NEW YORK STATE OF OPPORTUNITY. | Adirondack Park Agency

P2022-0003 and P2022-0004
Lake George Park Commission (LGPC)

April 13, 2022

- **Overview of Lake George, Eurasian Watermilfoil (EWM), Lake-wide Management of EWM, and the Aquatic Herbicide ProcellaCOR EC**
- **P2022-0003; LGPC, Sheep Meadow Bay**
- **P2022-0004; LGPC, Blairs Bay**

Lake George

Lake George *The Queen of American Lakes*

32 Miles Long, 28,000 Acres

AA Special Water – Suitable Use as a Public Water Supply

Surrounded by 9 municipalities

During a May 31, 1791 Visit Thomas Jefferson Said:

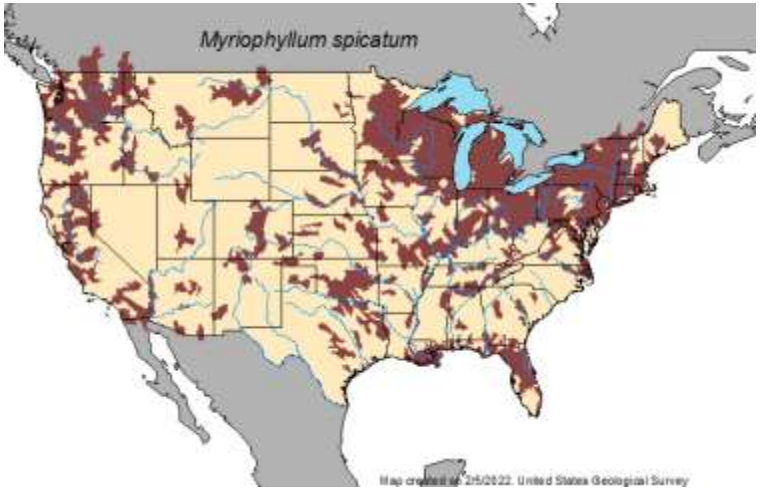
"**Lake George is without comparison, the most beautiful water I ever saw**…"

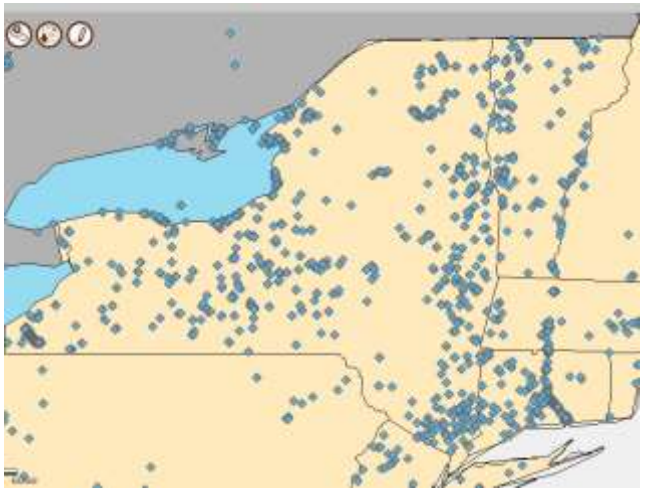
Eurasian Watermilfoil (EWM)

Eurasian Watermilfoil (EWM) is an aquatic invasive plant that is not native to the United States (est. 1800's).

The plant causes both economic and environmental harm: it impairs recreational use of waterways, including boating and swimming, while degrading the native habitat of fish and other wildlife.

There are no natural native predators to keep the population in check, thus in certain environments EWM can form extremely dense beds of vegetation. Once established, EWM is extremely difficult if not impossible to eradicate.



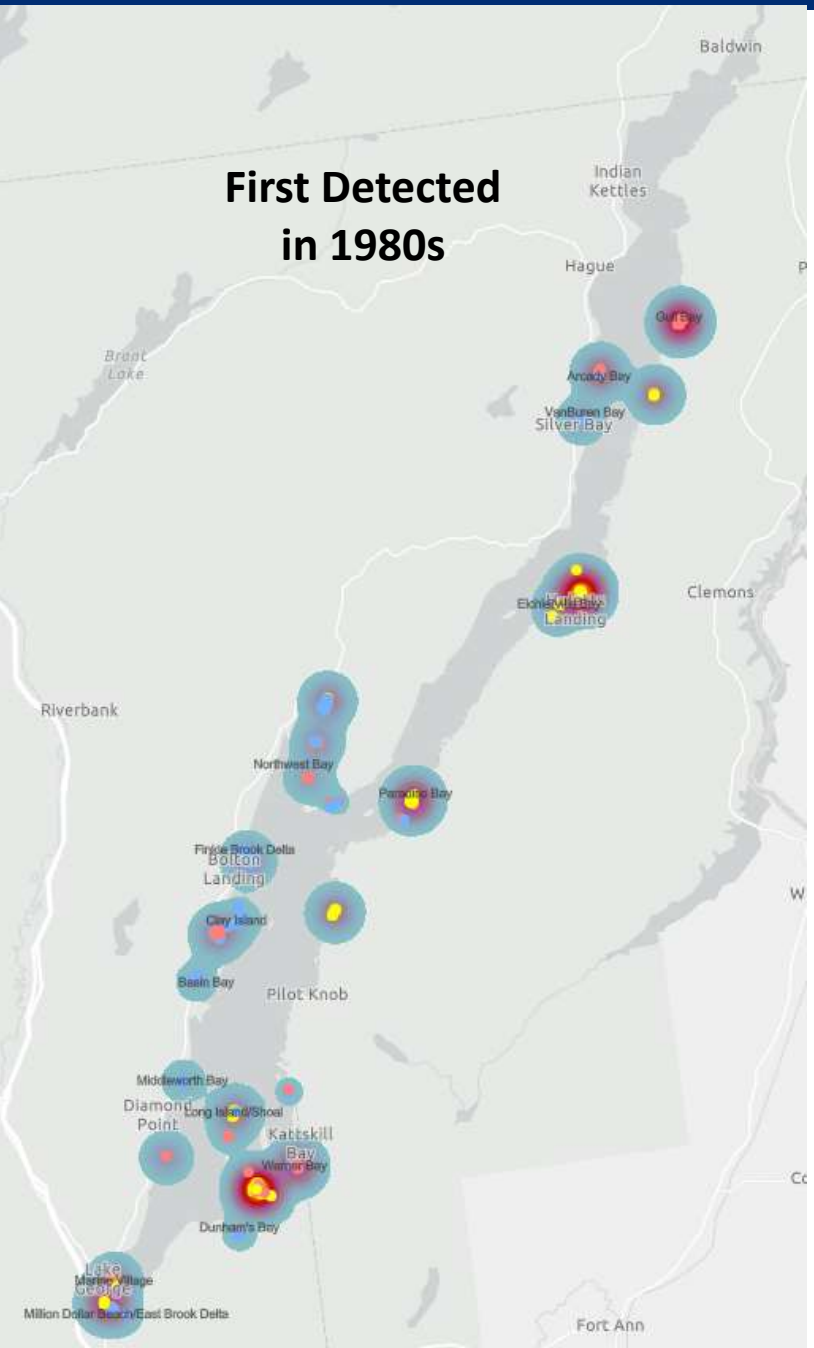


EWM grows well in areas that have experienced disturbances such as nutrient loading, intense plant management, or abundant motorboat use.

Each plant can produce approximately 100 seeds per season, but this species is much more successful at vegetative reproduction via fragments and runners.

After flowering, this species can undergo auto-fragmentation; fragments can be transported via wind, waves, or by human activity.


Aqua-Bound



$ 7 Million Spent Since Program First Began

<u>In 2021</u>:

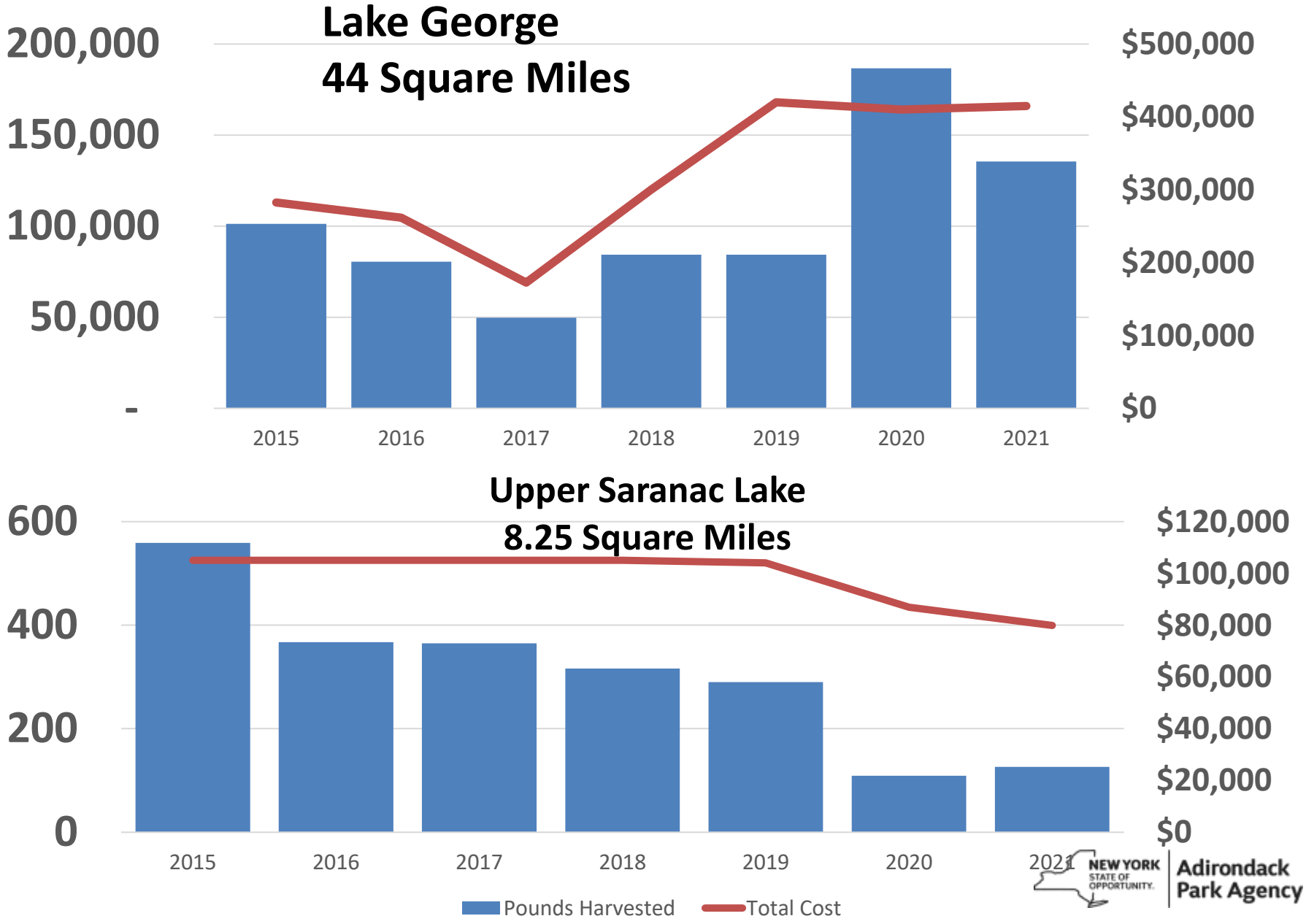
- **$425K Invested In EWM Management**
- **68 Tons Collected Using Hand Harvesting/Diver Assisted Suction Harvesting Techniques. Four DASH units and two hand harvesting boats (25 people)**

Public Can Access Dashboard Map and Annual Reports Through the LGPC's Website

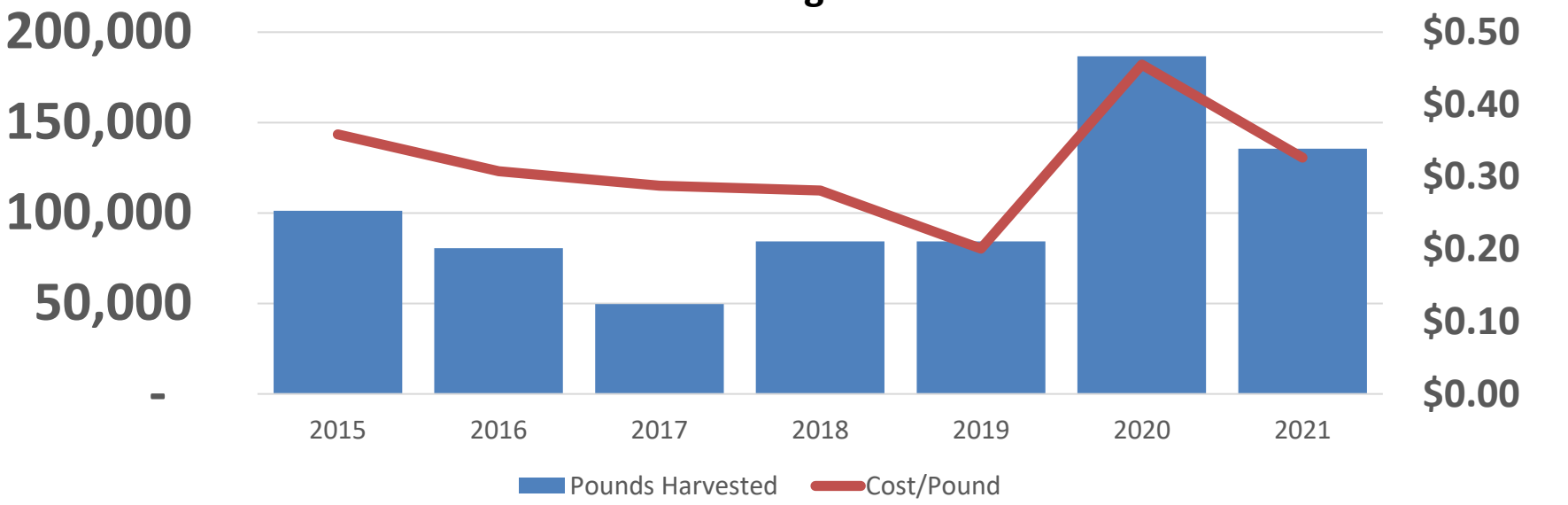
NEW YORK STATE OF OPPORTUNITY. Adirondack Park Agency

