Lake Sebago Hydrilla Control Project; Progress and Lessons Learned

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Little Bear Environmental

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Agenda

- Hydrilla Background
- Site Description and Invasion Discovery
- Treatment Strategy
- Monitoring Results
- Conclusions

Project Partners

Little Bear Environmental

THE POND AND LAKE CONNECTION

New York State Parks, Recreation and Historic Preservation

LOWER HUDSON PRISM

GEI Consulting Engineers and Scientists

SePRO

Work supported by the New York State Environmental Protection Fund

Image: Little Bear Environmental

Monoecious Hydrilla

New growth from viable fragments

Overwintering structures

Flowers

Images: Little Bear Environmental

Photo: Little Bear Environmental

Risk Assessment

1) **Risk to Submerged Aquatic Vegetation (SAV):** Hydrilla threatens to displace SAV beds, particularly those with native *Vallisneria americana* and *Potamogeton* species. Native SAV communities play a vital role in maintaining dissolved oxygen levels and providing aquatic habitat within waterbodies of New York State.

2) **Risk to waterfowl and raptors:** A toxic cyanobacteria (*Aetokthonos hydrillicola*) may grow on the underside of hydrilla leaves. This cyanobacterium causes avian vacuolar myelinopathy (AVM), a deadly neurological disease, in waterfowl and the bald eagles that consume them. AVM has been linked to the deaths of hundreds of bald eagles in South Carolina and Arkansas. It can also affect amphibians, reptiles, and fish.

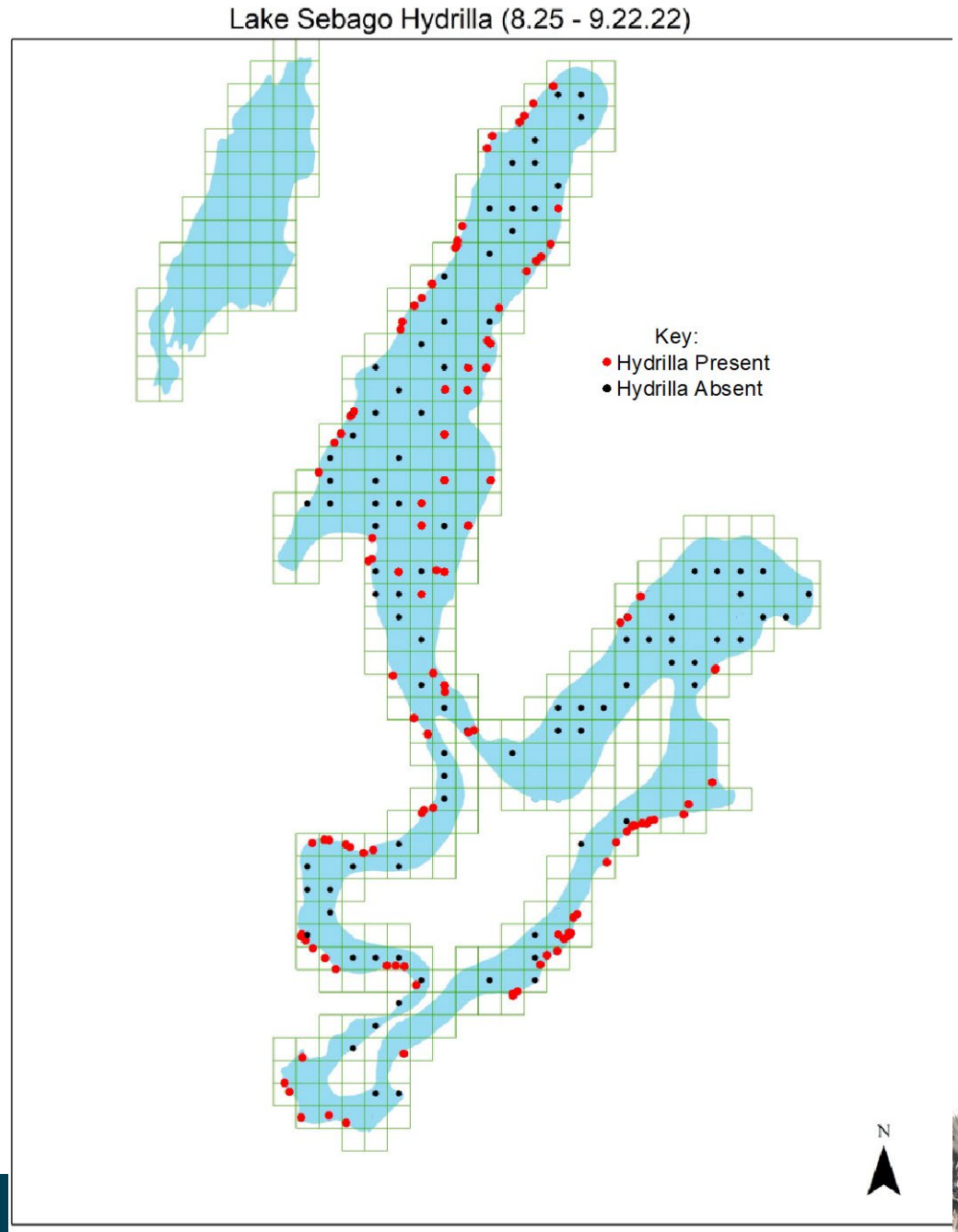
3) **Threat to waters in New York and adjacent states:** Given the proximity to numerous waterbodies within Harriman State Park, this infestation poses a very serious threat to the aesthetic values of many waters in New York, and Significant Natural Communities.

