2019 Fish Creek Aquatic Invasive Species Management Project Report

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

Invasive Solutions Dive Company, Divers at Fish Creek Pond -2019

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Acknowledgements

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Table 1: Abbreviations List.

Abbreviation	Complete Text
AIM	Aquatic Invasive Management, LLC
APIPP	Adirondack Park Invasive Plant Program
AWI	Paul Smith's College Adirondack Watershed Institute
EWM	Eurasian watermilfoil
FCAISMP	Fish Creek Aquatic Invasive Species Management Project
ISDC	Invasive Solutions Dive Company, LLC
NYSDEC	New York State Department of Environmental Conservation
Steward	Adirondack Watershed Institute Steward
USLA	Upper Saranac Lake Association
USF	Upper Saranac Foundation
VLM	Variable-leaf watermilfoil

Executive Summary

Aquatic invasive species (AIS) pose a significant threat to the Adirondack environment and economy. For more than a decade, the Upper Saranac Foundation (USF) has worked to address invasive species on Upper Saranac Lake (USL). The USF has had unprecedented success in managing AIS and could arguably be considered the leader in AIS management techniques.

The Fish Creek Aquatic Invasive Species Management Project (FCAISMP) is part of a larger watershed protection program, developed by the USF, that uses a combination of AIS prevention, monitoring, management, control activities and education to inhibit AIS spread. The USF is committed to the long-term success of maintaining the water quality of the Watershed.

The intent of this program is to combat invasive species to improve water quality and maintain native species in their natural habitats, ensuring the sustainability of our natural public resources for future generations. The program protects economic value through recreation, tourism, sportsmanship and second home ownership by providing clear waterways. Removal and control of AIS in the USL watershed at Fish Creek protects downstream waters from infestation and helps prevent the export of AIS to non-infested waters. This report can be summarized in the following key points:

1. Two AIS found and targeted for removal in the waterbodies of the NYSDEC Fish Creek Campground is Eurasian watermilfoil (Myriophyllum spicatum) and Variable-leaf milfoil (Myriophyllum heterophyllum). NYS ranks Eurasian watermilfoil and Variable-leaf milfoil as the top AIS in the State based on their ecological impacts, biological characteristics, and distribution.

2. Two separate surveys inventorying native and invasive plants provided the data for a report that outlined the extent of the invasive infestation, and a cost estimate for harvesting. The reports

estimated it would take 2,160 hand harvesting diver hours over an 18-week, three-year period, to bring the campground to a sustainable and maintainable level.

3. The USF developed a plan to manage AIS in Fish Creek Campground and seek funding to cover the estimated cost of the project. The goal was to restore the 108 acres of littoral campground waterfront, in addition to preventing AIS from infesting downstream and regional waters, and to prevent new AIS from establishing in the waters in the project area.

4. In 2016 the USF initiated a four-week pilot program to determine practicality and feasibility of the FCAISMP. The intent was to demonstrate the degree of the infestation and the viability of management to support prospective funding. The Pilot Program substantiated prior surveys, estimating a total cost of $160,000 for the initial intensive three-year management period.

5. To implement the FCAISMP, a fundraising campaign initiated by the USF raised over $60,000 in donations. Additional funding was awarded to the USF in the amount of $100,000 from the NYSDEC Invasive Species Rapid Response and Control Grant.

6. In 2019, the USF invested $34,750 into 600 diver hours. The divers harvest 5806 lbs. (2.9 tons) of invasive milfoil from within the campground's waters.

7. Throughout the entirety of the program (2016-2019) a total of $152,000 was invested in 2,904 diver hours. Altogether, 47,270lbs. (23.64 tons) of milfoil has been removed from the campgrounds 108 littoral acres.

8. The USF contracted Adirondack Watershed Institute (AWI) at Paul Smith's College to provide independent monitoring, evaluation and reporting of AIS control efforts in Fish Creek Campground. Plant surveys comparing AIS concentrations indicated an 92% average AIS stem density level decrease from 2017 through 2019.

9. Each year of the FCAISMP there has been fewer signs of AIS infestations. The Fish Creek project is following a similar trend as to the accomplishments seen on USL. It is estimated that there has been an 80% yearly reduction in plant density for each of the last three years.

10. Watershed Stewards stationed at the Campground boat launch inspecting boats being retrieved have found significantly less AIS. Over a four-year period, there has been a 73% reduction in AIS on watercraft being retrieved from the launch.

11. There is continued indications that management efforts are effective; through camper's comments relative to the reduction of nuisance aquatic vegetation, and with the reduction AIS found and harvested from year to year.

12. AIS containment booms, placed just upstream of the Fish Creek Campground boat launch, stopped 2,400 pounds of fragmented invasive plants from floating downstream, preventing their introduction into managed areas within the Campground and further downstream into Upper Saranac Lake.

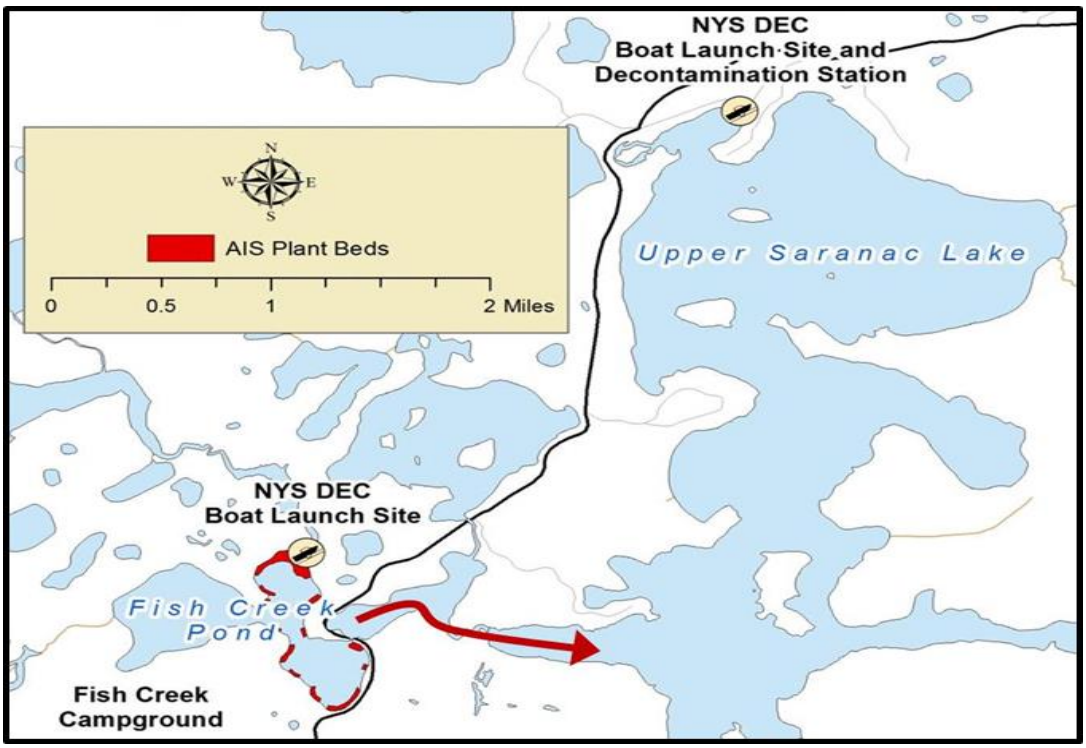
13. With the completion of the initial intensive harvesting period and the final year of the NYSDEC Invasive Species Rapid Response and Control Grant, the USF will take responsibility for the ongoing maintenance phase of the FCAISMP. In 2020 the USF will reduce diving time and expenditures to 480 dive hours at approximately $27,000.

