

Aquatic Invasive Species Management Report

Moody Pond
2023 Final Report

Prepared for
Friends of Moody Pond

Prepared By:

Upper Saranac Foundation
It still is, and always will be, about Water Quality



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Acknowledgements

The Upper Saranac Foundation thanks the Friends of Moody Pond for their commitment to preserve, protect, and rid Moody Pond of aquatic invasive species (AIS). Your effort exemplifies a grassroots collaborative effort that is successfully tackling an environmental challenge.

The Friends of Moody Pond contracted the Upper Saranac Foundation - Aquatic Invasive Divers (AID) to conduct field work that included aquatic invasive species harvesting, mapping, and data collection. This project is funded by the Friends of Moody Pond. Completion of this project would not have been possible without their role in protecting this important watershed.

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Executive Summary

- Moody Pond is a 24-acre pond located in Essex County, in the towns of Harrietstown and St. Armand. There is .9 miles of shoreline. The pond has a mean depth of 8-9 feet with a maximum depth of 17 feet. Most of the pond is privately owned with the exception of a small public access site across from the Baker Mountain trailhead (Stager, 2021). The pond has a rich historical background and is a community recreational attraction.
- Aquatic invasive species were first discovered in Moody Pond in 2018 by shore owners of the pond. Thereafter Friends of Moody Pond was organized to increase knowledge about invasive species spread prevention and to raise funds to implement a management response to the infestation (Stager, 2021).

- In 2019, a preliminary survey was completed by the Adirondack Park Invasive Plant Program (APIPP) / Adirondack Research Early Detection Team. The survey estimated that Eurasian Watermilfoil (EWM) was established in approximately 3.91 acres or 15% of the pond (Schwartzberg 2019, Appendix B). By 2020 observations made by Friends of Moody Pond members found additional concentrations of EWM growth and estimated that coverage was more extensive than the preliminary study indicated.
- A second AIS survey was completed by Adirondack Research in 2021(Appendix C). This survey followed Invasive Solutions Dive Company's first week of harvesting. The survey indicated a significant reduction in EWM.
- A preliminary pre-management survey conducted by the USF- AID in 2022 estimating that approximately 4.45 acres or 17% of Moody Pond had moderate (20% -59% coverage) including limited pockets with density levels (> 60%), as well as sporadic plant growth throughout the pond.
- The USF - AID crew found only one type of invasive; Eurasian watermilfoil. By 2023, mostly small milfoil plants were found with limited larger old growth. Where the majority of milfoil was located in the northern part of the pond in 2022, more plants were found in the east in 2023 (Figure 6).
- Eurasian watermilfoil was first managed in 2021 by Invasive Solutions Dive Company. The second and third year (2022-23) of management was conducted by USF - AID. Since harvesting began in 2021 a total of 850 diver work hours has been invested to remove 1,087 pounds of Eurasian watermilfoil.
- The 2023 harvesting season consisted of 360 hours (110 more hours than in 2022), divided into three-week sessions; June 26-29, July 24-27, and September 11-14. A total of 1,553 plants were removed totaling 46.25 pounds (Figure 1).
- The Adirondack Park Invasive Plant Program (AIPP) Lake Manager Tracker provided independent monitoring and evaluation confirming the efficacy of USF-AID team control and removal efforts. Results from a 2021 survey, prior to USF's management, found that 23.7% of the 41 monitoring sites had Moderate to Dense abundancies of EWM. Compared to 2023 there was no EWM found at any of the sampling sites (Appendix A).

Introduction

New York State ranks Eurasian watermilfoil (EWM) as one of the top AIS in the State, based on their ecological impacts, biological characteristics, and distribution. Knowing the consequence of unmanaged AIS and understanding the scope of this project, the Upper Saranac Foundation is confident that harvesting AIS from Moody Pond is not only practical, but an essential investment.

The Upper Saranac Foundation (USF) history of preventing the spread of AIS has proven to be effective in restoring the Upper Saranac Lake watershed, promoting healthy ecosystems, and allowing for continued recreational enjoyment. We are confident the Friends of Moody Pond's willingness to employ the Foundation's Aquatic Invasive Diver (AID) crew will result in a similar success.

While the ultimate outcome is to eradicate EWM from Moody Pond, the immediate objective of this project is to restore the 24-acre pond and prevent the spread of AIS while maintaining native species in their natural habitats. Effective management will preserve the recreational resource and enjoyment of the pond, and protect and maintain the economic value of the community derived from tourism and home worth. Success will be defined by immediate control and an ongoing year-to-year decline in total area and amount of plant material removed.

The project data-quality objective is to collect, provide, maintain, analyze, display, and document accurate AIS locational data for the entire pond, as well as provide historical statistical amounts of AIS removed. This report will establish and identify trends that will help guide future management practices for the Friends of Moody Pond. Submission of this Final Report by the Friends of Moody Pond to the Adirondack Park Agency will satisfy permit requirements as outlined in APA General Permit 2020-0249.

Methodology

The successful harvesting of aquatic invasive species is ever-evolving and requires knowledge in many areas to include the waterbody's specific tendencies, especially in relation to bathymetry, substrates, seasonal changes, historical aquatic AIS data and patterns, and knowledge of Eurasian watermilfoils life cycles. Considering the many variables, the USF has developed a foundation for a management plan to lay the groundwork for the harvest season, while still allowing for minor changes in harvesting methods to ensure the best harvesting practices are always being employed.

Data obtained from surveys and harvesting will be used to provide context and a qualitative baseline for developing a historic set of aquatic plant community records. This data assists in

guiding management as well as monitoring to quantify progress and assess efficacy of our management techniques.

In addition to recording pounds of AIS harvested, the AID crew maintains data on the number of plants harvested and their locations. Harvesting amounts measured in the number of plants removed and pounds are collected and recorded daily. Plant locations are mapped using GPS to provide a detailed map of plant locations.

While harvesting, our AID crew continuously monitored the growth cycle of the AIS to ensure we are using the most effective timeline and harvesting techniques for best management practices. For each of the three harvesting weeks, the Upper Saranac Foundation produced a report to reflect our findings. This not only keeps Friends of Moody Pond informed, but allows for a more responsive management approach.

Our trained, certified divers utilized a variety of techniques to locate and hand harvest AIS, including surface spotting from paddle boards, line or grid search swims, and even a submersible diver assisted scooter. Surface spotting surveys were completed during calm and optimal viewing times to locate and mark invasive plants. During harvesting operations, divers utilize a Hookah surface air compressor Dive System for best efficiency in deep water, and mask and snorkel in shallow water.



USF-Aquatic Invasive Divers and Hookah Air Compressor – Photo: Guy Middleton

Two to three divers hand harvest simultaneously while an additional crew member remained on the surface in a non-motorized watercraft to retrieve plant fragments, and guides the underwater divers. The top water tender utilized a hand-held GPS unit. Data is used to develop a map tracking and indicating the area the divers searched, and to mark harvested plants. In addition, the tender collected data on the number of plants removed.

Invasive plants were removed from the sediment by hand, including the root system and then bagged underwater in a mesh bag (5mm lobster mesh bag). Upon the bag becoming full, the galvanized/ stainless steel wire handles on the bag were sealed and delivered to the surface tender, swapping out for an empty mesh bag.



