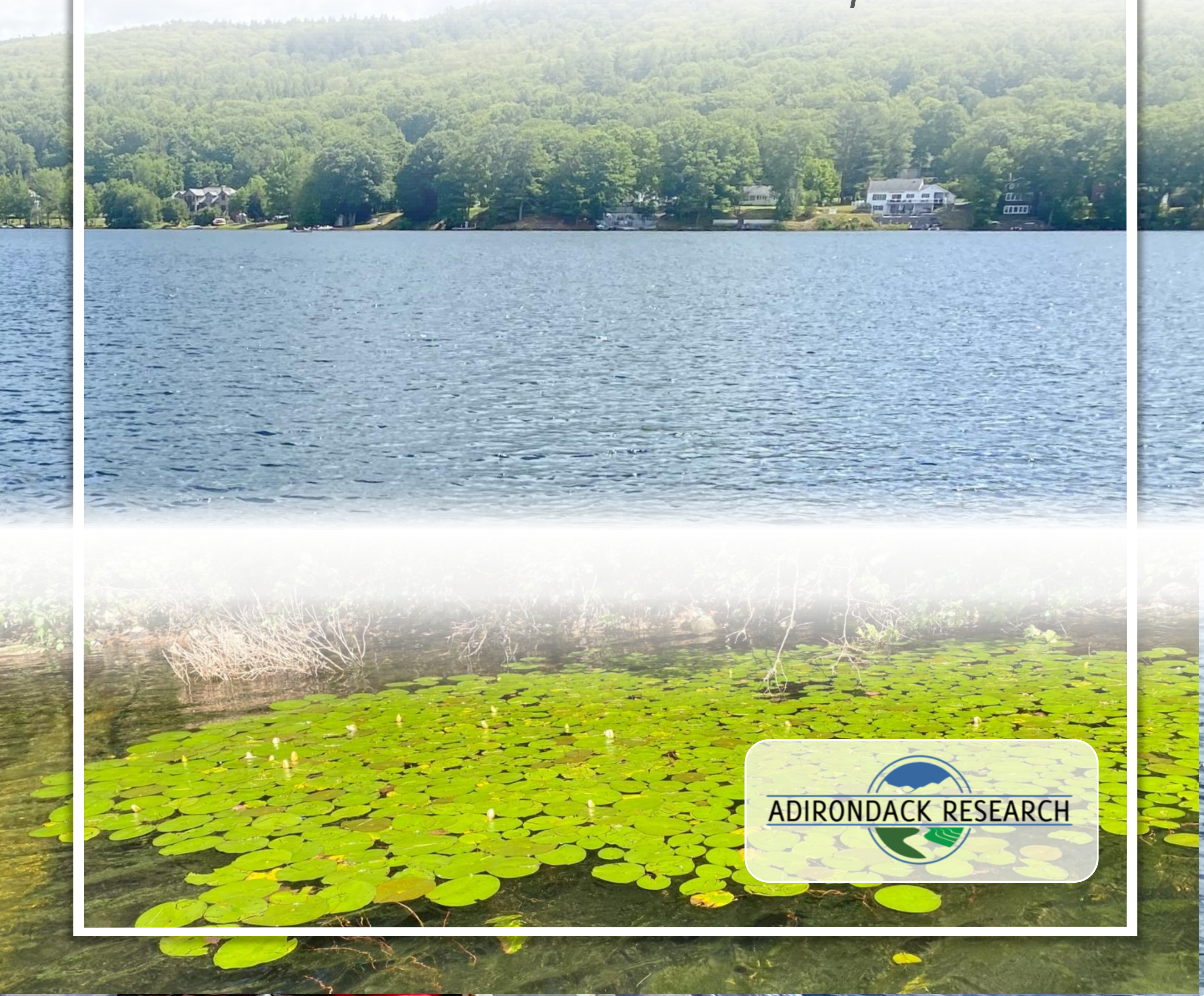
Capital Region Aquatic Plant Surveys

2022 Report



2022 Capital Region Aquatic Invasive Species Surveys

Written by:
Ezra Schwartzberg, Ph.D., Carrie Griffo, Kevin Dernier,
Mia Walton, Masen Sharpe, and Meghan Bargabos
Adirondack Research
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Background Cover image: Map of Halfway Brook Reservoir, top image from Glass Lake and bottom image of water lilies from Round Pond

Executive Summary

Invasive species are any kind of living organisms that are not native to an ecosystem and causes some sort of ecological, human health, or socio-economic harm. In 2022, Adirondack Research, a private research and mapmaking firm constituted the Capital Region PRISM's Aquatic Invasive Species (AIS) Early Detection Team. The team surveyed prioritized lakes and ponds in the Capital Region PRISM with a focus on discovering and documenting new populations of tiered AIS species of concern and utilizing data collected in the field to produce individualized maps documenting AIS distribution, bottom sediment hardness, and bathymetry.

In this report, we address the results of this year's work along with recommendations for continuing and adapting the survey strategy to enhance early detection and rapid response capabilities as well as ways to continually improve ongoing efforts to address AIS impacts in the Capital Region.

Figure 1: Illustration of the survey techniques utilizing a combination of sonar recording and manual rack toss.

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Acknowledgments

The Capital Region PRISM, a program hosted by the Cornell Corporation Extension of Saratoga County, is one of eight PRISMs in New York State whose mission is to protect the Capital region from the negative impacts of invasive species. The Capital Region PRISM contracted Adirondack Research during the 2022 field season to conduct AIS early detection surveys on 8 lakes in the Capital Region. Field work, data collection and the compilation of the narrative, maps and materials included in this report were conducted by Carrie Griffo, Kevin Dernier, Mia Walton, Masen Sharpe, Meghan Bargabos, and Dr. Ezra Schwartzberg, who constituted the Capital Region Early Detection Team. Project planning and lake prioritization was conducted by Kristopher Williams, Invasive Species Coordinator of the Capital Region PRISM.

Completion of this project would not have been possible without members of lake associations, businesses and other agencies: Capital Region PRISM, Kristopher Williams, Cornell Cooperative Extension, Crooked Lake Association, Glass Lake Association, Crystal Lake Association, Crystal Cove Venue, Burden Lake Conservation Association, Burden Lake Association, Glens Falls Country Club, Village of St. Johnsville Public Works, Glens Falls Water and Sewer Department. We are grateful for their role in protecting many of these important Capital Region lake ecosystems.

This project was advanced under contract with Adirondack Research by the Capital Region PRISM, with funding provided by the New York State's Environmental Protection Fund as administered by the New York State Department of Environmental Conservation.

Photo 1: *Research Technician, Josh Young investigating aquatic plants on Ballston Lake, Saratoga Co., NY in June 2021.*

Introduction

By deploying an Early Detection Team, new infestations of aquatic invasive species can be quickly recognized, and appropriate management actions taken before significant impacts are observed. Surveys this year were the second of two initial years completed by Adirondack Research and were part of a pilot study to better understand how to prioritize lakes in the Capital Region PRISM for future aquatic invasive species early detection surveys. Each survey on a lake had an emphasis on searching for AIS of concern based on the tiered system of AIS classification.

That said, early detection has always been the primary goal of the Team. Starting in 2020, the Team began using the Lowrance HDS Live Chartplotter and ReefMaster cloud processing platform (to map bottom hardness and bathymetry) as part of standard protocol. Bottom hardness is determined by using the strength of sonar reflectivity to infer whether the bottom is soft, medium or hard. Generally, sound signals reverberate strongly off hard substrates such as gravel and rocks and weakly off soft substrates such as muck and mud. In the maps presented in this report, the darkest shade of orange is the hardest and the lightest shade of orange is the softest. Data captured on the Lowrance HDS Live Chartplotter were uploaded to the ReefMaster web interface and then post-processed with Arc GIS Pro and Adobe Illustrator with Avenza MAPublisher to create the maps displayed in this report. This information will be used to inform invasive species vulnerability assessments to better prioritize and allocate resources for future early detection surveys.

Photo 2: *Research technician holding a sample vial collected from performing a zooplankton tow. All samples were identified in the field or brought back to the office for further evaluation.*

Photo 3: *Research technician Ingrid Miller assisting with a survey on an Adirondack Lake in 2022.*

Objectives

The primary objective of the 2022 AIS Early Detection Team was to detect and delineate any new or existing aquatic invasive plant or animal infestations within prioritized lakes with an emphasis on surveying for tiered AIS species of concern. The secondary objective was to deploy the Lowrance HDS Live system to map the contour lines and bottom hardness of all waterbodies to gather important baseline data on the physical parameters that influence aquatic species invasion.

Photo 5: *Water chestnut and variable leaf milfoil among native plants on Ballston Lake, Saratoga Co., NY in June 2021.*

Species Prioritization – A tier ranking system

The PRISM has categorized invasive species based on known populations into a tier ranking system. The purpose of the tier system is to focus attention on high threat species that are not found in our region or are appearing in small populations that are manageable with limited resources. Preventing the introduction of new species is the most cost-effective strategy in controlling invasive species. Early identification and rapid response to new infestations that are found in small populations can result in successful eradication that are cost effective. When an invasive species is found regionally over a widespread area the cost to control populations can become prohibitive. As such, we focused our surveys on performing early detection on Tier 1 and 2 species. Tier three and four species presence points are delineated with the understanding that if these species are relatively new to a waterbody the exclusion is still possible at the local level.

Tier 1 - Prevention / Early Detection

Tier 1 includes species that are not in yet PRISM, but that have anticipated high or very high impacts. Species delineation is necessary when new populations are found to advise on management.

- **Tier 1a:** Species not in the PRISM, but in the buffer (surrounding PRISM)
- **Tier 1b:** Species not in PRISM or the buffer, but in Eastern North America (with potential for establishment)
- **Tier 1c:** Species far outside PRISM and buffer (not in east NA), but introduction pathway exists

Tier 2 – Eradication / Full Containment may be Feasible

Tier 2 species have high and very high impacts but with low enough abundance and suitable treatment method available to make eradication feasible within the PRISM. These warrant the highest level of early detection and response efforts and surveys are designed to delimitate populations to determine the full extent of such populations.

Tier 3 – Containment / Strategic Management

High and very high impact species that are likely too widespread for eradication, but low enough abundance to think about regional containment. Target strategic management to slow the spread since many surrounding regions could be at risk if left unattended.

Tier 4 – Local Control / Exclusion or Suppression

Well-established species with high and very high impacts. Eradication efforts not feasible; only localized management over time to contain, exclude, or suppress, if justified to meet local management goals. (Suppression efforts) *Subcategory: Not established outside of PRISM, manage to contain within PRISM.

Plant List APPIP / CR-PRISM Tier Ranking and Assessment Levels

Plant List	Capital Region Tier	APIPP Tier	Growth	Threat Level
Capital Region Tier 1 AIS Plant Species				
Carolina fanwort (*Cabomba caroliniana*)	1	3	Submerged	High Threat
Hydrilla (*Hydrilla verticilate*)	1a	1	Submerged	Very High Threat
Floating water-primrose (*Ludwigia adscendens*)	1a	2	Floating	Very High Threat
Floating primrose willow (*Ludwigia peploides*)	1a	n/a	Floating	Very High Threat
Parrot feather (*Myriophyflum aquaticum*)	1a	1a	Emergent/Sub	High Threat
Capital Region Tier 2 AIS Plant Species				
Brazilian elodea (*Egeria densa*)	2	1a	Submerged	High Threat
European frog-bit (*Hydrocharsis morsus-ranae*)	2	4	Floating	Very High Threat
Starry stonewort (*Nitelopsis obtuse*)	2	5	Submerged	Very High Threat
Variable-leaf milfoil (*Myriophyllum heterophyflum*)	2	4	Submerged	Very High Threat
Capital Region Tier 3 AIS Plant Species				
Water chestnut (*Trapa natans*)	4	3	Floating	Very High Threat
Yellow floating heart (*Nymphoides peltate*)	3	2	Floating	High Threat
Capital Region Tier 4 AIS Plant Species				
Curly pondweed (*Potamogeton crispus*)	4	4	Submerged	Very High Threat
Eurasian Water Milfoil (*Myriophyllum spicatum*)	4	4	Submerged	Very High Threat
Animals				
Fishhook water flea (*Cercopagis bengoi*)	1a	3	N/A	Very High
Spiny water flea (*Bythotrephes longimanus*)	2	3	N/A	Very High
Quagga mussel (*Dreissena rostriformis bugensis*)	2	1	N/A	Very High
Zebra Mussel (*Dreissena polymorpha*)	4	3	N/A	Very High

Lake Selection and Prioritization

Lake selection was done by Kristopher Williams from Capital Region PRISM, along with recommendations from Adirondack Research, to establish a baseline survey for eight lakes in the Capital Region PRIM due to no lakes having this type of survey before. From the results this summer, researchers will be able to look at the data and prioritize lakes in the future for performing early detection surveying for AIS.

Methods

Equipment

Equipment used during this project consisted of double-sided rakes, Lowrance HDS Live Chartplotters, Bluetooth GPS antennas (Garmin GLO), and iPad 4 minis equipped with a cellular connection. Data and observations were recorded on iPad 4 mini using The Nature Conservancy's Invasive Plant Mobile Monitoring System (IPMMS), an Esri Collector for ArcGIS application. Surveys were completed using console motorboats or canoes, depending on waterbody access. Since the team was accessing multiple waterbodies over the course of each week, specific precautionary measures were taken to guarantee all equipment was decontaminated between waterbodies. Equipment was decontaminated using the Adirondack AIS Prevention Program's free boat wash and decontamination services located throughout the Adirondack Park. The team visited several different decontamination stations, multiple times, over the course of the summer. High pressure and hot water were used to kill any organisms, native or invasive, present on equipment after surveys. The specific equipment that was decontaminated by professional decontamination technicians included: motorboat hulls, trailers, motor lower units and bilges; canoes and paddles; ropes and all jars and containers.

Photo 6: On of Adirondack Research's watercrafts and equipment used for surveys.

Littoral Zone Plant Surveys and Identification

The littoral zone of each lake was surveyed for aquatic plants by the Early Detection Team from shoreline to a depth of about 15 feet, although the littoral zone water depth and distance from shore varied between waterbodies. Some waterbodies were completely comprised of littoral zone; others contained little area that supported plant growth. The team surveyed in a zig-zag search pattern, using visual detection from the surface in combination with the sonar output from the Lowrance unit, to locate plant beds. Once a plant bed was located, rake tosses were conducted to retrieve and identify plants that could not be confirmed through visual detection alone.

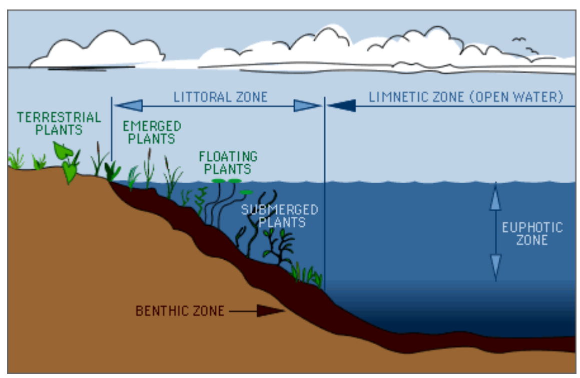


Figure 2: Illustration depicting the littoral zone on a waterbody.

