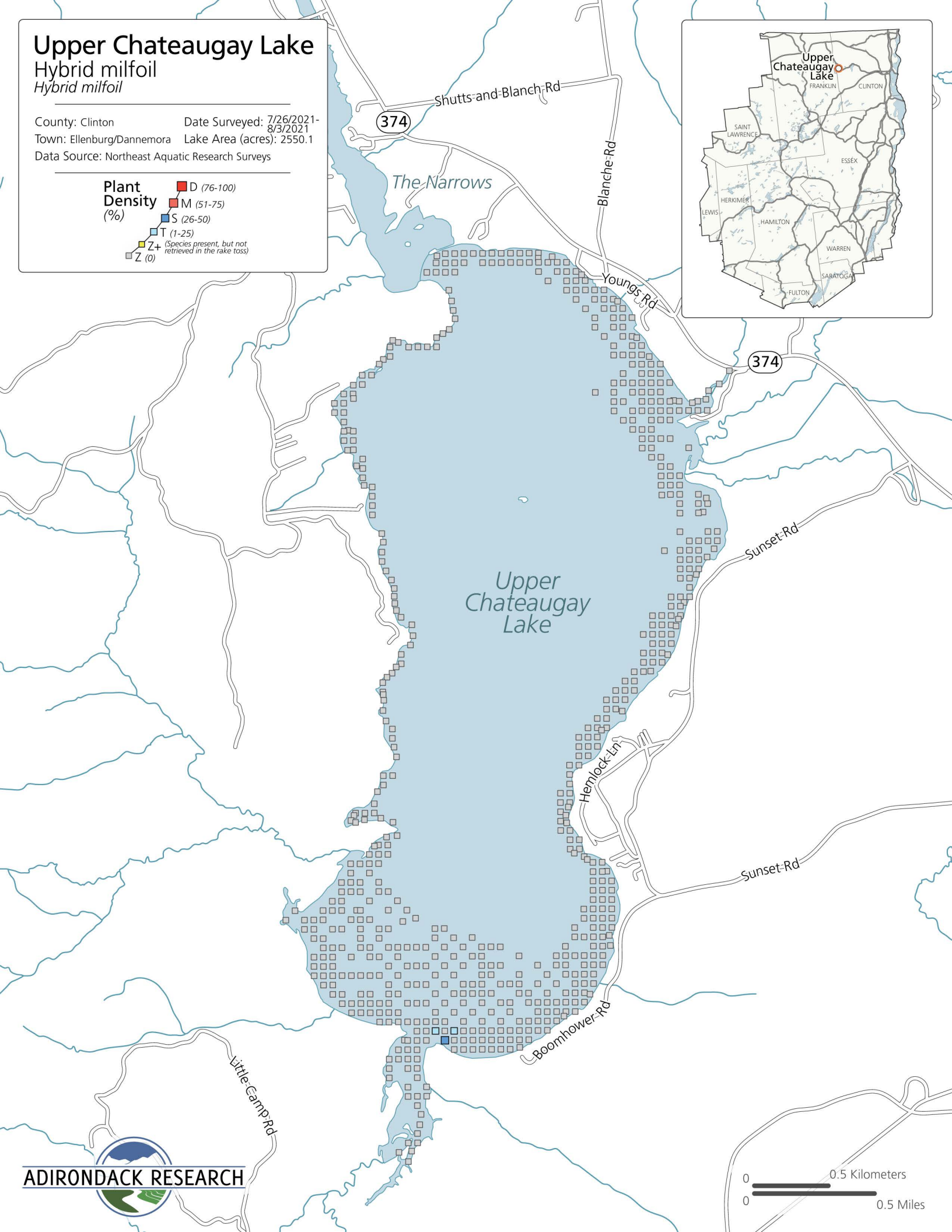
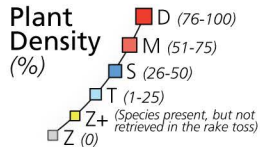


# Upper Chateaugay Lake

## Hybrid milfoil

*Hybrid milfoil*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys

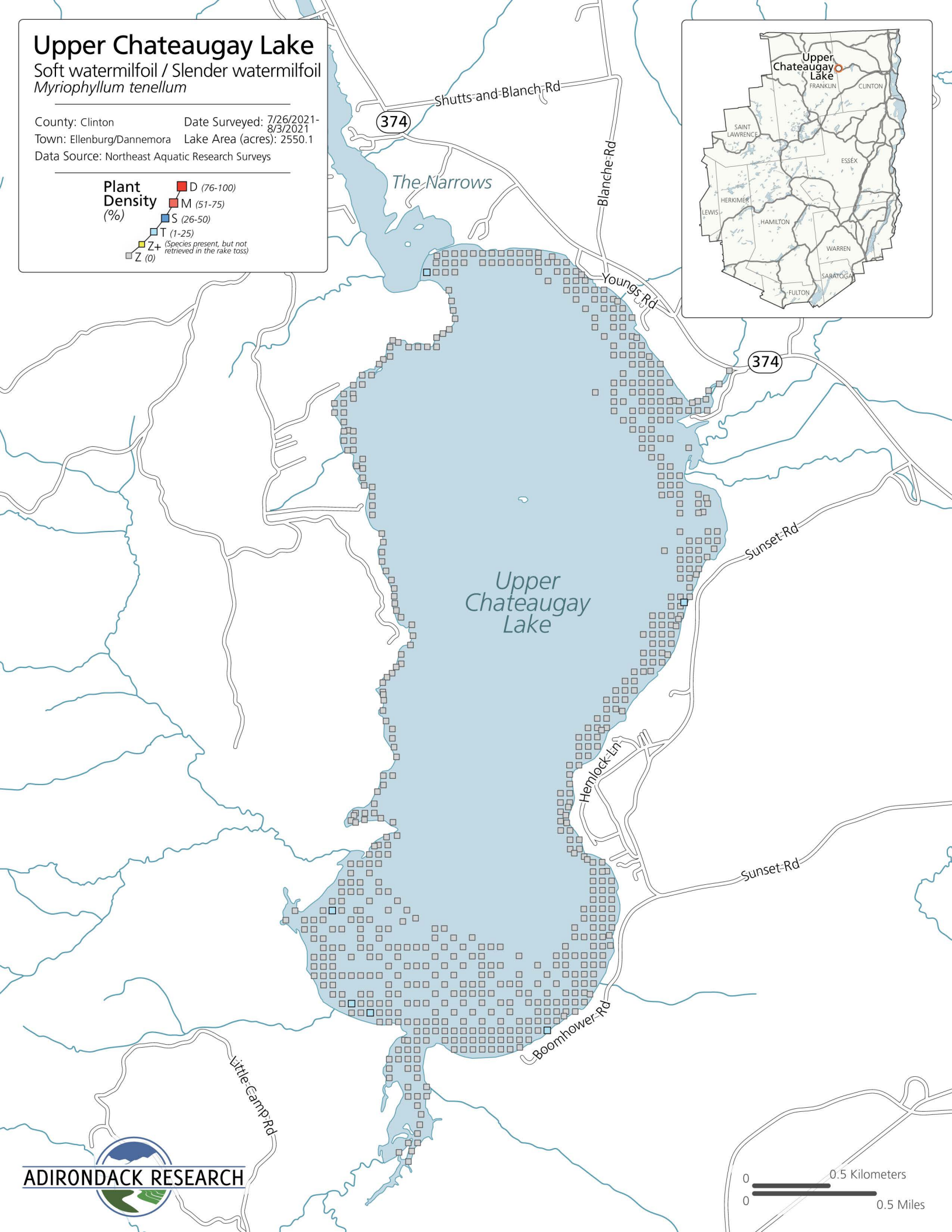
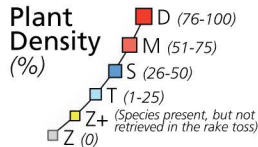




# Upper Chateaugay Lake

Soft water milfoil / Slender water milfoil  
*Myriophyllum tenellum*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



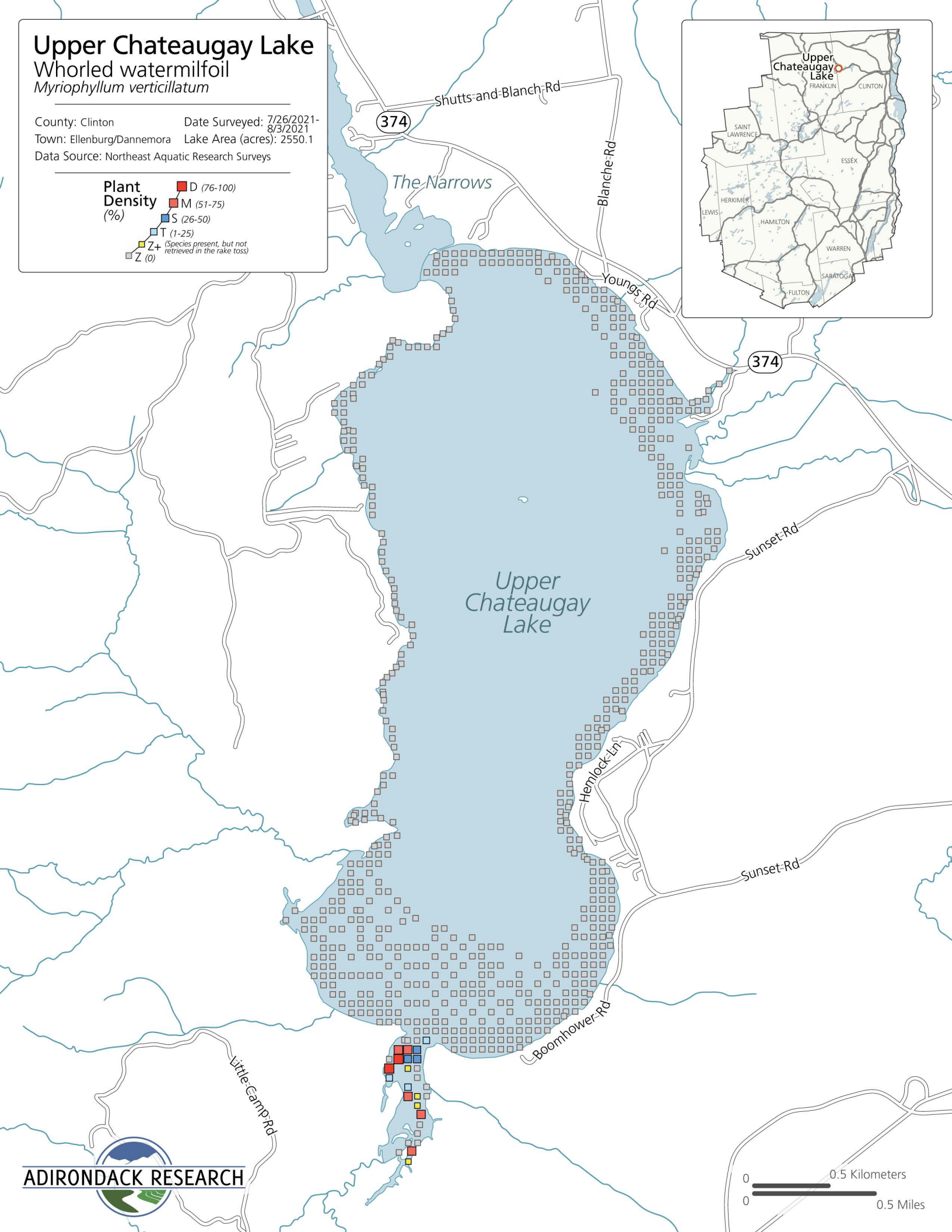
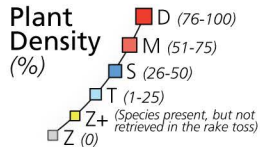


# Upper Chateaugay Lake

## Whorled watermilfoil

*Myriophyllum verticillatum*

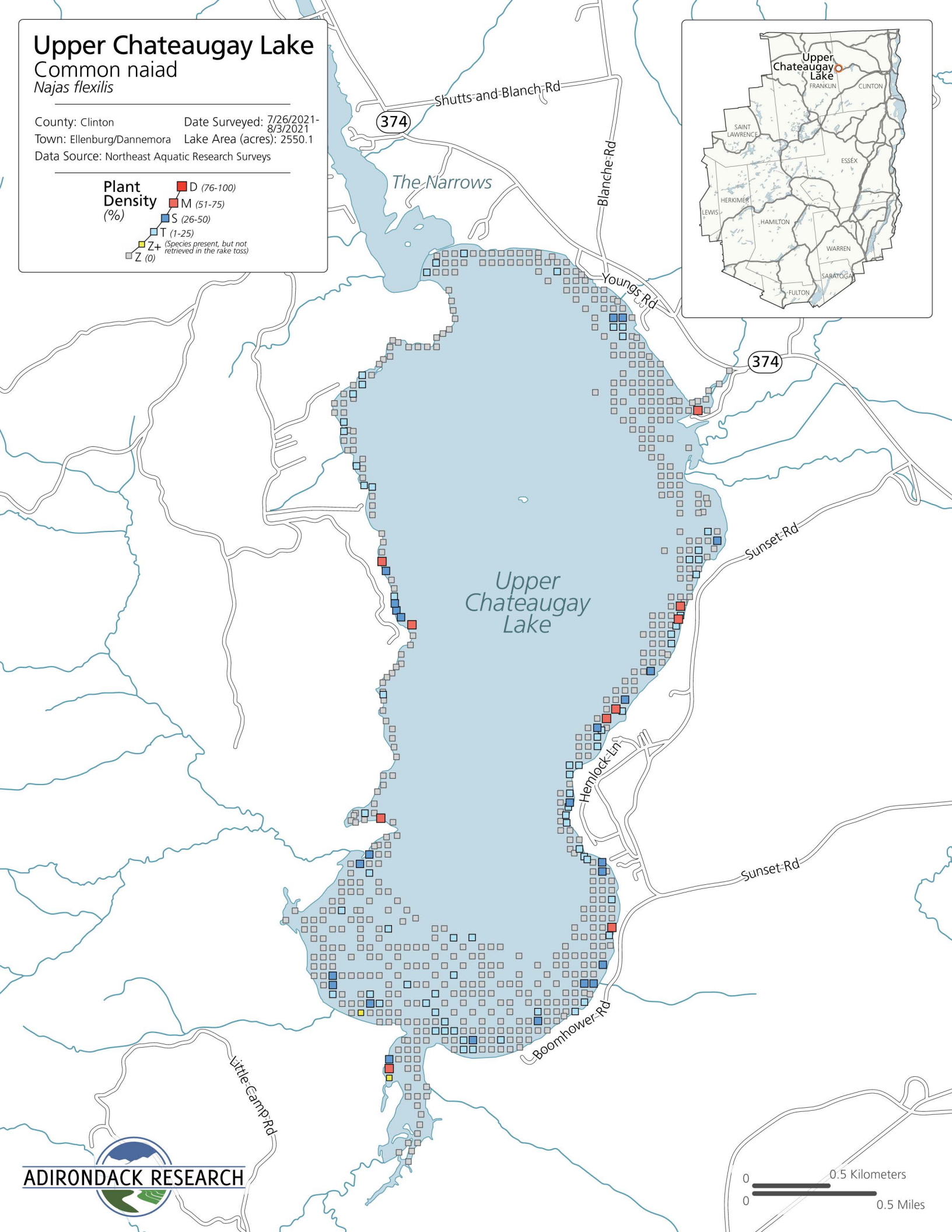
County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys





Upper Chateaugay Lake  
Common naiad  
*Najas flexilis*

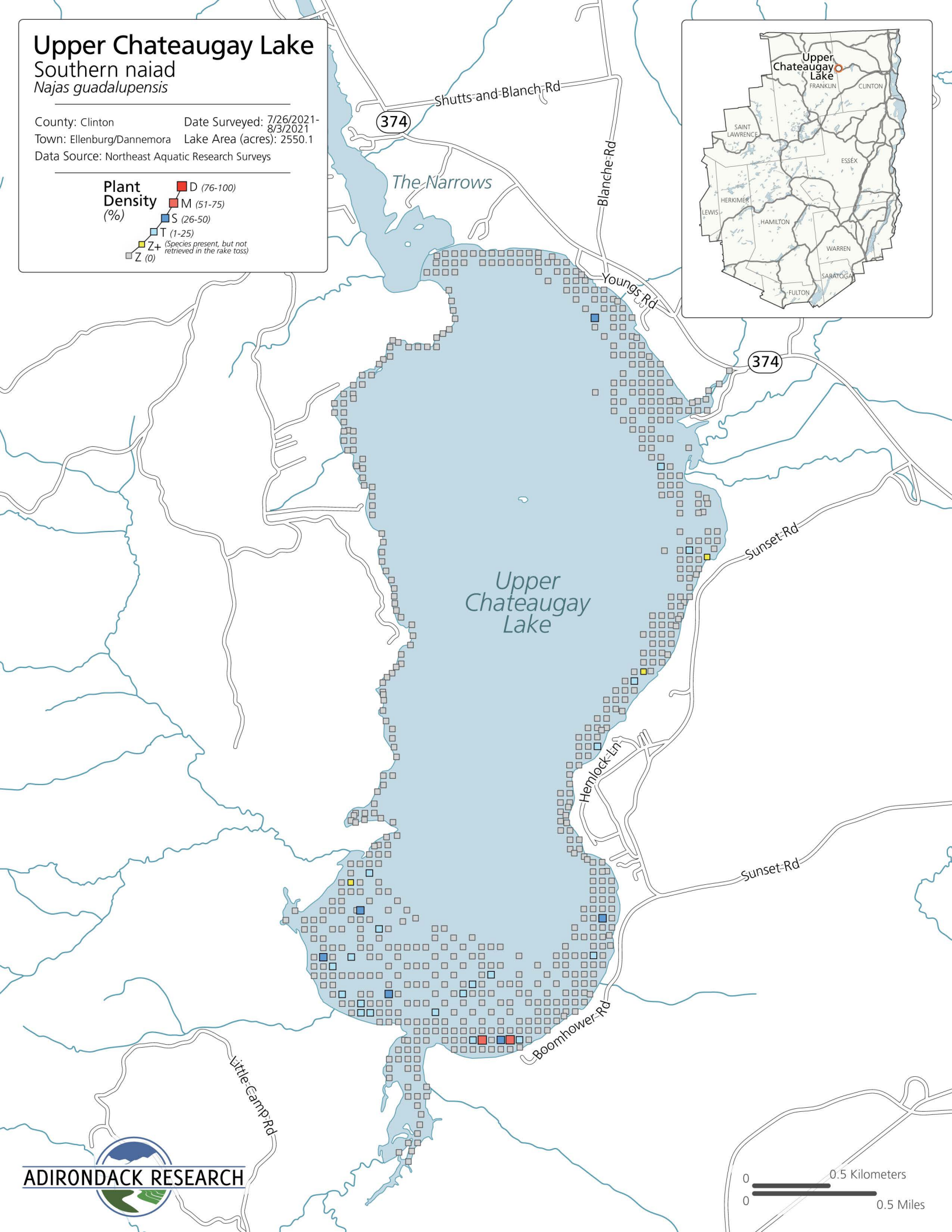
County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys





Upper Chateaugay Lake  
Southern naiad  
*Najas guadalupensis*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys





# Upper Chateaugay Lake

## Stonewort

*Nitella sp*

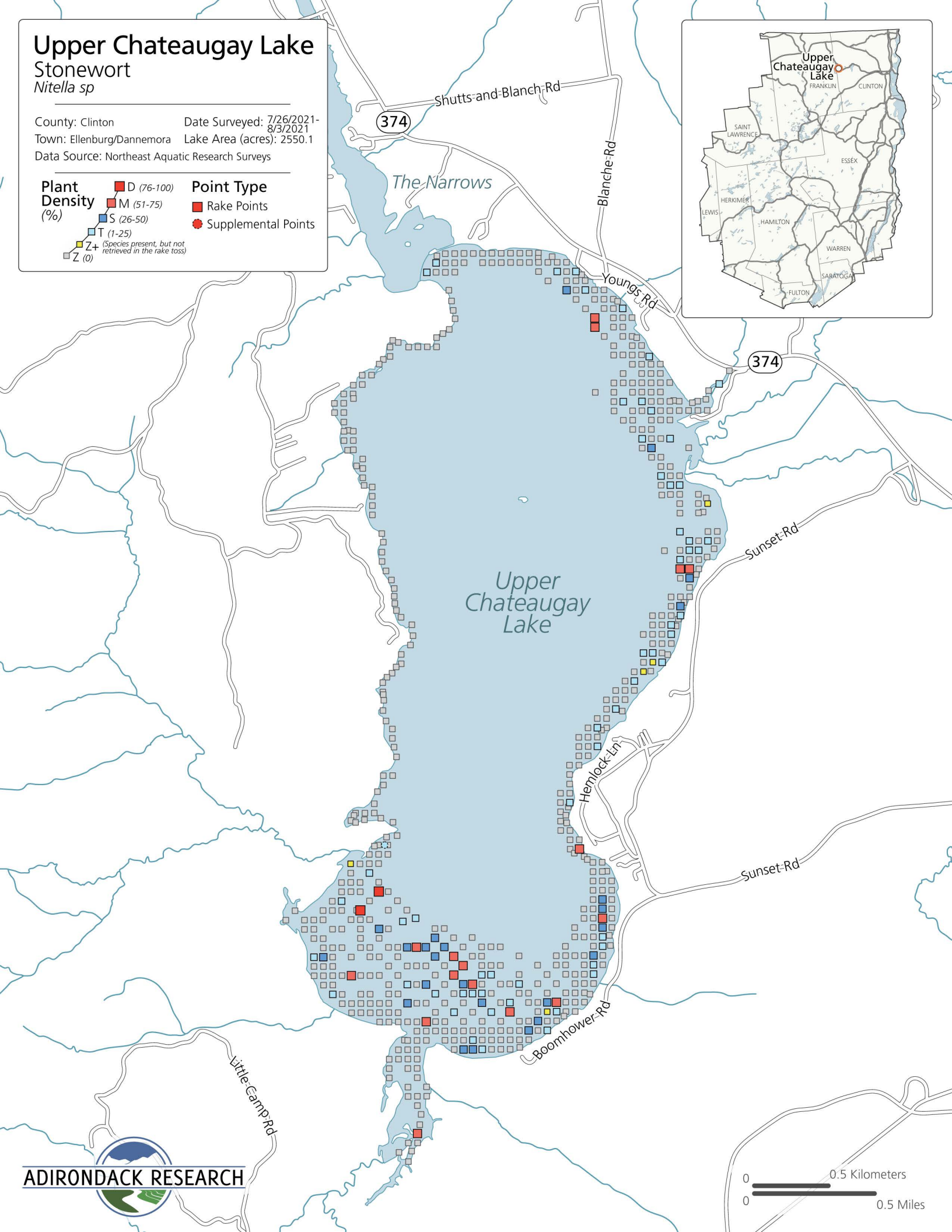
County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys

**Plant Density (%)**

- D (76-100)
- M (51-75)
- S (26-50)
- T (1-25)
- Z+ (Species present, but not retrieved in the rake toss)
- Z (0)

**Point Type**

- Rake Points
- Supplemental Points



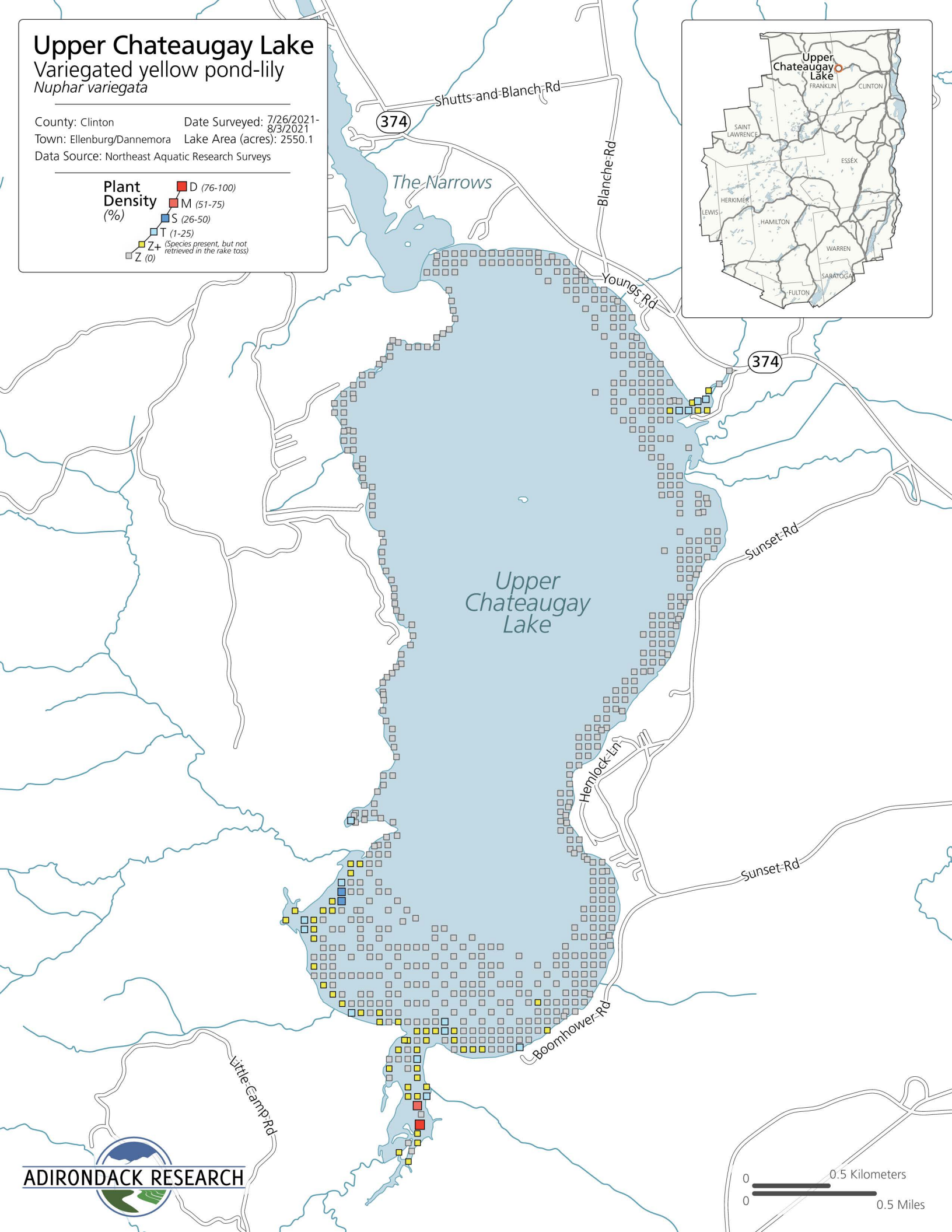
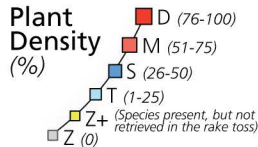


# Upper Chateaugay Lake

## Variegated yellow pond-lily

*Nuphar variegata*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys





# Upper Chateaugay Lake

Fragrant water lily  
*Nymphaea odorata*

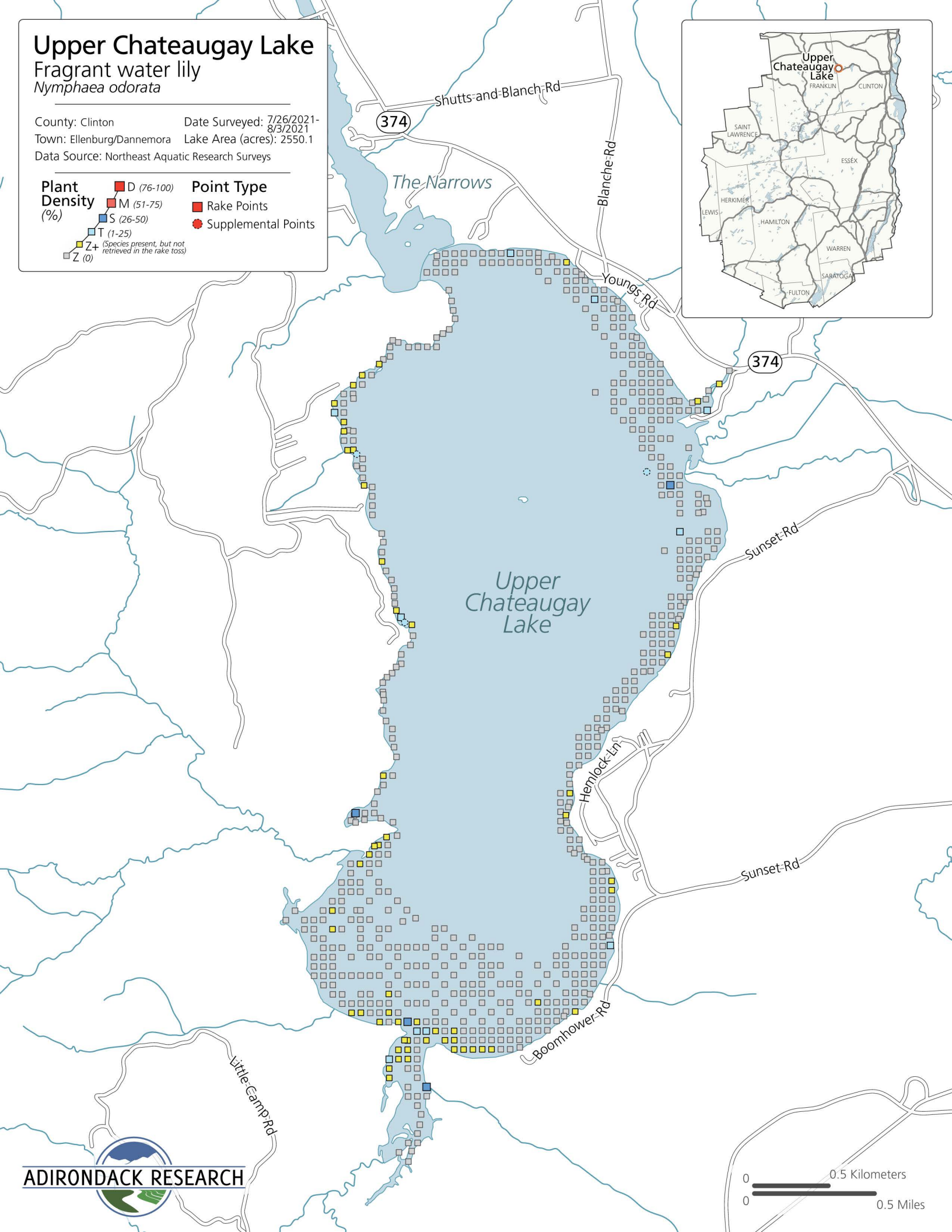
County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys

**Plant Density (%)**

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- S (26-50)
- T (1-25)
- Z+ (Species present, but not retrieved in the rake toss)
- Z (0)