Invasive plants, including the root system removed by hand – Photo: Meg Modley

Plants weights are determined by filled bags. Each filled bag weighs 25 lbs. This weighing system is consistent in past practices and with most other AIS harvesting companies throughout the region. Disposal of removed invasive species material is composted and used by local gardeners.

All equipment for both surveying and harvesting, was cleaned and decontaminated prior to use in Moody Pond and at the conclusion of each work week, and prior to use in other waterbodies. Decontamination was accomplished by utilizing the Upper Saranac Foundation's hot water (140F), high pressure decontamination unit located at the Upper Saranac Lake, Back Bay Boat Launch.



Equipment sanitization utilizing the USF's hot water / high pressure decontamination unit at Upper Saranac Lake– Photo: Guy Middleton

Operations

For the management of Moody Pond, we used historical harvesting data to prioritize site management based upon factors like plant densities, the location of AIS sites, and trends.

The USF-AID crew worked out of the private beach residence of the Dumas family on Moody Pond. This location provided convenience to known AIS infestation locations. The divers, trained in AIS identification, found only one type of invasive; Eurasian watermilfoil.

Work Hours / Pounds Removed: In 2023 the divers conducted 360 work hours of aquatic invasive plant surveying and harvesting. This was an increase from both 2021 - (240 hrs.), and 2022 - (250 hrs.). Each year has found a substantial reduction in the pounds harvested, dropping from 921 pounds removed in 2021 to 46.25 pounds in 2023. Since harvesting began in 2021 a total of 850 diver work hours was invested to remove 1,087 pounds of Eurasian watermilfoil (Figure 1).

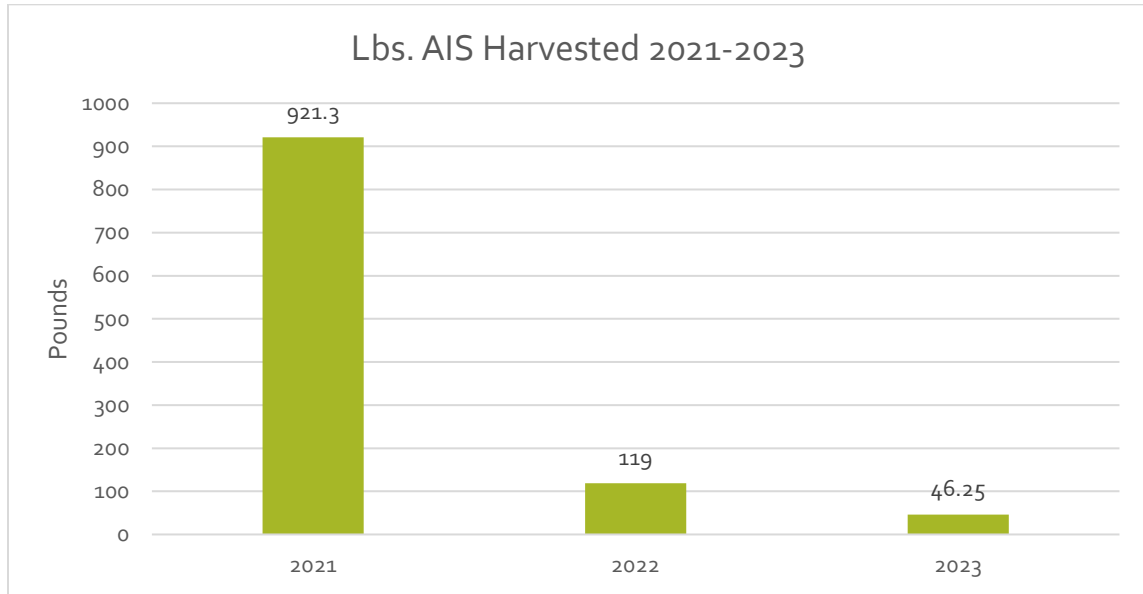


Figure 1. Pounds of Eurasian watermilfoil harvested for each year (2021 data retrieved from Invasive Solutions Dive Company)

Management in 2023 was spread out over three sessions June 26-29, July 24-27, and September 11-14. Each session found less milfoil from the previous session (figure 2). The spacing of management periods allows for AIS plant regrowth to emerge, but prior to allowing plants to mature enough to fragment and start additional new growth.

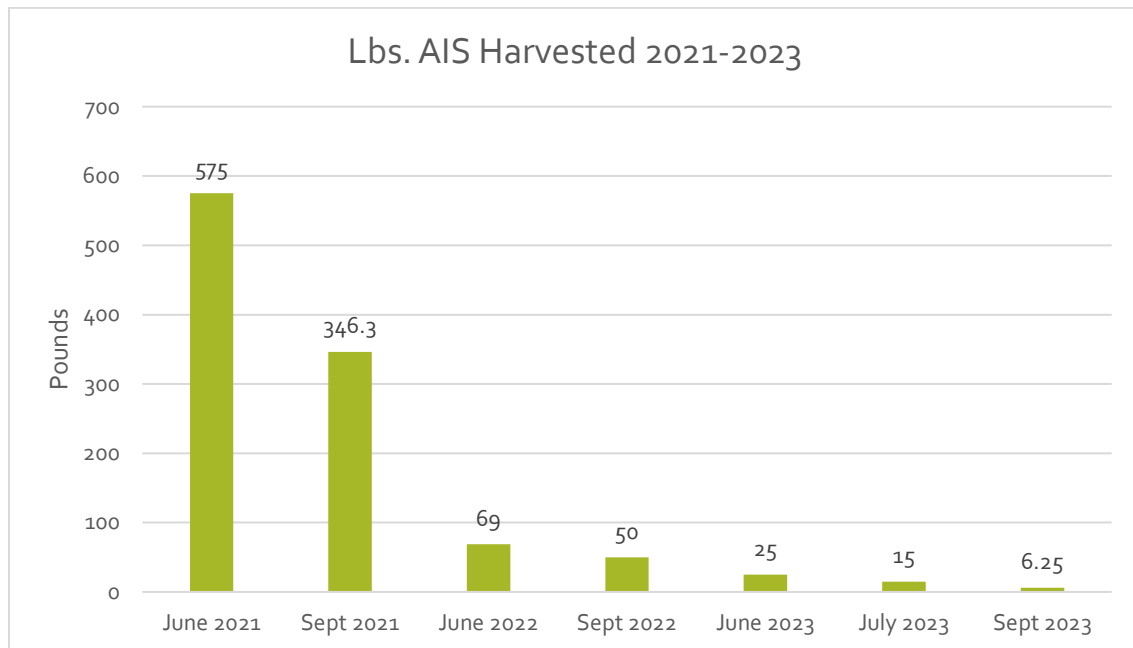


Figure 2. Pounds of Eurasian watermilfoil harvested for each management session (2021 data retrieved from Invasive Solutions Dive Company)

In the first week of the 2023 management session, divers worked 120 hours removing 1.0 bag of Eurasian watermilfoil, equaling 25 pounds. While initial management focused on removing mature and more dense plants that remained from the prior year, most plants found were small and immature. By removing AIS plants early in the season, we reduce their opportunity to fragment and proliferate.

