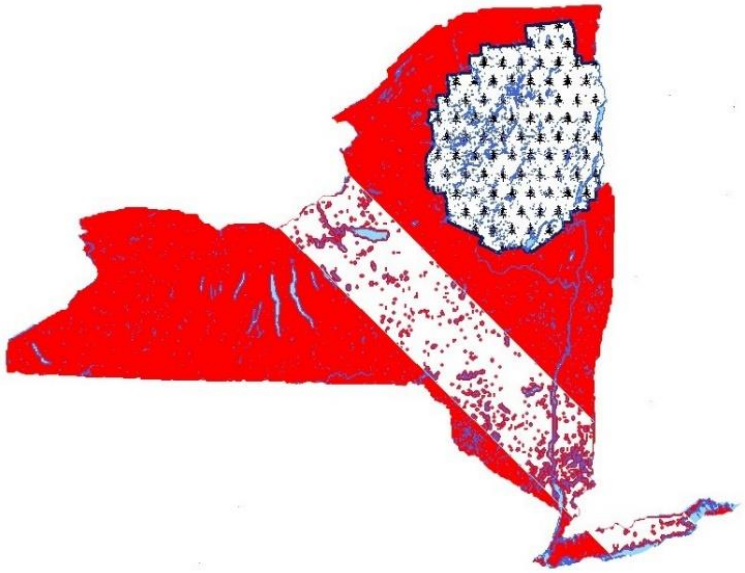
Aquatic Invasive Species Management Report

Schroon Lake

2019 Final Report

Prepared By:

INVASIVE SOLUTIONS



DIVE COMPANY, LLC

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Preface

Everyone at Invasive Solutions Dive Company would like to thank all the people, associations, and organizations involved with the aquatic invasive species management efforts for their time, energy, and contributions for the 2019 season. We recognize there is much more than meets the eye in all the efforts around the lake, throughout the season, and over the years to preserve, enhance, and protect Schroon Lake, it's beauty, and the abundant enjoyment opportunities it provides to its visitors. We consider this year to be a success in the continued management of aquatic invasive species throughout the lake, and as always, are excited for the opportunity to continue to be a part of those efforts in the coming years.

Introduction

The harvest season for 2019 consisted of four weeks, to include one in June, two in July, and one in August. In June there was a focus on sites which are known to harbor Curly-leaf Pondweed (CLPW) in an effort to harvest the plants before they can complete their life cycle, as well as focusing on sites with heavy boat traffic and higher densities of Eurasian Watermilfoil (EWM). For July we covered as many sites as able in line with our year's management plan with the focus on the "peak" of the growing season, while allowing for slight variations due to aquatic invasive species (AIS) sighting reports. Finally, our last week in August, we finished any sites which had not yet been worked, and revisited high-density sites to follow up on any possible regrowth.

Overall, we saw a decrease of 14.1%, or 185 lbs. of AIS harvested compared to 2018, breaking the increasing trend of pounds harvested the prior two years (although it should be noted there were new areas discovered each of these years.) Of the 27 sites throughout the lake, 5 sites produced no AIS, 7 sites did not produce enough AIS to be weighed, 7 sites saw an increase of 50% or more of AIS harvested, and 10 sites saw a reduction of 50% or more of AIS harvested.