Figure 3: *Example of AIS polygon delineated on a waterbody in the Capital Region.*

All plants retrieved, invasive and native, were identified using the field guides: "Aquatic Plants of the Upper Midwest" by Paul M. Skawinski and/ or "Maine Field

Guide to Invasive Aquatic Plants and Their Common Look Alikes” by the Maine Center for Invasive Aquatic Plants and Maine Volunteer Lake Monitoring Program. If an AIS infestation was detected, an occurrence point was marked in its approximate center using the IPMMS. The occurrence feature classifies which species is present and contains unique naming and attribute information for the specific infestation. After an occurrence was entered, the team collected an assessment polygon for the infestation. An assessment polygon was mapped by circumnavigating the exterior boundary of the infestation. The percent cover of the invasive plant was documented for each assessment polygon. Since the polygon is marked with GPS points, changes in acreage and percent cover can be monitored over time. The most common native plants identified were also recorded and noted for this report. However, complete lists of native plants and their abundance in each lake were not recorded.

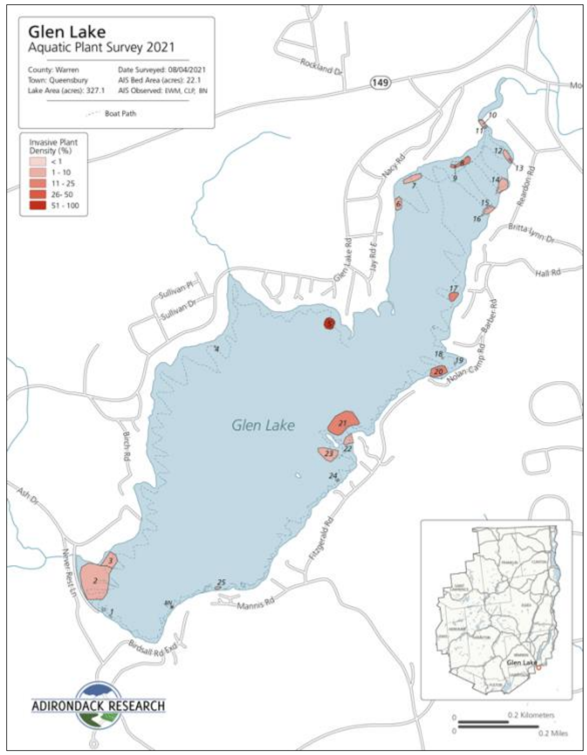


Figure 4: *Example of AIS polygon delineated on a waterbody in the Capital Region.*

Rake toss cover classes

Relative percent cover class range estimates of invasive plant species were taken using a rating system as follows: 0, <5, 5-25, 26-50, 51-75, and 76-100%. Note that we have two high density categories (51-75% and 76-100% while most systems clump our two highest categories together).

Cover Class	Description
0	No vegetation present; zero plants
<5	Trace (1-2 stems)
5-25	Low Density
26-50	Medium Density (Rakefull; no visible rake tines)
51-75	High Density (Difficult to bring to boat)
76-100	Very High Density (Difficult to bring to surface)

Table 2: Vegetation cover class categories used for surveys.

Photo 7: Beth Fisher holding up a double-sided rake after a toss.

Complete Lake Mapping

When conducting plant surveys, the AIS Early Detection Team focused efforts in the littoral zone of each waterbody. In the littoral zone, sunlight can penetrate through to the bottom of the lake, which allows for plant growth. Typically, the littoral zone of a lake is exclusively near shore. However, as advancements are made in underwater mapping and new technologies arrive, it’s becoming more apparent that we are all still learning about what lies below the surface of many lakes and ponds. Sunken islands or ridges can arise in seemingly deep water, resulting in potential aquatic plant habitat in unexpected locations of the lake. Covering all acreage of a waterbody lessens that chance of missing a "hidden" area of plant growth.

On lakes or ponds where complete lake mapping/surveys were conducted, the Team generally split the waterbody in half and each team of two paddled or drove from shore to shore in their respective half. To ensure no gaps in coverage occurred, each pass was done about 120 feet apart, which is within the range that ReefMaster can automatically interpolate lake characteristic parameters. For the purposes of this report, complete lake mapping/surveys refer to this method of data collection from the entire acreage of a lake or pond. Surveys of the littoral zone are still considered "completed," but they do not typically include waterbodies in their entirety.

Data Management

To ensure all data collected in the field were safely stored, redundant copies were kept at multiple steps throughout the collection process. Following are the steps taken to store and organize data:

Lowrance Chartplotter

1. Data collected on the Lowrance Chartplotter were saved on 32GB memory cards in the field.
2. New files were created and saved every hour to lessen the amount of data lost if a file became corrupted.
3. At the end of each week, data collected from the Lowrance Chartplotter and stored on memory cards were saved on a computer and backed up on a separate external hard drive.
4. Once backed up, data from the Lowrance Chartplotter were uploaded to the ReefMaster platform and processed. All processed data were then copied onto Adirondack Research's cloud data storage. Chartplotter data were also backed up (third copy) to cloud storage periodically.

ESRI ArcGIS Collector App – Invasive Plant Mobile Monitoring System (IPMMS)

1. Esri ArcGIS Collector data were backed up on the Esri server weekly. All ArcGIS data were uploaded to Adirondack Research's cloud storage in the middle of the field season, then again at the end of the season.

iNaturalist – Native Plant Collection

1. Lists and photos of native plants identified were recorded on the iNaturalist application and exported as a CSV.

GIS

1. Post processed GIS data (lake boundaries, invasive plant bed polygons and associated data, point data from Kriging interpolated biovolume, bottom hardness and bathymetry) were stored as GIS shapefiles in vector and raster format, depending on data source.
2. All GIS shapefiles and attribute tables were packaged and submitted to the Capital Region PRISM with this report and will be cross-walked to iMapInvasives for long-term storage and retrieval.

GIS Data Processing

GIS data were exported directly from ReefMaster and then post processed using a secondary Kriging interpolation. ReefMaster interpolated data to estimate and plot the geospatial extent of two parameters: bottom hardness and bathymetry. Data was further post-processed (exported in point and grid format) using subsequent interpolation to achieve the rasterized visualizations of these parameters displayed in the maps included in this report. Our interpolation was checked against the visual output available directly from ReefMaster on their web interface and confirmed that our interpolation methods resulted in identical visualizations of the two parameters mentioned above. These interpolations are stored as raster images in our report and the actual data points that created these images (available from ReefMaster or from raw sonar files) will need to be further processed if used for GIS-informed risk assessment.

The main uses of this GIS data are to record and track AIS abundance and distribution. Data was also used to create visually appealing lake maps for each of the 8 lakes surveyed. Because AIS presence data were collected using an Esri Collector for Arc GIS app, the original shapefiles recorded during each survey are stored in and are accessible through the GIS database accompanying this report.

Scheduling and Travel

The team of six worked 40-hour weeks, spending the majority of time in the field and the rest in the office planning for the following week and uploading and processing data. To increase efficiency and reduce travel costs, lodging near clusters of lakes to be surveyed were selected each week. Lake survey order for the week was determined by distance to lodging, weather, and scheduling with lake associations.

Photo 8: *Research Technician Josh Young examining water chestnut on Ballston Lake, Saratoga Co., NY.*

Photo 9: *A rake toss sample with Eurasion watermilfoil.*

Results

Between June 27th and August 18th, eight lakes and ponds were surveyed with the objective of AIS early detection. Of the eight lakes surveyed, five contained at least one AIS, with a total of six specific occurrences. Four lakes where AIS were detected in 2022 had been previously documented as invaded. One new AIS discovery was made, *Dreissena polymorpha* (zebra mussels) were detected in Round Pound, Warren County. One lake, (Crystal Lake, Rensselaer County) was previously invaded with Eurasian watermifoil was found to have no invasives this year. This is one case where a previously recorded invasive species was no longer present. *Myriophyllum spicatum* (Eurasian watermilfoil) and *Potamogeton crispus* (curly-leaf pondweed) were the most common AIS found in 2022, they were detected on three different occurrences each. No new "High Threat" or "Very High Threat" AIS were observed from the AIS Species of Concern List other then *Dreissena polymorpha* (zebra mussels).

A total of three different AIS species were found this year. The 2022 Early Detection Team surveyed a total of 786.7 acres and 27.8 miles of shoreline. Lakes surveyed ranged in size from 29.5 acres (Round Pond) to 247.7 acres (Burden Lake 3).

Invasive Species Presence

Water Body	Acres	Shoreline Miles	invaded past	invaded 2022	Current Species	Notes
Burden Lake 1&2	102	9.6	yes	yes	EWM	EWM beds were found however they were all dead
Burden Lake 3	247.7	4.8	yes	yes	EWM, CLP	Healthy beds of EWM found mostly on the western shoreline and outflow to Burden Lake 2. A low density bed of CLP is located along the outflow as well.
Crooked Lake	113	3	yes	yes	CLP	Small individual occurances of CLP along the eastern shoreline
Glass Lake	125	2.9	yes	yes	EWM, CLP	A bed of EWM was detected along the southern outflow to Crooked Lake along with scattered beds and points of CLP
Round Pond	29.5	0.9	no	yes	ZM	**NEW AIS detection of ZM** on the north eastern area of the lake
Crystal Lake	59.5	1.7	yes	no		**No AIS detected in 2022** previous records of EWM
Halfway Brook Reservoir	51	2.5	no	no		
St. Johnsville Reservoir	59	2.4	no	no		
8 waterbodies surveyed	**786.7**	**27.8**	**5**	**5**	**7 occurences**	**Totals**

Table 1: *AIS presence and size for each waterbody 2022.*

Photo 10: *Research Technician Sarah in 2019 on Horseshoe Lake, St Lawrence Co., NY.*

Data and Research Limitations

Project results were affected by various sources of data error, access limitations, time limitations, and equipment issues. Acknowledging these limitations provide a more prudent analysis of the data and assist with planning for future surveys.

Survey Accessibility

The team used either a canoes or motorboats to complete surveys depending on the accessibility and size of each waterbody. The canoes allowed the team to access lakes with restrictions on motorized usage, whereas the motorboat gave the team opportunity to conduct field work on a sturdier platform. There were limitations associated with each mode of transportation. Lakes and ponds are not always comprised of unobstructed, open water. Many waterbodies surveyed contained downed trees, stumps, rocks, emergent tussocks, mats of floating and submerged plants, or human improvements, such as docks and blocked off swimming areas. These obstacles limited the team's accessibility by both canoe and motorized watercraft. When accessibility was limited, the team maneuvered the vessel as close to the obstacles as possible while ensuring their safety and that of other lake users. When not using canoes, shallow bottom low draft aluminum boats used for this project worked well for these situations, but an outboard motor with electric trim was critical. However, even with this setup some areas were still inaccessible by boat. As a result of these accessibility limitations, the maps produced for this report may not provide a complete representation of the aquatic vegetation in each lake or pond – especially for shallow areas near shore. Areas unable to be accessed have been identified by hatch marks and labeled "Not Surveyed" in each map's legend. Additionally, all eight lakes surveyed this summer required permission and scheduling in order to access the waterbody. The team attempted to survey five additional waterbodies, however they were either denied access or unable to safely access the waterbodies.

Photo 11: *Research technician Mark Privee with a rake of coontail and brittle naiad on a waterbody in the Capital Region, July 2020.*

Technology

Various technologies were deployed over the course of this project to improve survey effectiveness and efficiency. The Esri ArcGIS Collector App ran on a cellular iPad Mini 4 tablet with an internal GPS antenna. This set-up was used to map invasive plant beds and mark locations, but spatial accuracy was often limited to around 16 feet due to terrain and insufficient satellite signals. Therefore, spatial data collected over the course of the project is potentially affected by this 16-foot variance. The team did their best to hold the boat stationary and reduce any drifting of the canoe or motorboat while collecting GPS data. Even with this care, the team had difficulty mapping the area of smaller plant beds.

The Lowrance Chartplotter and ReefMaster platform were not new to survey protocol in 2022. This same setup was utilized in 2020. During the 2020, 2021, and 2022 seasons, the team identified potential sources of error associated with the Lowrance HDS Live Chartplotter and ReefMaster platform. First, when navigating through dense beds of vegetation, the sonar was not able to accurately detect the lake or pond bottom to map sediment hardness and bathymetry. To eliminate this error, surveys focused on bathymetry and bottom hardness should be done in spring or early summer or in areas with less vegetation. When the transducer is in less than 2 feet of water, the sonar is not able to collect data. This results in data gaps that can only be corrected with visual confirmation or estimation of bottom hardness and bathymetry. Outputs may show areas of no bottom hardness because of these limitations. These limitations are also identified by hatch marks and labeled “Not Surveyed” in each map’s legend.

Future deployment of the Lowrance Chartplotter, transducer and ReefMaster platform will likely improve over time as the early detection teams become more familiar with the intricacies and limitations of these technologies.

Survey Thoroughness

The zig-zag search pattern used by the team increased the total area surveyed per lake, but it is not the most comprehensive technique to identify every species in a waterbody. Since the main goal of this project was to detect and identify tiered aquatic invasive species, documenting overall abundance of native vegetation was not a priority, and therefore, the serpentine search pattern offered the most effective method to meet project goals. With the serpentine search pattern, not every section of water is covered, but the likelihood of missing invasive plant beds is minimized while significantly increasing survey efficiency and reducing cost. There is the possibility that some small invasive plant beds (or single plants) were missed using the serpentine search pattern, but future repeat surveys will help ensure any missed small or isolated infestations will be detected. Survey techniques aside, other factors can influence survey thoroughness including seasonal survey timing, water clarity, or weather conditions. Day to day and year to year changes in survey condition may result in minor variations in documented plant species and abundance.

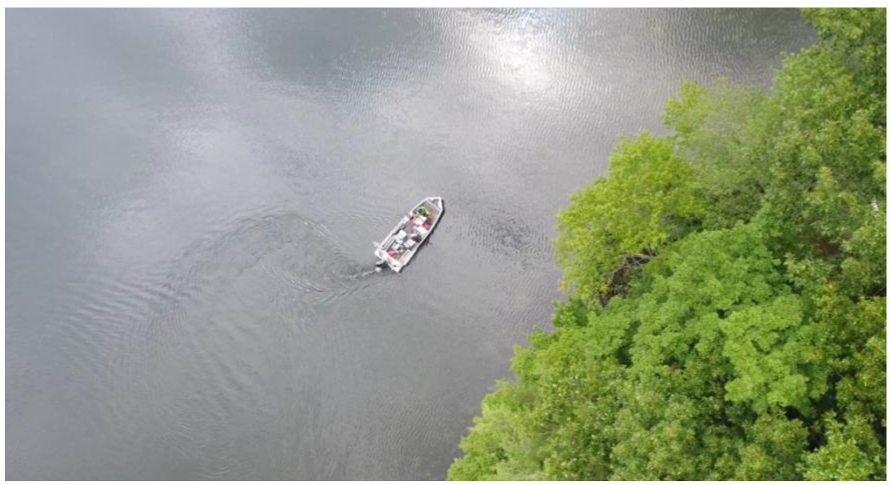


Photo 12: *Research vessel performing 'zig-zag' patterns on Lake Sunnyside, June 2020.*

Recommendations

Adirondack Research provides the following set of recommendations to improve future project effectiveness and techniques used to detect AIS infestations as they relate to informing management decisions.