Divers worked 120 hours in the second week and removed 6/10th of a bag of Eurasian watermilfoil, equaling 15 pounds. In the third and final September session, divers worked 120 hours and removed ¼ bag of milfoil equaling 6.25 pounds (figure 2). In both the second and third session, the team was pleased to find almost exclusively, small plants, with only a couple larger old growth milfoil. In addition to less plants found, the majority of plants that were harvested were smaller and less developed, usually under one foot in height.

Since the initiation of management in 2019 there has been a 48% average decrease in pounds of milfoil harvested for each management session (figure 3). There has been a 99% total decrease in pounds harvest from the initial 2021 session when 575 pounds was removed in June of 2019 to when 6.25 pounds was found and removed in September of 2023.

Percentage Change of Pounds Harvested	
June 2021 - Sept 2021	-40%
Sept 2021 - June 2022	-80%
June 2022 - Sept 2022	-28%
Sept 2022 - June 2023	-50%
June 2023 - July 2023	-40%
July 2023 - Sept 2023	-50%

Figure 3. Percentage decrease of EWM Lbs. harvested for each management session

Plants Removed: In a similar manor as the reduction of pounds of milfoil found and removed, the total number of plants found and removed has also significantly decreased. In 2023 the reduction in the number of plants found and removed fell by an average of 56% from each previous management session. Combined a total of 1,553 plants were removed in 2023. This is a reduction from 2022 when 5,376 plants were found and removed (figure 4).

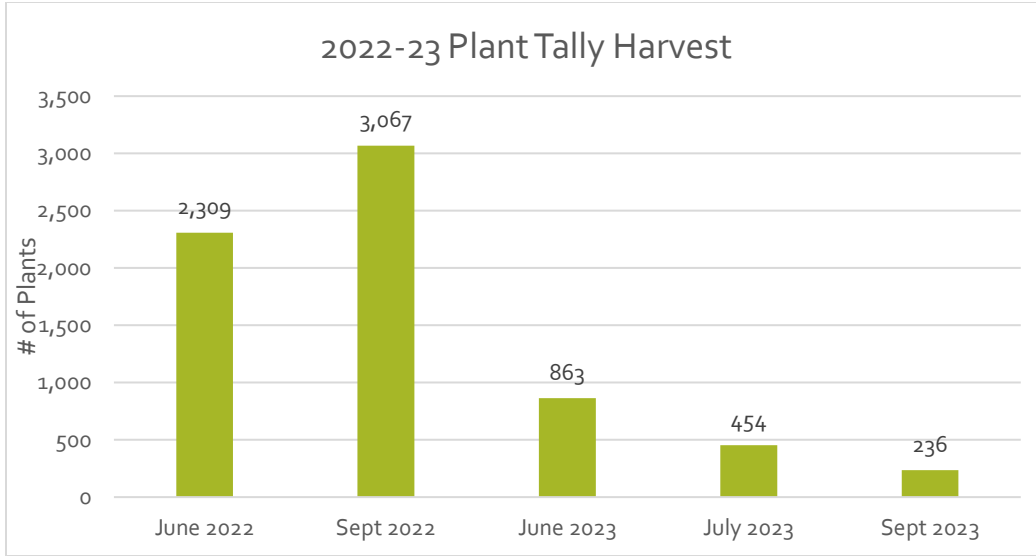
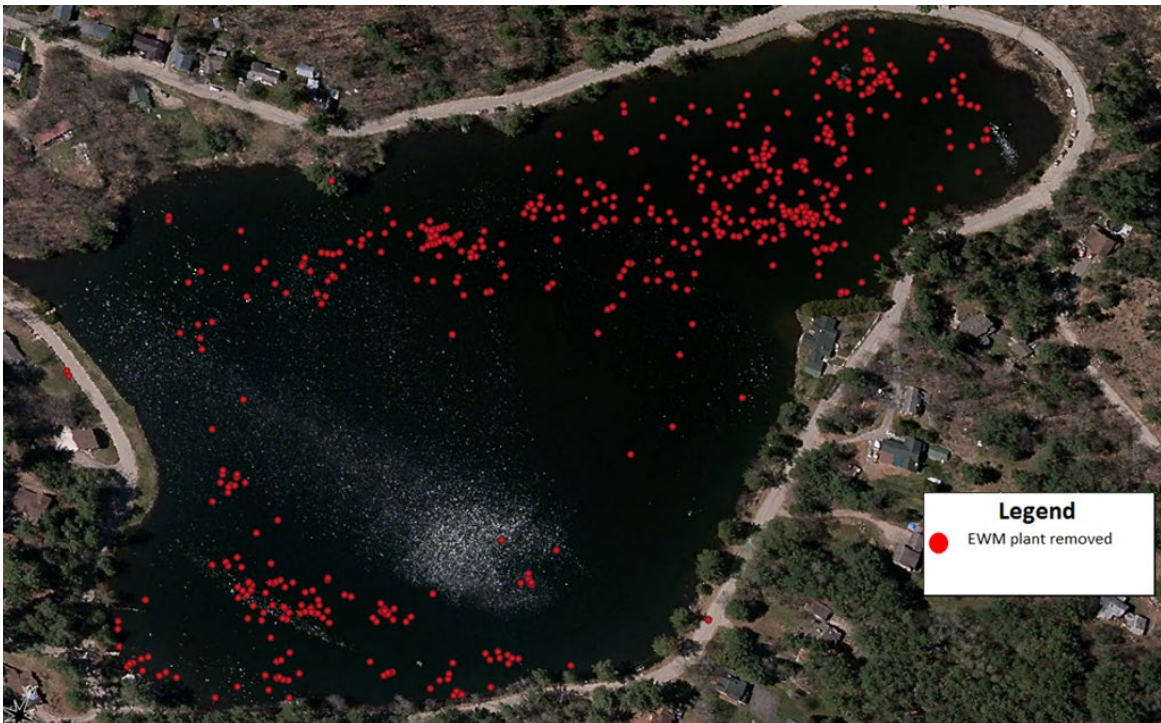


Figure 4. Number of Eurasian watermilfoil plants harvested for each management session

Overall management operations are encouraging considering that even in the height of the growing season, we continue to see reduced growth.

Plant Harvest Locations

In addition to amounts of pounds and the number of plants harvested we also identify locations of where plants are found each session/year.



2023 EWM harvest locations

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In addition, we have divided Moody Pond into three sections, North, West and East (figure 5).



Figure 5. Moody sections North, West, East

The locations of where most plants were found changed significantly from 2022 to 2023. In 2022, 99% of the plants harvested were found in the northern section of the pond. In 2023 just 45% of the plants harvested were located there. The majority of EWM harvested was located in the eastern portion of the pond - 48% (figure 6). Tracking trends over time helps guide future management. It should be noted that the earliest surveys didn't find any AIS plants in the east section of the pond. Plant growth that is now found in all but the center of the pond indicates that left unmanaged, EWM would have totally engulfed the entire shoreline of Moody Pond.