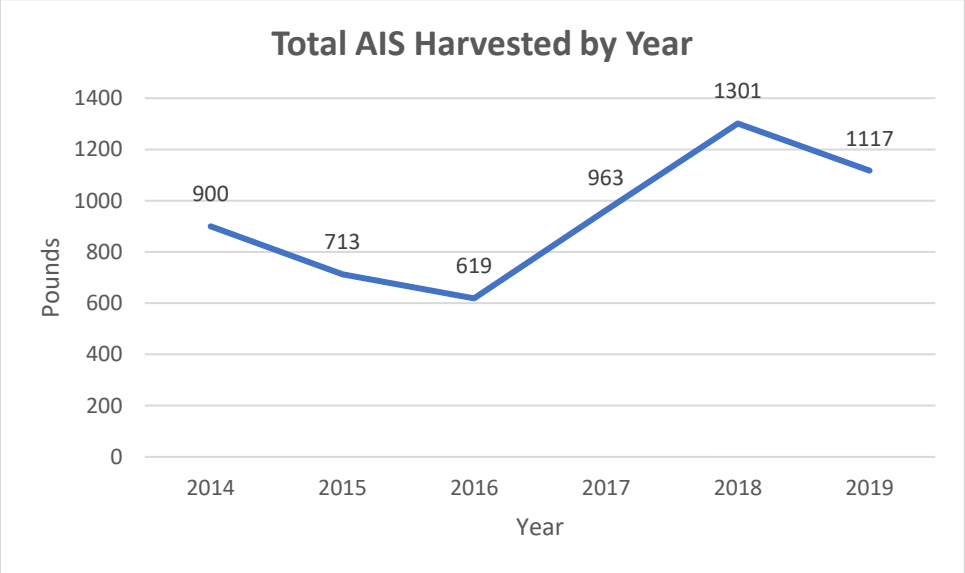
Methodology

The successful harvesting of aquatic invasive species is an ever-evolving world which requires knowledge in many areas to include the bodies of water and their specific tendencies, especially in relation to their natural flow and prevailing winds, seasonal changes, historical AIS data and patterns, and knowledge of AIS and their life cycles. Considering the many variables, we develop a foundation for a management plan to lay the groundwork for the harvest season, while still allowing flexibility for minor changes in harvesting methods to ensure the best harvesting practices are always being employed.

For the management of Schroon Lake, we began planning by using historical harvest data to prioritize site management based upon factors like historical plant densities, the location of AIS sites, AIS type and trend data. Throughout the season, our Crew collects data, to include plant locations via GPS waypoints, plant size and life cycle, bag count, and general data specific to the plant location, all of which can be used throughout the current and successive years.

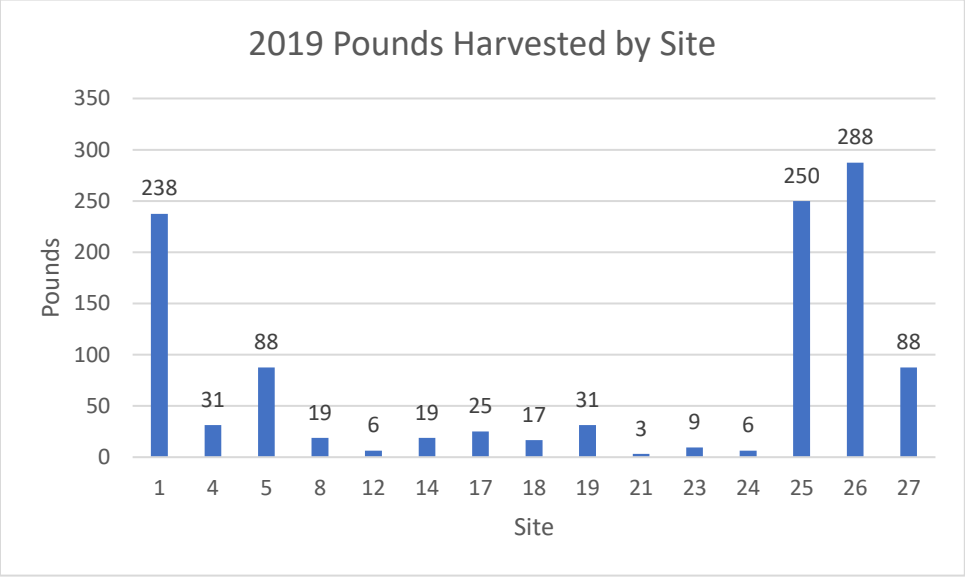
Once the season begins, we start harvesting according to our site prioritization and current findings to ensure the best utilization of time. Throughout the season our Crew continuously monitors the growth cycle of the AIS to ensure we are using the most effective harvesting techniques for the most thorough removal of all AIS plant matter while leaving in place the native plant communities. Finally, each week we produce a report to reflect our findings for the week and show the progress being made throughout the lake.