**Point Type**

- Rake Points
- Supplemental Points





# Upper Chateaugay Lake

## Tuberous water lily

*Nymphaea tuberosa*

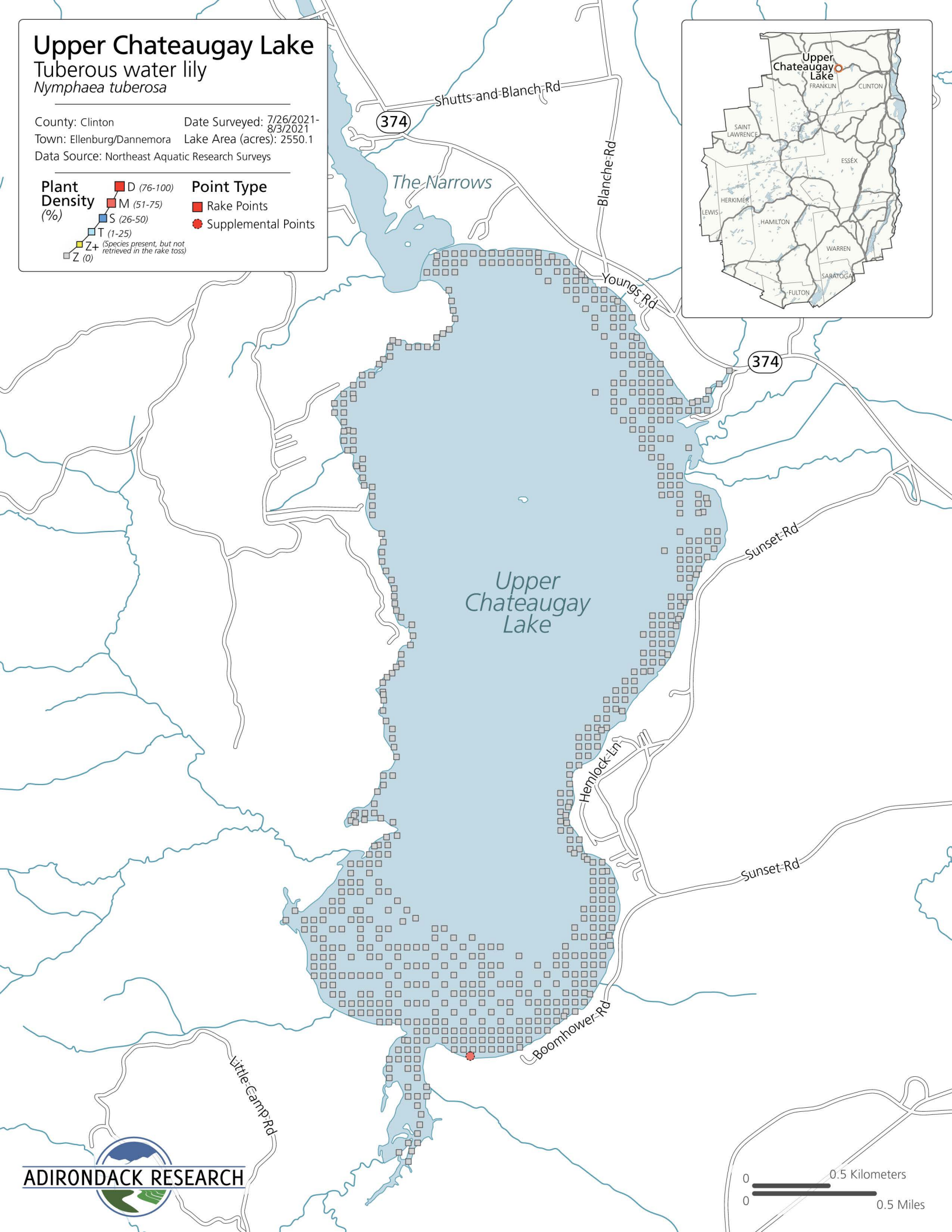
County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
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**Point Type**

- Rake Points
- Supplemental Points



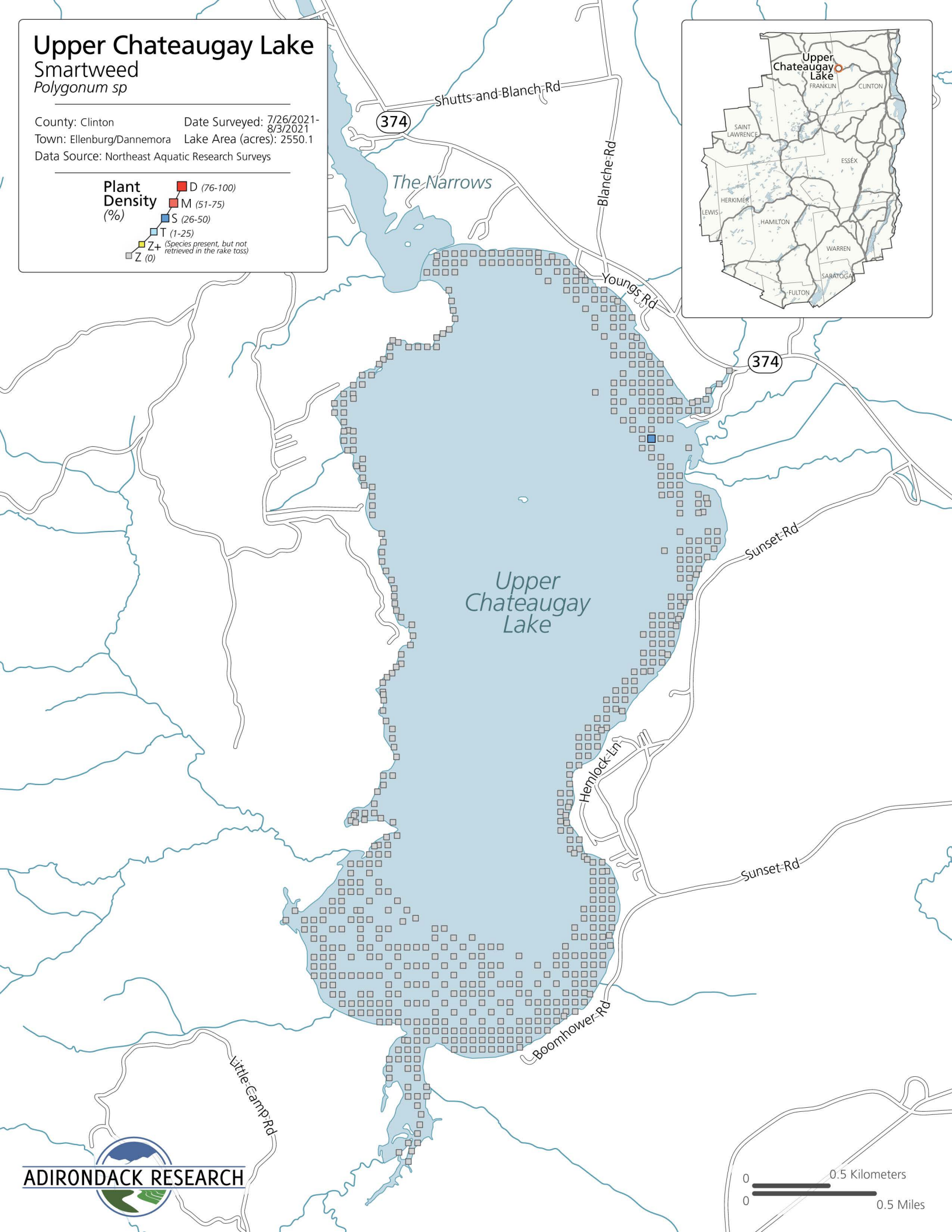
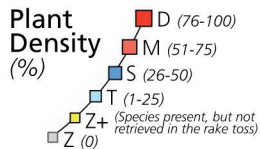


# Upper Chateaugay Lake

## Smartweed

*Polygonum sp*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



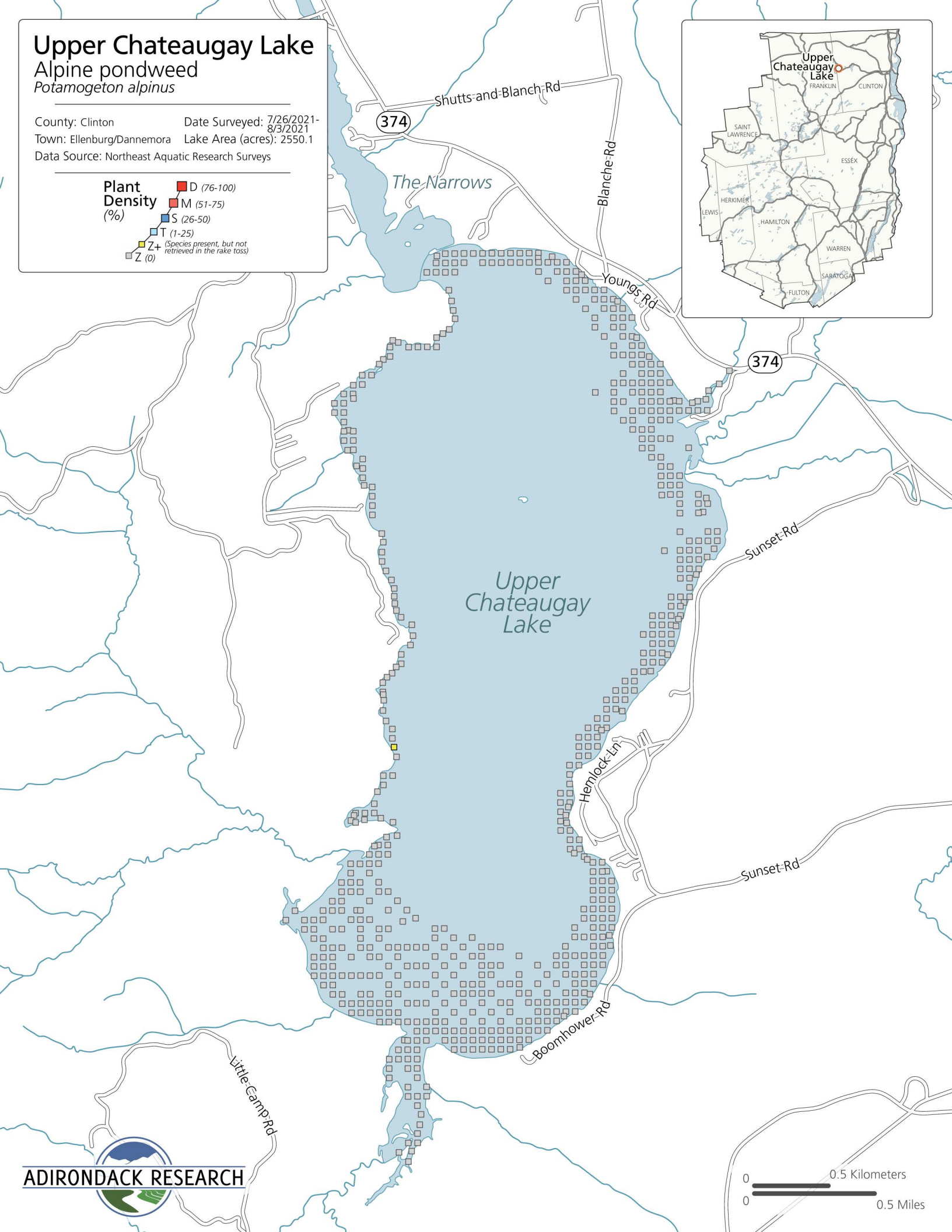
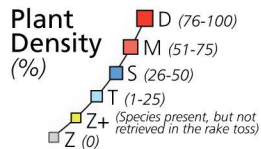


# Upper Chateaugay Lake

## Alpine pondweed

*Potamogeton alpinus*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys





# Upper Chateaugay Lake

## Large-leaved pondweed

*Potamogeton amplifolius*

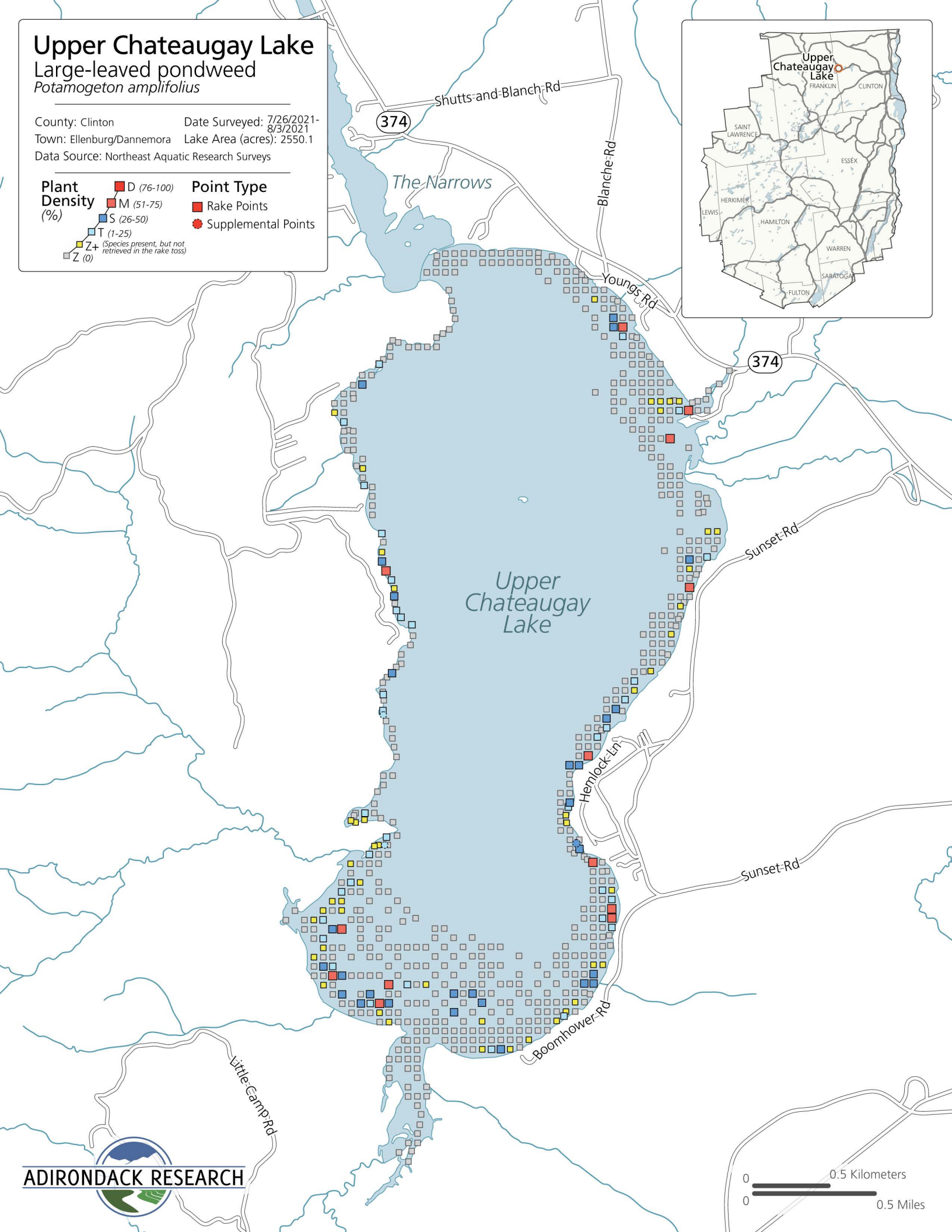
County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys

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- Z (0)

**Point Type**

- Rake Points
- Supplemental Points





# Upper Chateaugay Lake

## Grass-leaved pondweed

*Potamogeton gramineus*

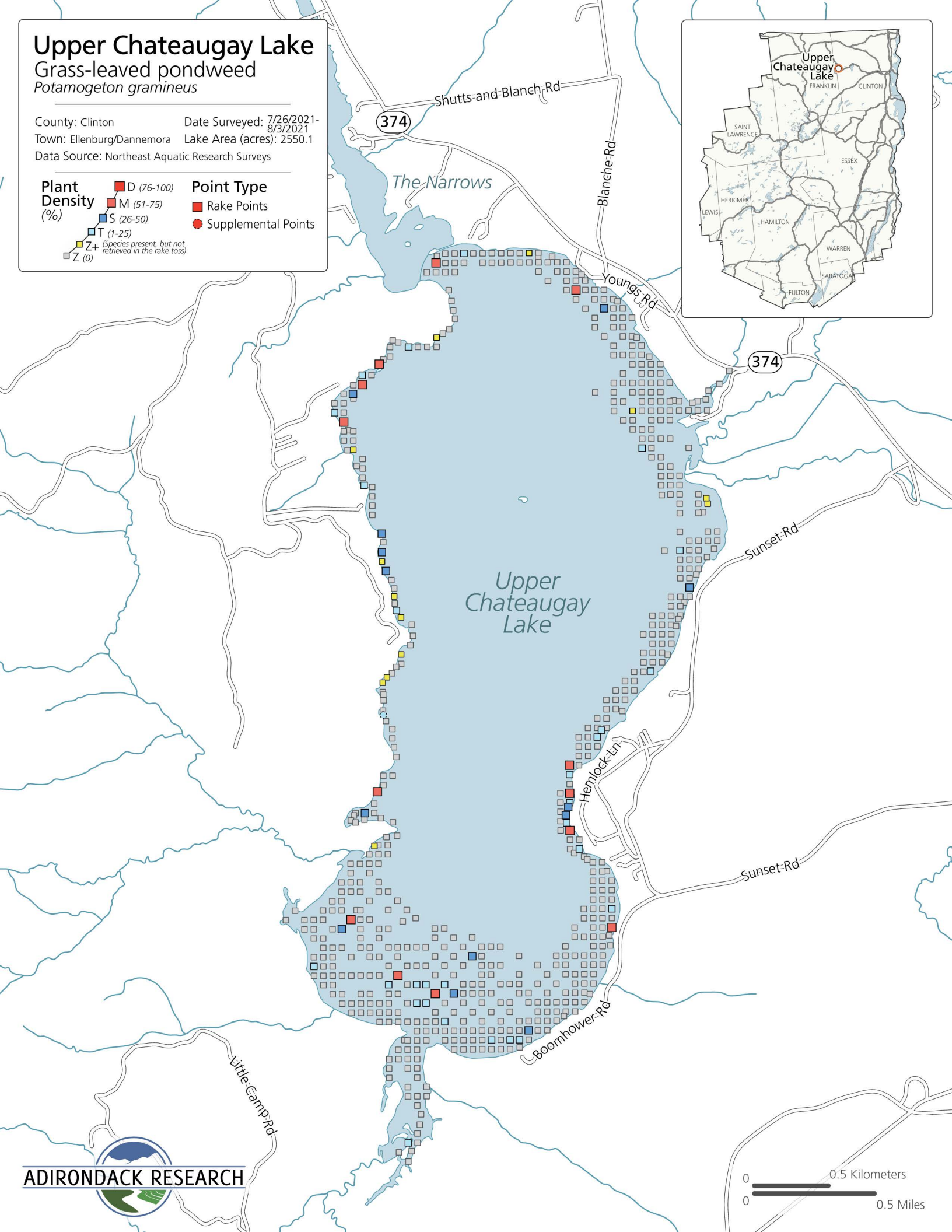
County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys

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**Point Type**

- Rake Points
- Supplemental Points

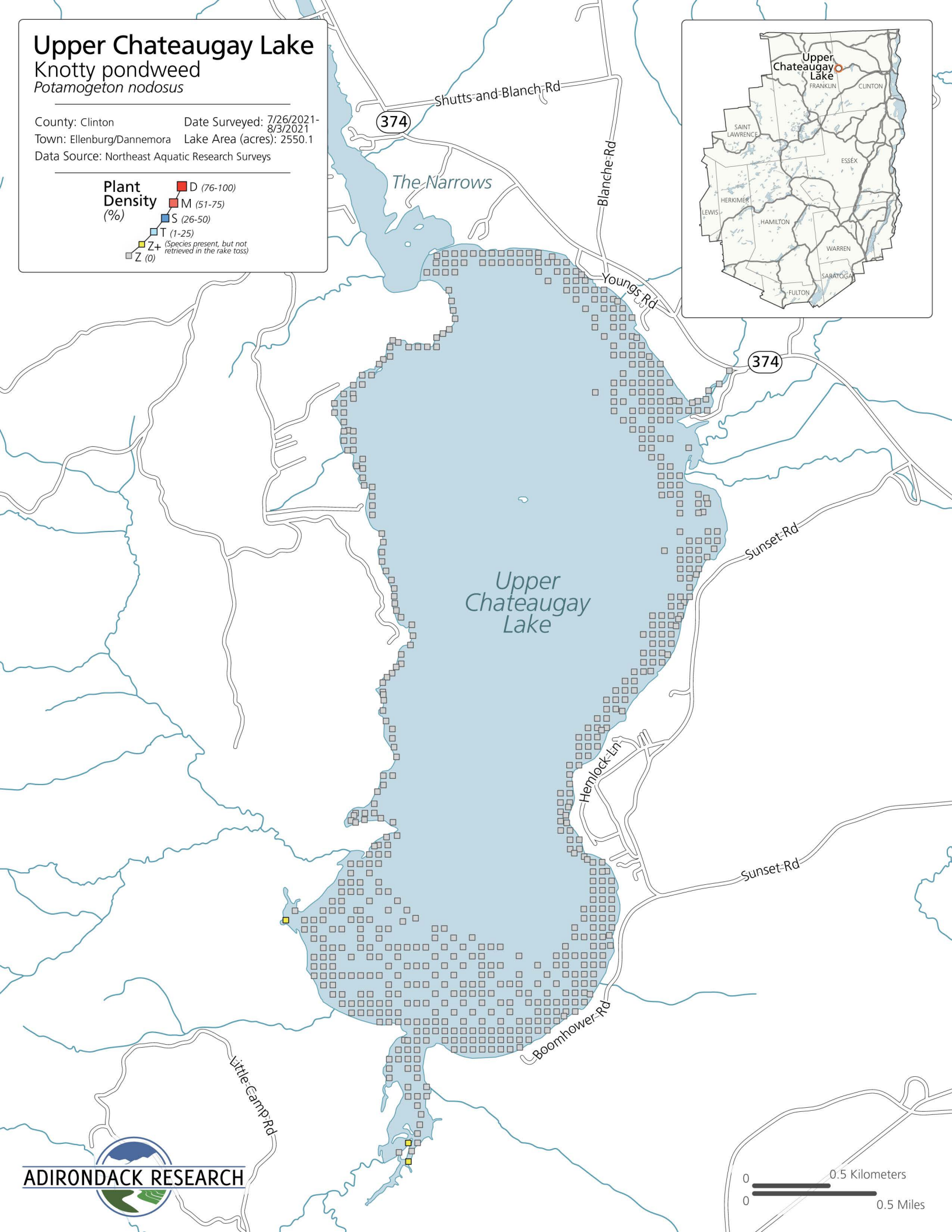




# Upper Chateaugay Lake

Knotty pondweed  
*Potamogeton nodosus*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



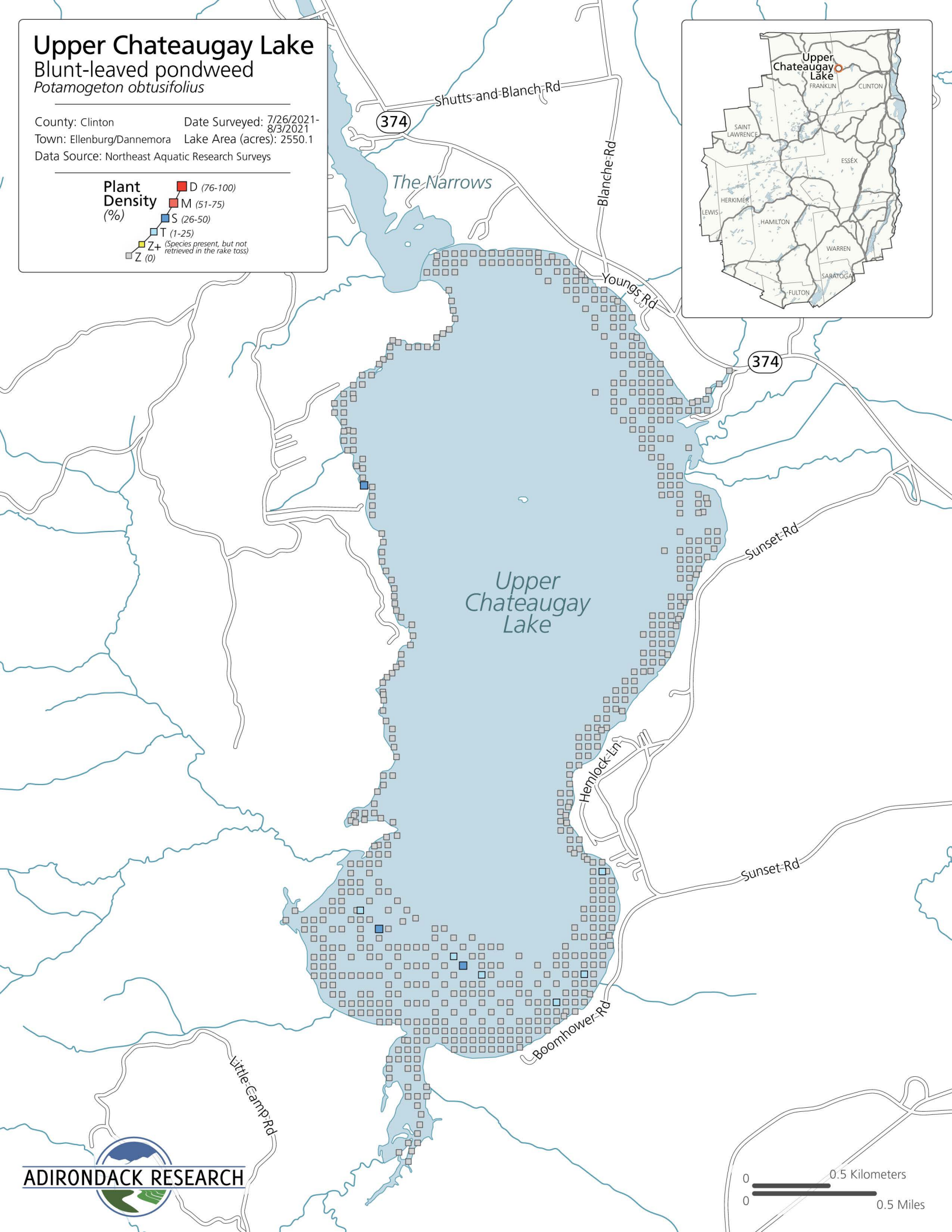


# Upper Chateaugay Lake

## Blunt-leaved pondweed

*Potamogeton obtusifolius*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys





# Upper Chateaugay Lake

## Clasping-leaved pondweed

*Potamogeton perfoliatus*

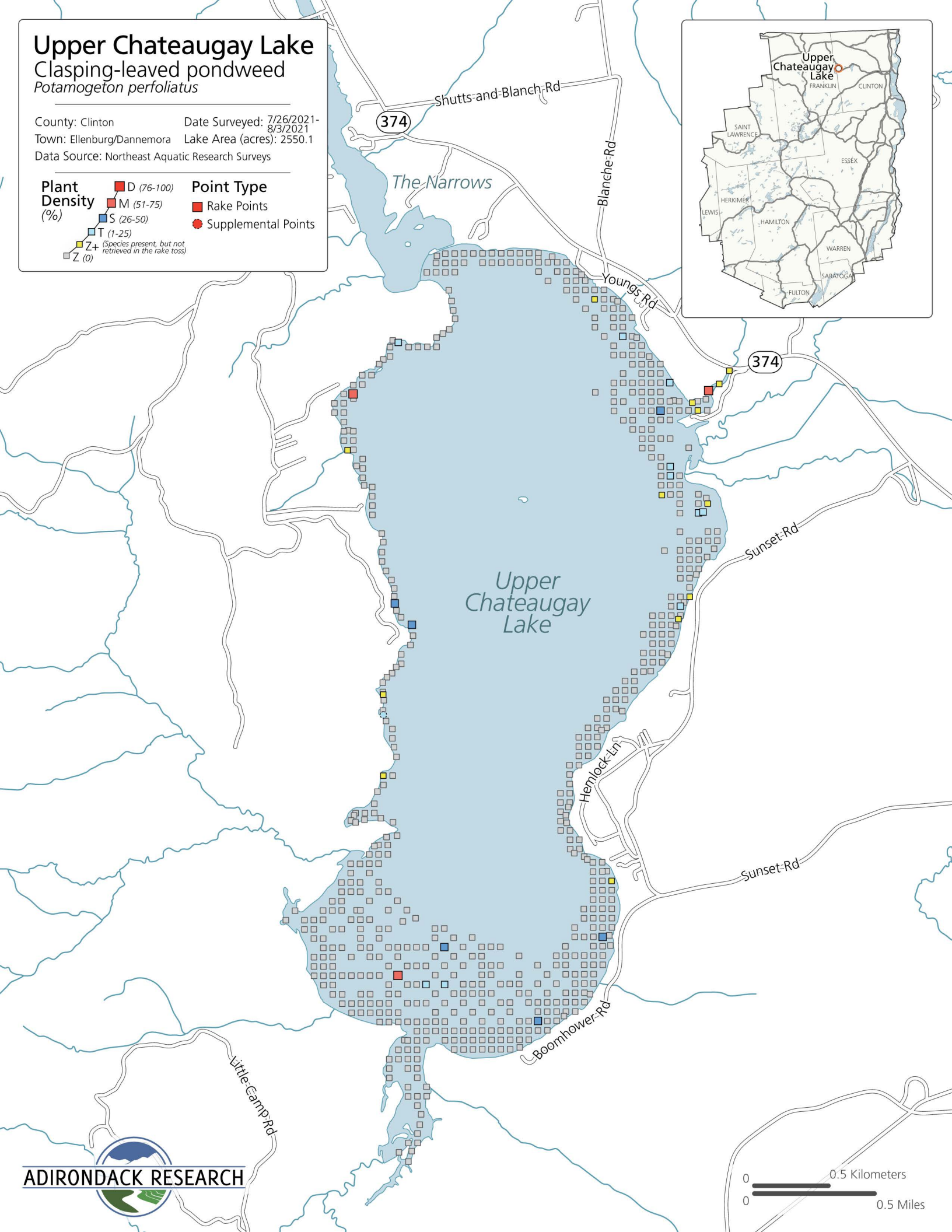
County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
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- Z (0)

**Point Type**

- Rake Points
- Supplemental Points





# Upper Chateaugay Lake

Small pondweed  
*Potamogeton pusillus*

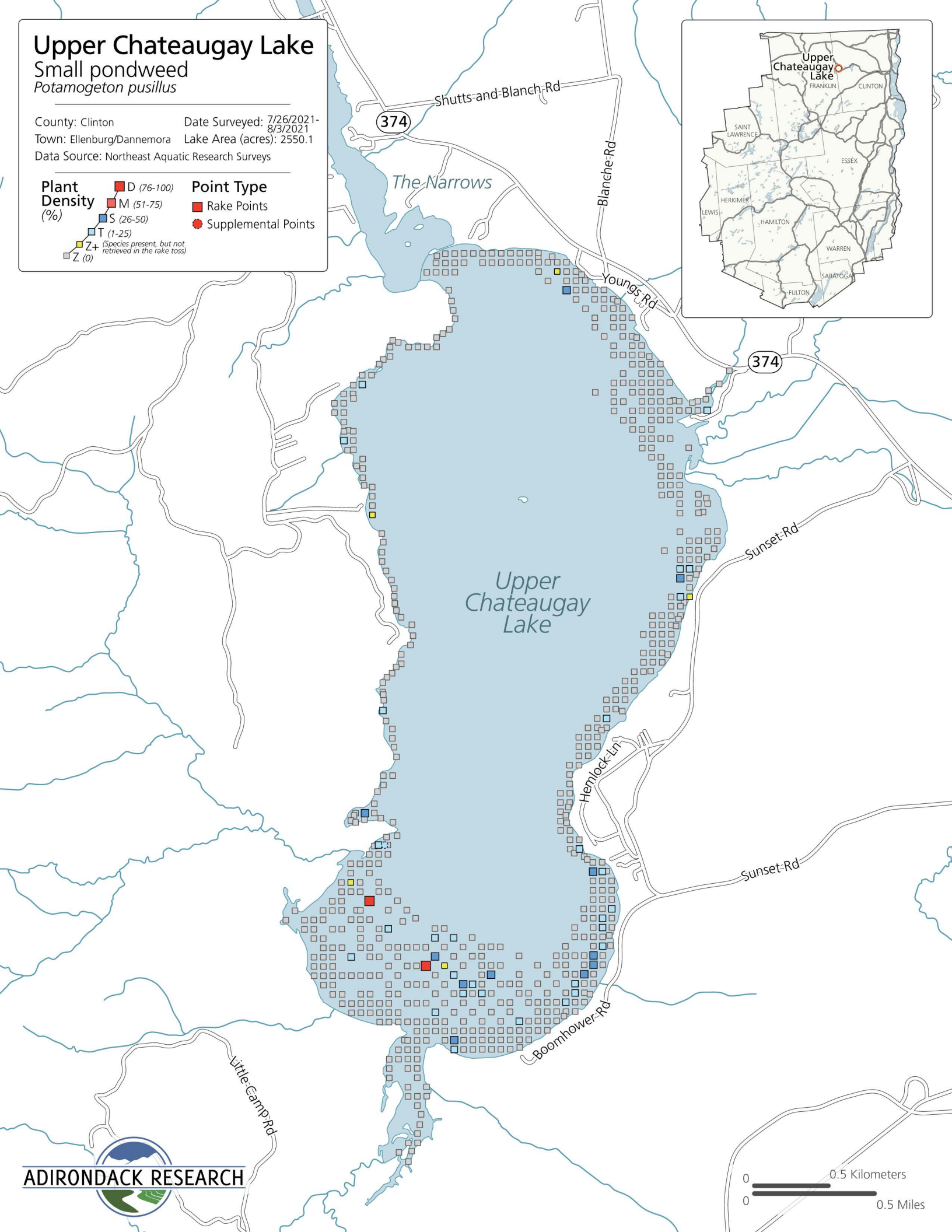
County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
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**Point Type**