Introduction:

The Upper Saranac Foundation's mission is to preserve, enhance and protect the natural beauties, environmental quality and recreational enjoyment of the USL watershed. This goal is consistent with tasks delineated in the proposed Fish Creek Aquatic Invasive Species Management Project (FCAISMP). The FCAISMP will address the threat of AIS and protects citizens' investment in public owned lands by expanding USF's successful AIS hand harvesting program for the Saranac watershed into the NYSDEC campground at Fish Creek.

Project Location

The NYSDEC Campground at Fish Creek has been a significant source for spreading AIS throughout the region. The Campground, with 355 campsites is the most used public campground in the State, averaging 120,000 annual visitors. The water bodies, Fish Creek and Square Ponds are located in the headwaters region of the Saranac River watershed in the Adirondack Park of northern New York. The Saranac River is one of six major drainage basins in this region and is located within the greater Lake Champlain basin. With all campsites having direct water access, campers enjoy the opportunity for water based recreation. Return visitation is predicated on weed-free thoroughfares. Fish Creek Pond Campground offers a natural pristine, sandy shoreline accessible to both motorized and non-motorized boats. From Square Pond and Fish Creek Pond, recreational users have direct access to miles of open water on Upper Saranac Lake. A trailered boat launch with a parking area is located within the Campground. Non-motorized boating opportunities are also accessible directly from the Campground.



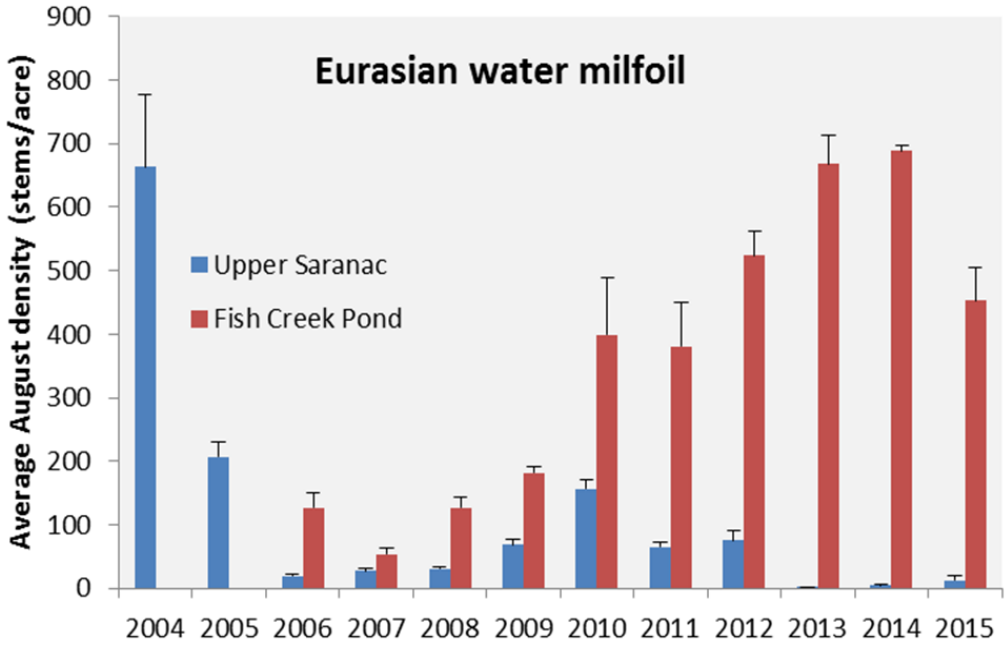
Map of project area showing location of NYS DEC boat launch sites, campground, and AIS plant beds in Fish Creek Pond. Red arrow shows direction of water flow. Channel between Fish Creek Pond and Upper Saranac Lake is navigable with large motorboats.

The USF has been working cooperatively on AIS management projects in the watershed since 2004 and has established a clear track record of sustaining this type of project. The USF has reduced a one-time prevailing AIS problem to infrequent occurrences on USL. With over 47 miles of shoreline and 1,200 acres of littoral zone, the USF in 2004 removed 18 tons of milfoil at a cost of $450/littoral acre on USL. This is a dramatic contrast from 2019, when under 300 pounds were found, and the cost was reduced to $89/littoral acre.

Plant Monitoring Program: A program funded by the USF was initiated in 2004 to monitor aquatic vegetation. The plant surveys are performed by the Adirondack Watershed Institute. This program was implemented to provide data on the efficacy of the Eurasian water milfoil management strategy being employed on Upper Saranac Lake. AWI established 588 underwater monitoring segments sites across USL in 2004, and 36 in Fish Creek Pond in 2006 to measure milfoil densities. At each site a transect line method was used to analyze current and historical native and invasive species plant growth. The unmanaged Fish Creek locations acted as a comparison to USL that is being managed for AIS's.

From 2006 - 2015 Eurasian watermilfoil in Fish Creek Campground had a significant increase in density in contrast to adjacent USL where hand harvesting AIS management methods were being deployed. In 2015 the average milfoil density across all locations on Upper Saranac Lake was 10.2 stems/acre, substantially lower than the 600 stems per acre that existed in 2004, the first year of the intensive USL management effort. Just prior to the initiation of management efforts in Fish Creek Camp Ground, the average Eurasian water-milfoil density was 517 stems/ acre.

Variable-leaf milfoil was first detected at the Fish Creek Pond transect locations in 2009. From that time, until the initiation of the FCAISMP, variable-leaf had exhibited a significant increase in its frequency of occurrence by approximately 4% per year (Laxson, 2016).



Density of EWM Comparison Between USL and Fish Creek USL Milfoil Monitoring Program: Project Update, Year 2015 Report, 4-15-2016, Corey L. Laxson and Daniel L. Kelting, Paul Smith's College Adirondack Watershed Institute:

Fish Creek Invasive Species Harvesting Feasibility Study: In 2015, two comprehensive surveys inventorying native and invasive plants were completed within the Campground. One was completed by the APIPP's Adirondack Aquatic Regional Response Team. The other by Aquatic Invasive Management, LLC and the USF's Lake Manager. These surveys provided the data for a report that outlined the extent of the invasive infestation, and a cost estimate for harvesting. The reports determined there were a total of 108 littoral acres within the campground. Of this, 24 acres had substantial AIS growth, EWM and VLM of varying densities (7 acres in Square Pond and 17 acres in Upper Fish Creek Pond). The report also estimated it would take 18 weeks of hand harvesting by divers, over a three-year period, to bring the campground to a sustainable and maintainable level similar to the success the USF had on Upper Saranac Lake (Middleton, Lewis, 2015).

Consequently, the USF developed a plan for managing AIS in Fish Creek Campground. The intent was to mimic the Foundation's accomplishments on USL and seek funding to cover the estimated cost for 18 weeks of divers to hand harvest for an initial three to four-year intensive start-up. The USF, who is committed to the long-term sustainability of this project, would support AIS management efforts beyond the initial start-up period, ensuring prolonged results. Continued maintenance efforts would be funded through the USFs annual budget.

The long-term outcome for the FCAISMP is to restore the 108 acres of littoral campground waterfront, in addition to preventing AIS from infesting downstream and regional waters, and to prevent new AIS from establishing in the waters in the project area. These outcomes will be achieved through project activities such as removal of AIS, inspection and decontamination of boats, and public education leading to reduced spread of new AIS from boats. Acres harvested and pounds of AIS material removed will be tracked. Success in the project period will be defined by year-to-year decline in total acres and amount of plant material removed. Longer-term success will be defined as sustained low density and low harvest removals during the maintenance period. An annual report will be produced reporting plant density.