The Numbers

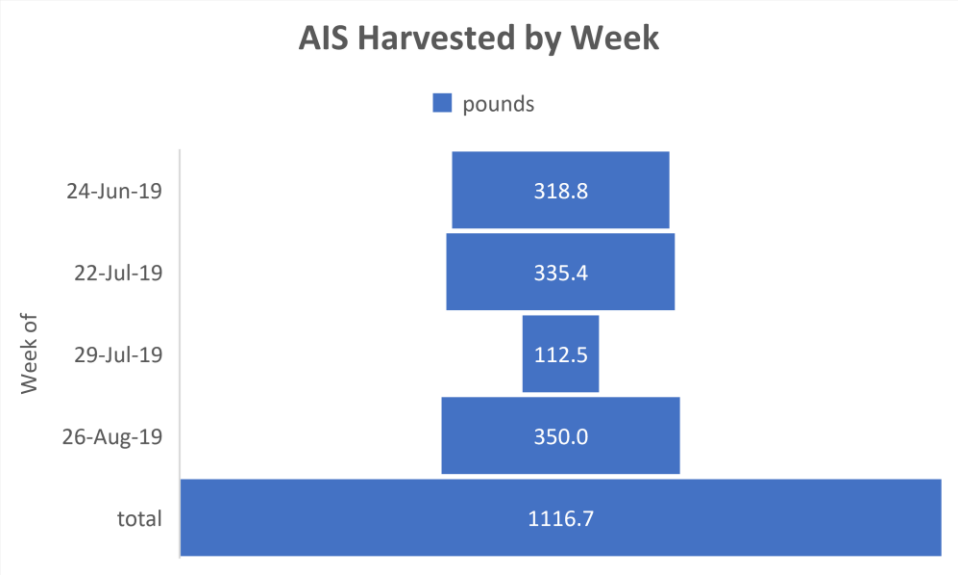


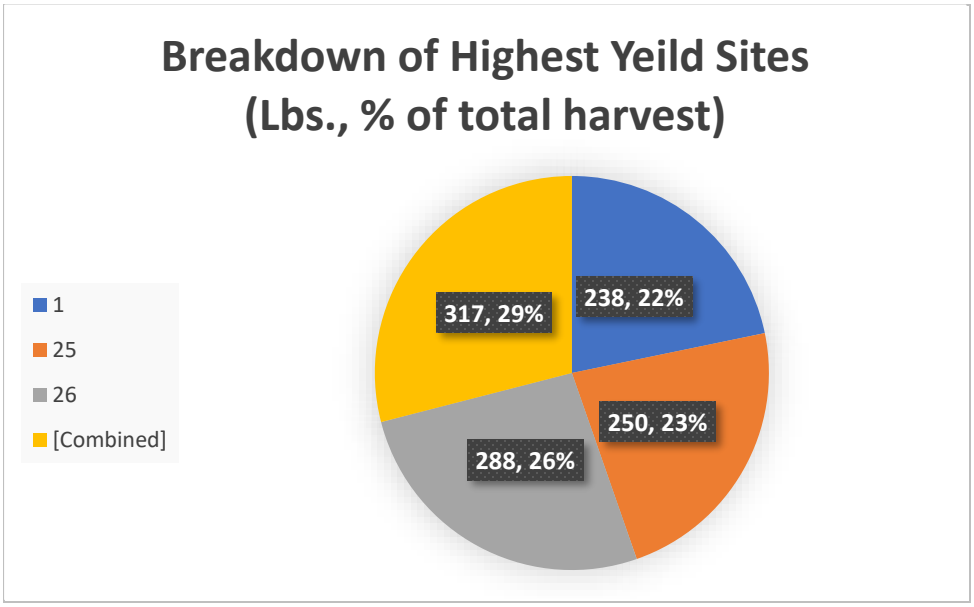
Yearly Change in Lbs. Harvested	
2018-2019	**-14.1%**
2017-2018	35.2%
2016-2017	55.6%
2015-2016	-13.2%
2014-2015	-20.8%

Pounds Harvested per Site: 2018 - 2019								
Site #	2018	2019	% Change		Site #	2018	2019	% Change
1	111.5	237.5	113.1%		15	0.6	0.0	-100.0%
2	0.0	(6 AIS)			16	6.3	(3 EWM)	-99.9%
3	0.0	(8 EWM)			17	11.1	25.0	125.8%
4	481.3	32.5	-93.2%		18	9.4	16.7	77.9%
5	5.0	87.5	1650.0%		19	21.9	31.3	42.9%
6	6.3	(8 EWM)	-99.9%		20	143.8	(5 EWM)	-99.9%
7	0.0	0.0			21	50.0	3.1	-93.8%
8	55.0	18.8	-65.9%		22	12.5	(15 EWM)	-99.9%
9	0.0	0.0			23	6.3	9.4	50.0%
10	0.0	(1 EWM)			24	12.5	6.3	-50.0%
11	0.0	0.0			25	68.8	250.0	263.6%
12	11.3	6.3	-44.4%		26	37.5	287.5	666.7%
13	0.0	0.0			27	68.8	87.5	27.3%
14	181.9	18.8	-89.7%		Total	1301.3	1117.9	-14.1%



Note: This graph does not include sites without AIS (sites 7, 9, 11, 13, 15) or sites with too little AIS harvested to weigh (sites 2, 3, 6, 10, 16, 20, 22)





