2020 CAPITAL REGION PRISM

Aquatic Invasive Species Surveys

Early Detection Team Report

ADIRONDACK RESEARCH

2020 Capital Region Aquatic Invasive Species Surveys

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November 2020

This project was contracted by the Capital Region PRISM a partnership program hosted by The Cornell Cooperative Extension of Saratoga County and sponsored by the New York State Department of Environmental Conservation through the Environmental Protection Fund.

Preferred citation: Schwartzberg, E.G., Firkins, T., Lloyd, C., Aveson, M.S., S., Bly, P., Vara, C., Privee, M. (2020). Capital Region PRISM AIS Surveys. Adirondack Research, Saranac Lake, NY.

Background Cover image: Lake Sunnyside, Warren County, June 2020.

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 2020, 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 European frog-bit (*Hydrocharis morsus-ranae*) and used 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 2020 field season to conduct AIS early detection surveys on 10 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 Thomas Firkins, Clara Lloyd, Sydney Aveson, M.S., Connor Vara, Patrick Bly, Mark Privee 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, McConchie's Heritage Acres Campground, Lake Sunnyside lake association, Galway Lake association. 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, with funding provided by New York State's Environmental Protection Fund as administered by The Cornell Cooperative Extension.

Photo 1: *Research vessel on Lake Sunnyside, Warren Co., NY*

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 first 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 European frog-bit since it has such damaging effects to waterbodies and waterways. European frog-bit is a free-floating aquatic plant with small heart shaped leaves. This invasive aquatic plant species thrives in shallow, slow moving, calcium rich waters. The plant regenerates by producing over-wintering turions that float to the surface in the spring and begin to grow. From there the turions are able to float downstream or around the waterbody and create new infestations and clog waterways[1] .

Photo 2: *Research technician Patrick Bly with a dense rake toss of European frog-bit from Weaver Lake, August 2020.*

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 3: *Photo of European frog-bit with its small white flower. Note small, heart shaped leaves similar to lily pads (Photo from WNYPRISM, 2020).*

[1] *Jacono, C.C., and L. Berent, 2020, Hydrocharis morsus-ranae L.: U.S. Geological Survey, Nonindigenous Aquatic Species Database, Gainesville, FL, https://nas.er.usgs.gov/queries/FactSheet.aspx?SpeciesID=1110, Revision Date: 8/19/2019, Access Date: 8/25/2020*

Objectives

The primary objective of the 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 European frog-bit. 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.

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.

Photo 5: *Variable leaf milfoil in Fifth Lake, Hamilton Co., NY.*

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.

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 ten 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 and European frog-bit.

Photo 4: *Research Technician Alex delineating beds of invasive milfoils on the tablet-based Arc Collector app.*

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: Adirondack Research's field vehicle and motor boat used for surveys. Fourth Lake DEC boat launch, Inlet, NY.

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.

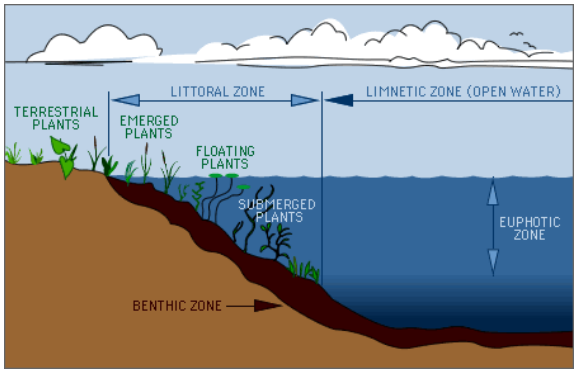


Figure 2: Illustration depicting the littoral zone on a waterbody.

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

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

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.

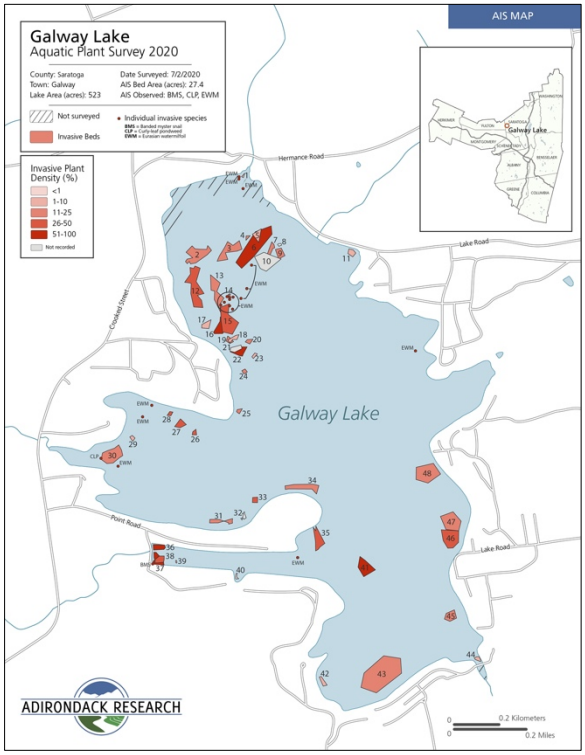


Figure 4: *Example of AIS polygon delineated on a waterbody in the Capital Region.*

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.

Photo 7: *Research vessel 'The Predator' cruising down the lake in July 2020 on a waterbody in the Capital Region.*

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.

Paper Collection

1. Lists of native plants identified were recorded on paper and transcribed to digital form weekly.

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 10 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 Alex tossing a rake to retrieve plants for identification in 2019. Fourth Lake, Hamilton Co., NY.*

Photo 9: *Research Technician Mason retrieving samples from a plankton tow in 2019. Limekiln Lake, Hamilton Co., NY.*

Results

Between June 1 and August 24, 10 lakes and ponds were surveyed with the objective of AIS early detection. Of the 10 lakes, 8 were documented to be invaded by at least one AIS. Even though 8 lakes and ponds surveyed contained AIS, all had been documented as invaded prior to 2020. No newly invaded lakes or ponds were discovered by the Early Detection Team in 2020. The most common AIS detected was *Myriophyllum heterophyllum* (variable leaf milfoil). *Myriophyllum spicatum* (Eurasian watermilfoil) was detected in two lakes and ponds. Two lakes or ponds contained both *Myriophyllum heterophyllum* and *Myriophyllum spicatum*. Lakes surveyed ranged in size from 39.27 acres (Lake Sunnyside, Warren County) to 523.03 acres (Galway Lake, Saratoga County). Approximately 170.3 acres of beds containing invasive plants were mapped, ranging in size from one plant to 32.3 acres.

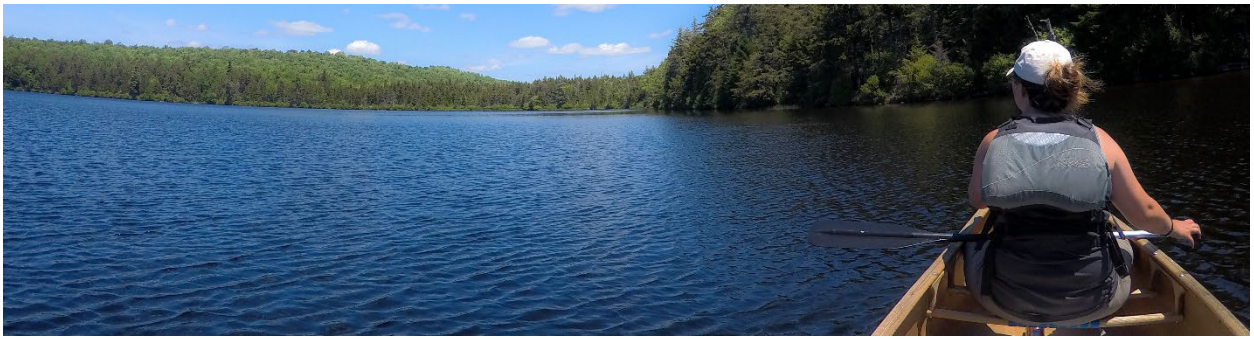


Photo 10: *Research Technician Sarah in 2019 on Horseshoe Lake, St Lawrence Co., NY.*

Native Vegetation

Below is a list of the common native plant species recorded in each surveyed lake. Assessing native vegetation biomass and richness was not the top priority but native aquatic plants were recorded when observed to better understand the plant community of the waterbody.

Capital Region Native Plant List	Galaway Lake	Lake Desolation	Lake Nancy	Lake Sunnyside	Myosotis Lake	Renssalear Lake	Rockwood Lake	Round Lake	Weaver Lake	Young Lake
Bur-reed spp.	*					*	*			
Clasping-leaf pondweed	*			*					*	
Common bladderwort		*	*				*	*		*
Coontail	*					*		*		*
Eel grass						*				
Elodea spp.	*			*	*	*			*	*
Floating-leaf pondweed		*				*				
Large-leaf pondweed	*	*	*	*						
Leafy pondweed										*
Low watermilfoil			*							
Narrow-leaf bur-reed		*						*		*
Nitella spp.							*			*
Pickerelweed		*								
Muskgrass	*			*						
Northern watermilfoil		*					*			
Pickerelweed		*		*			*	*		
Ribbon-leaf pondweed						*				
Robbins' Pondweed	*		*	*		*		*		*
Slender pondweed	*			*		*	*			
Spatterdock		*	*				*	*	*	*
Variable pondweed				*						
Water smartweed	*									
Water stargrass						*				
Watershield			*				*	*		*
White-stem pondweed	*								*	
White water lily		*	*				*	*	*	*

Table 1: *Native vegetation table for each surveyed lake.*

Data and Research Limitations

Project results were affected by various sources of data error, 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.

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 an cellular iPad Mini 4 tablet linked via Bluetooth to a Garmin GPS antenna (Garmin GLO). 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 new to survey protocol in 2020. During the season, 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 invasive species specifically European frog-bit, 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.

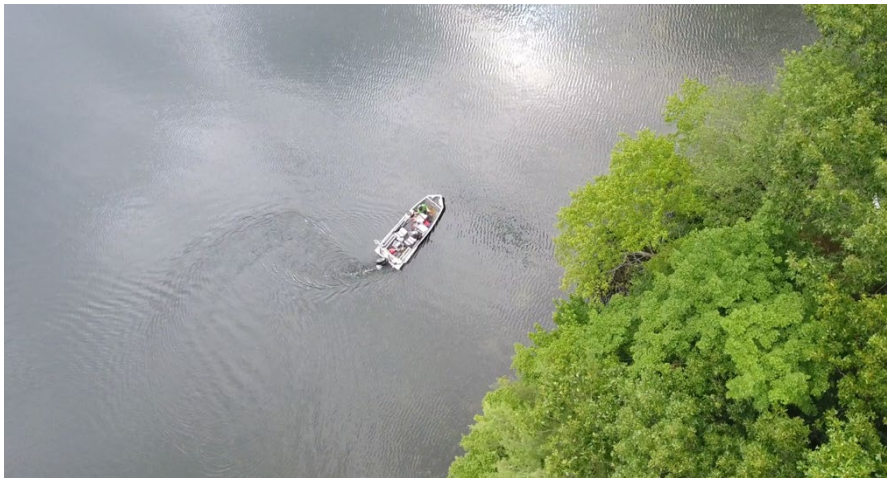


Photo 12: *Research vessel performing 'zig-zag' patterns on Lake Sunnyside, June 2020.*

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 2020, the team of six was able to complete serpentine

search surveys as well as complete ReefMaster on all 10 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

In 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 10 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 2021.

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

Conclusions

The 2020 AIS Early Detection Team surveyed 10 waterbodies in the Capital Region PRISM and did find several infestations of AIS on 80% of waterbodies surveyed, Lake Nancy and Lake Desolation did not have any AIS that were discovered by the team. AIS recorded include: Eurasian watermilfoil, variable leaf milfoil, European frog bit and curly leaf pondweed.

The greatest project advancement for the 2020 survey season was the incorporation of new technologies. The ReefMaster system allowed the team to map aquatic vegetation and lake characteristics in new and compelling ways. This newly administered data collection system allowed the early detection team to accurately map invasive plant beds within larger native plant communities. Invasive plant abundance data collected will allow the Capital Region PRISM to assess trends in infestation expansion or reduction over time. The Capital Region PRISM also now has the opportunity to utilize the ReefMaster data in combination with AIS distribution data to develop risk/vulnerability assessments for individual lakes.

Maps

The following section includes lake survey maps and description narratives of the 10 waterbodies surveyed in 2020. 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 2-3 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. 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.

Photo 4: *Research technician Mark retrieving a rake toss next to a milfoil hazard buoy on Chazy Lake, Adirondacks, July 2020.*

Bathymetry Maps

The next map, sometimes the first map of two total maps when no AIS are recorded, is the bathymetry map. This map shows water depth in increments contingent with the overall maximum depth of the waterbody.

Bottom Hardness

The next and last map 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.

Galway Lake

Survey Date: July 2, 2020
Survey Team: C. Lloyd, S. Aveson, C. Vara, T. Firkins, P. Bly, M. Privee

Lake Description

Galway Lake is 523.03-acres. It is located in the town of Galway, Saratoga County. The team launched three canoes at a private residence located on Lake Road in Galway.

Aquatic Invasive Plant Presence

Potamogeton crispus (curly-leaf pondweed) and *Myriophyllum spicatum* (Eurasian watermilfoil) were both detected.

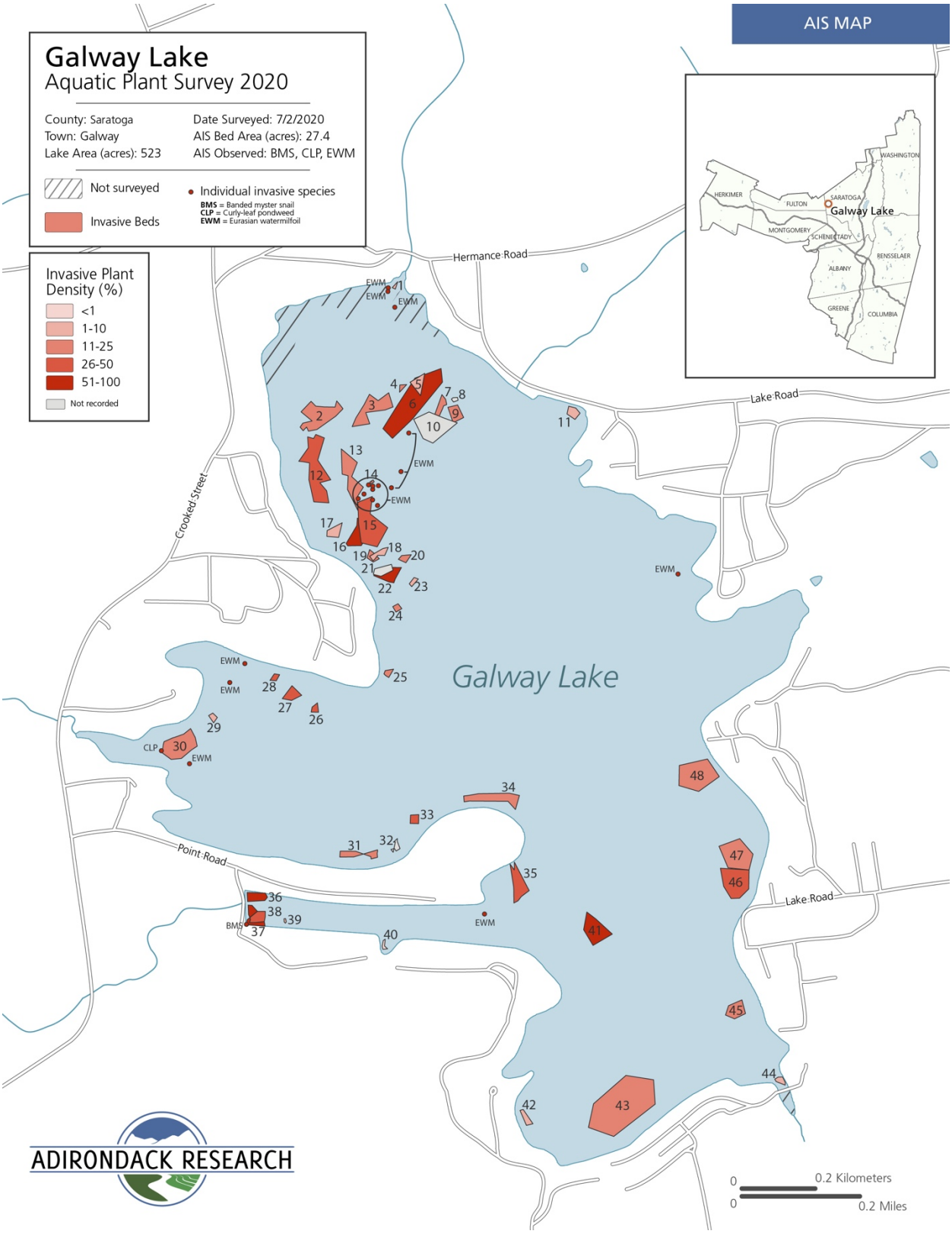
Native Plant Biota

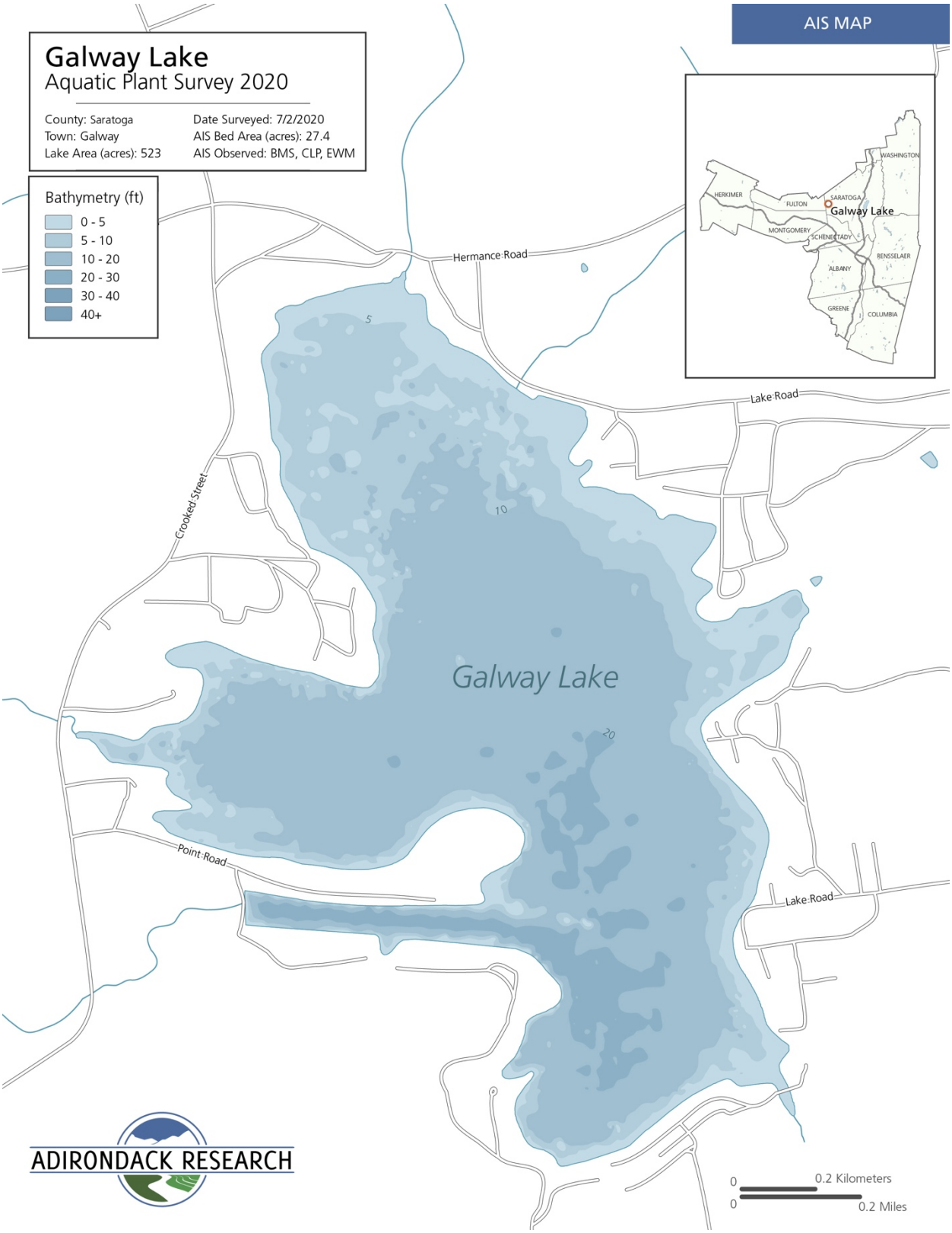
Species observed included: *Potamogeton amplifolius* (large-leaf pondweed), *Potamogeton praelongus* (white-stem pondweed), *Potamogeton perfoliatus* (clasping-leaf pondweed), *Potamogeton robbinsii* (Robbins' pondweed), *Potamogeton pusillus* (slender pondweed), *Ceratophyllum demersum* (coontail), *Chara spp.* (muskgrass), *Persicaria amphibia* (water smartweed), *Sparganium angustifolium* (narrow-leaf burr-reed) and *Najas spp.* (stonewort).