Pilot Program:

In early 2016, in preparation for implementation of the FCAISMP, permits were obtained from the NYSDEC and the Adirondack Park Agency to perform underwater hand harvesting of AIS. Later that fall, working in collaboration with AIM and the AWI, the USF initiated a four-week pilot program to determine practicality and feasibility of the FCAISMP. The intent was to demonstrate the degree of the infestation and the viability of management to support prospective funding. Funding for this Pilot Program was provided through the USF, USLA, APIPP and a Crowdfunding campaign sponsored by the Adirondack Foundation.

Prioritization of management areas for the Pilot Program focused on dense infestations and high traffic areas to reduce the likelihood that boaters would fragment and transport invasive material to non-invaded sections of the lake or surrounding waters. The management operation occurred mid-week, Monday – Thursday, with the majority after the busy summer season, post Labor Day. The total four-week operation yielded just under 9.5 tons (18937.5 lbs.) from 6.13 acres of littoral zone.

To quantify the feasibility of the FCAISMP, data from the 2016 Pilot Program and the 2015 surveys were compared in relation to the overall estimated cost of harvesting, relative to time and acreage. The results were within a small margin of error. The expected cost of diver harvesting expenses for the Fish Creek Campground project (Square Pond and Upper Fish Creek Pond) was estimated to be $160,000.

Knowing the potential outcome with unmanaged AIS, its economic and environmental impact and the potential to spread, as well as understanding the scope of the project, the USF is confident that harvesting AIS from Fish Creek Campground is not only practical but a necessary investment. Furthermore, the USF is confident that once the initial three year harvesting project is complete upkeep will be sustainable through the USF's yearly maintenance program.

Implementation:

The FCAISMP developed a technique mimicking the success of the USL effort from a decade prior where a "front-load" method was utilized. Meaning, the majority of funding and effort will be used in the first two years of the project in order to suppress large, dense milfoil beds and bring them under control. In the third year of the project, the amount of diver time would be reduced. Management would focus on regrowth of areas already harvested. This would transition into the management phase of the project in year four. The results would be a reduction in expenses over time, bringing the treatment area into a more easily manageable task.

Funding: As a requirement to match grant funds, a fundraising campaign was initiated by the USF in 2016. Through support of the USLA and the Upper Saranac Lake Community, the USF raised over $60,000 in donations. Subsequently, funding was awarded to the USF in the amount of $100,000 from the NYSDEC Invasive Species Rapid Response and Control Grants. This grant was made possible through donations that required the Foundation to match 50% of the award.

Adirondack Park Invasive Plant Program: As part of APIPP's commitment to preventing the spread of AIS, the Adirondack Aquatic Invasive Response Team was deployed in 2016 and again in 2017 to an area near the Fish Creek Boat Launch. The Fish Creek Campground launch was a known vector for transporting AIS from boats being launched and retrieved. The intent of the Response Team was to reduce the densities of AIS in and around the launch, thus reducing the number of AIS being transported to other water bodies. In the two years of the Rapid Response team's efforts, the Rapid Response team invested 120 hours of dive time and harvested 4,600 lbs. from an area of less than one acre.

Watershed Stewardship: As a result of managing AIS from Fish Creek Campground, the amount of invasive species found on boats being retrieved from the Campground boat launch has been significantly reduced. Watershed Stewards stationed at the launch inspect watercraft looking for AIS on boats being launched and retrieved. Over a four-year period, there has been a 73% reduction in AIS on watercraft attempting to leave the launch. This decrease is a strong indicator to the success of this project, reflecting the reduction of AIS in the management area and decreasing the likelihood of AIS being transported to regional uninfected waterbodies.

Table 2. Occurrence of AIS on watercraft being retrieved from Fish Creek Campground Boat launch

AIS on Watercraft being retrieved from Fish Creek Campground				
Year	# of Coverage Days	# of boats with AIS	boats /day with AIS	% reduction
2016	59	30	0.51	
2017	111	60	0.54	
2018	107	12	0.11	
2019	100	14	0.14	73%

Containment Booms: In order to achieve the FCAISMP long term goal of preventing AIS regrowth, there was a need to limit new AIS introductions. The Fish Creek tributary, above the campground boat launch, has a high density level of AIS.

In July of 2019, AIS containment booms, placed just upstream of the Fish Creek Campground boat launch, stopped fragmented invasive plants that were floating downstream, preventing their introduction into managed areas within the campground and further downstream into Upper Saranac Lake. The series of three alternating booms extend from shore to just past the center of the channel. The booms allowed non-motorized watercraft traffic to pass while plant fragments are stopped on the upstream side of each boom.

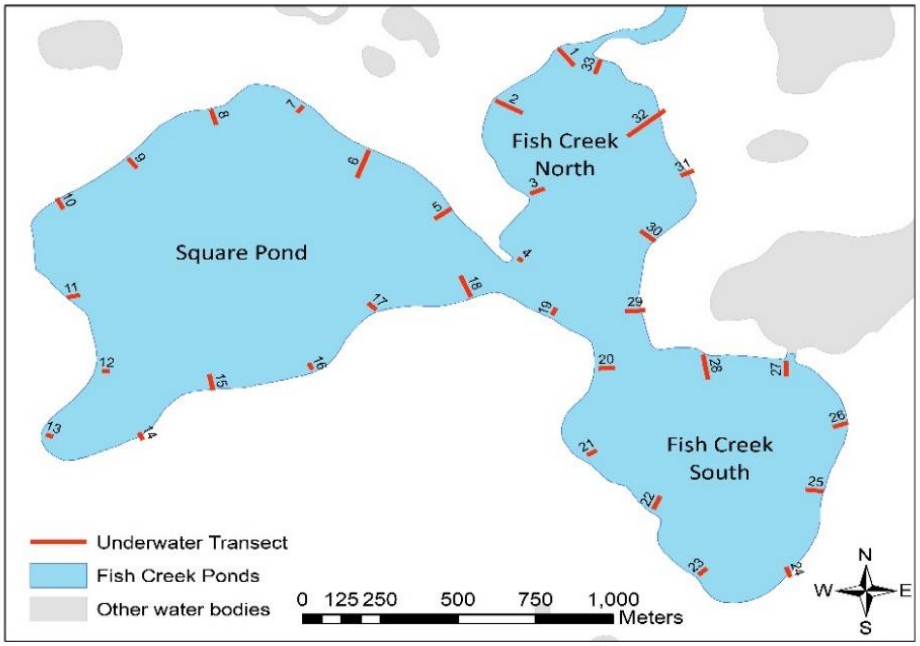
With milfoil propagating through fragmentation, each plant stopped by the booms is potentially one less infestation downstream in the watershed. The booms provide a needed advantage to AIS harvesting efforts within the campground. The majority of the plant fragments were removed just after the installation of the booms in July 2019 when the currents were fastest. AIS yields decreased as the water dropped. Clearing of the booms required three days per week maintenance early on, decreasing to one day a week into the fall.

USF received funding from the Cloudsplitter Foundation for the purchase of the booms. In 2019, over 2,400 pounds of invasive fragments were stopped and removed from spreading downstream. The USF will reinstall the seasonal booms in the spring, immediately after ice out. It is anticipated with next seasons earlier installation there will be even greater success preventing downstream fragmentation.