Note: [Combined] represents the remaining twenty-four (24) sites on the lake

Site Maps


27
26
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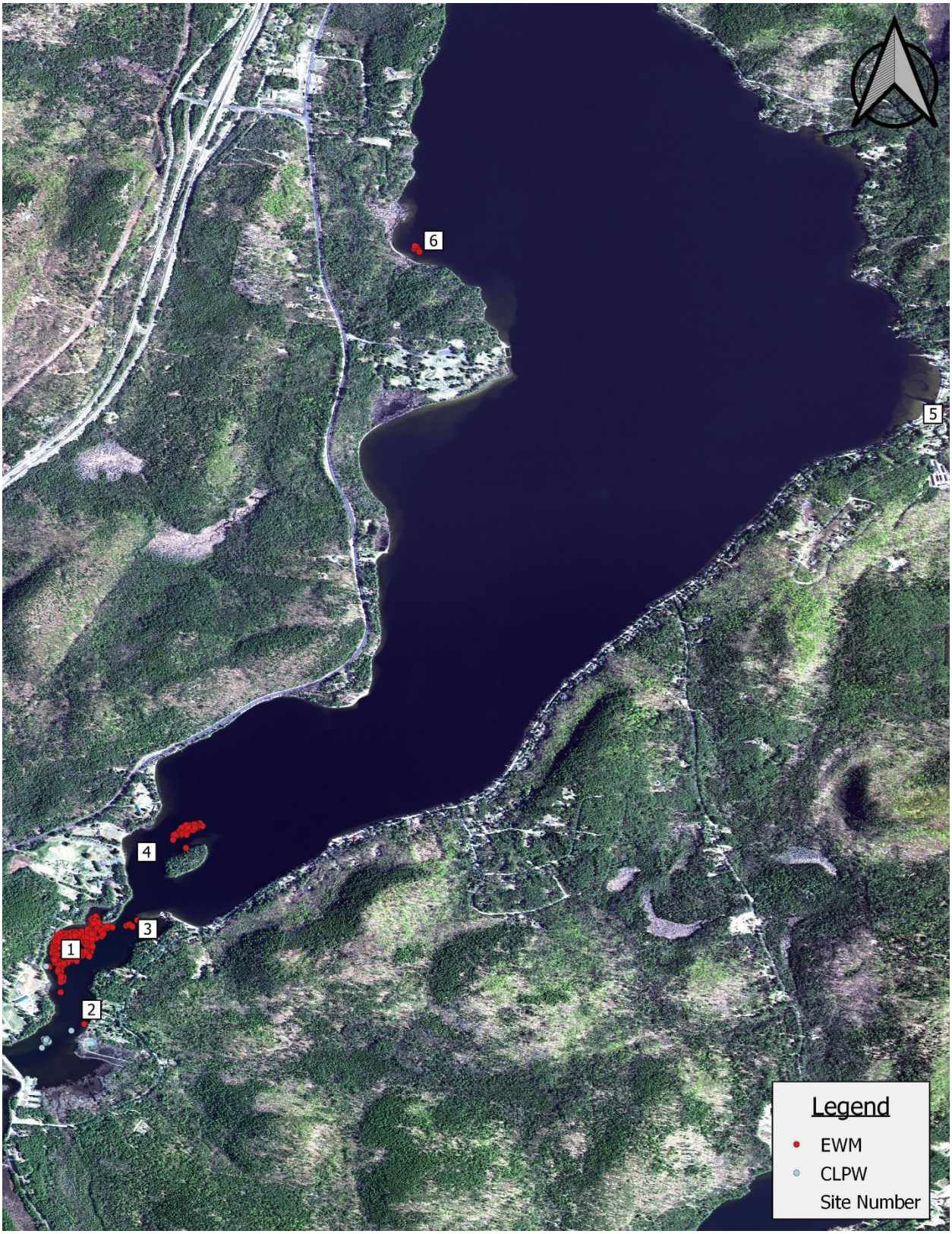
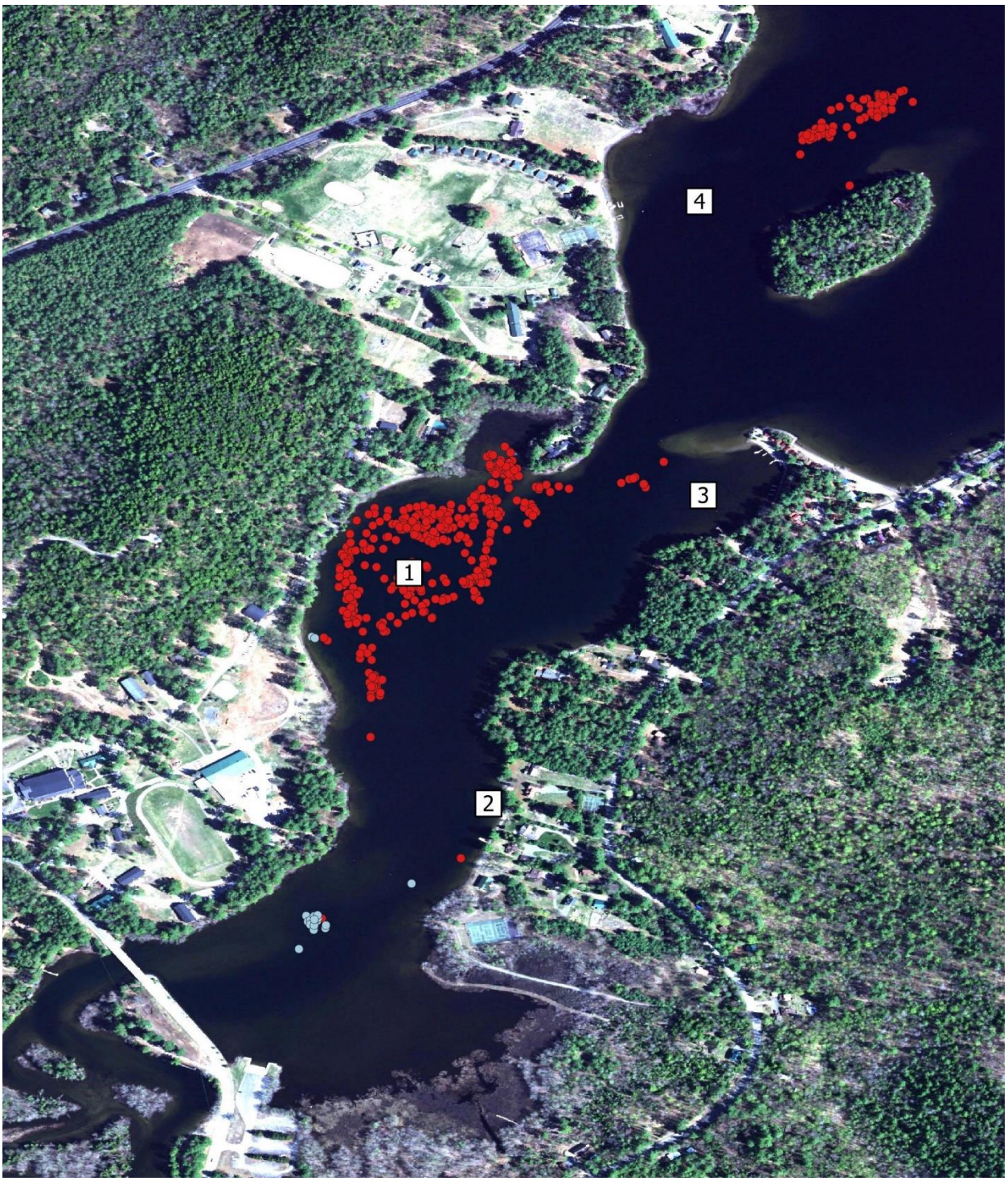
11
Legend
EWM
CLPW
Site Number


