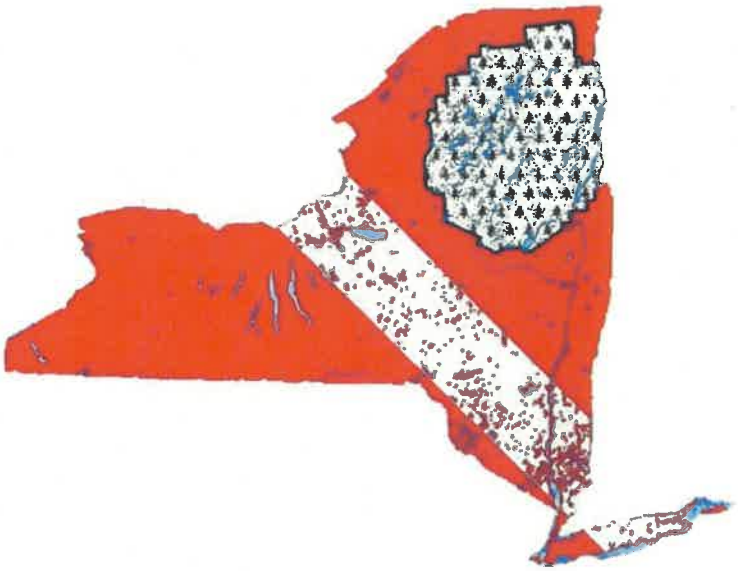
Aquatic Invasive Species Management Report

Schroon Lake

2022 Final Report

Prepared By:

INVASIVE SOLUTIONS



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Acknowledgments

This report was prepared for the County of Warren pursuant of WC 41-22- Schroon Lake Aquatic Invasive Species Control Program- Plant Management in accordance with Section V.

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Lake George, NY 12845

Funding for the Department's milfoil control activities is through a Memorandum of Agreements between the District and the Town of Chester, Town of Horicon and Town of Schroon.

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Preface

Everyone at Invasive Solutions would like to thank the County of Warren, the Town of Chester, the Town of Horicon, the Town of Schroon, and all the folks we worked with throughout the year for their time, hard work, and commitment to ensuring Schroon Lake continues its path of successful aquatic invasive species management. Additionally, we would like to thank the lake associations and volunteers for their continued commitment and hard work in the common goal of success. There is always a lot of work going on behind the scenes bringing everything together and working to better understand the intricacies of the lake then putting plans into action. The 2022 season wrapped up as another successful year managing both the historical growth areas as well as finding new aquatic invasive species beds which should lead to further reductions in local sites in the coming years.

Introduction

The 2022 harvest season consisted of four weeks, two in July and two in August. Typically, we schedule an earlier harvest week (June) to work high producing and priority sites before peak growth, helping to get ahead of the plant growth, minimizing seasonal site production and time needed within these sites. However, without the availability of an early week this season, the scheduled was manipulated to allow for three consecutive weeks with the goal of working all sites within this time frame. The final week was scheduled with a two-week gap between harvests to allow for regrowth of any remaining plant material within a site, increasing divers ability to quickly identify any aquatic invasive species (AIS) within native vegetation, helping to increase efficiency throughout their harvests.

Weeks one and two we worked to address historically high producing sites, high producing sites from the year prior, and sites which see increased boating traffic. By addressing these sites first, we aim to reduce AIS populations early, helping to minimize the likelihood of plants getting fragmented from boating activity, and allow time before performing follow-on harvests. During these weeks, Crews noted some sites had Eurasian Watermilfoil (EWM) which were cut near surface with plant fragmentation and small new growth within the surrounding area, and many of the Curly-leaf Pondweed (CLPW) plants had developed turions on the lager plants.

Week three was spent working throughout any site which had not seen harvesting activity yet, most of which produce little to no AIS each year. Once these sites had been inspected or harvested, Crew spent time reworking sites which produced higher volumes within the first weeks of harvesting.

The final week the Crew performed return inspections or harvests in seasonally high producing sites and very large sites which benefit from follow-on harvests due to challenges of addressing large sites. Additionally, during the final week the Crew follows up on any AIS Scout reported areas which had not yet been addressed.

Of the twenty-seven sites on the lake, ten sites had a decrease in harvested weight, five had no change with no AIS harvested, and twelve had an increase in harvest, though five of those sites had an increase of ten plants or less. Of the seven other sites which saw an increase, two saw an increase based on our ability to visit the sites more frequently, and two sites had a new area discovered which accounted for the increase in weight within those sites.