Management of Eurasian Water-milfoil, and AIS Spread Prevention in Lake George

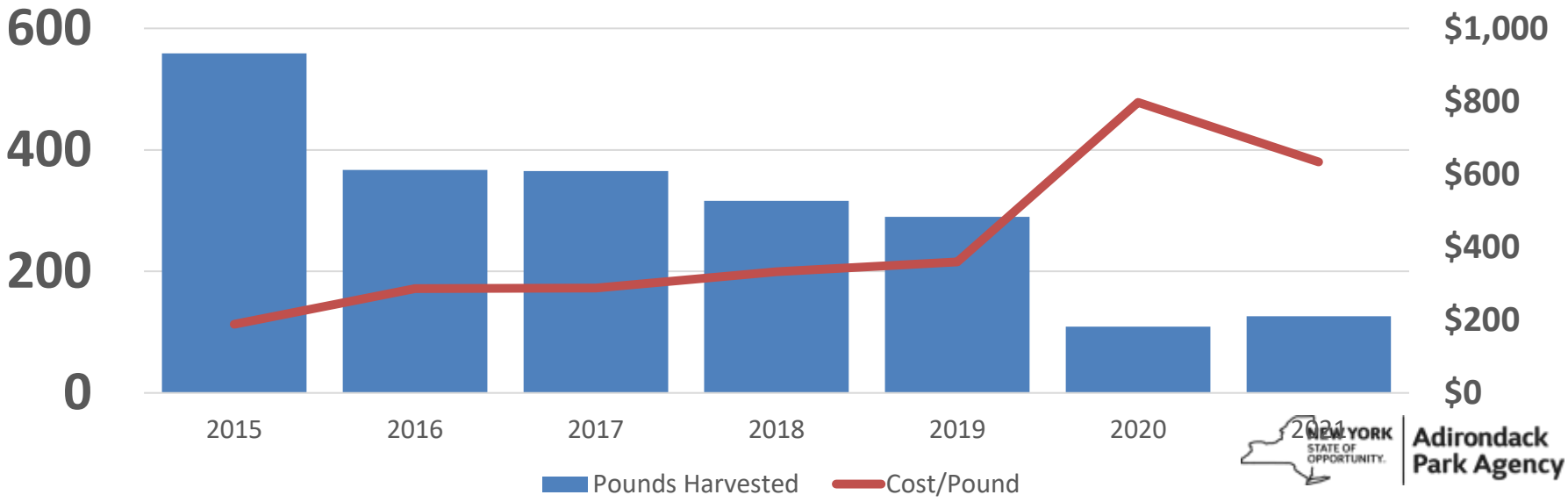
Careful removal of the entire plant, including roots, prevents re-growth. *Photo: Lakes Environmental Association.*


Lake George
44 Square Miles
200,000
150,000
100,000
50,000
-
$500,000
$400,000
$300,000
$200,000
$100,000
$0
2015
2016
2017
2018
2019
2020
2021
Upper Saranac Lake
8.25 Square Miles
600
400
200
0
$120,000
$100,000
$80,000
$60,000
$40,000
$20,000
$0
2015
2016
2017
2018
2019
2020
2021
Pounds Harvested
Total Cost
NEW YORK STATE OF OPPORTUNITY.
Adirondack Park Agency

Lake George



Upper Saranac Lake



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Lake George Boat Inspection Program

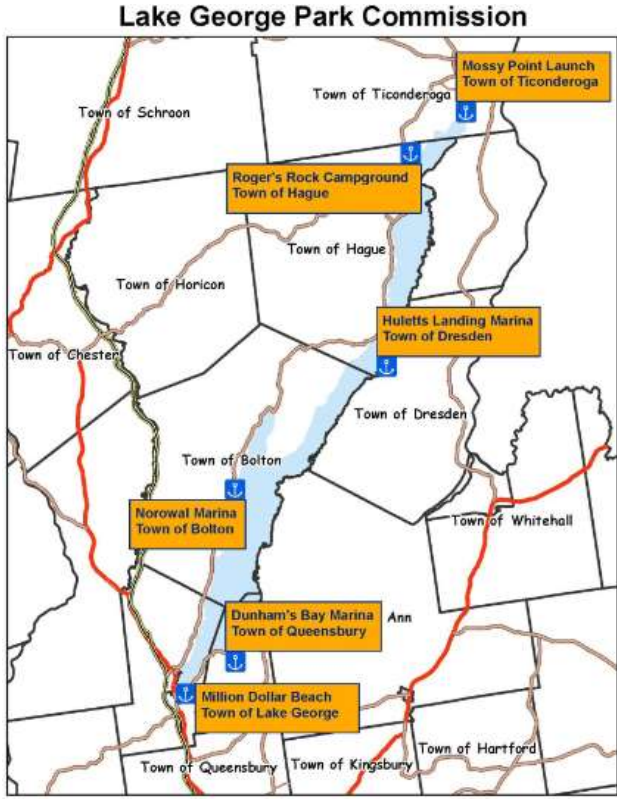
May 1 - October 31

Six regional inspection stations

All trailered boats must get inspected and "sealed" before launching into Lake George.

2021: 35,000 Contacts (Entrance/Exit)
1,000 Boats Decontaminated
113 Boats with Visible AIS

Inception: 247,000 Contacts
11,900 Boats Decontaminated
1,069 Boats with Visible AIS



Aquatic Herbicide ProcellaCOR EC

ProcellaCOR EC

- Approved for use by the US Environmental Protection Agency in 2018.

- Approved for use by NYS Department of Environmental Conservation in early 2019
  - Includes Review by:
    - Department of Health
    - Division of Fish and Wildlife

"The product application was fully reviewed regarding human health as well as ecosystem health. There were no objections to the registration of this product in New York State"

ProcellaCOR EC
A Selective Systemic Herbicide

- A new tool in the toolbox for EWM management
- Effective at low doses
- Rapid plant uptake
- Fast degradation
- Few non-target impacts

ProcellaCOR EC a New Class of Auxin Mimic

Active Ingredient Florpyrauxifen-benzyl

Mimics plant growth hormone - causes excessive elongation of plant cells that ultimately kills the plant (Epinasty)

- **Leaves grow larger and become twisted,**
- **Stems lengthen,**
- **Leaf and shoot tissue becomes fragile,**
- **Systemic herbicide – it is absorbed by the plant and distributed throughout the plant's stem, leaves, and roots.**

Short contact time required (2-6 hours) - Initial symptoms will be displayed within hours to days with plant death and decomposition within 2-3 weeks.

The herbicide is applied to plants while they are growing for efficient herbicide uptake. <u>Plant fragments not viable.</u>

Half Life of ProcellaCOR EC		
Aquatic	Aerobic	4 to 6 Days
	Anaerobic	2 Days
Sediment	Aerobic	8 Days
	Anaerobic	3 Days
Metabolites in Sediment	Aerobic	21.5 Days
	Anaerobic	28.9 Days

Toxicity	
Fish	Practically NonToxic (Least Toxic Value Assigned by EPA)
Invertebrates	Slightly Toxic
Birds, Mammals, Amphibians, Reptiles	Practically NonToxic (Least Toxic Value Assigned by EPA)

ProcellaCOR EC

Maximum Treatment Concentration Allowed by Label for Controlling EWM is 7.72 parts per billion (ppb)

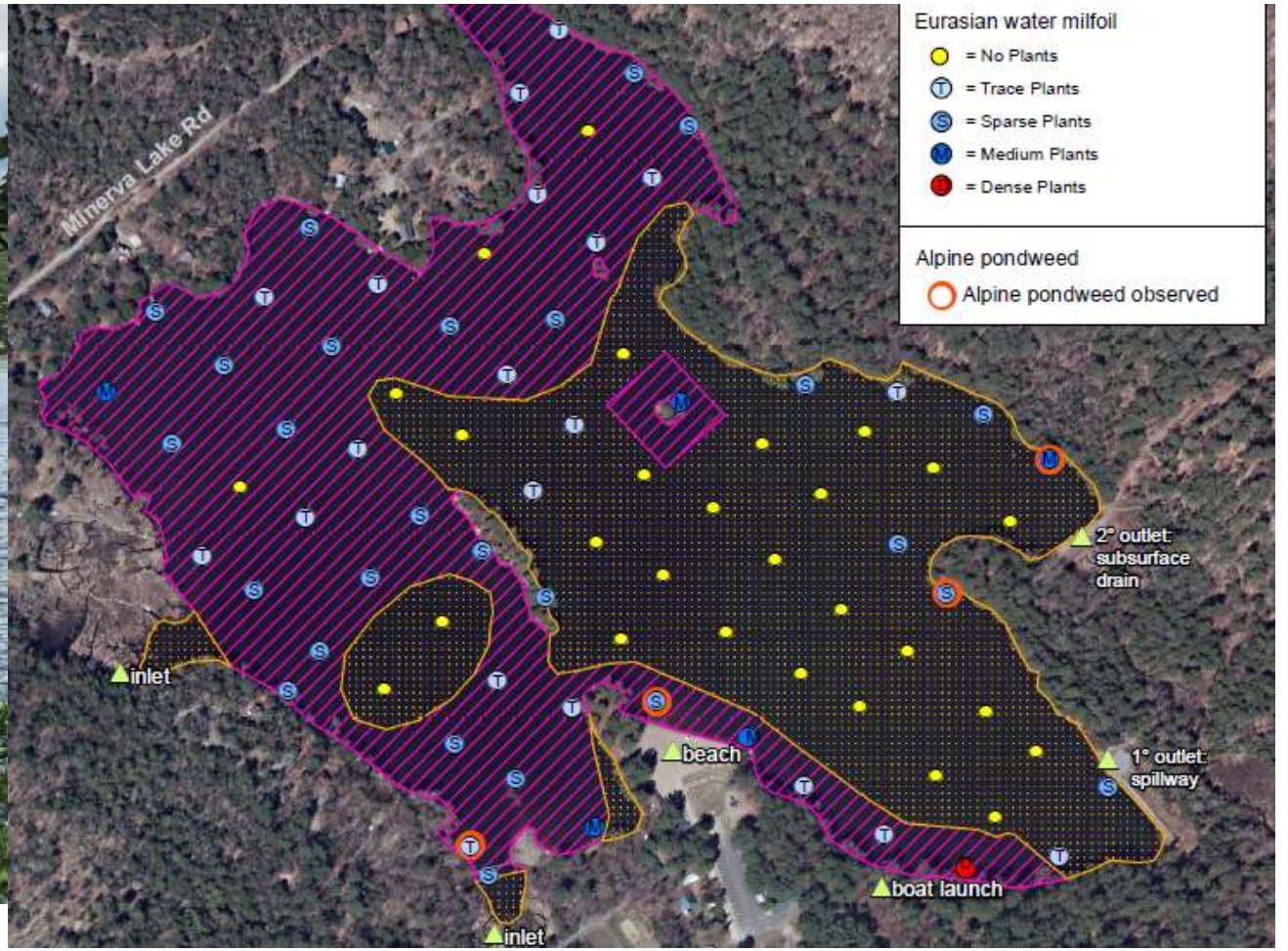
NYSDEC Use Restrictions:

- **Drinking Water: No restrictions under 50 ppb. Can and has been used in public drinking supplies**
- **Swimming / Contact Recreation: No restrictions**
- **Fishing: No restrictions**
- **Irrigation: Restriction until concentration is <1 ppb**

Overview of Regional ProCellaCor EC Treatments

	Number of Treatments	Total Treatment Area	Range of Treatment Area
New York	NYS: ≈ 30 6 in Region 5 1 in Adirondack Park	NYS: Undocumented ADK's: 41 ac	NYS: Undocumented ADK's: 41 ac
Vermont	18 Undertaken	480 ac	4 to 70 ac
New Hampshire	43 Undertaken	990 ac	0.75 to 78

P2020-0044: ProcellaCOR EC to Control EWM
APA Board Approval May, 2020 - Treatment June 5, 2020
41 Acre Treatment Area in Minerva Lake
8.73 gallons, application Rate of 3.82 ppb



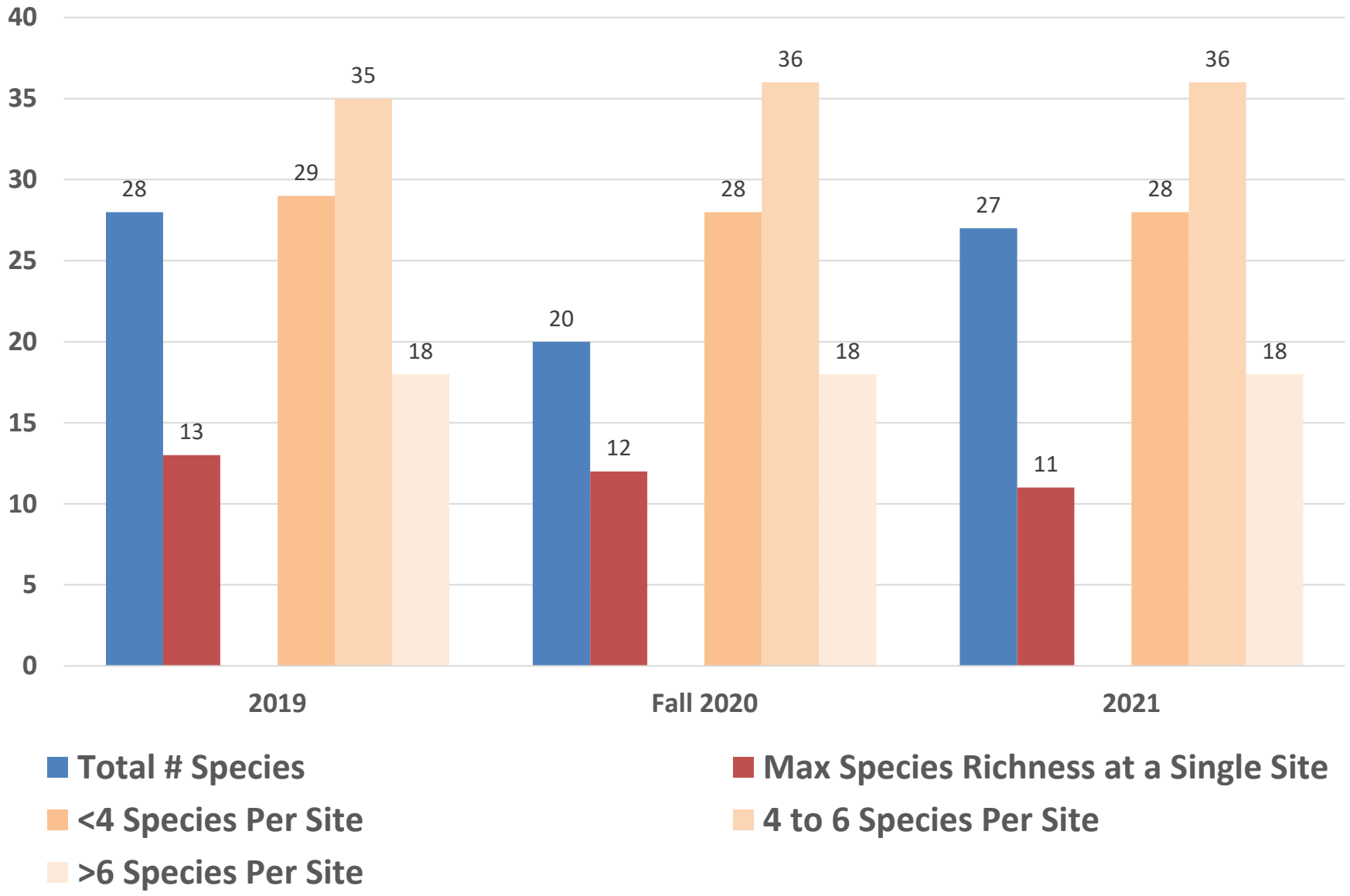
Plants Growing in Minerva Lake 3-Weeks Post Treatment