10
11
8
9
7
6
5
Legend
EWM
CLPW
Site Number


6
5
4
3
1
2
Legend
EWM
CLPW
Site Number

Site Summaries



Site 1- Word of Life Bay (Ww1)- Overall, there was 237.5 lbs. of AIS harvested in site 1 (21.8% of the lake's total harvest) as compared to last year's 111.5 lbs. Because of its locality to the Word of Life Camp, site 1 sees high traffic throughout the year. This site has a large littoral with EWM scattered throughout

native plants with very sporadic CLPW. This year's harvest occurred in the same general areas historically harvested with the southern end of the area extending approximately 125 yards further south than the prior year. Additionally, there was a patch of CLPW located in the southern section of the site which produced a little under 20 lbs. of harvest matter. These additional southern sections harvested account for the bulk of the increase of lbs. harvested this season.

This site would be best managed with multiple harvests over the course of the season. An early harvest of the site allows it to be worked before plants can be disturbed by lake traffic as well as targeting CLPW during its earlier growth pattern. A later season harvest allows for any smaller AIS which was undetectable in the native plant growth to be readily identified and harvested.

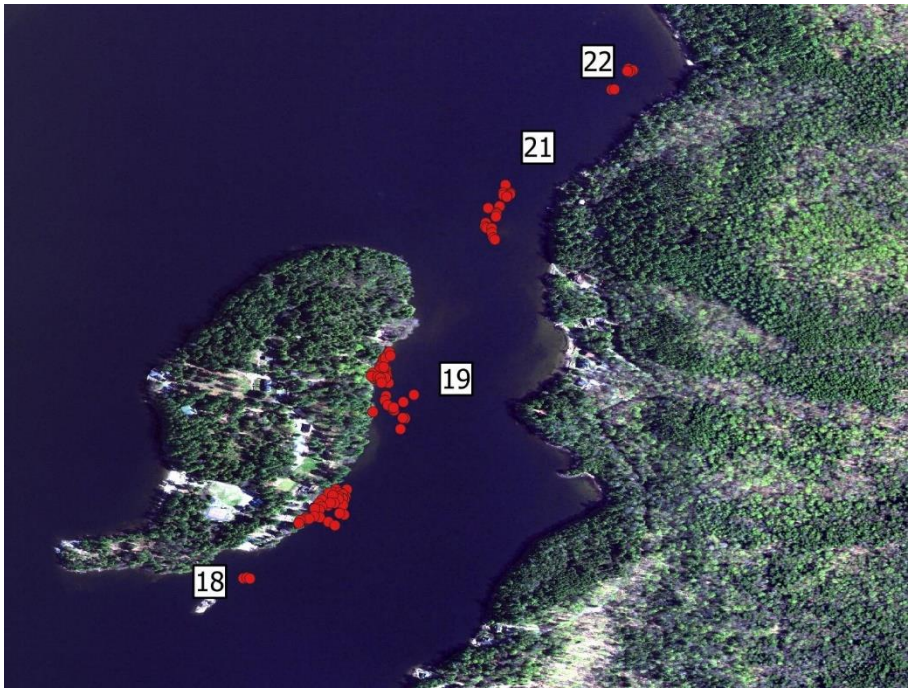
Note: The CLPW patch which was harvested in site 1 was originally reported in site 2 (in the June 24-27, 2019 AIS report), however upon further review has been reclassified/ included in site 1 (based off U.S. Geological Survey hydrography datasets.)

Site 4- Word of Life Ranch/ west of Brill Island (Ww2)- Site 4 saw a 93.5% decrease in AIS harvested from 2018 (2018- 481.3 lbs., 2019- 32.5 lbs.) There was very limited EWM harvested in the area just off the west of the island and sparse EWM found within the native plants in the area to the northwest of the island.

Site 5- ADK Lodges (We6)- Site 5 saw an increase of EWM harvested in 2019, harvesting 87.5 lbs. compared to 2018's 5 lbs. This site has heavy native growth which makes for slower harvesting of the site as well as high boat traffic later in the season. The site was harvested over two separate visits; the first week to harvest the bay while there is limited boat traffic and to reduce the possibility of fragmentation later in the season, and a follow-on harvest to remove any remaining AIS. The first week of harvest the

Crew reported small clusters of short EWM along the sides of the bay. The follow-on harvest was arranged to allow the boats to be moved for greater safety and freedom of movement for the Crew. The second harvest the Crew reported heavier EWM growth and fragmentation throughout the bay, with a higher density on the south of the bay.

Due to the high boat traffic within this site, it should be visited both early season with a follow-up visit later in the season. If able, coordination with the Lodges is preferred for both the safety of the Crew and the efficiency allowed with freedom of movement.



Site 18- Clark Island south (Ee8) & Site 19- Clark Island narrows (Ee8-9)- Overall, we saw an increase of 16.7 lbs. of AIS harvested from Clark Island this year, with the greatest increase of AIS coming from the east side of the island. Although there was an increase of lbs. harvested, the area which was harvested decrease in sized compared to last year, and the sites both north and south of the island saw a substantial decrease in AIS. Clark Island sees higher traffic throughout the year and should be visited early in the season to prevent fragmentation from boater traffic, then followed up later in the season for continued management of the area.

Sites 21 & 22 (Ee9)- Between the two sites there was a total of 3.1 lbs. harvested compared to 2018's 62.5 lbs. (95% reduction). There was EWM harvested from the same general historical areas as the years prior, but in greatly reduced numbers.