4) **Threat to fish populations and biodiversity:** Dense mats of hydrilla outshade and displace native plants that are food sources and shelter for native invertebrates and young fish. Decomposition of these extensive mats decrease the dissolved oxygen content in the water and can result in fish kills.

5) **Threat to recreation:** Hydrilla produces dense mats of vegetation extending from the bottom of the river to the surface. These mats will prohibit swimming, boating, and fishing in infested areas of Lake Sebago. Access to the water around docks and within swimming areas may significantly limited.

Project Background

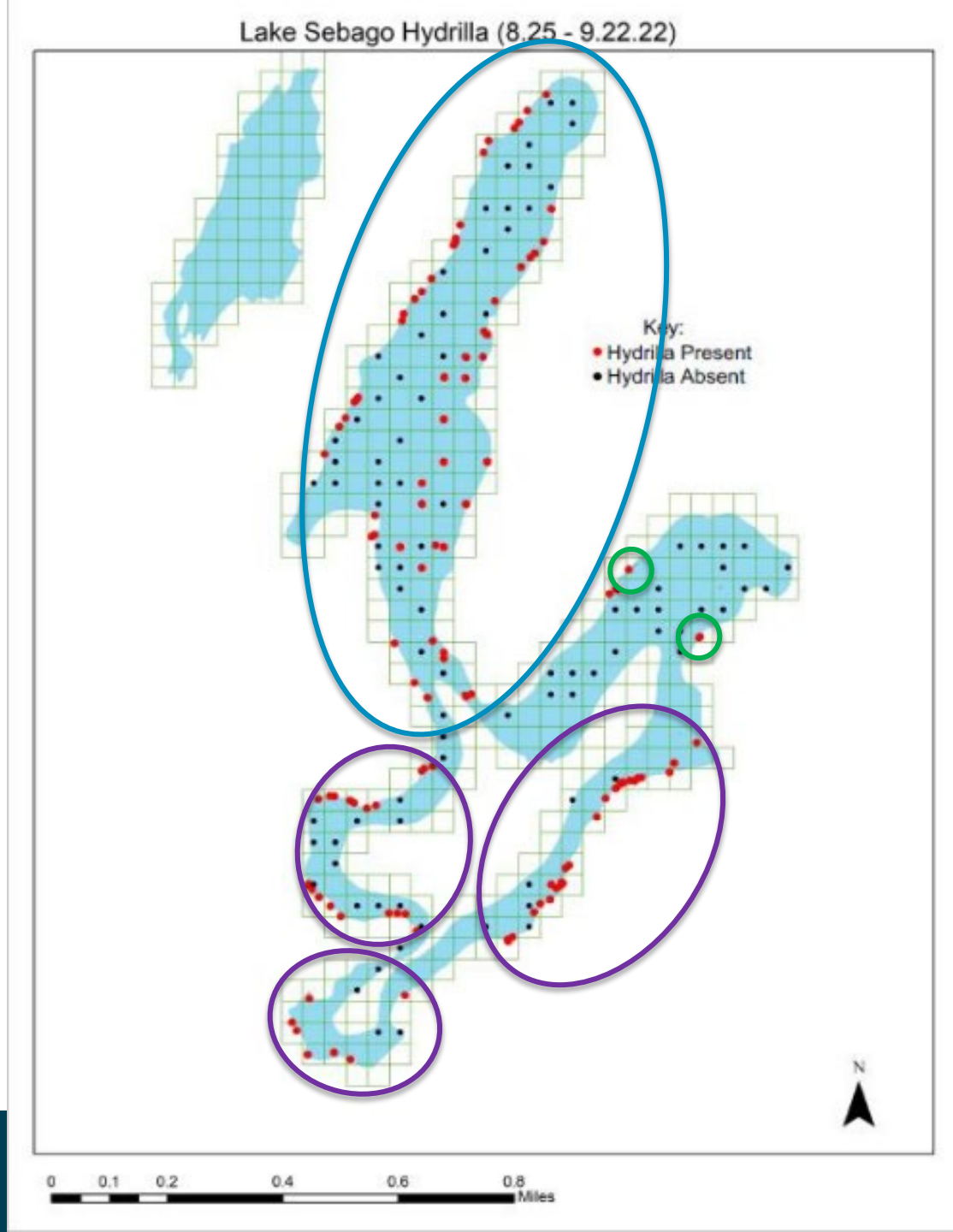
- **LHPRISM discovered & mapped Hydrilla in Lake Sebago in 2022**
- Surrounding waterbodies surveyed in 2022 (LHPRISM):
  - Skenonto, Kanawauke, Stony Brook (Sebago outlet), Whitney Brook, Diamond Creek, Little Long Pond, Welch, Kanawauke, Skannatati, Te Ata, Island Pond, Tiorati
  - **No hydrilla was present outside of Lake Sebago**