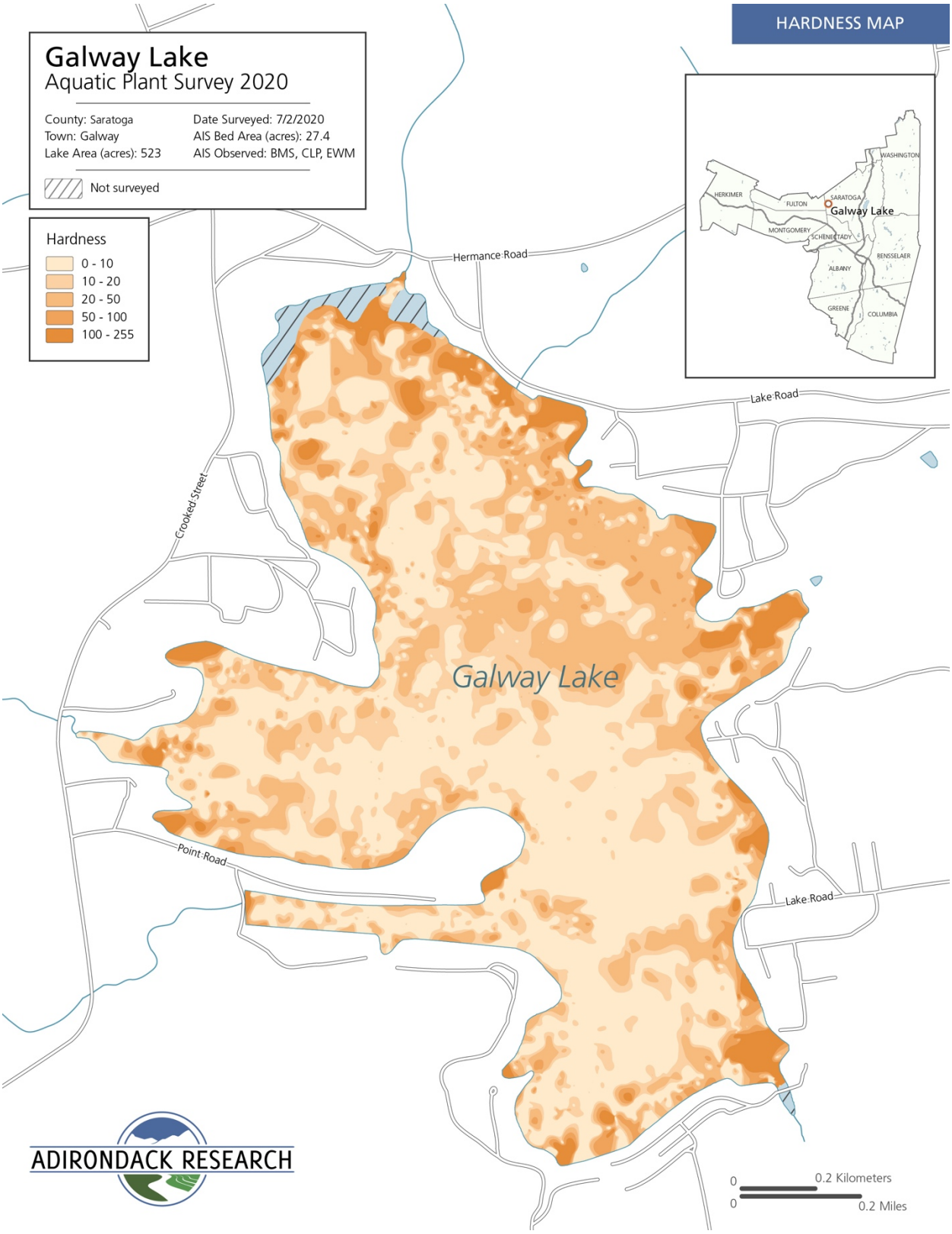
Invasive Species Percent Cover (See map on adjacent page)

Eurasian watermilfoil				Eurasian watermilfoil				Eurasian watermilfoil			
Bed	Size (Ac.)	Size (Sq. Ft.)	% Cover	Bed	Size (Ac.)	Size (Sq. ft)	%	Bed	Size (Ac.)	Size (Sq. Ft.)	% Cover
1	.02	1034.42	1-10	22	.31	13403.44	51-100	42	.14	6311.70	1-10
2	1.20	52444.60	11-25	23	.06	2761.68	1-10	43	4.51	196536.11	11-25
3	.96	41876.41	11-25	24	.07	3112.04	11-25	44	.09	3970.86	1-10
4	.04	1934.43	11-25	25	.08	3318.70	11-25	45	.42	18401.95	11-25
5	.26	11288.49	1-10	26	.08	3534.26	26-50	46	1.20	52345.62	26-50
6	2.49	108623.79	51-100	27	.25	10989.66	26-50	47	1.27	55176.81	11-25
7	.20	8508.16	11-25	28	.07	3017.62	26-50	48	1.60	69480.76	11-25
8	.04	1596.72	NR	29	.07	3228.91	1-10				
9	.29	12534.69	11-25	30	1.16	50325.78	11-25				
10	1.31	57230.29	NR	31	.31	13561.33	11-25				
11	.18	7998.69	1-10	32	.08	3535.60	NR				
12	1.78	77394.56	26-50	33	.13	5635.20	26-50				
13	.93	40693.04	11-25	34	.78	33892.00	11-25				
14	.01	653.21	11-25	35	.63	27551.07	26-50				
15	1.53	66633.03	26-50	36	.28	12061.55	51-100				
16	.35	15442.51	51-100	37	.25	10770.60	51-100				
17	.23	10097.51	1-10	38	.25	10894.52	26-50				
18	.16	7012.17	1-10	39	.01	567.91	1-10				
19	.09	3811.20	11-25	40	.04	1849.81	<1				
20	.10	4354.54	11-25	41	.85	36932.78	51-100				
21	.25	10770.67	NR								

% cover NR = not recorded


AIS MAP
Galway Lake
Aquatic Plant Survey 2020
County: Saratoga
Town: Galway
Lake Area (acres): 523
Date Surveyed: 7/2/2020
AIS Bed Area (acres): 27.4
AIS Observed: BMS, CLP, EWM
Not surveyed
Invasive Beds
Individual invasive species
BMS = Banded myster snail
CLP = Curly-leaf pondweed
EWM = Eurasian watermilfoil
Invasive Plant Density (%)
<1
1-10
11-25
26-50
51-100
Not recorded
WASHINGTON
HERKIMER
FULTON
SARATOGA
Galway Lake
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
GREENE
COLUMBIA
Hermance Road
Lake Road
Crooked Street
Point Road
Galway Lake
EWM
CLP
BMS
0
0.2 Kilometers
0
0.2 Miles


AIS MAP
Galway Lake
Aquatic Plant Survey 2020
County: Saratoga
Town: Galway
Lake Area (acres): 523
Date Surveyed: 7/2/2020
AIS Bed Area (acres): 27.4
AIS Observed: BMS, CLP, EWM
Bathymetry (ft)
0 - 5
5 - 10
10 - 20
20 - 30
30 - 40
40+
Hermance Road
Lake Road
Crooked Street
Point Road
Lake Road
Galway Lake
5
10
20
WASHINGTON
HERKIMER
FULTON
SARATOGA
Galway Lake
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
GREENE
COLUMBIA
ADIRONDACK RESEARCH
0
0.2 Kilometers
0
0.2 Miles



ADIRONDACK RESEARCH

Lake Desolation

Survey Date: June 30, 2020
Survey Team: C. Vara, T. Firkins, S. Aveson, C. Lloyd, M. Privee, P. Bly

Lake Description

Lake Desolation is 68.21-acres. It is located in the town of Greenfield, Saratoga County. The team launched two motorboats and a canoe at the boat launch on Lake Desolation Road, located at the south of the lake.

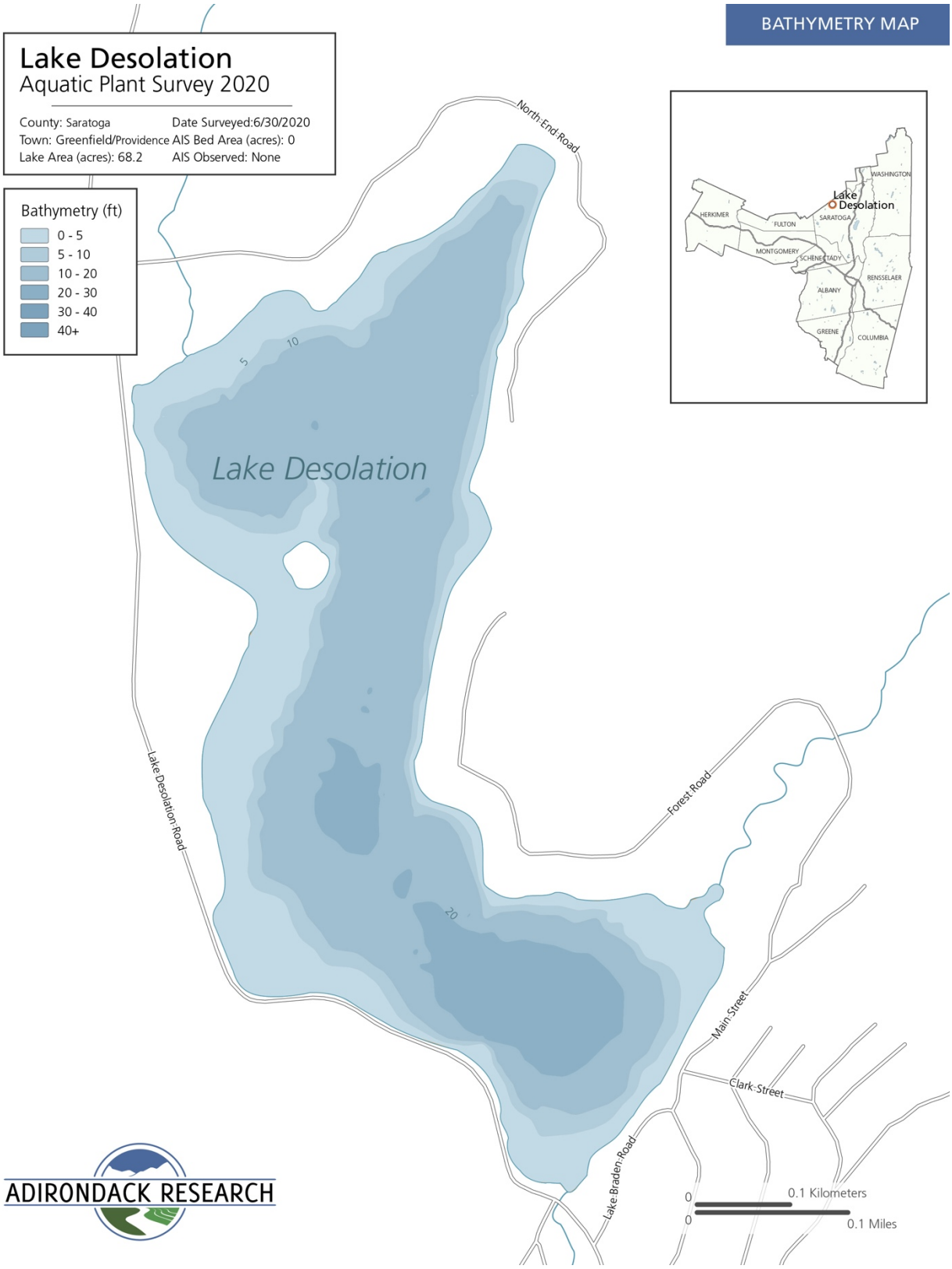
Aquatic Invasive Plant Presence

No invasive plants were detected.

Native Plant Biota

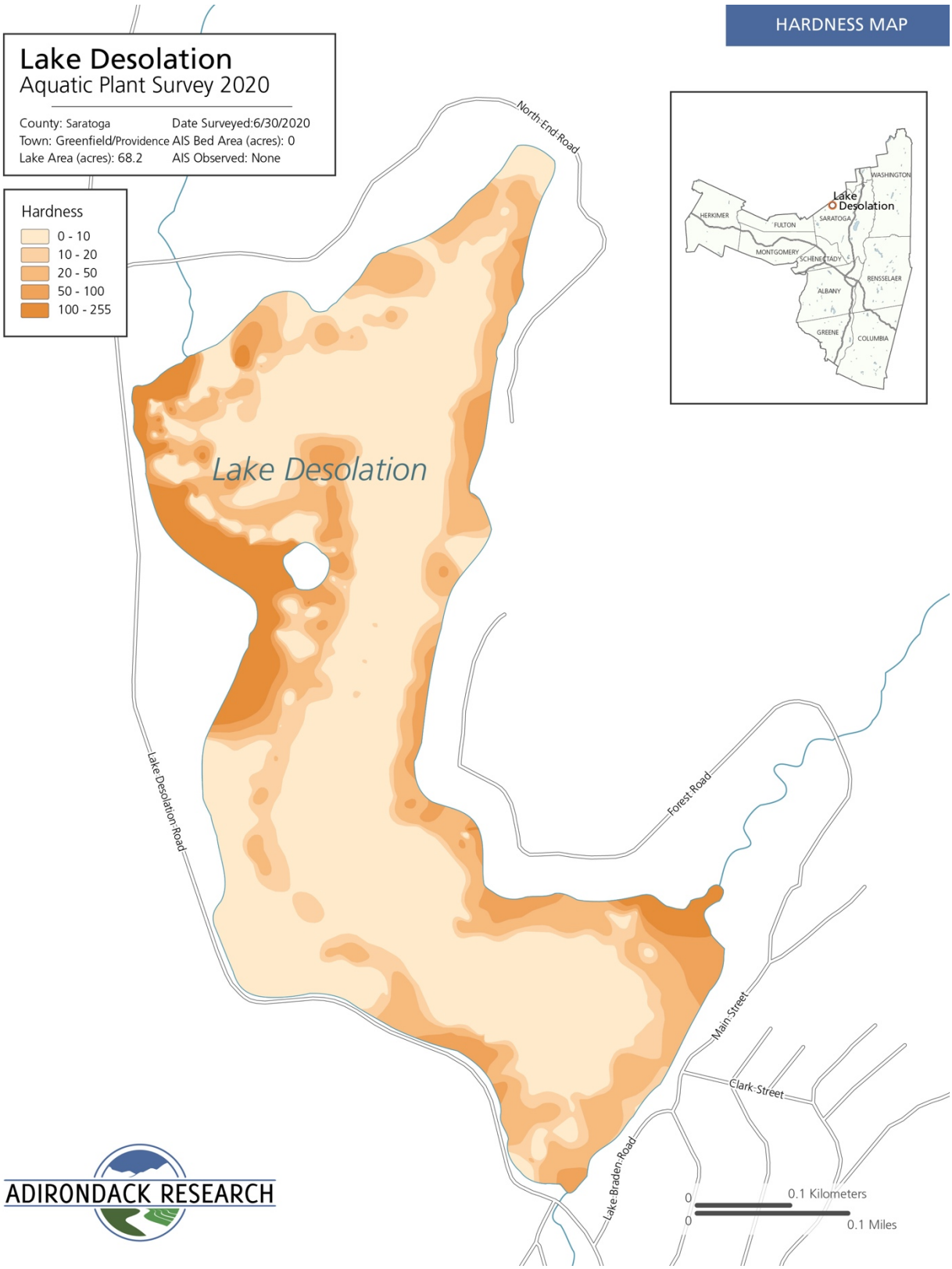
Comprehensive surveys of all the native plants found within the lake were not prioritized in this survey as this data has previously been collected June 2020. A combination of native floating and submerged plants was detected. These species include: *Nymphaea odorata* (white water lily), *Nuphar variegata* (spatterdock), *Potamogeton amplifolius* (large-leaf pondweed), *Brasenia schreberi* (watershield), *Utricularia macrorhiza* (common bladderwort), *Sparganium angustifolium* (narrow-leaf bur-reed), Myriophyllum sibiricum (northern watermilfoil), *Pontederia cordata* (pickerelweed) and *Potamogeton natans* (floating-leaf pondweed).