2020 Minerva Lake Herbicide Treatment Lake-wide and Individual Site Species Richness



Submersed Aquatic Plant Density

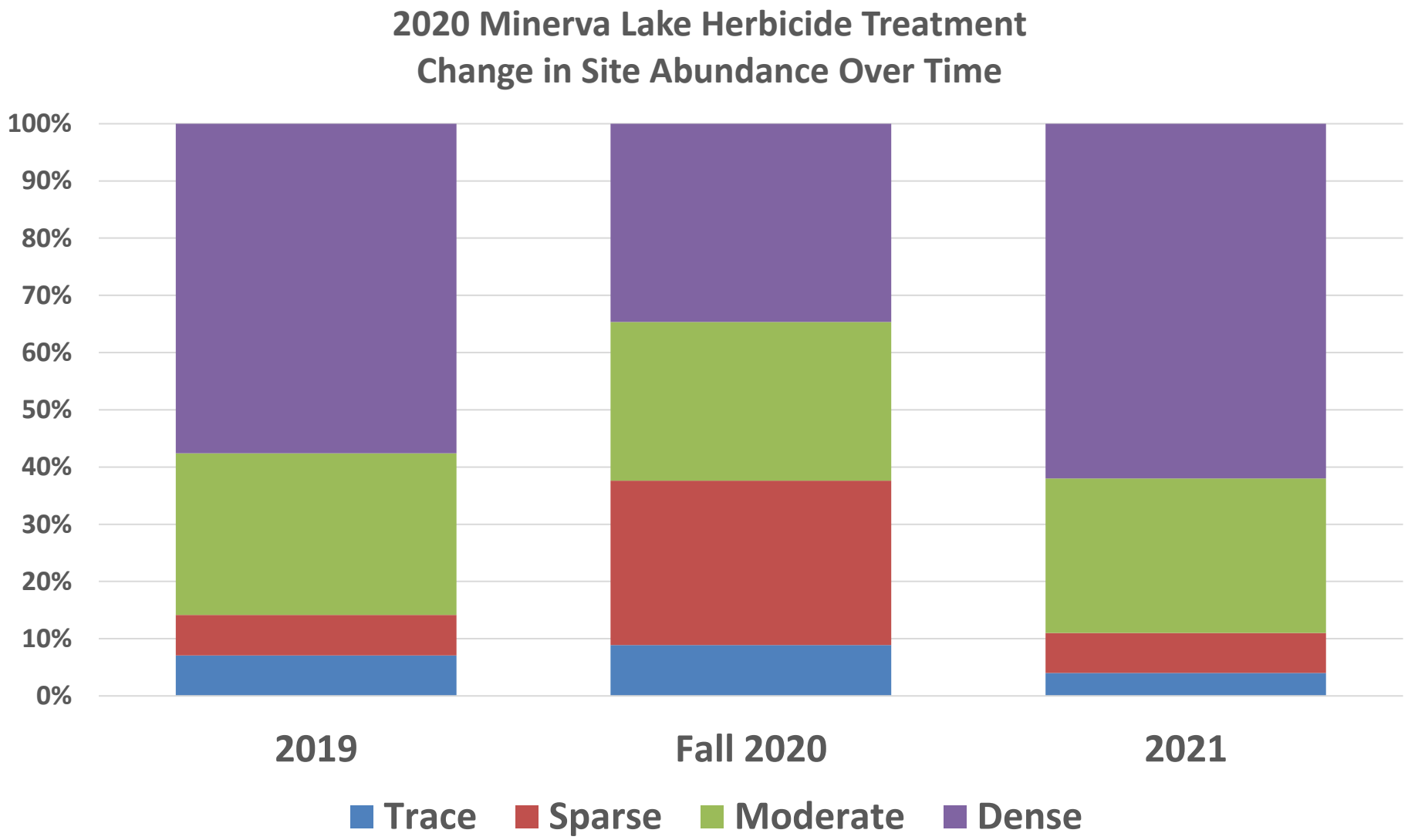
Trace

Medium

Sparse

Dense

Adirondack Park Agency



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Non-target Impacts Observed For Most Common Pre-treatment Species

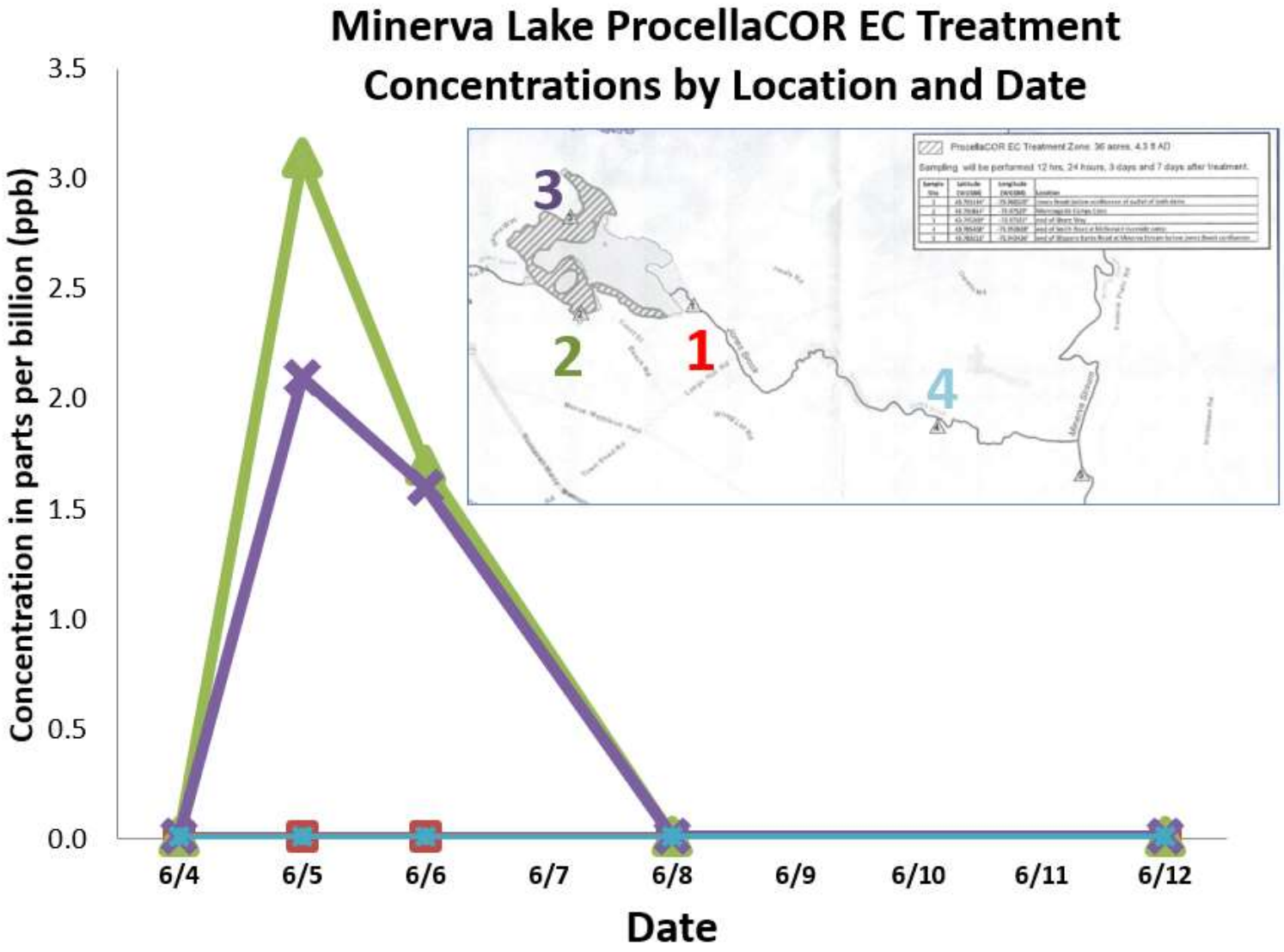
Table 2. Change in common species abundance from 2019-2021

COMMON NAME	SCIENTIFIC NAME	2019	2020	2021	CHANGE
Eurasian watermilfoil	*Myriophyllum spicatum*	66%	0%	0%	No change
Western/Common Waterweed	*Elodea spp.*	60%	63%	74%	Increase
Flat-stem Pondweed	*Potamogeton zosteriformis*	50%	54%	59%	Increase
Southern naiad	*Najas guadalupensis*	41%	60%	10%	Decrease
Macro-algae	*Chara/Nitella sp.*	38%	48%	23%	Decrease
Thin-leaf Pondweed	*Potamogeton pusillus*	44%	21%	33%	Increase
Watershield	*Brasenia schreberi*	37%	26%	20%	Decrease
Bassweed/Large-leaf pondweed	*Potamogeton amplifolius*	30%	37%	52%	Increase
Ribbon-leaf Pondweed	*Potamogeton epihydrus*	18%	34%	28%	Decrease
Northern (2019) Slender Naiad (2020, 2021)	*Najas gracillima*	17%	9%	2%	Decrease
Slender Naiad (2019) Nodding Naiad (2020, 2021)	*Najas flexilis*	16%	35%	82%	Increase
White water lily	*Nymphaea odorata*	12%	18%	21%	Increase

Increase = 6, Decrease = 4 (Does Not Include Eurasian watermilfoil)

NEW YORK STATE OF OPPORTUNITY. Adirondack Park Agency

June 5, 2020 Treatment of Minerva Lake.
Treatment Concentration 3.82 ppb, non-detectable in 3 Days



Conclusions From Minerva Lake Treatment

EWM was cleared over entire 79-acre waterbody, not just the 41-acre treatment area.

A single EWM plant was found in Fall 2021, outside the treatment area (18 months after treatment).

There is no evidence of an adverse impact to native plant community. Subtle changes in plant communities occurred.

Herbicide concentrations in the lake declined as predicted.

Treatment occurred as proposed and permitted and met the approval criteria as set forth in Wetlands Regulations.

Minerva Lake

Authorized Activity Within a Value 1 Wetland:

- Secured the natural benefits of wetlands associated with the project, consistent with the general welfare and beneficial economic, social, and agricultural development of the state; and

- Was compatible with preservation of the entire wetland and will not result in degradation or loss of any part of the wetland or its associated values.

NEW YORK STATE OF OPPORTUNITY. | Adirondack Park Agency

Lake George Park Commission Sheep Meadow Bay

Project 2022-3

April 13, 2022

Overview

- Jurisdiction
- Conclusions of Law
- Project Location
- Existing Conditions
- Proposed Project
- *Public Comment*
- Staff Recommendation

Jurisdiction

Application of Herbicides in Wetlands

Regulated Wetland Activity – 9 NYCRR Part 578

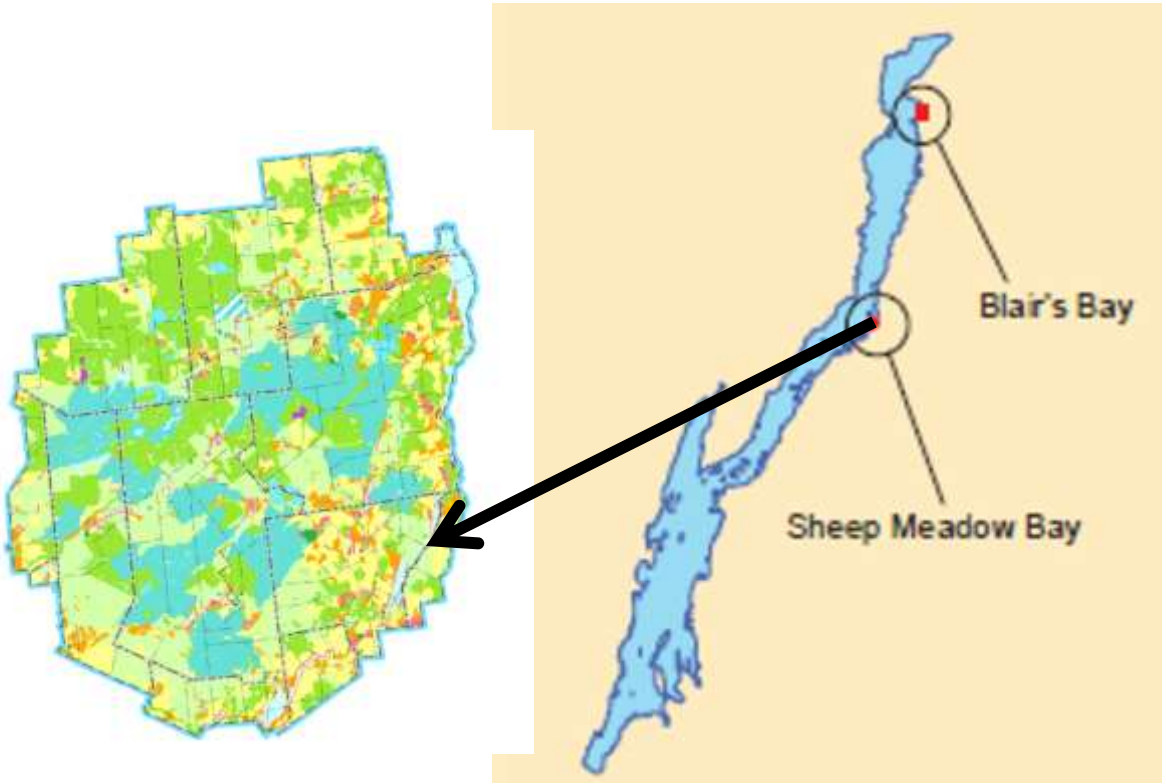
Conclusions of Law

- **Activity Authorized:**

a. will result in the minimum possible degradation or destruction of any part of the wetland or its associated values,
b. is the only alternative which reasonably can accomplish the applicant's objectives, and
c. will, weighing the benefits of the activity against its cost and the wetland values lost, provide a net social and/or economic gain to the community.