Site 25- Terra Alta (Ew11)- Site 25 saw the second largest increase of pounds harvested this season (2018- 69.lbs, 2019- 250 lbs.) Crew worked from the entrance of the Schroon Lake Marina south throughout the site, finding sporadic EWM growth which increased in density as they approached the swimming area. The section just south of the swimming area contained the highest density of EWM, which thinned and became sporadic as the Crew continued south into lily pads. This site has a large littoral area with generally consistent native plant growth which seems to encounter increased fragmentation, likely in part to increased traffic with the marina and swimming area nearby. This site is best managed with multiple visits and in contingency with the marina.

Site 26- Schroon Lake Marina (Ew11)- Site 26 saw the largest increase of pounds harvested this season (2018- 37.5 lbs., 2019- 287.5 lbs.) and has very dense native growth making for slower, more difficult harvesting, especially when coupled with the high fragmentation found within the site. The site often produces high numbers of single stem plants with limited multi-stems, most readily found along the southern shore, with the highest concentration coming from the west of the bay nearby the gas docks.

Because of the high boat traffic this site takes more time as the Crew must often make way for boats (sometimes in an abundance of caution.)

Due to the high boat traffic within this site, it should be visited early in the season to harvest any AIS to help prevent fragmentation and distribution of AIS from boat traffic, followed up with additional visit(s) (as time/needs allow/dictate), to allow any fragmentation or new growth AIS previously hidden within native plants to gain some height allowing them to be readily identified and harvested.

Site 27- Lockwood Bay (Ew11)- This site saw a small increase in lbs. harvested but also saw an increased amount of harvesting. The site is generally shallow with dense native growth which makes for slower more challenging harvesting. Within the site there is generally sporadic and lighter AIS densities near the entrance and along the south shore, with the heaviest EWM growth along the west and north shore. Because this site sees far less boat traffic than much of the lake and shows signs of limited water transfer between the lake and the bay, it's often lower priority among the sites. This site sees increased efficiency when surface observations are performed prior to harvest helping to identify the problem areas within the bay.

Conclusion

Overall, this was another successful year of AIS management throughout Schroon lake, with a 14.1% decrease of AIS harvested compared to 2018, breaking an upward trend in pounds harvested from the previous two years. Of the 27 sites throughout the lake, seven sites saw an increase of 50% or greater of lbs. harvested while 10 saw a decrease of 50% of greater of AIS harvested (8 of those saw 90% or greater reduction.) Although fluctuations are to be expected in the management of AIS, there are two main points highlighted by these numbers.

First, the reductions seen throughout sites show the ability and success of management efforts throughout the lake. As sites are worked throughout the season and years, they are constantly reprioritized to stay ahead of the everchanging and fluctuating task of AIS management. AIS in general, but more specifically EWM and CLPW are aggressive invaders which have the ability to quickly propagate an area when left unchecked or undermanaged. It is essential to build the management plan around the current state of the lake while always considering past trends and historical sites. Nevertheless, as sites get highlighted from one year to the next, management efforts are shifted which can result in drastic reductions in AIS numbers as seen in sites this season.