Crew Size and Training

Optimal early detection team size is dependent on the project scope of work. If deploying the ReefMaster platform or C-Map BioBase to produce detailed lake characteristic maps becomes a higher priority, a larger crew will be necessary, as this component of the survey protocol adds considerably to the time/resources required to survey and map each lake. This especially applies to larger lakes and ponds that have larger surface areas to map. In 2022, the team was able to complete serpentine search surveys as well as complete ReefMaster throughout the littoral zones of on eight waterbodies in which data was used to produce complete lake maps and AIS infestation beds delineated out.

Setup and maintenance of the technology used for this project are vital to collecting accurate, reliable data. Familiarity with the equipment is not a penultimate prerequisite, but it does keep the short field season running smooth. With new technologies comes troubleshooting and periods of trial and error. Understanding intricacies, nuisances, and common issues with the system will prove invaluable in the field.

Technology

With regard to the ReefMaster platform, the data and maps produced by this technology will be a tremendous asset to lake associations and communities looking to monitor or manage AIS. The data provide detailed waterbody-specific characteristic information with increased accuracy and at reduced cost than top-water or diver-assisted surveys. Utilizing these data to develop geospatial vulnerability models of aquatic invasive plant establishment and spread for individual lakes can help target future early detection surveys and to direct regional AIS spread prevention measures. For example, the bottom hardness data produced may allow for predictions of lake vulnerability to aquatic invasive plants, or even invasive mollusk establishment.

Survey Prioritization

We chose nine lakes in coordination with recommendations by the Capital Region PRISM staff based upon whether lakes have active management or whether they were in areas of high Ecological Significance Score as well as a high Comprehensive Score as determined by NYNHP in the NYSDEC Environmental Resource Mapper tool (https://gisservices.dec.ny.gov/gis/erm/). Additional selection criteria that can be used in subsequent years could include surveying lakes with requests by lake associations or by utilizing other criteria related to proximity of known invasive species infestations. In the Adirondacks, the regional PRISM is attempting to survey all publicly accessible lakes and ponds, so they have a prioritization plan that favors certain lakes over others based upon the last data of survey, whether it has public access, and whether it is surveyed by lake associations or citizen scientists. For the Capital Region, it makes more sense to use predictors of new infestations in a lake rather than access or survey history. I think a combination of Ecological Significance scores (mentioned above) combined with a GIS analysis of proximity to infested waterbodies by utilizing iMapInvasives data could yield a prioritized list of lakes in which to perform surveys in 2022.

Photo 13: *Research vessel, 'Predator' on Lake Sunnyside performing transects during June 2020.*

Lake Access

Lake access is often a challenge to performing surveys. Out of thirteen lakes the team attempted to gain access to, eight were approved and accessible for surveying in 2022; all waterbodies required permissions from either municipal bodies or lake associations for access. In 2022, the team was in contact with Woodland Lake in Saratoga County and Cork Center Reservoir in Fulton County, however access to these waterbodies were eventually denied. Additionally, Kyser Lake, which straddles the Fulton/Herkimer County line was contacted in 2021 and 2022, with no approval. While Goose-egg lake is on public land, the team could not find a location to launch that did not cross private property. Lastly the team attempted to re-survey Lake Nancy, however due to weather and limitations that required us to use a canoe, the team could not safely conduct the survey. We are still optimistic that we can gain access to these waterbodies for a survey in a subsequent year. The amount of time needed to gain access to some lakes is long, and we recommend reaching out to lakes in February to gain access. For some lakes with difficulty, a letter from the PRISM Coordinator works well to explain the program and the scope and use of the AIS surveys. We have generally had good luck with this approach.

Conclusions

The 2022 AIS Early Detection Team surveyed eight waterbodies in the Capital Region PRISM and five contain presence of AIS, (Burden Lake 1 & 2, Burden Lake 3, Crooked Lake, Glass Lake, Round Lake). While AIS on all other waterbodies were healthy, every AIS bed found on Burden Lakes 1 and 2 were dead. The different species recorded were: *Myriophyllum spicatum* (Eurasian watermilfoil), *Potamogeton crispus* (curly-leaf pondweed), and *Dreissena polymorpha* (Zebra mussel).

Maps

The following section includes lake survey maps and description narratives of the eight waterbodies surveyed in 2022. Each lake map includes either invasive plant beds delineated using the Collector for Arc GIS app, lake bathymetry, or lake bottom hardness.

Invasive Species Maps

Each lake description is followed by 1-2 maps. The first map, if aquatic invasive species were detected in the lake, is the "AIS Map" and shows presence of aquatic invasive species (AIS) beds and points overlayed on a bathymetry map. Points are labeled directly on the map and consist of individual plants. Polygons denote beds of invasive species. These polygons are labeled with numbers that correspond to a bed density and size in both acres and square feet in the facing table. The tables have only polygon data and do not include individual plant occurrences, which are denoted only with a point and acronym on the map. The acronym is listed in each map legend.

Aquatic Invasive Species Acronyms—The maps contain acronyms for invasive species occurrences. These occur when a polygon or point record for an invasive species are labeled directly on a map. The following acronyms and their full common names occur throughout.

Aquatic Invasive Species	*Acronym*
Curly Leaf Pondweed	CLP
Brittle Naiad	BN
Variable Leaf Milfoil	VLM
Eurasian Watermilfoil	EWM
Zebra Mussel	ZM
Water Chestnut	WC
Phragmites	Phrag

Bottom Hardness

The second map, if the central area of a lake was covered by sonar, is the bottom hardness map. The values of bottom hardness range from 0 to 255 and are an interpretation of sonar made by ReefMaster. The values are linear in hardness and range from the low end of 0, denoting a mucky bottom to 255, denoting a sandy or hard bottom.

Excessive Interpolation

We create the bathymetry and bottom hardness layers on the lake maps on the following pages by utilizing ReefMaster output (csv files of grid formatted values) and then interpolate them with one another to form a matrix raster image. This raster image estimates the values between each of the points. One issue we face with performing this type of interpolation of these data is that sometimes we interpolate over large distances. This results in errors of over guessing. For example, we can interpolate across a lake, but we will not take into consideration changes in depth or bottom hardness that exist in areas where we did not collect data directly with sonar. While these interpolations are inaccurate, it can help make a map look much nicer. For that reason, we have interpolated across larger areas, but we show these areas as being “excessively interpolated” by denoting their areas with a hatch marking. These can be seen over the centers of several of the lakes that follow.

Burden Lake 1 & 2

Survey Date: June 29th 2022
Survey Team: E. Schwartzberg, K. Dernier

Lake Description

Burden Lakes 1 and 2 are a combined 102 acres with 9.6 miles of shoreline. It is located in the towns of Sand Lake and Nassau in Rensselaer County and are part of the Lower Hudson watershed. These waterbodies are located north of Burden Lake 3, and are all connected. The team launched a motorboat with permissions from a private dock on the western shore of Burden Lake 3. From there, they were able to travel to Burden Lakes 1 and 2 by passing under a bridge between 3rd and 2nd and then through a small culvert to reach Burden Lake 1. Beds of Myriophyllum spicatum (Eurasian watermilfoil) were detected in these sections, however all beds appeared to be dead or severely browned.

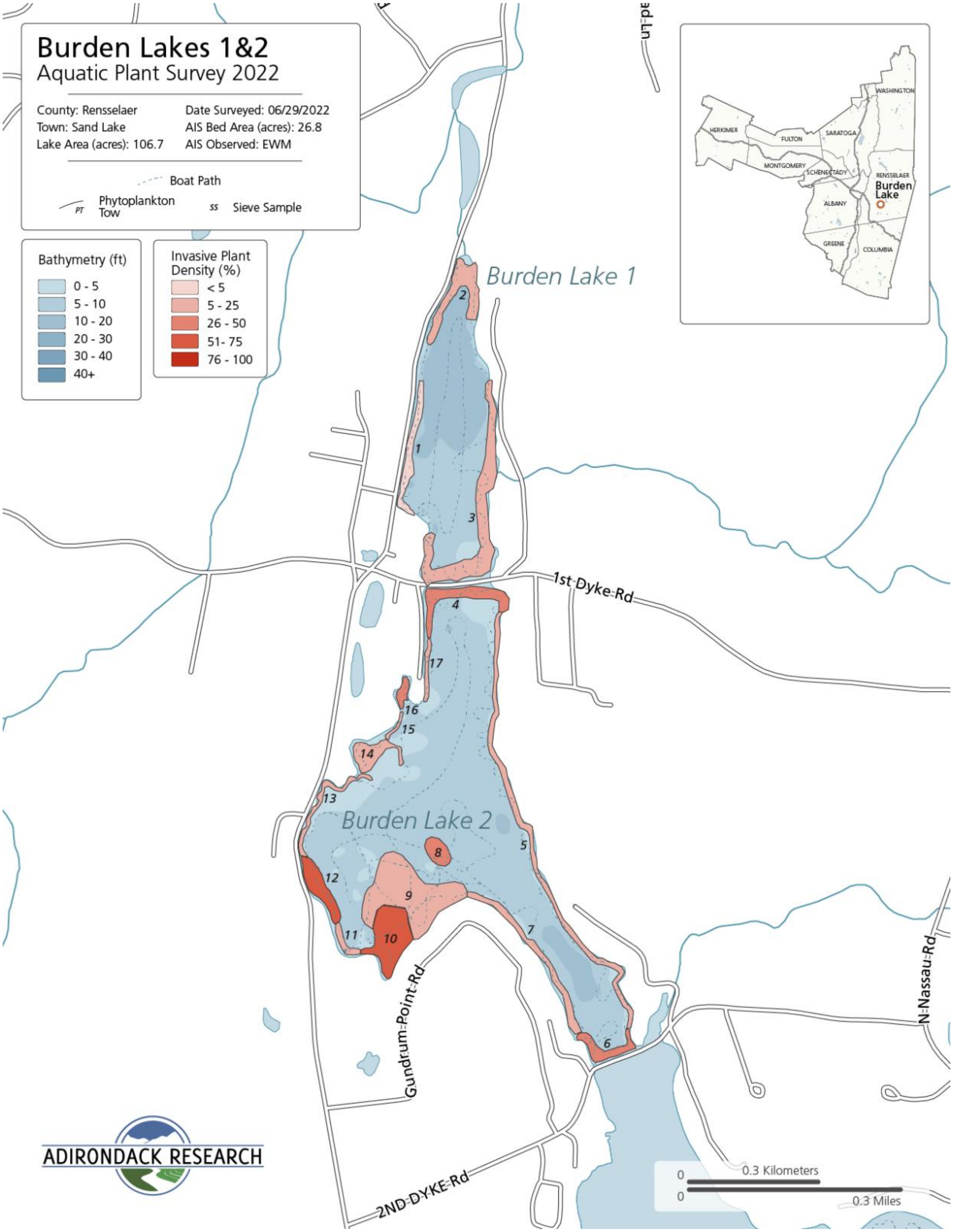
Aquatic Invasive Plant Presence

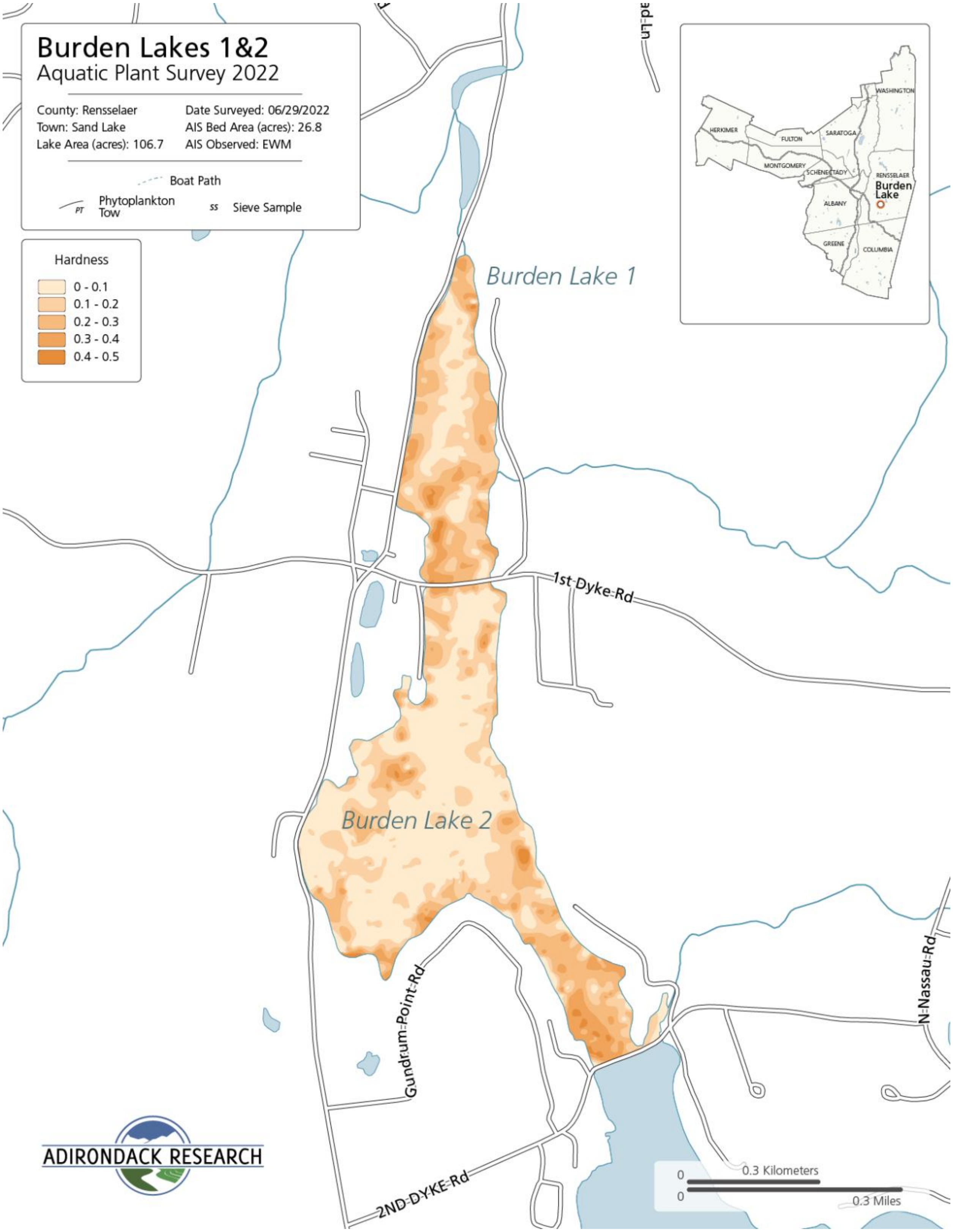
Multiple beds with varying densities of *Myriophyllum spicatum* (Eurasian watermilfoil) were detected in both sections 1 & 2 of the lake. Burden Lake 1 consisted of beds with moderate to low densities around the majority of its perimeter. Burden Lake 2 consisted of invasive beds high to moderate in density, surrounding the entirety of its perimeter.