Project Location

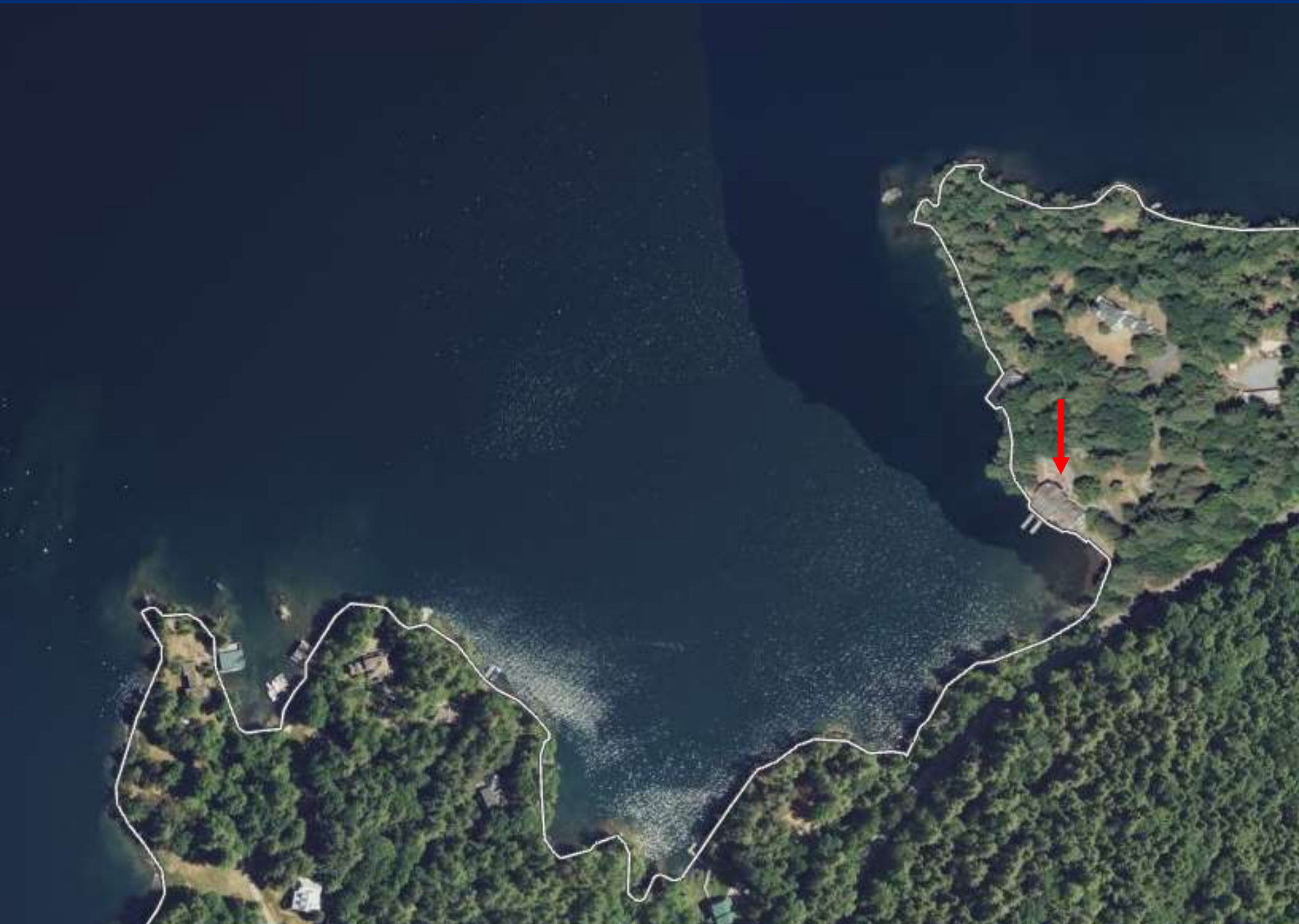
Project Location

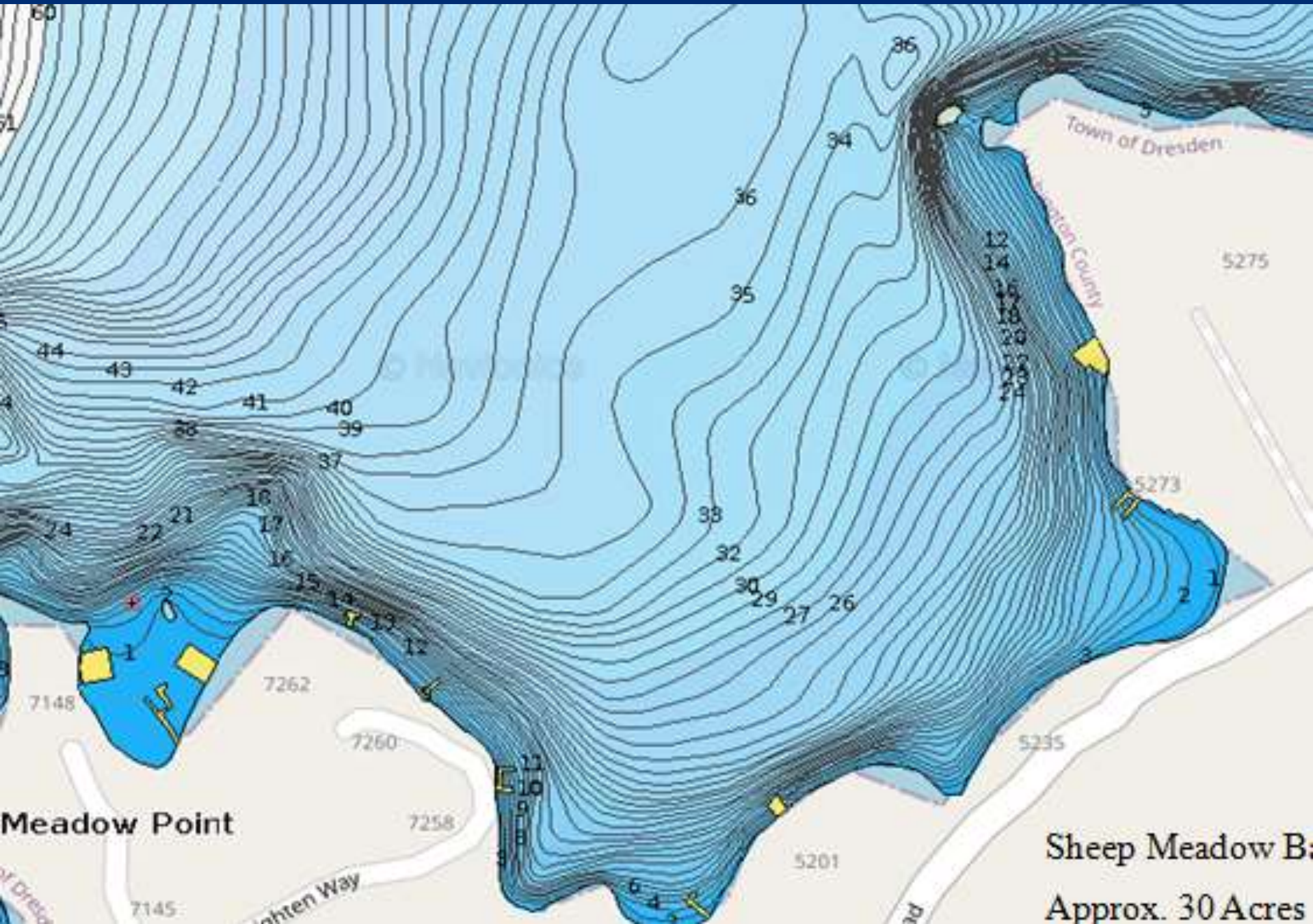


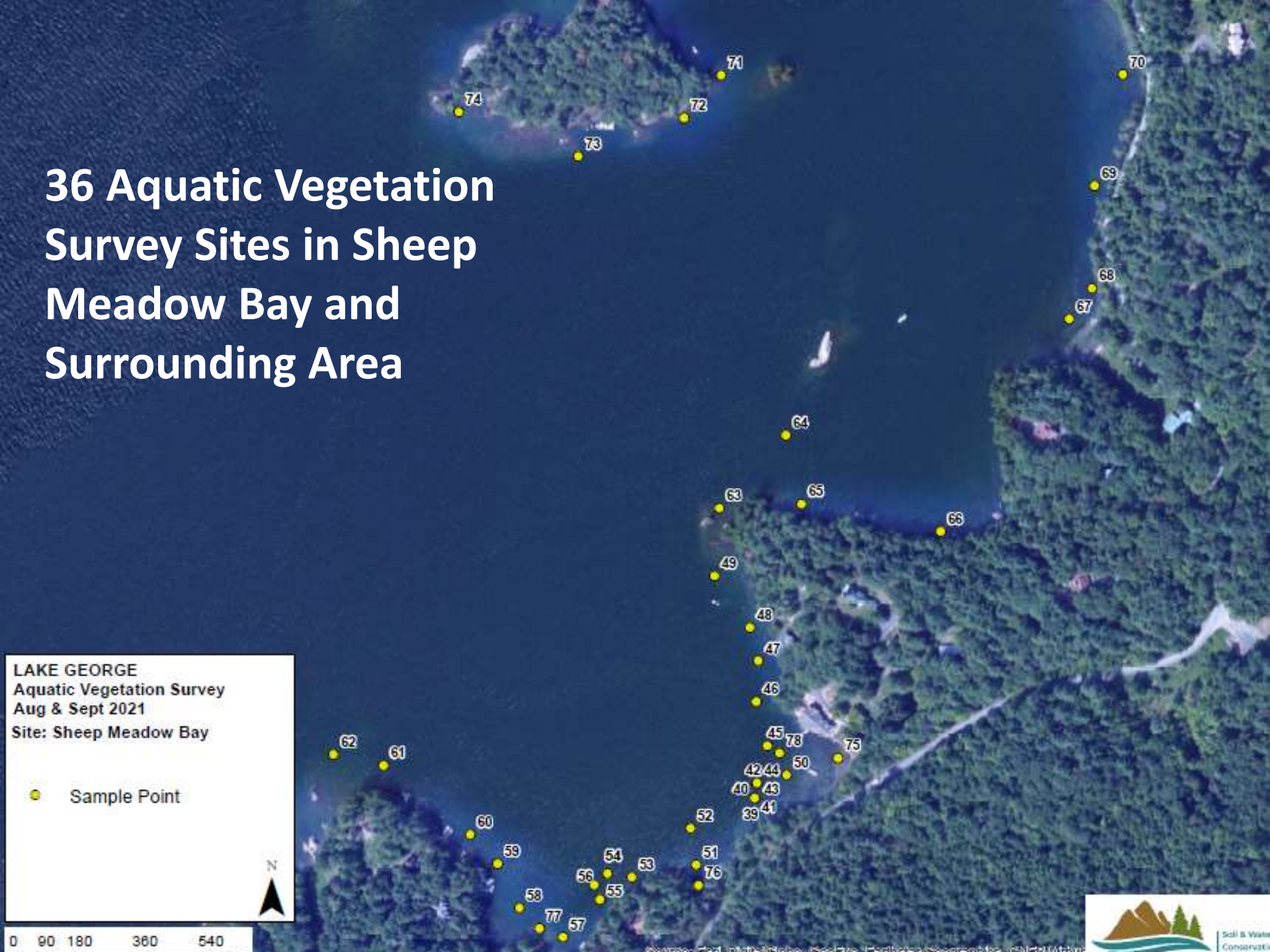
Sheep Meadow Bay
Town of Hague
Warren County

Blairs Bay, Project 2022-4 is Approximately 7.7 miles to the North.

Existing Conditions




Town of Dresden
Meadow Point
Sheep Meadow Ba
Approx. 30 Acres


36 Aquatic Vegetation Survey Sites in Sheep Meadow Bay and Surrounding Area
LAKE GEORGE
Aquatic Vegetation Survey
Aug & Sept 2021
Site: Sheep Meadow Bay
Sample Point
N
0 90 180 360 540
71
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73
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Sheep Meadow Bay Location and Abundance of Eurasian Watermilfoil

History of Management in Sheep Meadow Bay

Year	Managed	Year	Managed
2007	Yes	2015	No
2008	Yes	2016	No
2009	Yes	2017	No
2010	Yes	2018	No
2011	Yes	2019	No
2012	Yes	2020	No
2013	Yes	2021	No
2014	Yes		

Proposed Project

Applicant's Stated Goals

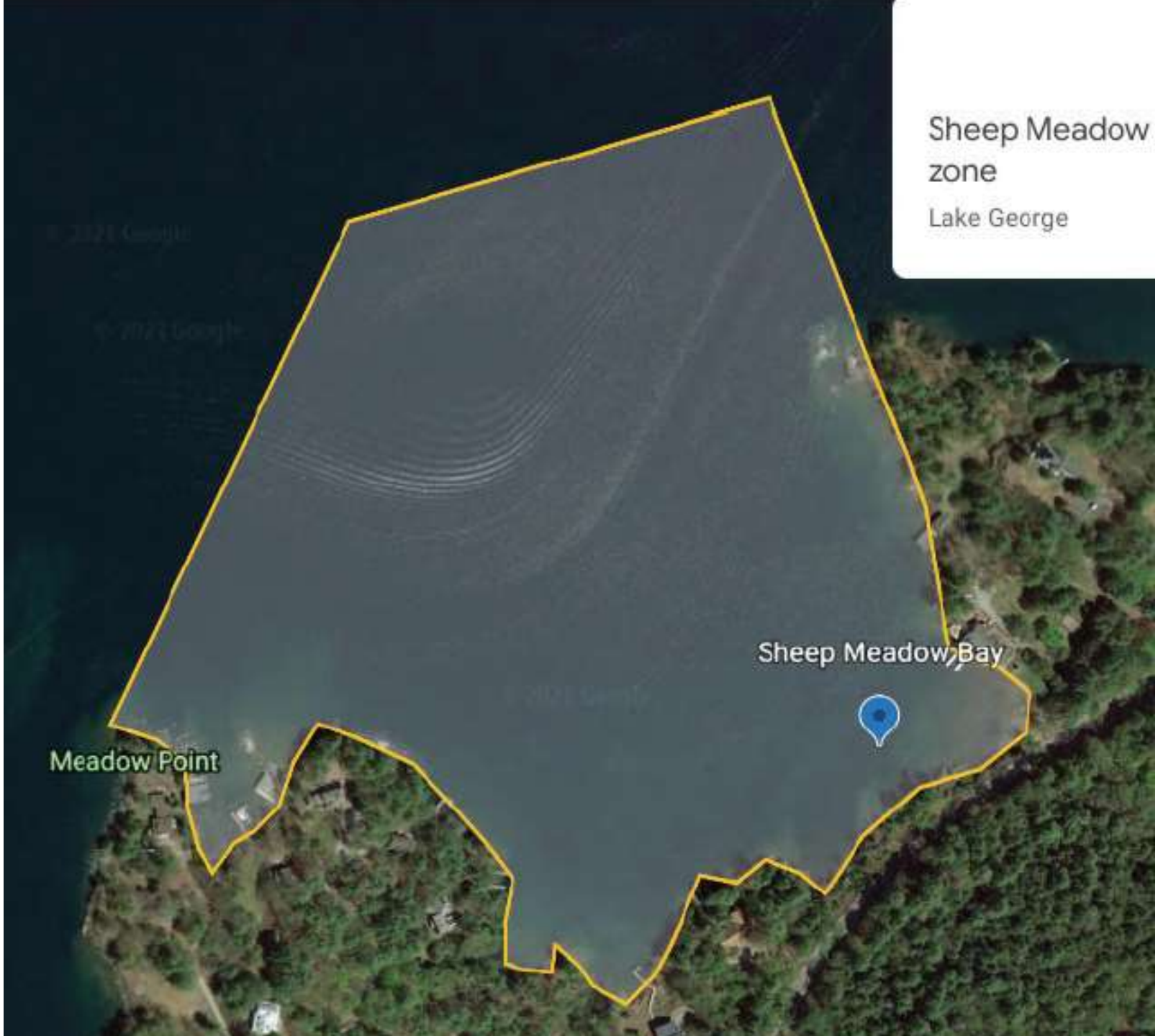
"The short-term goal is to eliminate the vast majority of milfoil in the two treatment areas, allowing for a much more cost-efficient and minimally impacting system to control milfoil growth and expansion."

"The longer-term goal is to show that this treatment methodology could cost-effectively be applied to other affected areas of Lake George that have shown resistance to traditional milfoil removal methods, while having no impact to public health, recreation or the environment."