BATHYMETRY MAP



ADIRONDACK RESEARCH

HARDNESS MAP



ADIRONDACK RESEARCH

Lake Nancy

Survey Date: July 2, 2020
Survey Team: P. Bly, T. Firkins

Lake Description

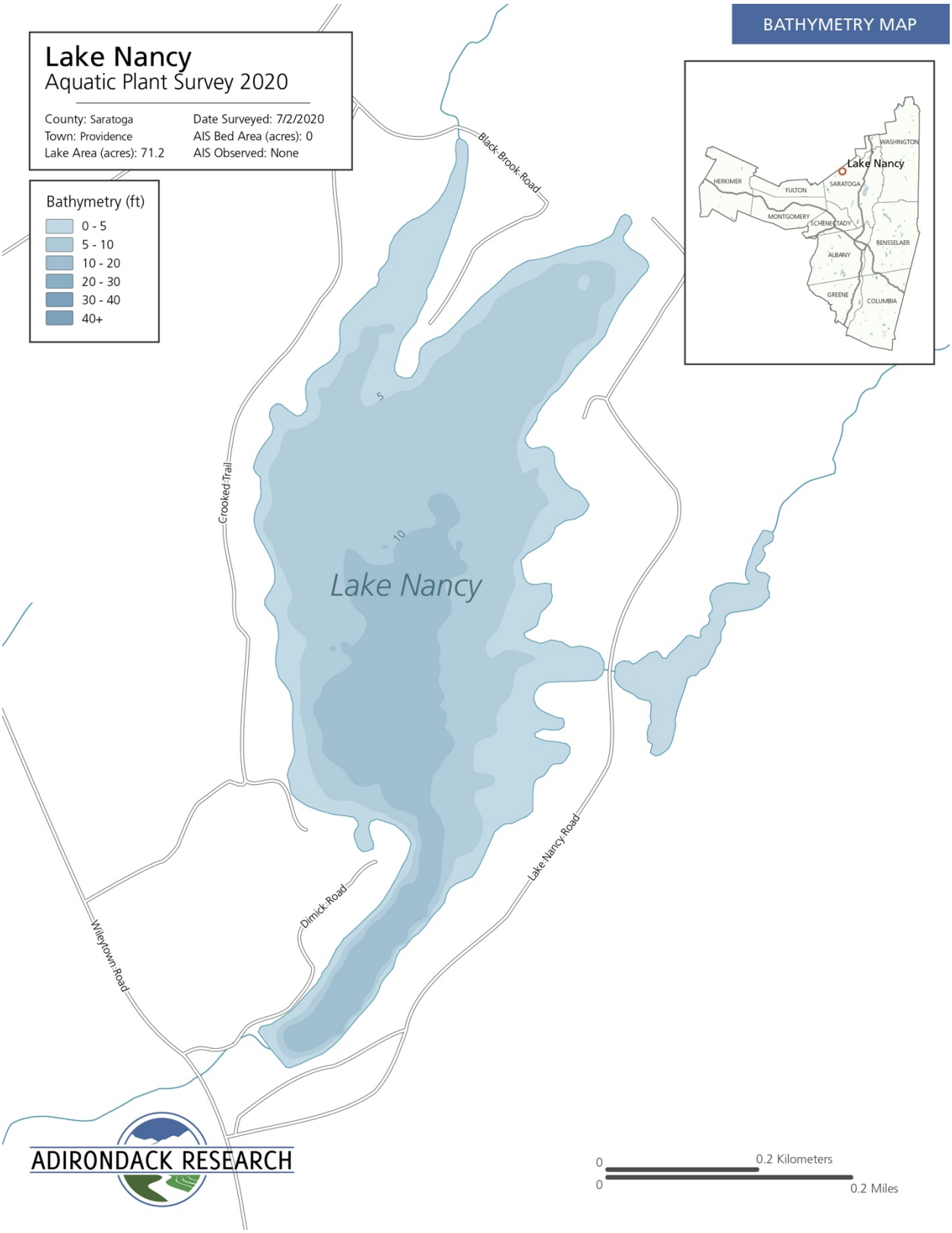
Lake Nancy is a 71-acre lake. It is located in the town of Middle Grove, Saratoga County. The team launched one motorboat at a private soft launch.

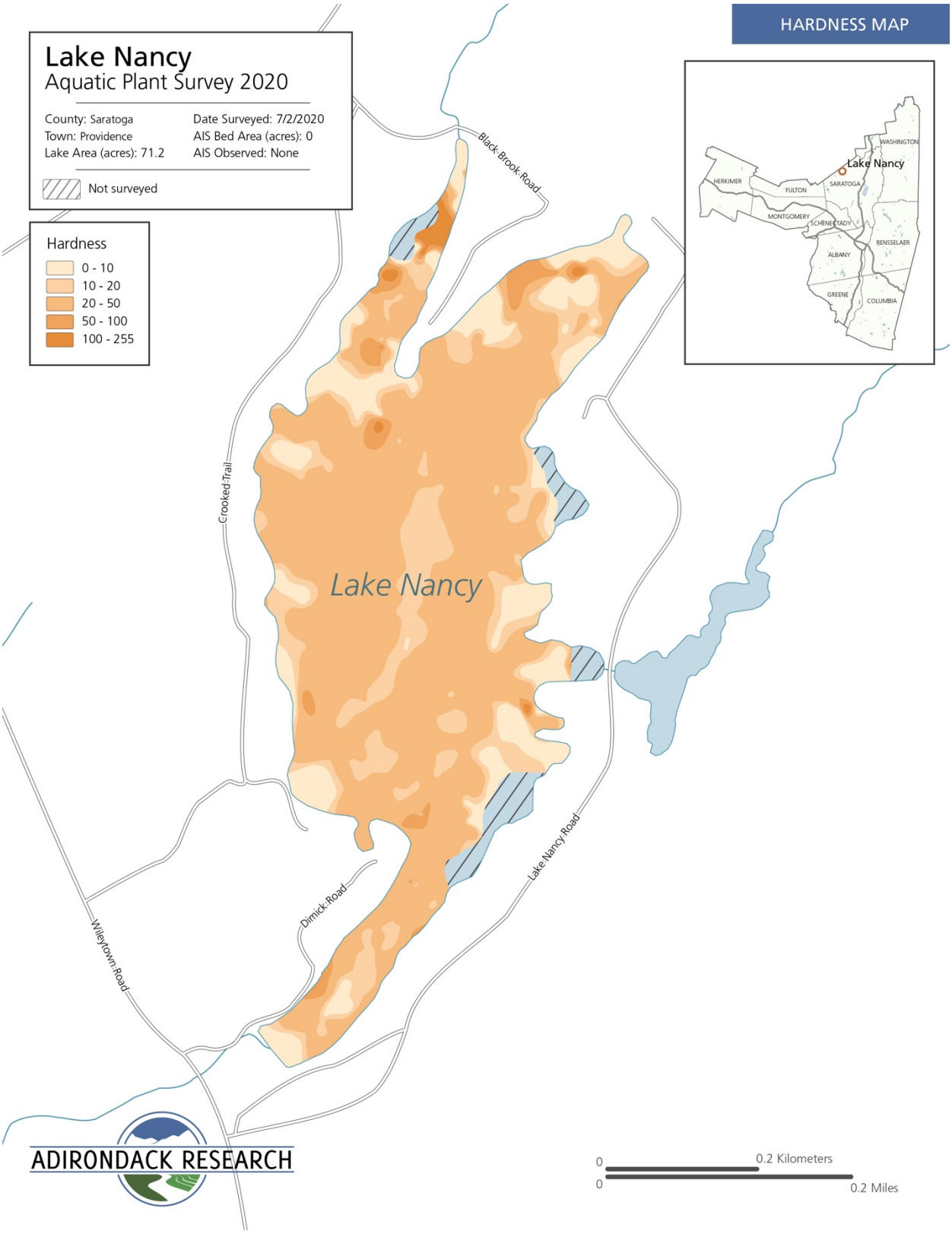
Aquatic Invasive Plant Presence

No invasive plants were detected.

Native Plant Biota

Comprehensive surveys of all native plants found within the lake were recorded. Native plants detected included: *Nymphaea odorata* (white water lily), *Brasenia schreberi* (watershield), (spatterdock), *Utricularia* (bladderwort), *Potamogeton amplifolius* (large-leaf pondweed), *Potamogeton robbinsii* (Robbins' pondweed), and *Myriophyllum humile* (low water milfoil).


BATHYMETRY MAP
Lake Nancy
Aquatic Plant Survey 2020
County: Saratoga
Town: Providence
Lake Area (acres): 71.2
Date Surveyed: 7/2/2020
AIS Bed Area (acres): 0
AIS Observed: None
Bathymetry (ft)
0 - 5
5 - 10
10 - 20
20 - 30
30 - 40
40+
Black Brook Road
Crooked Trail
Lake Nancy
Lake Nancy Road
Dimick Road
Wileytown Road
5
10
WASHINGTON
Lake Nancy
HERKIMER
FULTON
SARATOGA
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
GREENE
COLUMBIA
0
0.2 Kilometers
0
0.2 Miles
ADIRONDACK RESEARCH


HARDNESS MAP
Lake Nancy
Aquatic Plant Survey 2020
County: Saratoga
Town: Providence
Lake Area (acres): 71.2
Date Surveyed: 7/2/2020
AIS Bed Area (acres): 0
AIS Observed: None
Not surveyed
Hardness
0 - 10
10 - 20
20 - 50
50 - 100
100 - 255
Black Brook Road
Crooked Trail
Lake Nancy
Lake Nancy Road
Dimick Road
Wileytown Road
WASHINGTON
Lake Nancy
HERKIMER
FULTON
SARATOGA
MONTGOMERY
SCHENECTADY
BENSSELAER
ALBANY
GREENE
COLUMBIA
ADIRONDACK RESEARCH
0
0.2 Kilometers
0
0.2 Miles

Lake Sunnyside

Survey Date: June 30, 2020
Survey Team: C. Vara, T. Firkins

Lake Description

Lake Sunnyside is approximately 40-acres. It is located in the town of Queensbury, Warren County. The team launched one motorboat at a private roadside, soft boat launch located off of Sunnyside Drive.

Aquatic Invasive Plant Presence

Two aquatic invasive species were found, *Myriophyllum spicatum* (Eurasian watermilfoil) and *Potamogeton crispus* (curly-leaf pondweed).

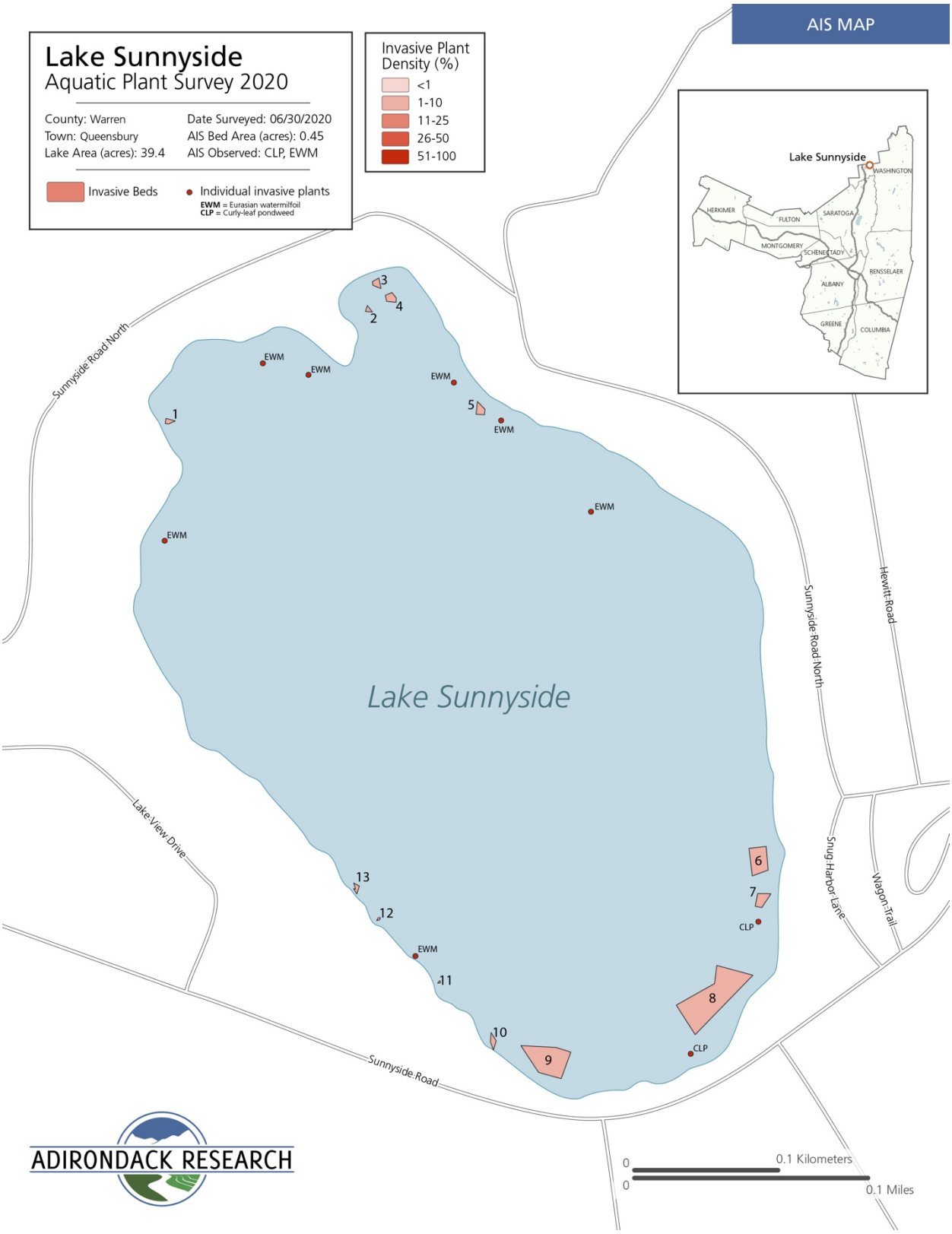
Native Plant Biota

A combination of native floating and submerged plants were detected. These species include: *Potamogeton amplifolius* (large-leaf pondweed), *Potamogeton robbinsii* (Robbins' pondweed), *Elodea canadensis* (common waterweed), *Potamogeton perfoliatus* (clasping-leaf pondweed), *Pontederia cordata* (pickerelweed), *Chara sp. (*muskgrass), *Potamogeton pusillus* (slender pondweed), and *Potamogeton gramineus* (variable pondweed).

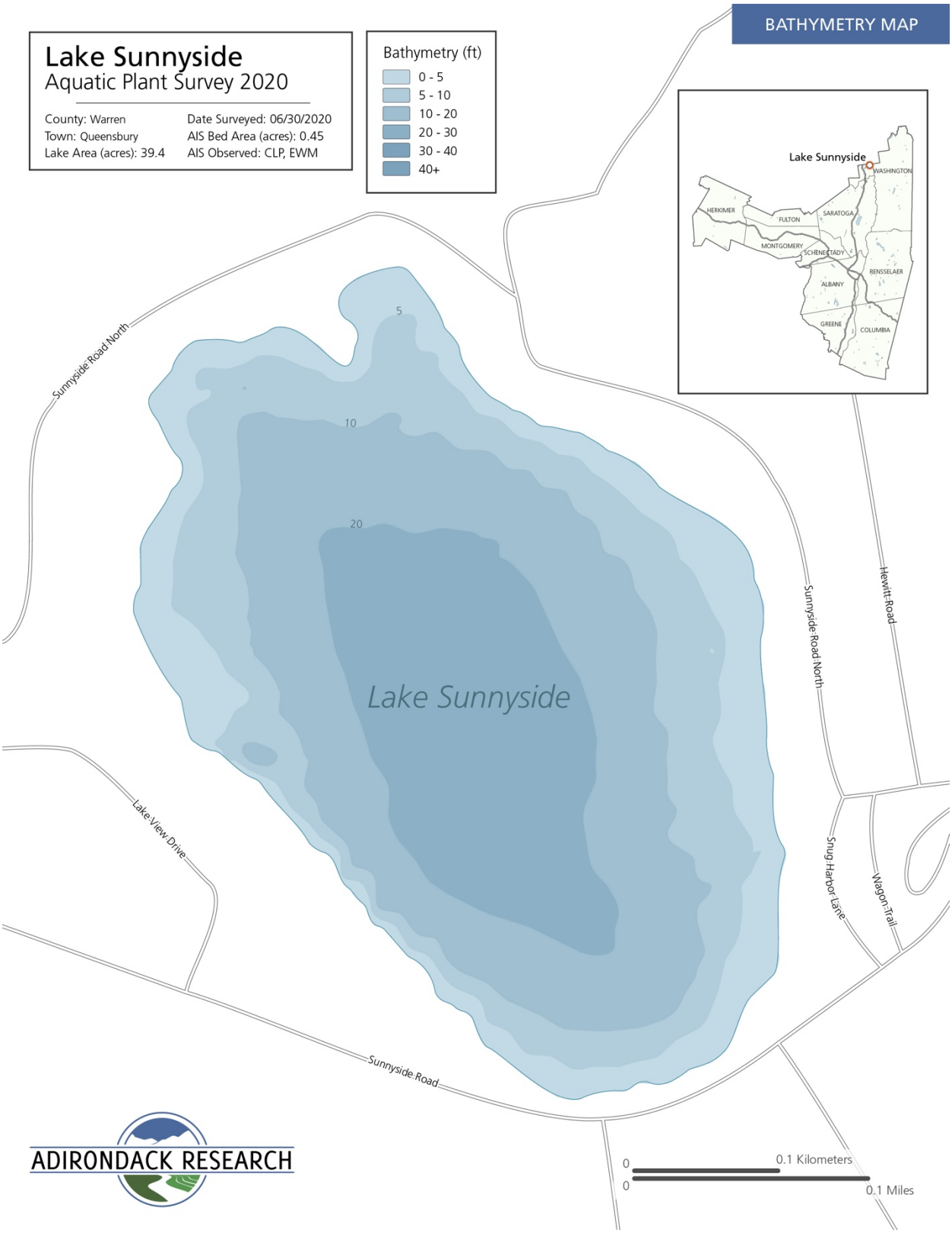
Invasive Species Percent Cover (See map on adjacent page)