In total, there was 1031.3 lbs. harvested, up from the previous years 834.4 lbs., yet notably without the harvest weight from the two new beds located (areas not previously on the radar,) we had a total harvest weight of 718.8 lbs. Though these beds cannot be discounted, their discovery is seen as positive progress (discussed in further detail in site descriptions below) which should help to reduce AIS numbers in coming seasons and hopefully help flatten fluctuations experienced year-to-year in harvest numbers.

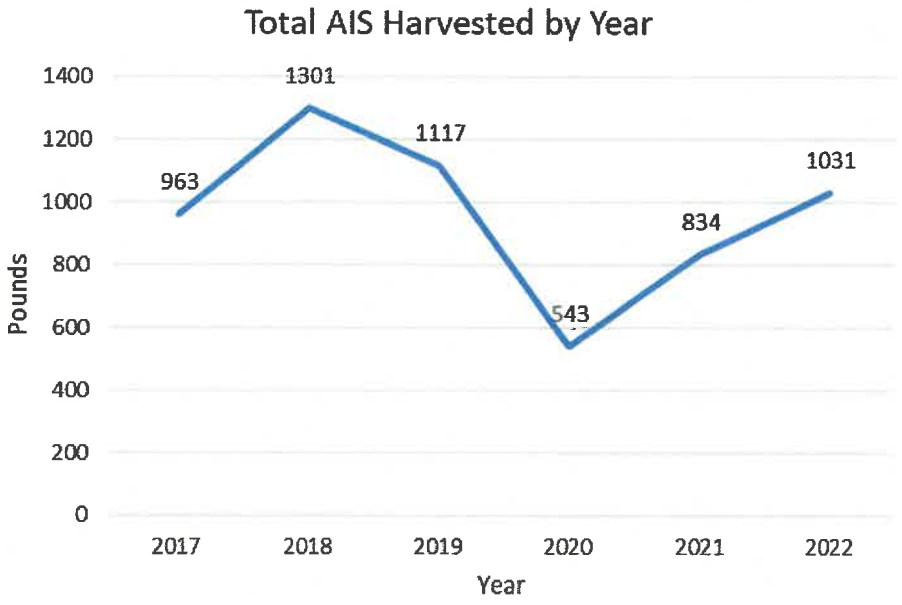
Methodology

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.

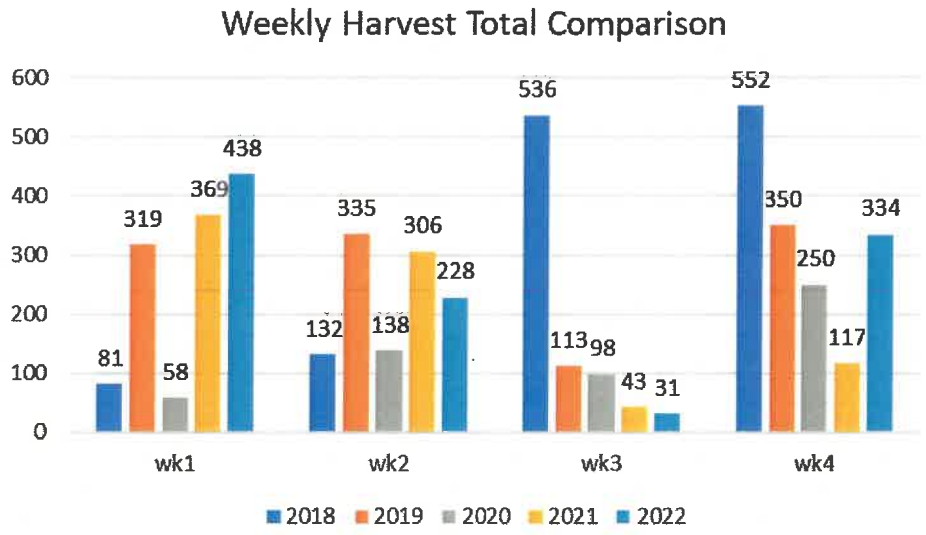
For the management of Schroon Lake, we begin planning by using historical harvest data to prioritize site management based upon factors like historical plant densities, harvesting trends, the location of AIS sites, and AIS type and life cycles. Throughout the season, our Crew collects data, to include plant locations via GPS waypoints, plant size and life stage, harvest weights, and general data specific to the plant location, all of which is considered throughout the current and successive years. Unique to Schroon Lake, we also take into consideration AIS Scout reports provided to us, which can help to identify and prioritize work sites throughout the season.