Treatment Strategy – Year 1

Lake Divided into Two Treatment Areas:

- Upper Basin –shallow area with hydrilla growing throughout.
  - **Liquid Sonar Genesis**
- Lower Basin –deeper, but with hydrilla growing in shallow waters.
  - **Pelleted Sonar**
  - **Chelated Copper**



Anticipated Goals

- ✓ Season 1: Significant reduction in hydrilla biomass. Suppression of tuber/turion production
- ✓ Season 2: Hydrilla likely only sparse or trace abundance at all locations, significant reduction in tuber bank observed
- ✓ Season 3: very difficult to find hydrilla plants/tubers
- Season 4: very difficult to find hydrilla plants/tubers
- Season 5: Goal is eradication in Year 5

Photo: Little Bear Environmental

Photo: Nicole White

Keys to Success

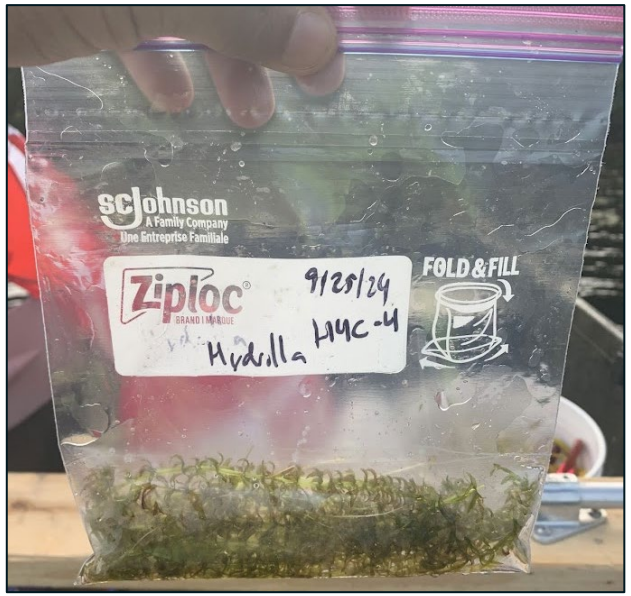
- RAPID RESPONSE
- Baseline Survey
- Visual surveys integrated into monitoring
- Consistent sampling to understand CET