Curly-leaf pondweed				Eurasian Watermilfoil			
Bed	Size (Ac.)	Size (Sq. Ft.)	% Cover	Bed	Size (Ac.)	Size (Sq. Ft.)	% Cover
1	.004	154.38	1-10	3	.006	257.15	1-10
2	.002	105.77	1-10	6	.05	2156.02	1-10
4	.01	377.62	1-10	7	.02	675.78	1-10
5	.01	376.60	1-10	8	.23	9983.64	1-10
6	.05	2156.02	1-10	9	.12	5030.84	1-10
9	.12	5030.84	1-10	13	.003	149.81	1-10
10	.01	259.52	1-10				
11	.0004	19.41	1-10				
12	.001	30.16	1-10				
13	.003	149.81	1-10				

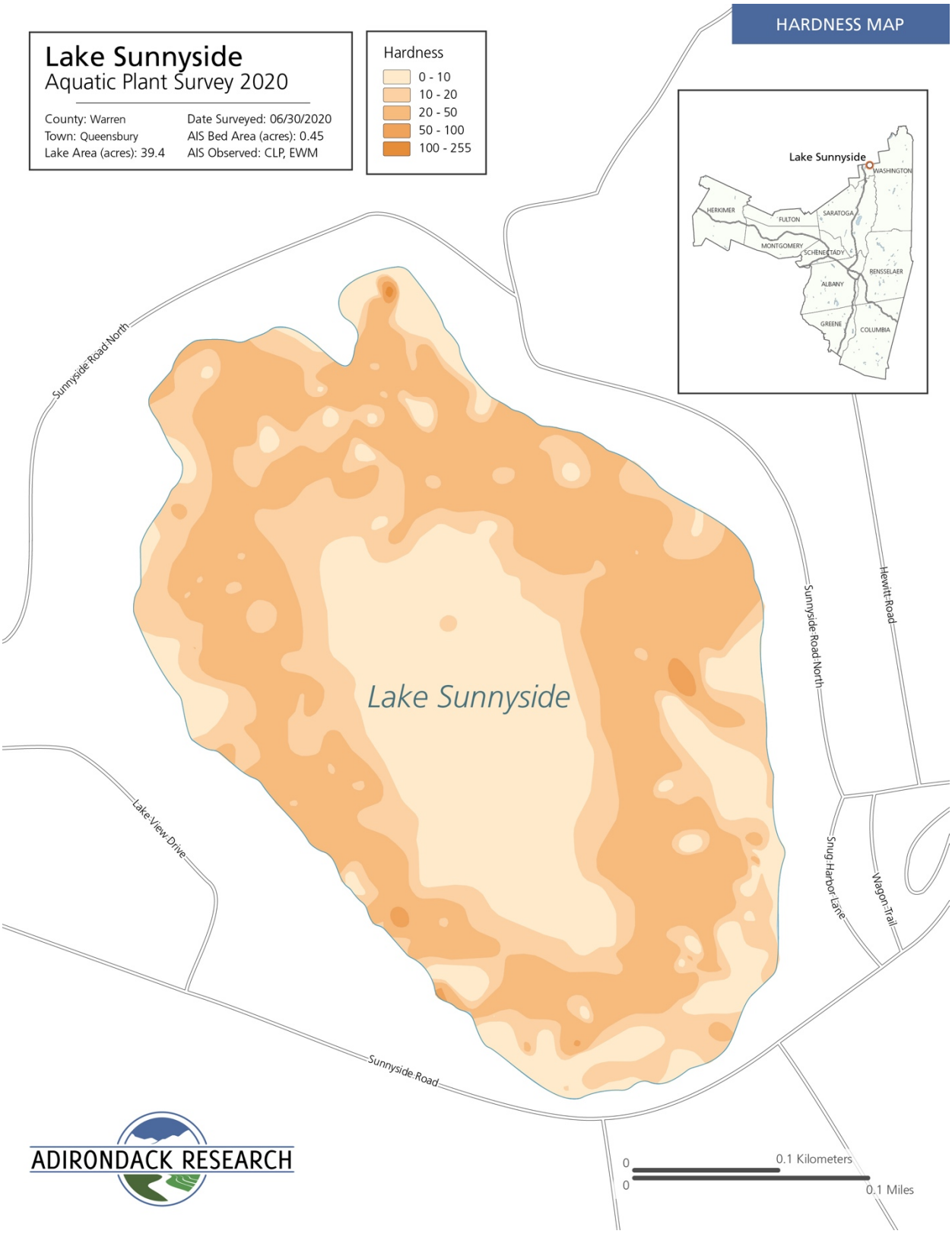
AIS MAP



ADIRONDACK RESEARCH


BATHYMETRY MAP
Lake Sunnyside
Aquatic Plant Survey 2020
County: Warren
Town: Queensbury
Lake Area (acres): 39.4
Date Surveyed: 06/30/2020
AIS Bed Area (acres): 0.45
AIS Observed: CLP, EWM
Bathymetry (ft)
0 - 5
5 - 10
10 - 20
20 - 30
30 - 40
40+
Lake Sunnyside
WASHINGTON
HERKIMER
FULTON
SARATOGA
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
GREENE
COLUMBIA
5
10
20
Lake Sunnyside
Sunnyside Road North
Sunnyside Road North
Hewitt Road
Lake View Drive
Snug Harbor Lane
Wagon Trail
Sunnyside Road
ADIRONDACK RESEARCH
0
0.1 Kilometers
0
0.1 Miles

HARDNESS MAP



ADIRONDACK RESEARCH

Lake Myosotis

Survey Date: August 18, 2020
Survey Team: C. Vara, T, Firkins

Lake Description

Lake Myosotis is 91-acre lake found in Rensselaerville, Albany County. The team launched one canoe from the eastern side of the lake at the public, soft boat launch on the Hyuck Preserve.

Invasive Animal Presence

Beds of *Myriophyllum spicatum* (Eurasian watermilfoil) were detected in Lake Myosotis. In total, 5 beds of *Myriophyllum spicatum* were mapped.

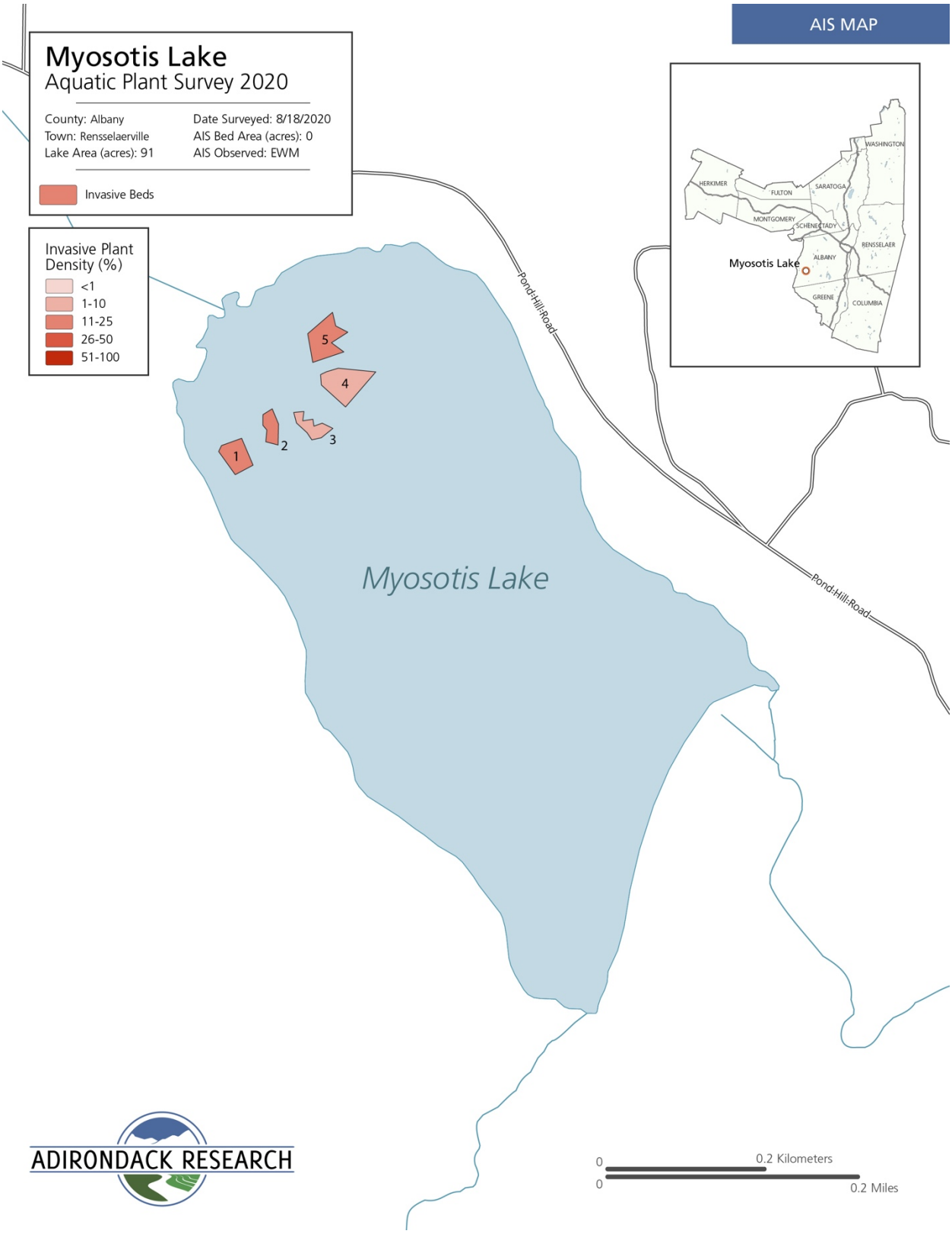
Native Plant Biota

Comprehensive surveys of all native plants found within the lake were recorded. Native plants detected included: *Elodea canadensis* (elodea).

Invasive Species Percent Cover (See map on adjacent page)

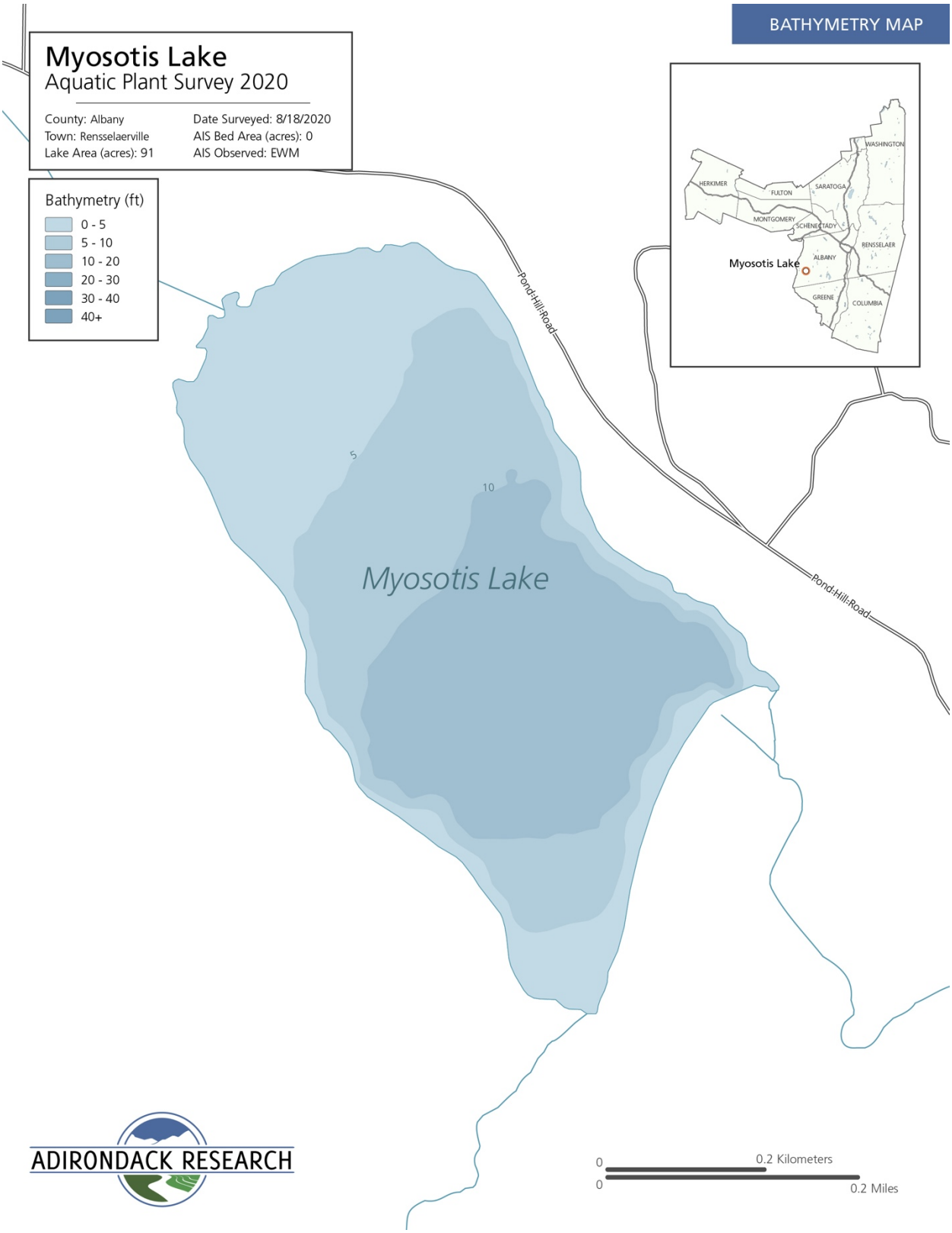
Eurasian watermilfoil				
Bed	Species	Size (Ac.)	Size (Sq. Ft.)	% Cover
1	EWM	0.29	12630.19	11-25
2	EWM	0.16	7157.12	11-25
3	EWM	0.18	8022.17	1-10
4	EWM	0.48	21105.95	1-10
5	EWM	0.43	18649.87	11-25

AIS MAP

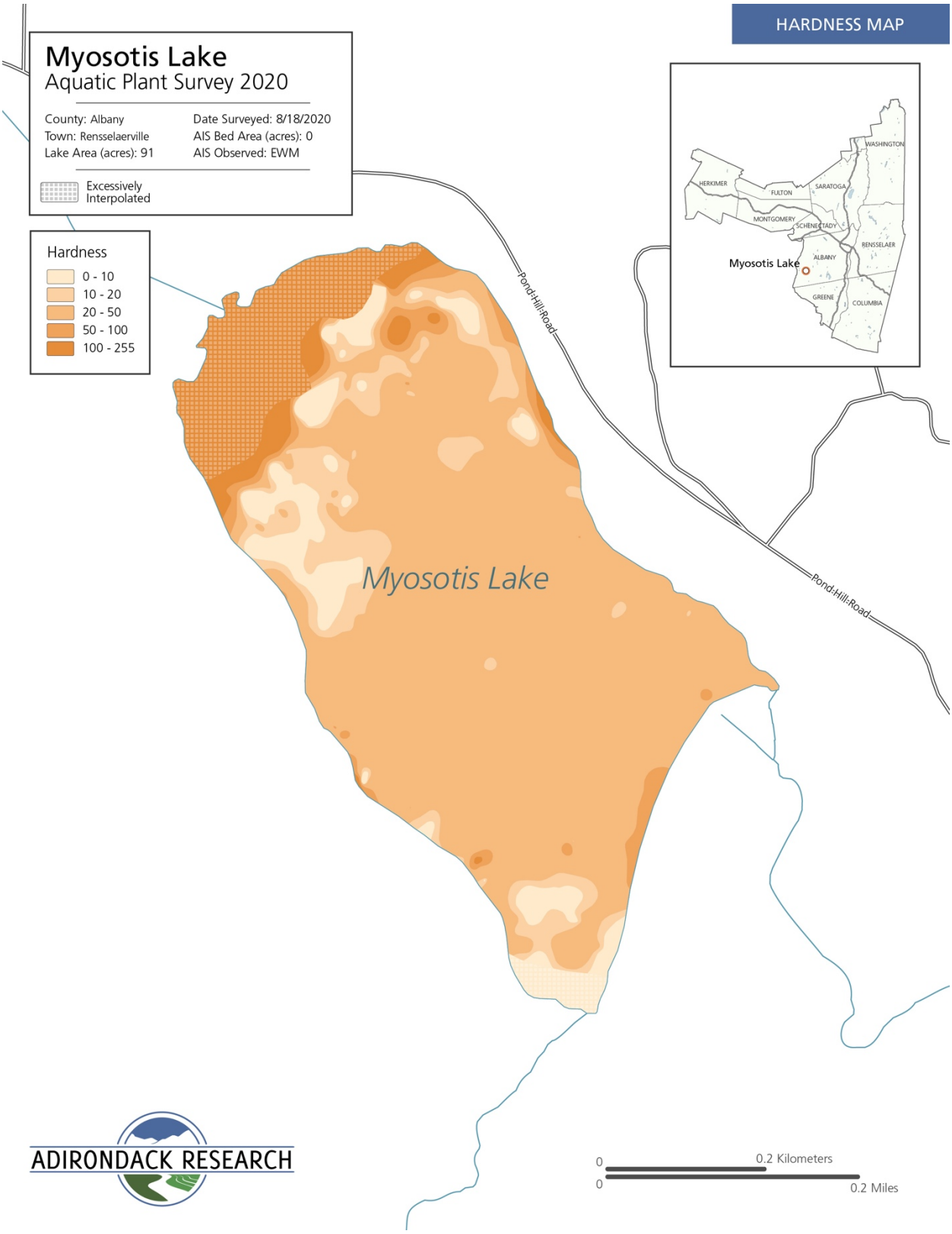


ADIRONDACK RESEARCH

BATHYMETRY MAP



HARDNESS MAP



ADIRONDACK RESEARCH

Rensselaer Lake

Survey Date: August 20th, 2020
Survey Team: C. Vara, T. Firkins

Lake Description

Rensselaer Lake is a 35-acre lake found within Six Mile Waterworks Park and is located in the town of Colonie, Rensselaer County. The team launched one canoe from the southeast shore of the Lake within the park.