Invasive Species Containment Booms – Fish Creek Ponds tributary

Independent Monitoring and Evaluation:

The Upper Saranac Foundation contracted AWI to provide independent monitoring, evaluation and reporting of AIS control efforts in Fish Creek Campground. In doing so the AWI established 33 underwater monitoring sites delineated by Global Positioning Systems. At each of the 33 sites a combination of the line intercept method and fixed plot method are used to monitor the presence and abundance of aquatic plants, native and invasive. Both of these methods have been used for over 100 years in forest ecosystem studies, and have since been adopted as standard methods in aquatic ecosystem studies. The transect sites were surveyed by AWI divers prior to the initiation of the FCAISMP in August 2017. A second survey was completed following two years of the intensive harvesting in October of 2018. An additional survey was completed at the conclusion of the intensive harvesting period, in October of 2019. Data collected measured the abundance of aquatic vegetation and is used to assess and measure the effectiveness of control and eradication efforts for AIS, as well as monitoring restoration of native aquatic habitat. This method of monitoring will continue into the maintenance period of the program.



Adirondack Watershed Institute Fish Creek Campground Transect Survey Locations

Eurasian Water Milfoil (*Myriophyllum spicatum*):

Table 3. Occurrence of Eurasian water milfoil on the underwater transects of the Fish Creek Ponds study area, 2017 - 2019. The percent of active transects refers to the proportion of transects where the invasive plant was encountered. Provided by the Adirondack Watershed Institute.

Time Frame	Basin	Total number of transects	Percent of transects active	Mean density on active transects (stems/acre)
August 2017	Fish Creek North	10	10%	2,497
	Fish Creek South	9	33%	677
	Square Pond	14	*none*	*below detection*
October 2018	Fish Creek North	10	10%	20
	Fish Creek South	9	33%	237
	Square Pond	14	*none*	*below detection*
October 2019	Fish Creek North	10	30%	56
	Fish Creek South	9	22%	183
	Square Pond	14	*none*	*below detection*

The number of transects where Eurasian water milfoil was encountered did not vary significantly between 2017 and 2019; however, the stem density decreased by 98% in Fish Creek Pond North and by 72% in Fish Creek Pond South. AWI did not encounter any Eurasian water milfoil in Square Pond during any of the three surveys.

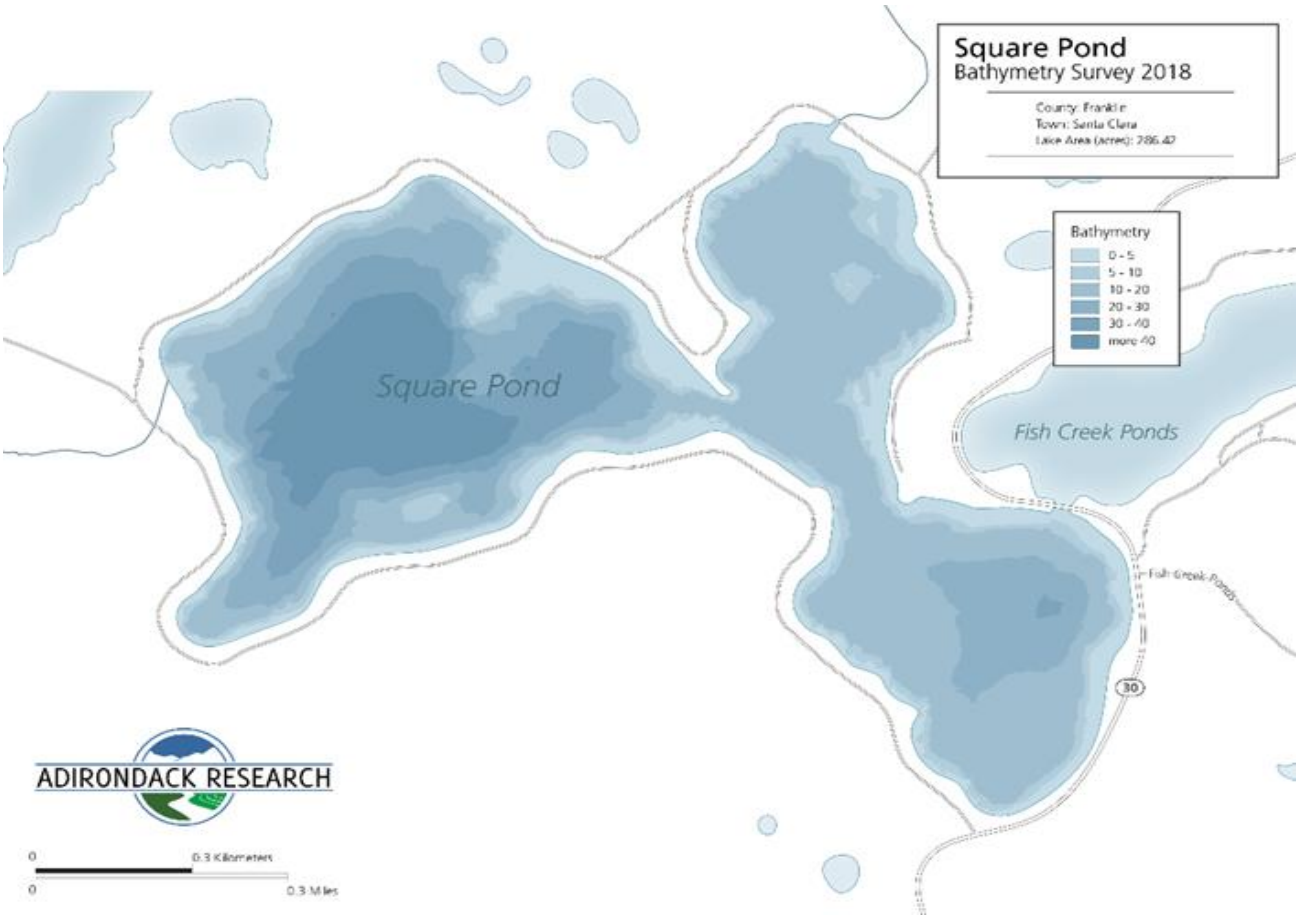
Variable Leaf Milfoil (*Myriophyllum heterophyllum*):

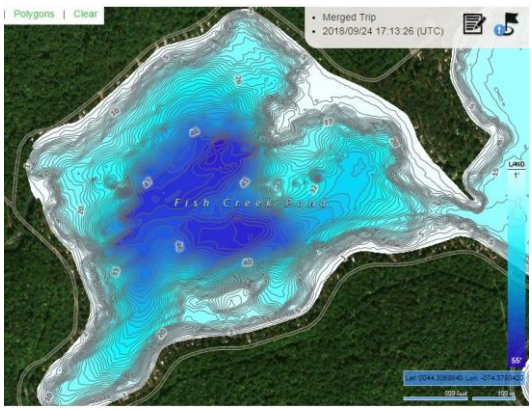
Table 4. Occurrence of variable leaf milfoil on the underwater transects of the Fish Creek Ponds study area, 2017 - 2019. The percent of active transects refers to the proportion of transects where the invasive plant was encountered. Provided by the Adirondack Watershed Institute.