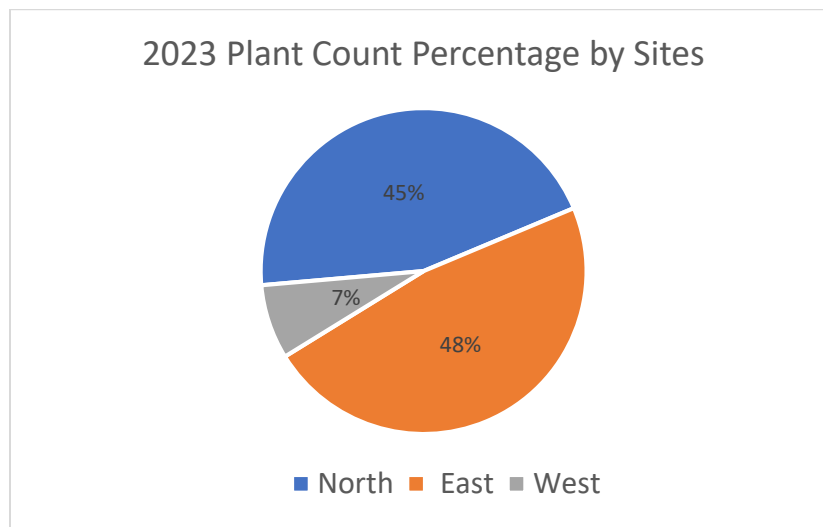
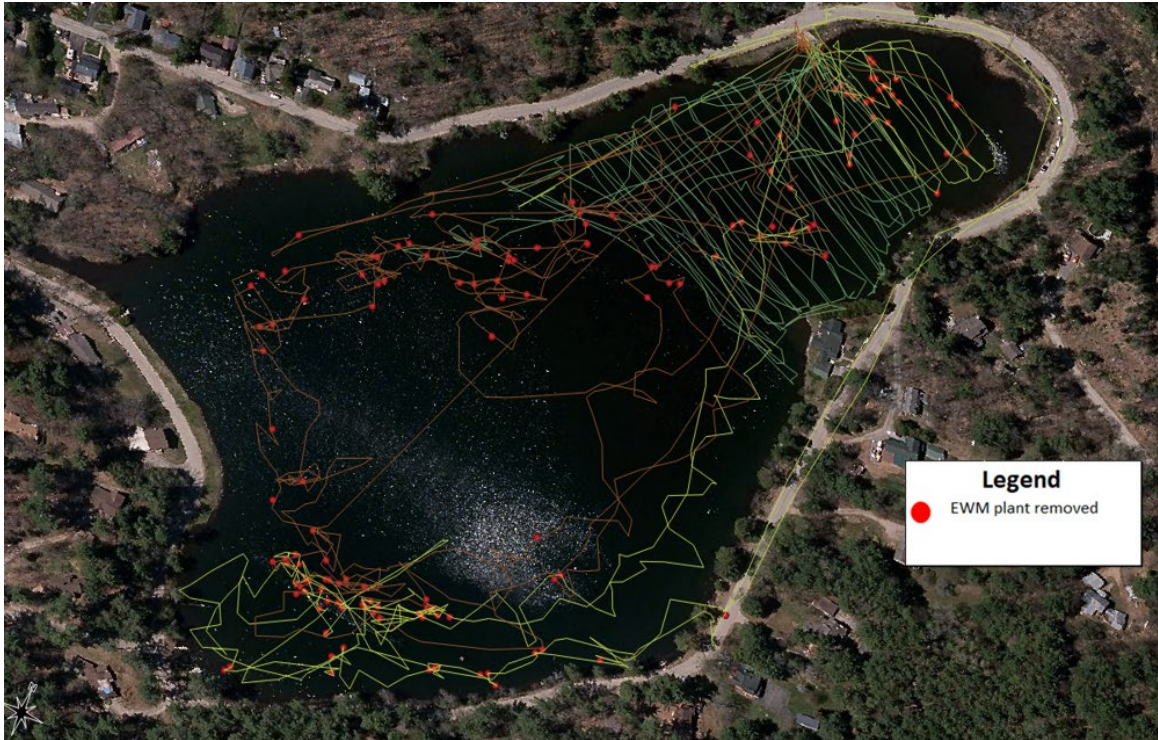
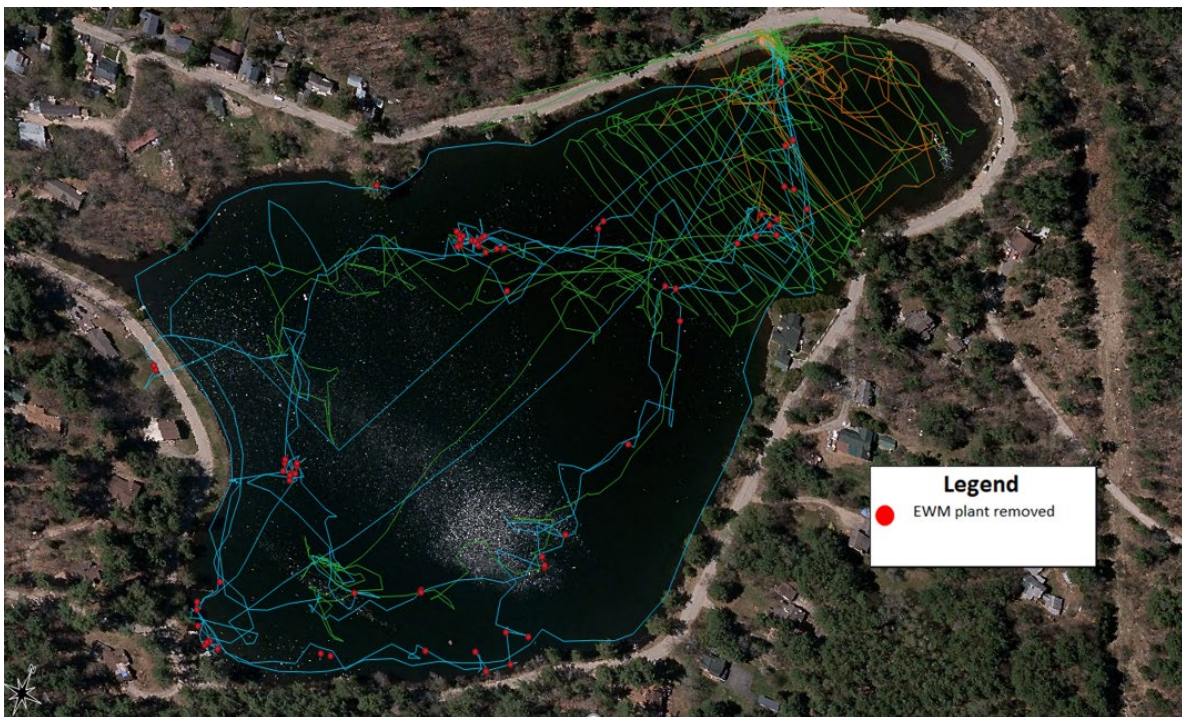