Aquatic Invasive Plant Presence

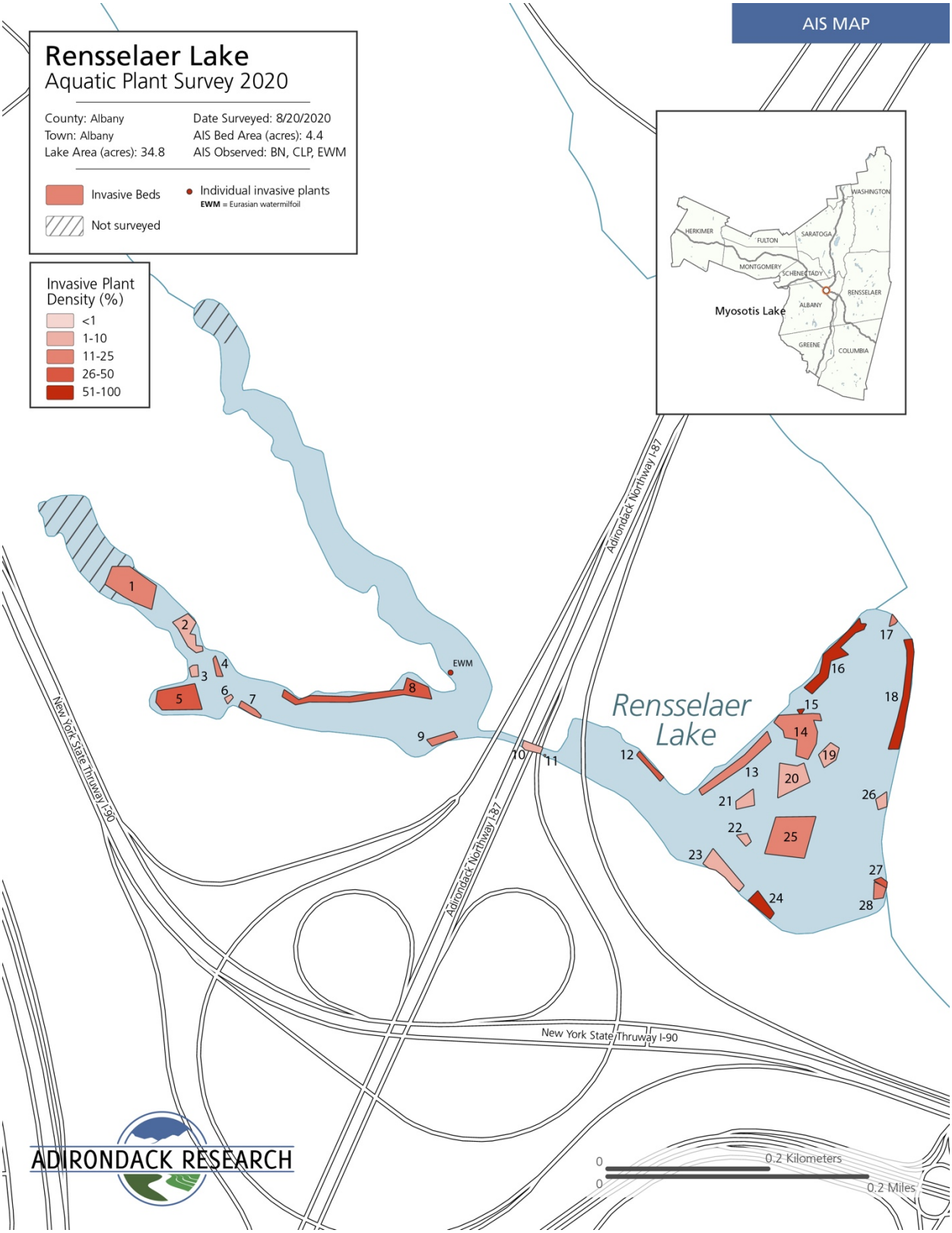
Beds of *Myriophyllum spicatum* (Eurasian watermilfoil), *Potamogeton crispus* (curly-leaf pondweed), and *Najas minor* (brittle naiad) were detected in Rensselaer Lake. In total 17 beds of *Myriophyllum spicatum*, 11 beds of *Najas minor*, and 2 beds of *Potamogeton crispus* were mapped.

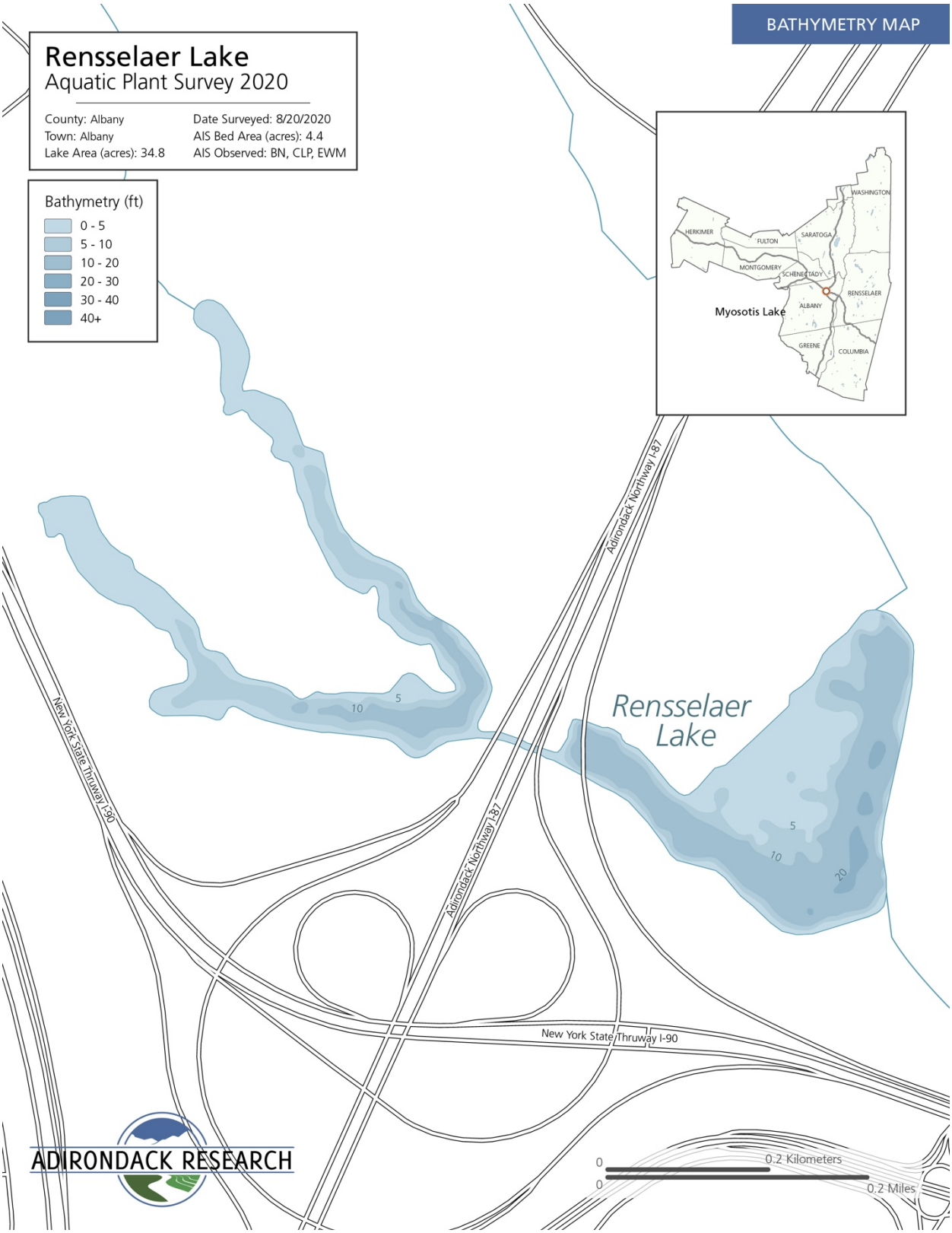
Native Plant Biota

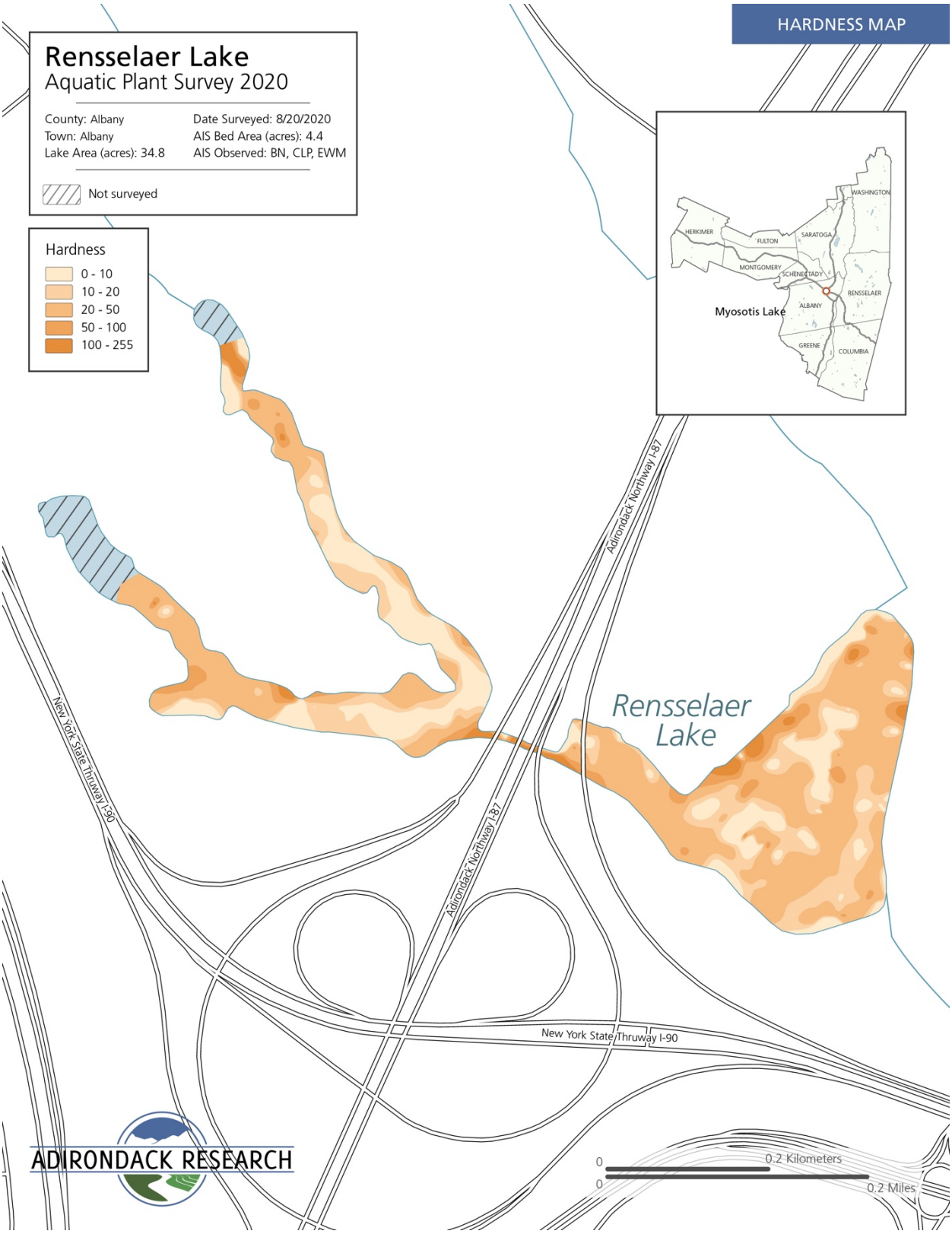
Comprehensive surveys of all native plants found within the lake were recorded. Native plants detected included: *Ceratophyllum demersum* (coontail), *Potamogeton natans* (floating-leaf pondweed), and *Vallisneria americana* (Eelgrass).

Invasive Species Percent Cover (See map on adjacent page)

Eurasian watermilfoil				Brittle naiad				Curly-leaf pondweed			
Bed	Size (Ac.)	Size (Sq. Ft.)	% Cover	Bed	Size (Ac.)	Size (Sq. ft)	%	Bed	Size (Ac.)	Size (Sq. Ft.)	% Cover
1	.48	20813.24	11-25	10	.05	2141.99	1-10	16	.29	12650.48	1-10
2	.17	7431.53	1-10	12	.05	2359.58	26-50	20	.27	11651.88	1-10
3	.03	1248.02	1-10	15	.01	279.31	51-100				
4	.03	1295.60	11-25	16	.29	12650.48	51-100				
5	.34	14684.61	26-50	17	.02	686.70	11-25				
6	.01	553.79	1-10	18	.29	12547.69	51-100				
7	.05	1965.94	11-25	21	.08	3366.55	1-10				
8	.38	16391.04	26-50	22	.03	1435.67	1-10				
9	.07	2965.86	11-25	23	.19	8352.19	1-10				
11	.0005	21.39	1-10	24	.10	4456.96	51-100				
13	.25	11105.55	11-25	27	.02	964.41	26-50				
14	.45	19494.18	11-25								
19	.10	4478.97	1-10								
20	.27	11651.88	1-10								
25	.58	25202.38	11-25								
26	.04	1948.38	1-10								
28	.05	2275.09	11-25								


Rensselaer Lake
Aquatic Plant Survey 2020
County: Albany
Town: Albany
Lake Area (acres): 34.8
Date Surveyed: 8/20/2020
AIS Bed Area (acres): 4.4
AIS Observed: BN, CLP, EWM
Invasive Beds
Individual invasive plants
EWM = Eurasian watermilfoil
Not surveyed
Invasive Plant Density (%)
<1
1-10
11-25
26-50
51-100
AIS MAP
WASHINGTON
HERKIMER
FULTON
SARATOGA
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
GREENE
COLUMBIA
Myosotis Lake
Adirondack Northway I-87
New York State Thruway I-90
EWM
Rensselaer Lake
ADIRONDACK RESEARCH
0
0.2 Kilometers
0
0.2 Miles


BATHYMETRY MAP
Rensselaer Lake
Aquatic Plant Survey 2020
County: Albany
Town: Albany
Lake Area (acres): 34.8
Date Surveyed: 8/20/2020
AIS Bed Area (acres): 4.4
AIS Observed: BN, CLP, EWM
Bathymetry (ft)
0 - 5
5 - 10
10 - 20
20 - 30
30 - 40
40+
WASHINGTON
HERKIMER
FULTON
SARATOGA
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
Myosotis Lake
GREENE
COLUMBIA
Adirondack Northway I-87
New York State Thruway I-90
Rensselaer Lake
5
10
20
0
0.2 Kilometers
0.2 Miles
ADIRONDACK RESEARCH


HARDNESS MAP
Rensselaer Lake
Aquatic Plant Survey 2020
County: Albany
Town: Albany
Lake Area (acres): 34.8
Date Surveyed: 8/20/2020
AIS Bed Area (acres): 4.4
AIS Observed: BN, CLP, EWM
Not surveyed
Hardness
0 - 10
10 - 20
20 - 50
50 - 100
100 - 255
WASHINGTON
HERKIMER
FULTON
SARATOGA
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
Myosotis Lake
GREENE
COLUMBIA
Adirondack Northway I-87
New York State Thruway I-90
Rensselaer Lake
0
0.2 Kilometers
0
0.2 Miles
ADIRONDACK RESEARCH

Rockwood Lake

Survey Date: June 30,2020
Survey team: P.Bly, M.Privee, C.Lloyd, S.Aveson

Lake Description

Rockwood Lake is a 78.47-acre lake found in the towns of Ephratah and Johnstown, in Fulton county. Two canoes were used to survey and launched from a soft boat launch on the southern shore of the lake off of Cemetery Road.

Aquatic Invasive Plant Presence

Comprehensive surveys of all aquatic invasive plants were recorded. Several dense beds of *Myriophyllum heterophyllum* (variable-leaf milfoil) and *Myriophyllum spicatum* (Eurasian milfoil) were detected throughout the lake. One small bed of *Potamogeton crispus* (curly-leaf pondweed) was also found along the southeastern end of the lake.