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- Supplemental Points



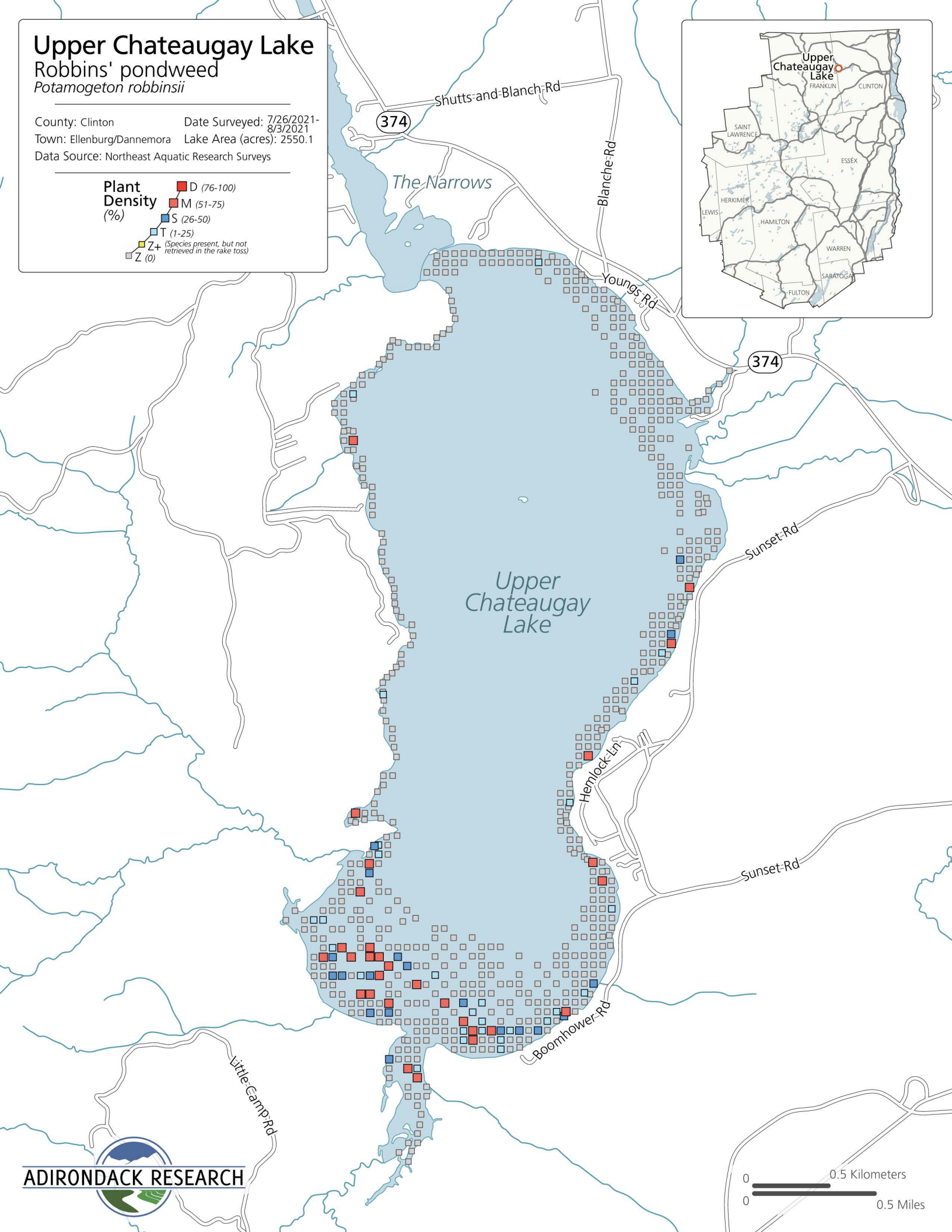


# Upper Chateaugay Lake

## Robbins' pondweed

*Potamogeton robbinsii*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



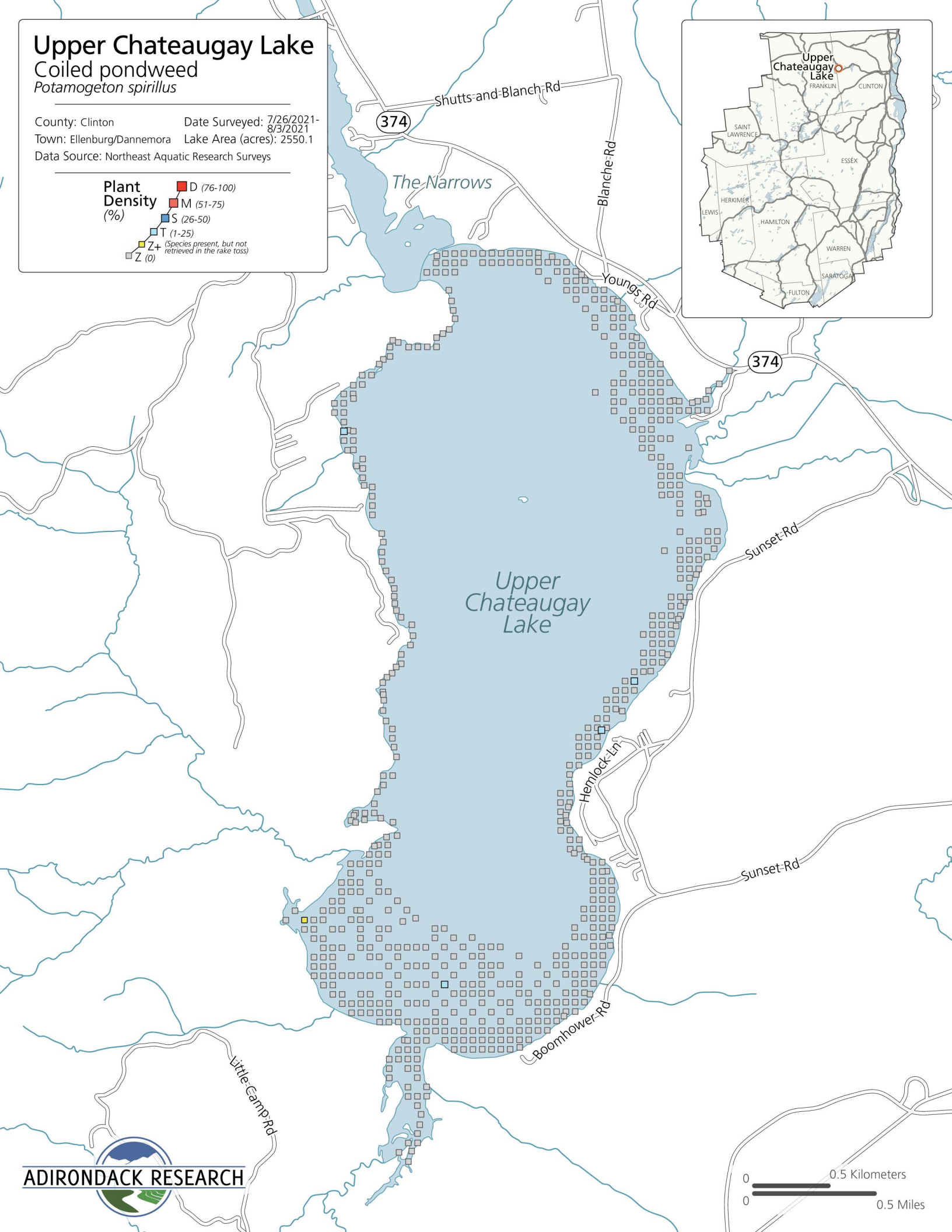


# Upper Chateaugay Lake

## Coiled pondweed

*Potamogeton spirillus*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



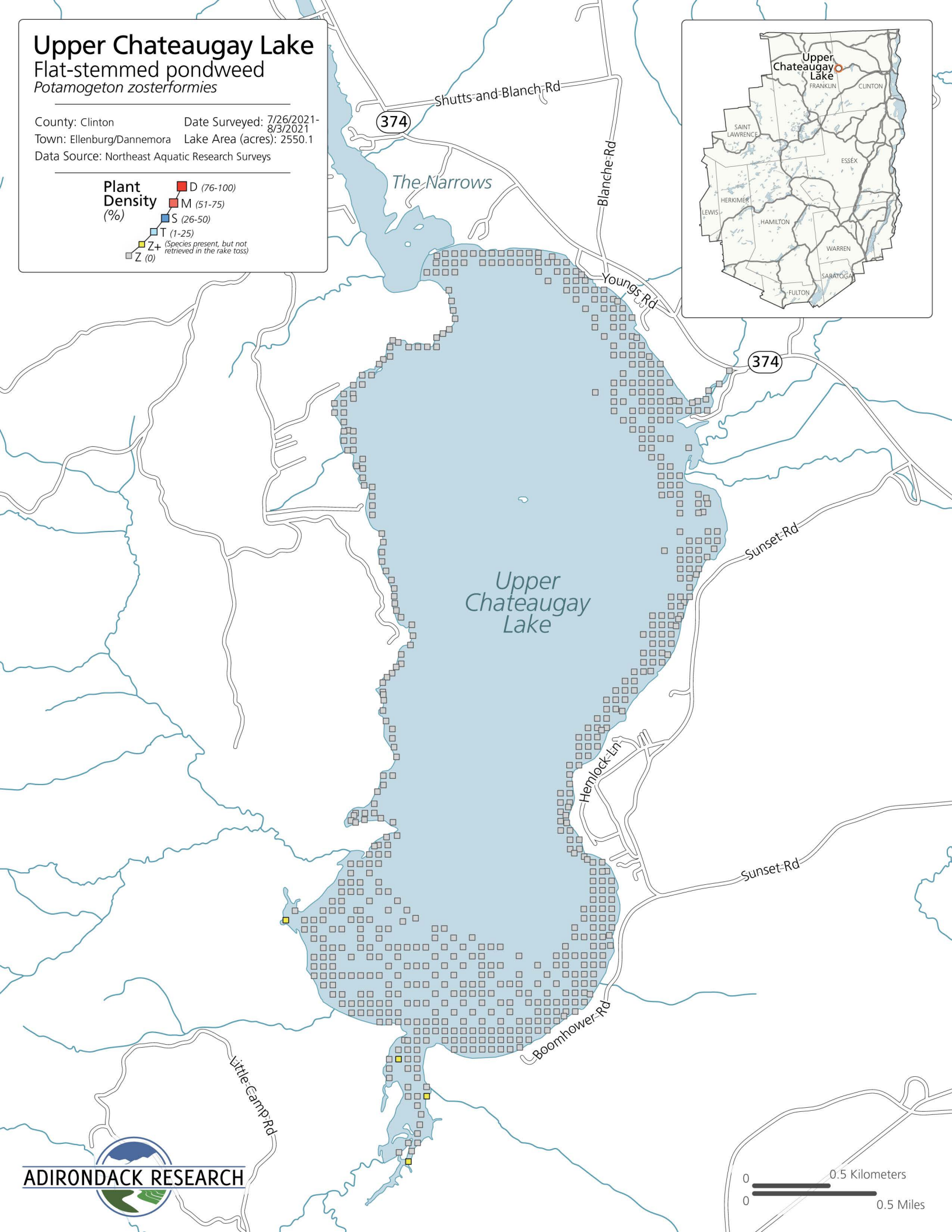
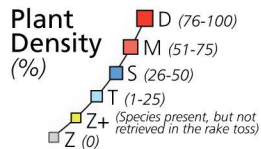


# Upper Chateaugay Lake

## Flat-stemmed pondweed

*Potamogeton zosterformis*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys





# Upper Chateaugay Lake

## Thread-leaved crowfoot

*Ranunculus trichophyllus*

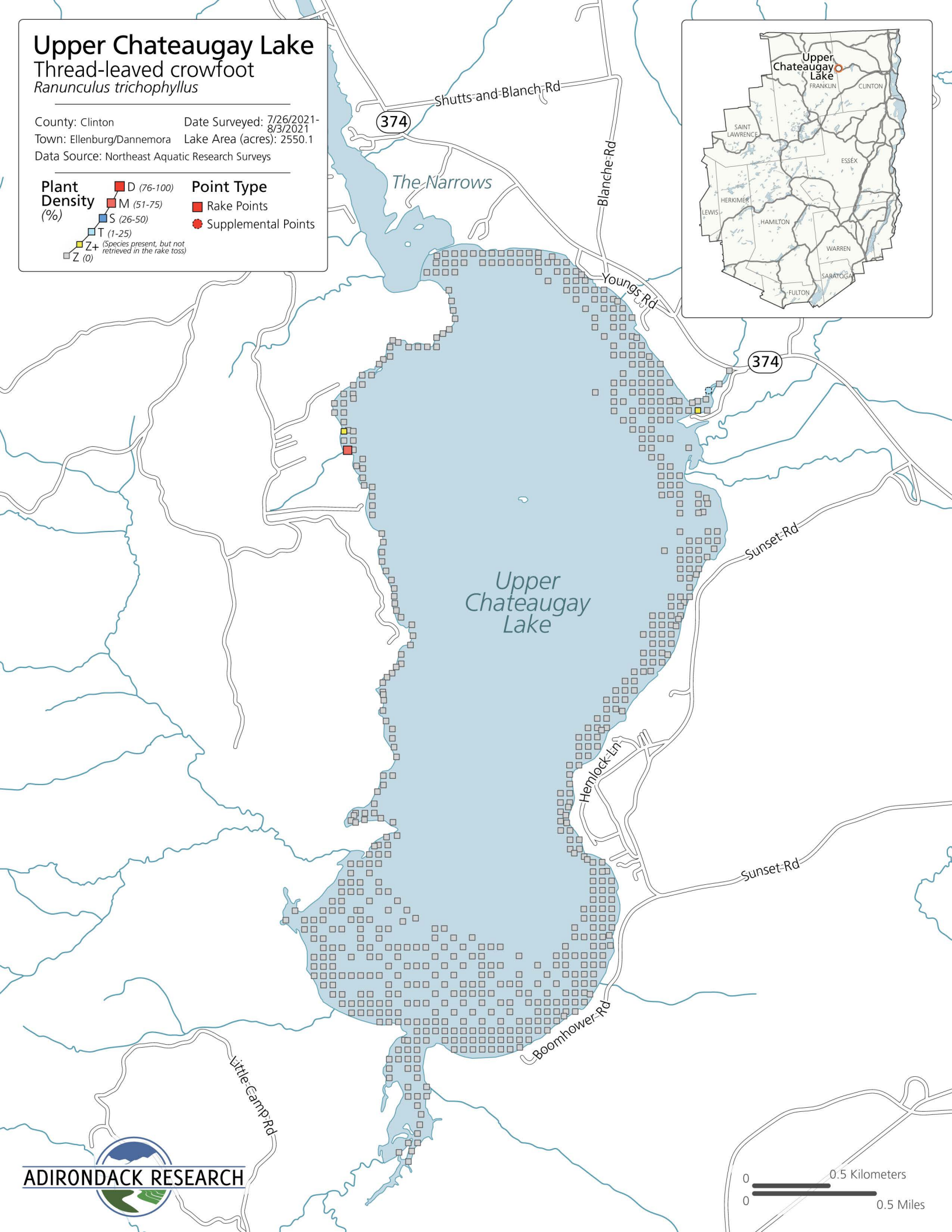
County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys

**Plant Density (%)**

- D (76-100)
- M (51-75)
- S (26-50)
- T (1-25)
- Z+ (Species present, but not retrieved in the rake toss)
- Z (0)

**Point Type**

- Rake Points
- Supplemental Points





# Upper Chateaugay Lake

## Grass-leaved arrowhead

*Sagittaria graminea*

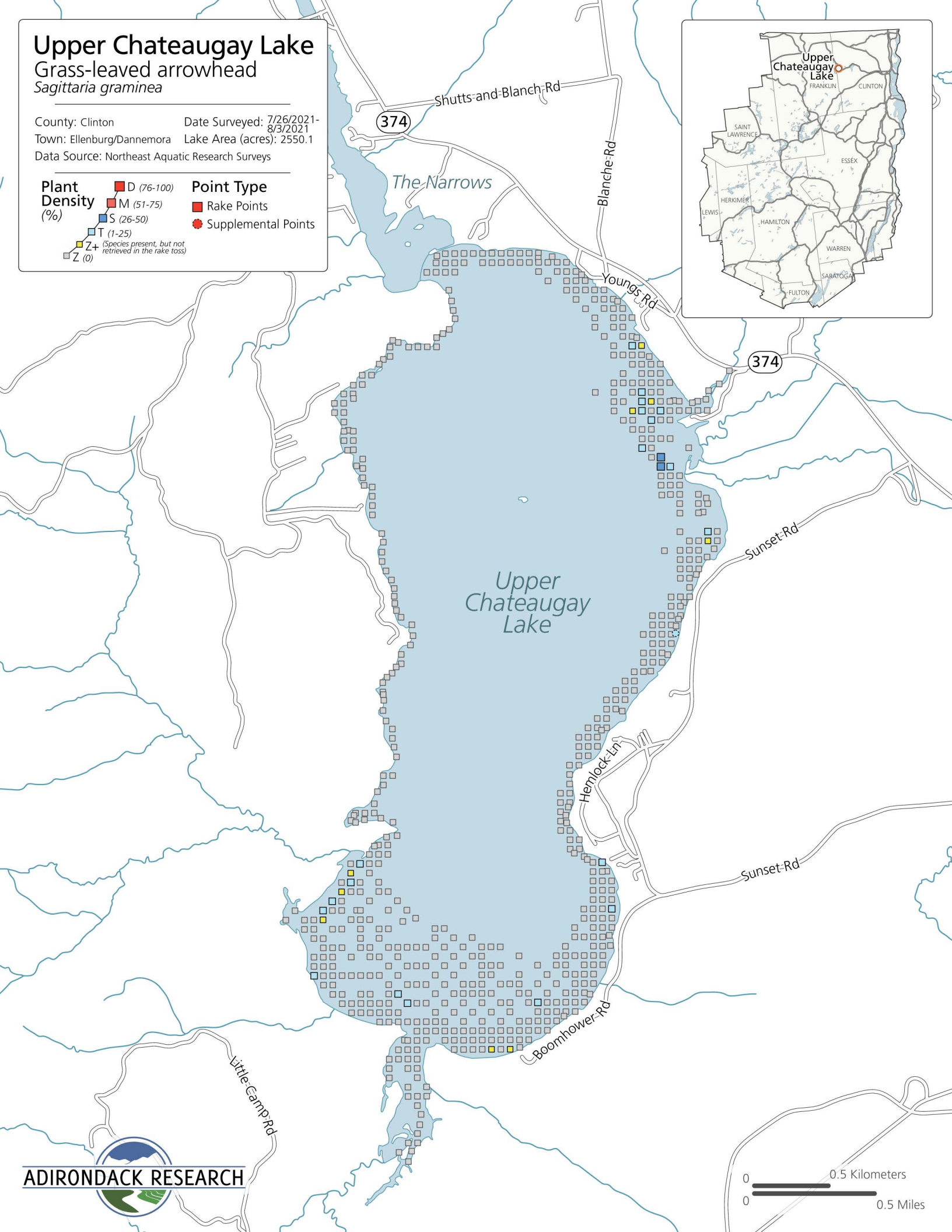
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- Z (0)

**Point Type**

- Rake Points
- Supplemental Points



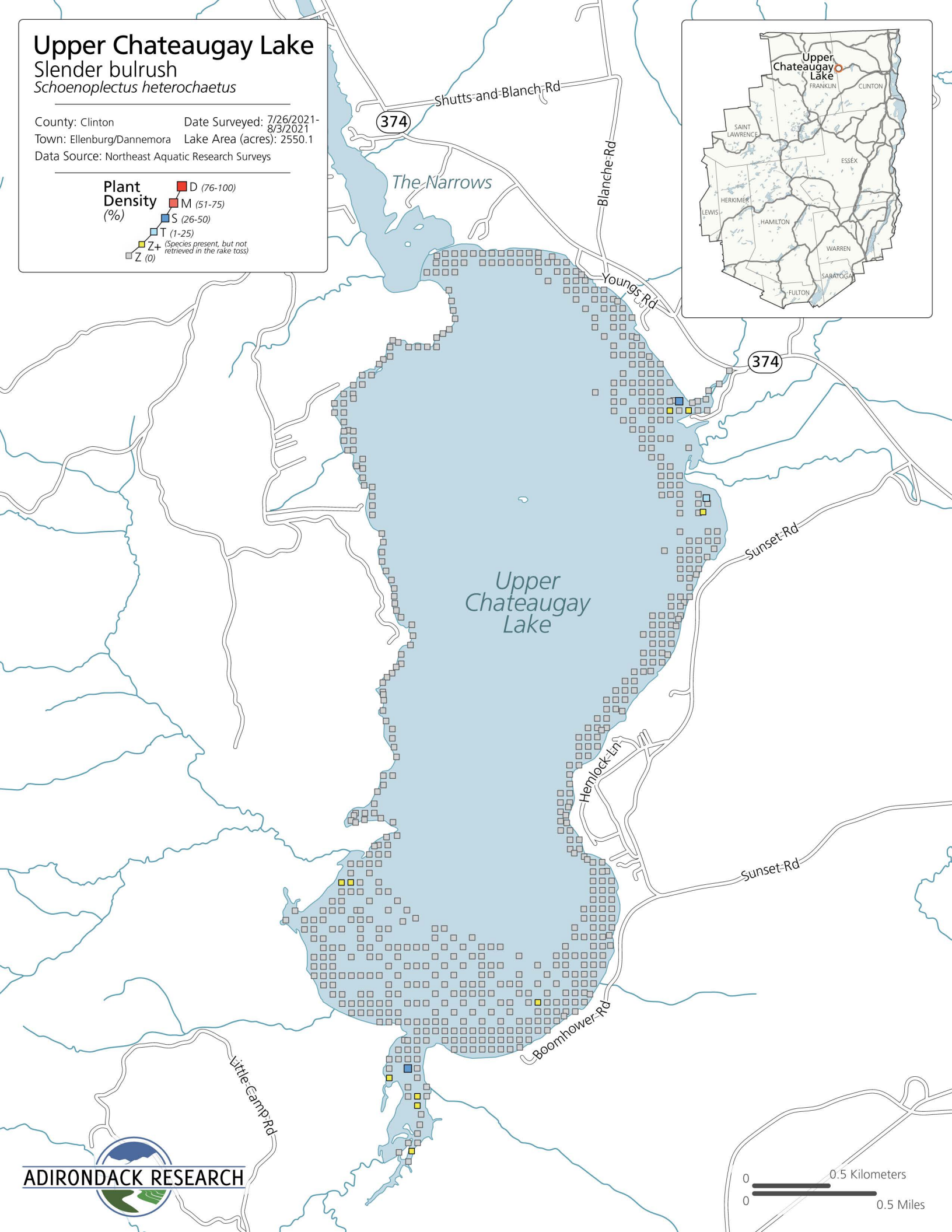
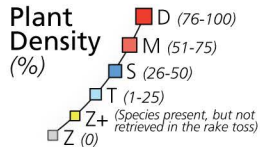


# Upper Chateaugay Lake

## Slender bulrush

*Schoenoplectus heterochaetus*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



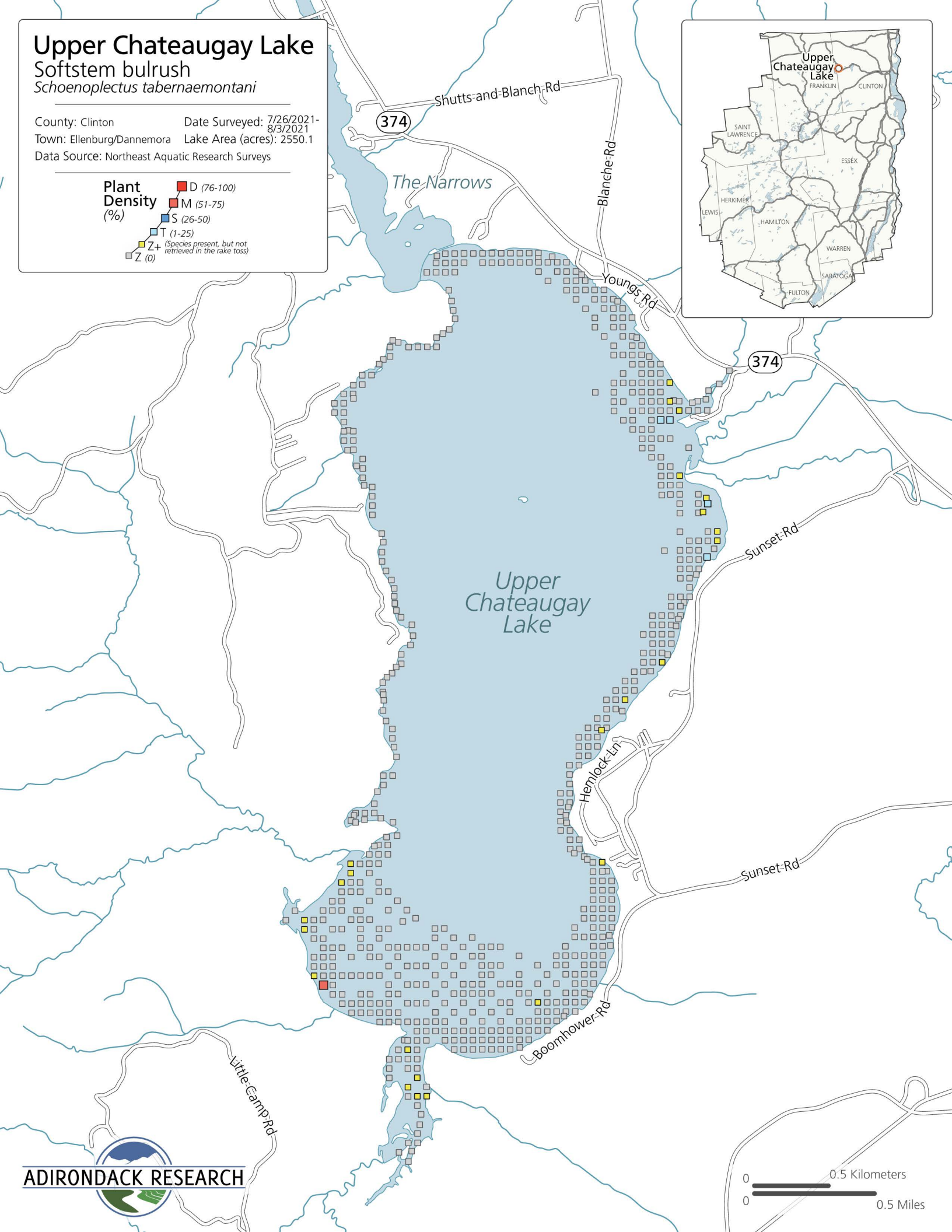
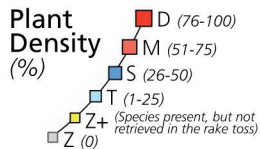


# Upper Chateaugay Lake

## Softstem bulrush

*Schoenoplectus tabernaemontani*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