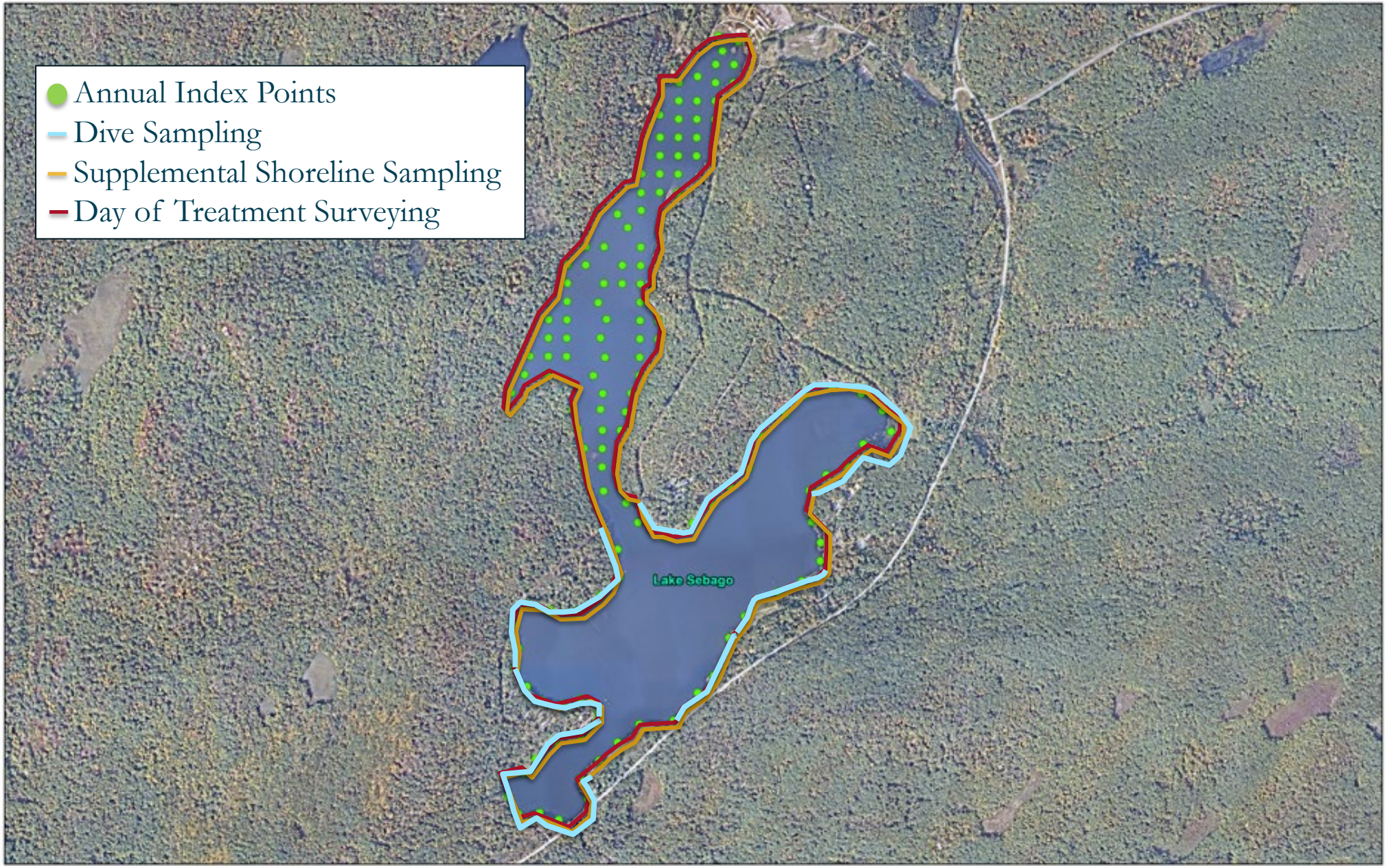
Monitoring

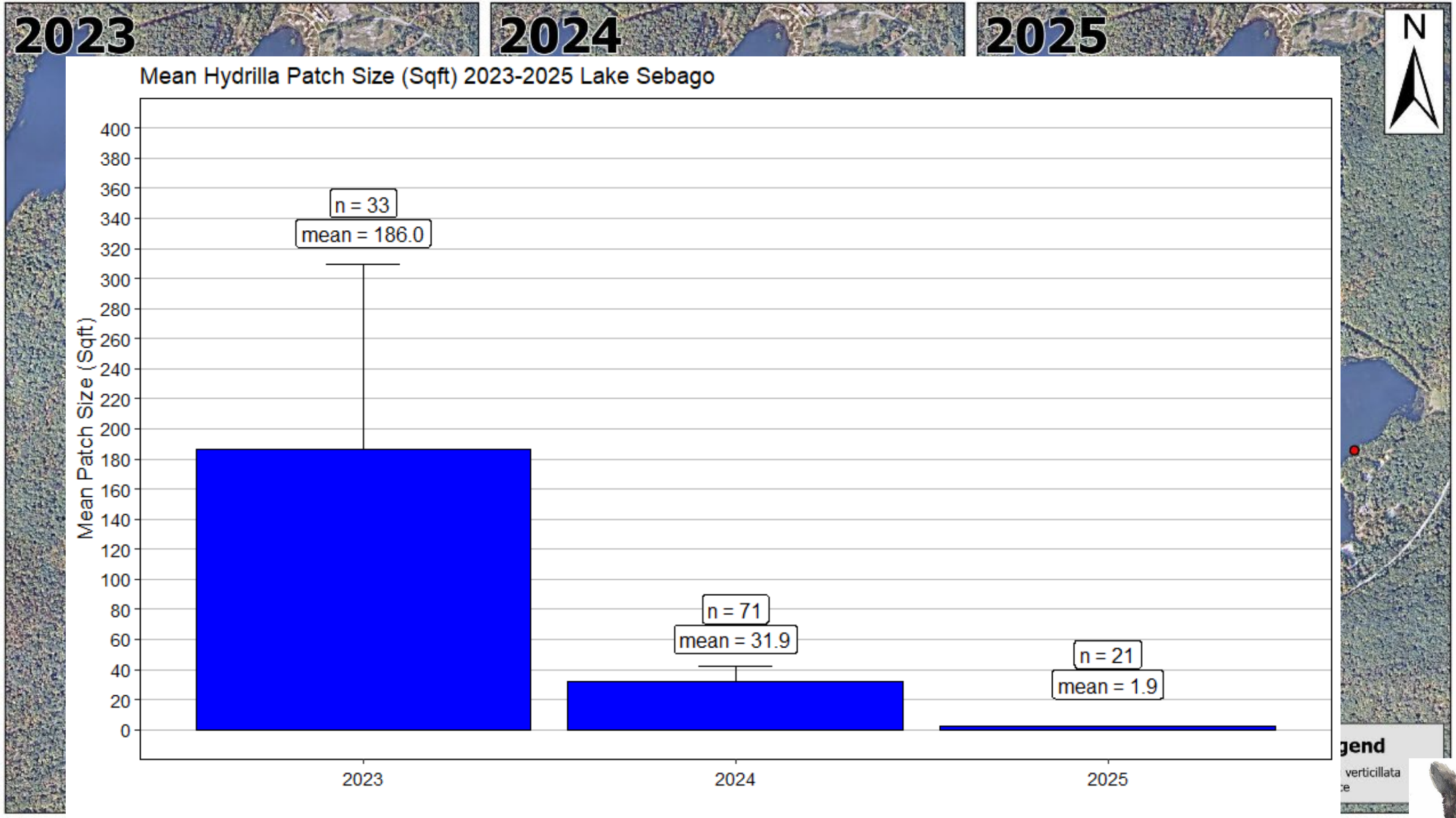
- Aquatic Plant Surveys
  - Native and Invasive Plants via point intercept and shoreline surveying
- Fluridone Residue Monitoring
  - Weekly at multiple in lake and outlet sites for season
- Tuber Sampling
  - Multiple sites once a year