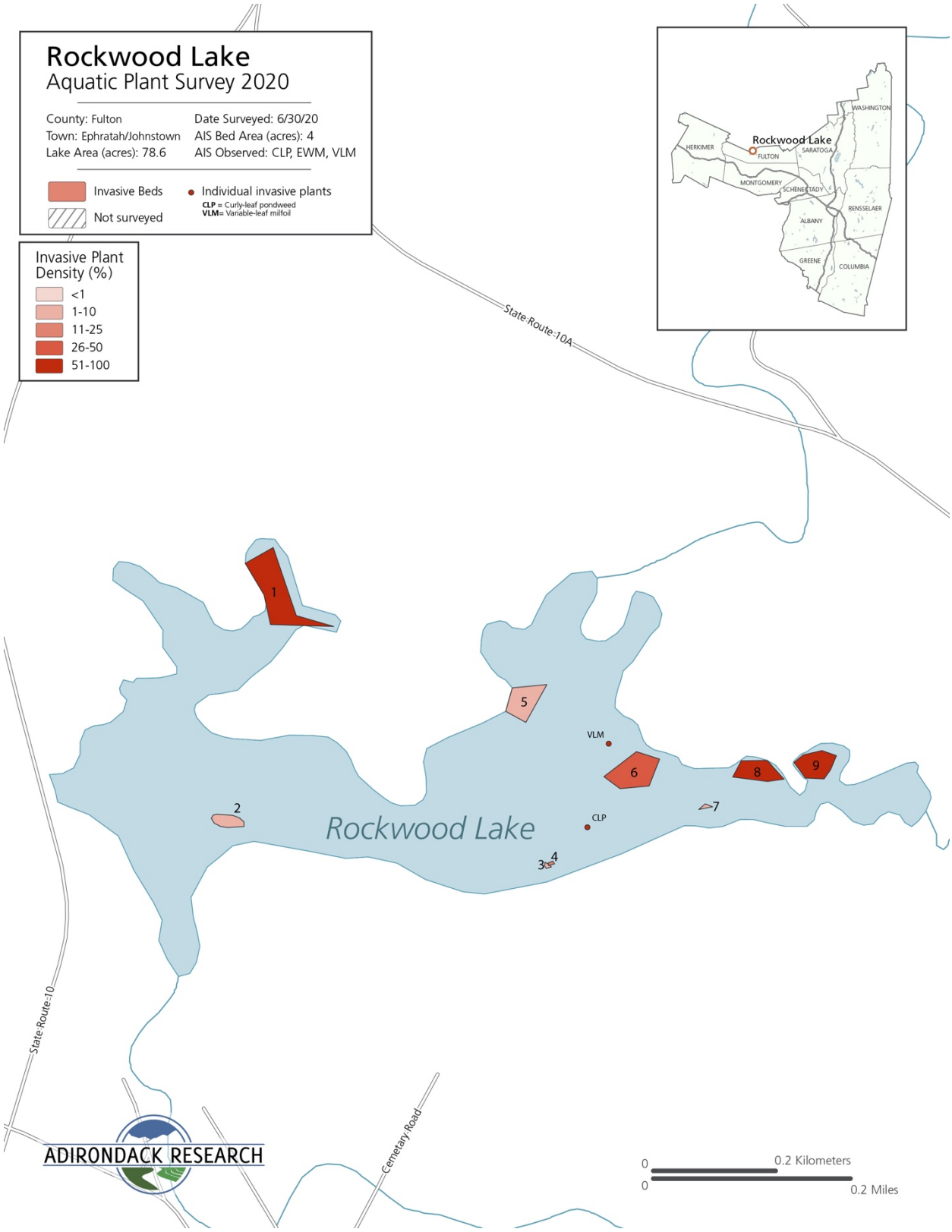
Native Plant Biota

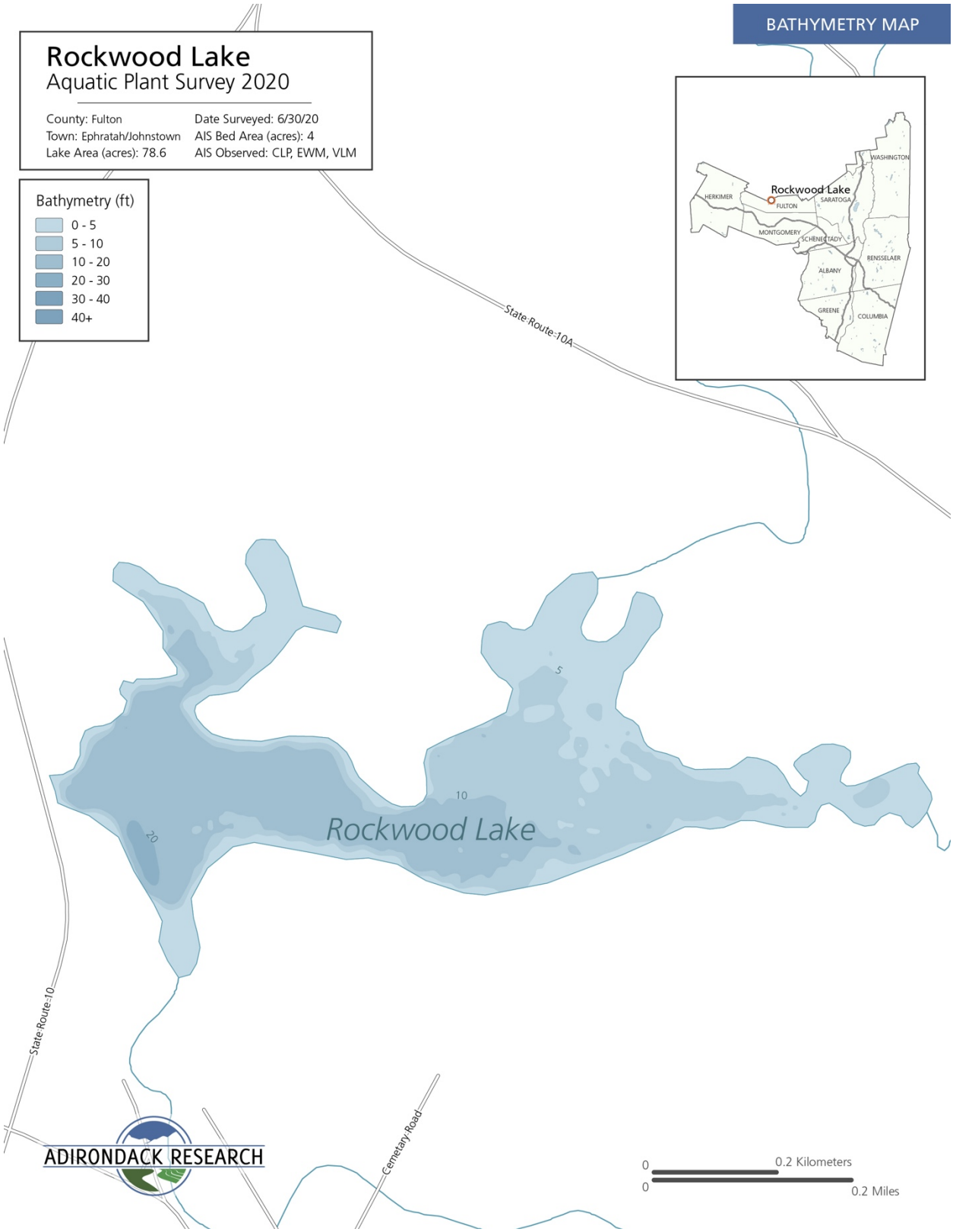
Comprehensive surveys of all native plants found within the lake were recorded. Native plants detected included: *Brasenia schreberi* (watershield), *Nuphar variegate* (spatterdock), *Elodea canadensis* (common waterweed), *Nymphaea odorata* (white water lily), *Pontederia cordata* (pickerelweed), *Utricularia macrorhiza* (bladderwort), *Sparganium angustifolium* (narrow-leaf burr-reed) and *Nitella spp.* (Nitella).

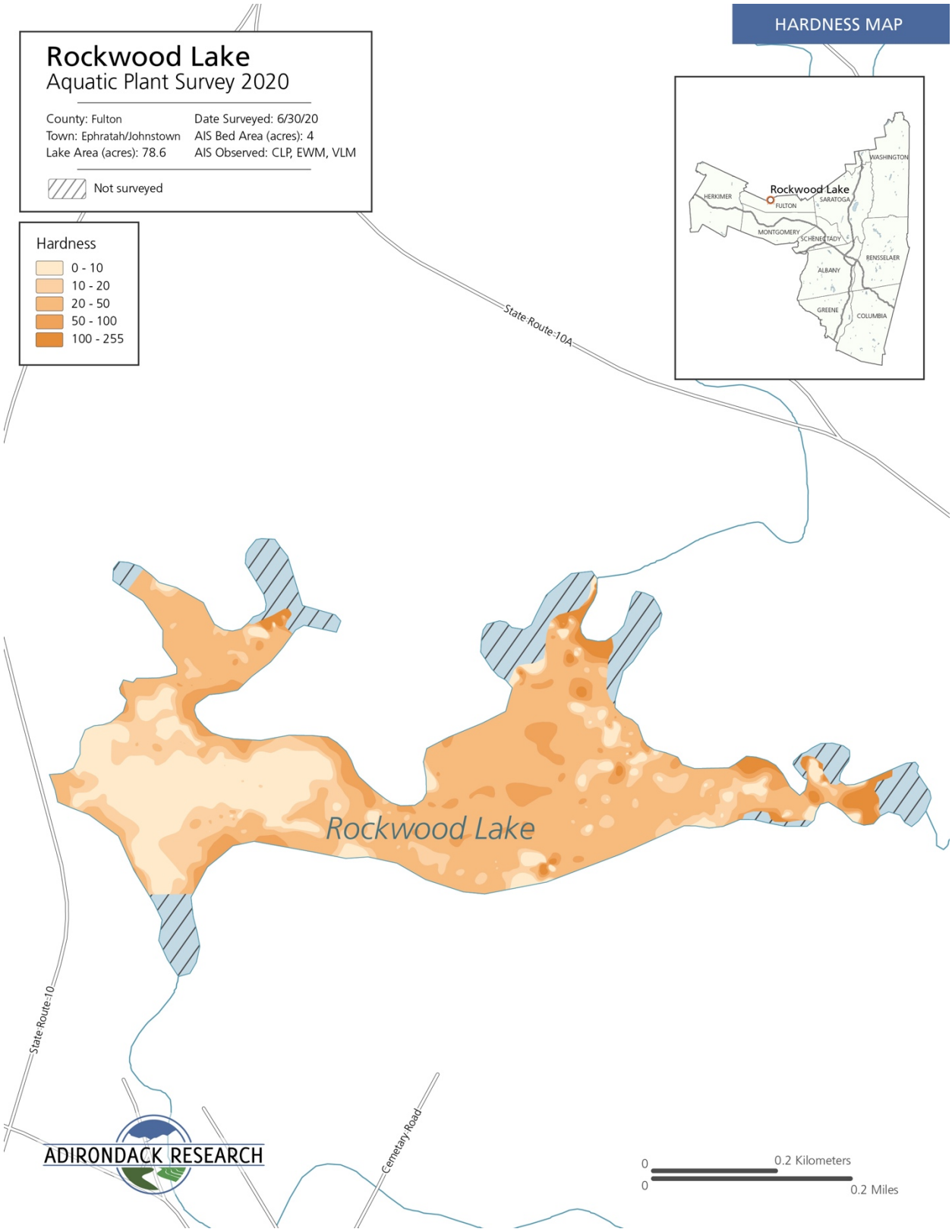
Invasive Species Percent Cover (See map on adjacent page)

Species				
Bed	Species	Size (Ac.)	Size (Sq. Ft.)	% Cover
1	VLW	1.36	59415.20	51-100
2	VLW	.21	9000.15	1-10
3	CLP	.01	611.72	1-10
4	VLW	.01	449.51	11-25
5	EWM	.56	24400.64	1-10
6	VLW	.79	34623.66	26-50
7	VLW	.02	836.74	1-10
8	VLW	.47	20546.29	51-100
9	VLW	.51	22398.78	51-100

VLW = Variable=leaf watermilfoil; CLP = Curly-leaf pondweed; EWM = Eurasian watermilfoil


Rockwood Lake
Aquatic Plant Survey 2020
County: Fulton
Town: Ephratah/Johnstown
Lake Area (acres): 78.6
Date Surveyed: 6/30/20
AIS Bed Area (acres): 4
AIS Observed: CLP, EWM, VLM
Invasive Beds
Not surveyed
Individual invasive plants
CLP = Curly-leaf pondweed
VLM= Variable-leaf milfoil
Invasive Plant Density (%)
<1
1-10
11-25
26-50
51-100
State Route 10A
State Route 10
Cemetary Road
Rockwood Lake
VLM
CLP
1
2
3
4
5
6
7
8
9
WASHINGTON
HERKIMER
FULTON
SARATOGA
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
GREENE
COLUMBIA
0
0.2 Kilometers
0
0.2 Miles
ADIRONDACK RESEARCH


Rockwood Lake
Aquatic Plant Survey 2020
County: Fulton
Town: Ephratah/Johnstown
Lake Area (acres): 78.6
Date Surveyed: 6/30/20
AIS Bed Area (acres): 4
AIS Observed: CLP, EWM, VLM
Bathymetry (ft)
0 - 5
5 - 10
10 - 20
20 - 30
30 - 40
40+
BATHYMETRY MAP
Rockwood Lake
HERKIMER
FULTON
SARATOGA
WASHINGTON
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
GREENE
COLUMBIA
State Route 10A
Rockwood Lake
5
10
20
State Route 10
Cemetery Road
ADIRONDACK RESEARCH
0
0.2 Kilometers
0
0.2 Miles


HARDNESS MAP
Rockwood Lake
Aquatic Plant Survey 2020
County: Fulton
Town: Ephratah/Johnstown
Lake Area (acres): 78.6
Date Surveyed: 6/30/20
AIS Bed Area (acres): 4
AIS Observed: CLP, EWM, VLM
Not surveyed
Hardness
0 - 10
10 - 20
20 - 50
50 - 100
100 - 255
WASHINGTON
Rockwood Lake
HERKIMER
FULTON
SARATOGA
MONTGOMERY
SCHENECTADY
BENSSELAER
ALBANY
GREENE
COLUMBIA
State Route 10A
Rockwood Lake
State Route 10
Cemetary Road
ADIRONDACK RESEARCH
0
0.2 Kilometers
0
0.2 Miles

Round Lake

Survey Date: June 10, 2020
Survey Team: P. Bly, T. Firkins

Lake Description

Round Lake is 321-acres. It is located in the town of Malta, Saratoga County. The team launched a motorboat at the public launch.

Aquatic Invasive Plant Presence

Potamogeton crispus (curly-leaf pondweed) and *Myriophyllum spicatum* (Eurasian watermilfoil) were detected.

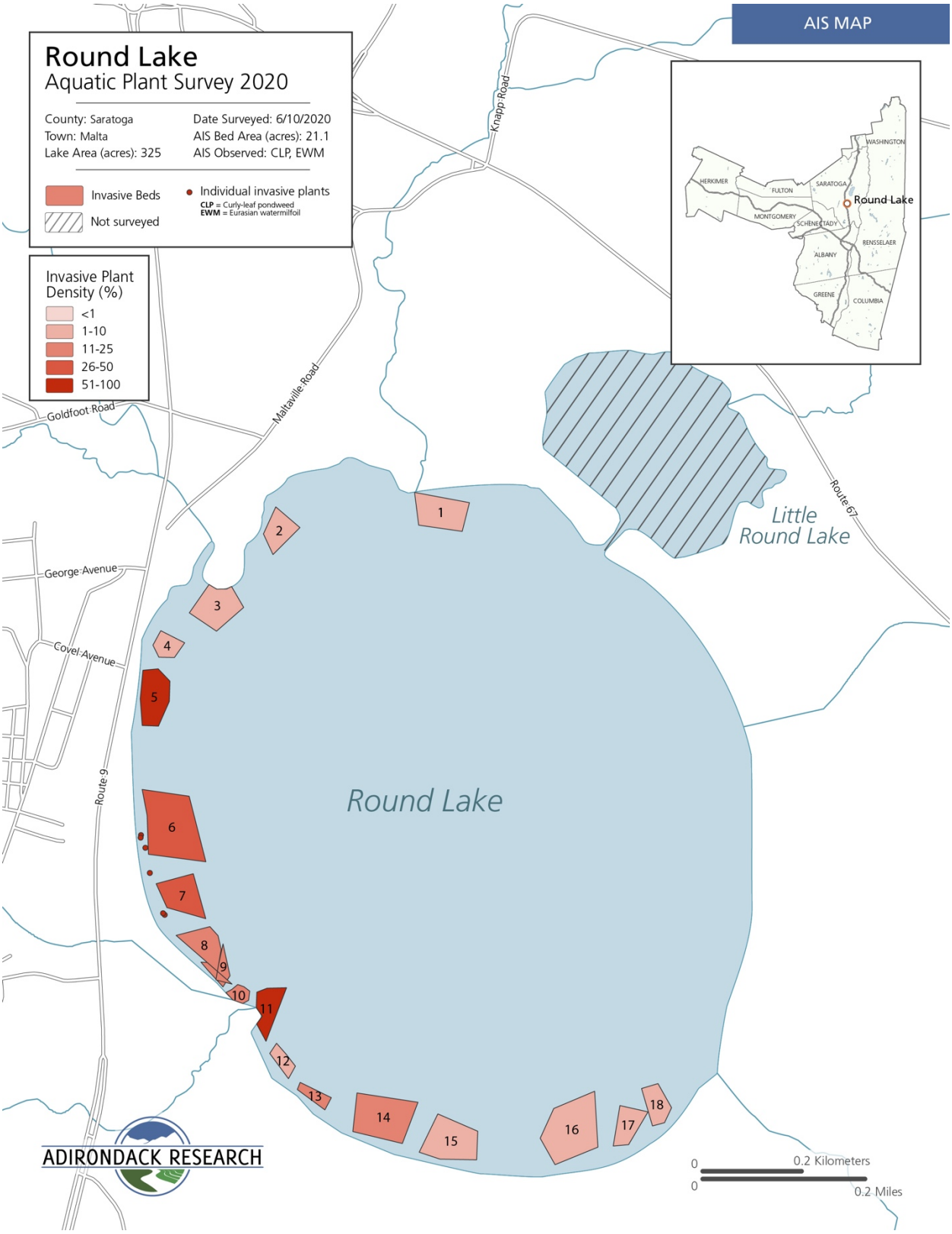
Native Plant Biota

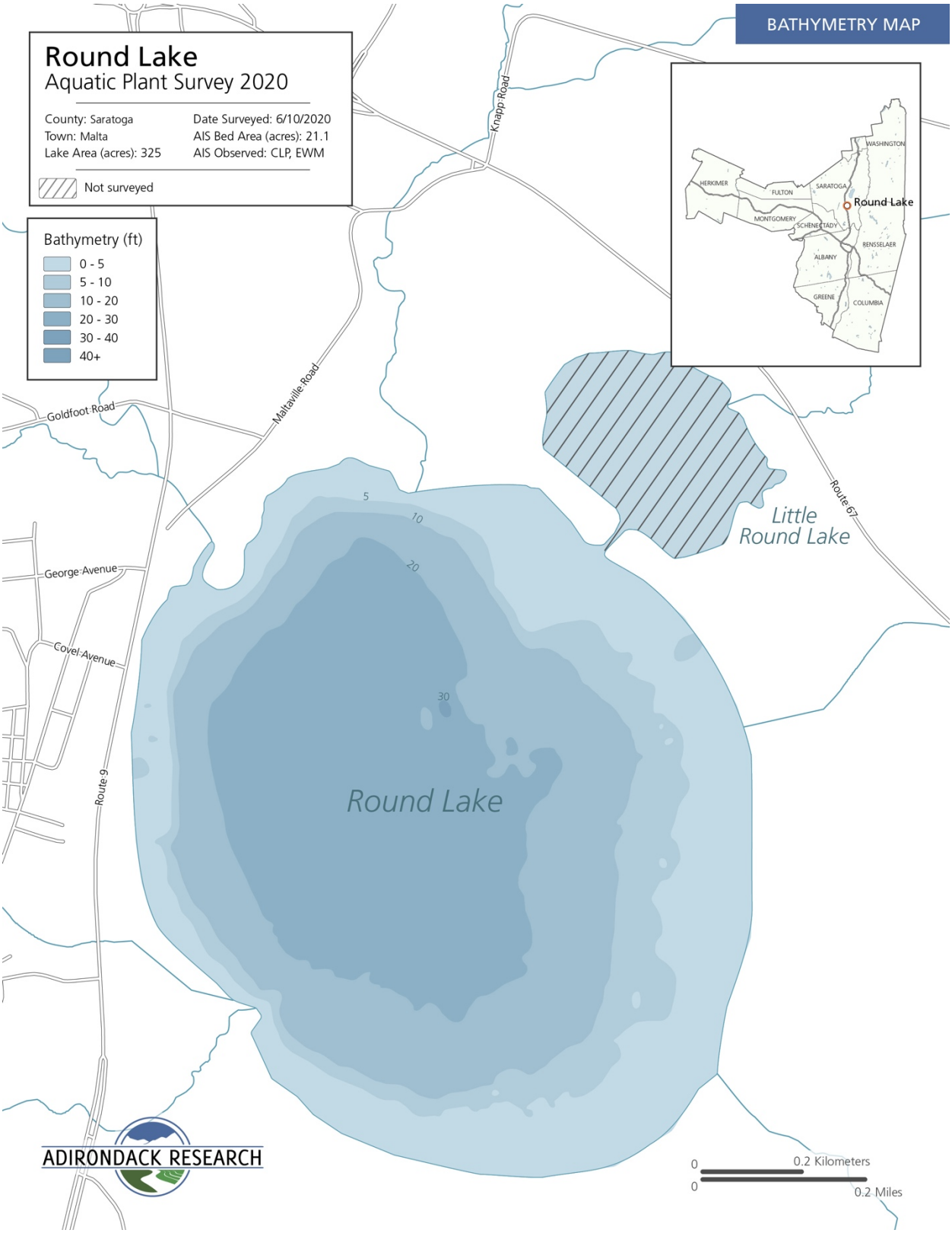
Comprehensive surveys of all native plants found within the reservoir were not prioritized in 2020 as this data had previously been collected in 2017. The following native plants were found: *Potamogeton robinsii* (Robbins' pondweed), *Nuphar variegata* (spatterdock), *Brasenia schreberi* (watershield), *Nymphaea odorata* (white water lily), *Utricularia macrorhiza* (common bladderwort), *Pontederia cordata* (pickerelweed), *Sparaganium angustifolium* (narrow-leaf burr-reed), and *Ceratophyllum demersum* (coontail).