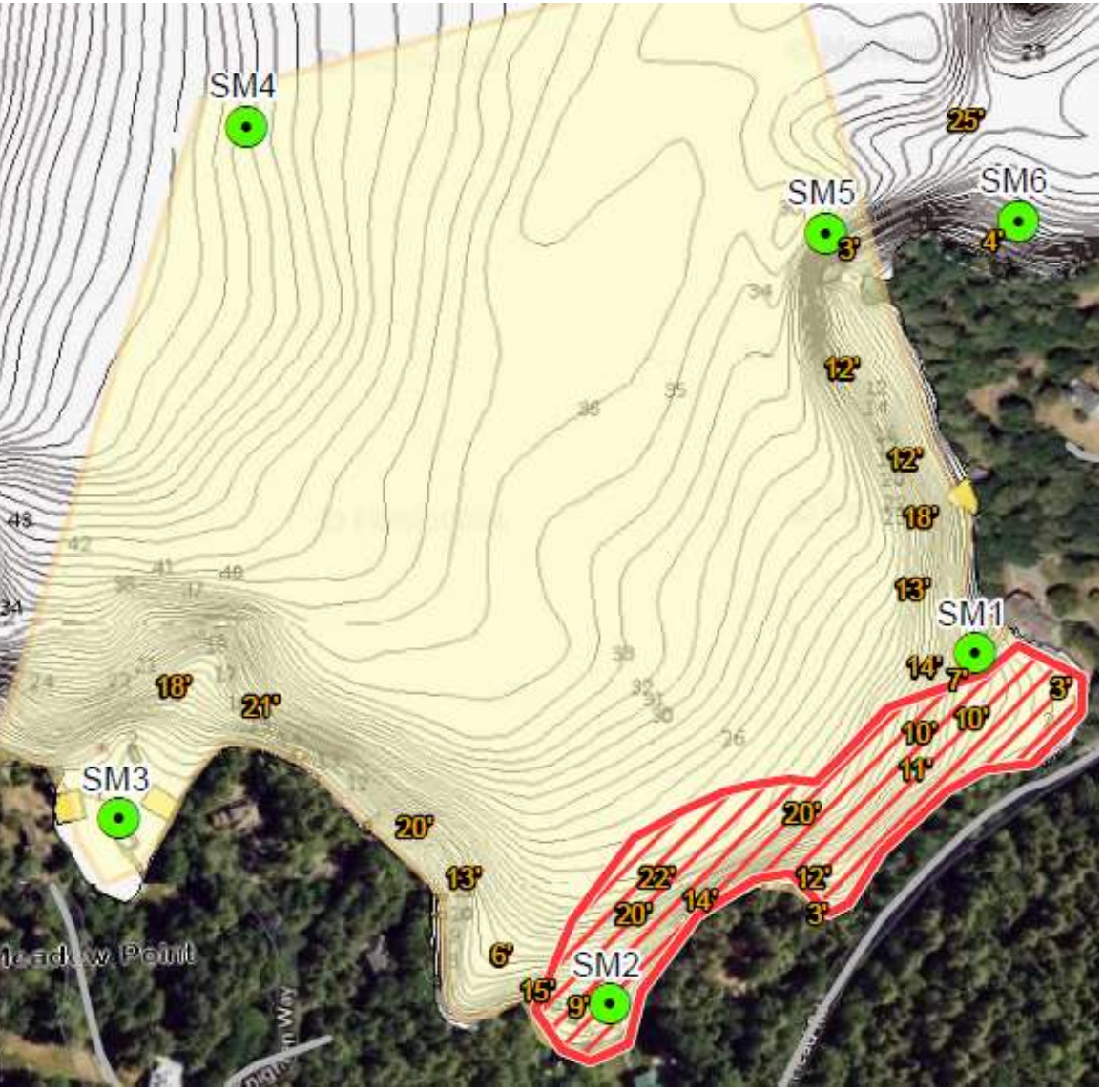
Sheep Meadow Bay:

Treat 3.6-acres with ProcellaCOR EC at a concentration of 7.72 ppb in Spring/early-Summer 2022.

Total volume of herbicide will be 4.78 gallons, which will be injected below the surface within the red hatched area.


Sheep Meadow zone
Lake George
Sheep Meadow Bay
Meadow Point

Post-treatment Concentration Monitoring

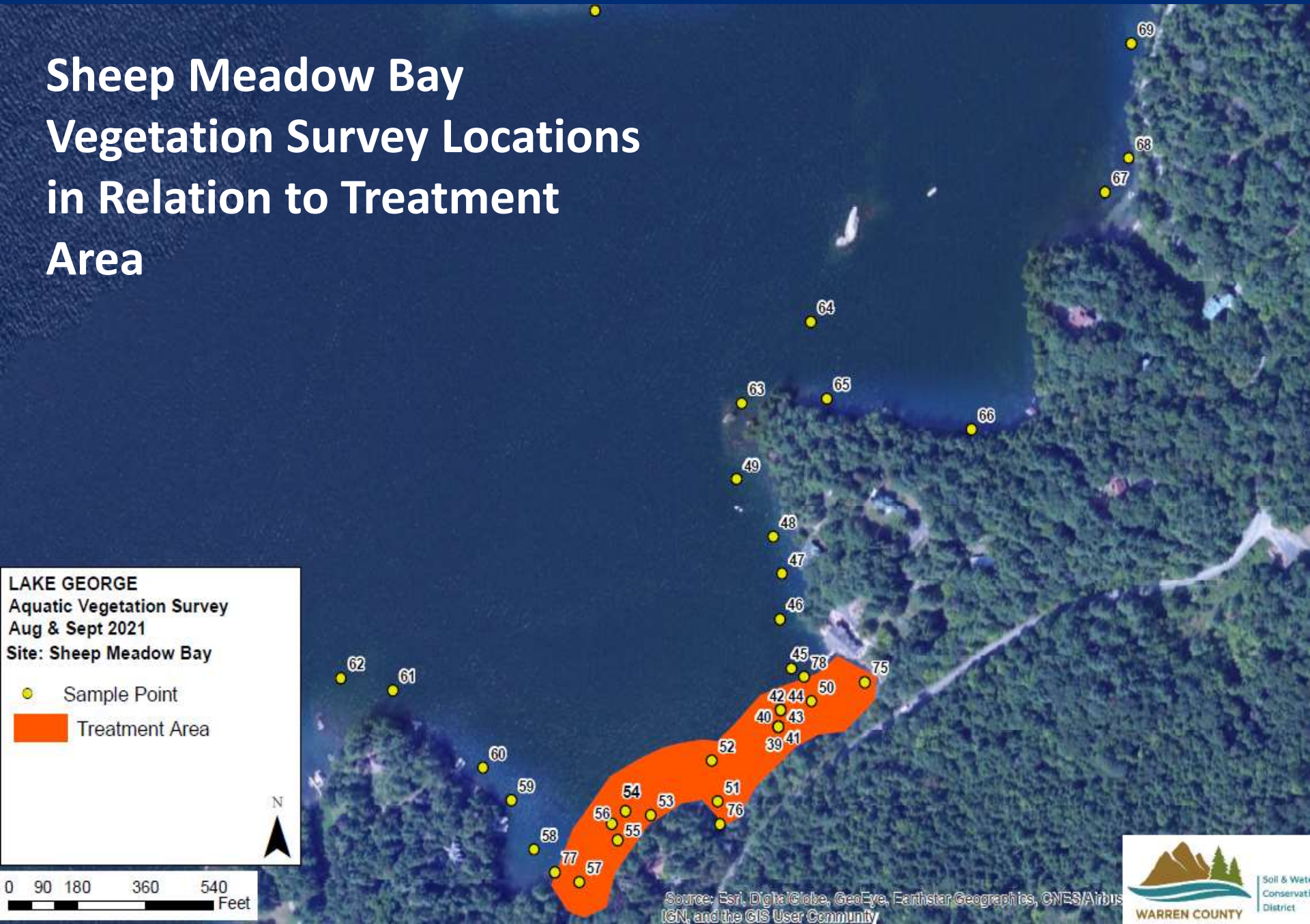


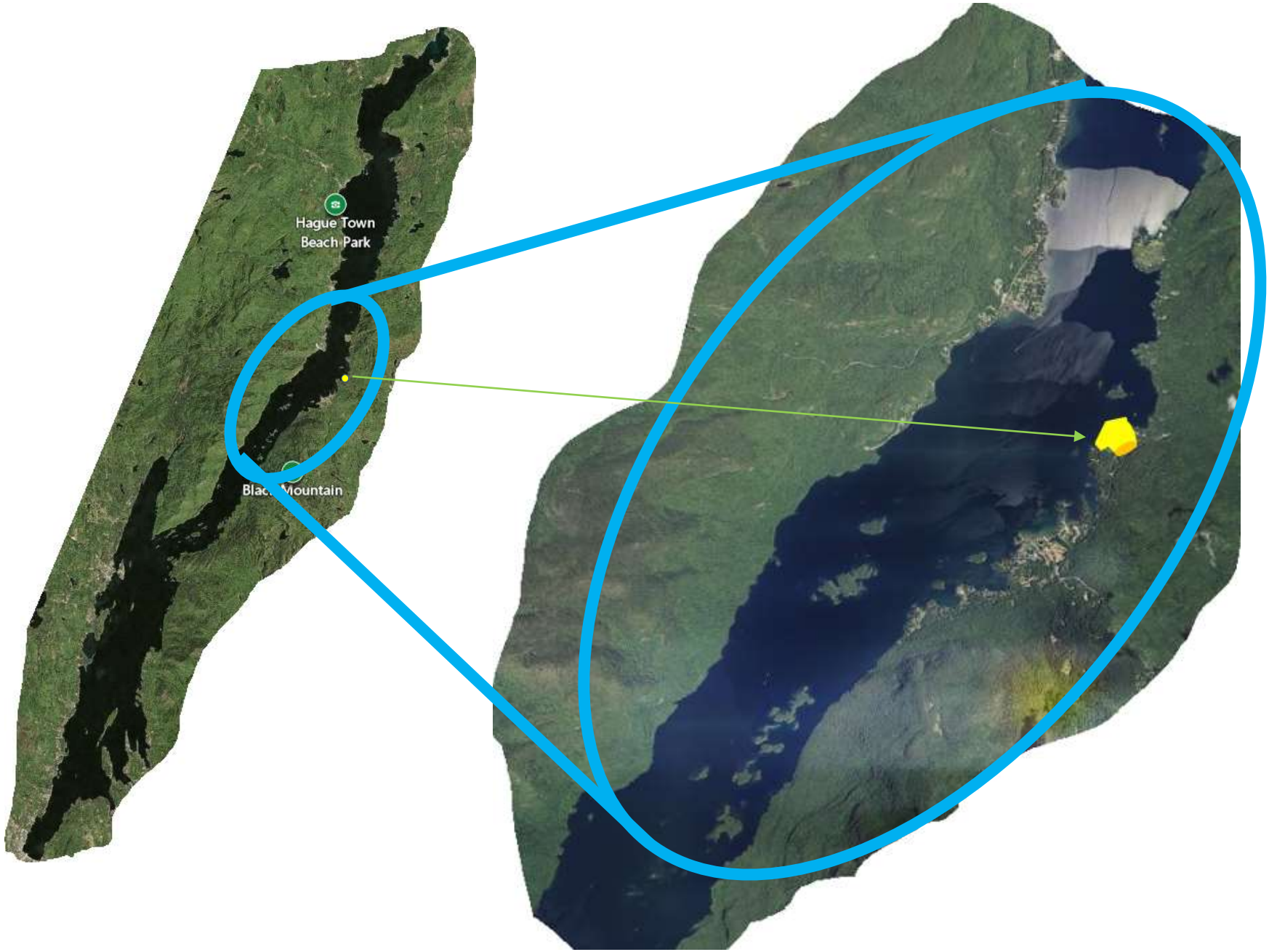
Samples collected from six locations will be analyzed until herbicide concentration is below 1 ppb in all samples.

Post Treatment Collection Schedule:

1 to 3 Hours
10 to 12 Hours
24 Hours
3 Days
7 Days
7-14 Days thereafter

Sheep Meadow Bay Vegetation Survey Locations in Relation to Treatment Area




Hague Town
Beach Park
Black Mountain

Milfoil species sensitive to ProcellaCOR EC and known to be present in Lake George

Common	Native	Protected
Slender Water-milfoil	Yes	No
Alternate Water-milfoil	Yes	Yes
Eurasian Water-milfoil	No	No
Whorled Water-milfoil	Yes	No
Northern Water-milfoil	Yes	No

NYS Museum Publication Ogden et.al (1976) Field Guide to the Aquatic Plants of Lake George and Larry Eichler DFWI)

Susceptibility to ProcellaCOR EC of Plants Found Within and Surrounding Sheep Meadow Bay

Plant Species	Susceptibility
Eurasian Watermilfoil (Target Species)	High
Slender Watermilfoil Found in low densities at two locations outside treatment area	Medium to High
Water Marigold Found in low densities at four locations within treatment area	Low **
All Other Species (N=19)	Low

Sheep Meadow Bay and Surrounding Area Location and Abundance of Water Marigold

0 90 180 360 540 Feet

Source: Esri, DigitalGlobe, GeoEye, IGN, and the GIS User Community

Sheep Meadow Bay and Surrounding Area Location and Abundance of Slender Watermilfoil

0 90 180 360 540 Feet

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus

Soil & Water Conservation District

Post-treatment Plant Survey

Sheep Meadow Lake George, New York

2021 Submersed Aquatic Macrophyte Survey Report

Repeat Plant Survey Undertaken in 2021

Record observed impacts to all target and non-target species (plant or animal) as observed during any post-treatment qualitative assessment, or as observed during routine post-treatment herbicide concentration sampling.

Public Comment and Review by Others

Staff Recommendation: Approve with Conditions

Draft Permit Conditions

- Undertake project as proposed
- Provide post-treatment monitoring report for herbicide concentration and assessment of impacts to aquatic community.

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Lake George Park Commission
Blairs Bay

Project 2022-4

April 13, 2022

Overview

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- Conclusions of Law
- Project Location
- Existing Conditions
- Proposed Project
- Public Comment
- Staff Recommendation

Jurisdiction

Application of Herbicides in Wetlands

Regulated Wetland Activity – 9 NYCRR Part 578

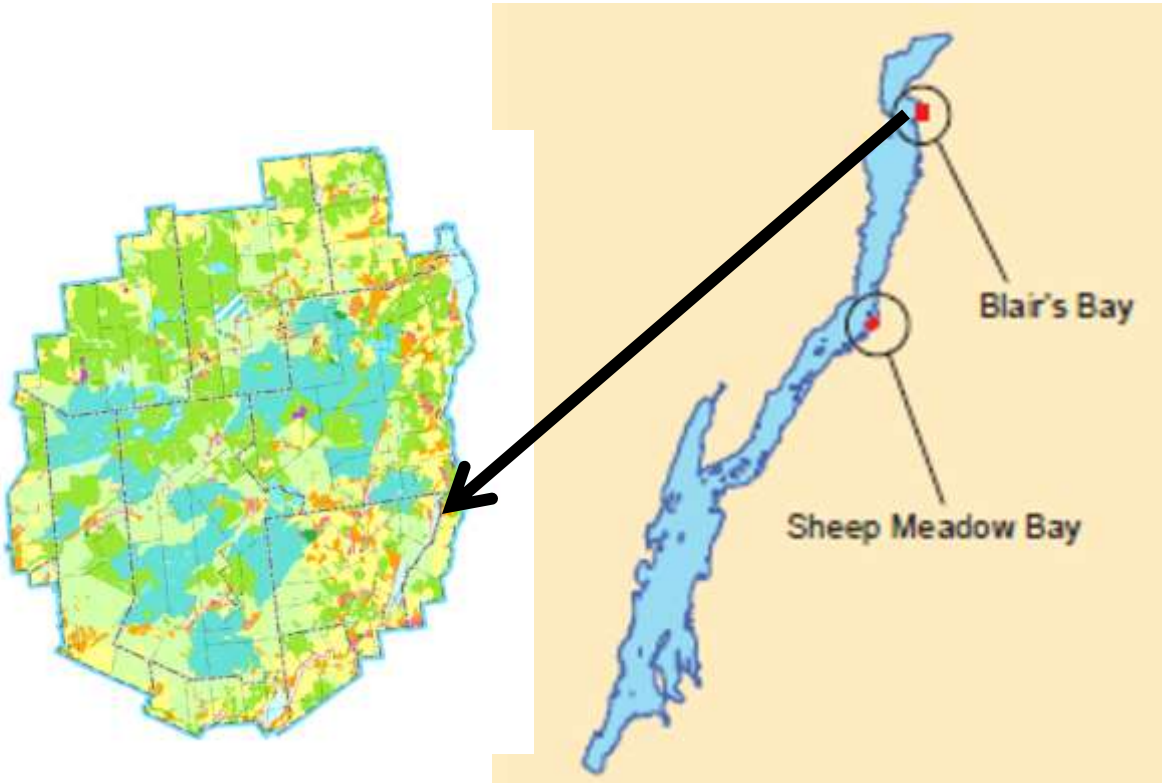
Conclusions of Law

- **Activity Authorized:**

  will, although economic, social and other benefits to be derived from the activity proposed compel a departure from the guidelines of 9 NYCRR Part 578.10(a)(1), secure the natural benefits of wetlands associated with the project, consistent with the general welfare and beneficial economic, social, and agricultural development of the state