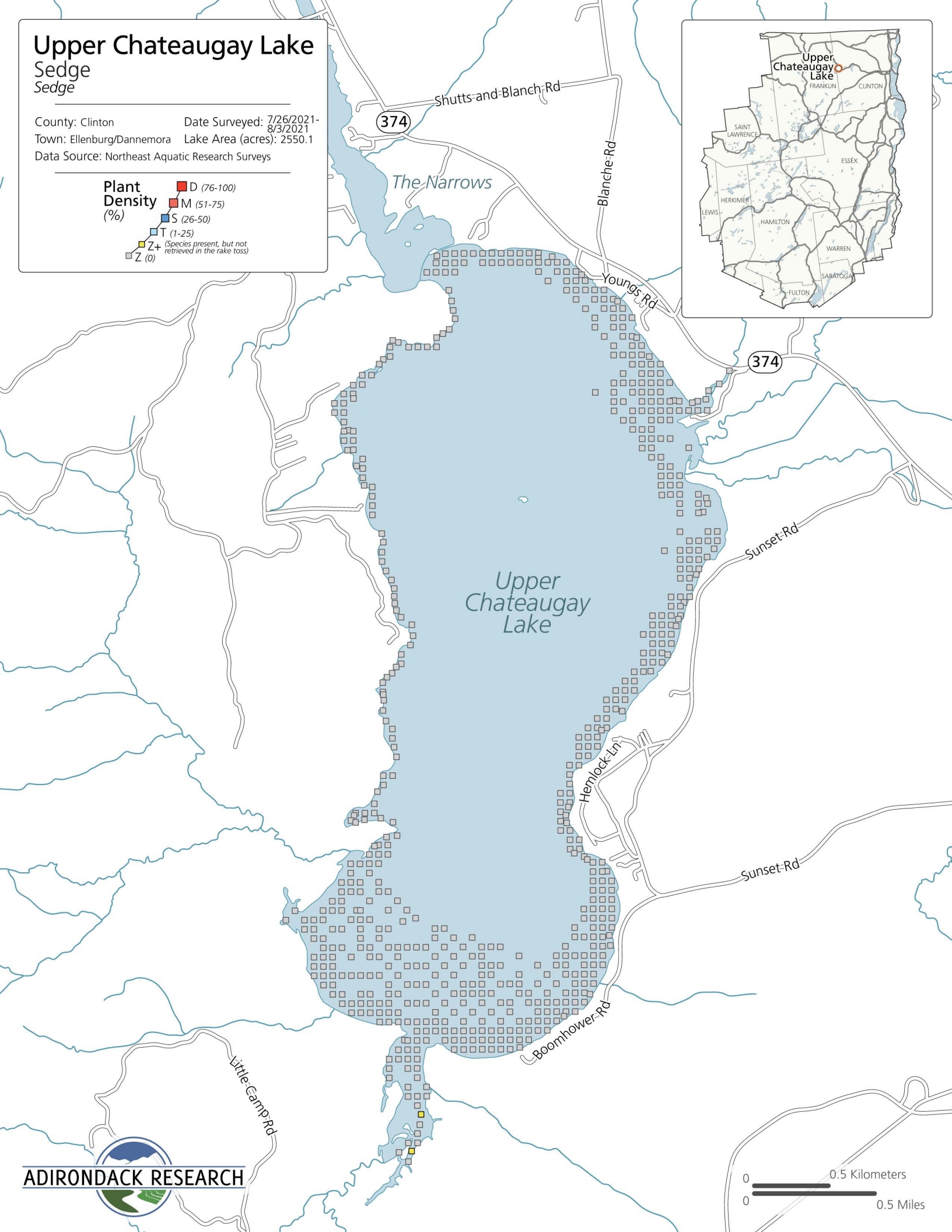


# Upper Chateaugay Lake

## Sedge

## Sedge

County: Clinton Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



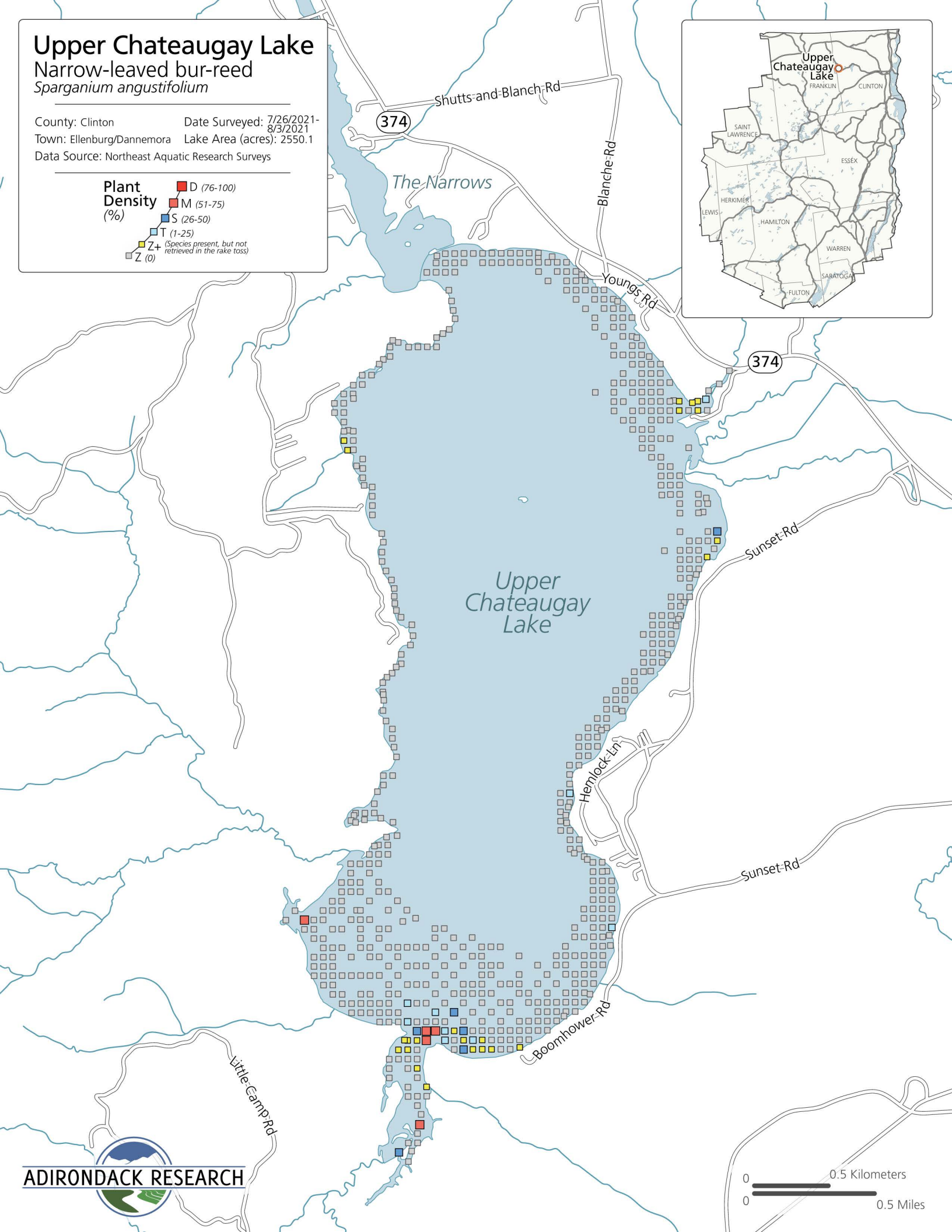


# Upper Chateaugay Lake

## Narrow-leaved bur-reed

*Sparganium angustifolium*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



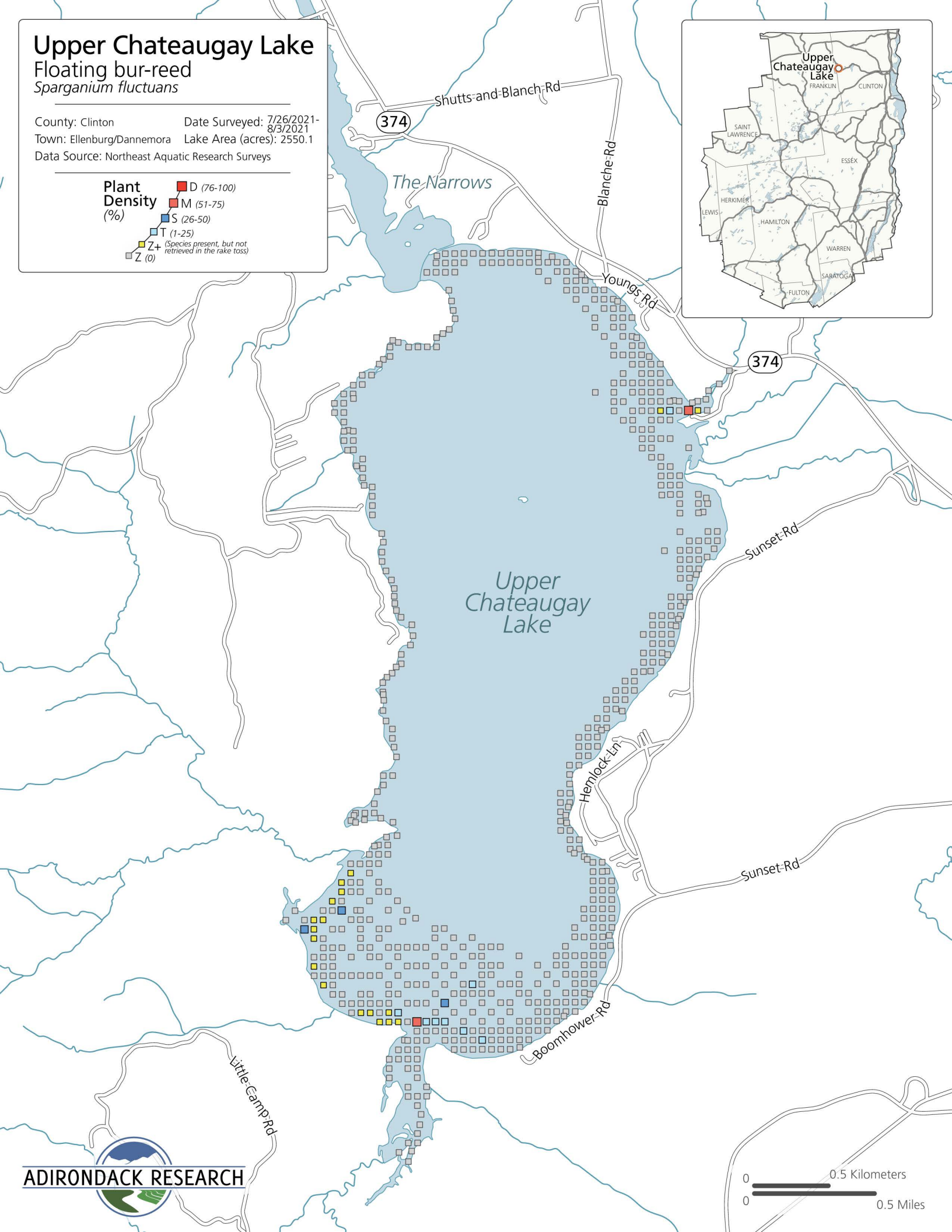
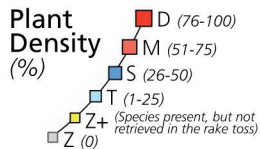


# Upper Chateaugay Lake

## Floating bur-reed

*Sparganium fluctuans*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



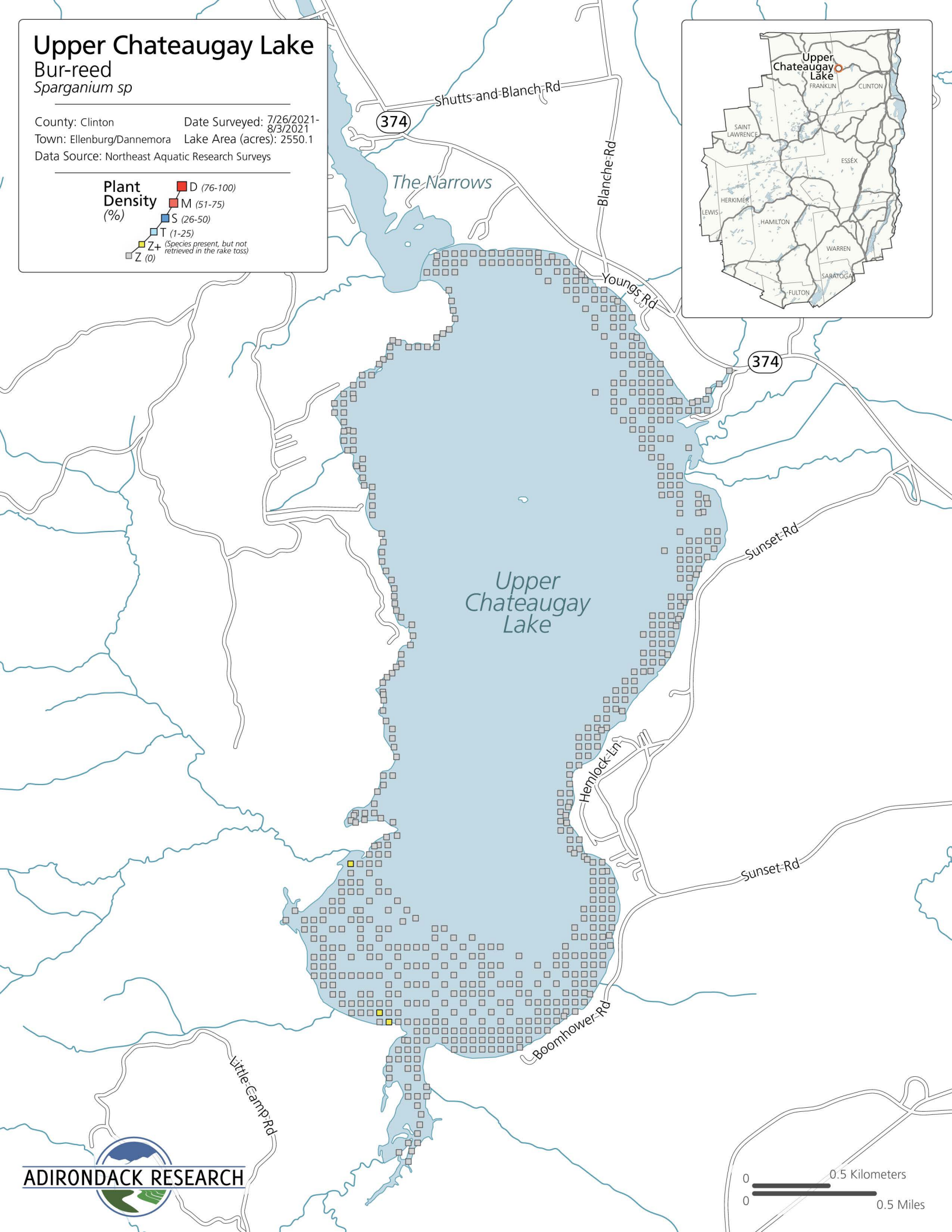


# Upper Chateaugay Lake

## Bur-reed

*Sparganium sp*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys



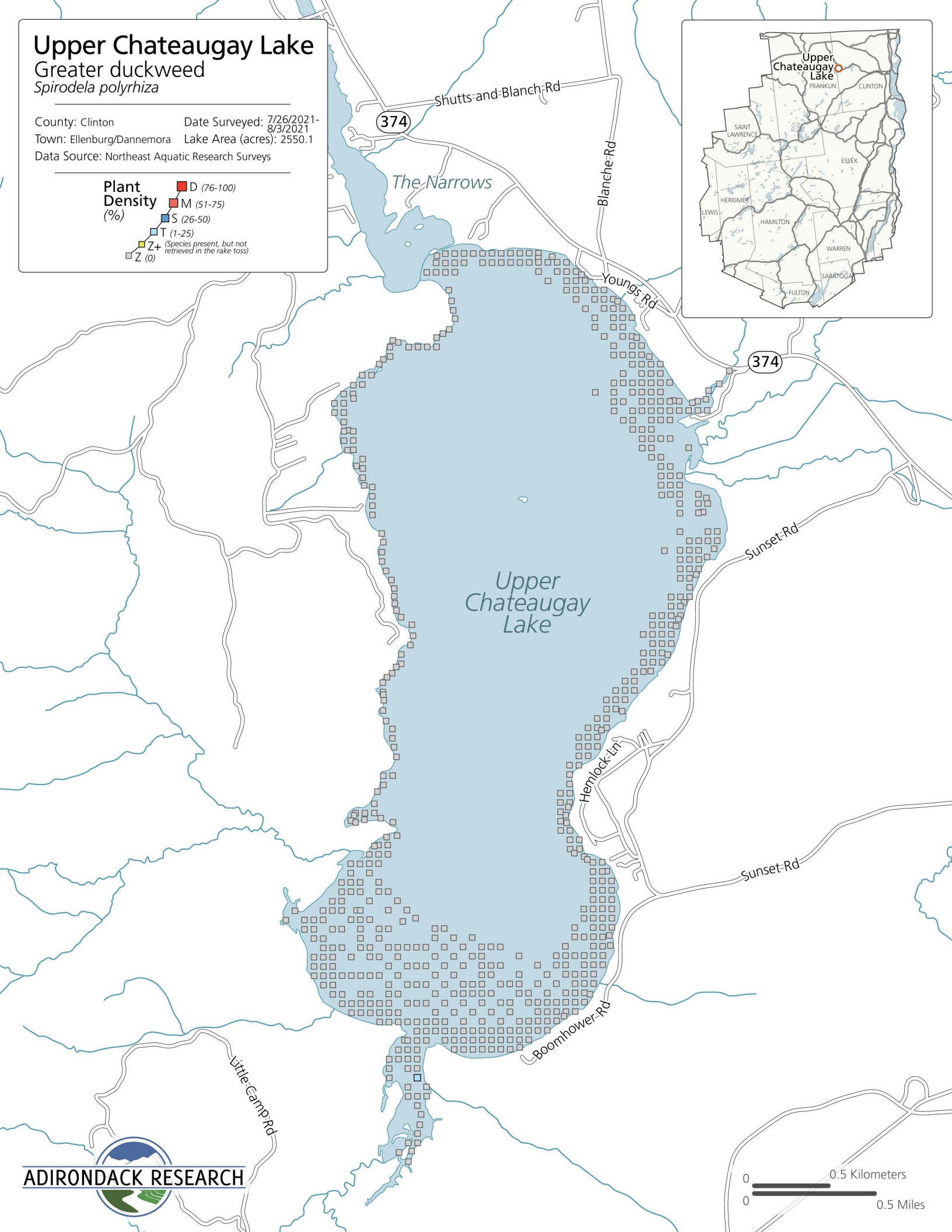


# Upper Chateaugay Lake

## Greater duckweed

*Spirodela polyrhiza*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys





# Upper Chateaugay Lake

## Cattail

*Typha sp*

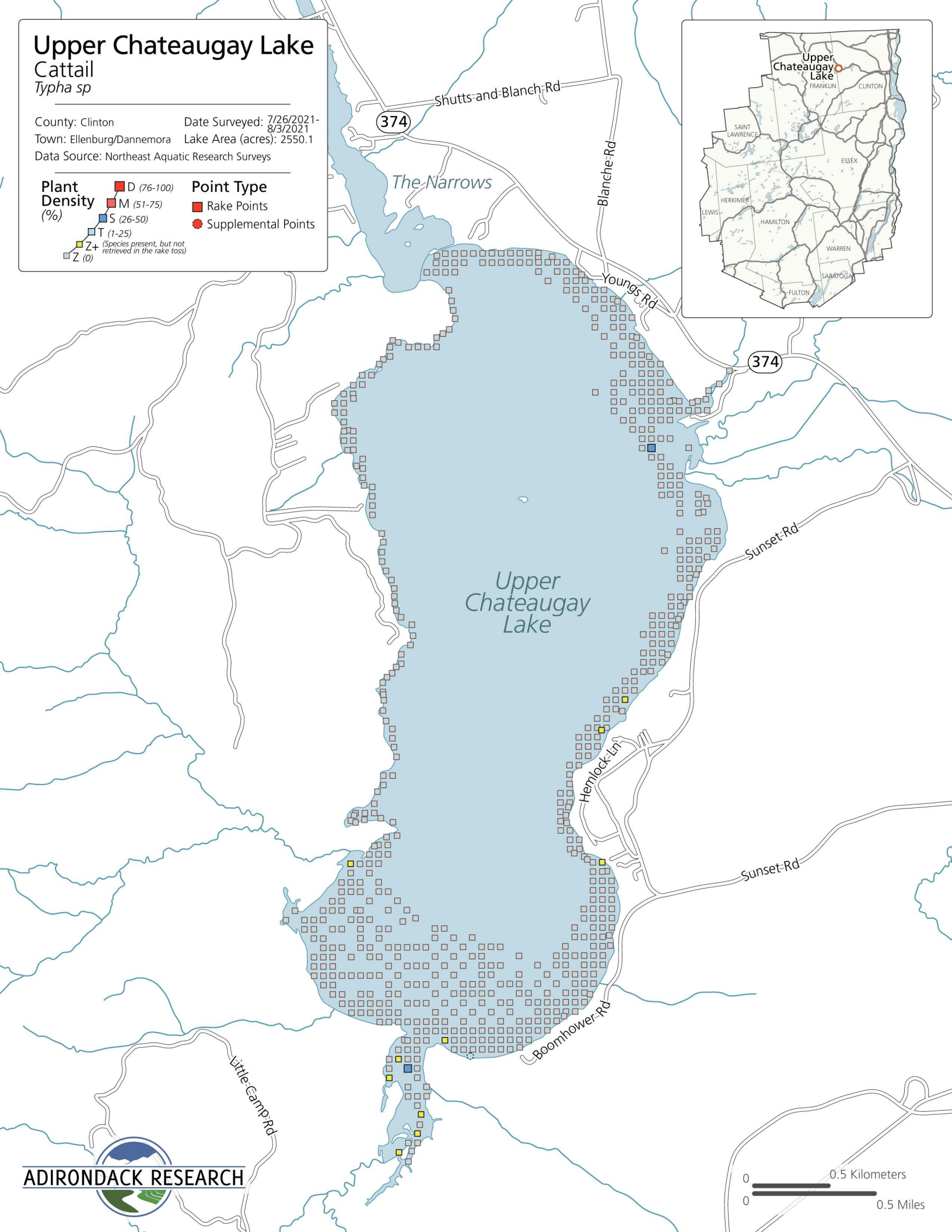
County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
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Data Source: Northeast Aquatic Research Surveys

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- S (26-50)
- T (1-25)
- Z+ (Species present, but not retrieved in the rake toss)
- Z (0)

**Point Type**

- Rake Points
- Supplemental Points





# Upper Chateaugay Lake

## Common bladderwort

*Utricularia macrorhiza*

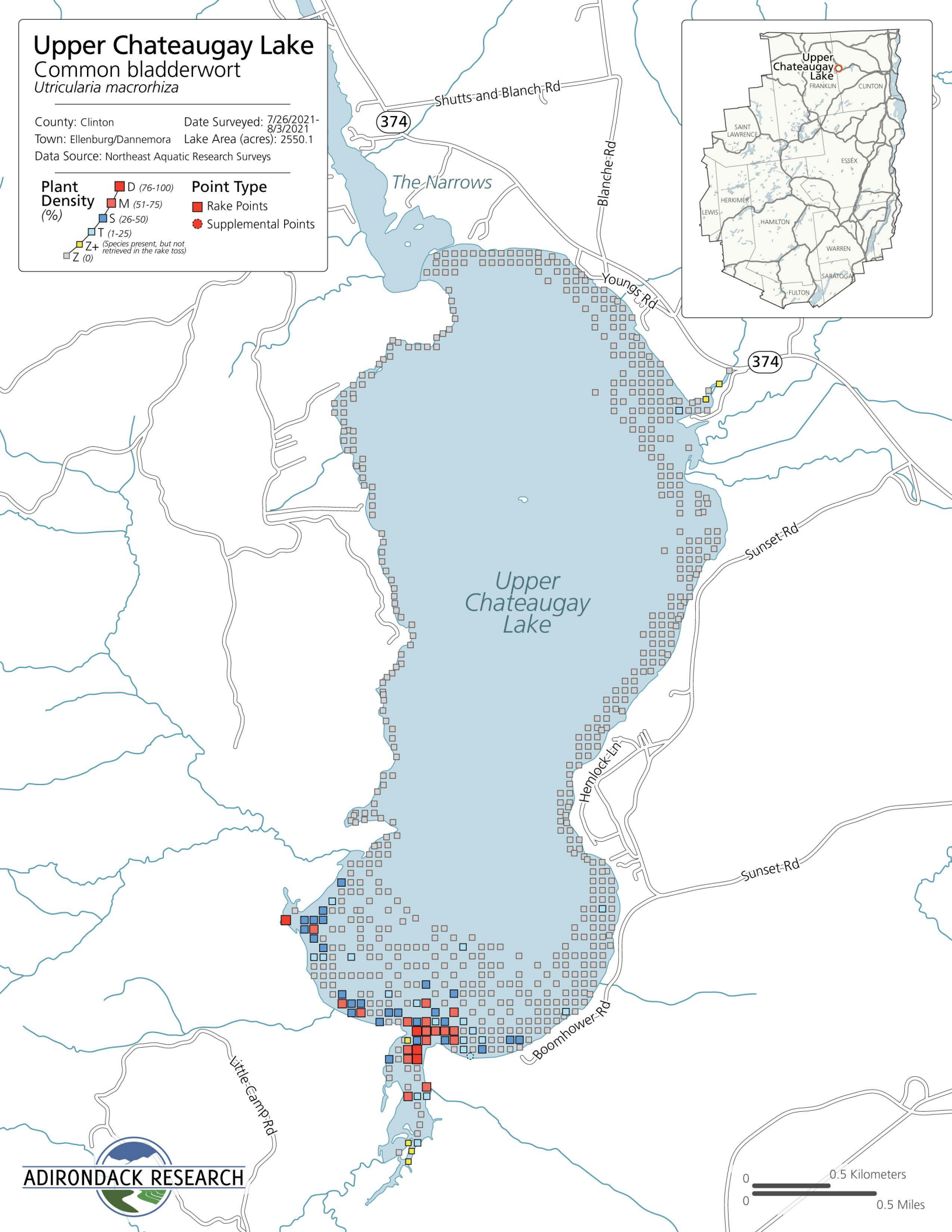
County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys

**Plant Density (%)**

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- T (1-25)
- Z+ (Species present, but not retrieved in the rake toss)
- Z (0)

**Point Type**

- Rake Points
- Supplemental Points



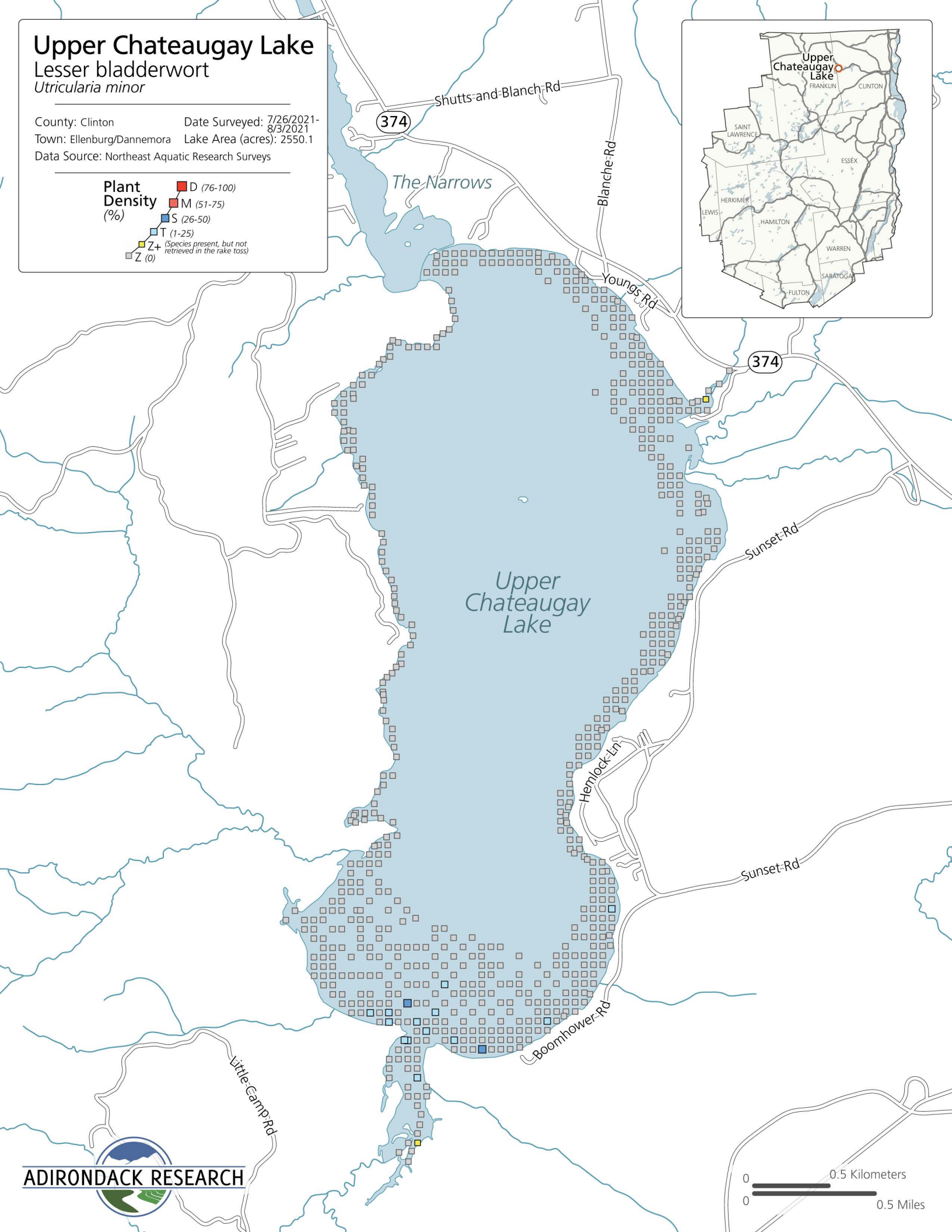


# Upper Chateaugay Lake

## Lesser bladderwort

*Utricularia minor*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys





# Upper Chateaugay Lake

## American eelgrass / Tapegrass

*Vallisneria americana*

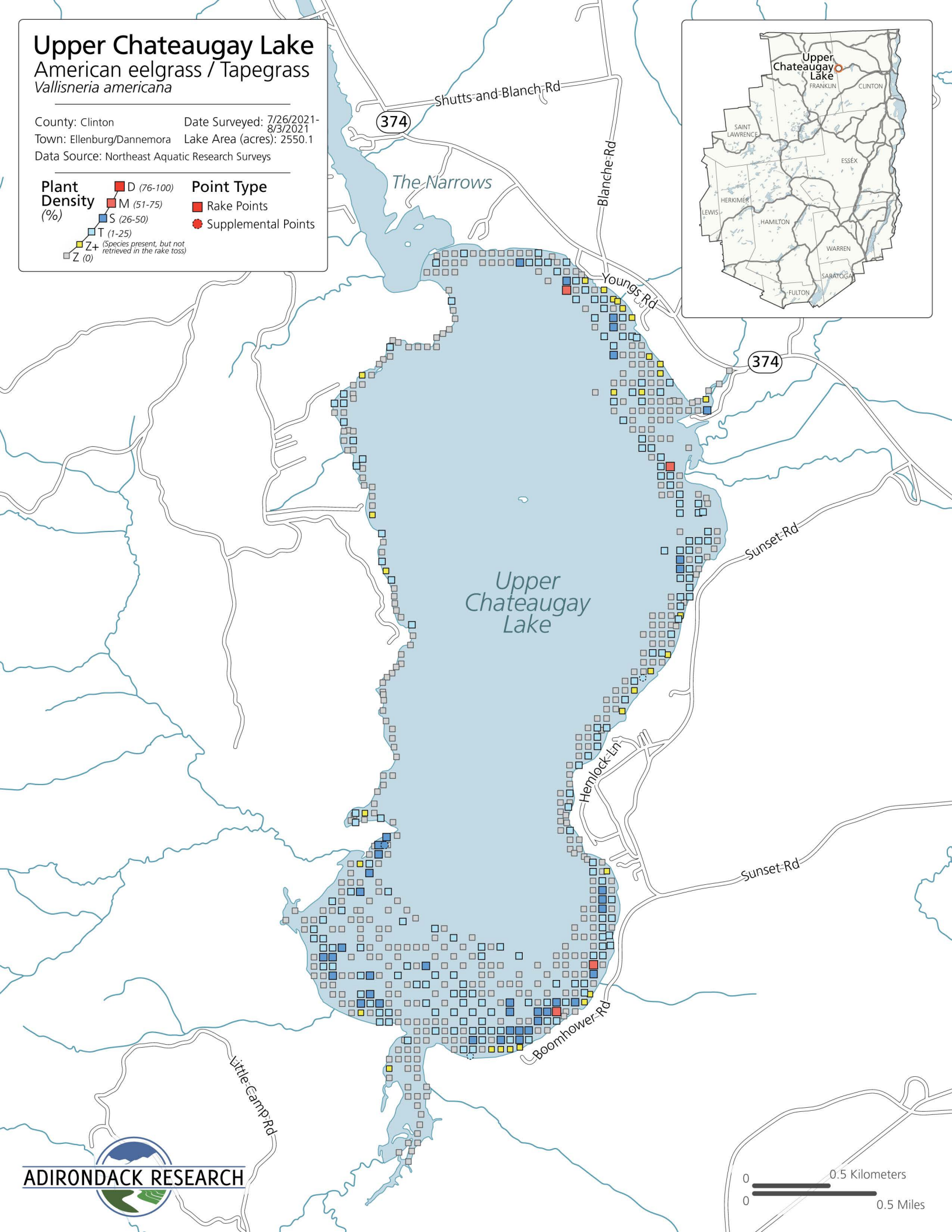
County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys

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- T (1-25)
- Z+ (Species present, but not retrieved in the rake toss)
- Z (0)

**Point Type**

- Rake Points
- Supplemental Points



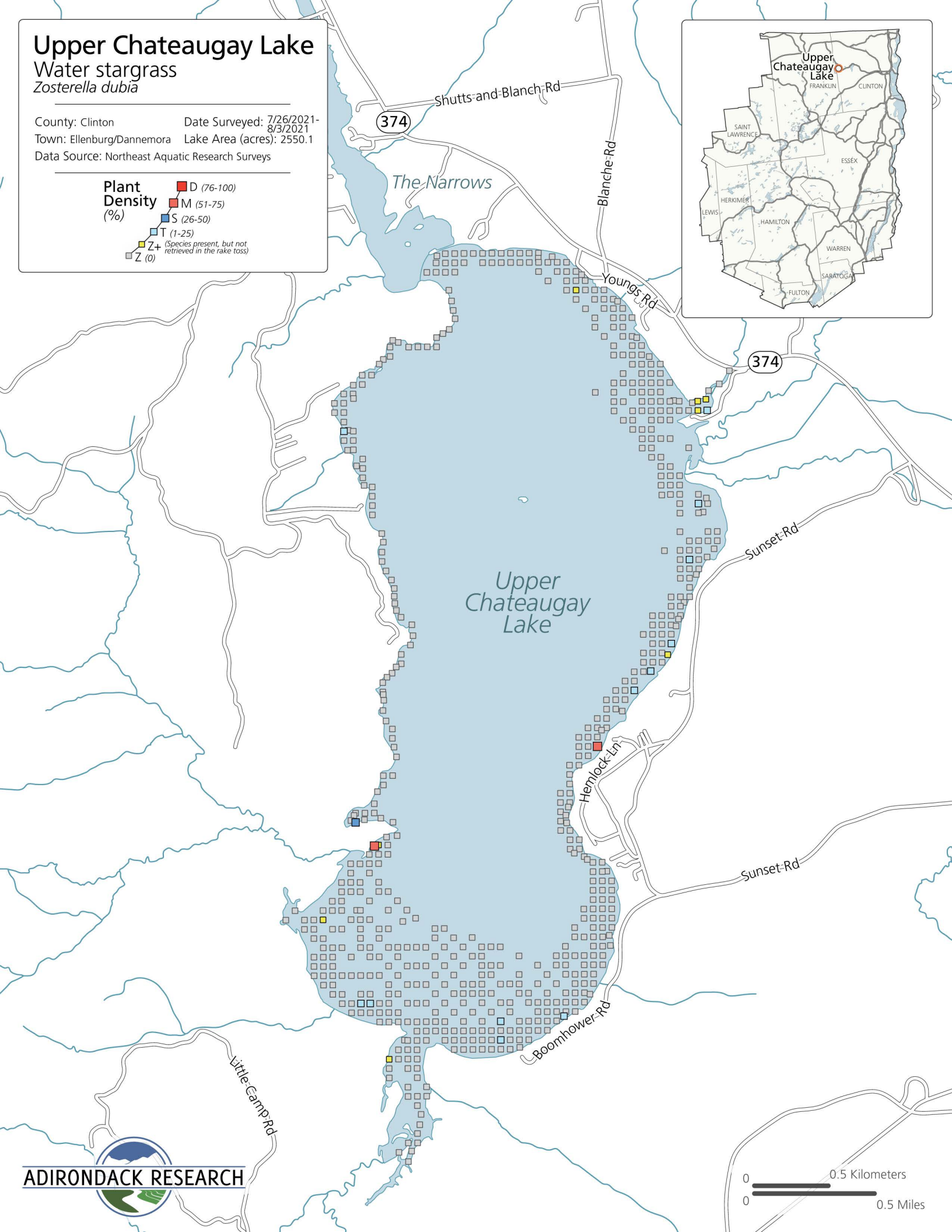


# Upper Chateaugay Lake

## Water stargrass

*Zosterella dubia*

County: Clinton      Date Surveyed: 7/26/2021-8/3/2021  
Town: Ellenburg/Dannemora      Lake Area (acres): 2550.1  
Data Source: Northeast Aquatic Research Surveys





# Chateaugay Lake Aquatic Plant Survey Report



Prepared for: Chateaugay Lake  
Foundation

October 21<sup>st</sup>, 2022





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## Acknowledgements

We would like to thank the Chateaugay Lake Foundation for supporting this lake-wide survey effort. It is a privilege to work on such a beautiful Adirondack waterbody.