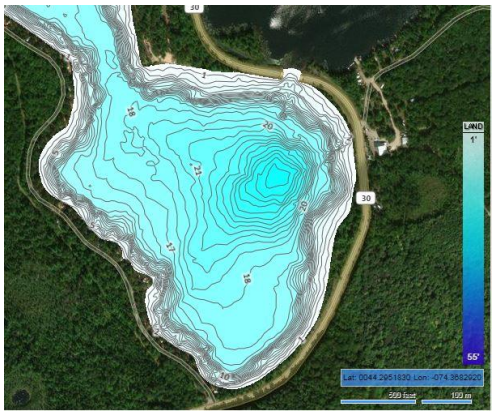
Time Frame	Basin	Total number of transects	Percent of transects active	Mean density on active transects (stems/acre)
August 2017	Fish Creek North	10	50%	2,949
	Fish Creek South	9	22%	220
	Square Pond	14	14%	169
October 2018	Fish Creek North	10	30%	119
	Fish Creek South	9	22%	43
	Square Pond	14	7%	36
October 2019	Fish Creek North	10	30%	91
	Fish Creek South	9	none	*below detection*
	Square Pond	14	none	*below detection*

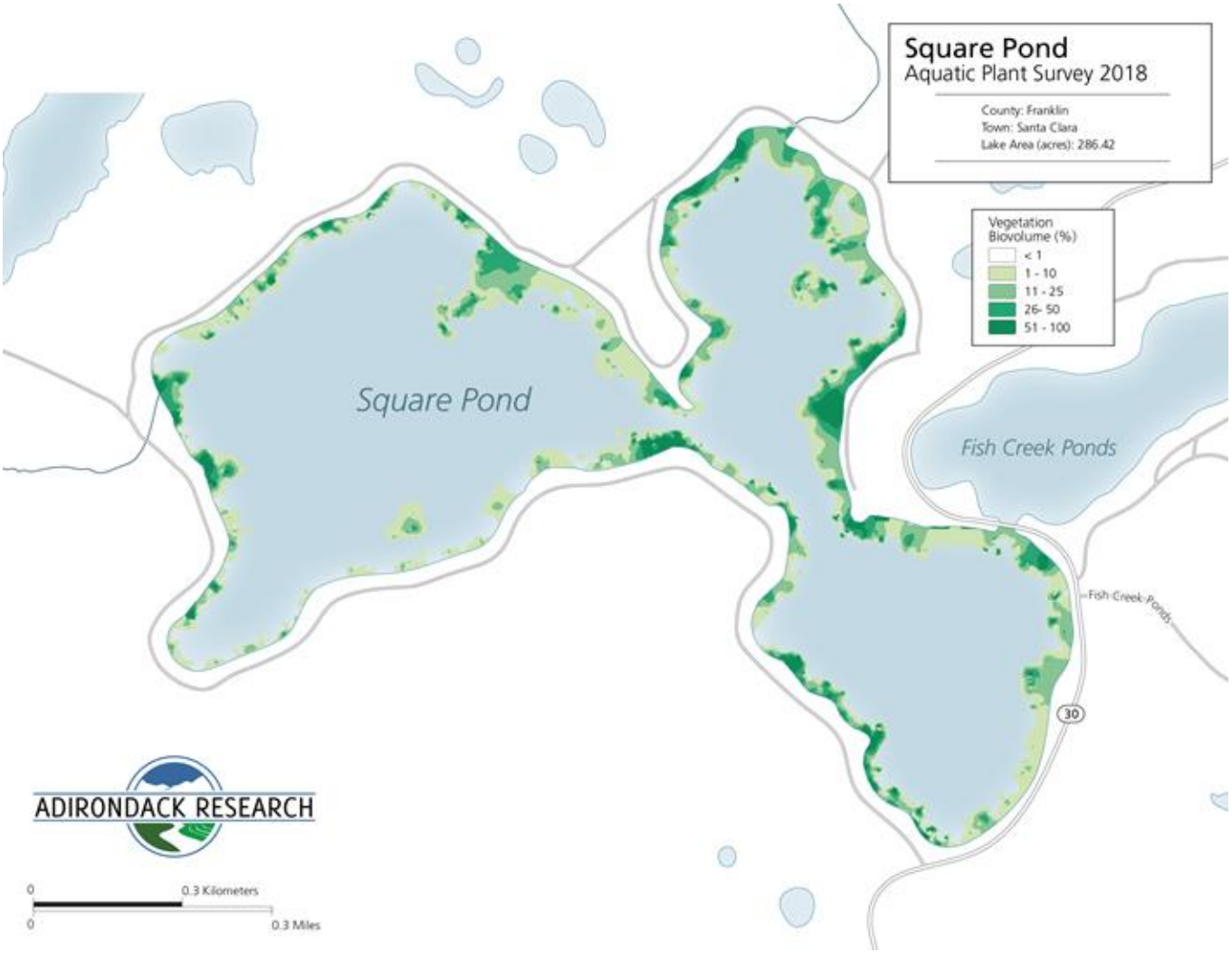
The number of transects with active Variable leaf milfoil infestations decreased in all three basins. In addition, the stem densities AWI encountered on active transects decreased by 97% at Fish Creek Pond North, and by 100% in both Fish Creek Pond South and Square Pond.

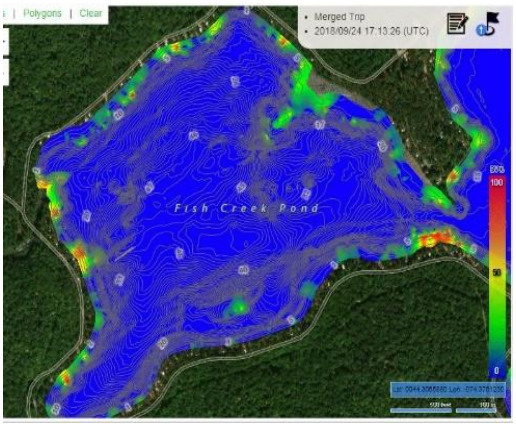
Lake Bottom Mapping: To get a better understanding of the characteristics of the bottom of Fish Creek and Square Ponds, the Upper Saranac Foundation utilized BioBase, an aquatic habitat sonar mapping technology. Data was compiled into bathymetric, aquatic vegetation and bottom hardness maps. This information developed a baseline for monitoring changes over time, measuring the waterbodies response to the FCAISMP.








Square Pond
Aquatic Plant Survey 2018
County: Franklin
Town: Santa Clara
Lake Area (acres): 286.42
Vegetation Biovolume (%)
< 1
1 - 10
11 - 25
26- 50
51 - 100
Square Pond
Fish Creek Ponds
Fish Creek Ponds
30
ADIRONDACK RESEARCH
0
0.3 Kilometers
0
0.3 Miles


Merged Trip
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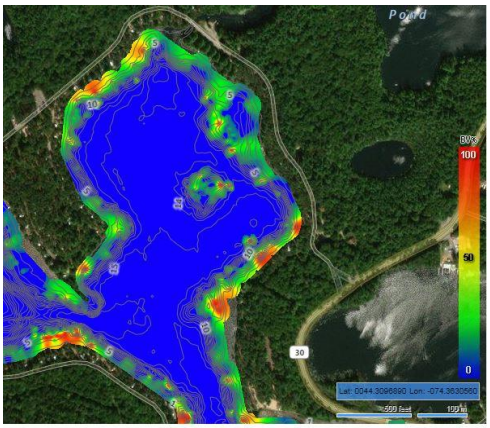
Fish Creek Pond
BV%
100
50
0