Native Plant Biota

Comprehensive surveys were not prioritized in 2022 as invasive species were the primary focus of the surveys. The following native plants were found: *Vallisneria americana* (American eelgrass), *Nymphaea odorata* (American white waterlily), *Elodea canadensis* (Canadian waterweed), *Lemna minor* (common duckweed), *Ceratophyllum demersum* (coontail), *Potamogeton robbinsii* (Robbins' pondweed), *Nuphar advena* (spatterdock).

Eurasian Watermilfoil				Eurasian Watermilfoil			
Bed	Size (Ac.)	Size (Sq. Ft.)	% Cover	Bed	Size (Ac.)	Size (Sq. Ft.)	% Cover
1	1.20	52348.44	less than 5%	10	2.59	112640.08	51% - 75%
2	1.77	77189.94	5% - 25%	11	0.33	14530.41	5% - 25%
3	4.27	186100.39	5% - 25%	12	1.20	52288.76	51% - 75%
4	1.55	67434.63	26% - 50%	13	0.68	29604.98	5% - 25%
5	2.92	127038.46	5% - 25%	14	1.03	44738.48	5% - 25%
6	0.83	36294.34	26% - 50%	15	0.13	5493.07	5% - 25%
7	1.45	63317.33	5% - 25%	16	0.31	13544.47	26% - 50%
8	0.67	29160.79	26% - 50%	17	0.32	13900.57	5% - 25%
9	5.51	240088.00	5% - 25%				


Burden Lakes 1&2
Aquatic Plant Survey 2022
County: Rensselaer
Town: Sand Lake
Lake Area (acres): 106.7
Date Surveyed: 06/29/2022
AIS Bed Area (acres): 26.8
AIS Observed: EWM
Boat Path
Phytoplankton Tow
Sieve Sample
Bathymetry (ft)
0 - 5
5 - 10
10 - 20
20 - 30
30 - 40
40+
Invasive Plant Density (%)
< 5
5 - 25
26 - 50
51 - 75
76 - 100
Burden Lake 1
Burden Lake 2
1st-Dyke-Rd
Gundrum-Point-Rd
2ND-DYKE-Rd
N-Nassau-Rd
0.3 Kilometers
0.3 Miles
HERKIMER
FULTON
SARATOGA
WASHINGTON
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
GREENE
COLUMBIA
Burden Lake
ADIRONDACK RESEARCH


Burden Lakes 1&2
Aquatic Plant Survey 2022
County: Rensselaer
Town: Sand Lake
Lake Area (acres): 106.7
Date Surveyed: 06/29/2022
AIS Bed Area (acres): 26.8
AIS Observed: EWM
Boat Path
Phytoplankton Tow
Sieve Sample
Hardness
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
Burden Lake 1
Burden Lake 2
1st Dyke Rd
Gundrum Point Rd
2ND DYKE Rd
N Nassau Rd
HERKIMER
FULTON
SARATOGA
WASHINGTON
MONTGOMERY
SCHENECTADY
RENSSELAER
Burden Lake
ALBANY
GREENE
COLUMBIA
ADIRONDACK RESEARCH
0.3 Kilometers
0.3 Miles

Burden Lake 3

Survey Date: June 29th 2022
Survey Team: E. Schwartzberg, K. Dernier

Lake Description

Burden Lake 3 is 247.7 acres with approximately 4.8 miles of shoreline. It is located in the towns of Sand Lake and Nassau in Rensselaer County and is part of the Lower Hudson watershed. This waterbody is located south of Burden 2, they connect with a bridge built between the two. The team launched a motorboat with permissions from a private resident on the Eastern shore of Burden Lake 3. Aquatic

Invasive Plant Presence

A single low-density bed of *Potamogeton crispus* (curly leaf pondweed) was detected at the northern most section of the lake connecting to Burden Lake 2. Beds and single occcurances of *Myriophyllum spicatum* (Eurasian watermilfoil) were scattered across the waterbody, appearing most present on the western shorelines and bays. Unlike Burden Lakes 1 & 2, all beds of *Myriophyllum spicatum* (Eurasian watermilfoil) were alive and healthy.

Native Plant Biota

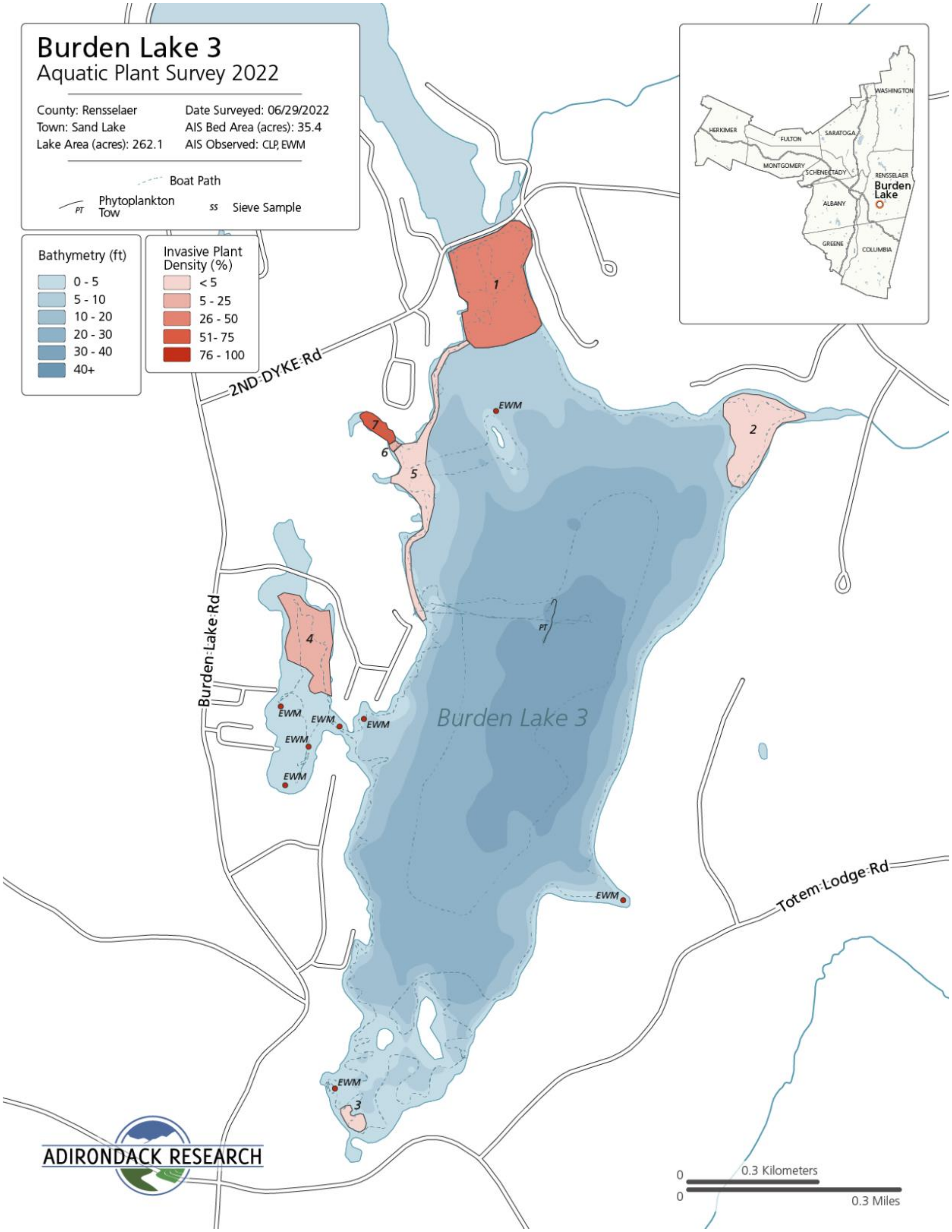
Comprehensive surveys were not prioritized in 2022 as invasive species were the primary focus of the surveys. The following native plants were found: *Vallisneria americana* (American eelgrass), *Nymphaea odorata* (American white waterlily), *Elodea canadensis* (Canadian waterweed), *Lemna minor* (common Duckweed), *Ceratophyllum demersum* (coontail), *Potamogeton robbinsii* (Robbins' pondweed), *Nuphar advena* (spatterdock).

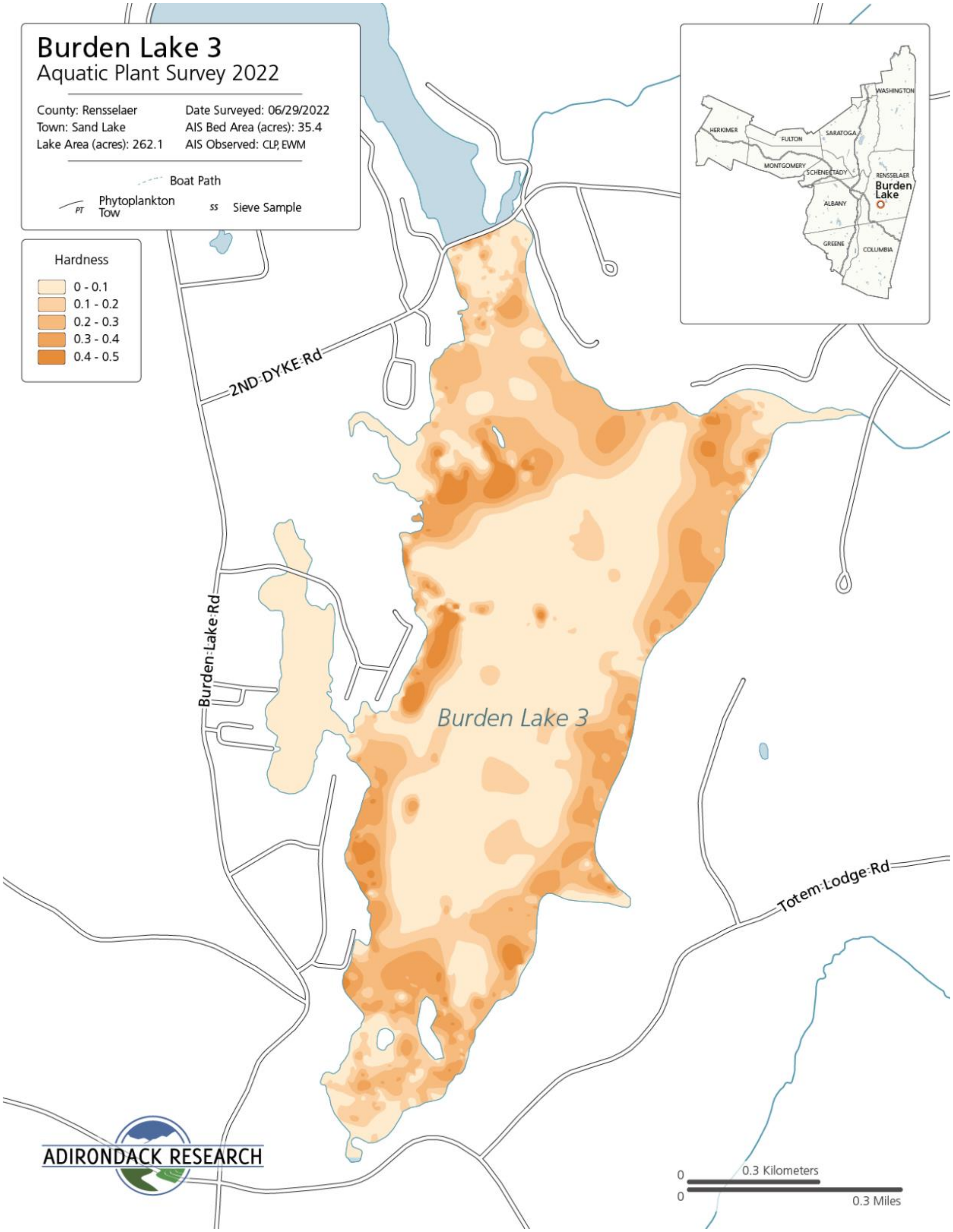
Aquatic Invasive Animal Presence

A plankton tow was conducted with no invasive zooplankton detected.

Curly Pondweed			
Bed	Size (Ac.)	Size (Sq. Ft.)	% Cover
1	10.35	450791.18	less than 5%

Eurasian Watermilfoil			
Bed	Size (Ac.)	Size (Sq. Ft.)	% Cover
1	10.35	450791.18	26% - 50%
2	5.02	218758.76	less than 5%
3	0.50	21852.22	less than 5%
4	4.30	187410.68	5% - 25%
5	4.18	182122.04	less than 5%
6	0.09	3975.87	5% - 25%
7	0.65	28131.47	51% - 75%


Burden Lake 3
Aquatic Plant Survey 2022
County: Rensselaer
Town: Sand Lake
Lake Area (acres): 262.1
Date Surveyed: 06/29/2022
AIS Bed Area (acres): 35.4
AIS Observed: CLP, EWM
Boat Path
PT Phytoplankton Tow
ss Sieve Sample
Bathymetry (ft)
0 - 5
5 - 10
10 - 20
20 - 30
30 - 40
40+
Invasive Plant Density (%)
< 5
5 - 25
26 - 50
51 - 75
76 - 100
WASHINGTON
HERKIMER
FULTON
SARATOGA
MONTGOMERY
SCHENECTADY
RENSSELAER
Burden Lake
ALBANY
GREENE
COLUMBIA
2ND DYKE Rd
Burden Lake Rd
Totem Lodge Rd
Burden Lake 3
EWM
PT
1
2
3
4
5
6
7
ADIRONDACK RESEARCH
0 0.3 Kilometers
0 0.3 Miles


Burden Lake 3
Aquatic Plant Survey 2022
County: Rensselaer
Town: Sand Lake
Lake Area (acres): 262.1
Date Surveyed: 06/29/2022
AIS Bed Area (acres): 35.4
AIS Observed: CLP, EWM
Boat Path
Phytoplankton Tow
Sieve Sample
Hardness
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
2ND DYKE Rd
Burden Lake Rd
Totem Lodge Rd
Burden Lake 3
HERKIMER
FULTON
SARATOGA
WASHINGTON
MONTGOMERY
SCHENECTADY
RENSSELAER
Burden Lake
ALBANY
GREENE
COLUMBIA
ADIRONDACK RESEARCH
0.3 Kilometers
0.3 Miles

Crooked Lake

Survey Date: June 28th 2022
Survey Team: E. Schwartzberg, K. Dernier

Lake Description

Crooked Lake is 113 acres with approximately 3 miles of shoreline. It is located in the town of Sand Lake, in Rensselaer County, and is part of the Lower Hudson watershed. The team launched a motorboat with permissions from a private dock on the north-western shore of the lake. The majority of the littoral zone was overgrown and choked with native *Potamogeton robbinsii* (Robbins' pond weed).