Figure 6. Plant Count by Site

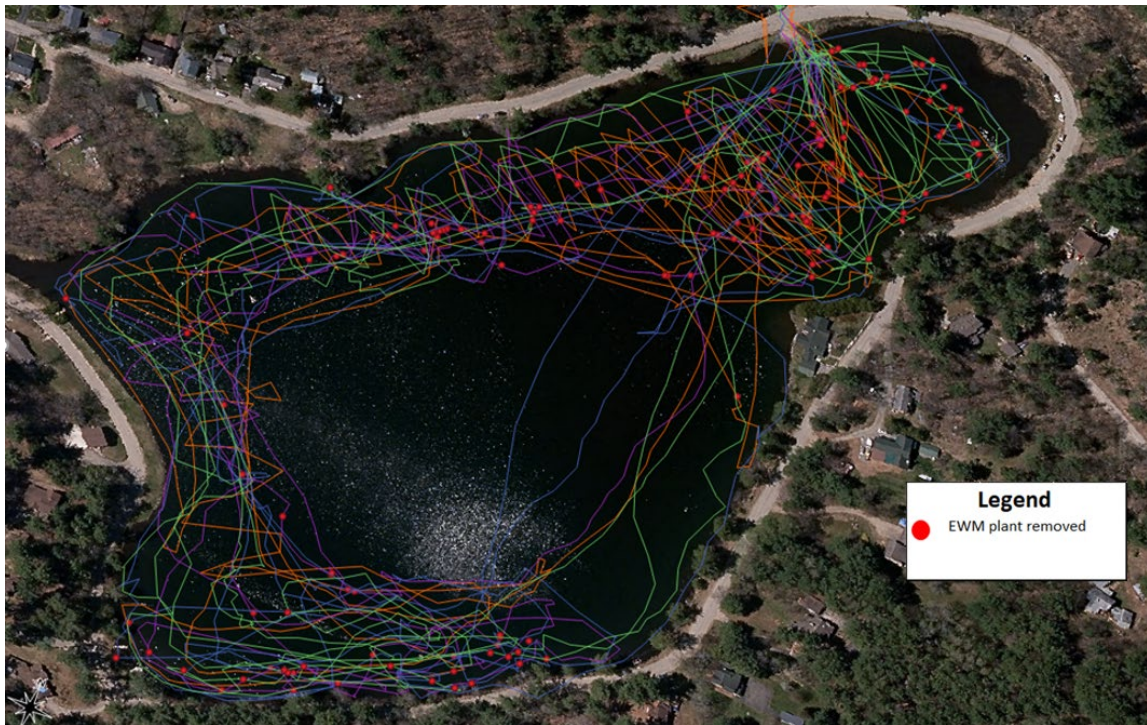
Weekly Diver Tracking and Plant Harvest Locations 2023



June 26-29, 2023 EWM harvest locations with diver tracking. Each tracking color represents a different day.

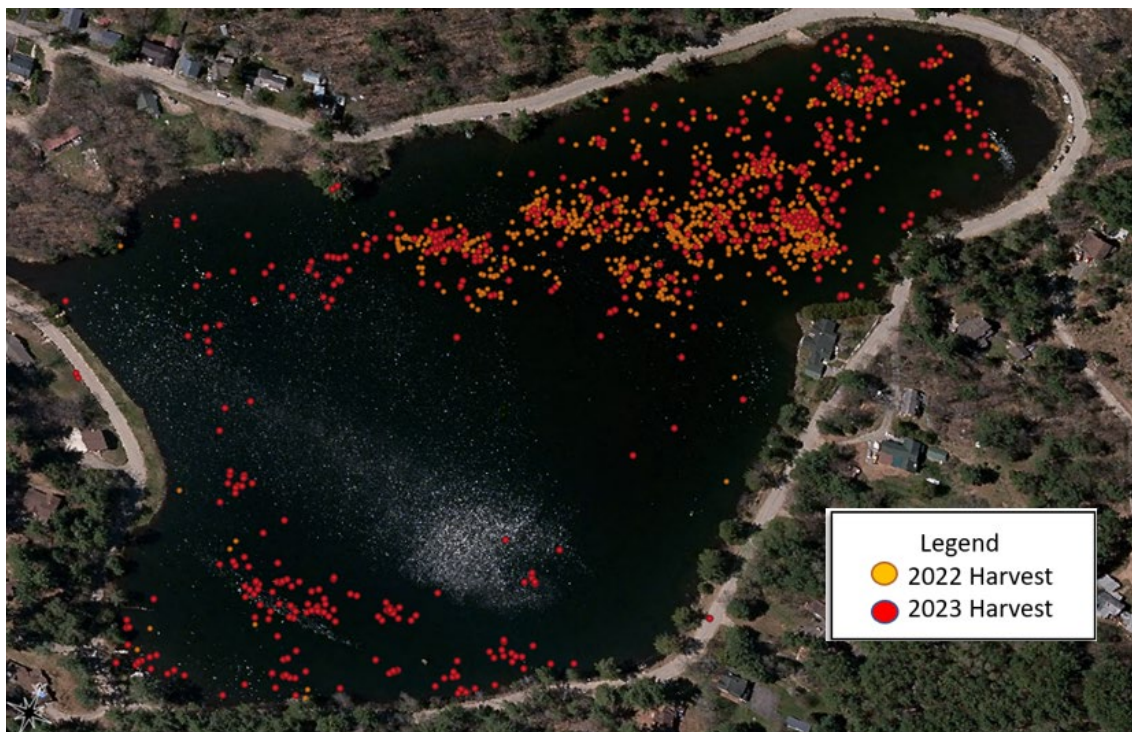


July 24-27, 2023 EWM harvest locations with diver tracking. Each tracking color represents a different day.



Sept 11-14, 2023 EWM harvest locations with diver tracking. Each tracking color represents a different day.

Plant Harvest Locations Comparisons (2022-2023)



2022- 2023 Eurasian water milfoil plant removal locations comparisons

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Independent Monitoring: The Adirondack Park Invasive Plant Program, Lake Manager Tracker (LMT) program collects data to guide management efforts and track the progress and effectiveness of invasive species management on Moody Pond over time. Volunteers from Friends of Moody Pond monitor 41 locations that stay the same each year using a combination of visual, aquascope and rake tosses. Observations, prior to the USFs management in September of 2021, indicated Moderate to Dense abundance at 23.7% of the monitored locations. Following one year of management, concluding in 2022, there were no areas found to have Moderate to Dense abundancies and only 4.9% of the locations had a Trace or Sparse amount observed (Appendix A). By 2023 there was no EWM found at any of the 41 monitoring locations (Figure 7).

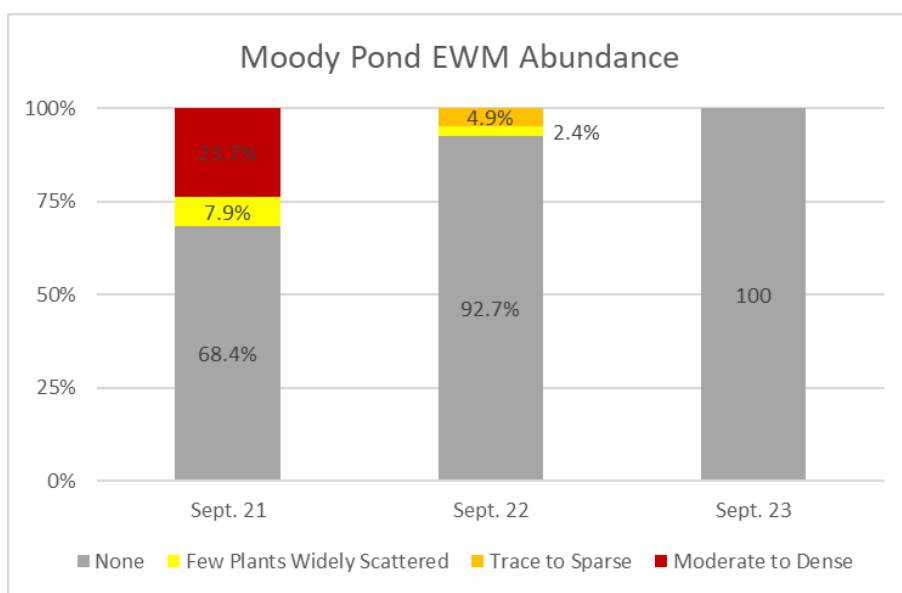


Figure 7. 2012-2023 Moody Pond EWM Abundance (courtesy of APIPP)

Conclusion

The USF- AID divers completed the second-year of harvesting objective by reducing dense infestations of AIS through hand harvesting methods. Data collected from our AID crew, and provided in this report presents historical information used to inform invasive species assessments and to better prioritize and allocate future resources for AIS management.