Project Location

Project Location

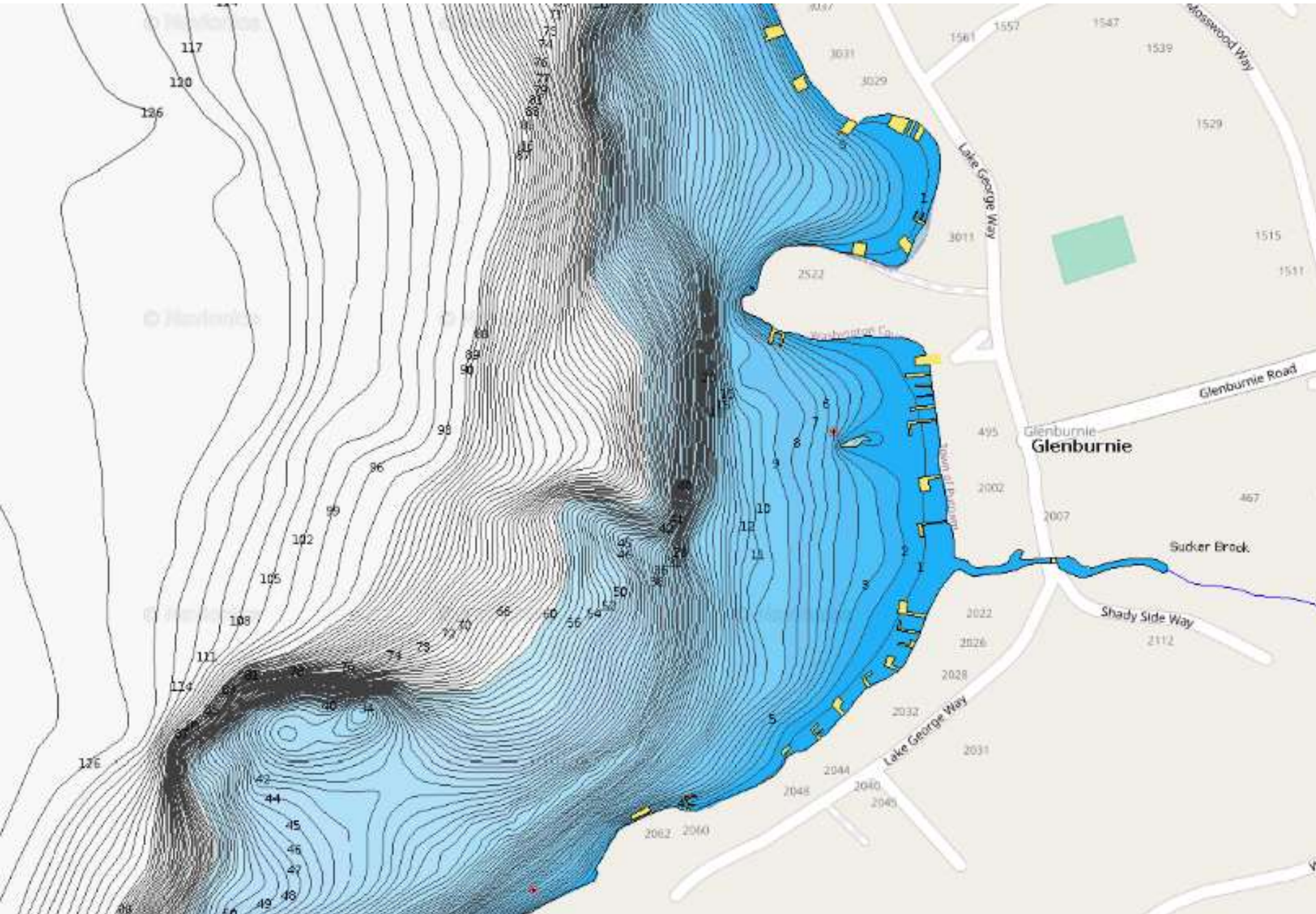


Blair's Bay
Town of Hague
Warren County

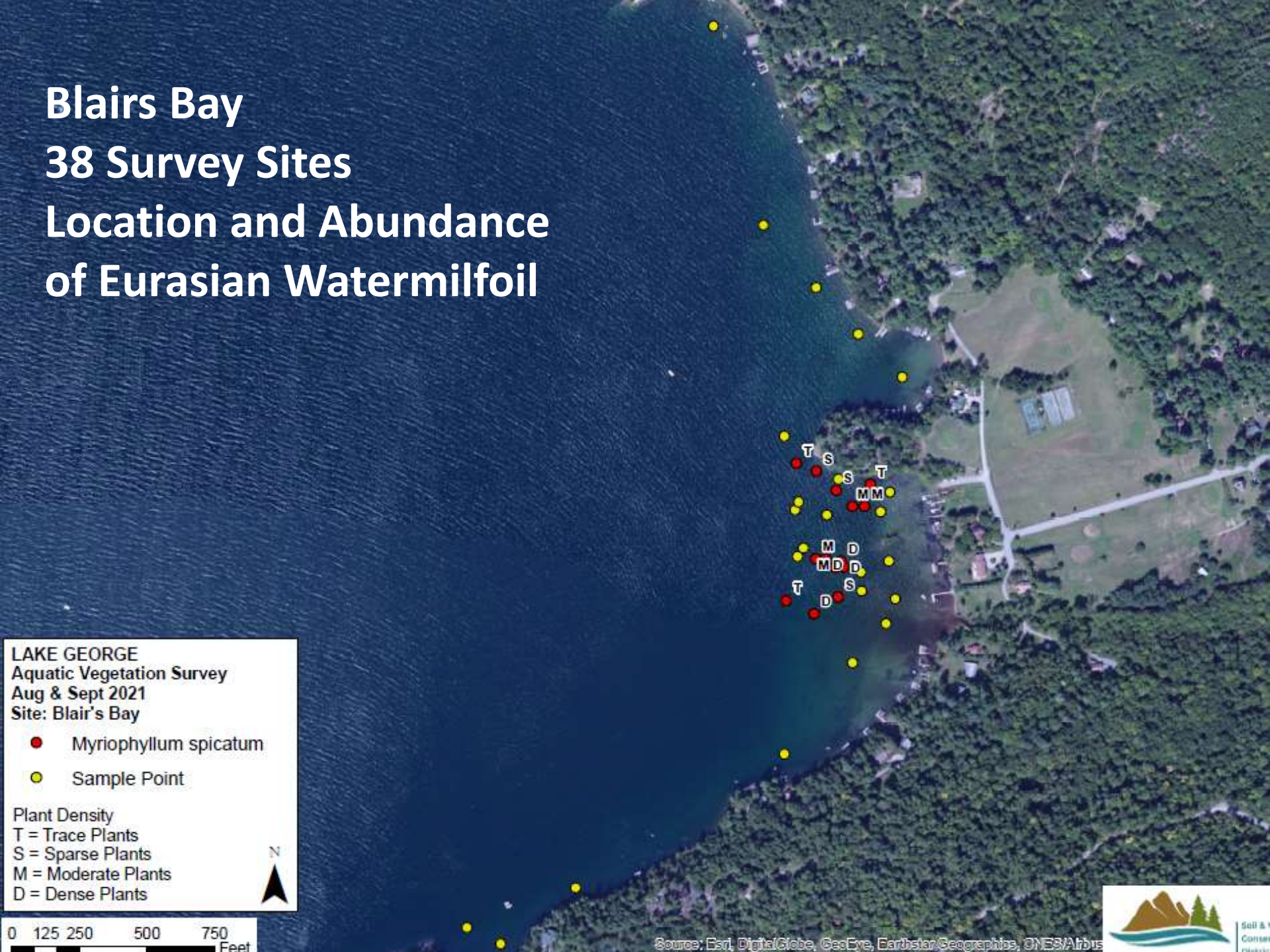
Sheep Meadow Bay, Project 2022-3, is Approximately 7.7 miles to the South.

Existing Conditions


Rte 1


Lake George Way
Glenburnie Road
Glenburnie
Glenburnie
Sucker Brook
Shady Side Way
Lake George Way
Mosswood Way

Blairs Bay
38 Survey Sites
Location and Abundance of Eurasian Watermilfoil



Close-up Blairs Bay Location and Abundance of Eurasian Watermilfoil

History of Management in Blairs Bay

Year	Managed	Year	Managed
2007	Yes	2015	Yes
2008	Yes	2016	Yes
2009	Yes	2017	Yes
2010	Yes	2018	No
2011	Yes	2019	No
2012	Yes	2020	No
2013	Yes	2021	No
2014	Yes		

2017 Management Report

Each year crews spend an increasing amount of time harvesting and consistently remove bag totals in the hundreds.

EWM here is noticeably fragile and fragments easily, exacerbating the problem.

Crews wind up chasing their tails and can easily spend enormous amounts of time here.

…recommended an all-out assault approach by keeping a crew harvesting for as much time as needed or supplementing with another technique…

Proposed Project

Applicant's Stated Goals

"The short-term goal is to eliminate the vast majority of milfoil in the two treatment areas, allowing for a much more cost-efficient and minimally impacting system to control milfoil growth and expansion."

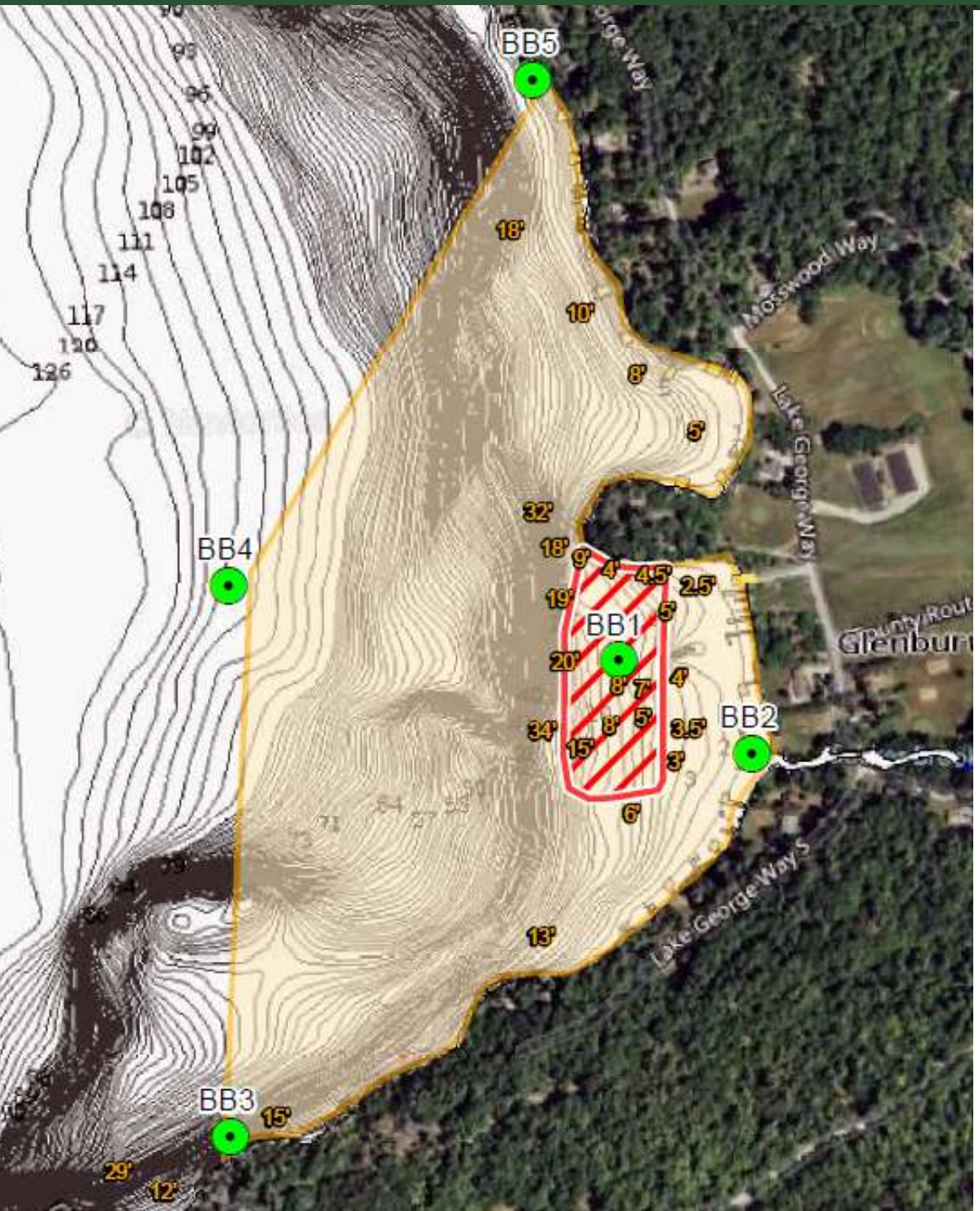
"The longer-term goal is to show that this treatment methodology could cost-effectively be applied to other affected areas of Lake George that have shown resistance to traditional milfoil removal methods, while having no impact to public health, recreation or the environment."

Blairs Bay:

Treat 4.0-acres with ProcellaCOR EC at a concentration of 7.72 ppb of Spring/early-Summer 2022.

Total volume of herbicide will be 4.2 gallons, which will be injected below the surface within the red hatched area.


Blair Bay 60 acre dilution zone
Lake George
Blairs Bay
Blair Bay
Sucker Brook
Adirondack Camp
3D



Samples collected from five locations will be analyzed until herbicide concentration is below 1 ppb in all samples.

