Aquatic Invasive Plant Surveys on Long Lake

A presentation on the 2022 survey to document Eurasian watermilfoil between 2016 and 2022.



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Aquatic Invasive Species Surveys

FARCH

Survey Team Report

Long Lake AIS Survey



Adirondack Research

Aquatic Invasive Species Surveys

• Surveying lakes and rivers across New York State for aquatic invasive species.



GIS and Cartography

- Various projects related to land conservation, recreation, and community infrastructure.
- Green Goat Maps waterproof recreation maps.





Green Goat Maps

Waterproof Recreation Maps

• Thirteen maps across the U.S. – more each year.



can live from 20 to 30 years top of the aquatic food web. ns indicates environmental o monitor the health of those

Inlet

DEBAR MOUNTAIN WILD FOREST

LAINBOW

FLOATING BOGS OF RAINBOW LAKE

birds, insects and other wildlife

Bog attached to shore

Rainbow Lake has several floating bogs, which can

appear either as floating islands scattered throughout the

lake, or large mats of vegetation that extend outward

from the shoreline. These bogs formed over hundreds

to thousands of years as vegetation decomposed and

Only the top few inches of the floating bog is made up

of living vegetation. The rest of the bog is formed by

decayed sphagnum peat. Changing lake levels cause

floating bogs like these to separate from their shoreline

attachments and move freely through the lake, usually

at guite a slow pace. These unique habitats support fish,

Floating Island

accumulated on peat shelves extending from shore.

Concern in New York State, and are protected under the Federal Migratory nerous threats including environmental mercury pollution, shoreline rglement, lead poisoning from toxic fishing tackle, and human disturbance.

Pond

RAINBOW LAKE ESKER

One of Rainbow Lake's most beautiful geologic features is the esker that separates it from Clear Pond and the Inlet. Eskers are aremnant of when glaciers covered parts of Earth's surface in the past. As the glaciers melted, meltwater streams carved channels into the ice where it met the ground's surface. Over time, meltwater deposited sand and gravel in these stream channels. Once the glacier completely melted, the mounds of sand and gravel, or the esker, remained as long raised beds on the surface where the glacier noce sat.





No public services available on Rainbow Lake, including bathrooms and fuel.

- Operate all watercraft in accordance with state law, in a safe and courteous manner that will protect persons and property and enhance the enjoyment of all those who live on and use the lake.
- Be aware of areas which are environmentally sensitive and/or may present hazards.
- Use extreme caution and go very slowly through cuts and under bridges. Cut speed when nearing or passing canoes, rowboats, kayaks or fishing activity.
- Except for access, limit jet craft and water skiing to the middle part of the lake, away from shorelines, swimming areas and docks.
- State law requires that a spotter at least 10 years of age be present in any boat towing a tuber or skien. No one under the age of 18 is permitted to operate a motorized craft unless (1) that individual has a state-approved boating safety certificate or (2) is accompanied by a person 18 years of age or older.
- Do not exceed 5 miles per hour within 100 feet of shore, a bog or island, docks, rafts, floats, or anchored craft.
- Do not operate motorized craft while under the influence of alcohol or drugs.
- It is required that any watercraft entering Rainbow Lake that has been in another waterbody prior be cleaned and washed in order to prevent the introduction and spread of aquatic invasive species.

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Survey Overview

History

- Comprehensive 2016 plant survey funded by APIPP
- Active management (2017–2019)
- 2022 follow-up survey with contract with Adirondack Research

Goals of 2022 Survey

- Document management success or failure (2017–2019 harvests)
 - Inform management
 - Useful for raising funds
 - Needed for grant proposals



Survey Overview

Challenges

- Large lake (4,200 acres and 14 miles long)
- 2016 survey was delineated by multispecies beds

Strategy

- Map existing beds within areas of 2016 plant beds
- Compare density changes, not size of beds between years

Anticipated Results

- Changes in AIS presence and/or density
- Differences linked to management





Survey Logistics

Survey Strategy

- Visual surveys with sonar input for boat crew
- Rake-tosses every turn







Survey Logistics

Equipment

- Lowrance HDS Live sonar unit
- iPad tablet with Arc GIS







Native species

 17 native species across Long Lake and Jennings Pond



Common Name slender water-nymph Richardson's pondweed yellow water-lily little floatingheart American white waterlily common pipewort water lobelia quillworts small waterwort floating bur-reed swollen bladderwort American cranberry spoonleaf sundew slender water-nymph clasping-leaved pondweed ribbon-leaved pondweed little floatingheart variable-leaf milfoil