Plant growth that is now found in all but the very center of the pond indicates that left unmanaged, EWM would have totally engulfed the entire shoreline of Moody Pond.

Each successive year of “intensive” management has yielded less AIS plant growth. Immediate success of this project is defined by direct control and a decline in total area and amount of plant material removed.

Commitment by the Friends of Moody Pond to the long-term sustainability of this project will assure success and prevent any resurgence in AIS growth, improve water quality and maintain native species in their natural habitat.

While the ultimate objective of the USF- AID team is to eradicate the EWM, this is a long-term goal. Currently the project is on track and is consistent with the Friends of Moody Ponds Management Plan goals; slowing, stopping, and reversing the growth of EWM. Further attributes of AIS management are also in line with providing clean waterways and ensuring the sustainability of the pond's natural public resources for future generations.

The Upper Saranac Foundation thanks the Friends of Moody Pond, its members, donors, and all those involved in the management efforts of the pond. It is the efforts from the community which has allowed us to successfully implement the recovery of the pond. The Upper Saranac Foundation looks forward to continuing these efforts on Moody Pond in the coming years for joint, and continued successes.

APPENDIX A

Courtesy of Adirondack Park Invasive Plant Program, Lake Manager Tracker program.

Moody Pond 2022 Report

Brian Greene Aquatic Invasive Species Coordinator for Adirondack Park Invasive Plant Program

Created on Jan. 6, 2023

Background

The Adirondack Park Invasive Plant Program (APIPP) helps organizations and communities manage invasive species. The Lake Management Tracker (LMT) program is designed to collect data so informed decisions can be made to track the progress and effectiveness of invasive species management on lakes. This can be part of an adaptive management plan (see diagram below) to help you reach your goals for AIS management.

Across the Adirondack Park 10 different lakes have been monitored by different lake associations since the program started in 2018. Friends of Moody Pond (FMP) joined the program in 2021 and began to monitor the entire pond. The purpose of this monitoring was to track the locations and abundance of Eurasian water milfoil (EWM). Volunteers have collected data for two consecutive years (2021-2022) surveying the lake in June and September.

Lake Management Tracker

APIPP reviewed the procedures with FMP volunteers in June 2022 on how to survey the lake and record data in Lake Management Tracker (LMT) program. There are [41 monitoring locations](#) on the pond that stay the same each year. All volunteers collected observations from the water using a combination of visual, aquascope and rake toss. Observations were recorded between June 23-26 (pre-management), the week before the dive crew started hand harvesting EWM, and September 8-12.

Data

June

Volunteers made 37 observations at 35 monitoring locations. For compiling the data I removed the duplicates that had two observations each containing the same information.

September

Volunteers made 41 observations at 41 monitoring locations.

Results

June

Overall, there was a small amount of EWM reported. This low abundance could reflect that it was still early in the growing season.

	Count	Percent
Sites No Vegetation	5	14.3%
Sites Vegetated	30	85.7%
	Count	Percent
Sites with EWM	2	5.7%
Sites without EWM	33	94.3%

EWM Abundance	Count	Percent
None	33	94.3%
Few Plants Widely Scattered	1	2.9%
Trace to Sparse	0	0.0%
Moderate to Dense	1	2.9%

Native plant abundance was denser than the EWM.

Native Abundance	Count	Percent
None	5	14.3%
Few Plants Widely Scattered	6	17.1%
Trace to Sparse	10	28.6%
Moderate to Dense	14	40.0%

September

The majority of sites monitored continued to have no EWM present.

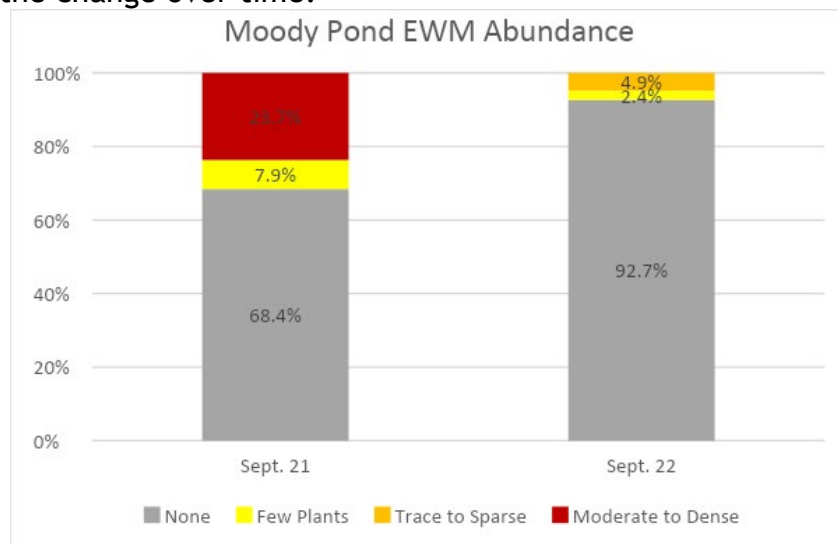
	Count	Percent
Sites No Vegetation	6	14.6%
Sites Vegetated	35	85.4%
	Count	Percent
Sites with EWM	3	7.3%
Sites without EWM	38	92.7%

EWM Abundance	Count	Percent
None	38	92.7 %
Few Plants Widely Scattered	1	2.4%
Trace to Sparse	2	4.9%
Moderate to Dense	0	0.0%

Native Abundance	Count	Percent
None	6	14.6%
Few Plants Widely Scattered	15	36.6%
Trace to Sparse	8	19.5%
Moderate to Dense	12	29.3 %