Post Treatment Collection Schedule:

1 to 3 Hours

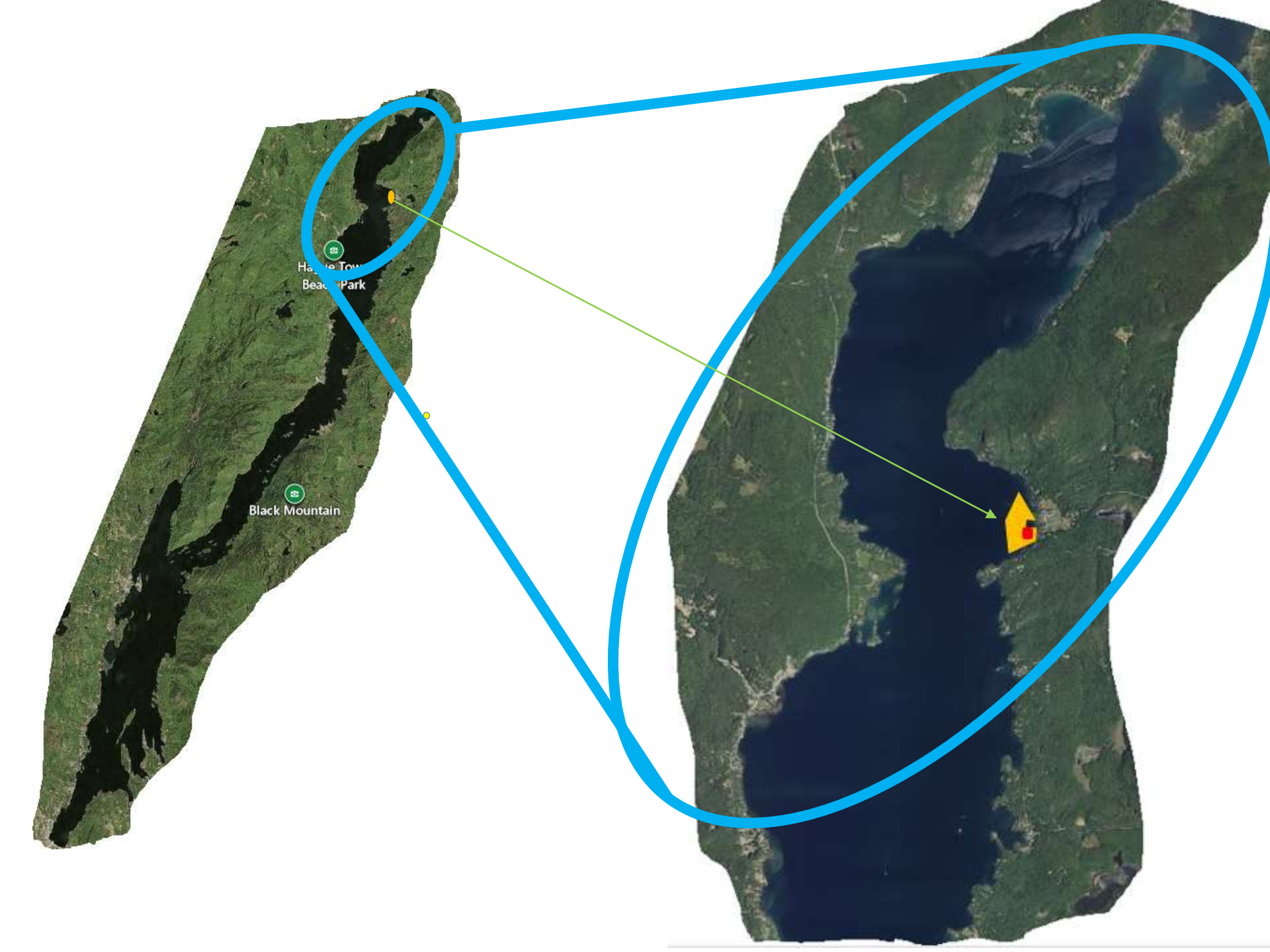
10 to 12 Hours

24 Hours

3 Days

7 Days

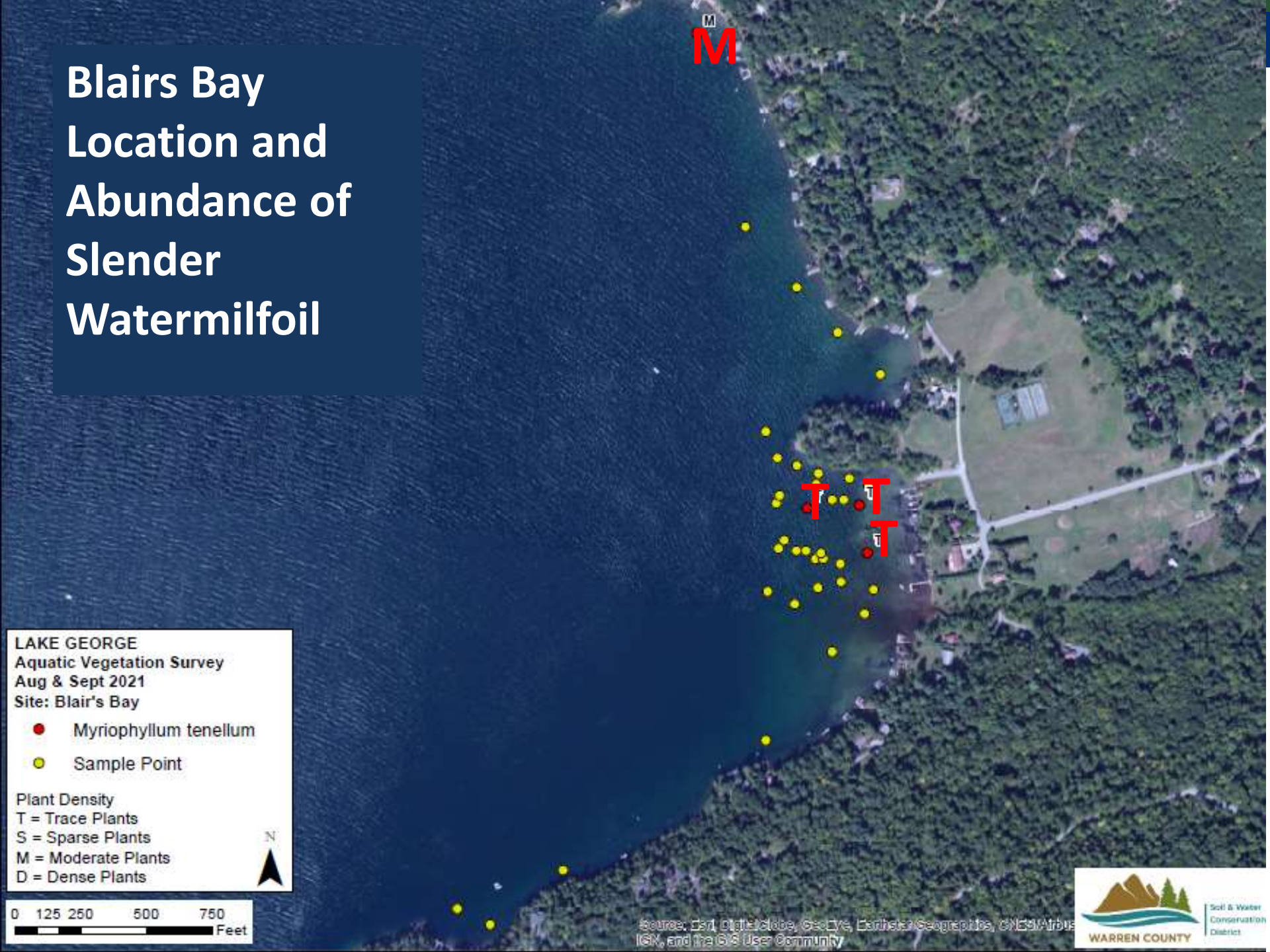
7-14 Days thereafter


Black Mountain

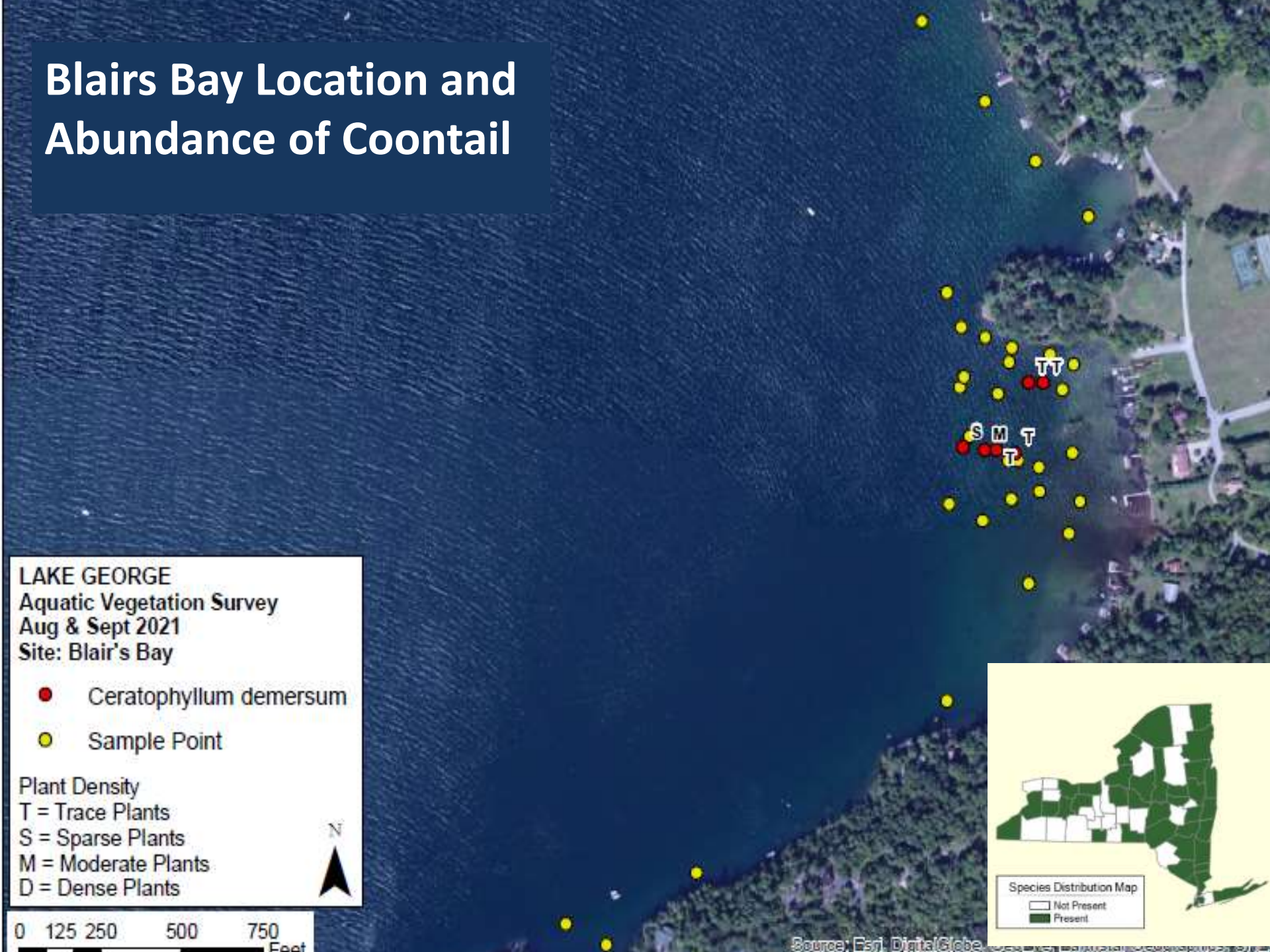
Susceptibility to ProcellaCOR EC of Plants Found Within and Surrounding Blairs Bay

Plant Species	Susceptibility
Eurasian Watermilfoil	High
Slender Watermilfoil	Medium to High
Alternate-flowered Watermilfoil	Medium to High
Coontail	Medium to High
Water Marigold	Low
Lake Quillwort	Low
All Other Species (N=20)	Low

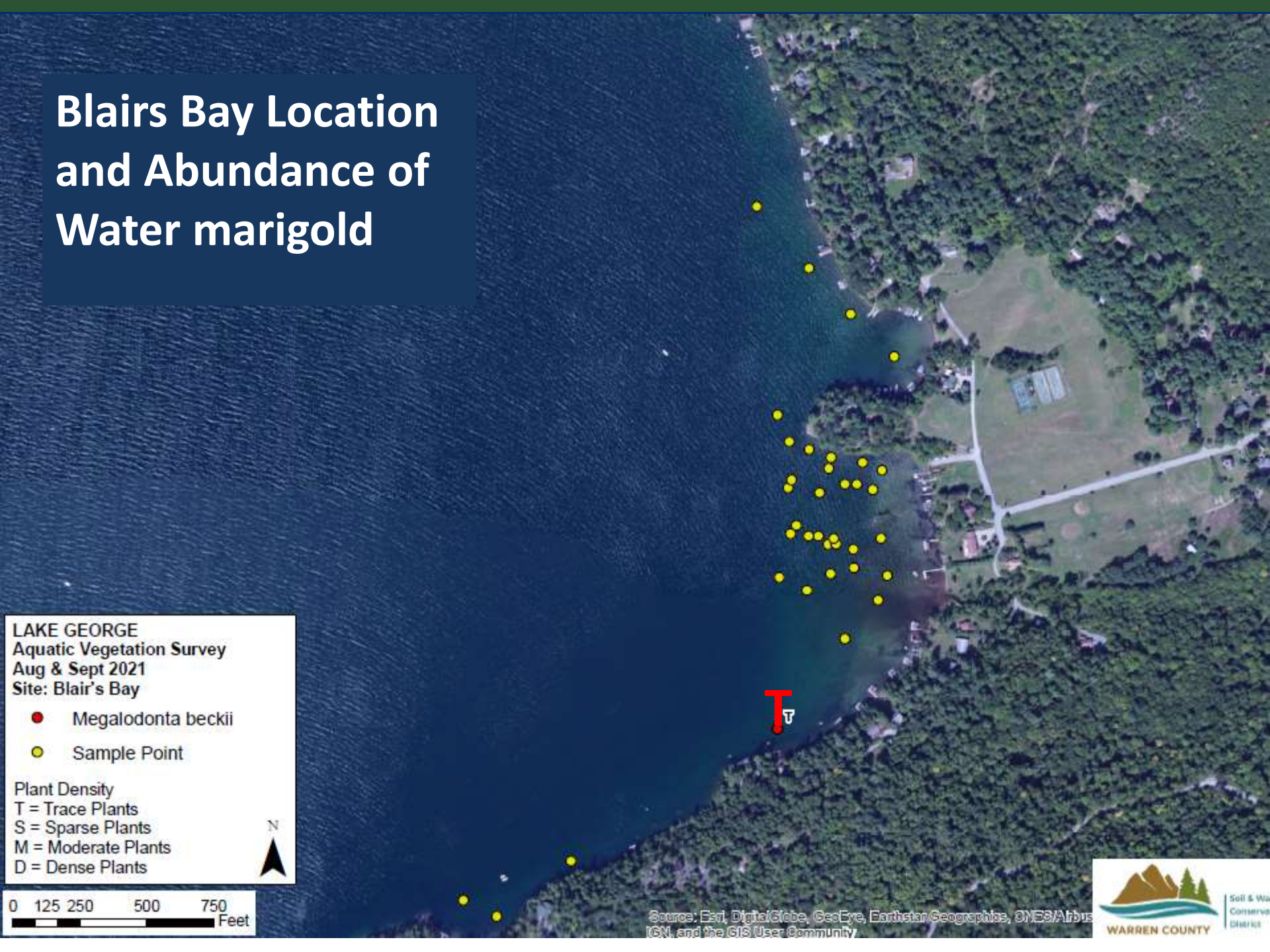
Blairs Bay Location and Abundance of Slender Watermilfoil