Plant Monitoring Schematic

- Annual Lake Surveys (2023-2025) using Index Points.
  - Native and Invasive Species, Percent Cover and Growth Form (Biovolume)
- Diving Supplemental Sampling (2023-2025).
  - Hydrilla patch size
- Shoreline Supplemental Points (2024-2025).
  - Hydrilla patch size
- Day of Treatment Surveys.
  - Presence/Absence



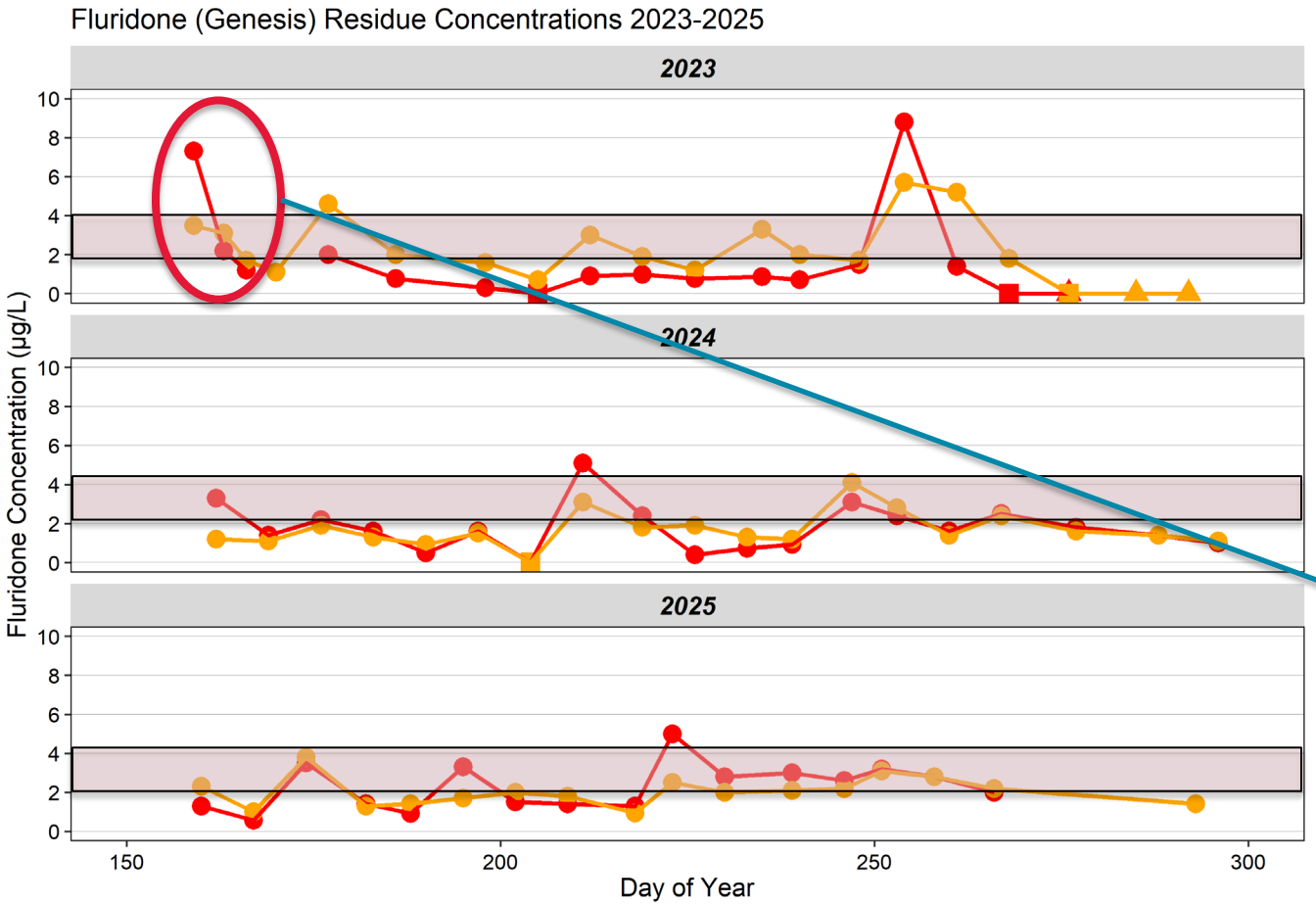

Annual Index Points
Dive Sampling
Supplemental Shoreline Sampling
Day of Treatment Surveying
Lake Sebago