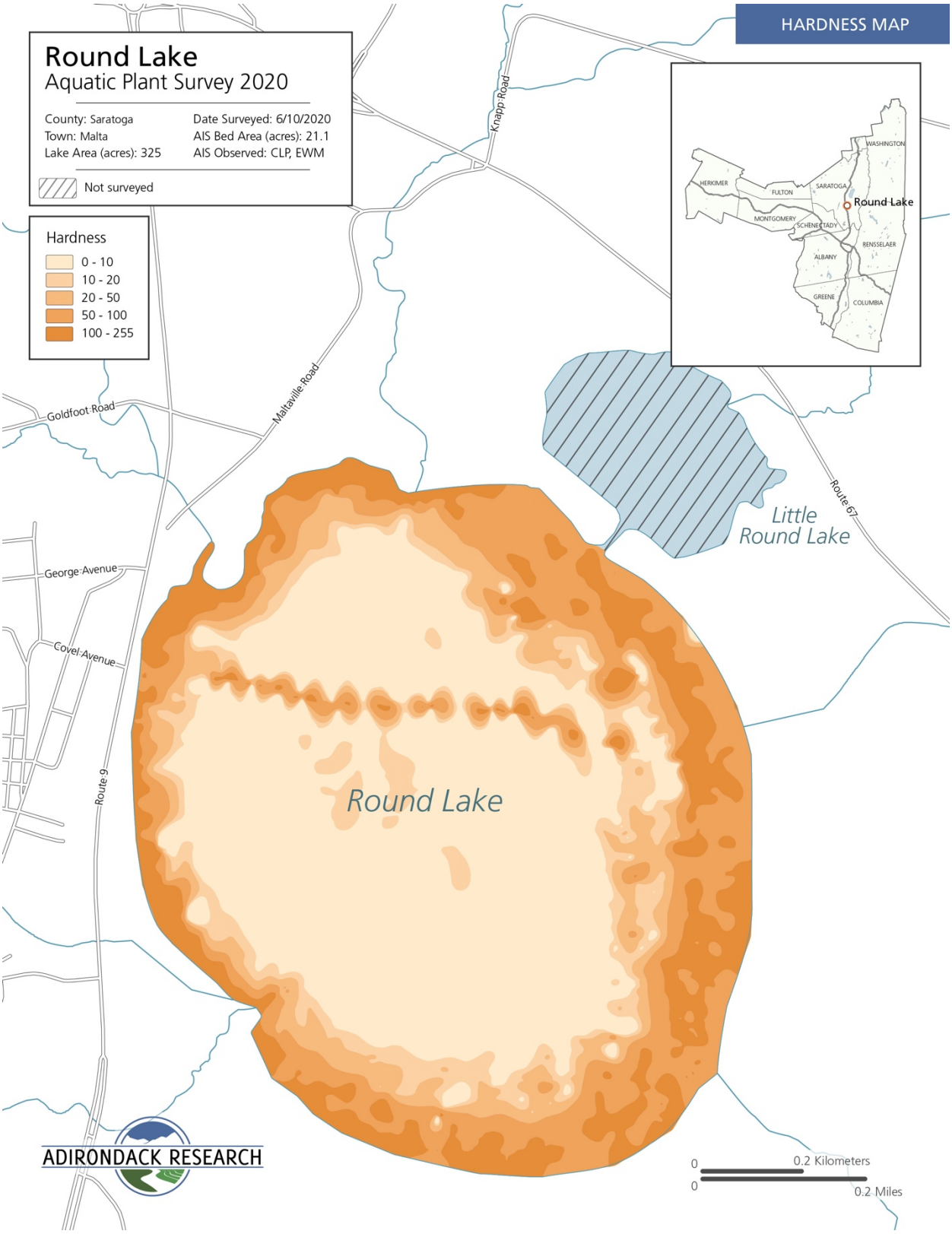
Invasive Species Percent Cover (See map on adjacent page)

Eurasian watermilfoil				Curly-leaf pondweed			
Bed	Size (Ac.)	Size (Sq. Ft.)	% Cover	Bed	Size (Ac.)	Size (Sq. Ft.)	% Cover
2	.82	35556.15	1-10	1	1.44	62904.55	1-10
3	1.38	60011.43	1-10	4	.51	22053.45	1-10
6	3.07	133712.98	26-50	5	1.31	57280.74	51-100
7	1.23	53646.19	26-50	7	1.23	53646.19	NR
8	1.01	44047.66	11-25	9	0.43	18757.20	11-25
11	.85	37056.23	51-100	10	.27	11582.63	11-25
13	.35	15146.13	11-25	12	.36	15894.01	1-10
14	2.19	95285.48	11-25				
15	1.77	77131.20	1-10				
16	2.64	114883.01	1-10				
17	.78	34126.34	1-10				
18	.73	31670.24	1-10				

% cover NR = not recorded


AIS MAP
Round Lake
Aquatic Plant Survey 2020
County: Saratoga
Town: Malta
Lake Area (acres): 325
Date Surveyed: 6/10/2020
AIS Bed Area (acres): 21.1
AIS Observed: CLP, EWM
Invasive Beds
Not surveyed
Individual invasive plants
CLP = Curly-leaf pondweed
EWM = Eurasian watermilfoil
Invasive Plant Density (%)
<1
1-10
11-25
26-50
51-100
Knapp Road
Maltaville Road
Goldfoot Road
George Avenue
Covel Avenue
Route 9
Route 67
Round Lake
Little Round Lake
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
WASHINGTON
HERKIMER
FULTON
SARATOGA
Round Lake
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
GREENE
COLUMBIA
ADIRONDACK RESEARCH
0
0.2 Kilometers
0
0.2 Miles


BATHYMETRY MAP
Round Lake
Aquatic Plant Survey 2020
County: Saratoga
Town: Malta
Lake Area (acres): 325
Date Surveyed: 6/10/2020
AIS Bed Area (acres): 21.1
AIS Observed: CLP, EWM
Not surveyed
Bathymetry (ft)
0 - 5
5 - 10
10 - 20
20 - 30
30 - 40
40+
Knapp Road
Maltaville Road
Goldfoot Road
George Avenue
Covel Avenue
Route 9
Route 67
Little Round Lake
Round Lake
5
10
20
30
WASHINGTON
HERKIMER
FULTON
SARATOGA
Round Lake
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
GREENE
COLUMBIA
0
0.2 Kilometers
0
0.2 Miles
ADIRONDACK RESEARCH


HARDNESS MAP
Round Lake
Aquatic Plant Survey 2020
County: Saratoga
Town: Malta
Lake Area (acres): 325
Date Surveyed: 6/10/2020
AIS Bed Area (acres): 21.1
AIS Observed: CLP, EWM
Not surveyed
Hardness
0 - 10
10 - 20
20 - 50
50 - 100
100 - 255
WASHINGTON
HERKIMER
FULTON
SARATOGA
Round Lake
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
GREENE
COLUMBIA
Knapp Road
Maltaville Road
Goldfoot Road
George Avenue
Covel Avenue
Route 9
Route 67
Little Round Lake
Round Lake
ADIRONDACK RESEARCH
0
0.2 Kilometers
0
0.2 Miles

Weaver Lake

Survey Date: August 11, 2020
Survey Team: P. Bly, M. Privee

Lake Description

Weaver Lake is approximately 109-acres. It is located in the town of Warren, Herkimer County. The team launched one canoe at a roadside, soft boat launch located off of Rt. 20 in Warren.

Aquatic Invasive Plant Presence

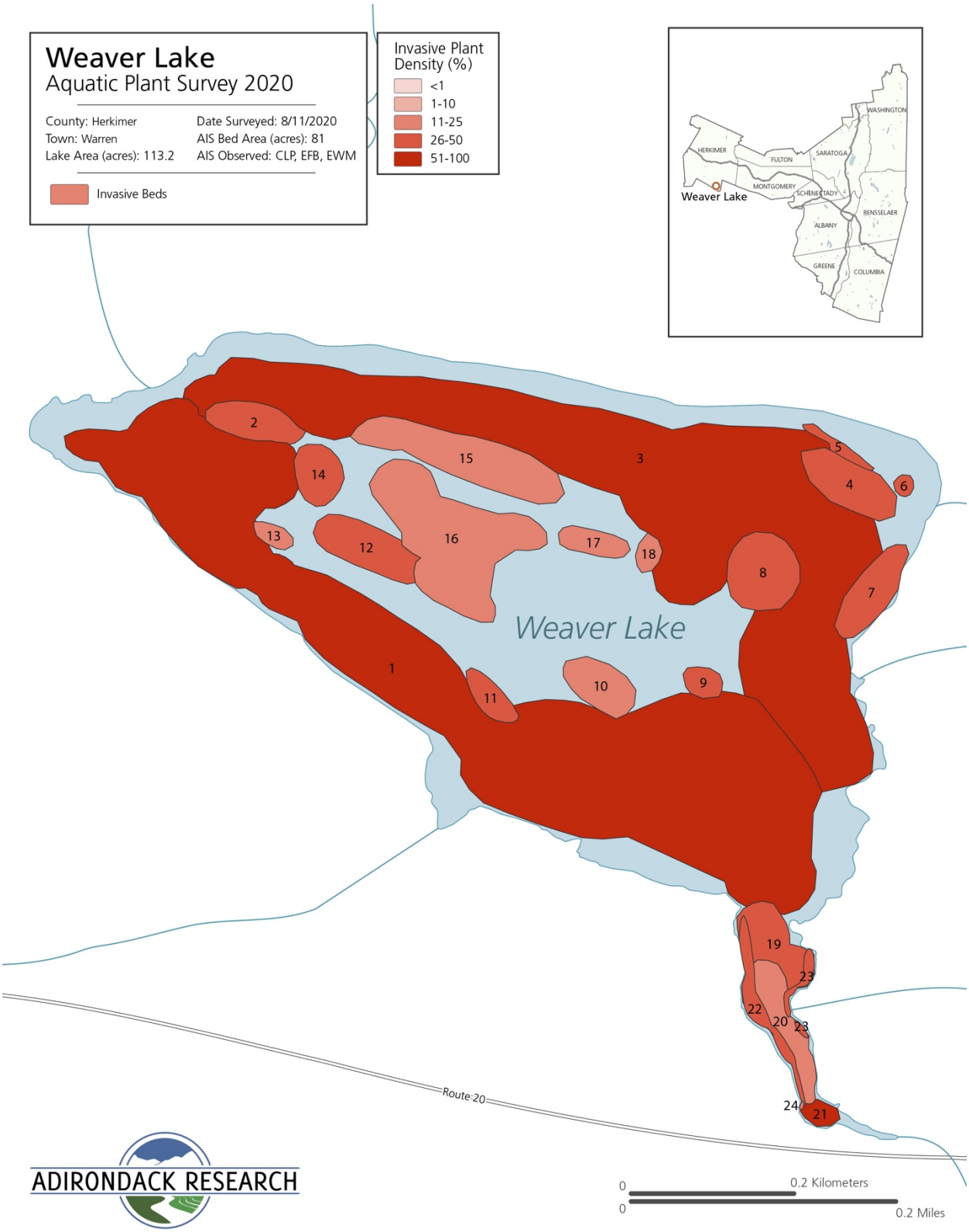
Several aquatic invasive species were found, *Myriophyllum spicatum* (Eurasian watermilfoil), *Potamogeton crispus* (curly-leaf pondweed), and *Hydrocharis morsus-ranea* (European frogbit)) were detected throughout the whole waterbody.

Native Plant Biota

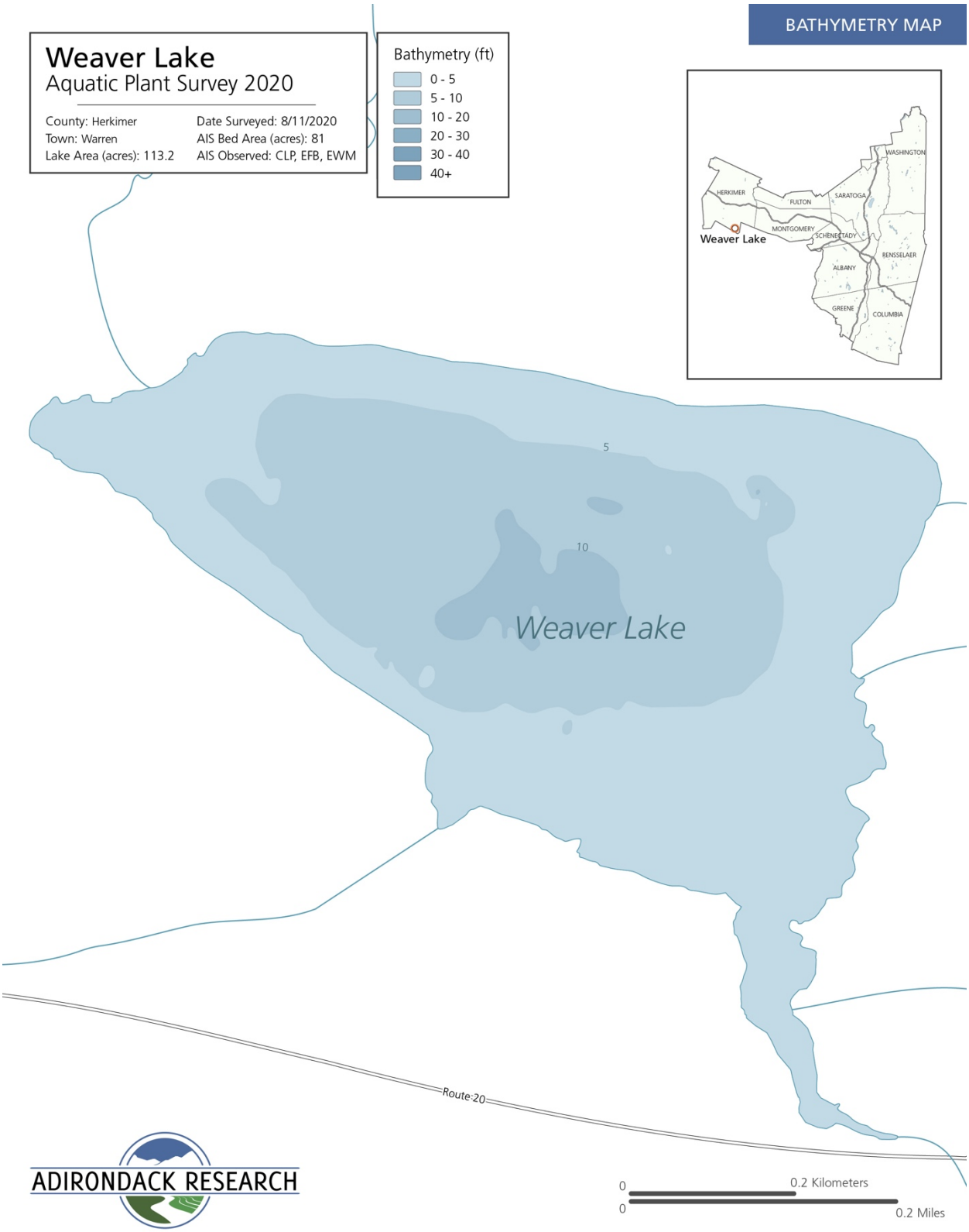
A combination of native floating and submerged plants were detected. These species include: *Elodea canadensis* (common waterweed), *Potamogeton perfoliatus* (clasping-leaf pondweed), *Nymphaea odorata* (white water lily), *Nuphar variegata* (spatterdock), *Brasenia schreberi* (watershield), (white-stem pondweed).