Scientific Name

Najas flexilis Potamogeton richardsonii Nuphar lutea Nymphoides cordata Nymphaea odorata Eriocaulon aquaticum Lobelia dortmanna Isoetes sp. Elatine minima Sparganium fluctuans Utricularia Vaccinium macrocarpon Drosera intermedia Najas flexilis Potamogeton perfoliatus Potamogeton epihydrus Nymphoides cordata *Myriophyllum heterophyllum*

Aquatic invasive species

 Variable-leaf milfoil found in Long Lake and Jennings Pond

		Variable I	eaf Milfoil		
Bed	Size (Acres)	Size (Sq. Ft.)	% Cover	Latitude	Longitude
3	5.85	254,986	5-25%	-74.414182	43.990954
6	0.30	13,141	<5%	-74.37736	44.035471
7	9.38	408,609	<5%	-74.405952	44.000975
9	19.82	863,553	5-25%	-74.401184	44.002595
10	0.25	10,688	<5%	-74.400241	44.005128
12	1.17	50,829	<5%	-74.391572	44.010741
31	N/A	N/A	<5%	-74.423257	43.974538
37	3.93	171,152	5-25%	-74.392565	44.000904
39	N/A	N/A	<5%	-74.381976	44.008202
81	6.34	276,109	5-25%	-74.454371	43.953145
84	0.07	2,912	5-25%	-74.424151	43.970028
85	2.51	109,164	51-75%	-74.421301	43.968573
	Asian Clam	Sniny Wa	torfloa		

Asidii Cidiii	Spirly Water fiea		
Present (Y/N)	Present (Y/N)		
No	No		



Map Features

Boat path

Bathymetry

2016 beds

Variable-leaf milfoil beds



Map 1 (northern section)

- Bed #56 was 6-16% in 2016
- VLM harvested in 2018 & 2019



Map 1 (northern section)

- Bed #56 was 6-16% in 2016
- VLM harvested in 2018 & 2019
- Bed #6 new in 2022













Bed	2016	2022		Pounds	Days of	
Number	Cover Class	Cover Class	Years of harvest	harvested	harvesting	Change
1	<5%	Absent				
3	<5%	5-25%				
6	Absent	<5%				
7	<5%	<5%	2017, 2018, 2019	10,902	19	Similar
8	>50%	Absent				
9	>50%	5-25%				
14	Absent	Absent	2019	170	2	Similar
23	<5%	Absent				
31	26-50%	<5%	2017, 2018, 2019	4,429	12	Decreased
35	6-15%	Absent				
37	6-15%	5-25%	2017, 2018, 2019	15,168	15	Similar
39	6-15%	<5%	2019	31	1	Decreased
43	6-15%	Absent				
56	6-15%	Absent	2018, 2019	66	2	Decreased
57	26-50%	Absent	2017, 2018, 2019	3,637	16	Decreased
59	6-15%	Absent				
62	<5%	Absent				
65	6-15%	Absent				
66	6-15%	Absent				
70	16-25%	Absent	2018, 2019	474	2	Decreased
79	16-25%	Absent				
81	6-15%	5-25%				

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Higher Cover Class Lower Cover Class Harvest Data Decreased AIS Cover Class

Conclusions

Limitations to interpretation

- There is year-to-year variation
- We used a different scale
- We did not compare bed size
- Some beds may not overlap

	Adirondack		
Adirondack Research	Watershed Institute		
Cover Classes	Cover Classes		
Absent	Absent		
<5%	<5%		
5-25%	6-15%		
5-25%	16-25%		
26-50%	26-50%		
>50%	>50%		



Conclusions

Changes in milfoil density

- 10 beds decreased without any management
- 6 managed beds had decreased densities (includes bed 14)
- 2 managed beds (7 & 37) stayed the same
- 20 beds were present in 2016 and 7 remain in 2022

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Harvest Data Decreased AIS Cover Class

Recommendations

Survey schedule

- Yearly surveys with a focus on 2022 known beds
- 3-year surveys of entire lake to perform early detection in all bays



Paid Photography Internship



Questions