Aquatic Invasive Plant Presence

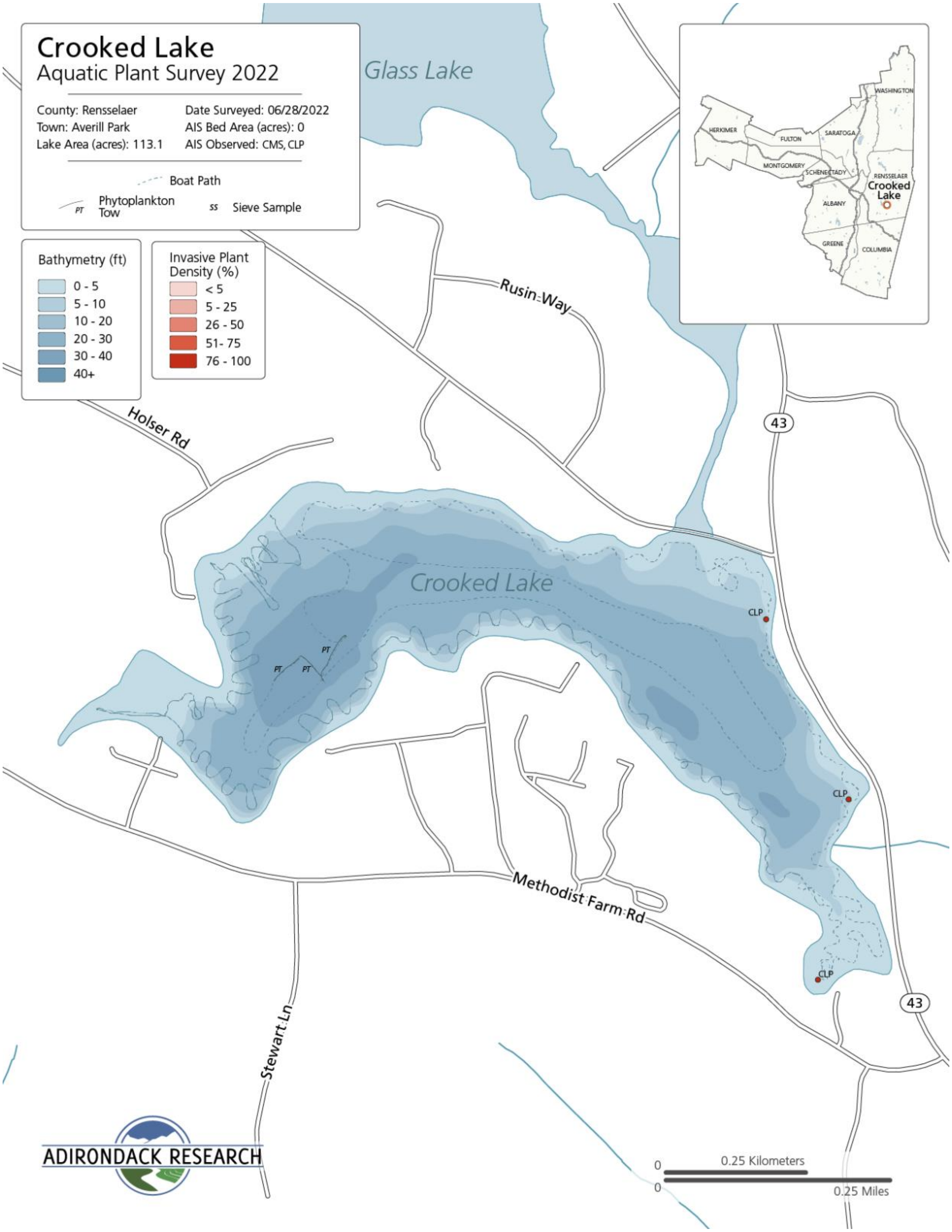
Potamogeton crispus (curly leaf pondweed) was detected at three locations along the eastern shoreline of the lake.

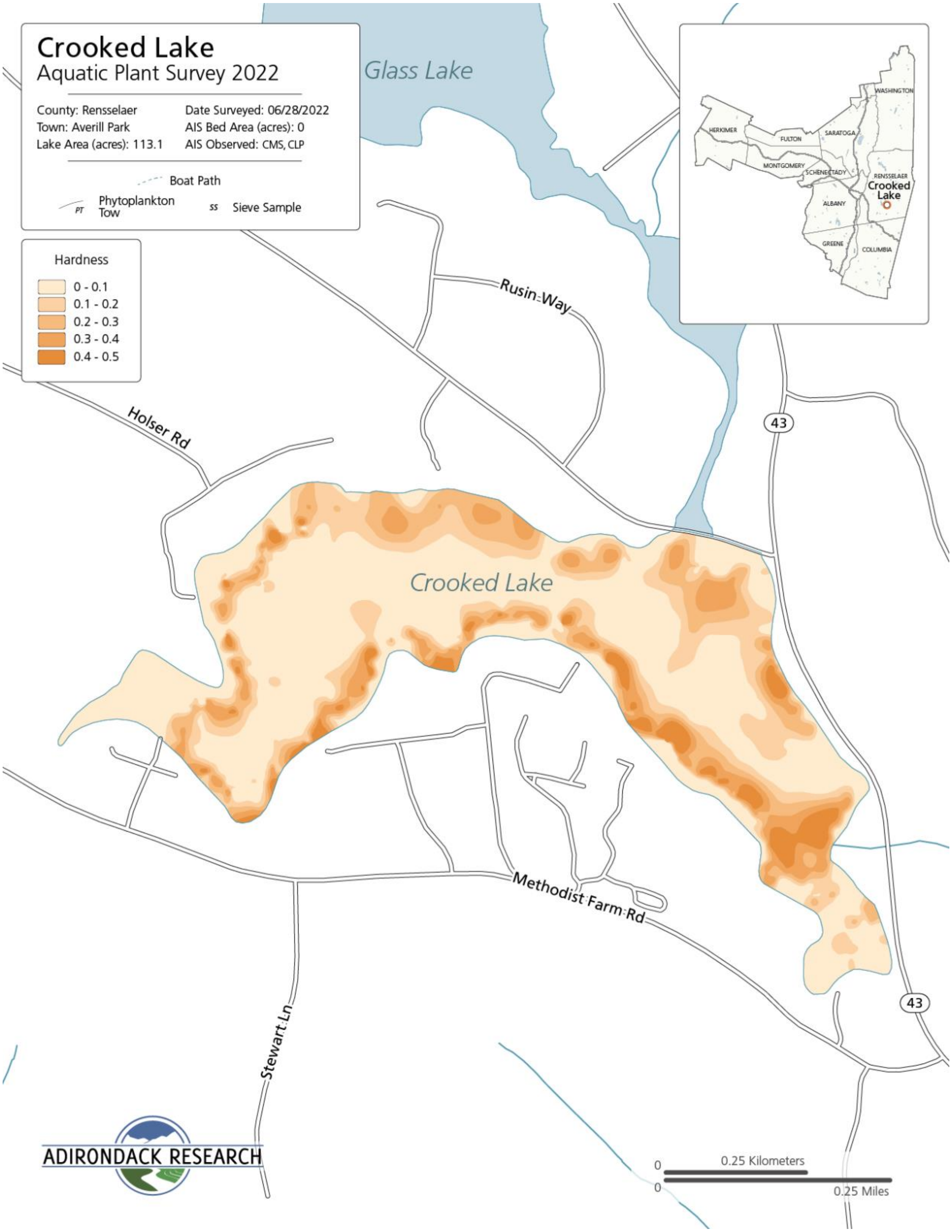
Native Plant Biota

Comprehensive surveys were not prioritized in 2022 as invasive species were the primary focus of the surveys. The following native plants were found: *Nuphar advena* (spatterdock), *Potamogeton robbinsii* (Robbins' pond weed).

Aquatic Invasive Animal Presence

Three plankton tows were conducted with no invasive zooplankton detected.


Crooked Lake
Aquatic Plant Survey 2022
County: Rensselaer
Town: Averill Park
Lake Area (acres): 113.1
Date Surveyed: 06/28/2022
AIS Bed Area (acres): 0
AIS Observed: CMS, CLP
Boat Path
Phytoplankton Tow
Sieve Sample
Bathymetry (ft)
0 - 5
5 - 10
10 - 20
20 - 30
30 - 40
40+
Invasive Plant Density (%)
< 5
5 - 25
26 - 50
51- 75
76 - 100
Glass Lake
Crooked Lake
Rusin Way
Holser Rd
Methodist Farm Rd
Stewart Ln
43
CLP
PT
HERKIMER
FULTON
SARATOGA
WASHINGTON
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
GREENE
COLUMBIA
ADIRONDACK RESEARCH
0.25 Kilometers
0.25 Miles


Crooked Lake
Aquatic Plant Survey 2022
County: Rensselaer
Town: Averill Park
Lake Area (acres): 113.1
Date Surveyed: 06/28/2022
AIS Bed Area (acres): 0
AIS Observed: CMS, CLP
Boat Path
PT Phytoplankton Tow
SS Sieve Sample
Hardness
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
Glass Lake
Rusin Way
Holser Rd
Crooked Lake
Methodist Farm Rd
Stewart Ln
43
43
HERKIMER
FULTON
SARATOGA
WASHINGTON
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
GREENE
COLUMBIA
ADIRONDACK RESEARCH
0
0.25 Kilometers
0
0.25 Miles

Crystal Lake

Survey Date: August 18th 2022
Survey Team: M. Sharpe, M. Bargabos

Lake Description

Crystal Lake is 59.5 acres with approximately 1.7 miles of shoreline. It is located in the town of Sand Lake, in Rensselaer County, and is part of the Lower Hudson watershed. With permissions from the Crystal Lake Association and The Crystal Cove Venue, the team launched a canoe from Crystal Cove on the Southern shore of the lake.

Aquatic Invasive Plant Presence

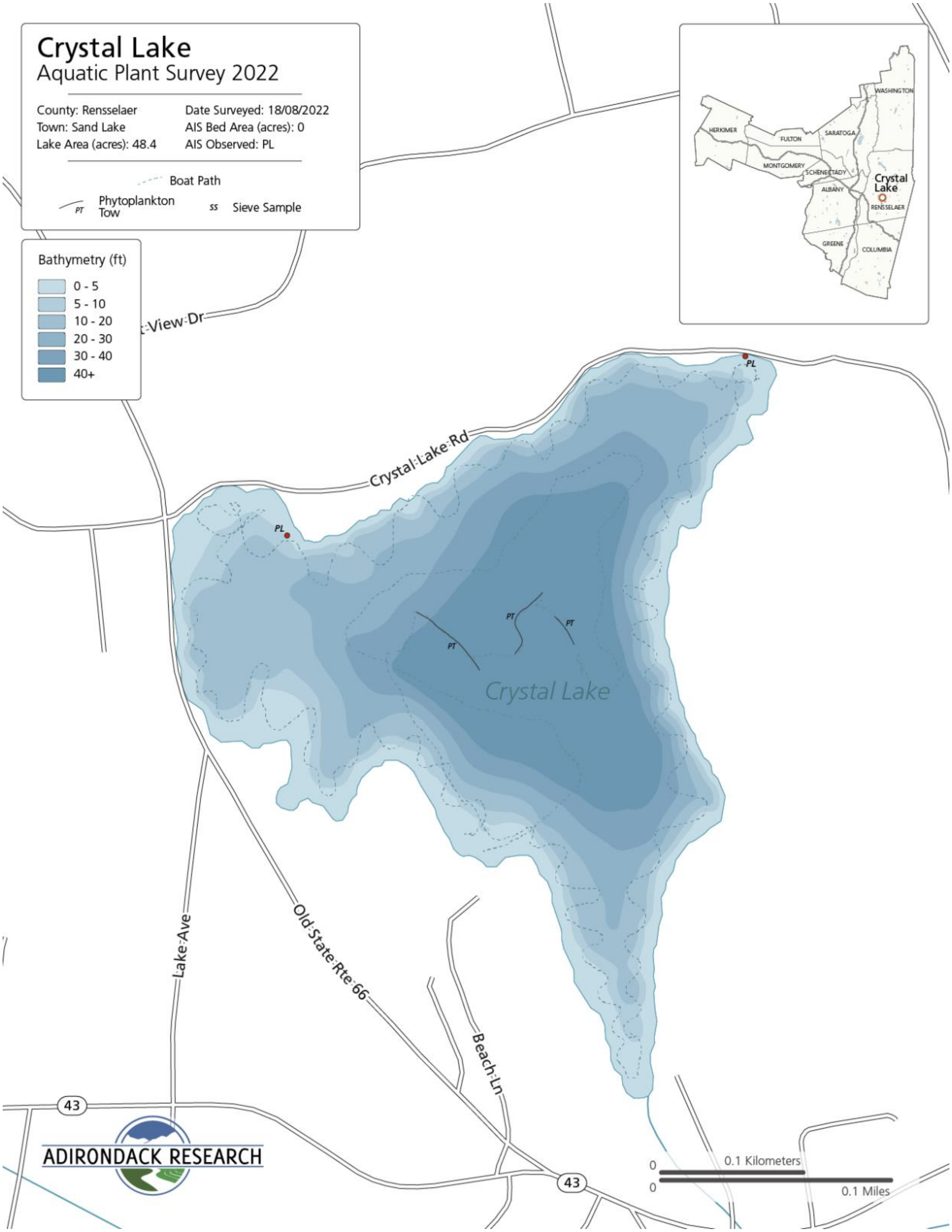
No aquatic invasive plant species were recorded. *Lythrum salicaria* (purple loosestrife) was detected at two points along the north-west and north-eastern shoreline. This plant is considered a low tier 4 invasive and is technically considered a terrestrial plant, not a submerged invasive.