2023
2024
2025
N
Mean Hydrilla Patch Size (Sqft) 2023-2025 Lake Sebago
Mean Patch Size (Sqft)
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
n = 33
mean = 186.0
n = 71
mean = 31.9
n = 21
mean = 1.9
2023
2024
2025
gend
verticillata

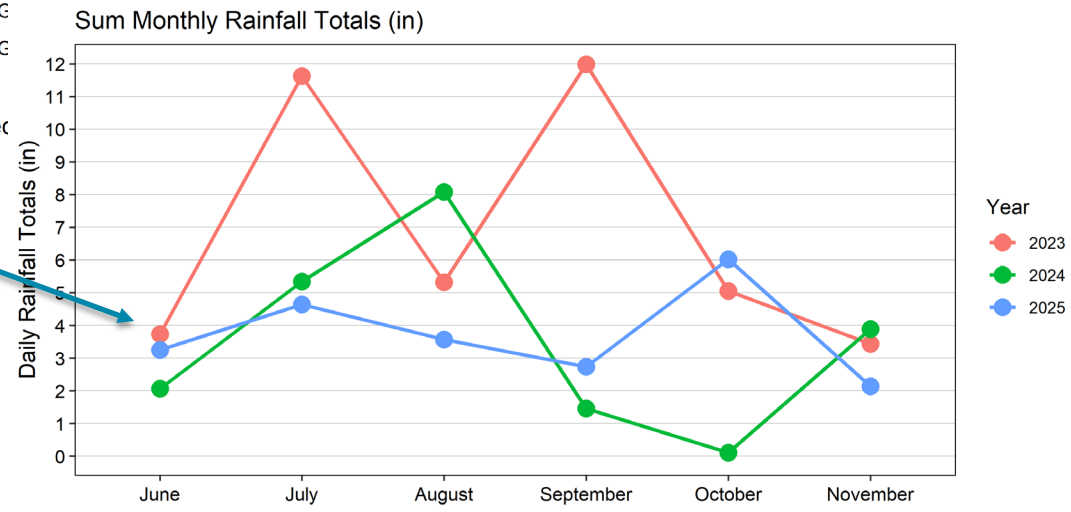
Plant Condition

Photo: Nicole White

Residue Results

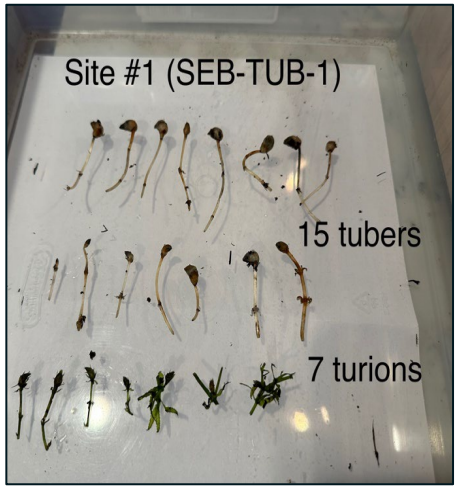


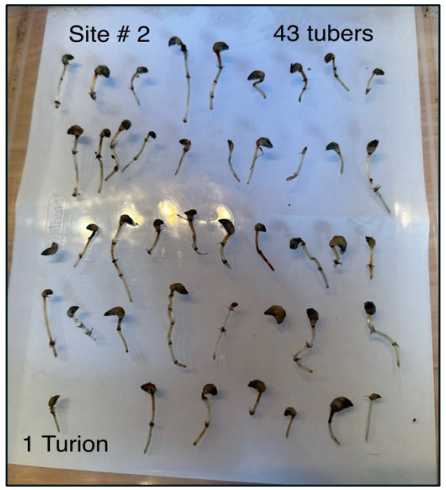
Number of Days						
Sampling Year	**2023**		**2024**		**2025**	
Concentration Range (ppb)	**>1**	**2-4**	**>1**	**2-4**	**>1**	**2-4**
SEB_GEN_1	46	13	120	43	146	60
SEB_GEN_2	110	44	142	30	154	62