Pond
30
BV%
100
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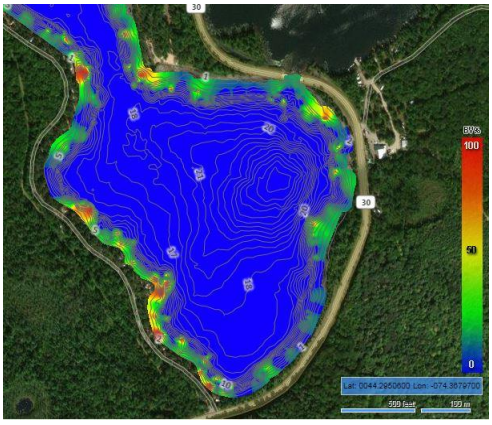
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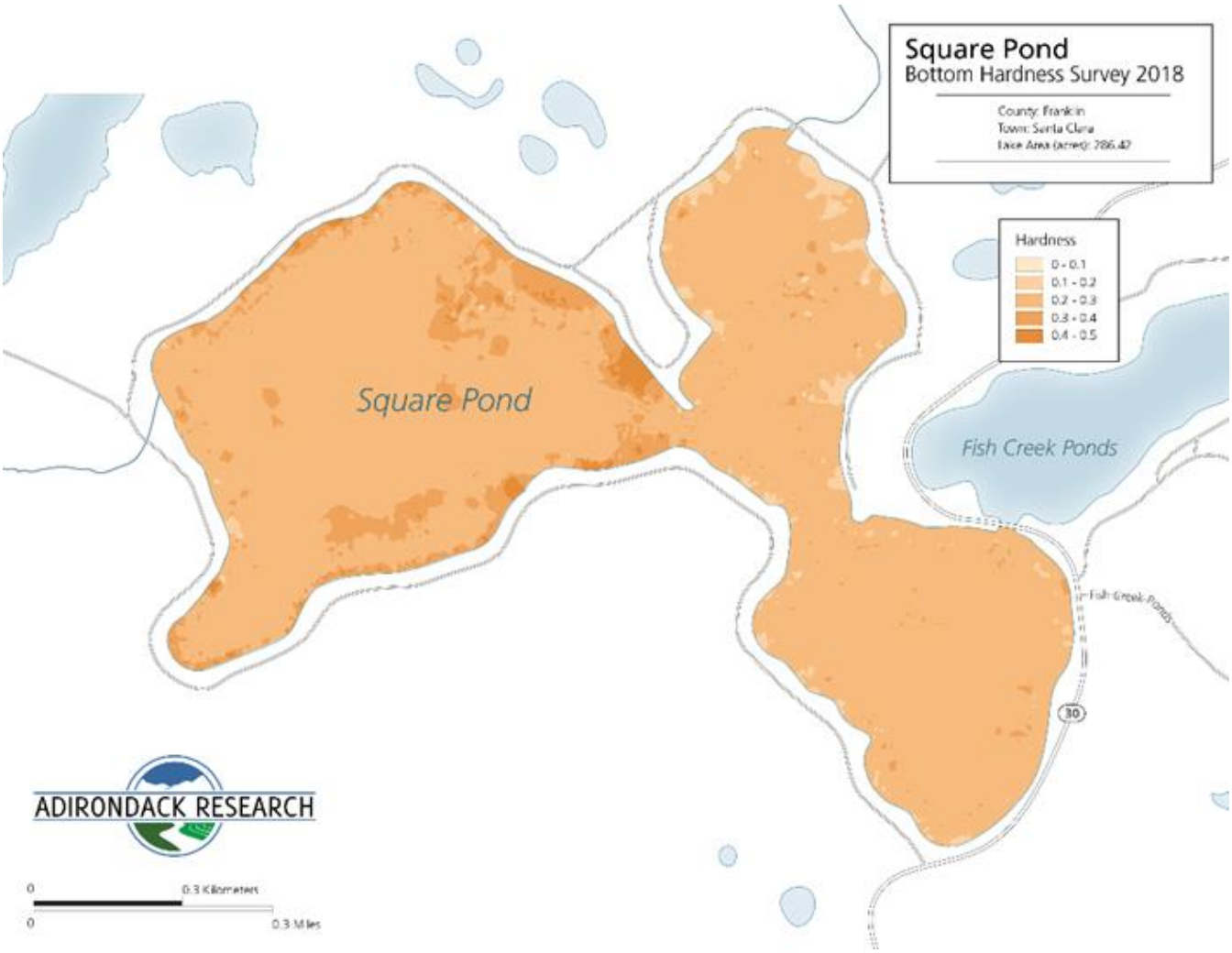
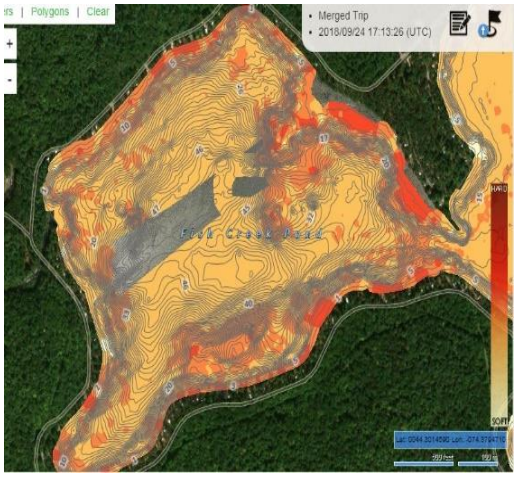
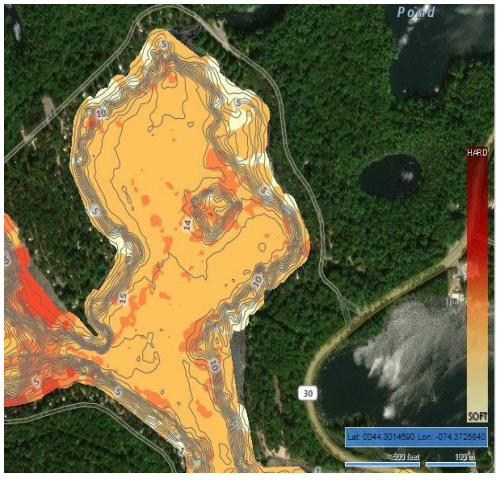

Square Pond
Bottom Hardness Survey 2018
County: Franklin
Town: Santa Clara
Lake Area (acres): 786.42
Hardness
0 - 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
0.4 - 0.5
Square Pond
Fish Creek Ponds
Fish Creek Ponds
30
ADIRONDACK RESEARCH
0
0.3 Kilometers
0
0.3 Miles


Polygons | Clear
Merged Trip
2018/09/24 17:13:26 (UTC)
HARD
SOFT


Pond
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HARD
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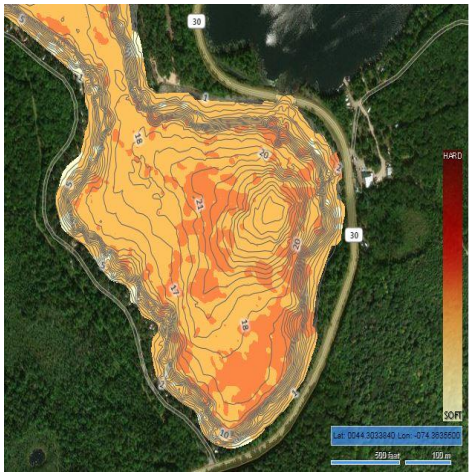

30
HARD
SOFT

Harvesting Methodology:

The harvesting project, similar to USL's, utilizes a Hooka Dive System. Each Hooka air compressor system allows two to three divers to hand harvest simultaneously. The invasive plants, both EWM and VLM were removed from the sediment by hand, including the root system and then bagged. An additional team member remained on the surface to retrieve plant fragments, notify boaters that divers are underwater and collect filled bags. Traditional "diver down" flags were deployed as well as additional safety navigation buoys which were strategically placed. A sediment curtain was utilized to assist in preventing fragments from floating outside the management area. Harvest periods are scheduled around the busy tourist season, traditionally following Labor Day. This reduced dangerous operating conditions due to high boater traffic. To reduce any user conflict issues with campers, the dive operation and use of the Hooka air compressor is focused in areas where campsites are unoccupied in the early morning hours.