## Introduction

---

Northeast Aquatic Research (NEAR) conducted a comprehensive aquatic plant survey of the Chateaugay Lakes system during the summer of 2021. The lake system consists of Upper and Lower Chateaugay Lakes, and the Narrows, the 3.45 mile-long out-flow stream from Upper Chateaugay Lake to Lower Chateaugay Lake.

This survey fulfills the Adirondack Park Agency (APA) requirement for a permit to apply herbicides into lakes within Park boundaries. Eurasian watermilfoil (*Myriophyllum spicatum*) is one of two invasive submersed aquatic plants currently growing in the Chateaugay Lakes system. The other is Curly-leaf pondweed (*Potamogeton crispus*), which had died back at the time of the NEAR survey. Curly-leaf is regularly observed during annual hand-harvesting work early in the season.

The survey was conducted over 6 days in 2021, July 26<sup>th</sup>, July 27<sup>th</sup>, 28<sup>th</sup>, and 29<sup>th</sup>, and August 2<sup>nd</sup> and, 3<sup>rd</sup>. The survey covered the entire littoral zone—shallow water vegetated areas--of both lakes and the Narrows connecting them. Approximately 31 miles of shoreline were investigated during this survey.

## Methodology

---

### Study Sites

The Chateaugay Lakes system is a complex of two lakes: Upper Chateaugay Lake to the south, and Lower Chateaugay Lake to the north. The lakes are connected by the outflow from Upper Chateaugay to Lower Chateaugay, a wide 50-250ft, 3.45-mile-long river. The outfall of Lower Chateaugay Lake becomes the Chateaugay River flowing north through the towns of Brainardsville and Chateaugay, where it passes through the United States border and joins the Trout River in Godmanchester, Quebec (CA). From there, the river flows northeast until it empties into the St. Lawrence in the Town of Chateaugay, Quebec.

### Upper Chateaugay Lake

Upper Chateaugay Lake at 2,564 acres is 4x larger and with a mean depth of 33 feet, 3x deeper than Lower Chateaugay Lake. The majority of the eastern shoreline is steep, with only a narrow band of littoral zone. There are two expansive shallow water areas, on the south shore there is large shallow shelf associated with the inlet of the Middle Kiln Brook, and on the northeast shore a similar large shallow shelf exists associated with inlets of the Ouleout Creek and Separator Book, both entering the lake at roughly the same site.

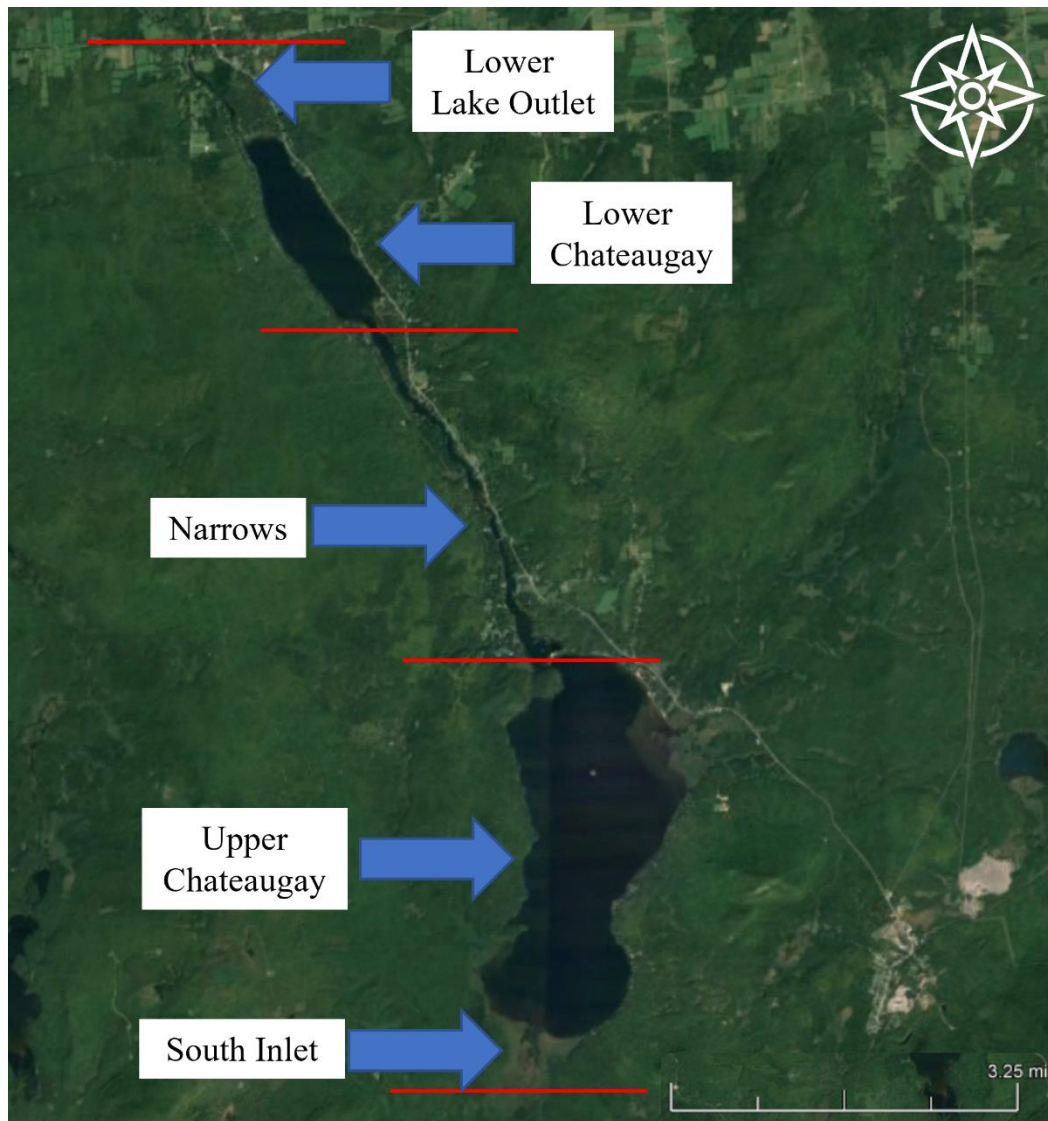
### Narrows

The Narrows is a riverine reach of 216 acres that connects the lower and upper lake. The channel is between 50 and 250 feet wide with relatively good water flow. The stream runs relatively straight, with little meandering, for 3.45 miles north by northwest to Lower Chateaugay Lake. The Narrows contains a shallow water zone where aquatic plants were abundant, and a slender deeper water channel running along the middle where aquatic plants were scarce.



### Lower Chateaugay Lake

Lower Chateaugay has a surface area of 545 acres and a shallow mean depth of 12 feet. However due to overall steep sided basin has more limited littoral zone than Upper Chateaugay Lake. Both the east and west shores of Lower Chateaugay drop off quickly with little vegetation. Most aquatic plant growth occurs on the shallow shelf associated with the inlet of the Narrows at the south end of the lake, and along the northern shore in the area of the lake's outlet.



*Figure 1. Map of Chateaugay Lake system investigated during our 2021 survey.*



## Survey Methodology

---

NEAR established a 1-acre grid of GPS waypoints throughout the littoral zone of each lake. Waypoints provide geographical sampling units to estimate community species richness, diversity, abundance, and density. Grid waypoints can also be used for replication in future years, to assess changes over time or in response to management actions. The grid was contained to the littoral zone of each lake segment. The littoral zone area was estimated using previous reports from Adirondack Research. Grid points were generated using the ARC GIS fishnet tool. As per the conversation with the Adirondack Park Agency, sites located within 150 meters of the shoreline were sampled at a frequency of one point per acre and sites outside of the 150 meters of shoreline (excluding the narrows) were sampled at a frequency of no less than 1 point per two vegetated acres.

NEAR staff navigated to each grid point using a Garmin handheld GPS unit. At each point, NEAR staff tossed a 14-inch double tined rake a distance of at least 30 feet off the starboard side of the boat. The rake is constructed by taking the tines off two garden rakes and fastening them back-to-back. A 40-foot line is attached to the rake and tied to the boat to prevent rake loss. The rake was allowed to rest on the bottom before being slowly retrieved. Once plants were on board, NEAR staff followed the rake toss methodology laid out in Lord and Johnson (2006). Overall plant abundance was estimated using the Cornell abundance scale:

**Table 1.** Cornell plant abundance scale for point intercept rake toss surveys.

	Rating Code	Description
<b>Z</b>	Zero Plants	No plants on rake
<b>T</b>	Trace Plants	Finger full on rake
<b>S</b>	Sparse Plants	Hand full on rake
<b>M</b>	Moderate Plants	Rake full of plants
<b>D</b>	Dense Plants	Difficult to bring into boat

Collected plants were separated into individual piles based on species and given an abundance ranking based on the above scale. Any plant species unidentifiable on the water were placed into a Ziploc bag labeled with the site, date, and species number and taken back to shore for further identification. At each point, a visual assessment was made to account for plants not captured on the rake.

## NEAR Lake Survey Methods

In addition to the survey methods requested via the APA, NEAR utilized a meander style approach to complement the existing survey and move toward a more complete picture of the aquatic plant community.

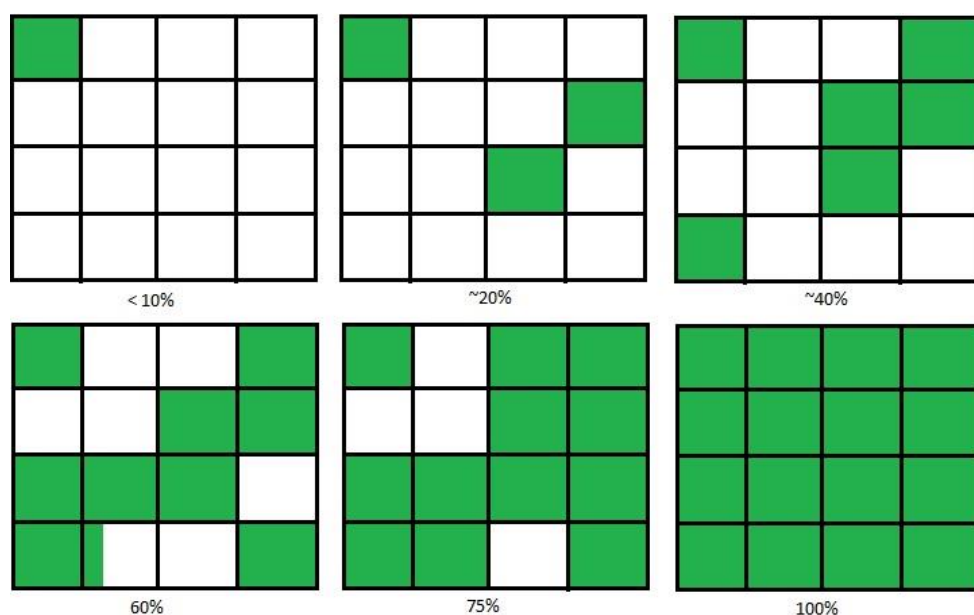
A Garmin GPS was used to record waypoints and tracks during the survey. GPS waypoints were made when the boat was stopped to improve location accuracy. Additional waypoints were made when water depth changed rapidly, species composition or density changed significantly, or when a new species was found. Special attention was paid to



shallow shoreline or cove areas where rare plants could reside. Water depth was recorded at each waypoint using a Lowrance Elite FS-7 Fishfinder with an HDI transducer.

Plant density at these additional points was determined using a combination of methods. The first, visual determination, is based on what is visible from the surface. This method involves using a hypothetical quadrat (**Figure 2**). In this method, one visually assesses an estimate of how much area is covered by the plant in question. The use of actual survey quadrats in the field is not appropriate for the large scale of most aquatic plant surveys, so surveyors must visualize a rough hypothetical quadrat overlaying the area and estimate percent coverage accordingly.

Visual estimates are made by a single person throughout the survey, but survey team members do input their perceived percent coverage estimates if the primary surveyor's estimate seems too low or too high. Team collaboration encourages objectivity and more accurate estimates.



**Figure 2.** Visual Percent Cover Estimate Guides - Hypothetical Field Quadrats ~20ft across.

The visual estimates are also verified with down imaging SONAR. SONAR provides scrolling images of bottom features and water depth, which allows for accurate estimates of invasive species plant height in the water column. When possible, both methods of estimating the percent cover were used at each waypoint, and the resulting estimate was recorded on the datasheet. These combination density estimates tend to be more accurate than the basic rake-toss density determination method from USACE, simply because certain aquatic plant species are not easily retrieved on a standard double-tined throw-rake. Similarly, certain aquatic plants can be dominant and cover >60% of the visible bottom but appear only at “Sparse” amounts when measured by the throw-rake method alone. The rake-toss estimates tend to under-estimate presence of infrequently encountered species and smaller plants that can escape the tines.



As a supplement to the survey methods, NEAR also recorded sonar logs throughout the entire survey. These sonar logs were then uploaded to a third-party software program called CI Biobase, which creates heat maps using the recorded information. The heat maps represent both lake depth and plant biovolume, which is a measure of the percentage of the water column occupied by plants. This helps to establish the true boundaries of the littoral zone and accurately describe the presence and absence of plant beds on a large scale. Heat maps for several areas appear in this report.

## General Results

---

Our survey involved visiting a total of 1,074 waypoints throughout the littoral zone of the two lakes and the stream connecting them. A throw rake was used to collect samples of the aquatic vegetation at all waypoints, with a small fraction of the waypoints being in shallow enough water where visual assessment of plant communities was possible.

### Important Species Findings

We found a total of 59 species of submersed and semi-emergent<sup>1</sup> aquatic plant species during the 6 days of surveying (**Table 2**). This is more than twice the number of species found by any prior survey of Chateaugay Lake that NEAR reviewed for this report. We found only one submersed invasive aquatic plant species, Eurasian watermilfoil (*Myriophyllum spicatum*). Curly-leaf pondweed, which appears early in the growing season and then dies back, was not observed during the survey but it has been found in Chateaugay Lake during prior surveys. Four state listed protected submersed aquatic plant species were found: Mare's tail (*Hippuris vulgaris*), Alternate-leaved milfoil (*Myriophyllum alterniflorum*), Farwell's milfoil (*Myriophyllum farwellii*), and Red pondweed (*Potamogeton alpinus*). Pictures of each species are located in appendix D.

### Frequency of Occurrence

Frequency of occurrence is the measure of how often a species was encountered during a survey and is reported as percentage of the waypoints where the plant was collected out of the total 1,074 waypoints. This value is an estimate of the overall abundance of that species in the lake. Species found at all waypoints would have a frequency of occurrence of 100% while those found at only one waypoint would have a frequency of occurrence 0.09%.

The most abundant species, the one encountered the most often, was Tape-Grass (*Vallisneria americana*) which was found at 485 waypoints and had a frequency of occurrence of 45% (**Table 3**). The next most abundant species included Nuttall's waterweed (*Elodea nuttallii*), Eurasian watermilfoil (*Myriophyllum spicatum*) and Large-leaf pondweed (*Potamogeton amplifolius*). These four species have frequency of occurrence values over 20%. Plant species with frequencies of 20% and greater are considered common and tend to have a wide, ubiquitous distribution in a lake. Eurasian watermilfoil was found at 423 points but was documented at an additional 145 points to fill in gaps in map spacing and changes in plant community.

**Table 4** shows the density for plant species collected by rake toss. **Table 5** shows the mean percent cover for each species encountered during the survey.

---

<sup>1</sup> Semi-emergent refers to species that emerge from the water with flowering structures but have greater than 50% of the shoot material underwater



**Table 2.** List of all aquatic plant species found in Chateaugay Lake from both current and past surveys.  
Pictures of species are included in appendix D.

Scientific Name	Common Name	2002 Cedar Eden	2014 AWI Survey Upper	2014 AWI Narrows	2014 AWI Survey Lower	2021 NEAR Survey
--	Hybrid Milfoil					X
<i>Brasenia schreberi</i>	Watershield	X	X	X		X
<i>Ceratophyllum demersum</i>	Coontail		X	X	X	X
<i>Chara</i> sp	Muskgrass					X
<i>Eleocharis acicularis</i>	Needle Spikerush	.				X
<i>Eleocharis robbinsii</i>	Robbin's Spike-rush					X
<i>Eleocharis</i> sp.	Spikerush	X	X	X		
<i>Elodea canadensis</i>	American Waterweed	X	X	X	X	
<i>Elodea nuttallii</i>	Nuttall's Waterweed			X	X	X
<i>Equisetum</i> sp	Horsetail					X
<i>Eriocaulon</i> sp	Pipewort		X	X	X	
<i>Fontinalis</i> sp	Water Moss					X
<i>Glyceria borealis</i>	Northern Manna Grass					X
<i>Hippuris vulgaris</i>	Mare's Tail	X	X			X
<i>Isoetes</i> sp	Quillwort					X
<i>Lemna minor</i>	Small Duckweed					X
<i>Lobelia dortmanna</i>	Water Lobelia	X	X			X
<i>Lythrum salicaria</i>	Purple Loosestrife	X				X
<i>Myriophyllum alterniflorum</i>	Alternate-Leaf Watermilfoil					X
<i>Myriophyllum farwellii</i>	Farwell's Watermilfoil					X
<i>Myriophyllum humile</i>	Low Watermilfoil					X
<i>Myriophyllum sibiricum</i>	Northern Watermilfoil					X
<i>Myriophyllum spicatum</i>	Eurasian Watermilfoil	X	X	X	X	X
<i>Myriophyllum tenellum</i>	Slender Watermilfoil					X
<i>Myriophyllum verticillatum</i>	Whorled Watermilfoil					X
<i>Najas flexilis</i>	Slender Naiad	X				X
<i>Najas guadalupensis</i>	Southern Naiad					X
<i>Najas</i> sp.	Waternymph		X	X	X	
<i>Nitella</i> sp.	Stonewort	X	X	X	X	X
<i>Nuphar variegata</i>	Yellow Water Pond Lily	X	X	X	X	X
<i>Nymphaea odorata</i>	White Water Lily	X	X	X	X	X
<i>Nymphaea odorata</i> spp <i>tuberosa</i>	American White Waterlily					X
<i>Nymphoides cordata</i>	Little Floating Heart		X			
<i>Persicaria amphibia</i>	Water Smartweed	X		X		X
<i>Phragmites australis</i>	Common Reed					X
<i>Polygonum</i> sp.	Smartweed					X



Scientific Name	Common Name	2002 Cedar Eden	2014 AWI Survey Upper	2014 AWI Narrows	2014 AWI Survey Lower	2021 NEAR Survey
<i>Potamogeton alpinus</i>	Alpine Pondweed					X
<i>Potamogeton amplifolius</i>	Largeleaf Pondweed	X	X	X	X	X
<i>Potamogeton bicupulatus</i>	Snail-seed Pondweed					X
<i>Potamogeton crispus</i>	Curly-Leaf Pondweed		X			
<i>Potamogeton epihydrus</i>	Ribbon-leaf Pondweed	X		X	X	X
<i>Potamogeton gramineus</i>	Grassy-Leaf Pondweed	X	X	X	X	X
<i>Potamogeton natans</i>	Floating-Leaf Pondweed	X	X	X		X
<i>Potamogeton nodosus</i>	American Pondweed					X
<i>Potamogeton obtusifolius</i>	Blunt-Leaf Pondweed					X
<i>Potamogeton perfoliatus</i>	Clasping-Leaf Pondweed	X	X	X	X	X
<i>Potamogeton praelongus</i>	White-Stem Pondweed		X			
<i>Potamogeton pusillus</i>	Small Pondweed					X
<i>Potamogeton robbinsii</i>	Robbin's Pondweed		X	X	X	X
<i>Potamogeton spirillus</i>	Spiral Pondweed					X
<i>Potamogeton zosteriformis</i>	Flat-Stem Pondweed					X
<i>Ranunculus longirostris</i>	Long-beak Buttercup	X				
<i>Ranunculus trichophyllus</i>	Thread-leaf Crowfoot					X
<i>Sagittaria graminea</i>	Grassy Arrowhead		X	X	X	X
<i>Schoenoplectus</i> sp	Bulrush					X
<i>Schoenoplectus tabernaemontani</i>	Soft Stem Bulrush					X
<i>Sparganium angustifolium</i>	Narrowleaf Bur-Reed	X				X
<i>Sparganium fluctuans</i>	Floating Bur-Reed					X
<i>Sparganium</i> sp	Bur-Reed		X	X	X	X
<i>Spirodela polyrhiza</i>	Greater Duckweed	X				X
<i>Spirogyra</i>	Filamentous Algae					X
<i>Typha</i> sp	Cattail	X				X
<i>Utricularia geminiscapa</i>	Hidden Fruit Bladderwort					X
<i>Utricularia macrorhiza</i>	Common Bladderwort		X	X	X	X
<i>Utricularia minor</i>	Lesser Bladderwort					X
<i>Utricularia purpurea</i>	Purple Bladderwort		X	X		
<i>Utricularia</i> sp.	Bladderwort	X				
<i>Vallisneria americana</i>	Tape-Grass	X	X	X	X	X
<i>Zosterella dubia</i>	Water Star-grass					X
<b>Totals =</b>		<b>23</b>	<b>25</b>	<b>23</b>	<b>18</b>	<b>59</b>



**Table 3.** Aquatic plants (in order of abundance) found during our 2021 Chateaugay Lake survey. Table also gives the number of waypoints where each was observed and resulting frequency of occurrence. Total number of rake toss points: 1074.

Scientific Name	# of waypoints	Frequency %	Scientific Name	# of waypoints	Frequency %
<i>Vallisneria americana</i>	485	45	<i>Myriophyllum verticillatum</i>	17	2
<i>Elodea nuttallii</i>	439	41	<i>Potamogeton epihydrus</i>	17	2
<i>Myriophyllum spicatum</i>	423	39	<i>Potamogeton spirillus</i>	17	2
<i>Potamogeton amplifolius</i>	281	26	<i>Hippuris vulgaris</i>	16	1
<i>Nitella</i> sp	196	18	<i>Schoenoplectus</i> sp	16	1
<i>Nymphaea odorata</i>	165	15	<i>Myriophyllum sibiricum</i>	13	1
<i>Zosterella dubia</i>	163	15	<i>Potamogeton obtusifolius</i>	13	1
<i>Najas flexilis</i>	122	11	<i>Ranunculus trichophyllus</i>	12	1
<i>Potamogeton robbinsii</i>	105	10	<i>Isoetes</i> sp	13	1
<i>Brasenia schreberi</i>	102	9	<i>Myriophyllum farwellii</i>	10	1
<i>Potamogeton perfoliatus</i>	101	9	<i>Equisetum</i> sp	9	1
Filamentous algae	98	9	<i>Myriophyllum tenellum</i>	9	1
<i>Ceratophyllum demersum</i>	96	9	<i>Glyceria borealis</i>	8	1
<i>Potamogeton pusillus</i>	89	8	<i>Eleocharis robbinsii</i>	6	1
<i>Lobelia dortmanna</i>	88	8	<i>Persicaria amphibia</i>	4	<1
<i>Utricularia macrorhiza</i>	88	8	<i>Potamogeton zosteriformis</i>	4	<1
<i>Potamogeton gramineus</i>	85	8	Hybrid milfoil	3	<1
<i>Najas guadalupensis</i>	75	7	<i>Myriophyllum alterniflorum</i>	3	<1
<i>Nuphar variegata</i>	73	7	<i>Potamogeton nodosus</i>	3	<1
<i>Chara</i> sp	62	6	<i>Sparganium</i> sp	3	<1
<i>Eleocharis acicularis</i>	60	6	<i>Myriophyllum humile</i>	2	<1
<i>Sparganium angustifolium</i>	55	5	<i>Lemna minor</i>	1	<1
<i>Sparganium fluctuans</i>	44	4	<i>Nymphaea tuberosa</i>	1	<1
<i>Utricularia geminiscapa</i>	41	4	<i>Polygonum</i> sp	1	<1
<i>Fontinalis</i> sp	39	4	<i>Potamogeton alpinus</i>	1	<1
<i>Sagittaria graminea</i>	37	3	<i>Potamogeton bicupulatus</i>	1	<1
<i>Schoenoplectus tabernaemontani</i>	33	3	<i>Spirodela polyrhiza</i>	1	<1
<i>Potamogeton natans</i>	30	3	Nothing present	167	15
<i>Typha</i> sp	23	2			
<i>Utricularia minor</i>	18	2			



**Table 4.** Density for aquatic plant species collected during our 2021 survey. Certain plants were not found using the one rake toss off of the side of the boat but were noted visually in the vicinity of the rake. Those species have no density data associated with them.

Scientific Name	Trace	Sparse	Moderate	Dense	Total
<i>Brasenia schreberi</i>	3	8	9	2	22
<i>Ceratophyllum demersum</i>	30	31	20	13	94
<i>Chara</i> sp	38	12	5	0	55
<i>Eleocharis acicularis</i>	44	11	3	0	58
<i>Eleocharis robbinsii</i>	3	1	2	0	6
<i>Elodea nuttallii</i>	166	95	92	60	413
<i>Equisetum</i> sp	1	0	1	0	2
Filamentous algae	22	24	9	0	55
<i>Fontinalis</i> sp	23	7	7	0	37
<i>Glyceria borealis</i>	1	0	0	0	1
<i>Hippuris vulgaris</i>	3	4	1	1	9
<i>Isoetes</i> sp	2	5	4	0	11
<i>Lemna minor</i>	0	0	0	0	0
<i>Lobelia dortmanna</i>	34	16	0	0	50
<i>Myriophyllum alterniflorum</i>	1	0	1	0	2
<i>Myriophyllum farwellii</i>	6	0	1	0	7
<i>Myriophyllum humile</i>	1	0	0	0	1
<i>Myriophyllum sibiricum</i>	7	2	1	2	12
<i>Myriophyllum spicatum</i>	135	72	47	30	284
<i>Myriophyllum tenellum</i>	8	0	0	0	8
<i>Myriophyllum verticillatum</i>	3	3	5	2	13
<i>Myriophyllum spicatum</i> hybrid	2	1	0	0	3
<i>Najas flexilis</i>	79	27	12	0	118
<i>Najas guadalupensis</i>	53	9	7	0	69
<i>Nitella</i> sp	98	51	34	2	185
<i>Nuphar variegata</i>	17	2	1	1	21
<i>Nymphaea odorata</i>	21	13	4	1	39
<i>Persicaria amphibia</i>	0	1	1	0	2
<i>Potamogeton alpinus</i>	Not found with rake tosses				
<i>Potamogeton amplifolius</i>	79	58	25	1	163
<i>Potamogeton bicipulatus</i>	Not found with rake tosses				
<i>Potamogeton epihydrus</i>	7	1	0	0	8
<i>Potamogeton gramineus</i>	32	18	16	1	67
<i>Potamogeton natans</i>	2	1	2	1	6
<i>Potamogeton nodosus</i>	Not found with rake tosses				
<i>Potamogeton obtusifolius</i>	8	3	2	0	13
<i>Potamogeton perfoliatus</i>	38	21	8	0	67
<i>Potamogeton pusillus</i>	56	16	2	2	76
<i>Potamogeton robbinsii</i>	45	27	32	0	104
<i>Potamogeton spirillus</i>	13	0	1	0	14



Scientific Name	Trace	Sparse	Moderate	Dense	Total
<i>Potamogeton zosteriformis</i>	Not found with rake tosses				
<i>Ranunculus trichophyllus</i>	5	2	1	0	8
<i>Sagittaria graminea</i>	23	2	0	0	25
<i>Schoenoplectus sp</i>	1	3	0	0	4
<i>Schoenoplectus tabernaemontani</i>	5	0	1	0	6
<i>Sparganium angustifolium</i>	9	8	5	0	22
<i>Sparganium fluctuans</i>	8	3	2	0	13
<i>Sparganium sp</i>	Not found with rake tosses				
<i>Spirodela polyrhiza</i>	1	0	0	0	1
<i>Typha sp</i>	Not found with rake tosses				
<i>Utricularia geminiscapa</i>	26	10	1	0	37
<i>Utricularia macrorhiza</i>	28	27	17	4	76
<i>Utricularia minor</i>	13	2	0	0	15
<i>Vallisneria americana</i>	307	93	20	1	421
<i>Zosterella dubia</i>	58	32	15	0	105

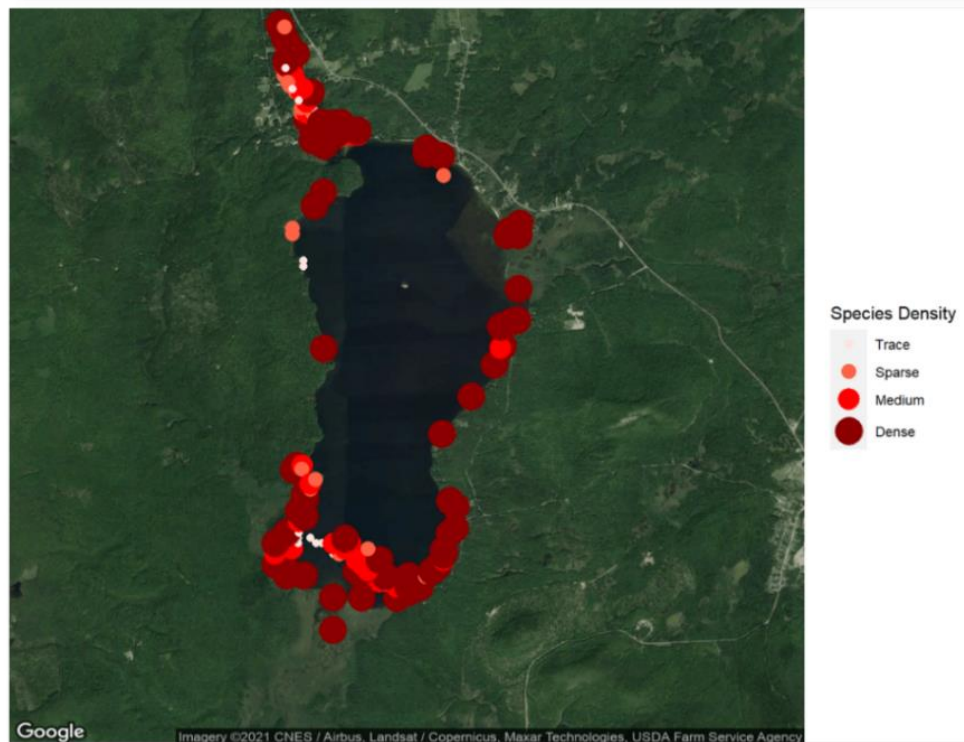
**Table 5. Mean percent cover for all species encountered during survey.**