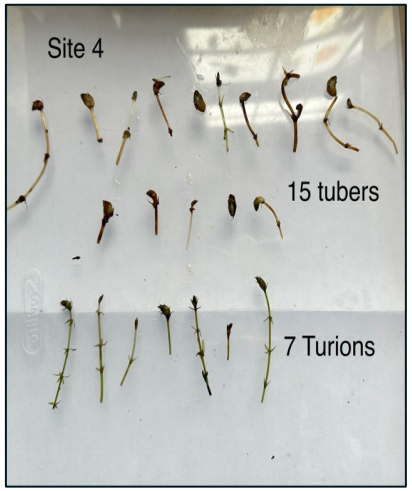


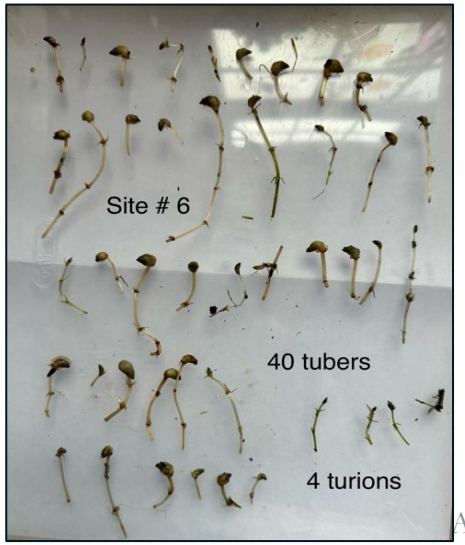
2022 PRE-TREATMENT

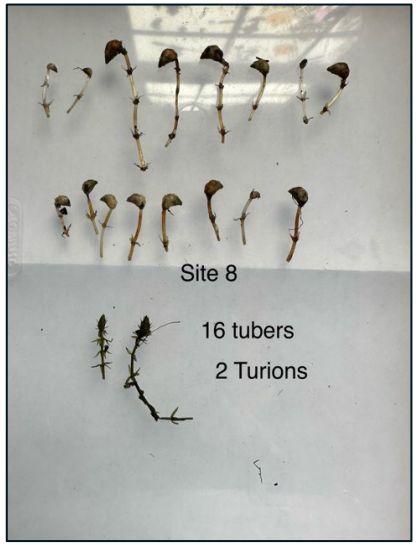
TUBER SURVEY

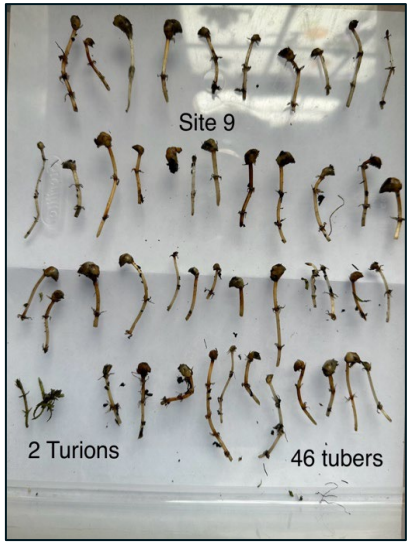




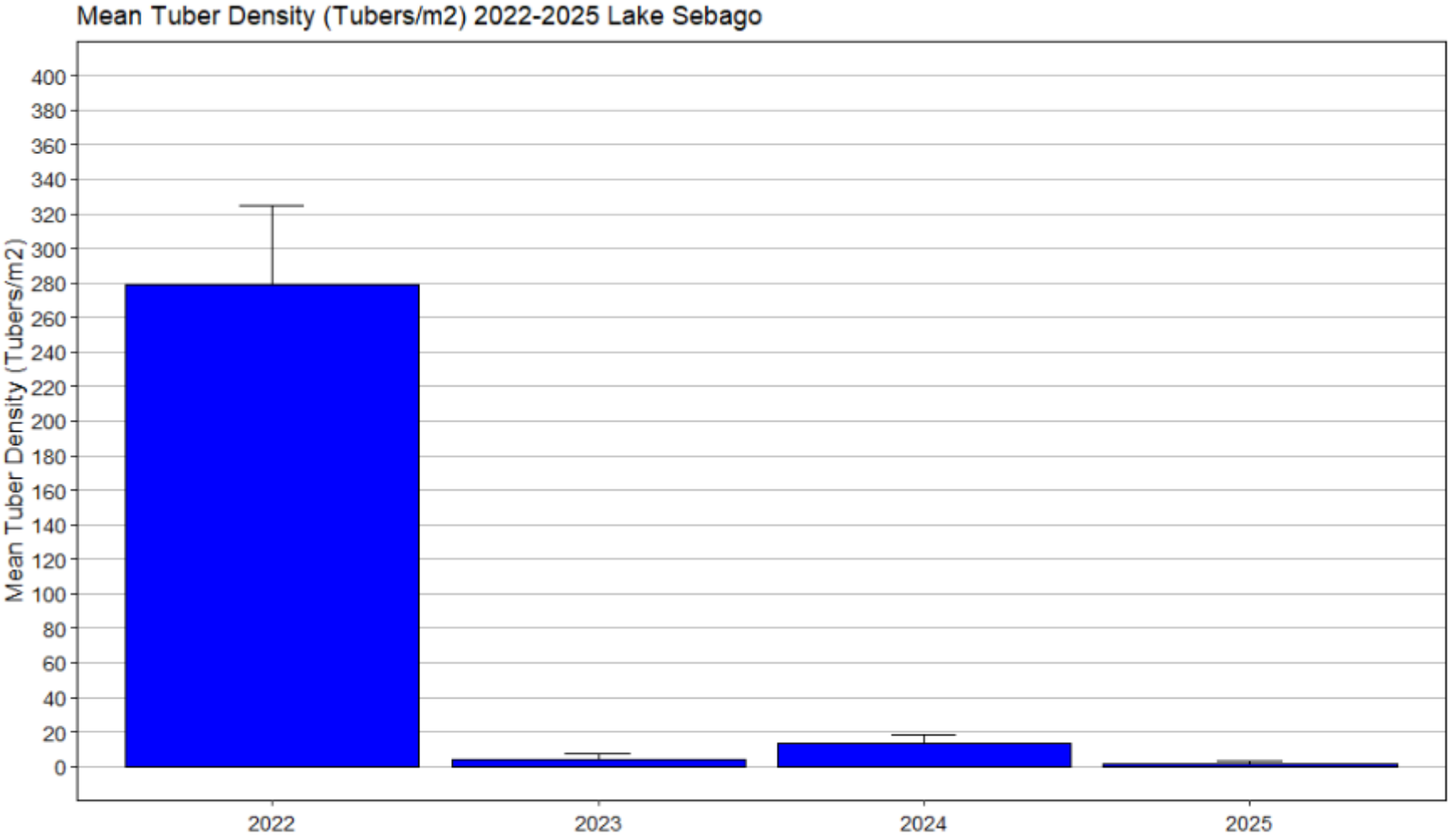


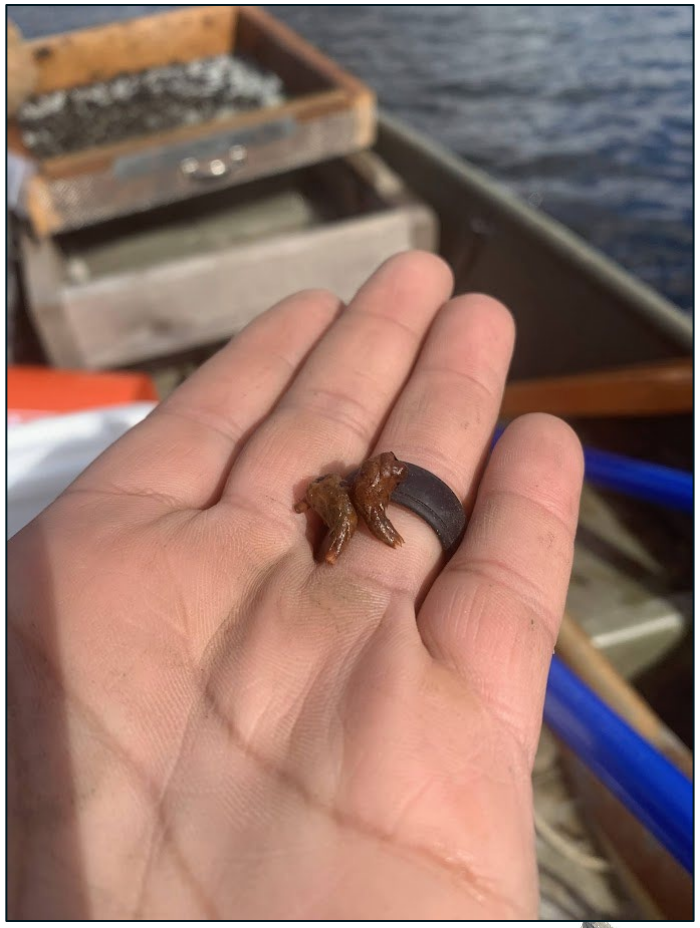






Tuber Results





Invasive Species

Scientific Name	Percent Occurrence			Change '23 - '24	Change '24 - '25
	2023	2024	2025		
Cabomba caroliniana	31	10.9	15.7	-20.1	4.8
Hydrilla verticillata	12.3	4.3	1.5	-8.0	-2.8
Myriophyllum heterophyllum	28.1	26.1	51.5	-2.0	25.4
Myriophyllum spicatum	15.2	8.7	14.9	-6.5	6.2

- Hydrilla declines at index sites '23-'25
- Fanwort declines from '23-'24
  - Evidence of fluridone damage
- (Native) VLM large '25 increase.
- EWM completely controlled within the north basin.

Native Plants

- North basin is currently mix of purple bladderwort, inflated bladderwort, coontail and ribbonleaf pondweed.
- Partial bleaching of select species.
- Return of large Robbin's pondweed beds.

Scientific Name	Percent Occurrence			Change '23 - '24	Change '24 - '25
	2023	2024	2025		
Ceratophyllum demersum	46.2	47.8	31.3	1.6	-16.5
Nymphaea odorata tuberosa	30.4	22.5	24.6	-7.9	2.1
Potamogeton epihydrus	19.9	15.9	23.1	-4.0	7.2
Potamogeton robbinsii	0.0	0.0	4.5	0.0	4.5
Utricularia inflata	18.1	24.6	46.3	6.5	21.7
Utricularia purpurea	26.3	35.5	35.1	9.2	-0.4
Vallisneria americana	42.1	39.1	29.1	-3.0	-10.0

Conclusions

- Strategy has been successful at reducing hydrilla in both basins.
- “Whack a Mole” done right!
  - Targeted pelleted treatment can be effective if monitoring is sufficient
- Early start, reducing risk of spread early on.
  - From discovery in fall of ‘22 to full management in summer 2023
- Looking forward.

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