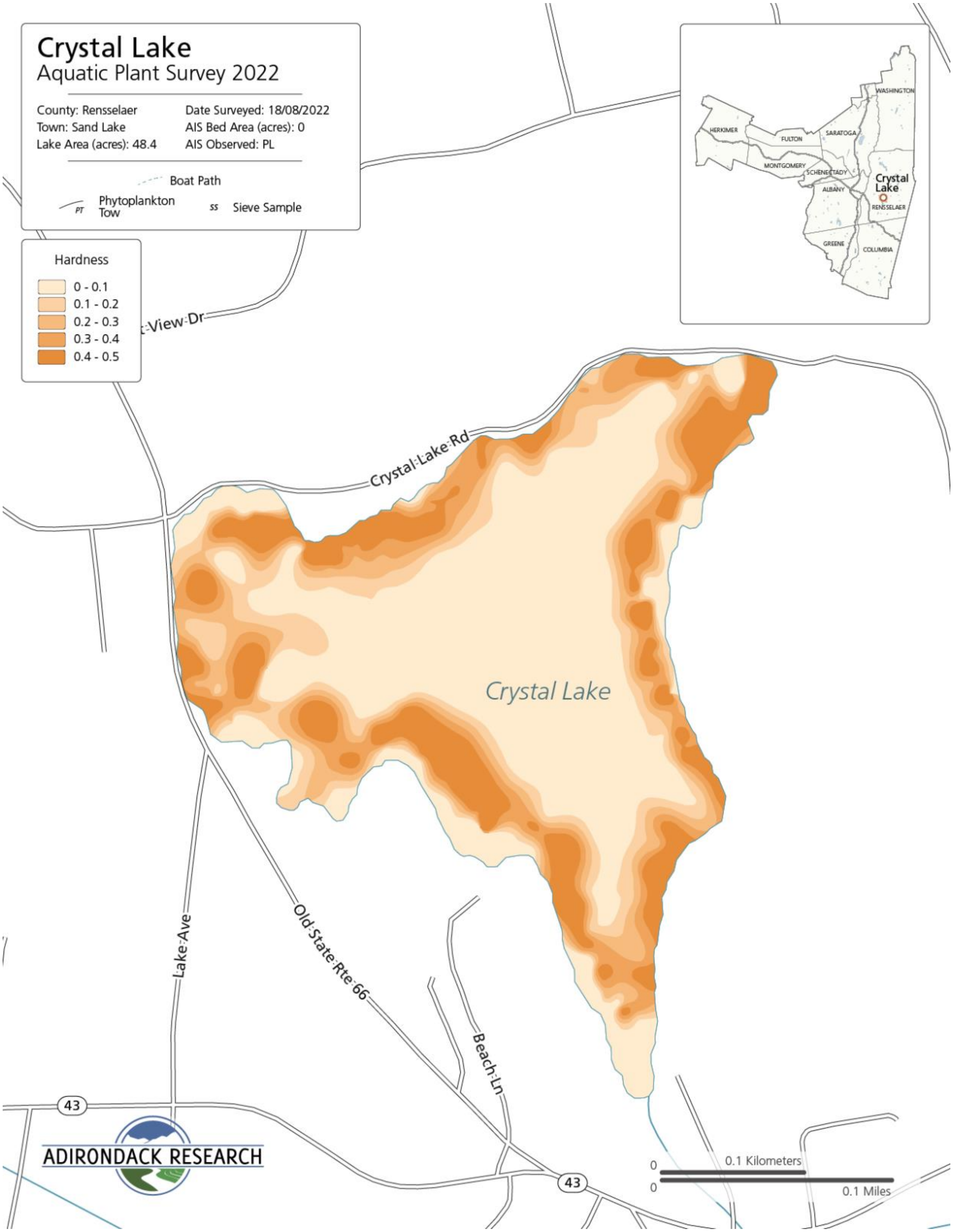
Native Plant Biota

Comprehensive surveys were not prioritized in 2022 as invasive species were the primary focus of the surveys. The following native plants were found: *Vallisneria americana* (American eelgrass), *Nymphaea odorata* (American white waterlily), *Elodea canadensis* (Canadian waterweed), *Ceratophyllum demersum* (coontail), *Potamogeton robbinsii* (Robbins' pondweed).

Aquatic Invasive Animal Presence

Three plankton tows were conducted with no invasive zooplankton detected.


Crystal Lake
Aquatic Plant Survey 2022
County: Rensselaer
Town: Sand Lake
Lake Area (acres): 48.4
Date Surveyed: 18/08/2022
AIS Bed Area (acres): 0
AIS Observed: PL
Boat Path
Phytoplankton Tow
Sieve Sample
Bathymetry (ft)
0 - 5
5 - 10
10 - 20
20 - 30
30 - 40
40+
HERKIMER
FULTON
SARATOGA
WASHINGTON
MONTGOMERY
SCHENECTADY
ALBANY
Crystal Lake
RENSSELAER
GREENE
COLUMBIA
Crystal Lake Rd
Crystal Lake
Lake Ave
Old State Rte 66
Beach Ln
43
ADIRONDACK RESEARCH
0.1 Kilometers
0.1 Miles


Crystal Lake
Aquatic Plant Survey 2022
County: Rensselaer
Town: Sand Lake
Lake Area (acres): 48.4
Date Surveyed: 18/08/2022
AIS Bed Area (acres): 0
AIS Observed: PL
Boat Path
Phytoplankton Tow
Sieve Sample
Hardness
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
WASHINGTON
HERKIMER
FULTON
SARATOGA
MONTGOMERY
SCHENECTADY
ALBANY
RENSSELAER
GREENE
COLUMBIA
Crystal Lake
Crystal Lake Rd
View Dr
Crystal Lake
Lake Ave
Old State Rte 66
Beach Ln
43
43
ADIRONDACK RESEARCH
0
0.1 Kilometers
0
0.1 Miles

Glass Lake

Survey Date: June 28th 2022
Survey Team: E. Schwartzberg, K. Dernier

Lake Description

Glass Lake is 125 acres with approximately 2.9 miles of shoreline. It is located in the town of Averill Park, in Rensselaer County, and is part of the Lower Hudson watershed. The team launched a motorboat with permissions from a private dock. Areas known to be treated with ProcellaCOR had no apparent growth of *Myriophyllum spicatum* (Eurasian watermilfoil), however it could be found in the outflow connected to Crooked Lake.

Aquatic Invasive Plant Presence

Scattered points and beds of *Potamogeton crispus* (curly leaf pondweed) were found throughout the waterbody, predominantly along the western shoreline. A bed of *Myriophyllum spicatum* (Eurasian watermilfoil) was detected in the southern outflow to Crooked Lake.

Native Plant Biota

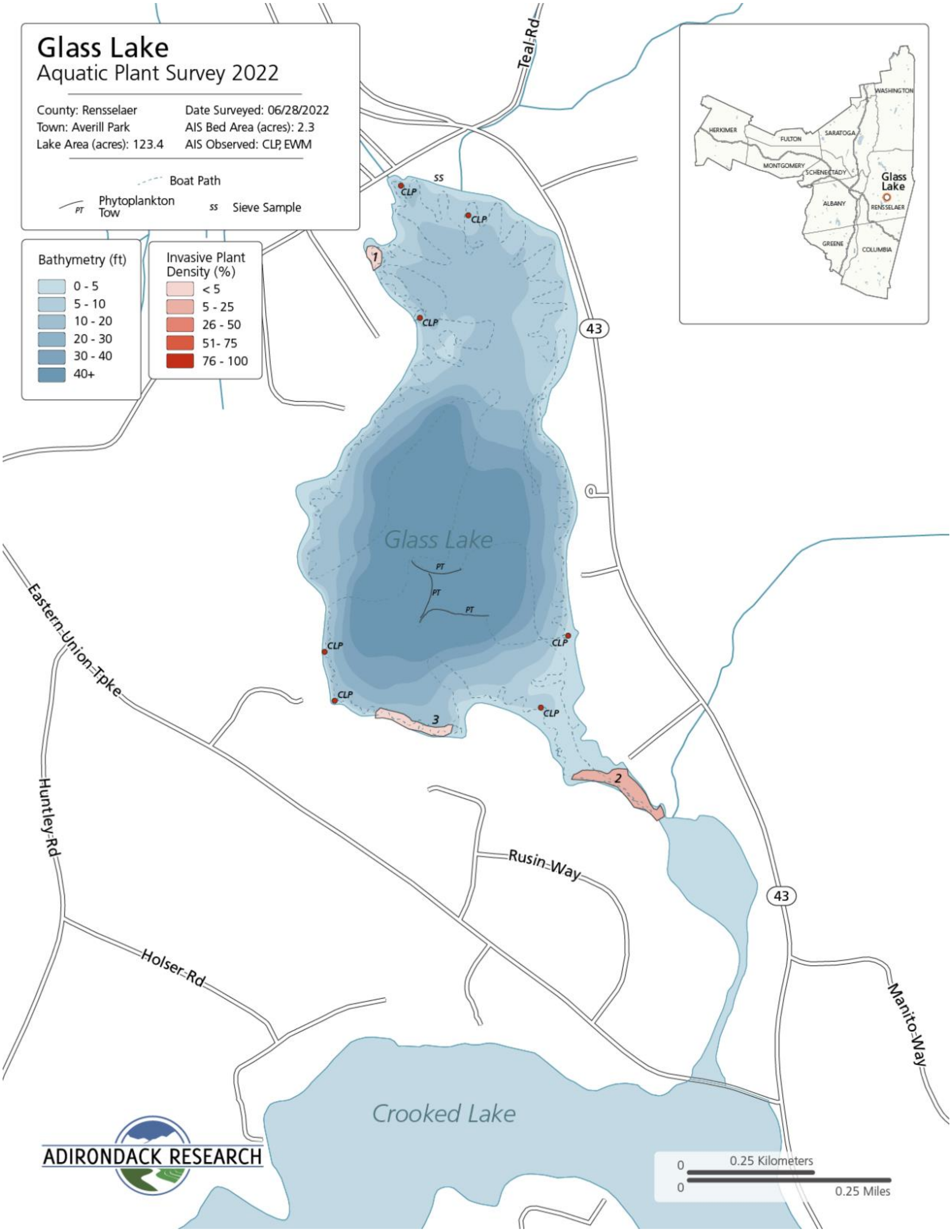
Comprehensive surveys were not prioritized in 2022 as invasive species were the primary focus of the surveys. The following native plants were found: *Nymphaea odorata* (American white waterlily), *Potamogeton schweinfurthii* (broad-leaved pondweed), *Elodea canadensis* (Canadian waterweed), *Potamogeton gramineus* (grass-leaved pondweed), *Potamogeton epihydrus* (ribbon-leaved pondweed), *Potamogeton robbinsii* (Robbins' pondweed)

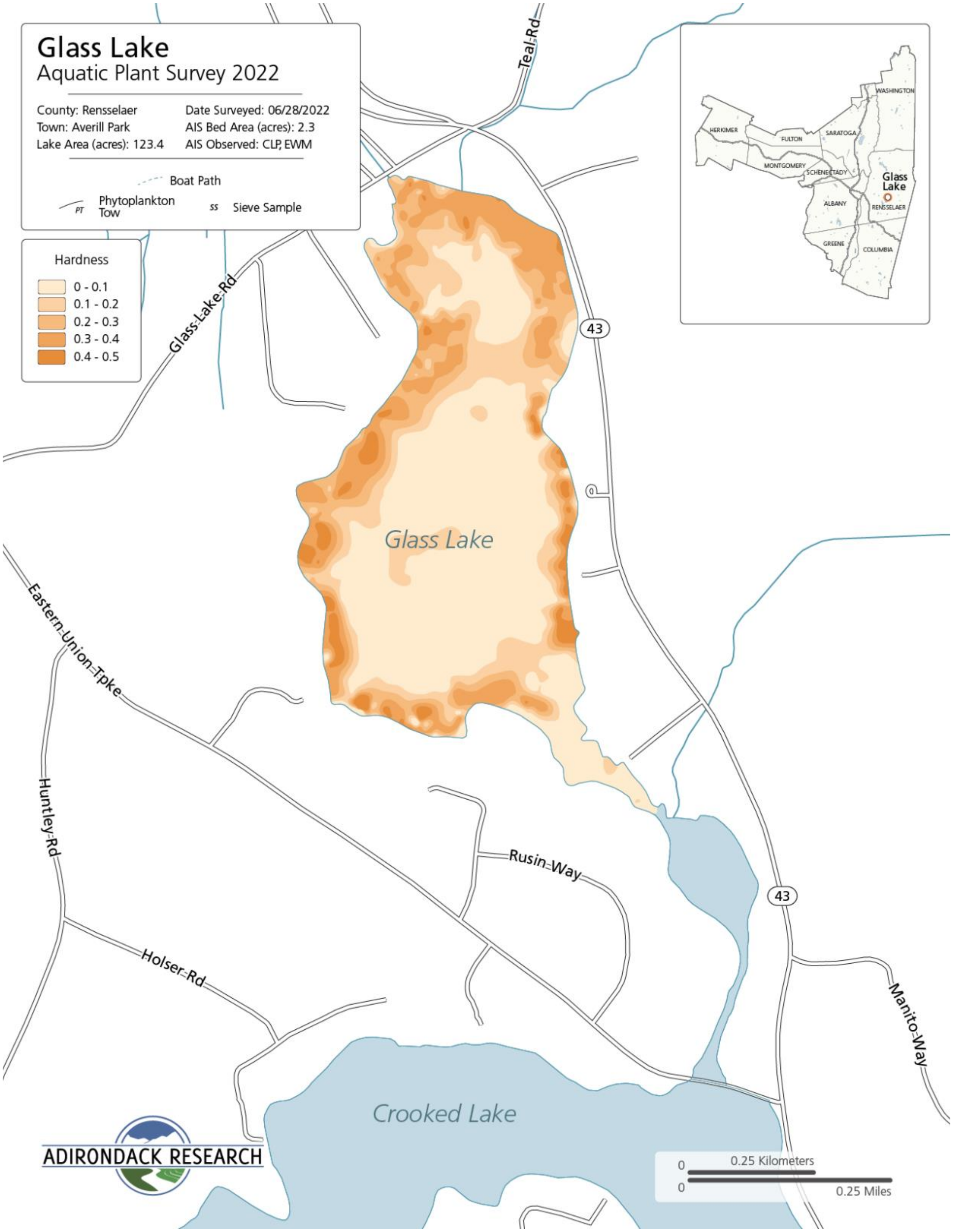
Aquatic Invasive Animal Presence

Sediment sieves were taken to determine the presence of Corbicula fluminea (Asian clams). None were found. Three plankton tows were also conducted with no invasive zooplankton detected.