Scientific Name	Mean Percent Cover	Scientific Name	Mean Percent Cover
<i>Brasenia schreberi</i>	22.8%	<i>Persicaria amphibia</i>	30.0%
<i>Ceratophyllum demersum</i>	20.2%	<i>Polygonum sp</i>	40.0%
<i>Chara sp</i>	11.0%	<i>Potamogeton alpinus</i>	5.0%
<i>Eleocharis acicularis</i>	12.6%	<i>Potamogeton amplifolius</i>	18.0%
<i>Eleocharis robbinsii</i>	11.7%	<i>Potamogeton bicupulatus</i>	5.0%
<i>Elodea nuttallii</i>	26.8%	<i>Potamogeton epihydrus</i>	12.7%
<i>Equisetum sp</i>	10.6%	<i>Potamogeton gramineus</i>	13.8%
Filamentous algae	19.1%	<i>Potamogeton natans</i>	20.2%
<i>Fontinalis sp</i>	13.3%	<i>Potamogeton nodosus</i>	6.7%
<i>Glyceria borealis</i>	6.4%	<i>Potamogeton obtusifolius</i>	11.7%
<i>Hippuris vulgaris</i>	37.5%	<i>Potamogeton perfoliatus</i>	12.2%
Hybrid milfoil	8.3%	<i>Potamogeton pusillus</i>	9.3%
<i>Isoetes sp</i>	38.3%	<i>Potamogeton robbinsii</i>	18.9%
<i>Lemna minor</i>	10.0%	<i>Potamogeton spirillus</i>	9.1%
<i>Lobelia dortmanna</i>	30.7%	<i>Potamogeton zosteriformis</i>	5.0%
<i>Myriophyllum alterniflorum</i>	10.0%	<i>Ranunculus trichophyllus</i>	8.3%
<i>Myriophyllum farwellii</i>	5.0%	<i>Sagittaria graminea</i>	14.5%
<i>Myriophyllum humile</i>	5.0%	<i>Schoenoplectus sp</i>	29.6%
<i>Myriophyllum sibiricum</i>	14.5%	<i>Schoenoplectus tabernaemontani</i>	28.0%
<i>Myriophyllum spicatum</i>	28.9%	<i>Sparganium angustifolium</i>	22.3%
<i>Myriophyllum tenellum</i>	5.6%	<i>Sparganium fluctuans</i>	15.5%
<i>Myriophyllum verticillatum</i>	28.5%	<i>Sparganium sp</i>	13.3%
<i>Najas flexilis</i>	12.1%	<i>Spirodela polyrhiza</i>	5.0%
<i>Najas guadalupensis</i>	12.0%	<i>Typha sp</i>	28.0%
<i>Nitella sp</i>	15.8%	<i>Utricularia geminiscapa</i>	9.2%
Nothing present	NA	<i>Utricularia macrorrhiza</i>	18.8%
<i>Nuphar variegata</i>	26.3%	<i>Utricularia minor</i>	6.5%
<i>Nymphaea odorata</i>	15.7%	<i>Vallisneria americana</i>	10.7%
<i>Nymphaea tuberosa</i>	60.0%	<i>Zosterella dubia</i>	22.8%

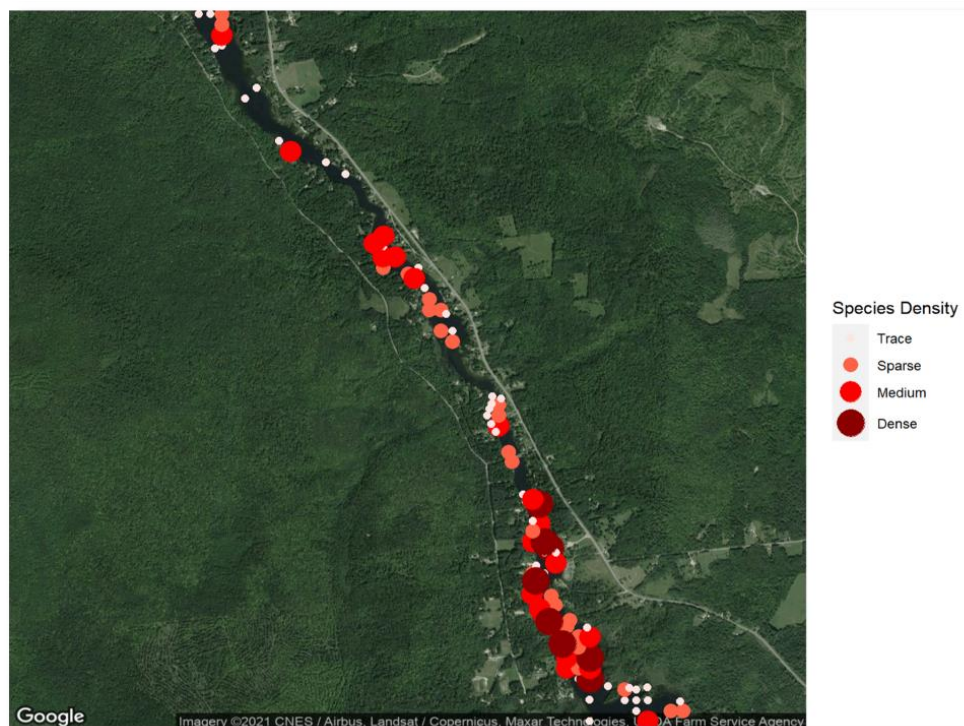
## Eurasian Watermilfoil

All three lake sections had significant Eurasian watermilfoil (EWM) populations (**Figures 3-5**). Steep shorelines on Upper Chateaugay and Lower Chateaugay Lakes, along with the shallow deltas of the major inlets that were found to consist of unconsolidated sands, represented the key areas where EWM was absent.

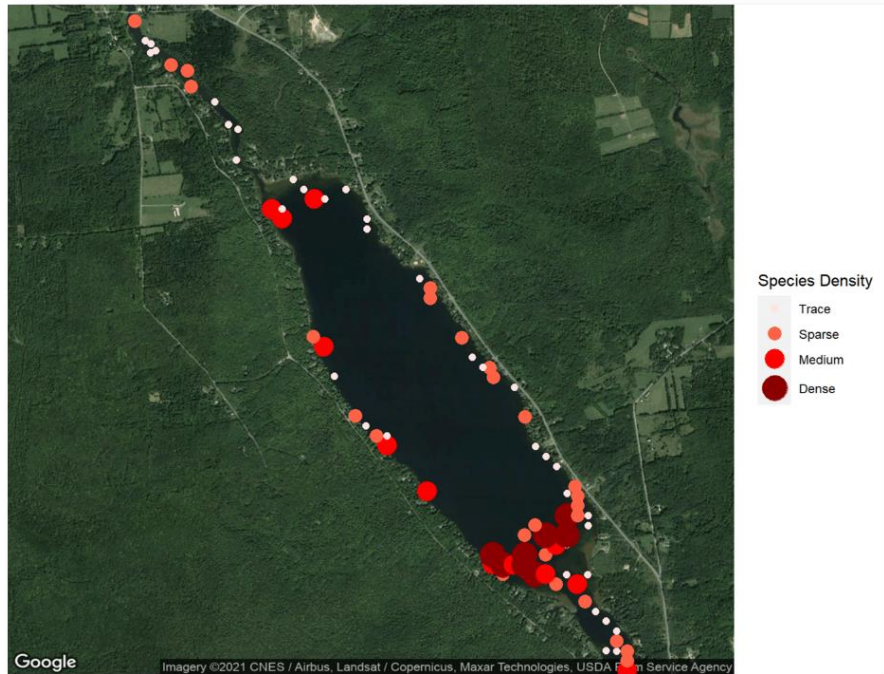




*Figure 3. Eurasian watermilfoil locations and densities in Upper Chateaugay Lake.*



*Figure 4. Eurasian watermilfoil locations and densities in the Narrows.*

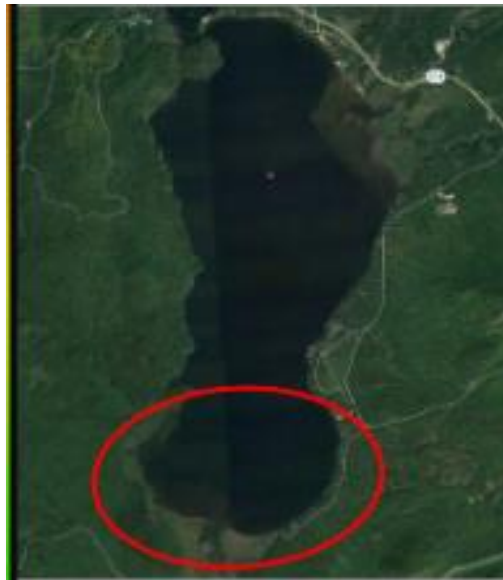


*Figure 5. Eurasian watermilfoil locations and densities in Lower Chateaugay Lake.*

## Upper Chateaugay Lake

### *Southern Shores*

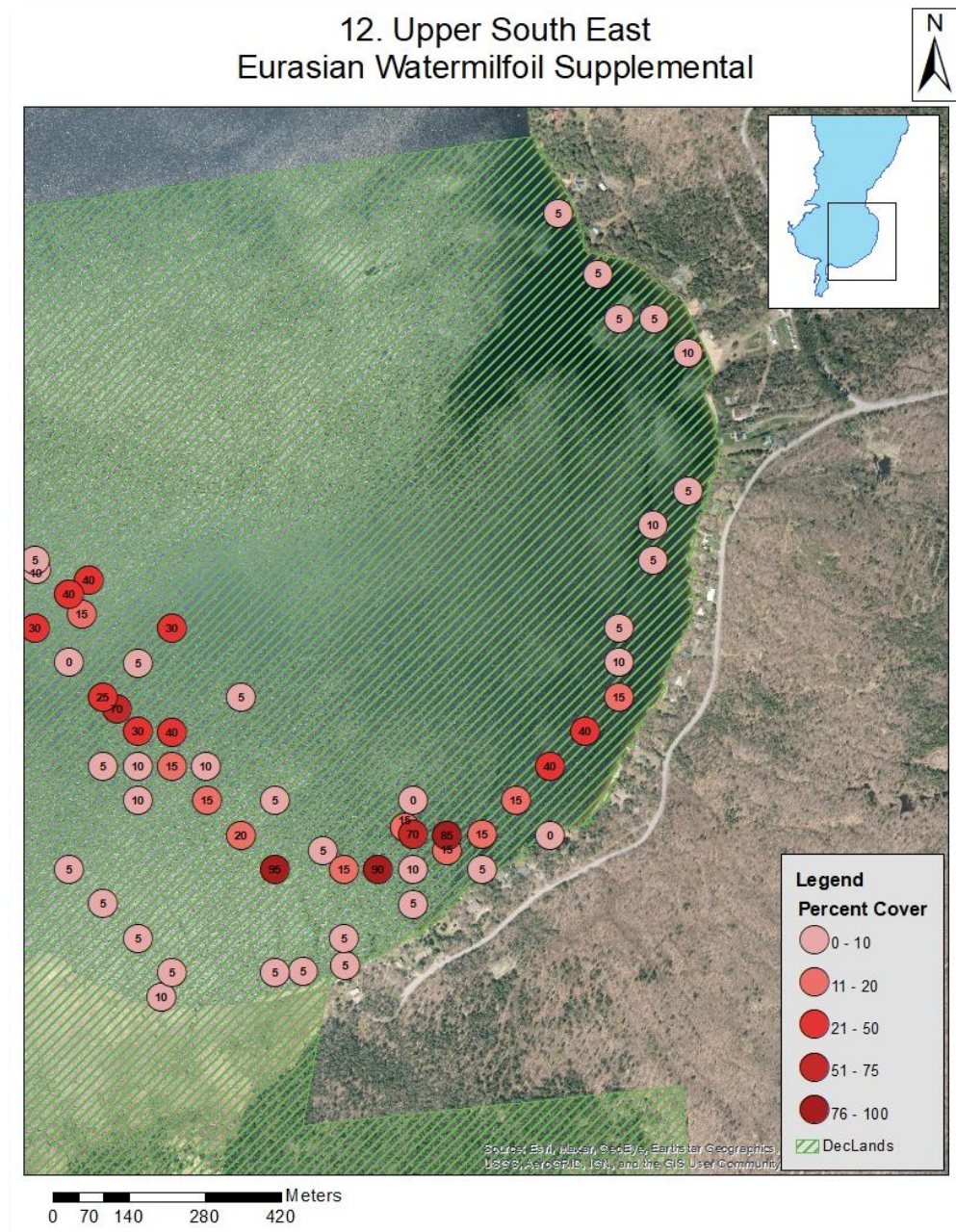
The southern section of Upper Chateaugay Lake contained the largest continuous expanse of vegetated littoral zone in the Chateaugay Lake System, with almost all areas with less than 12 feet of water depth containing submersed aquatic plants (**Figure 6**). The following sets of maps show the percent cover of both rake toss and supplemental EWM points.



*Figure 6. Southern section of Upper Chateaugay Lake-within red circle -see text.*



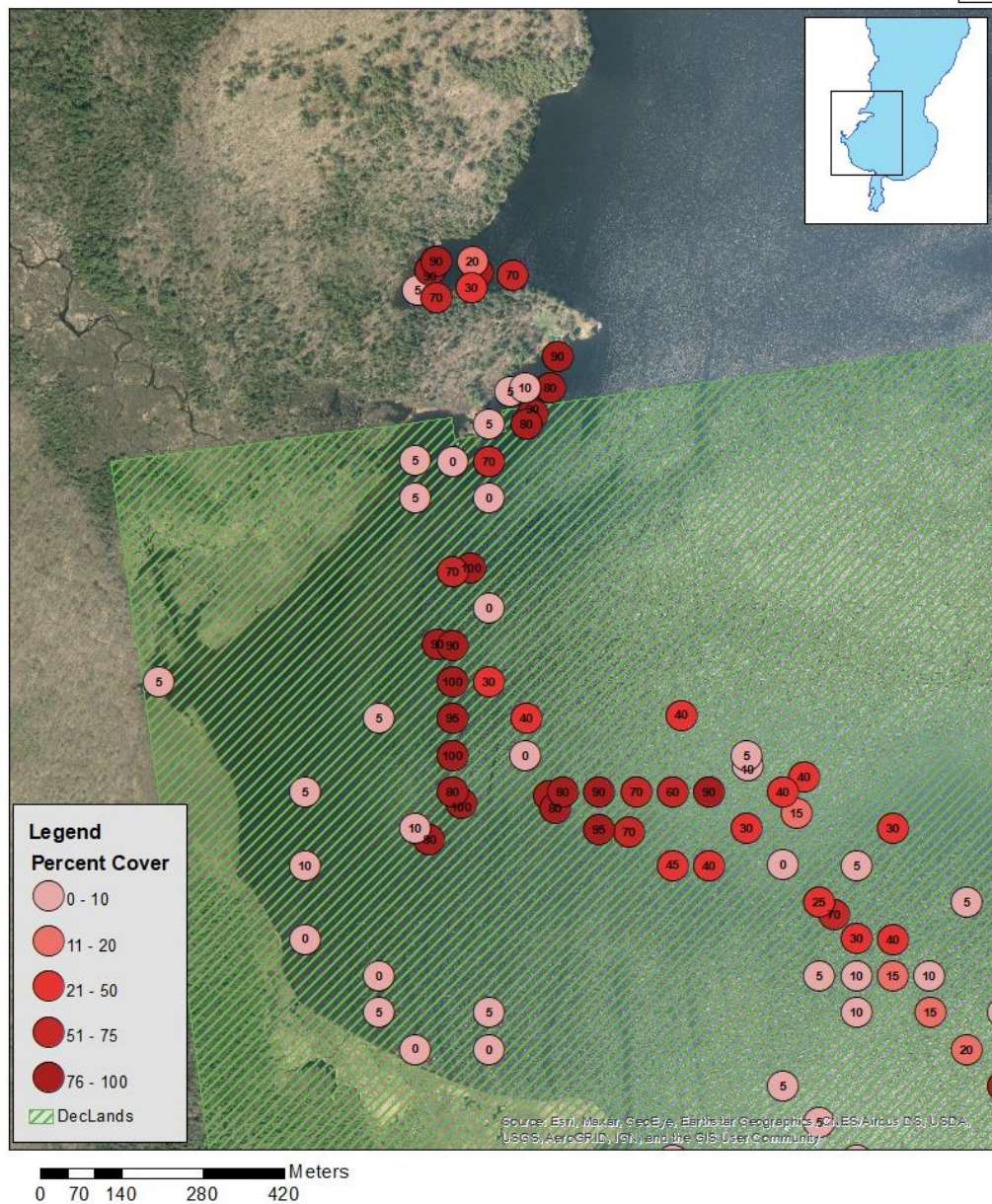
Most of the dense beds of Eurasian watermilfoil generally occurred along the outside edge of the littoral zone, between 8-12 ft of water depth (**Figure 7 & 8**). In shallower water, EWM beds were low density, dominated by a mixed community of native pondweeds, naiads and water weed. Near shore <6feet deep was dominated by dense floating leaved plant coverage, mostly white and yellow water lilies and water-shield. Alternate-leaved watermilfoil and Farwell's watermilfoil were both found within floating-leaved plant beds.



**Figure 7.** Density of Eurasian watermilfoil beds in southern Upper Chateaugay Lake: Eastern section.



# 14. Upper South West Eurasian Watermilfoil Supplemental

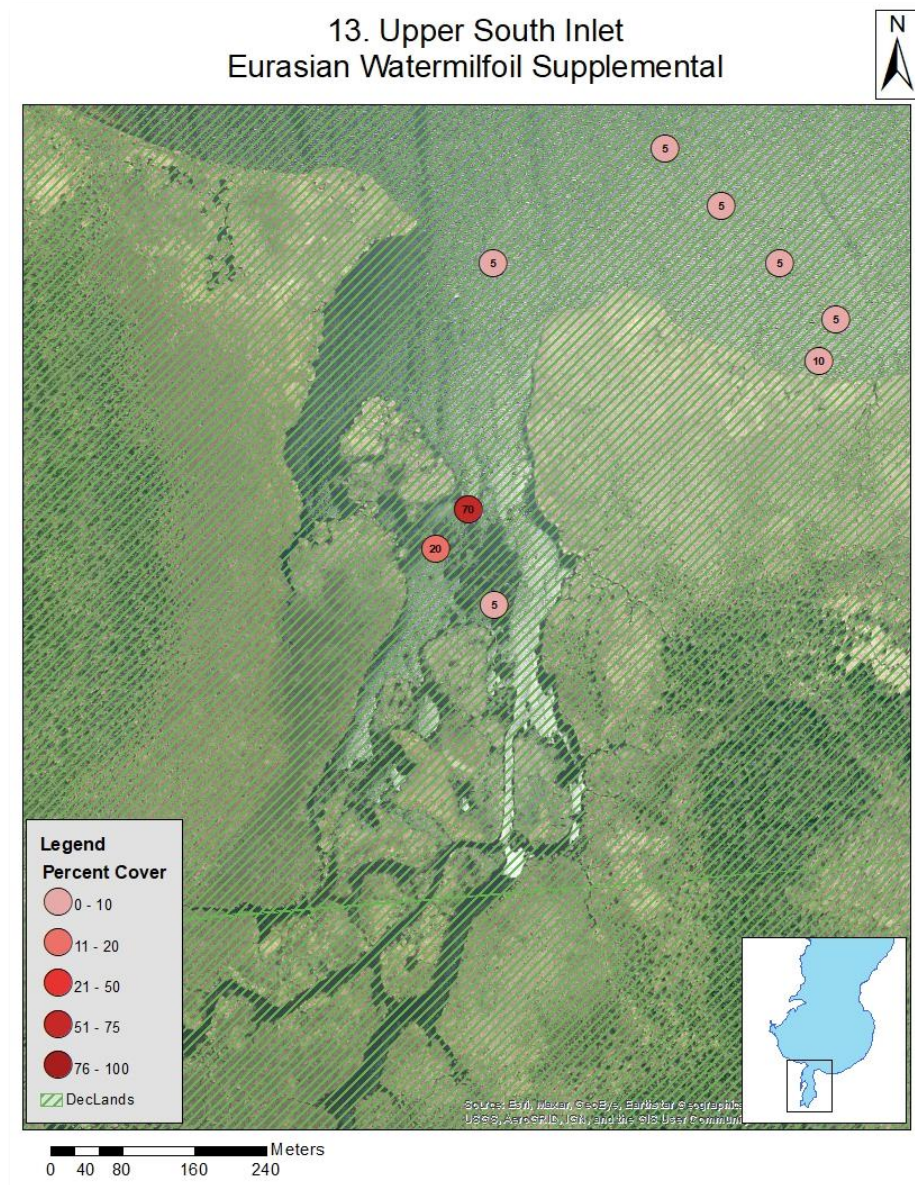


**Figure 8.** Density of Eurasian watermilfoil beds in southern Upper Chateaugay Lake: Western Section

## South Inlet

The South Inlet, Middle Kiln Brook, is a large, braided wetland complex approximately 24 acres in size. We found several species in this area that were not found anywhere else in the lake, specifically the endangered Mare's tail (*Hippuris vulgaris*) and Whorled-leaf milfoil (*Myriophyllum verticillatum*). EWM was found in a few locations within the South Inlet, but generally not at high abundance (**Figure 9**).



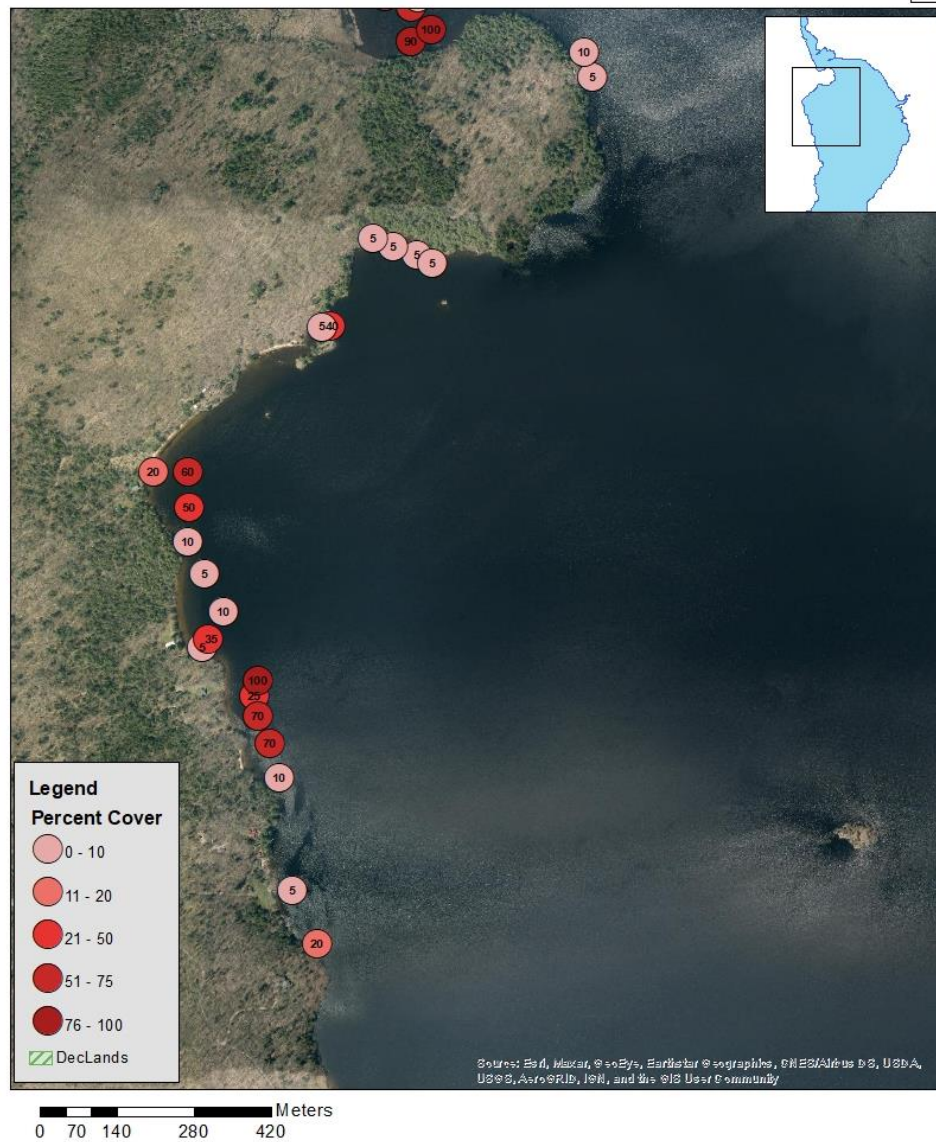


**Figure 9.** Eurasian watermilfoil within the South Inlet of Upper Chateaugay Lake.

### *Western Shore*

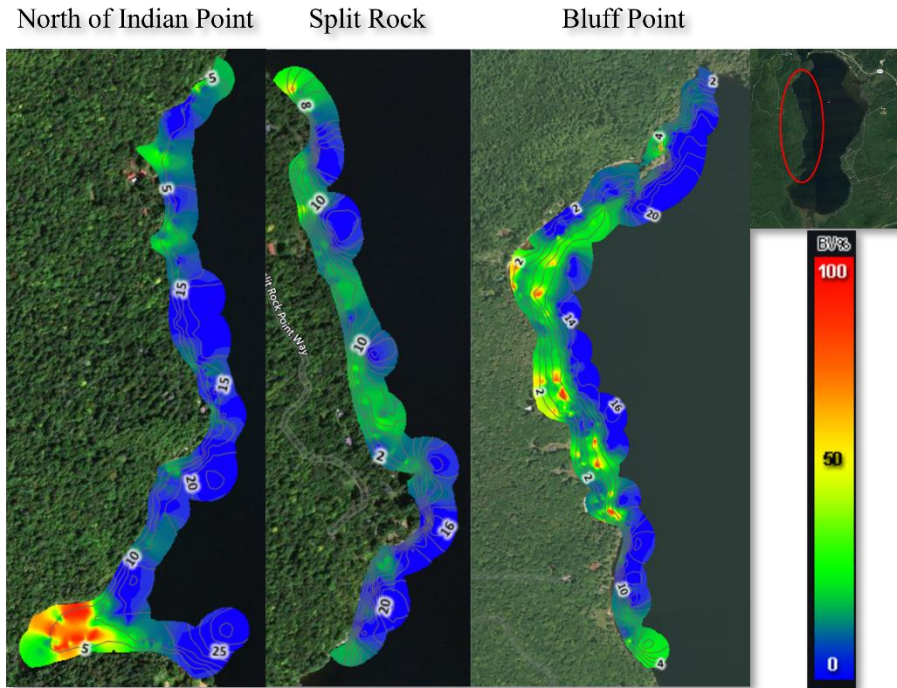
The western shore of Upper Chateaugay Lake is almost all undeveloped, with a few camps scattered along this length of the shore (**Figures 10 & 11**). The western shore is characterized by steep sloped bedrock cliffs with intermixed dense forest cover. Due to the steep nature of this area, plant growth is limited to a few specific areas (**Figure 10**). There are a few shallow bays, particularly on the northern end of the western shoreline and the southern end, which support localized, dense aquatic plant patches. The northern beds, south of Bluff Point, support a band of milfoil from 8-11 feet and the southern bay, north of Indian Point, has a lot of milfoil growing close to the surface.

## 16. Upper West Bluff Point Eurasian Watermilfoil Supplemental



**Figure 10.** Northern portion of the Western shoreline and shore area of Upper Chateaugay.



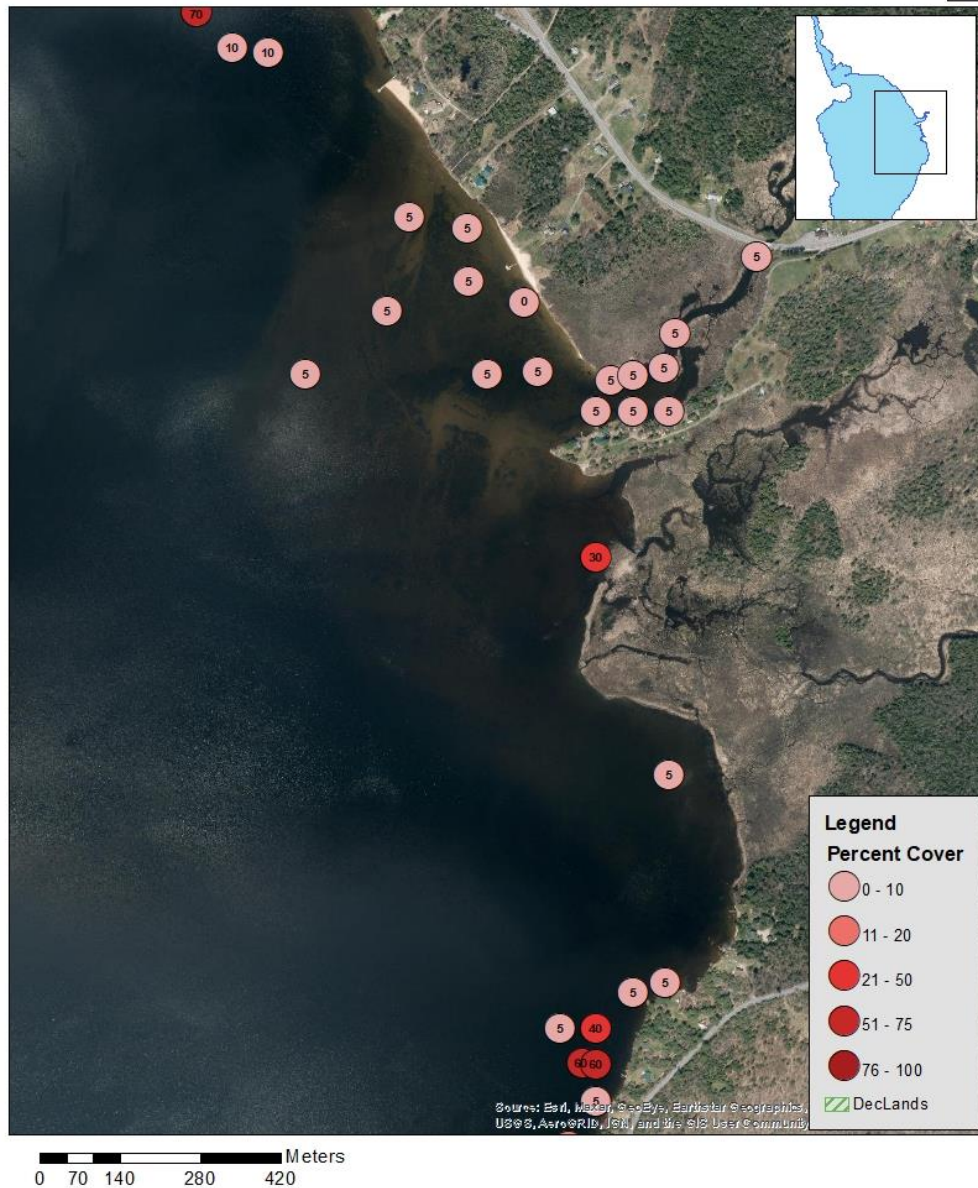


**Figure 11.** Western shoreline plant biovolume (map on the right at each area).

### *Eastern Shore*

The Eastern shore (**Figure 12**) contains a variety of habitats similar to the western shore of Upper Chateaugay. Rocky, steep habitats are prevalent. Near the inlets of Ouleout Creek and Separator Brook the habitat shifts to a shallow shelf of unconsolidated sand. Few aquatic plants were found in this 187-acre area (**Figure 13**), except for the occasional low-lying Tape-grass (*Vallisneria americana*), Water lobelia (*Lobelia dortmanna*), and Tiny spikerush (*Eleocharis acicularis*) and large stands of Emergent bulrush (*Schonoplectus* sp.). EWM was found throughout this area, especially in the Ouleout creek inlet area, but was mostly single stalks.