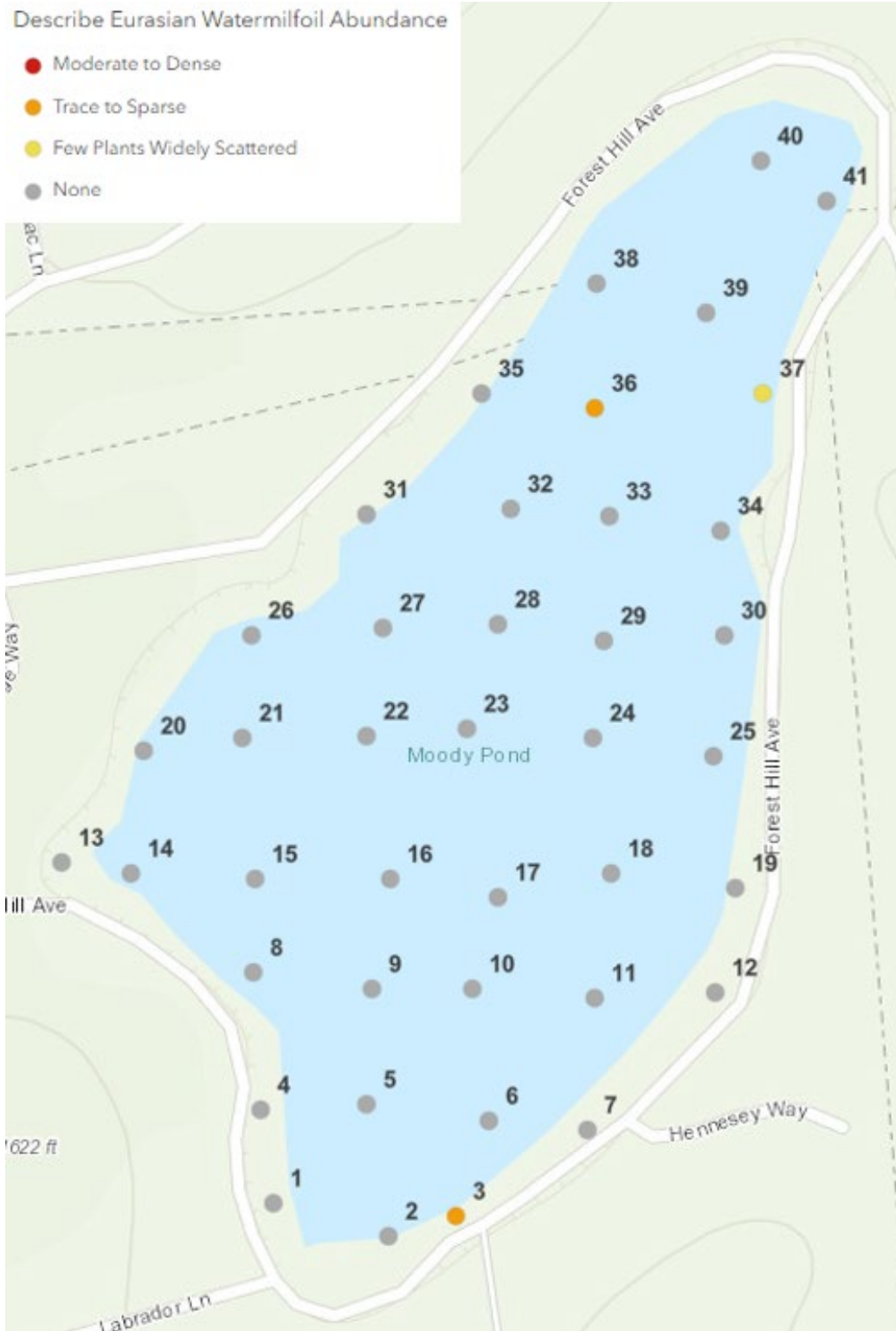
Charts

Because we are using the same monitoring locations and techniques each year, we can compare the change over time.



Comparing the data from 2021 to 2022 shows that the abundance of EWM has decreased, especially in the moderate to dense category that was eliminated in 2022.

Map of September 2022 Data Collection

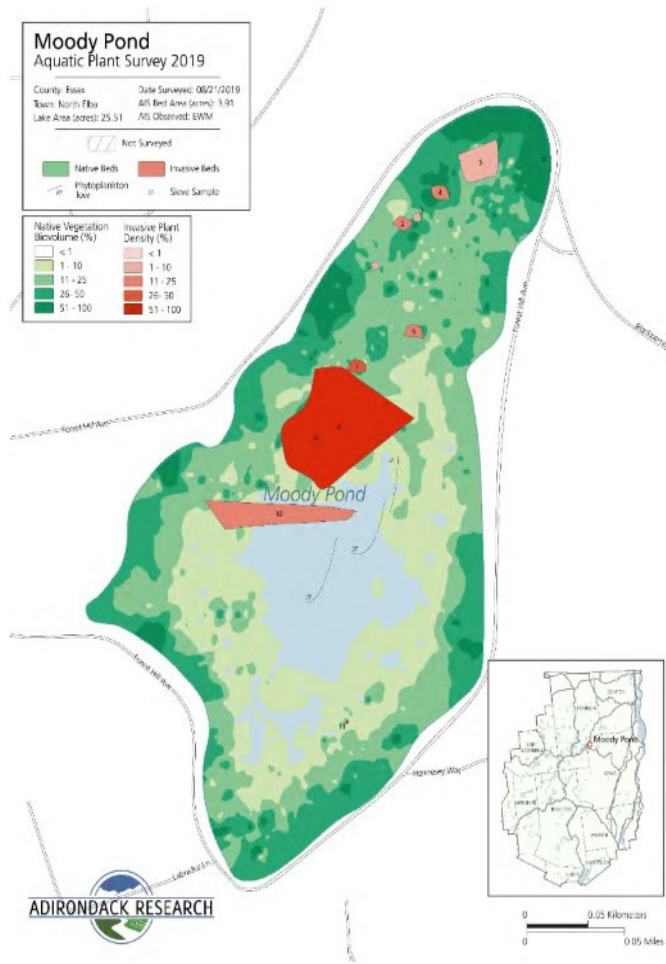


APPENDIX B

Courtesy of Adirondack Aquatic Invasive Species Surveys Early Detection Team Report- written by Adirondack Research for the Adirondack Park Invasive Plant Program