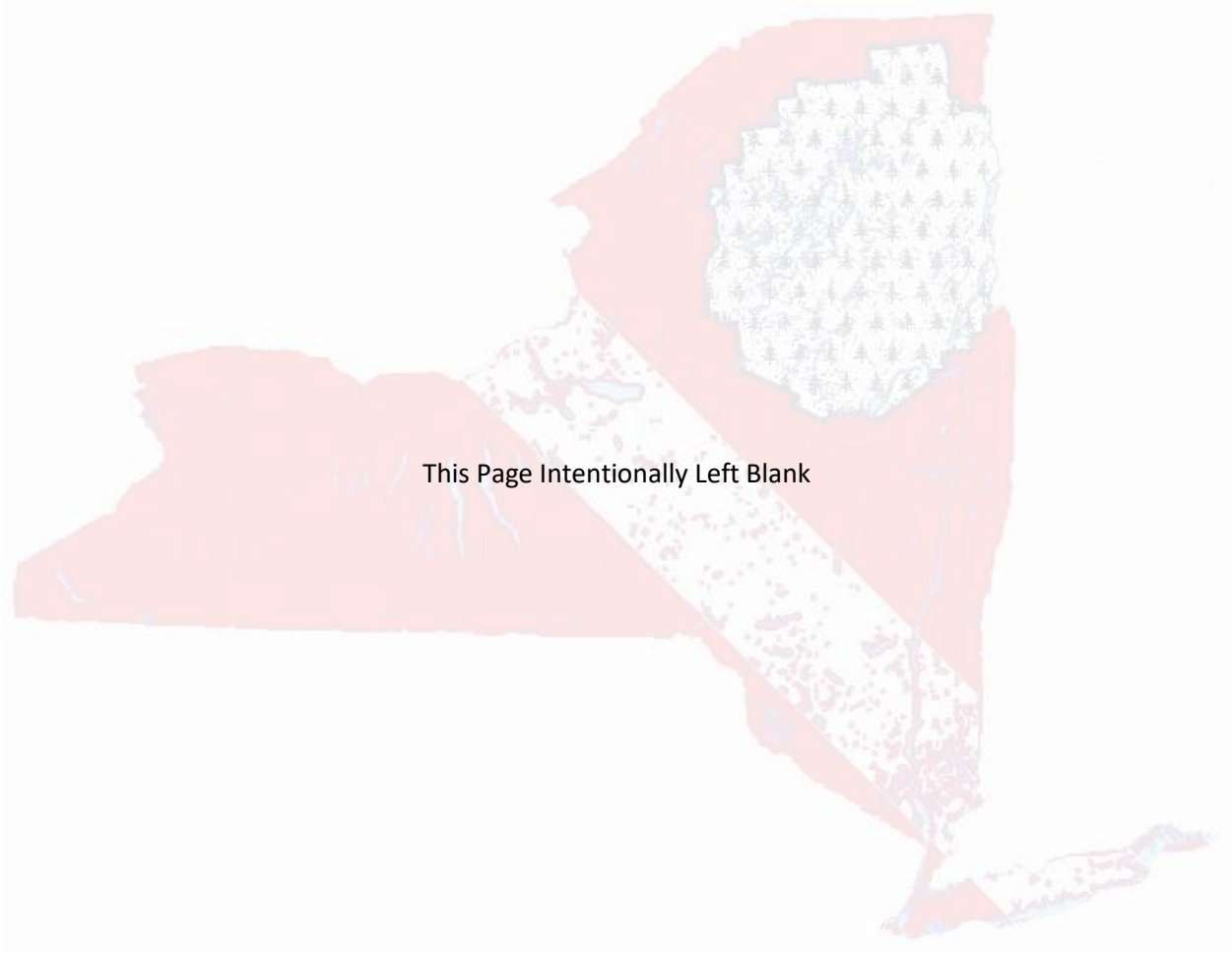
Secondly, as we see increases of AIS within sites, it further highlights AIS' ability to aggressively populate or repopulate areas, even while under current management and with the selective harvest of AIS around native plant communities. EWM and CLPW have the adapt ability to produce abundant offspring through vegetative fragmentation/ reproduction often aided by the incidental disruption of the plant by lake-goers. The sites which experienced the greatest increases of AIS have the commonality of high lake traffic and large littoral areas, generally with lush native plant populations which lend to divers looking for that "needle in the haystack" outlier.

The current four-week harvest plan allows for all former and presently known AIS sites to be visited and harvested but does not allow for follow up of most sites, additional exploration of sites, and if a new area is discovered, it requires the redistribution of remaining time to address the site which can lead to rushed harvests of other sites (ex. 2017- EWM patch near site 14, 2018- EWM patch in site 4).

Ideally, and particularly with high trafficked sites, site management is optimal with multiple visits throughout the growing season. This allows for addressing of the different life cycles of AIS as well as the various periods of growth experienced throughout the season, which can vary according to factors like weather and lake temperatures. It is beneficial to harvest sites early in the season to harvest plants before they hit their peak growing allowing for easier surface disruption of the plant, followed with a successive harvest(s) to address any new growth or outliers, while further exploring areas outside the main areas of concentration or reported plant sightings.

In summary, we had a successful year of AIS management throughout Schroon Lake and expect to see continued success in the coming years. However, we believe with the addition of a fifth harvest week, we would experience a more rapid and predictable reduction in numbers throughout the lake as a whole. The added flexibility of an additional week would not only allow more harvest time and thorough site inspections throughout the lake, but would allow the Crew the ability to better address any current site fluctuations or reported AIS, better keeping ahead of the ability of AIS to propagate it's surrounding area.

In the coming years, we will continue to use all the data available while remaining flexible so we can plan, act, and react accordingly, ensuring the best management practices are kept in place to meet the demands of the lake. We would like to say thank you once more to everyone involved one way or another in the ongoing efforts to preserve and protect the lake. We look forward to the continued success of the lake and are excited for the prospect of continuing to be a part of the success and enjoy the awe-inspiring views it provides, both above and below the water.



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