# 10. Upper Ouleout Creek Eurasian Watermilfoil Supplemental



**Figure 12.** Eastern shore area of Upper Chateaugay Lake.





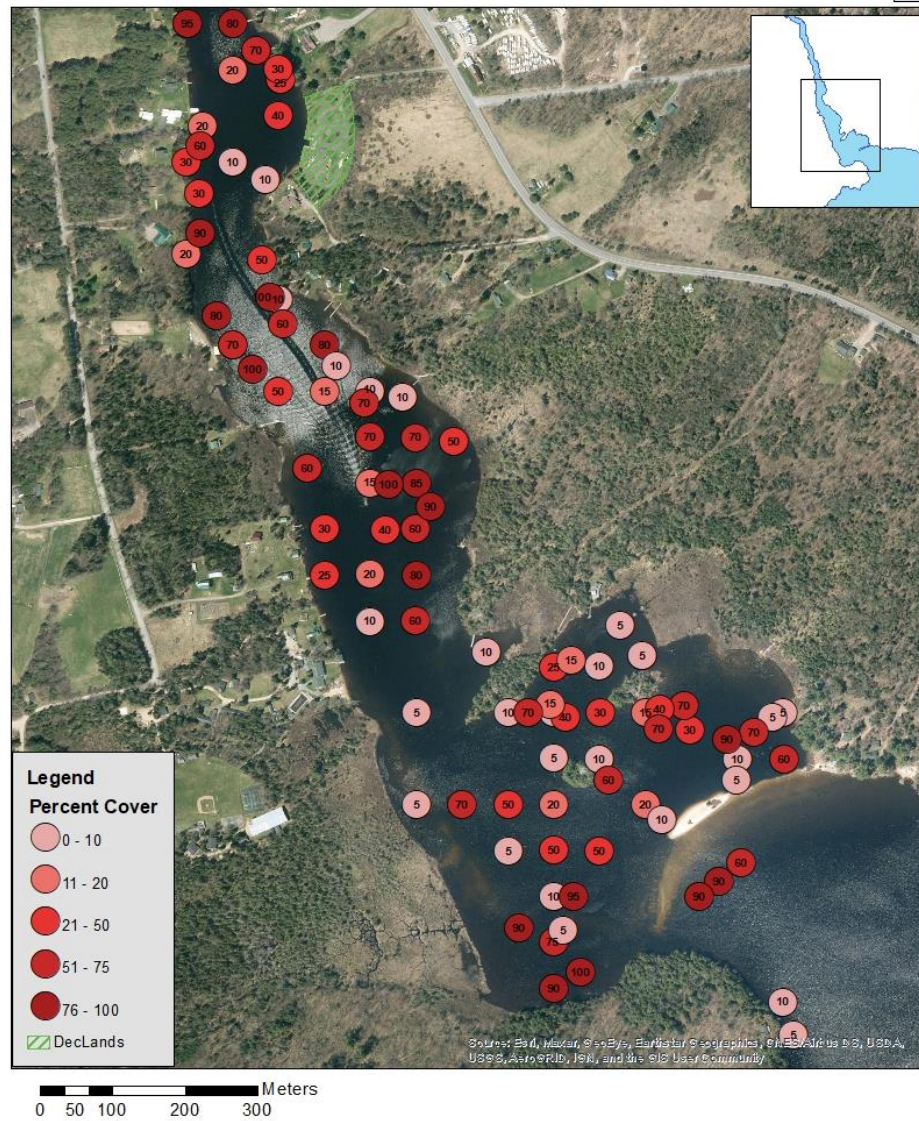
**Figure 13.** Sandbar along eastern shore left and bottom right, photograph in upper right shows extensive bulrush beds.

## Narrows

### *Southern Reach*

The southern reach of the Narrows is characterized by a long sandbar at the confluence with Upper Chateaugay Lake that semi-encloses a large bay that see a lot of boat traffic (**Figure 14**). Consequently, this area has been the focus of aquatic plant management efforts, especially in the channel and immediately to the east, north of the sandbar. The bay and the back of the wetlands on either side contained little EWM with most beds trace to sparse in density. EWM becomes more abundant downstream with most beds of medium to high density plants.

## 8. Narrows Sandbar Eurasian Watermilfoil Supplemental



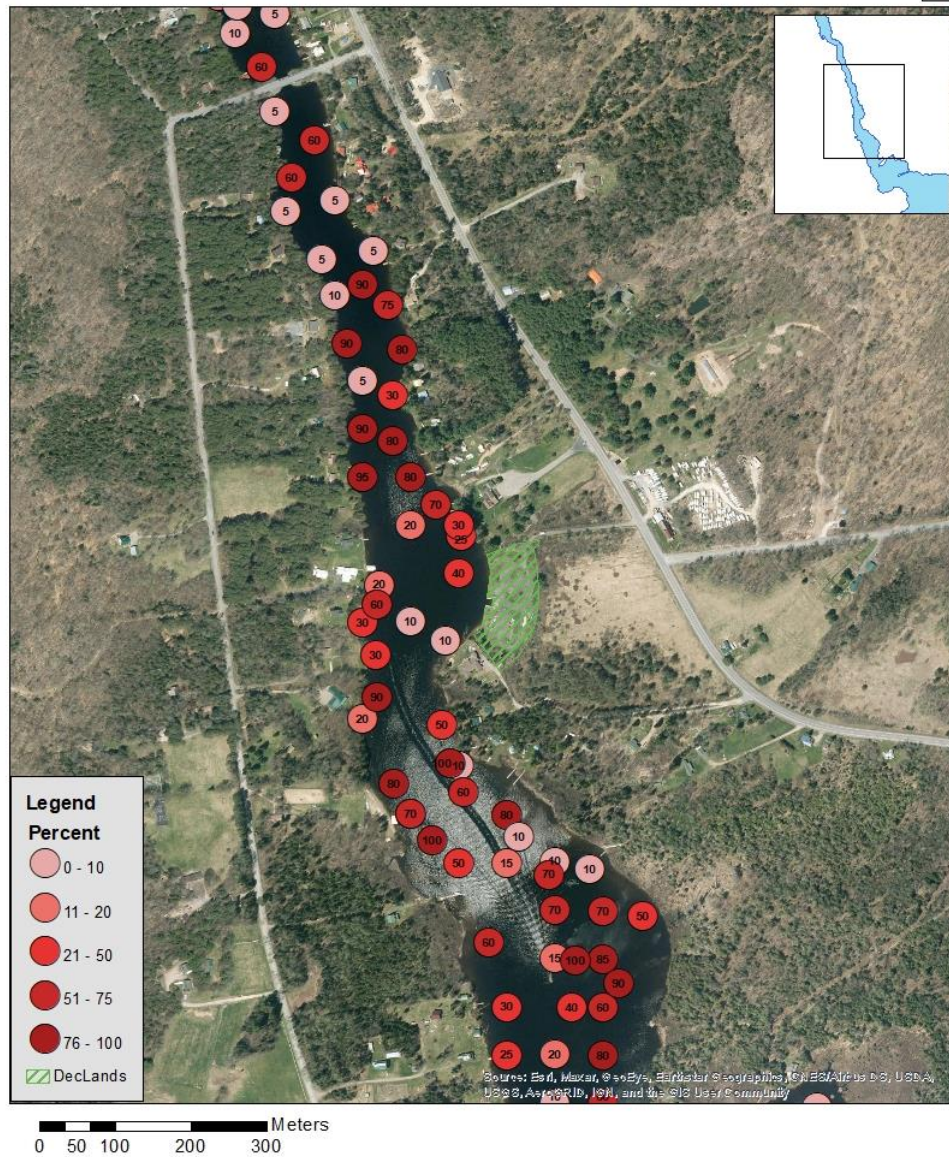
**Figure 14.** Eurasian watermilfoil distribution and percent cover in the southern section of the Narrows.

### Boat Launch Section

The State of NY DEC owned boat launch has had significant aquatic plant management in the past. Benthic mats were first used here after the completion of the 2006 aquatic plant management plan (**Figure 15**). The general area around the boat launch is clear of EWM, but there are stands in the water immediately upstream and downstream of this area. North of the boat launch, NEAR also found a small patch of Thread-leaf crowfoot (*Ranunculus trichophyllus*), which is a native plant and one of the few areas in the lake where it is present.



## 7. Narrows South of Bridge Eurasian Watermilfoil Supplemental



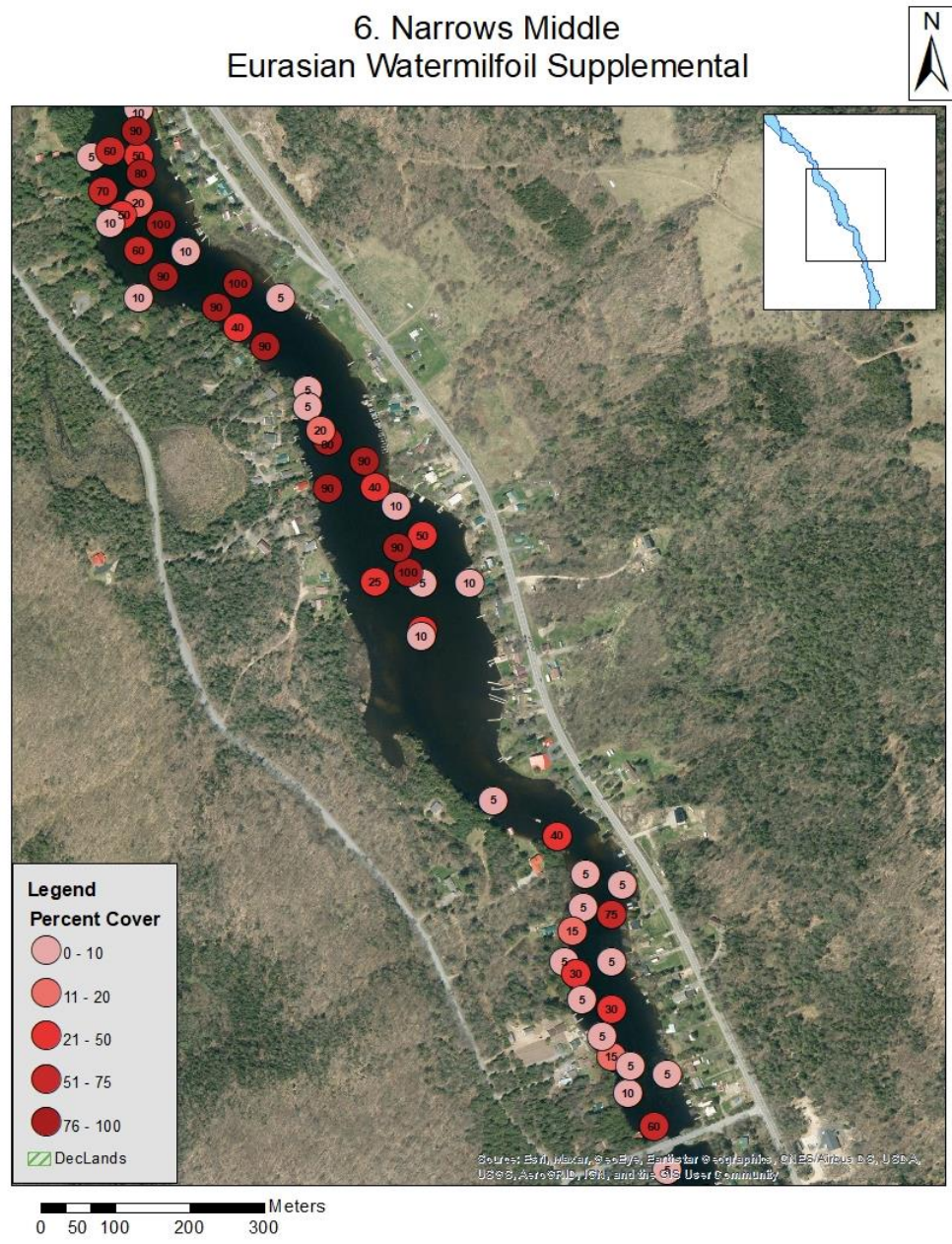
**Figure 15.** Eurasian watermilfoil distribution and percent cover in the Boat Launch area.

### *Narrows Middle*

Immediately north of the bridge, Eurasian watermilfoil was present, but not in high abundance with most plant cover being native both in the middle of the channel and the western side (**Figure 16**). Native plants were most common including Nuttall's waterweed (*Elodea nuttallii*), especially in the middle of the channel. As the narrows widen, the channel shallows to 4-5 feet, with a population of mixed lilies along the eastern shoreline. Halfway up north of the channel widening, Eurasian watermilfoil starts to become more abundant.



## 6. Narrows Middle Eurasian Watermilfoil Supplemental



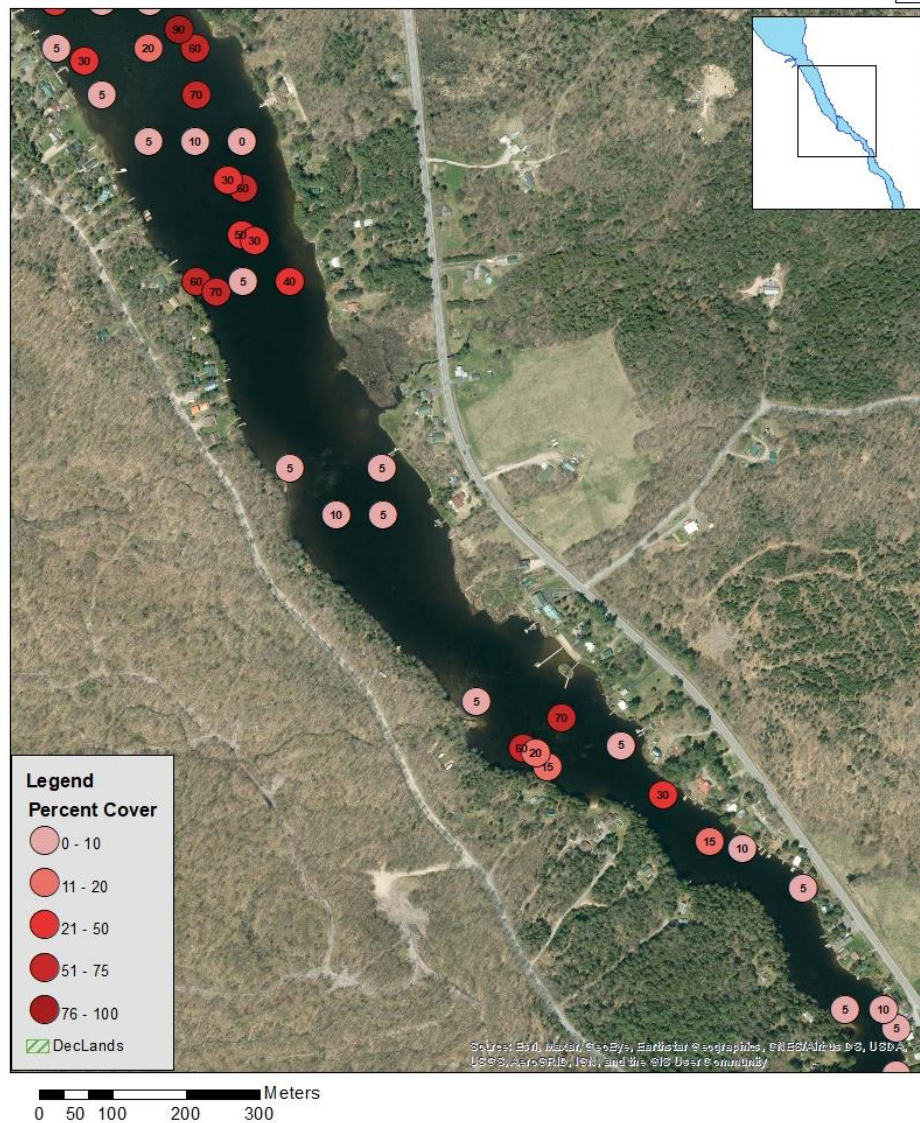
**Figure 16.** Eurasian watermilfoil distribution and percent cover at the Narrows middle section.

### *Narrows North*

Moving north towards the lower lake inlet, Eurasian watermilfoil distribution and abundance was lower than the southern sections of the narrows (**Figure 17**). Small pockets of yellow water lilies were found, along with Nuttall's waterweed and Claspingleaf pondweed (*Potamogeton perfoliatus*). As the inlet starts to widen, Eurasian watermilfoil becomes more abundant, especially in the middle of the channel.



## 5. Narrows North Eurasian Watermilfoil Supplemental



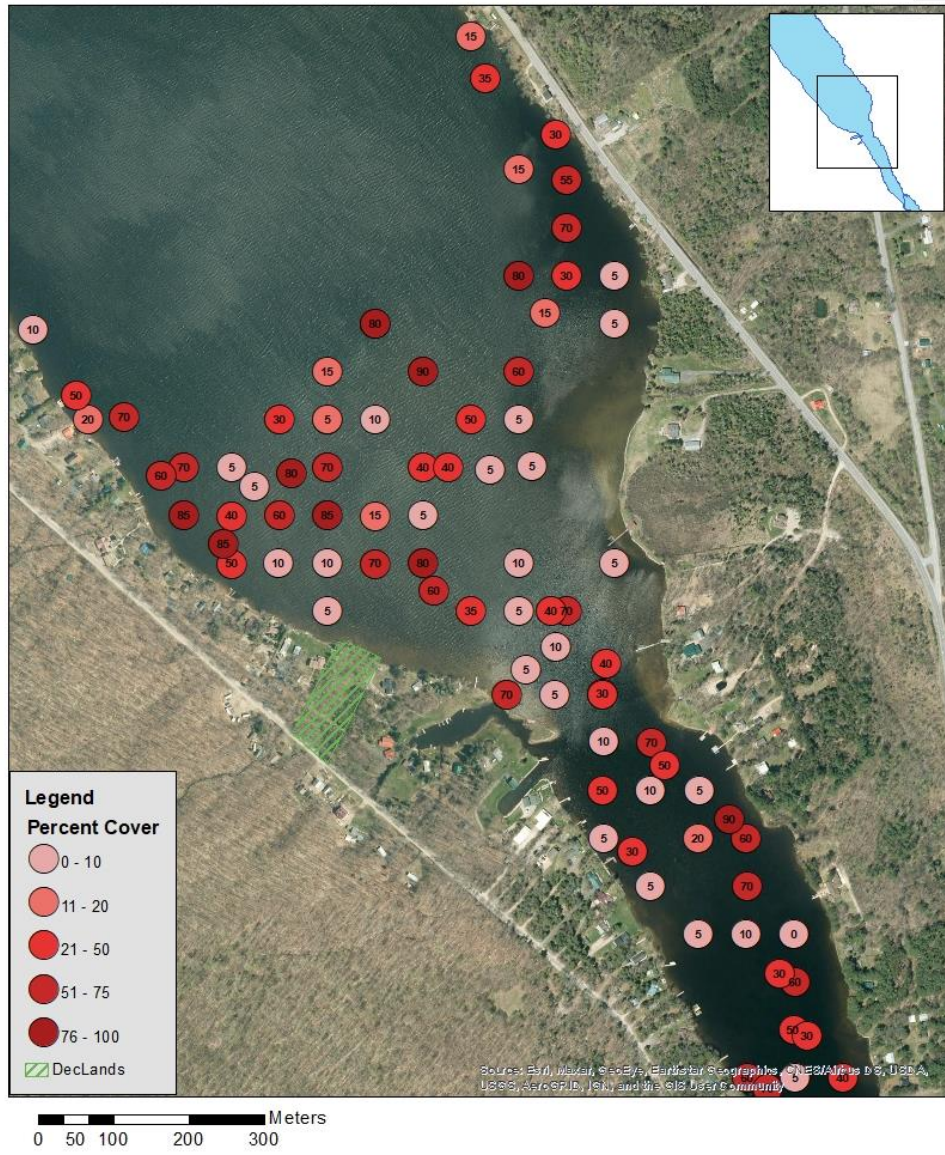
**Figure 17.** Eurasian watermilfoil distribution and percent cover at the Narrows middle section.

### Lower Chateaugay Lake

#### Lower Lake Inlet

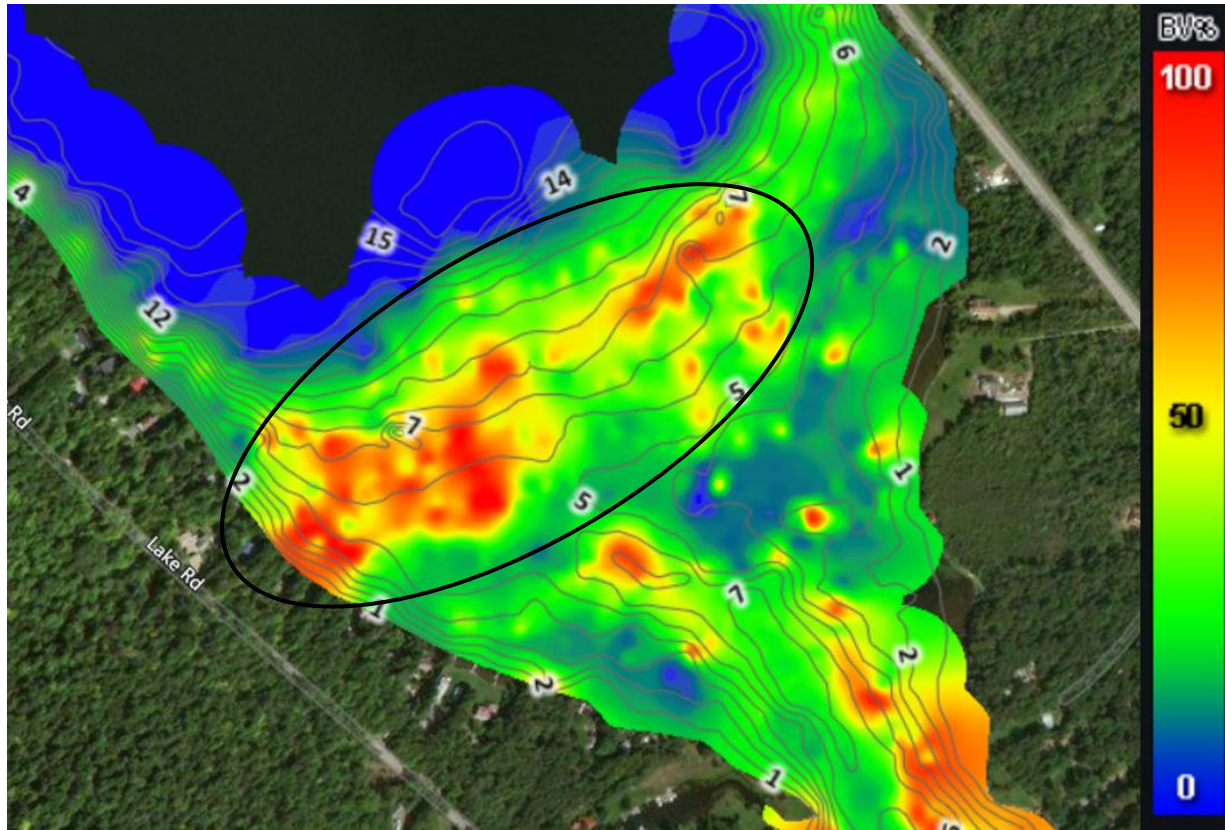
The confluence of Lower Chateaugay and the Narrows is an area of significant management interest, as EWM has been historically abundant. On either side of the inlet, large sandbars have formed of very shallow shifting sand preventing growth of aquatic plants. The center of the channel contained a mix of EWM and pondweeds with EWM getting more abundant in deeper water to the north. We noted large beds where EWM was dense that is 100% surface coverage by tall plants almost to the surface (**Figure 18**) especially along the western edge of the littoral zone (**Figure 19**).

#### 4. Lower Lake Inlet Eurasian Watermilfoil Supplemental



**Figure 18.** Eurasian watermilfoil distribution and percent cover in the Lower Chateaugay Lake Inlet Area.



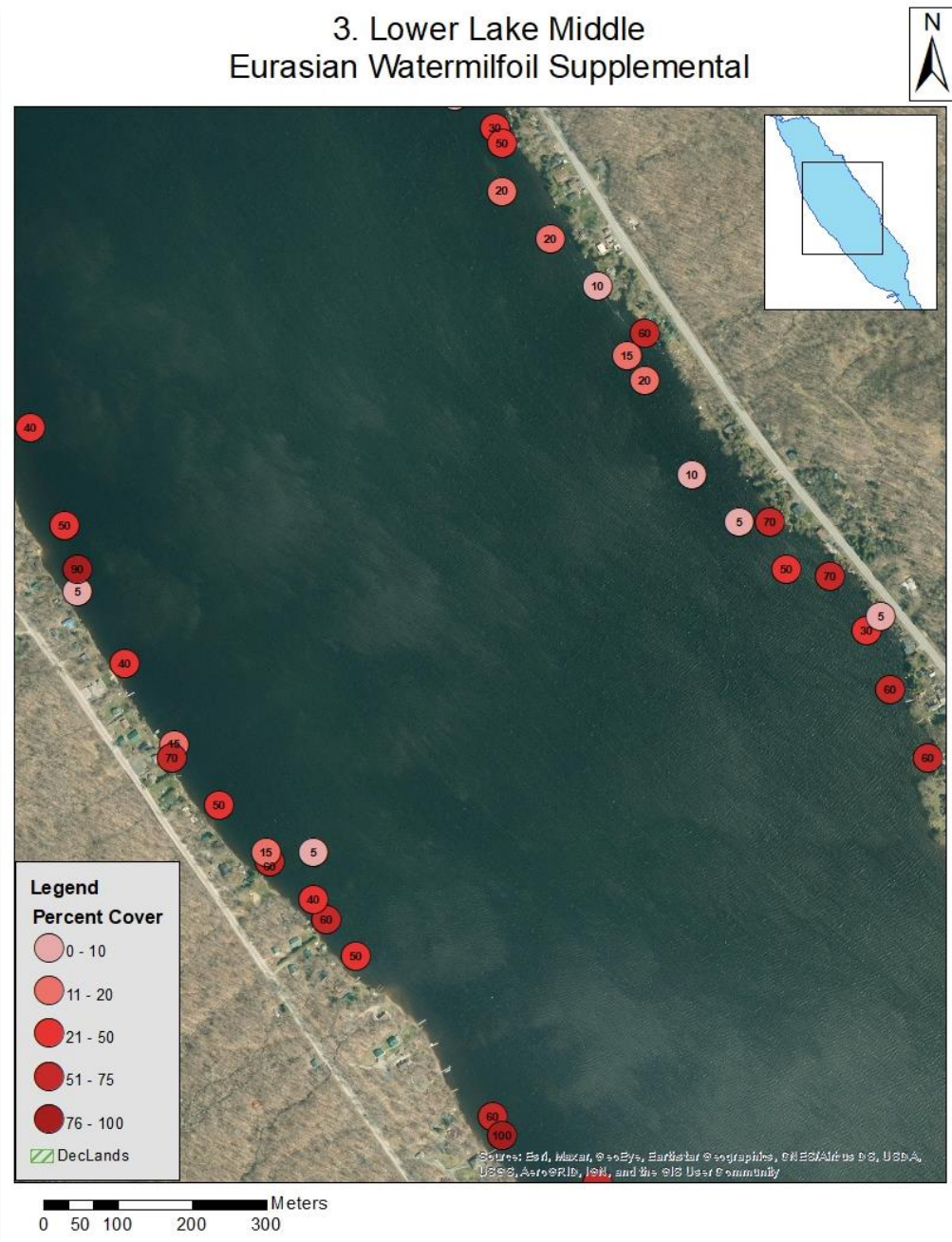


**Figure 19.** Aquatic plant coverage and biovolume in Lower Chateaugay Inlet. Black circle on map indicates dense Eurasian watermilfoil locations.

### *Lower Lake Middle*

The middle of the lower lake is mostly open, deeper water with a very limited area for aquatic plants to grow. Eurasian watermilfoil was found in high abundance, but in narrow bands, sometimes only a few feet wide (**Figure 20**). Depending on how steep the shoreline was, Eurasian watermilfoil was not found. Native plants were sparse, as shallow areas were both small in size and sandy, limiting the colonization potential of species in this area.

### 3. Lower Lake Middle Eurasian Watermilfoil Supplemental



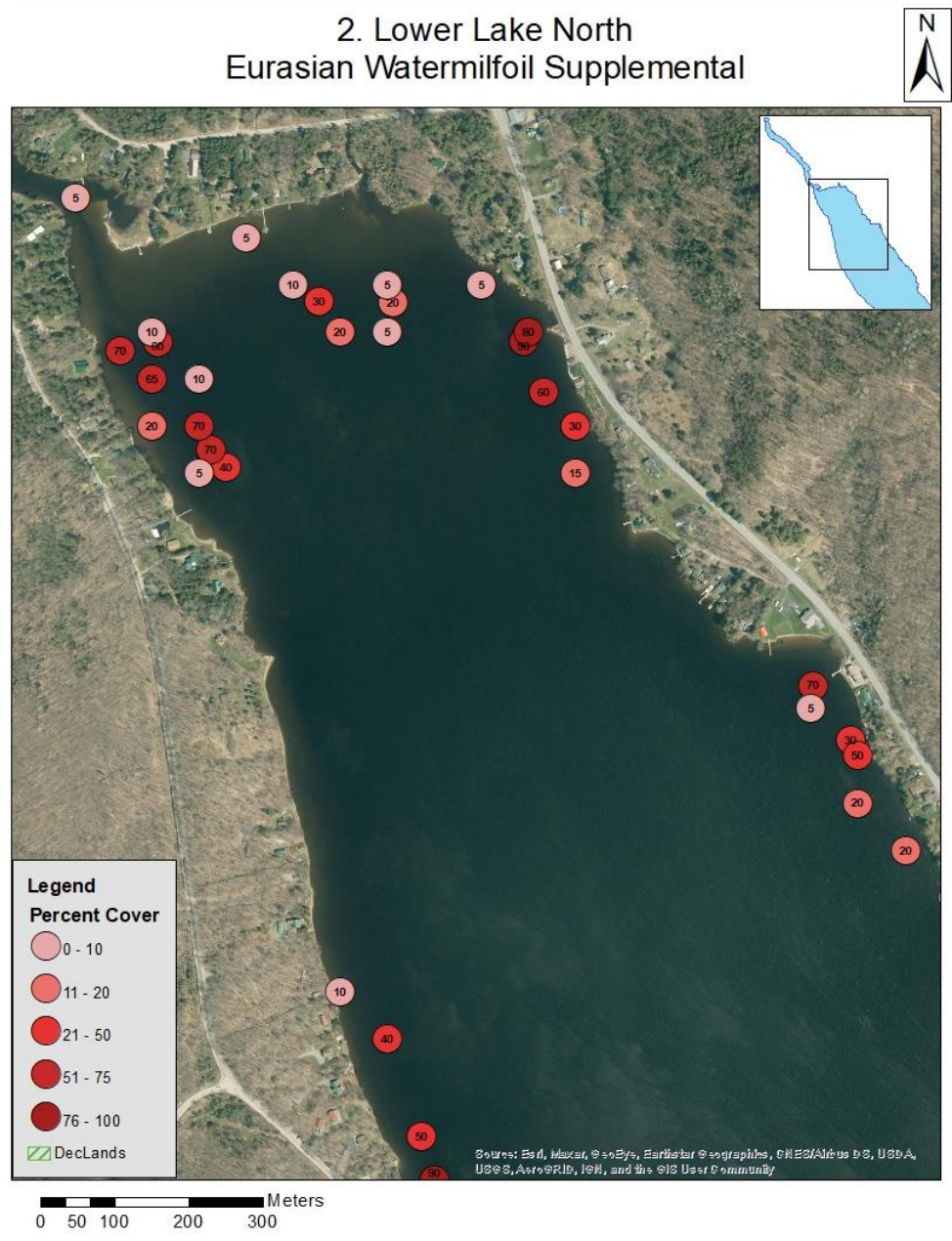
**Figure 20.** Eurasian watermilfoil distribution and percent cover in the Lower Chateaugay Lake Middle Area.

#### Lower Lake North

The northern section of the lower lake is similar to the middle area, but does have a shallow, sandy shelf at the northmost end, adjacent to the start of the outlet. Eurasian watermilfoil was distributed in the deeper waters adjacent to the sandy sections (**Figure 21**). The western side of the lake had very little Eurasian watermilfoil along the steep contours. Native plants in this area include Large-leaf pondweed, White water lily, and Nuttall's waterweed, mostly in the area closest to the outlet.