Eurasian Watermilfoil			
Bed	Size (Ac.)	Size (Sq. Ft.)	% Cover
2	1.31	57008.07	5% - 25%

Curly Pondweed			
Bed	Size (Ac.)	Size (Sq. Ft.)	% Cover
1	0.26	11260.35	less than 5%
3	0.70	30442.46	less than 5%


Glass Lake
Aquatic Plant Survey 2022
County: Rensselaer
Town: Averill Park
Lake Area (acres): 123.4
Date Surveyed: 06/28/2022
AIS Bed Area (acres): 2.3
AIS Observed: CLP, EWM
Boat Path
PT Phytoplankton Tow
SS Sieve Sample
Bathymetry (ft)
0 - 5
5 - 10
10 - 20
20 - 30
30 - 40
40+
Invasive Plant Density (%)
< 5
5 - 25
26 - 50
51 - 75
76 - 100
HERKIMER
FULTON
SARATOGA
WASHINGTON
MONTGOMERY
SCHENECTADY
ALBANY
RENSSELAER
GREENE
COLUMBIA
Glass Lake
Teal Rd
43
Glass Lake
Eastern Union Tpke
Huntley Rd
Rusin Way
Holser Rd
Manito Way
Crooked Lake
ADIRONDACK RESEARCH
0 0.25 Kilometers
0 0.25 Miles


Glass Lake
Aquatic Plant Survey 2022
County: Rensselaer
Town: Averill Park
Lake Area (acres): 123.4
Date Surveyed: 06/28/2022
AIS Bed Area (acres): 2.3
AIS Observed: CLP, EWM
Boat Path
PT Phytoplankton Tow
ss Sieve Sample
Hardness
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
Teal Rd
Glass Lake Rd
43
Glass Lake
Eastern Union Tpke
Huntley Rd
Rusin Way
Holser Rd
Manito Way
Crooked Lake
HERKIMER
FULTON
SARATOGA
WASHINGTON
MONTGOMERY
SCHENECTADY
ALBANY
RENSSELAER
GREENE
COLUMBIA
Glass Lake
ADIRONDACK RESEARCH
0.25 Kilometers
0.25 Miles
0

Halfway Brook Reservoir

Survey Date: June 27th 2022
Survey Team: E. Schwartzberg, K. Dernier

Lake Description

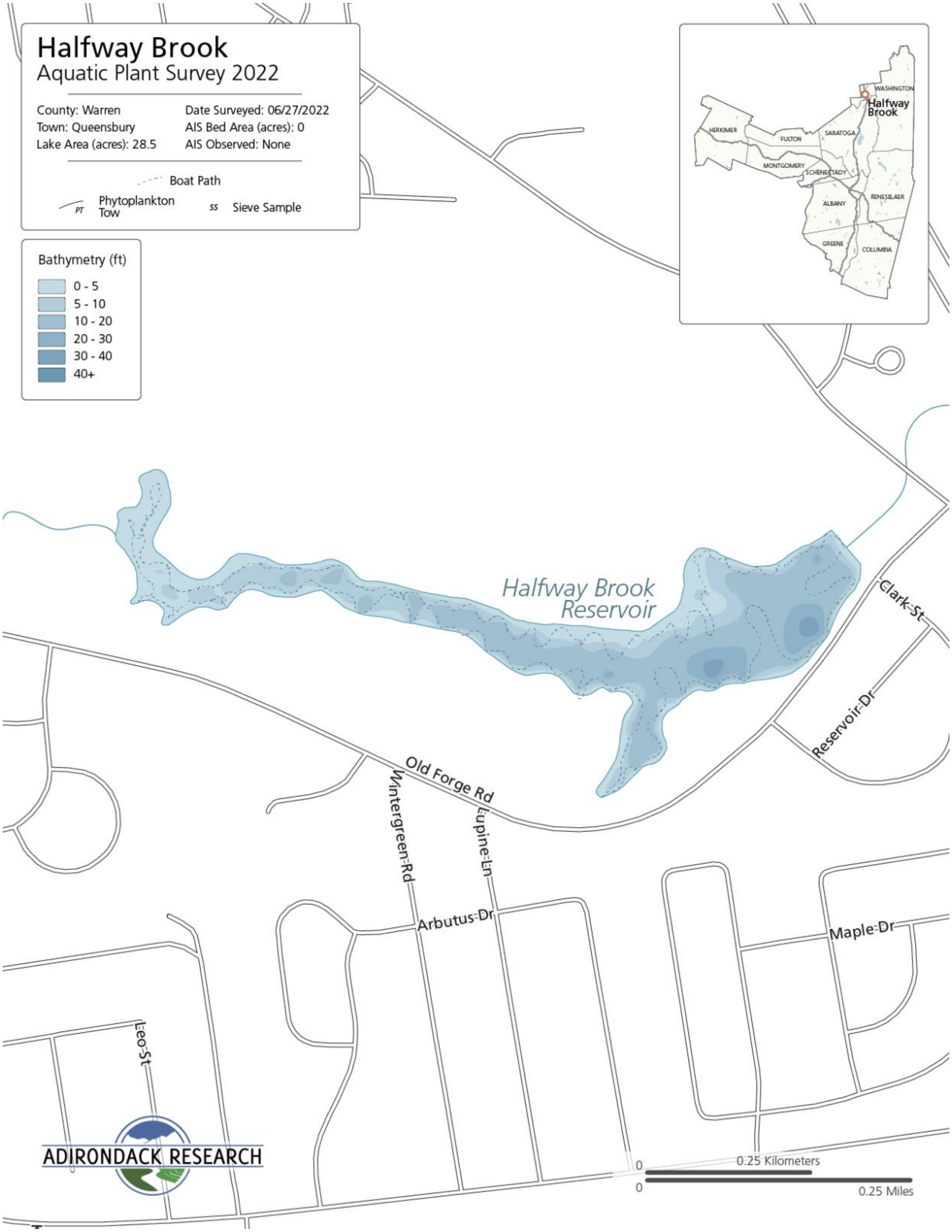
Halfway Brook Reservoir is 51-acres with approximately 2.5 miles of shoreline. It is located in the town of Queensbury in Warren County, and is a part of the Lake Champlain watershed. The team launched a canoe with special permissions from the town's water treatment plant operations management.

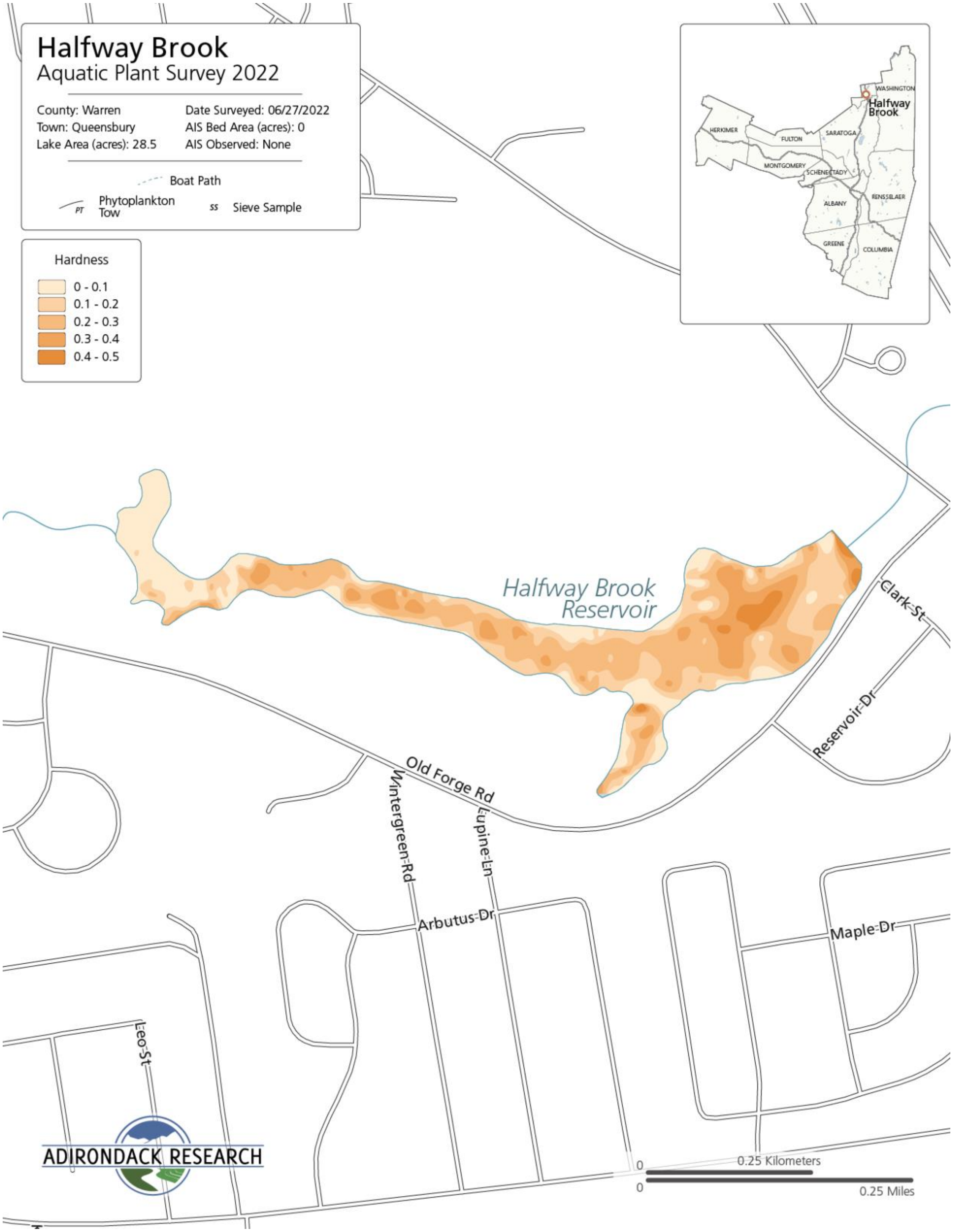
Aquatic Invasive Plant Presence

No aquatic invasive plant species were recorded.

Native Plant Biota

Comprehensive surveys were not prioritized in 2022 as invasive species were the primary focus of the surveys. The following native plants were found: *Potamogeton amplifolius* (broad-leaved pondweed), *Elodea canadensis* (Canadian Waterweed), *Lemna minor* (common Duckweed), *Potamogeton zosteriformis* (eel-grass pondweed), Potamogeton gramineus (grass-leaved pondweed), *Zannichellia palustris* (horned Pondweed), *Potamogeton* (common pondweed), *Potamogeton epihydrus* (ribbon-leaved pondweed), *Comptonia peregrina* (sweetfern), and *Vallisneria spiralis* (tapegrass).


Halfway Brook
Aquatic Plant Survey 2022
County: Warren
Town: Queensbury
Lake Area (acres): 28.5
Date Surveyed: 06/27/2022
AIS Bed Area (acres): 0
AIS Observed: None
Boat Path
PT Phytoplankton Tow
ss Sieve Sample
Bathymetry (ft)
0 - 5
5 - 10
10 - 20
20 - 30
30 - 40
40+
WASHINGTON
Halfway Brook
HERKIMER
FULTON
SARATOGA
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
GREENE
COLUMBIA
Halfway Brook Reservoir
Clark St
Reservoir Dr
Old Forge Rd
Wintergreen Rd
Lupine Ln
Arbutus Dr
Maple Dr
Leo St
ADIRONDACK RESEARCH
0
0.25 Kilometers
0
0.25 Miles


Halfway Brook
Aquatic Plant Survey 2022
County: Warren
Town: Queensbury
Lake Area (acres): 28.5
Date Surveyed: 06/27/2022
AIS Bed Area (acres): 0
AIS Observed: None
Boat Path
Phytoplankton Tow
Sieve Sample
Hardness
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
Halfway Brook
Halfway Brook Reservoir
Clark St
Reservoir Dr
Old Forge Rd
Wintergreen Rd
Lupine Ln
Arbutus Dr
Maple Dr
Leo St
0.25 Kilometers
0.25 Miles
ADIRONDACK RESEARCH

Round Pond

Survey Date: June 27th 2022
Survey Team: E. Schwartzberg, K. Dernier

Lake Description

Round Pond is a 29.5-acre lake with a shoreline of 0.9 miles. It is located in Warren County in the Town of Queensberry. With special permissions the team launched a canoe from the beach on the Glens Falls Country Club's property.

Aquatic Invasive Plant Presence

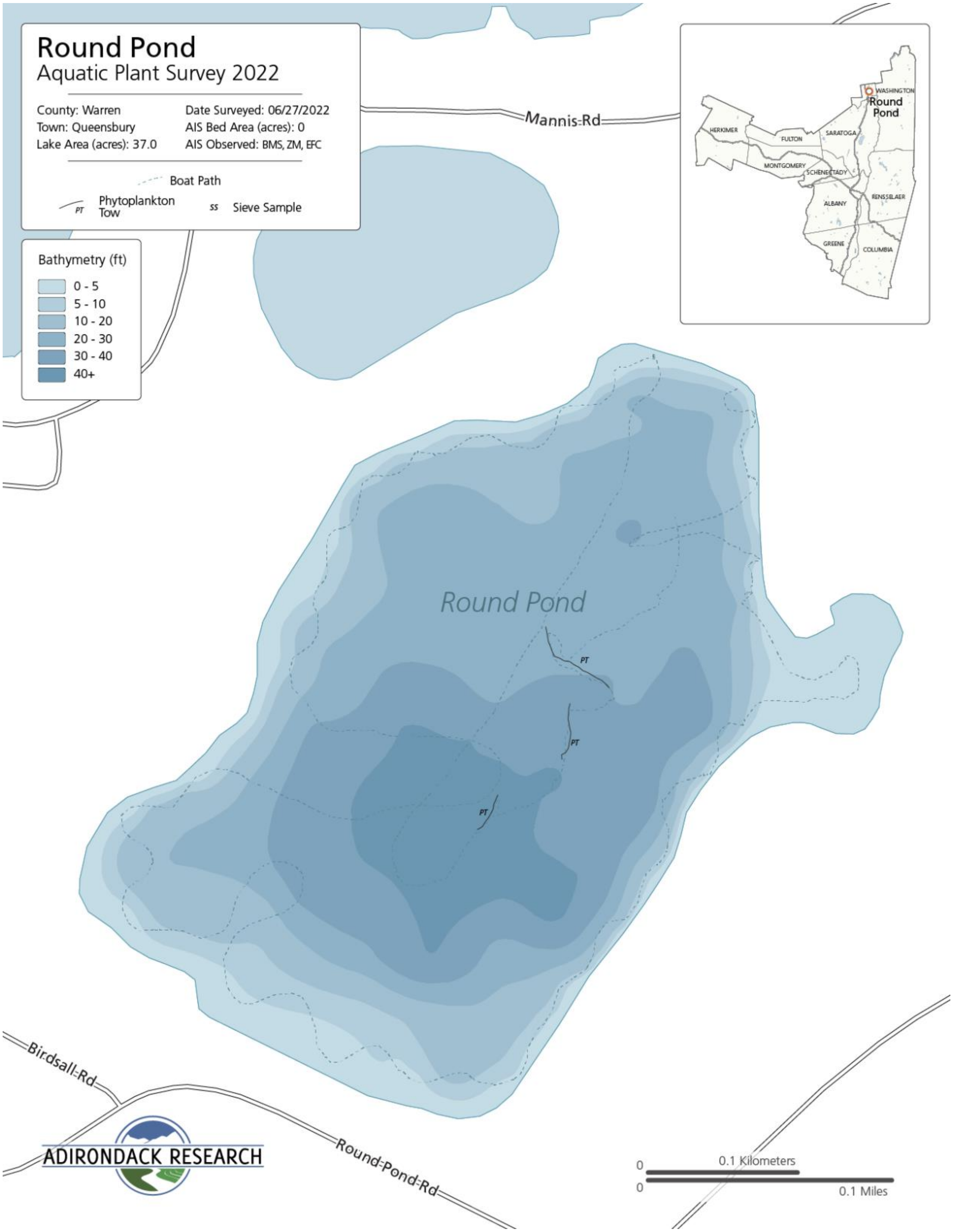
No aquatic invasive plant species were recorded.