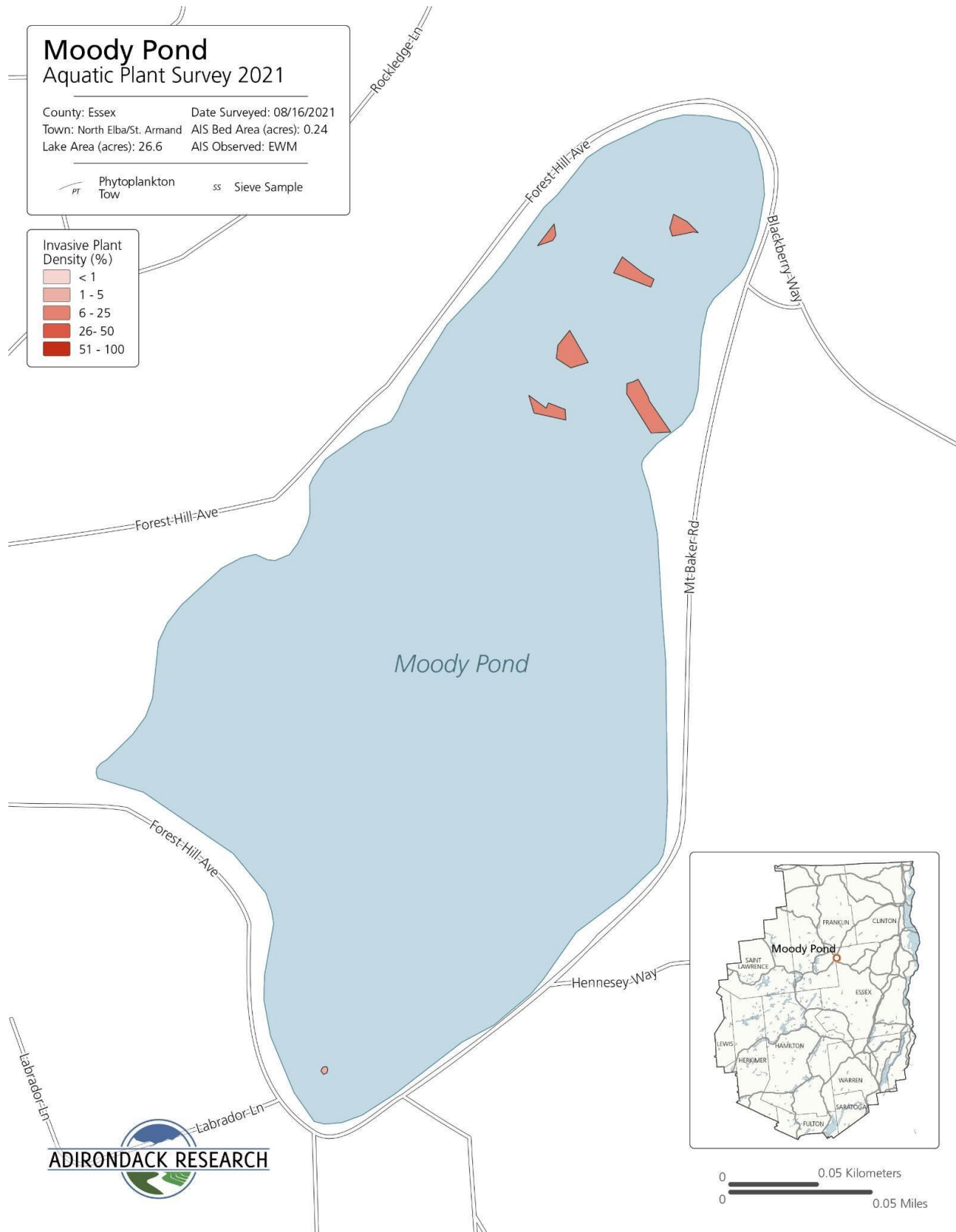
Invasive Species Percent Cover (See map on adjacent page)

Eurasian Watermilfoil				Eurasian Watermilfoil			
Bed	Size (Ac.)	Size (Sq. Ft.)	% Cover	Bed	Size (Ac.)	Size (Sq. Ft.)	% Cover
1	.01	561.55	1-10	9	.03	1168.21	51-100
2	.05	2387.88	11-25	10	.63	27393.70	11-25
3	.02	799.46	1-10	11	.0005	20.35	51-10
4	.06	2756.79	11-25				
5	.34	14955.80	1-10				
6	.06	2470.38	11-25				
7	.05	2175.78	26-50				
8	2.64	115046.00	51-100				
				Asian Clam		Spiny Waterflea	
				Present (Y/N)		Present (Y/N)	
				No		No	



Map of EWM extent in Moody Pond in 2019 produced by Adirondack Research and APIPP, showing EWM beds in red and native plants in green

APPENDIX C



Photos

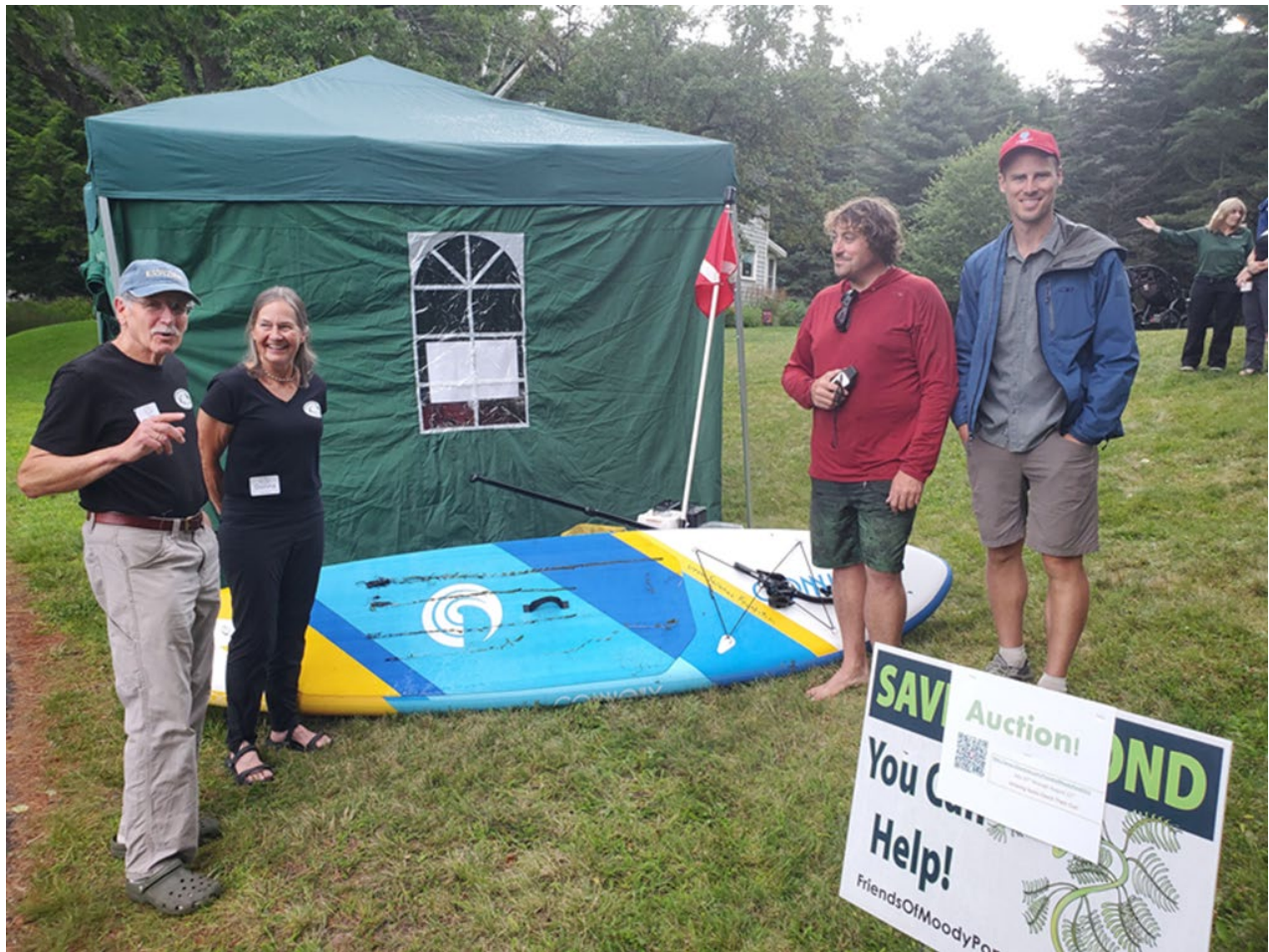


Remnants from ice harvesting on Moody Pond – Pick Poles (also known as pike poles) Photo: Guy Middleton



Surface spotting techniques utilized by the divers. Photo: Guy Middleton

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Upper Saranac Foundation participating in the Save Moody Pond Ice-cream Social – Photo: Guy Middleton

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Stager, C. (March 14, 2021) Management Plan for Moody Pond (Saranac Lake, NY).