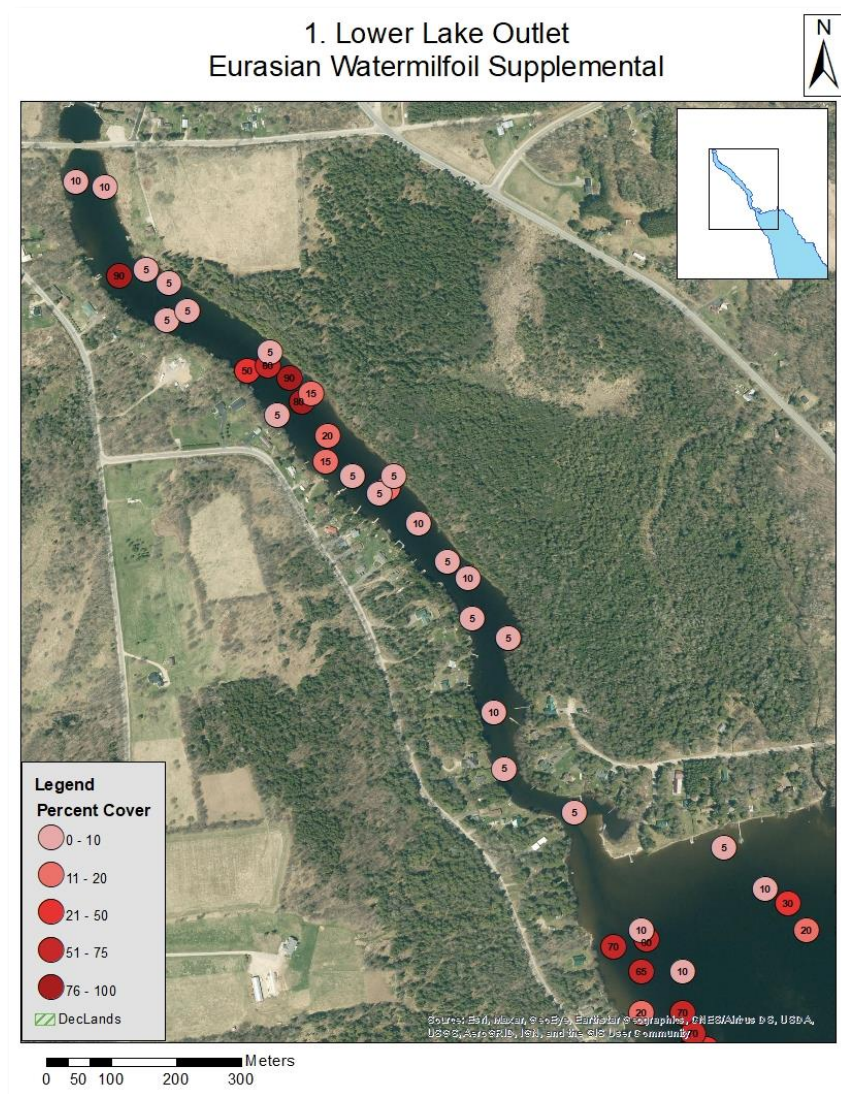
## 2. Lower Lake North Eurasian Watermilfoil Supplemental



**Figure 21.** Eurasian watermilfoil distribution and percent cover in the Lower Chateaugay Lake North Area.

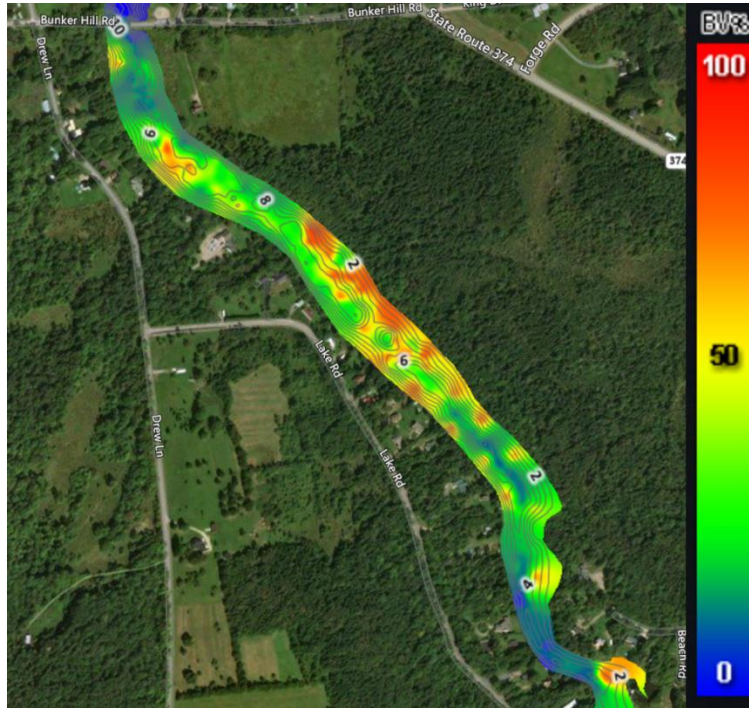
### Lower Lake Outlet

The lake's outlet was mostly vegetated, with EWM present throughout, but in low densities outside of a small area more than halfway down the outlet (**Figure 22**). There were not many "dense" patches of EWM in this section, with native plants such as Nuttall's pondweed, Coontail (*Ceratophyllum demersum*), and Claspingleaf pondweed commonly encountered. Despite the widespread coverage of aquatic plants within this section, plant height was not significant enough to impede boating access in the middle of the channel. The beginning of the channel was quite rocky, limiting aquatic plant growth as well. There were also two patches of Common reed (*Phragmites australis*) found in the inlet, with the first patch ~70 feet long and the second ~20 ft long (**Figure 24**).



**Figure 22.** Eurasian watermilfoil locations and densities the Lower Chateaugay Lake Outlet Area.





**Figure 23.** Aquatic plant coverage and biovolume in Lower Chateaugay Outlet Area.



**Figure 24.** *Phragmites australis* bed in the Lower Lake Outlet

## Curly-leaf Pondweed

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Though the invasive species Curly-leaf pondweed was not found in Chateaugay Lake during the 2021 plant survey, it was found in Upper Chateaugay Lake in 2014 (**Figure 25**). The lake should be closely monitored for the recurrence of this species. Curly-leaf pondweed produces turions (winter buds) that fall to the sediment at the lake bottom and can remain dormant for several years before sprouting. If any turions remain at the bottom of Chateaugay Lake, there is the potential for recurrence. Curly-leaf pondweed is easily identifiable by its ‘lasagna-shaped’ leaves. This species grows early in the season and dies off by mid- to late-summer.



*Figure 25. Curly-leaf pondweed found in Upper Chateaugay Lake in 2014.*

## Protected Species

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### State Ranking Overview

The Federal Endangered Species Act calls for the protection of species that show declining numbers as well as overall scarcity. The State of New York has established ratings for this class of plants that is consistent with Federal rankings. Protected species in New York fall into one of three categories: “Endangered”, “Threatened”, and “Rare” based on the number of known locations. Endangered plants are found at 5 or fewer locations, Threatened plants between 6 and 20 locations, and Rare plants are found at between 20 and 35 locations (Young et al. 2020).

The survey conducted in 2021 documented four protected species (**Table 6**): the endangered Mare’s Tail (*Hippuris vulgaris*) and the threatened Alpine pondweed (*Potamogeton alpinus*), Farwell’s milfoil (*Myriophyllum farwellii*), and Alternate-leaf watermilfoil (*Myriophyllum alterniflorum*). The rare Water marigold (*Bidens beckii*), documented in



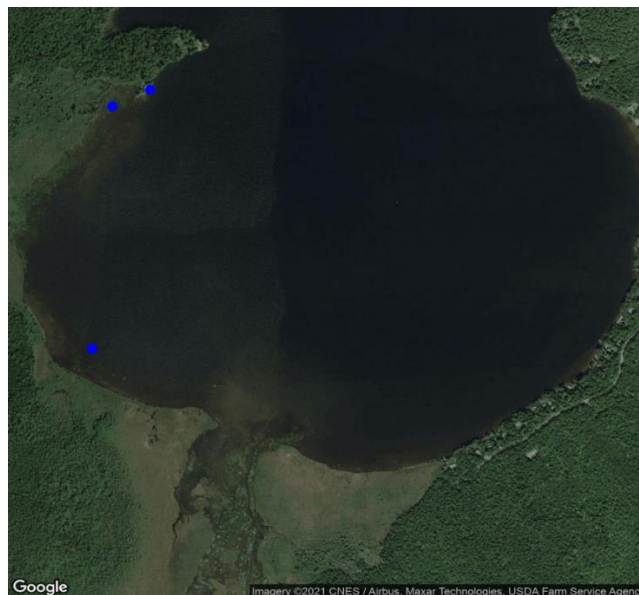
2014 by the Adirondack Watershed Institute, was not found during our survey. Based on the picture accompanying the description of *Bidens beckii* within the report, NEAR strongly believes that this specimen was misidentified and was actually a *Ranunculus* species

**Table 6.** List of protected aquatic plant species found in Chateaugay Lake.

Common Name	Scientific Name	Year and Survey	Protected Status	State Rank	List
Mare's tail	<i>Hippuris vulgaris</i>	2021, NEAR	Endangered	S1	Active
Alpine pondweed	<i>Potamogeton alpinus</i>	2021, NEAR	Threatened	S1S2	Active
Alternate-leaf milfoil	<i>Myriophyllum alterniflorum</i>	2021, NEAR	Threatened	S2	Active
Farwell's milfoil	<i>Myriophyllum farwellii</i>	2021, NEAR	Threatened	S2	Active

### Alternate Leaf Watermilfoil

Alternate-leaf watermilfoil was found at three locations in the southern section of Upper Chateaugay (**Figure 26**). Two of these locations were south of Indian Point and the other location was in the southwestern portion of the southern Upper Chateaugay. Alternate-leaf watermilfoil can be identified by its whorled leaves (distinguishes it from *M. farwellii* and *M. humile*) and shorter leaves (distinguishes it from other *Myriophyllum* taxa; Crow and Hellquist 2006).



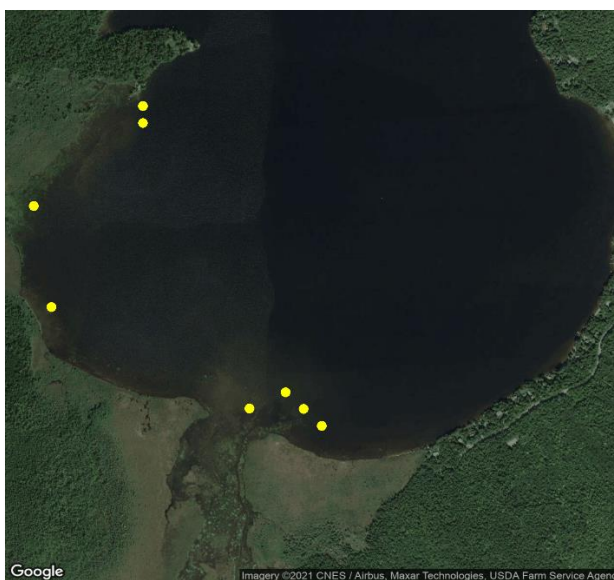
**Figure 26.** Locations of Alternate-leaf watermilfoil (blue dots) in the southern portion of Upper Chateaugay Lake.



**Figure 27.** Alternate-leaf watermilfoil.

#### Farwell's Milfoil

Farwell's milfoil was found at eight locations in the southern section of Upper Chateaugay (**Figure 27**). Occurrences were fairly spread out, with some of the plants being found directly outside of the South Inlet and with some being found on the western side. Farwell's milfoil can be identified by the alternate and whorled nature of its leaves (distinguishes it from *M. alterniflorum* and *M. humile*). The presence of fruits on the submersed stems distinguished it from *M. pinnatum* (**Figure 28**).



**Figure 28.** Locations of Farwell's milfoil (yellow dots) in the southern portion of Upper Chateaugay Lake.





**Figure 29.** Fruits of Farwell's milfoil present on the submersed section of stem, differentiating it from *M. pinnatum*.

### Mare's Tail

Mare's-tail, the only protected plant species with endangered status in the Chateaugay Lakes System was found abundantly throughout large portions of the South Inlet Area (**Figure 29**). Mare's Tail was found in 13 locations in 2021, but this distribution is most likely an underestimate of the species' true coverage, which can be seen in **Figures 30 & 31**.



**Figure 30.** Locations of Mare's tail (red dots) in the southern portion of Upper Chateaugay.



**Figure 31.** Close up of emergent and submergent portions of Mare's tail

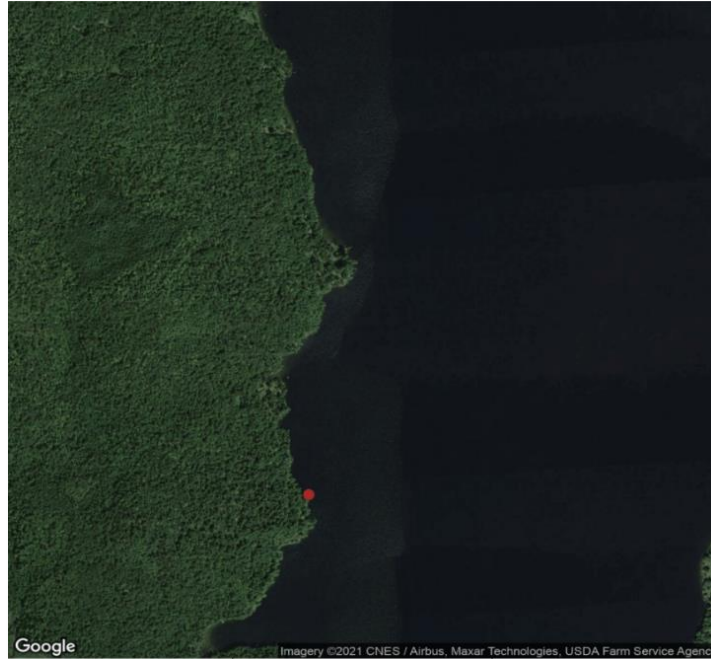


**Figure 32.** Large beds of Mare's tail in the South Inlet Area.

### Alpine Pondweed

Alpine pondweed, a protected species with threatened status, was documented at one location north of Indian Point in the southern basin of Upper Chateaugay Lake (**Figure 32**). It is distinguished from its closest relative Grassy pondweed (*Potamogeton gramineus*) by reticulate veins along the center line of the leaf and by obtuse leaf tips (Crow and Hellquist 2006).





**Figure 33.** Location of Alpine pondweed (red dot) in the southern portion of Upper Chateaugay Lake.

## Discussion and Recommendations

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### Establish Yearly Aquatic Plant Monitoring Program

In anticipation of management in future years, a systematic monitoring approach should be implemented. This monitoring program should be able to provide insight on a few key characteristics of the plant community and management program. Specifically, the program should aim to document:

- Species richness throughout the lake
- Native plant presence and abundance
- Invasive plant presence and abundance
- Rare plant presence and abundance
- Effectiveness of management
- Changes over time to native and invasive plants
- Early detection of invasive plants

These goals can be explored using a combination of annual rotating surveys of each lake section and specific pre- and post-monitoring of treatment areas. The annual rotating survey will cover species richness, native, invasive species and rare species presence and abundance, early detection of new invasive species, and changes over time. The annual rotating surveys should cover the three main lake sections (Upper Chateaugay, Narrows and Lower Chateaugay). In

terms of study design, these three surveys should revisit the pre-determined points from the 2021 survey, and additional points should be created whenever an invasive species is detected.

The pre- and post-surveys, conducted whenever there is a management action taking place, will help determine how successful the action was and if there were any non-target impacts that occurred. The surveys will also provide insight into the other items listed above, especially plant presence and abundance over time. The pre-management survey should ideally be scheduled a week or two before the management action occurs and 3-7 weeks after for the post treatment. The variation in the post treatment scheduling is based on what management action is performed. Results from a Diver Assisted Suction Harvesting (DASH) operation will be evident as soon as a few days after the action, while an herbicide treatment could take a month or so for effects to be noticed. Costs can be reduced if pre- and post-surveys in an area take place in the same year where that area is being surveyed as a part of the annual rotating basis.

The lake tracker program should continue in the southern portion of Upper Chateaugay for the foreseeable future. This program is excellent at engaging volunteer monitors and provides a consistent measure of EWM presence and abundance across time.

Another option for surveying, especially for the shallow wetland sections, would be to use a drone. Drone work has become more popular over the last 8-10 years for natural resource management and for aquatic plant management more recently. The advantage of a drone is that a large area that is inaccessible to motorcraft can be searched in a relatively short amount of time. Drone work is particularly useful for spotting floating invasive plants such as Water Chestnut and European Frogbit (*Hydrocharis morsus-ranae*) over a wide range. There is a tradeoff between resolution and cost, meaning that not every single plant can be ID'd from a drone for a reasonable cost. The drone will also not pick up submersed vegetation unless it is growing right to the surface. The South Inlet would be an area where a drone survey would work well. Another candidate area would be the eastern shoreline, both to search Ouleout Creek and to delineate the coverage of the Softstem Bulrush (*Schoenoplectus tabernaemontani*), which is the dominant plant in that area. These drone surveys would only need to be done once every 3 years.

## Rare Plant Investigation

Building off the current survey, a detailed investigation into the rare plants in the Chateaugay Lakes system is warranted. Rare plants are often at lower abundances than common native plants and therefore can be hard to find. While we are confident that our survey accurately captured the distribution of these plants, increased effort in subsequent years may provide further understanding of rare plant distribution and seasonality. Specifically, the southern inlet area, the inlet of Ouleout Creek and the small wetland sections in the narrows and lower lake should be investigated in future years.

Detailing the specific locations of these rare plants would also help with understanding the effects of future invaders. Since EWM is not a plant that does especially well in very shallow waters, some of the rare plants encountered should



not be threatened by its presence. However, this is not the case for other invasive plant species that thrive in these wetland backwater areas. European Frogbit (*Hydrocharis morsus-ranae*), Fanwort (*Cabomba caroliniana*) and Water Chestnut can do well in the 1-3 ft of water present in many of the wetland areas. These plants, if introduced, would likely pose an immediate threat to most of the rare plants within these backwater areas.

## EWM Genetics

The current survey identified a few specimens of EWM with inconsistent morphology, leading us to believe that there may be hybrid milfoils present (**Table 6**). These suspected plants may point to significant genetic diversity within the population. With some genetic strains of EWM and hybrid milfoils having greater growth potential, genetic investigations are warranted. NEAR suggests collecting a few representative samples from across the three lakes for species level ID and genotype analysis.

**Table 7.** Waypoints where suspected hybrid Eurasian watermilfoil was identified.

Waypoint	Lat	Lon
1000	44.71767	-73.9738
1002	44.71766	-73.9722
987	44.71709	-73.973

## Appendix A: Literature Cited

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## Appendix B: Excerpts from Rare Plant Status Lists (Young 2020)

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### New York State Legal Status

E = Endangered Species: listed species are those with

- 1) 5 or fewer extant sites, or
- 2) fewer than 1,000 individuals, or
- 3) restricted to fewer than 4 U.S.G.S. 7 1/2 minute topographical maps, or
- 4) species listed as endangered by the U. S. Department of Interior, as enumerated in the Code of Federal Regulations 50 CFR 17.11.

T = Threatened: listed species are those with

- 1) 6 to fewer than 20 extant sites, or
- 2) 1,000 to fewer than 3,000 individuals, or
- 3) restricted to not less than 4 or more than 7 U.S.G.S. 7 1/2 minute topographical maps, or
- 4) listed as threatened by the U. S. Department of the Interior, as enumerated in the Code of Federal Regulations 50 CFR 17.11.

R = Rare: listed species have

- 1) 20 to 35 extant sites, or
- 2) 3,000 to 5,000 individuals statewide.

EV = Exploitably vulnerable: listed species are likely to become threatened in the near future throughout all or a significant portion of their range within the state if causal factors continue unchecked. [This definition does not apply to many plants on this list and efforts are underway to change the definition or the list - SMY]

U = Unprotected

### Explanation of Heritage Ranks and Codes

#### Global Rank

G1 = Critically Imperiled. At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors. **(5 taxa in 2020)**

G2 = Imperiled. At high risk of extinction or elimination due to very restricted range, very few populations, steep declines, or other factors. **(9 taxa in 2020)**

G3 = Vulnerable. At moderate risk of extinction or elimination due to very restricted range, very few populations, steep declines, or other factors. **(43 taxa in 2020)**

G4 = Apparently Secure. Uncommon but not rare; some cause for long-term concern from declines or other factors.

G5 = Secure. Common; widespread and abundant. (but possibly rare in parts).

GH = Historical and Possibly Extinct. No extant sites known but it may be rediscovered.

GX = Presumed Extinct. Species not located despite intensive searches and virtually no likelihood of rediscovery.


GNR = Not Ranked. No global rank has been assigned by NatureServe.







## State Rank

- S1 = Critically imperiled in New York State because of extreme rarity (5 or fewer sites or very few remaining individuals) or extremely vulnerable to extirpation from New York State due to biological or human factors.
- S2 = Imperiled in New York State because of rarity (6 - 20 sites or few remaining individuals) or highly vulnerable to extirpation from New York State due to biological or human factors.
- S3 = Vulnerable in New York State. At moderate risk of extinction or elimination due to very restricted range, very few populations (usually 21 - 35 extant sites), steep declines, or other factors.
- S4 = Apparently secure in New York State. Common in many areas of the state but possibly rare in other areas.
- S5 = Demonstrably secure in New York State. Common; widespread and abundant.
- SH = Historical. No existing sites known in New York State in the last 20-30 years but it may be rediscovered.
- SX = Presumed extirpated from New York State with very low probability of rediscovery.

## Appendix C: Species Photo Inventory

Scientific Name (Common Name)	Photo
<p><i>Brasenia schreberi</i> (Watershield)</p> <p>Photo credit: NEAR</p>	
<p><i>Ceratophyllum demersum</i> (Coontail)</p> <p>Photo credit: NEAR</p>	
<p><i>Chara vulgaris</i>. (Muskgrass sp.)</p> <p>Photo credit: J.M. DiTomaso &amp; G.B. Kyser</p>	<p><i>Chara</i> sp.</p> 
<p><i>Eleocharis acicularis</i> (Needle Spikerush)</p> <p>Photo credit: NEAR</p>	



<p><i>Eleocharis emergent</i> (Emergent Spikerush)</p> <p>Photo credit:  <a href="https://gobotany.nativeplanttrust.org/species/eleocharis/acicularis/">https://gobotany.nativeplanttrust.org/species/eleocharis/acicularis/</a></p>	
<p><i>Eleocharis robbinsii</i> (Robbin's Spikerush)</p> <p>Photo credit:  <a href="https://gobotany.nativeplanttrust.org/species/eleocharis/robbinsii/">https://gobotany.nativeplanttrust.org/species/eleocharis/robbinsii/</a></p>	
<p><i>Elodea nuttallii</i> (Nuttall's Waterweed)</p> <p>Photo credit:  Christian Fisher</p>	
<p><i>Equisetum</i> sp. (Horsetail)</p> <p>Photo credit: <a href="https://www.greenmeadowgrowers.com/plants/horsetail-or-scouring-rush/">https://www.greenmeadowgrowers.com/plants/horsetail-or-scouring-rush/</a></p>	

*Fontinalis sp.* (Aquatic Moss)

Photo credit:  
John Game



*Glyceria borealis* (Northern Manna Grass)



*Hippuris vulgaris* (Mare's Tail)

Photo credit:  
NEAR








*Isoetes sp.* (Quillwort)

Photo credit:  
NEAR









<p><i>Lemna minor</i> (Duckweed)</p> <p>Photo credit:  <a href="https://snailemporium.com/product/duck-weed-lemna-minor/">https://snailemporium.com/product/duck-weed-lemna-minor/</a></p>	
<p><i>Lobelia dortmanna</i> (Water Lobelia)</p> <p>Photo credit:  <a href="https://michiganflora.net/species.aspx?id=704">https://michiganflora.net/species.aspx?id=704</a></p>	
<p><i>Ludwigia palustris</i> (Water Purslane)</p> <p>Photo credit:  <a href="https://www.gardenia.net/plant/ludwigia-palustris">https://www.gardenia.net/plant/ludwigia-palustris</a></p>	
<p><i>Myriophyllum alterniflorum</i> (Alternate-Leaf Watermilfoil)</p> <p>Photo credit:  NEAR</p>	

<p><i>Myriophyllum humile</i> (Low-Watermilfoil)</p> <p>Photo credit: NEAR</p>	
<p><i>Myriophyllum farwellii</i> (Farwell's Watermilfoil)</p> <p>Photo credit: <a href="https://gobotany.nativeplanttrust.org/species/myriophyllum/humile/">https://gobotany.nativeplanttrust.org/species/myriophyllum/humile/</a></p>	
<p><i>Myriophyllum sibiricum</i> (Northern Watermilfoil)</p> <p>Photo credit: <a href="https://gobotany.nativeplanttrust.org/species/myriophyllum/sibiricum/">https://gobotany.nativeplanttrust.org/species/myriophyllum/sibiricum/</a></p>	
<p><i>Myriophyllum spicatum</i> (Eurasian Watermilfoil)</p> <p>Photo credit: NEAR</p>	







<p><i>Myriophyllum tenellum</i> (Slender Watermilfoil)</p> <p>Photo credit: NEAR</p>	
<p><i>Myriophyllum verticillatum</i> (Whorled Watermilfoil)</p> <p>Photo credit: NEAR</p>	
<p><i>Najas flexilis</i> (Slender Naiad)</p> <p>Photo credit: NEAR</p>	
<p><i>Najas guadalupensis</i> (Southern Naiad)</p> <p>Photo credit: NEAR</p>	

<p><i>Nitella sp.</i> (Stonewort sp.)</p> <p>Photo credit: Show Ryn</p>	
<p><i>Nuphar variegata</i> (Yellow Water Lily)</p> <p>Photo credit: NEAR</p>	
<p><i>Nymphaea odorata</i> (White Water Lily)</p> <p>Photo credit: NEAR</p>	
<p><i>Nymphaea odorata tuberosa</i> (American White-Water Lily)</p> <p>Photo credit: <a href="http://www.minnesotaseasons.com/Plants/American_white_waterlily_(tuberosa).html">http://www.minnesotaseasons.com/Plants/American_white_waterlily_(tuberosa).html</a></p>	







<p><i>Phragmites australis</i> (Common Reed)</p> <p>Photo credit: R.A. Nonemacher</p>	
<p><i>Polygonum amphibium</i> (Water Smartweed)</p> <p>Photo credit: NEAR</p>	
<p><i>Potamogeton alpinus</i> (Alpine Pondweed)</p> <p>Photo credit: <a href="https://en.wikipedia.org/wiki/Potamogeton_alpinus">https://en.wikipedia.org/wiki/Potamogeton_alpinus</a></p>	
<p><i>Potamogeton amplifolius</i> (Large-leaf Pondweed)</p> <p>Photo credit: <a href="https://www.minnesotawildflowers.info/aquatic/large-leaved-pondweed">https://www.minnesotawildflowers.info/aquatic/large-leaved-pondweed</a></p>	


<p><i>Potamogeton crispus</i> (Curly-leaf Pondweed)</p> <p>Photo credit:  <a href="https://www.minnesotawildflowers.info/aquatic/curly-pondweed">https://www.minnesotawildflowers.info/aquatic/curly-pondweed</a></p>	
<p><i>Potamogeton epihydrus</i> (Ribbon-leaf Pondweed)</p> <p>Photo credit:  NEAR</p>	
<p><i>Potamogeton gramineus</i> (Grassy Pondweed)</p> <p>Photo credit:  NEAR</p>	
<p><i>Potamogeton natans</i> (Floating-Leaf Pondweed)</p> <p>Photo credit:  <a href="https://gobotany.nativeplanttrust.org/species/potamogeton/natans/">https://gobotany.nativeplanttrust.org/species/potamogeton/natans/</a></p>	







<p><i>Potamogeton nodosus</i> (River Pondweed)</p> <p>Photo credit:  <a href="https://www.illinoiswildflowers.info/wetland/plants/il_pondweed.html">https://www.illinoiswildflowers.info/wetland/plants/il_pondweed.html</a></p>	
<p><i>Potamogeton obtusifolius</i> (Blunt-leaved Pondweed)</p> <p>Photo credit:  <a href="http://www.biopix.com/blunt-leaved-pondweed-potamogeton-obtusifolius_photo-100751.aspx">http://www.biopix.com/blunt-leaved-pondweed-potamogeton-obtusifolius_photo-100751.aspx</a></p>	
<p><i>Potamogeton perfoliatus</i> (Clasping-Leaf Pondweed)</p> <p>Photo credit:  NEAR</p>	
<p><i>Potamogeton pusillus</i> (Small Pondweed)</p> <p>Photo credit:  NEAR</p>	

<p><i>Potamogeton robbinsii</i> (Robbin's Pondweed)</p> <p>Photo credit: NEAR</p>	
<p><i>Potamogeton spirillus</i> (Northern Snailseed Pondweed)</p> <p>Photo credit: NEAR</p>	
<p><i>Potamogeton zosteriformis</i> (Flat Stemmed Pondweed)</p> <p>Photo credit: <a href="https://gobotany.nativeplanttrust.org/species/potamogeton/zosteriformis/">https://gobotany.nativeplanttrust.org/species/potamogeton/zosteriformis/</a></p>	
<p><i>Ranunculus sp.</i> (Buttercup)</p> <p>Photo credit: NEAR</p>	



<p><i>Sagittaria graminea</i> (Grassy Arrowhead)</p> <p>Photo credit: NEAR</p>	
<p><i>Sagittaria sp.</i></p> <p>Photo credit: NEAR</p>	
<p><i>Schoenoplectus sp.</i> (Bulrush)</p> <p>Photo credit: NEAR</p>	
<p><i>Carex sp.</i> (Sedge sp.)</p> <p>Photo credit: <a href="https://naturalcommunities.net/products/carex-aquaticilis-water-sedge">https://naturalcommunities.net/products/carex-aquaticilis-water-sedge</a></p>	

<p><i>Sparganium angustifolium</i> (Narrowleaf Bur-reed)</p> <p>Photo credit:  <a href="https://gobotany.nativeplanttrust.org/species/sparganium/angustifolium/">https://gobotany.nativeplanttrust.org/species/sparganium/angustifolium/</a></p>	
<p><i>Sparganium fluctuans</i> (Floating Bur-reed)</p> <p>Photo credit:  NEAR</p>	
<p><i>Spirodela polyrhiza</i> (Greater Duckweed)</p> <p>Photo credit:  <a href="https://sites.google.com/site/herbismundi/aquatic-phytoremediants/spirodela-polyrhiza">https://sites.google.com/site/herbismundi/aquatic-phytoremediants/spirodela-polyrhiza</a></p>	
<p><i>Typha</i> sp. (Cattail)</p> <p>Photo credit:  <a href="https://www.gardeningknowhow.com/ornamental/water-plants/cattails/controlling-cattails.htm">https://www.gardeningknowhow.com/ornamental/water-plants/cattails/controlling-cattails.htm</a></p>	



<p><i>Utricularia macrorhiza</i> (Common Bladderwort)</p> <p>Photo credit:  <a href="https://www.minnesotawildflowers.info/flower/common-bladderwort">https://www.minnesotawildflowers.info/flower/common-bladderwort</a></p>	
<p><i>Utricularia minor</i> (Lesser Bladderwort)</p> <p>Photo credit:  NEAR</p>	
<p><i>Vallisneria americana</i> (Tape Grass)</p> <p>Photo credit:  William &amp; Wilma Follette</p>	
<p><i>Zosterella dubia</i> (Water Stargrass)</p> <p>Photo credit:  NEAR</p>	

## Appendix D: Hybrid Watermilfoil

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During the survey, multiple specimens of EWM were observed that had distinctly different characteristics than what is considered standard for the species (**Figure 33**). The most striking characteristic was the number of leaflets, which varied greatly between plants. Some plants had 16 leaflet pairs while others had only 6. EWM usually has over 12 pairs of leaflets on each leaf (Crow and Hellquist). The specimens also did not exhibit typical characteristics of Northern Watermilfoil (*Myriophyllum sibiricum*). It has been known for about 20 years now that EWM can hybridize with other milfoil species, such as Northern Watermilfoil (Moody and Les 2002). Morphological characteristics alone are not sufficient to identify hybrid Watermilfoils in the field. Moody and Les (2007) examined morphological data from Watermilfoil species that also had genetic analysis done to identify lineage. They found that they could easily distinguish between invasive EWM and native Northern Watermilfoil using morphology but could not identify hybrids using morphology alone.

Hybrid Watermilfoils don't just represent another aspect of lake ecology and intermixing of species, they can pose significant issues for management. Hybrid Watermilfoils have been shown to have increased growth rates, increased sexual reproduction potential and increased tolerances to some herbicides compared to non-hybrid plants (LaRue et al. 2012; Berger et al. 2017; Glisson and Larkin 2021). There is significant genetic variation even within hybrid Watermilfoils, which each have specific traits which allow them to thrive in a variety of conditions (Taylor et al. 2017). Not every hybrid milfoil will have the same tolerance to specific herbicides, meaning that identification of specific genotypes for lakes may be more important than just knowing if a hybrid is present.



**Figure 34.** Specimens of EWM and other milfoils from Chateaugay with varying leaflet counts.