Harvesting Outcome:

2017 Harvesting efforts: AIS harvesting began shortly after the AWI transect survey in the fall of 2017. Efforts focused on revisiting known AIS sites that were harvested in the 2016 Pilot Program and expand harvesting to cover the entirety 60-acre littoral zone of Upper Fish Creek Pond. Divers from Aquatic Invasive Management (AIM), under the direction of the USF's Lake Manager began their harvesting efforts September 11 and concluded October 13. A total of 984 hours of dive time was invested over a five-week period by AIM. At times there were as many 7 divers in the water with two top water personnel. The total investment for AIM divers in 2017 was $54,880. A total of 15,050lbs (7.5 tons) of EWM and VLM were removed from an approximate area of 60 acres of littoral zone in Upper Fish Creek Pond.

2018 Harvesting efforts: In 2018 the USF hired a new invasive dive company, Invasive Solutions Dive Company (ISDC). Divers began hand harvesting following the Labor Day weekend on September 4th and concluded one month later on October 4th. A total of 840 diver hours were invested and 299 bags of invasive plants or 7477 lbs. (3.74 tons) were removed from both Square Pond and Upper Fish Creek Pond. 2018 was the first year of the FCAISMP that the entire littoral zone within the Campground was harvested. The USF invested $48,650 in direct diver expense in 2018.

2019 Harvesting efforts: The USF again hired Invasive Solutions Dive Company (ISDC) to perform harvesting operations. Divers began hand harvesting following the Labor Day weekend on September 9th and concluded on October 10th. A total of 600 diver hours were invested and 232 bags of invasive plants or 5806 lbs. (2.9 tons) were removed from both Square Pond and Upper Fish Creek Pond. 2019 was the second year of the FCAISMP that the entire littoral zone within the Campground was harvested. The USF invested $34,750 in direct diver expenses in 2019. Milfoil harvesting amounts increased in the fifth week of harvesting as the dive crews focused efforts upstream of the Campgrounds Boat Launch into areas that have not been managed in previous years.

Table 5. Harvesting totals for 2019

Fish Creek Harvesting Totals 2019				
Week	**Date**	**Dive Hrs**	**Bags**	**Lbs @ 25 bs/bag**
1	9/9-10 & 16-17	120	5.25	131.25
2	9/23-24 & 9/30-10/1	120	11.75	293.75
3	Sept 23-26	120	24.5	612.5
4	Oct 1-4	120	59	1475
5	Oct 7-10	120	131.75	3293.75
Total	20 -10hr days w/3 divers	600	232.25	5806.25

Intensive Harvesting Period Entirety: From the beginning of the intensive harvesting program a total of 47,270 lbs. (23.64 tons) of the nuisance AIS have been removed from the Campgrounds 108 littoral acres. This was accomplished with 2,904 diver work hours and a $152,000 investment.

Table 6. Yearly dive hours in relation to area cleared and AIS removed

Fish Creek Campground Yearly AIS Harvesting Totals				
Year	Dive Hours	Acres Cleared	Pounds	tons
2016	480	6.13	18937	9.47
2017	984	44.25	15050	7.53
2018	840	108	7477	3.74
2019	600	108	5806	2.9
Total	2904	108	47270	23.64

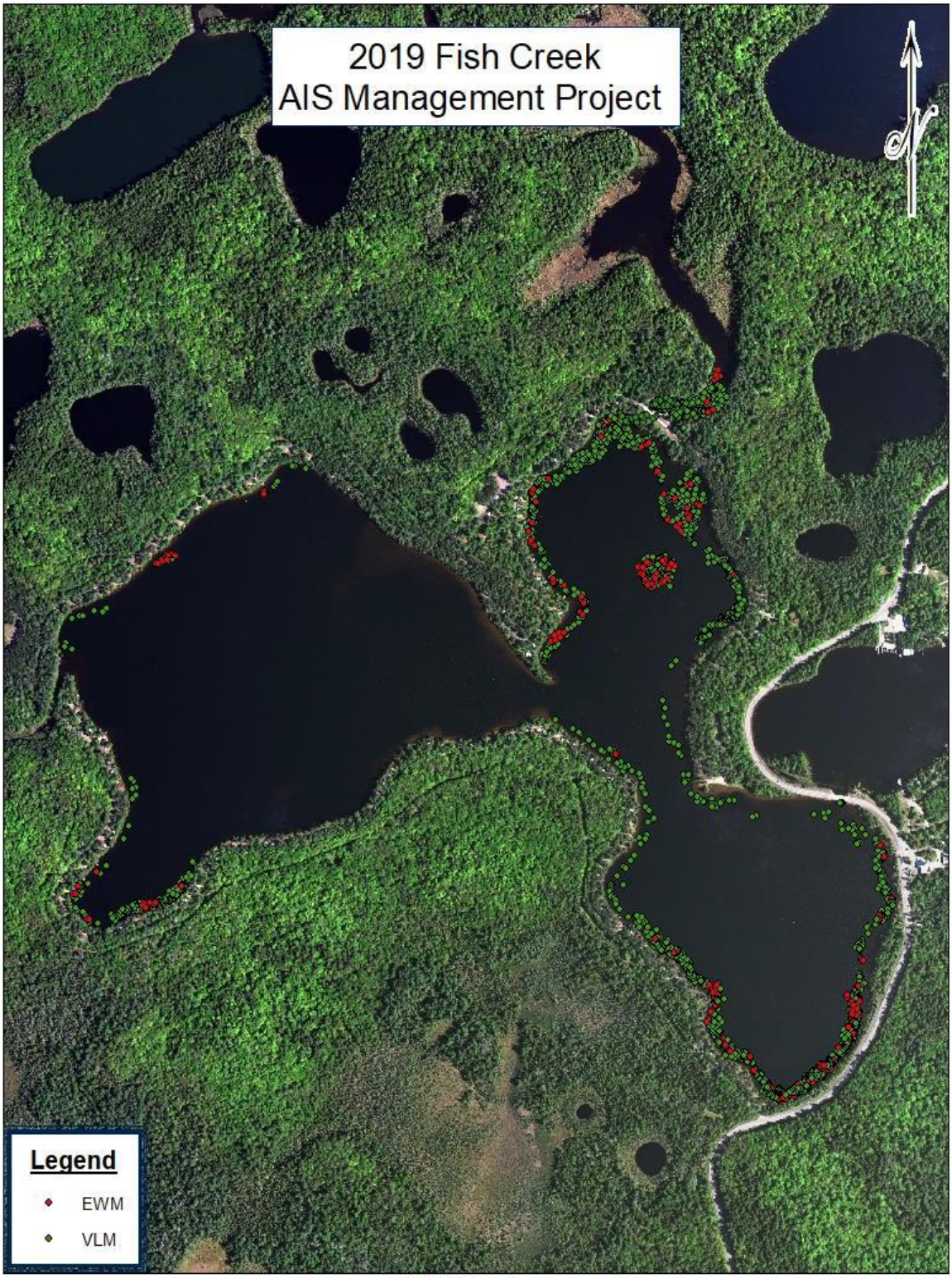
Each year of the FCAISMP there has been fewer signs of AIS infestation with significantly less milfoil harvested. The Fish Creek project is following a similar trend as to the accomplishments seen on USL. It is estimated that there is an 80% yearly reduction in plant density.