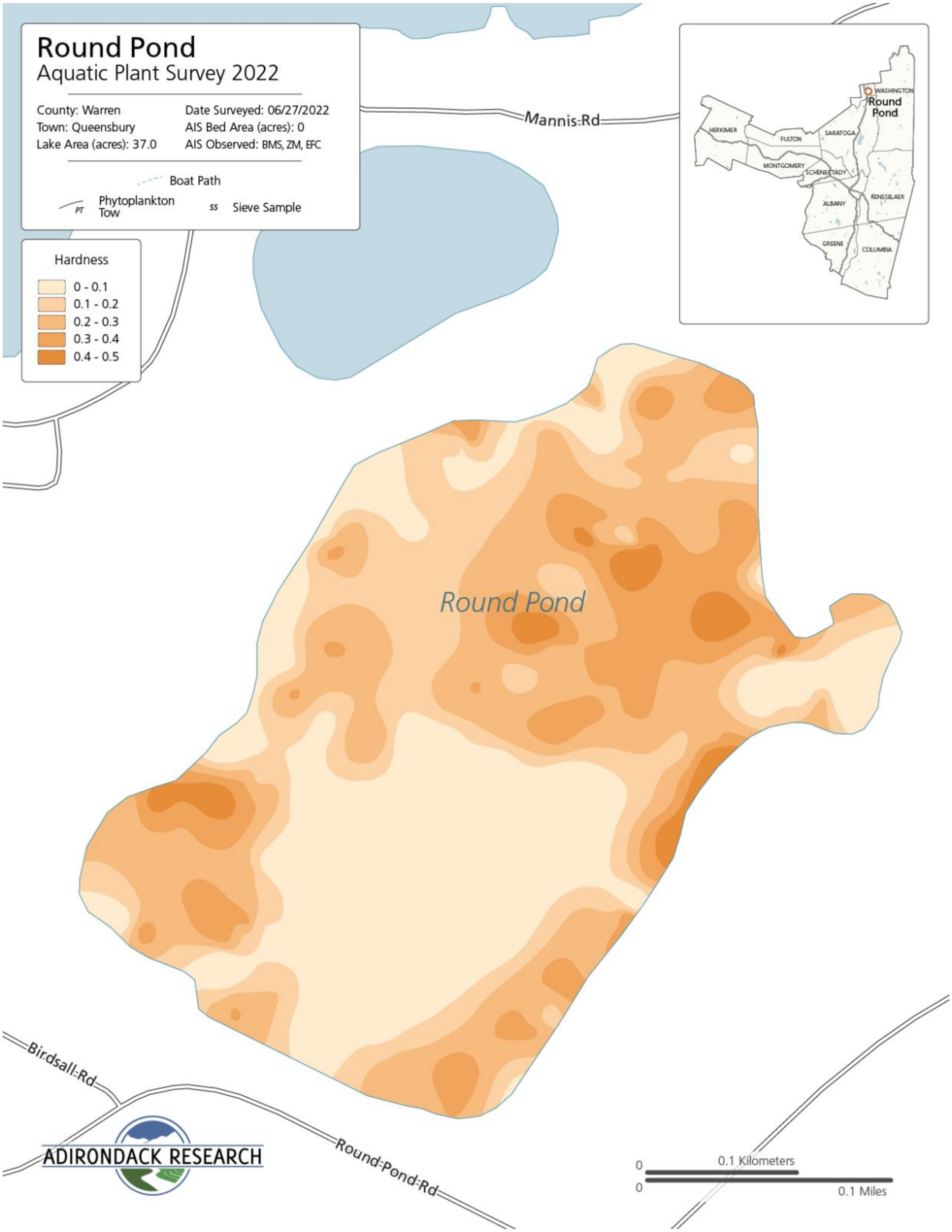
Native Plant Biota

Comprehensive surveys were not prioritized in 2022 as invasive species were the primary focus of the surveys. The following native plants were found: *Nymphaea odorata* (American white waterlily), and *Nuphar advena* (spatterdock).

Aquatic Invasive Animal Presence

Three plankton tows were conducted with no invasive zooplankton detected. *Dreissena polymorpha* (Zebra mussel) were detected in the waterbody.


Round Pond
Aquatic Plant Survey 2022
County: Warren
Town: Queensbury
Lake Area (acres): 37.0
Date Surveyed: 06/27/2022
AIS Bed Area (acres): 0
AIS Observed: BMS, ZM, EFC
Boat Path
PT Phytoplankton Tow
SS Sieve Sample
Bathymetry (ft)
0 - 5
5 - 10
10 - 20
20 - 30
30 - 40
40+
Mannis Rd
Round Pond
HERKIMER
FULTON
SARATOGA
WASHINGTON
MONTGOMERY
SCHENECTADY
ALBANY
RENSSELAER
GREENE
COLUMBIA
Round Pond
PT
PT
PT
Birdsall Rd
Round Pond Rd
ADIRONDACK RESEARCH
0 0.1 Kilometers
0 0.1 Miles


Round Pond
Aquatic Plant Survey 2022
County: Warren
Town: Queensbury
Lake Area (acres): 37.0
Date Surveyed: 06/27/2022
AIS Bed Area (acres): 0
AIS Observed: BMS, ZM, EFC
Boat Path
Phytoplankton Tow
Sieve Sample
Hardness
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
Mannis-Rd
Round Pond
Birdsall-Rd
Round-Pond-Rd
ADIRONDACK RESEARCH
0.1 Kilometers
0.1 Miles
Round Pond
WASHINGTON
HERKIMER
FULTON
SARATOGA
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
GREENE
COLUMBIA

St. Johnsville Reservoir

Survey Date: August 17th, 2022
Survey Team: M. Sharpe, M. Bargabos

Lake Description

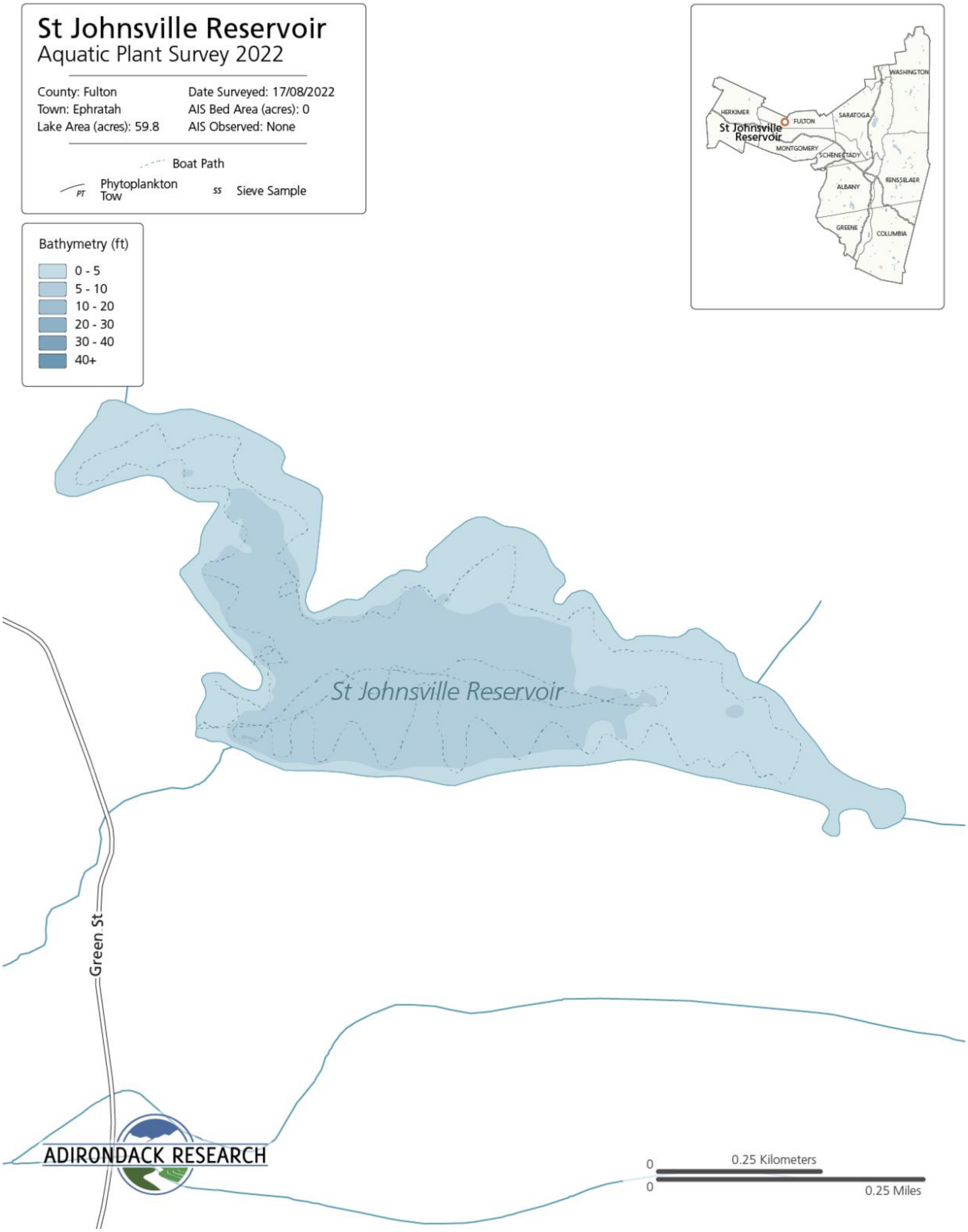
St. Johnsville Reservoir is a 59-acre lake with 2.4 miles of shoreline. It is located in the town of Ephratah, in the County of Fulton, and is a part of the Mohawk River watershed. The team launched a single canoe with permissions from the Department of Public Works.

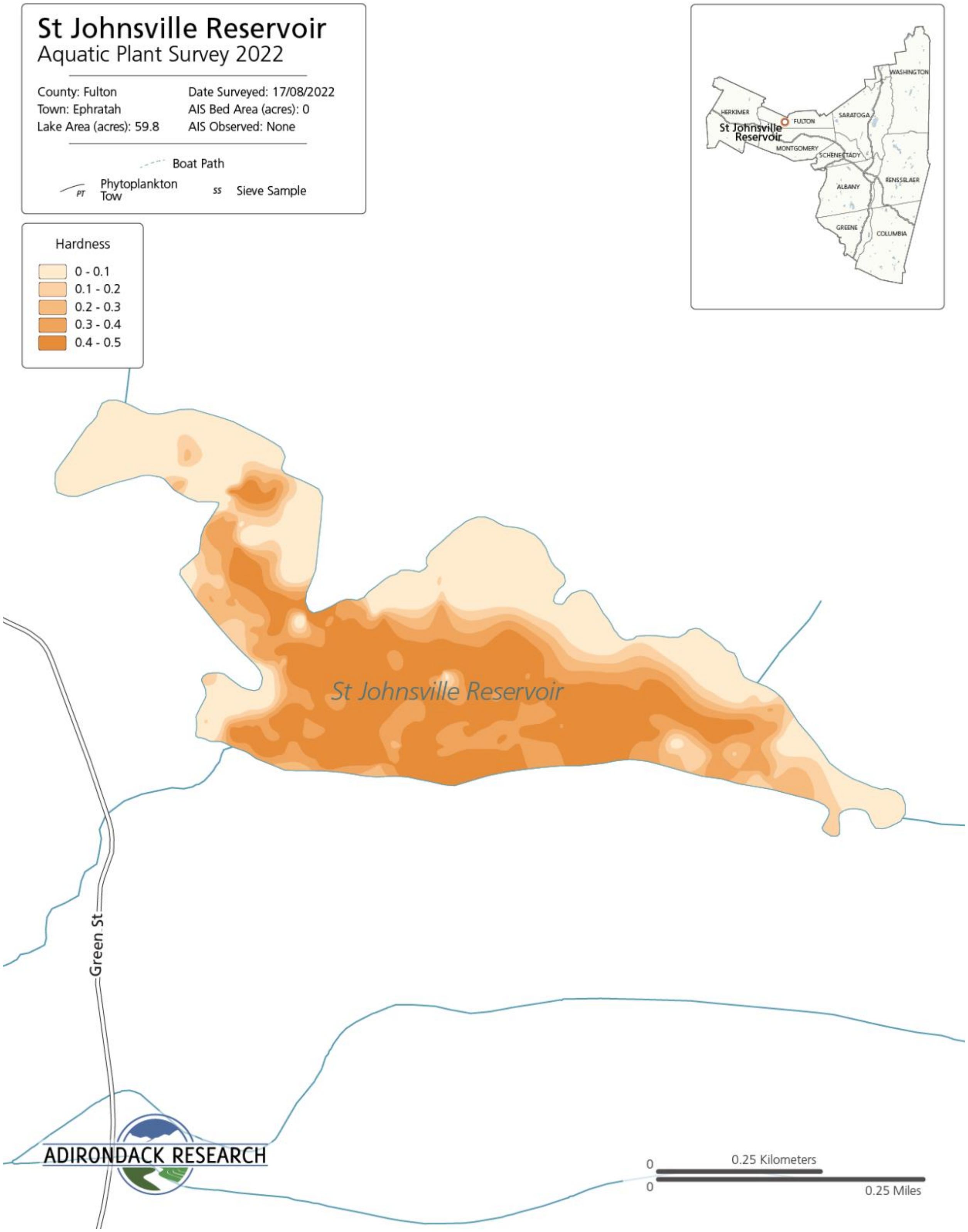
Aquatic Invasive Plant Presence

No aquatic invasive plant species were recorded.

Native Plant Biota

Comprehensive surveys were not prioritized in 2022 as invasive species were the primary focus of the surveys. The following native plants were found: *Vallisneria americana* (American eelgrass), *Sparganium fluctuans* (floating bur-reed), *Potamogeton epihydrus* (ribbon-leaved pondweed), *Potamogeton pusillus* (small pondweed), *Brasenia schreberi* (watershield).


St Johnsville Reservoir
Aquatic Plant Survey 2022
County: Fulton
Town: Ephratah
Lake Area (acres): 59.8
Date Surveyed: 17/08/2022
AIS Bed Area (acres): 0
AIS Observed: None
Boat Path
PT
Phytoplankton Tow
ss
Sieve Sample
Bathymetry (ft)
0 - 5
5 - 10
10 - 20
20 - 30
30 - 40
40+
WASHINGTON
HERKIMER
FULTON
SARATOGA
St Johnsville Reservoir
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
GREENE
COLUMBIA
St Johnsville Reservoir
Green St
ADIRONDACK RESEARCH
0
0.25 Kilometers
0
0.25 Miles


St Johnsville Reservoir
Aquatic Plant Survey 2022
County: Fulton
Town: Ephratah
Lake Area (acres): 59.8
Date Surveyed: 17/08/2022
AIS Bed Area (acres): 0
AIS Observed: None
Boat Path
PT Phytoplankton Tow
SS Sieve Sample
Hardness
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
WASHINGTON
HERKIMER
FULTON
SARATOGA
St Johnsville Reservoir
MONTGOMERY
SCHENECTADY
ALBANY
RENSSELAER
GREENE
COLUMBIA
St Johnsville Reservoir
Green St
ADIRONDACK RESEARCH
0 0.25 Kilometers
0 0.25 Miles

73 Church Street, Suite 2, Saranac Lake, NY 12983 ▪ (518) 278-6070
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