Invasive Species Percent Cover (See map on adjacent page)

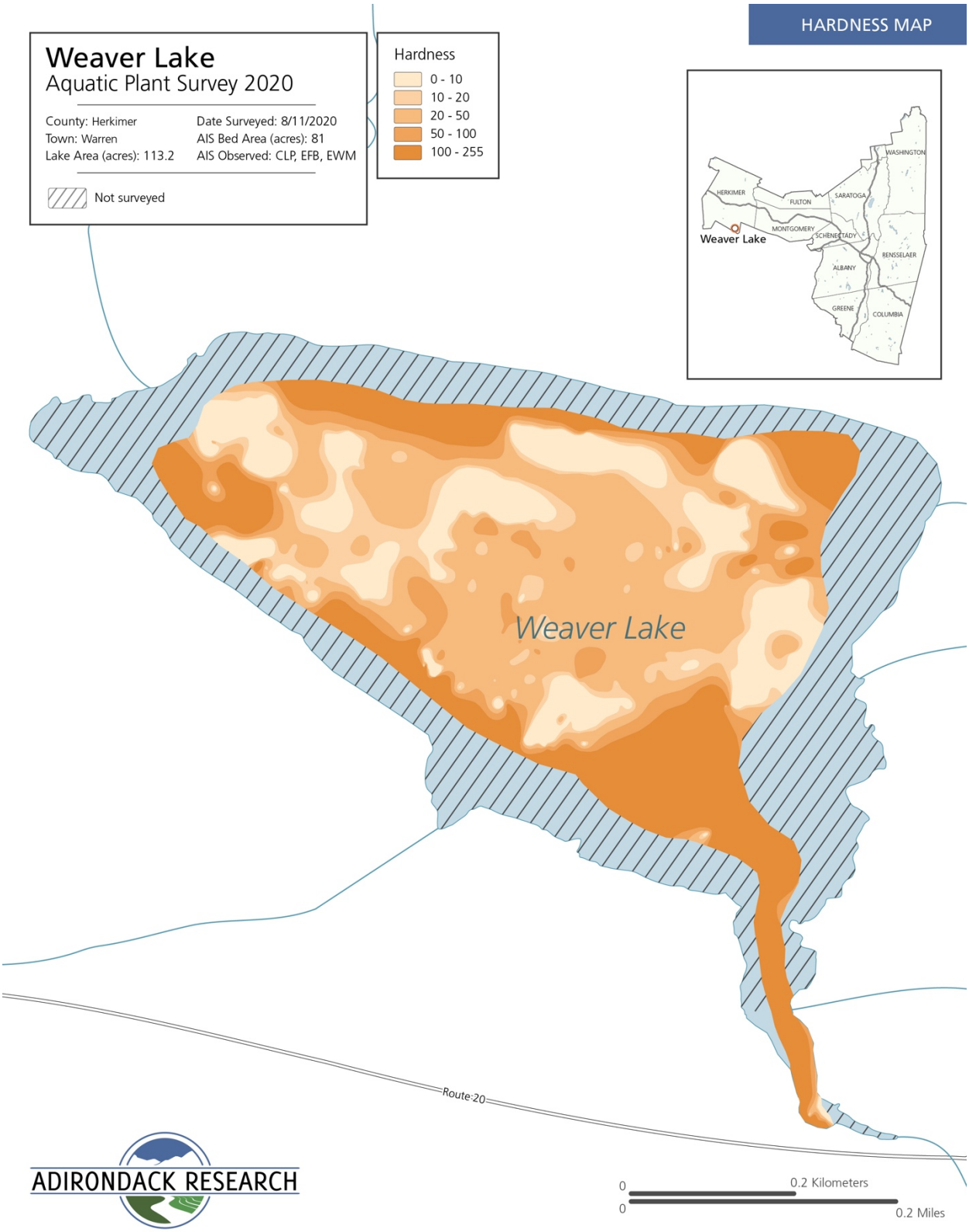
Eurasian watermilfoil				European frog-bit			
Bed	Size (Ac.)	Size (Sq. Ft.)	% Cover	Bed	Size (Ac.)	Size (Sq. Ft.)	% Cover
1	32.26	1405385.98	51-100	5	.25	11030.29	26-50
2	1.04	45472.82	26-50	6	.12	5273.33	26-50
3	25.78	1122984.11	51-100	22	.68	29794.21	26-50
4	1.45	63086.58	26-50	23	.19	8289.35	26-50
7	1.23	53783.36	26-50	24	.04	1623.06	26-50
8	1.66	72238.16	26-50	25	.01	350.04	11-25
9	.35	15457.22	26-50				
10	1.03	45051.20	11-25				
11	.54	23323.47	26-50				
12	1.46	63771.67	26-50				
13	.26	11371.12	11-25				
14	.85	37155.76	26-50				
15	2.90	126199.73	11-25				
16	4.86	211573.20	11-25				
17	.56	24288.04	11-25				
18	.27	11549.46	11-25				
19	1.35	58865.28	26-50				
20	1.58	68691.29	11-25				
21	.26	11448.82	51-100				


Weaver Lake
Aquatic Plant Survey 2020
County: Herkimer
Town: Warren
Lake Area (acres): 113.2
Date Surveyed: 8/11/2020
AIS Bed Area (acres): 81
AIS Observed: CLP, EFB, EWM
Invasive Beds
Invasive Plant Density (%)
<1
1-10
11-25
26-50
51-100
WASHINGTON
HERKIMER
FULTON
SARATOGA
MONTGOMERY
SCHENECTADY
Weaver Lake
RENSSELAER
ALBANY
GREENE
COLUMBIA
Weaver Lake
Route 20
0
0.2 Kilometers
0
0.2 Miles

BATHYMETRY MAP



HARDNESS MAP



ADIRONDACK RESEARCH

Young Lake

Survey Date: August 11, 2020
Survey Team: P. Bly, M. Privee

Lake Description

Young Lake is approximately 72-acres. It is located in the town of Warren, Herkimer County. The team launched one canoe at a roadside, soft boat launch located on Hole Rd of Rt. 20 in Warren.

Aquatic Invasive Plant Presence

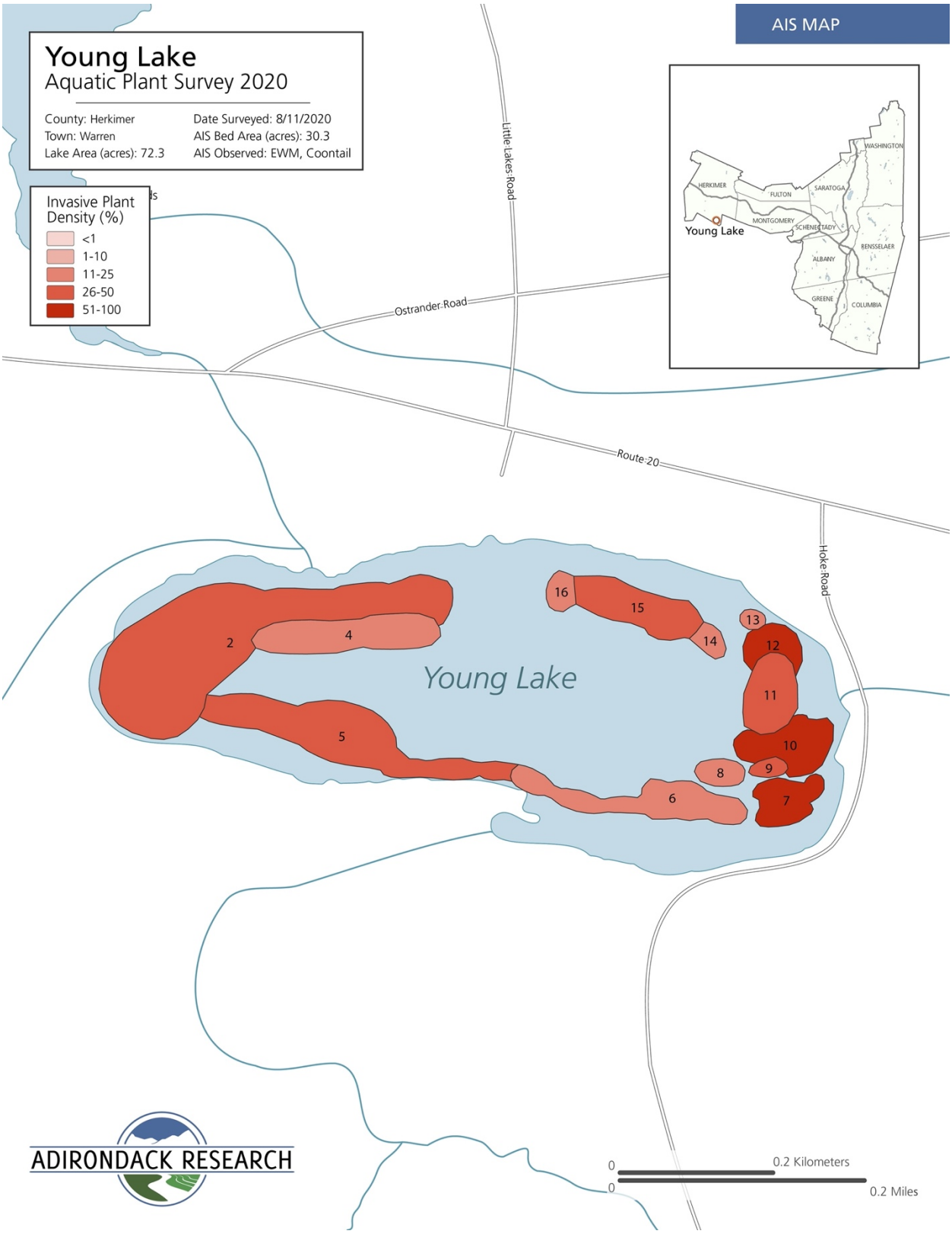
Myriophyllum spicatum (Eurasian watermilfoil) was found around the entire lake.

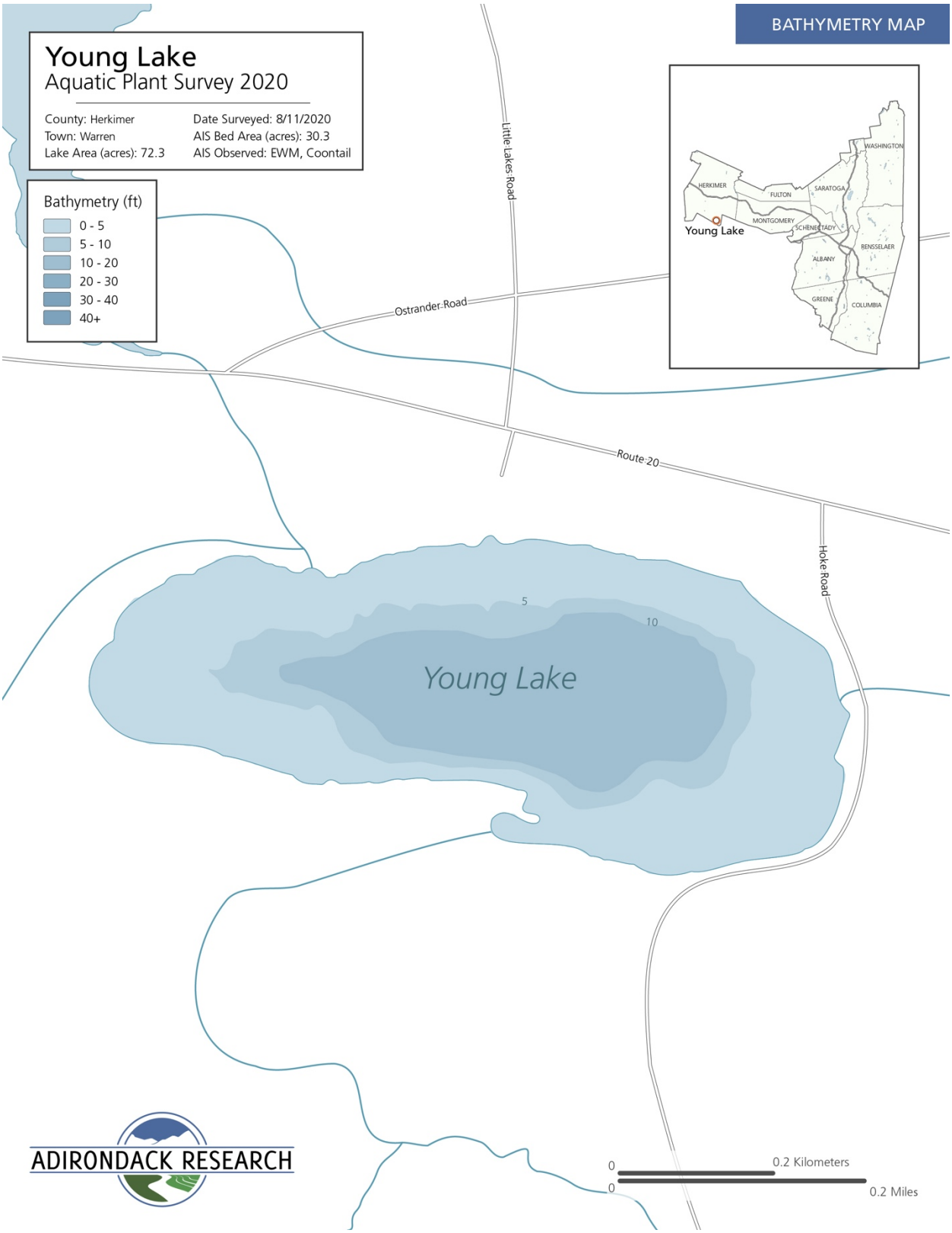
Native Plant Biota

A combination of native floating and submerged plants were detected. These species include: *Elodea canadensis* (common waterweed), *Nymphaea odorata* (white water lily), *Nuphar variegata* (spatterdock), *Brasenia schreberi* (watershield), *Potamogeton praelongus* (white-stem pondweed), *Ceratophyllum demersum* (coontail), *Sparganium angustifolium* (narrow-leaf burr-reed), *Nitella microcarpa* (small fruited nitella), *Utricularia macrorhiza* (common bladderwort) and *Potamogeton foliosus* (leafy pondweed). Ceratophyllum demersum (coontail) is a native plant, but it was noted to be acting invasively in dense beds, growing in the thousands within bed #2.

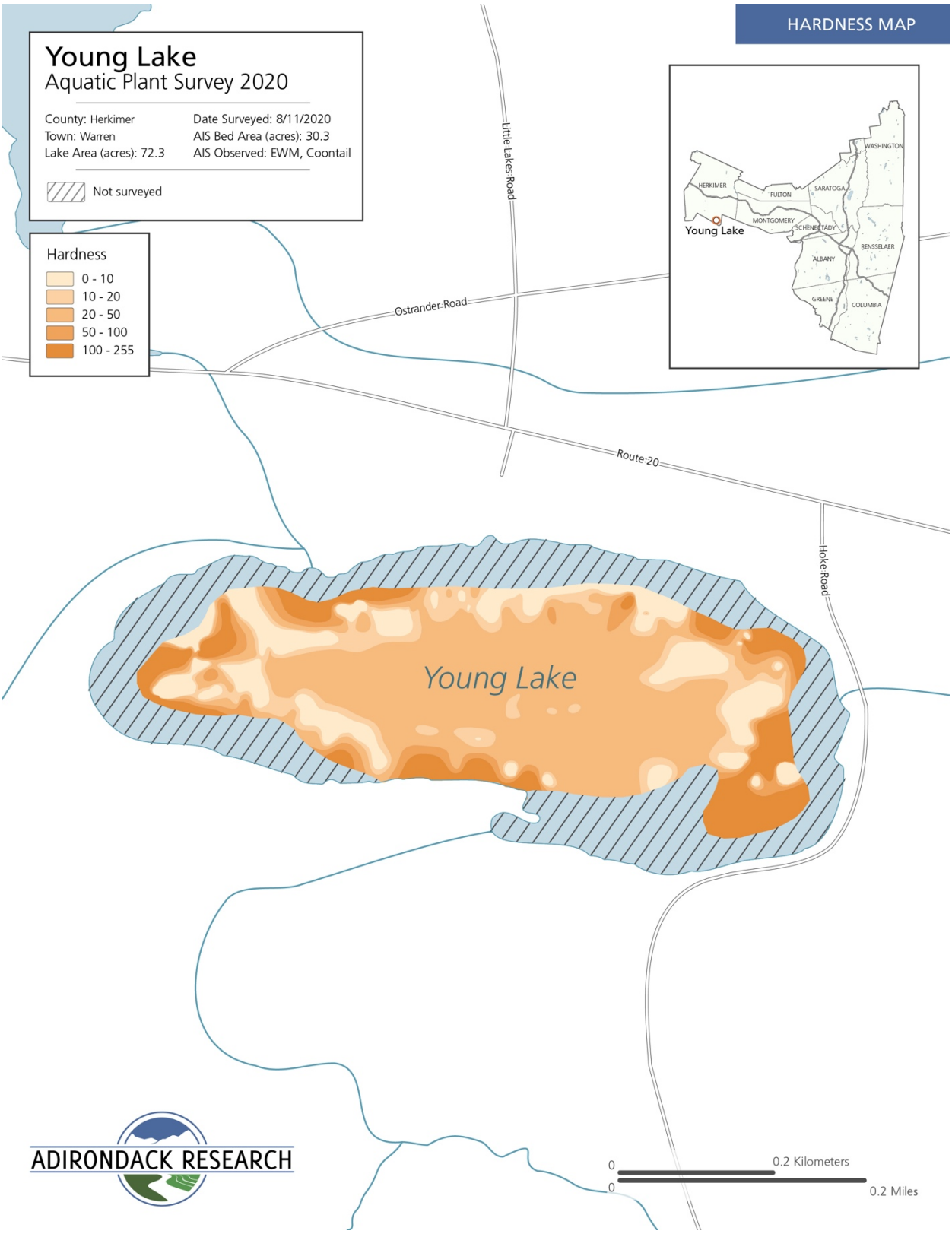
Invasive Species Percent Cover (See map on adjacent page)

Eurasian watermilfoil			
Bed	Size (Ac.)	Size (Sq. Ft.)	% Cover
2	9.64	419728.53	26-50
4	2.41	105099.55	11-25
5	4.52	196712.75	26-50
6	2.43	105700.51	11-25
7	1.11	48286.04	51-100
8	.47	20376.96	11-25
9	.24	10523.41	26-50
10	1.58	68712.26	51-100
11	1.47	64161.98	26-50
12	.76	32907.38	51-100
13	.17	7500.11	11-25
14	.33	14448.51	11-25
15	1.97	86020.42	26-50
16	.40	17380.90	11-25


AIS MAP
Young Lake
Aquatic Plant Survey 2020
County: Herkimer
Town: Warren
Lake Area (acres): 72.3
Date Surveyed: 8/11/2020
AIS Bed Area (acres): 30.3
AIS Observed: EWM, Coontail
Invasive Plant Density (%)
<1
1-10
11-25
26-50
51-100
Little Lakes Road
Ostrander Road
Route 20
Hoke Road
Young Lake
WASHINGTON
HERKIMER
FULTON
SARATOGA
MONTGOMERY
SCHENECTADY
RENSSELAER
ALBANY
GREENE
COLUMBIA
Young Lake
2
4
5
6
7
8
9
10
11
12
13
14
15
16
0
0.2 Kilometers
0
0.2 Miles
ADIRONDACK RESEARCH


BATHYMETRY MAP
Young Lake
Aquatic Plant Survey 2020
County: Herkimer
Town: Warren
Lake Area (acres): 72.3
Date Surveyed: 8/11/2020
AIS Bed Area (acres): 30.3
AIS Observed: EWM, Coontail
Bathymetry (ft)
0 - 5
5 - 10
10 - 20
20 - 30
30 - 40
40+
Little Lakes Road
Ostrander Road
Route 20
Hoke Road
5
10
Young Lake
WASHINGTON
HERKIMER
FULTON
SARATOGA
MONTGOMERY
SCHENECTADY
Young Lake
RENSSELAER
ALBANY
GREENE
COLUMBIA
0
0.2 Kilometers
0
0.2 Miles
ADIRONDACK RESEARCH

HARDNESS MAP



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