Table 7. Average AIS lbs. removed per day comparing Upper Saranac Lake to Fish Creek Campground since 2010

	Average AIS Lbs / Day Harvested	
Year	USL	FCCG
2010	50	…….
2016	6.11	1183.59
2017	6.07	456.06
2018	5.27	267.04
2019	4.84	290.31

The trend of finding and removing less AIS each year mimics the success as seen on Upper Saranac Lake (USL). When compared to efforts on the main lake that began in 2010, the FCAISMP is moving in the right direction. The slight upswing for the FCAISMP in 2019 can be attributed to divers expanding harvest efforts upstream into the Fish Creek tributary above the Campgrounds boat launch, into areas that have not been managed in previous years.

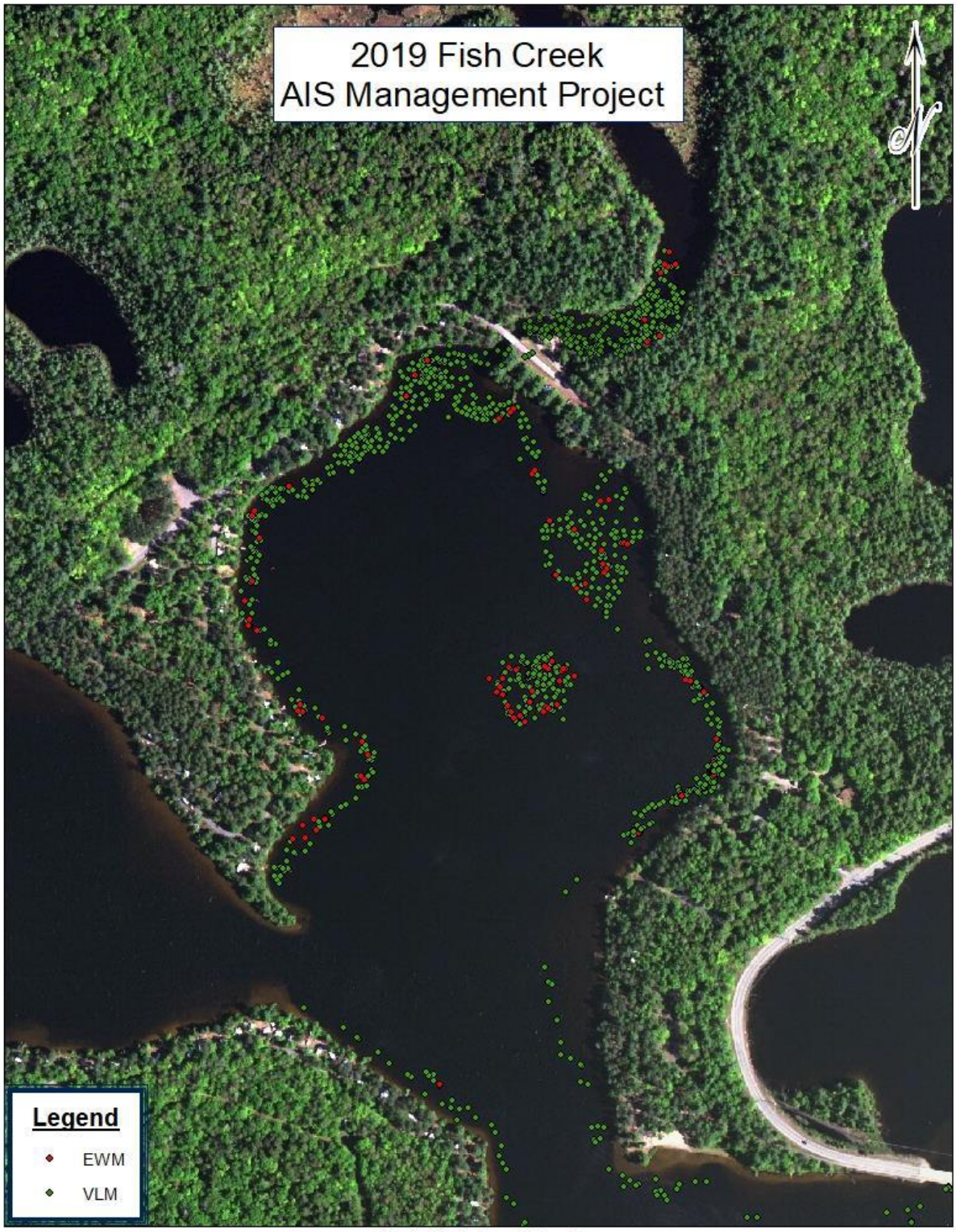
There is continued indications that management efforts are effective; through camper's comments relative to the reduction of nuisance aquatic vegetation, and with the reduction of material found and removed from year to year.



2019 Overview

Dots on the maps indicate points crews extensively harvested in 2019. Green dots = VLM and red dots = EWM.

Map provided by Invasive Solutions Dive Company.



North Fish Creek Pond

South Fish Creek Pond

Square Pond

Conclusion:

The FCAISMP uses a combination of AIS prevention, monitoring, and control activities to inhibit further AIS from establishing and spreading in the Watershed. This conclusion summarizes the monitoring and control methods of managing AIS through hand harvesting within Fish Creek Campground (Upper Fish Creek Pond and Square Pond).

After a successful four-week (480 dive hours) Pilot Program in 2016, where 9.47 tons of Milfoil was harvested from Fish Creek Campground, in 2017, 2018 and 2019 full implementation of the FCAISMP was put into motion. An additional 2,424 dive hours was invested over the next three years and an additional 14.17 tons of Milfoil was removed from within the campground.

Throughout the entirety of the program (2016-2019) a total of $165,720 was invested in 2,904 diver hours. Altogether, 47,270lbs. (23.64 tons) of milfoil has been removed from the campgrounds 108 littoral acres.

The entire 108-acre littoral zone of Campground has been completely harvested each of the last two years. It is estimated that our average invasive removal efficiency rate is 80%. Meaning, while nearly 100% of the plants have been hand harvested it is estimated that there is a 20% regrowth rate each year due to extensive root systems that were not fully retrieved or through upstream plant fragmentation establishing new plants.

Sustained harvesting efforts transitioning from the initial intensive period into the maintenance phase will continue to reduce the overall returning plant growth. In addition, AIS containment booms, placed just upstream of the Fish Creek Campground boat launch will aid in preventing new invasive introductions flowing from the Fish Creek tributary, also increasing the efficiency rate.

There is a strong indication that management efforts are effective. First, by comments made from campers relative to the reduction of nuisance aquatic vegetation and recreation value. Secondly, by the decrease in invasive plants removed each year. This follows a similar trend that occurred on Upper Saranac Lake during the initial intensive harvesting period. In addition, independent plant monitoring conducted by the Adirondack Watershed Institute indicates an average AIS stem density level decrease of 92% from 2017 to 2019.

2019 concludes the initial intensive harvesting period and the conclusion of the NYSDEC Invasive Species Rapid Response and Control Grant. The Upper Saranac Foundation, who is committed to the long-term sustainability of this Project will continue the management through the maintenance phase of the FCAISMP. Continued maintenance efforts will be funded through the USF's annual budget.

In 2020 the USF will continue with a four week, 480 dive hour harvesting maintenance effort at a cost of approximately $27,000. The focus will be to continue “clean up” by harvesting regrowth of the entire littoral zone two times over the summer, two weeks in June and two weeks in September.

Transect monitoring by AWI, in collaboration with the USF’s Lake Manager surface spotting, will help guide future harvesting needs. The USF will continue to monitor the results of the Project, documenting and tracking yearly declines of invasive plant growth.

The long-term outcome for the FCAISMP will improve water quality and maintain native species in their natural habitats, ensuring the sustainability of our natural public resources for future generations.

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