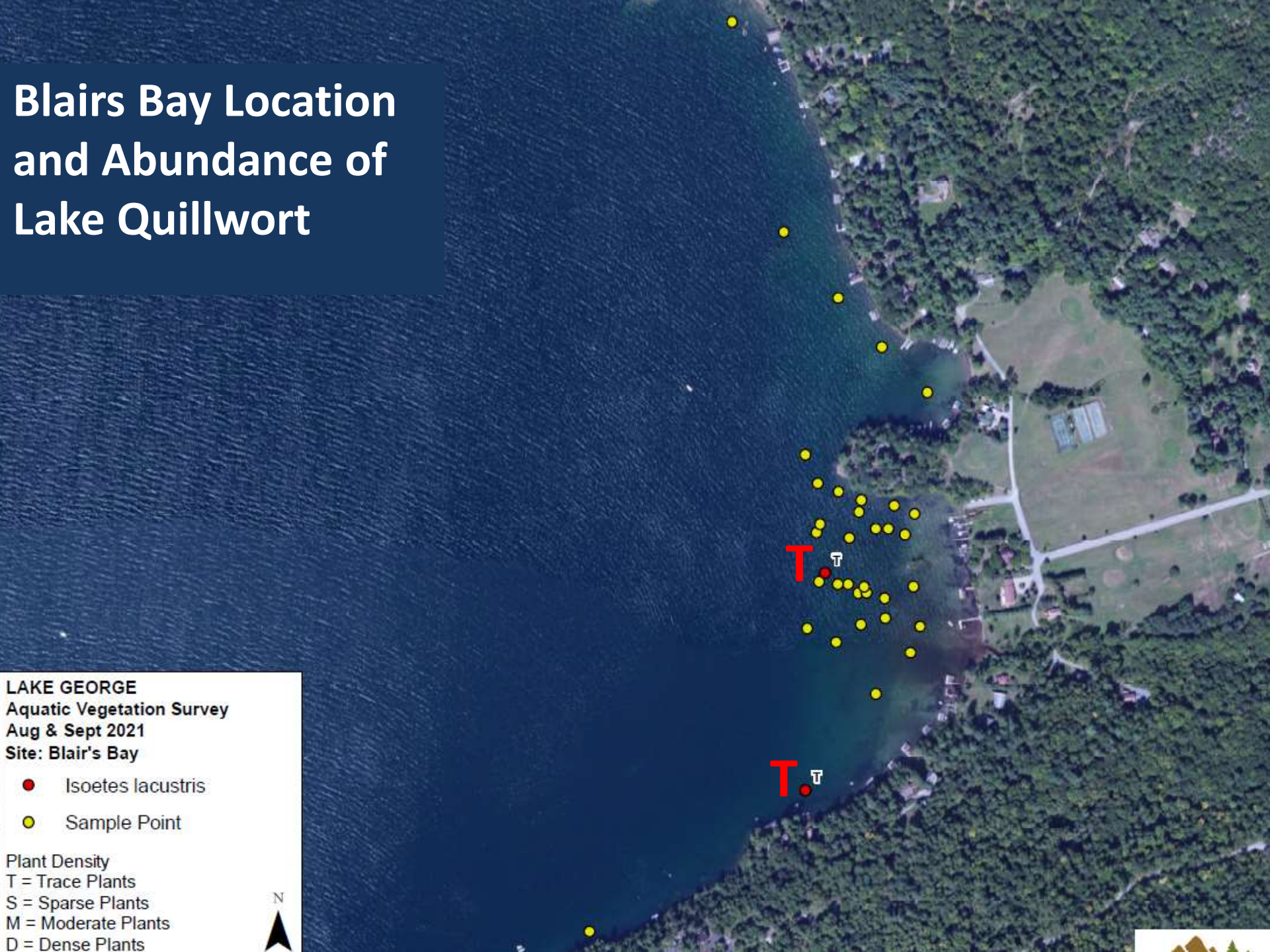
Blairs Bay Location and Abundance of Coontail



Blairs Bay Location and Abundance of Water marigold



Blairs Bay Location and Abundance of Lake Quillwort



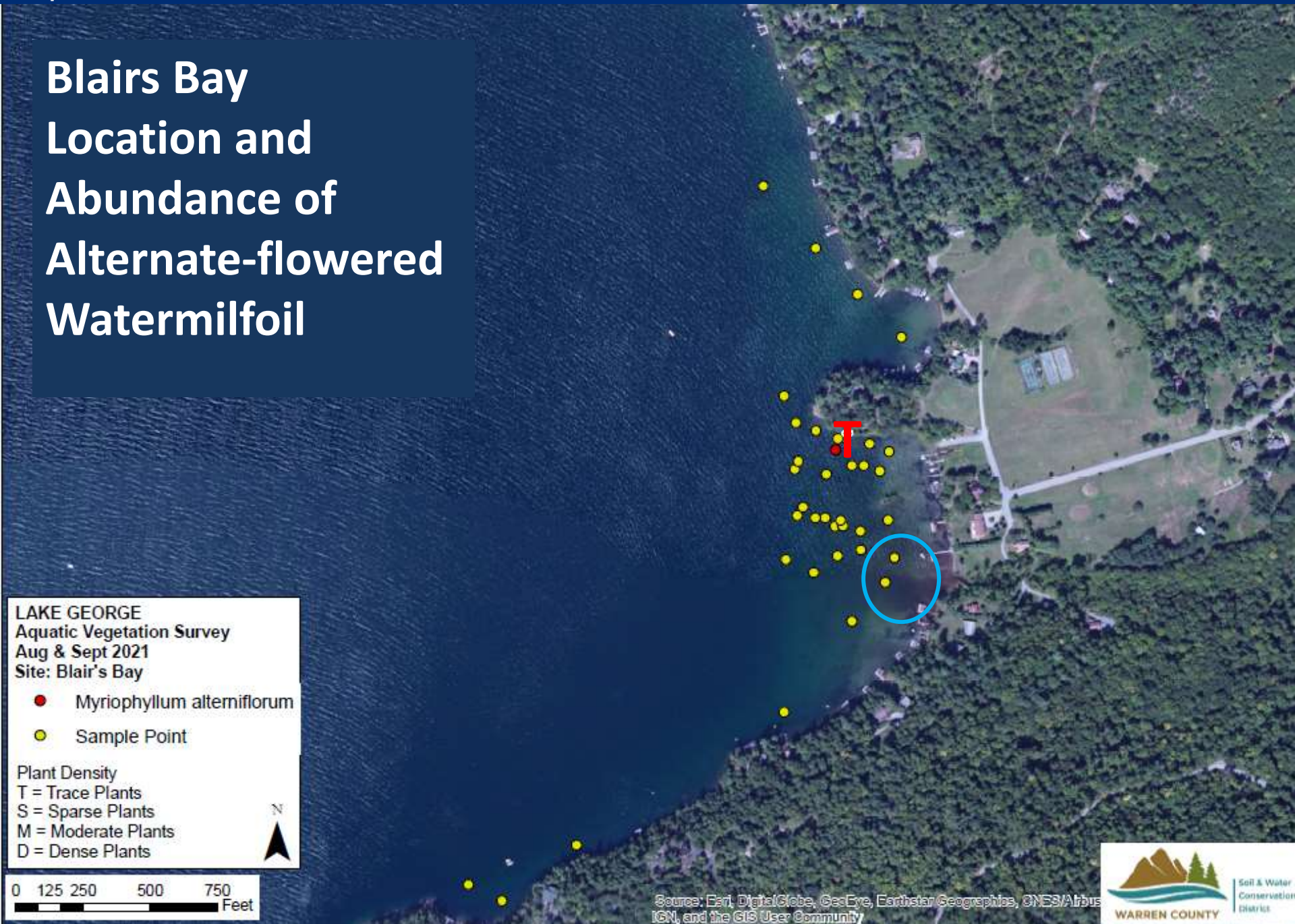
LAKE GEORGE
Aquatic Vegetation Survey
Aug & Sept 2021
Site: Blair's Bay

- Isoetes lacustris
- Sample Point

Plant Density
T = Trace Plants
S = Sparse Plants
M = Moderate Plants
D = Dense Plants

N

Blairs Bay Location and Abundance of Alternate-flowered Watermilfoil



Close-up of Blairs Bay Location and Abundance of Alternate-flowered Watermilfoil

Alternate-flowered Watermilfoil in Lake George

Natural Heritage Database
7 Locations

Darrin Freshwater Institute
30 Locations

Total Number of
Unique Locations = 35
(not including Blairs Bay)

FROM NYSNHP:

***Myriophyllum alterniflorum* State Ranking Justification**

There are only **13 verified occurrences**, and 11 historical records in the state. Only two of the existing populations have 100 or more plants. **Most occurrences lack accurate counts or estimates of population size. Only 3 of the sites have been visited since 1993**.

Conservation and Management Threats

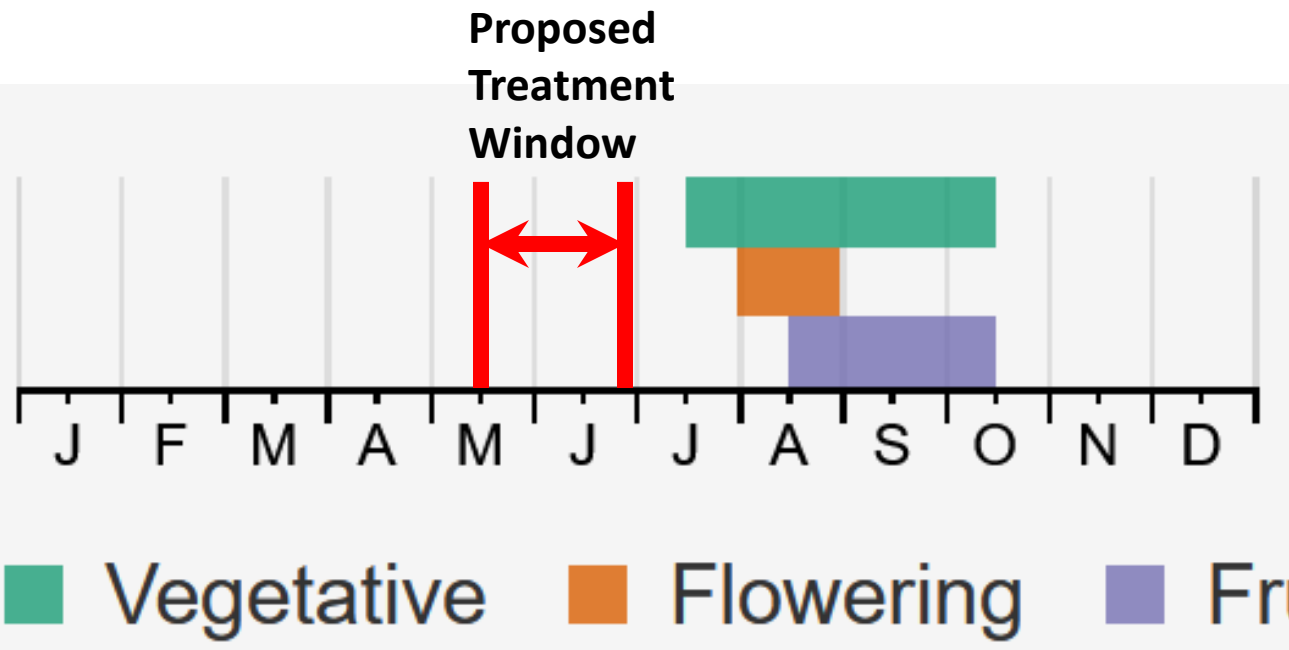
The use of chemical herbicides to eliminate Myriophyllum spicatum (EWM) and other submerged aquatic plants is an ongoing threat to this species.

Conservation Strategies and Management Practices

Care should be taken to survey for this species before using herbicides to control aquatic invasives (including M. spicatum).

https://guides.nynhp.org/alternate-flowered-watermilfoil/#conservation-management

Myriophyllum alterniflorum Growth in New York in Relation to Proposed Herbicide Treatment Timeframe



The time of year you would expect to find Alternate-flowered Water Milfoil vegetative, flowering, and fruiting in New York.

Post-treatment Plant Survey

Sheep Meadow Lake George, New York

2021 Submersed Aquatic Macrophyte Survey Report

Repeat Plant Survey Undertaken in 2021

Record observed impacts to all target and non-target species (plant or animal) as observed during any post-treatment qualitative assessment, or as observed during routine post-treatment herbicide concentration sampling.

NEW YORK STATE OF OPPORTUNITY. Adirondack Park Agency

Records indicate that *Myriophyllum alterniflorum* is also found in:

Lake Colby
Brant Lake
Lake Luzerne
Chateaugay Lake
Raquette Lake
Upper Saranac Lake
Fern Lake
Loon Lake
Schroon Lake
Paradox Lake

Public Comment and Review by Others

Public Comment

- **Public Notice**
  - **Agency Noticed all shoreline owners that were also noticed by the NYSDEC.**
  - **Notice of Completion was Published in ENB**

- **Comment Letters**
  - **176 received**
  - **134 against (generated by LGA campaign)**
  - **24 others against**
  - **18 in support**

Public Comment

- **Notable Supporters:**

Adirondack Park Invasive Species Prevention Program (APIPP)
Town of Fort Ann/Washington County
Warren County Soil and Water Conservation
Brant Lake Association
Loon Lake Park District Association
Glen Lake Association
Chateaugay Lake Association
Friends Lake Association
Luzerne Lake Town and Association
Paradox Lake Association

- **Notable Against:**

Adirondack Council
Lake George Association/Waterkeeper (Joint Letter)
Protect the Adirondacks!

Public Comment – Themes (Against)

- Drinking Water Concerns
- Degradation Times of the Product & Degradates
- Toxicity of the Product & Degradates
- Development of Resistant Weed Populations
- Water Currents

Public Comment – Themes (Against)

- Nutrient loading, Harmful Algal Blooms, Fish suffocation associated with die-off of Eurasian Watermilfoil
  - Early season treatment → Less Biomass to Die-Off, Certainly less than annual die-off that occurs every year
  - Both sites are close to deep, open water → Fish would swim to areas of higher oxygen concentration if needed

Public Comment – Themes (Against)

- Unclear impacts to rare native species, other non-target impacts
  - Staff review conservatively assumes removal of some non-target species that have shown susceptibility → All of these species are secure lakewide.
  - Track record of post treatment reports across the region show consistently strong selectivity to watermilfoil, especially Eurasian watermilfoil.
  - Treatment results in a community of native plants, with natural competition in absence of the invasive species

Public Comment – Themes (Against)

- Return to hand harvesting/benthic mats is warranted before moving to chemicals
  - “Intensive hand harvesting was conducted at the subject sites for many years, and unfortunately the milfoil beds returned within two-years’ time.”
  - Benthic barriers are not a favored approach (kill all species under them and leave a large disturbed area vulnerable to EWM reinfestation)
  - Available resources require triage of sites, can’t focus everywhere at once

Public Comment – Themes (Against)

- Need More Data from APA Approved Minerva Lake Project
  - Permit is completed in compliance → no authority to require additional surveys
  - Long term assessments would be unable to parse out non-target impacts of the treatment in comparison to natural rebalancing of the system in absence of the aggressive invasive species

Public Comment – Themes (Against)

- Potential Food Web Impacts
  - Hopefully! Removal of EWM will result in a return to a native plant community, able to sort out the available resources without the presence of the invasive

Staff Recommendation: Approve with Conditions

Draft Permit Conditions

- Undertake project as proposed
- Provide post-treatment monitoring report for concentration of herbicide and aquatic vegetation.
- Specific pre- and post-treatment assessment of Alternate Flowered Watermilfoil within and adjacent to the treatment area