Starting the season, we begin harvests based off our prior planning for the year, working accordingly to make sure to best utilize the time available, and progress and adapt our management as dictated by our findings. We are continuously monitoring 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.

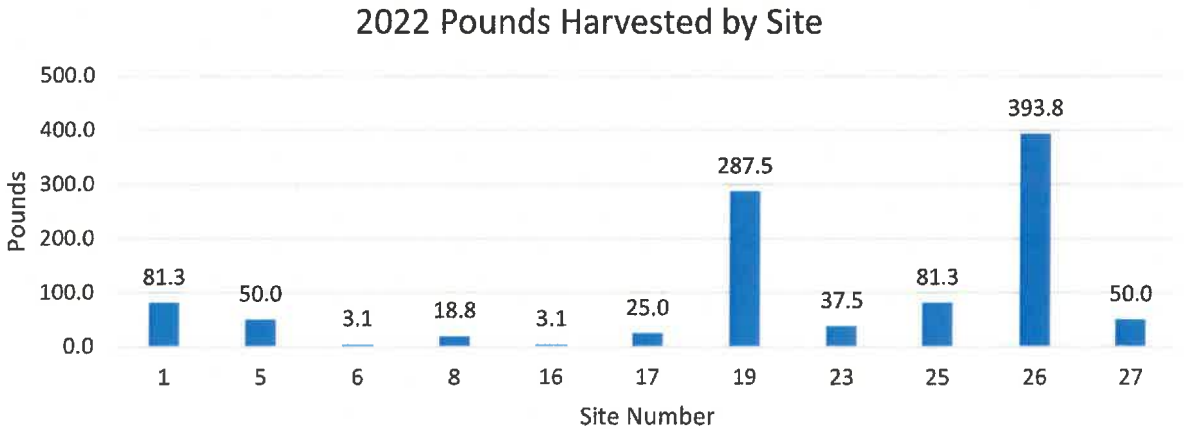
Harvest Numbers



Yearly Change in Lbs. Harvested	
2021-2022	23.6%
2020-2021	53.7%
2019-2020	-51.4%
2018-2019	-14.2%
2017-2018	35.2%

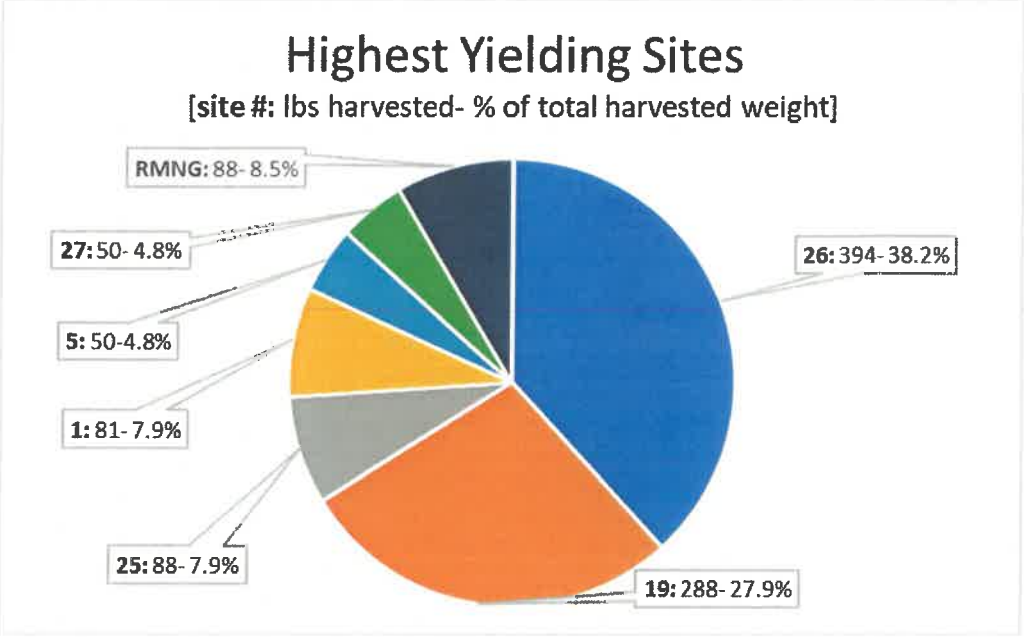


Note: Week four consistently produces high AIS harvested weights.



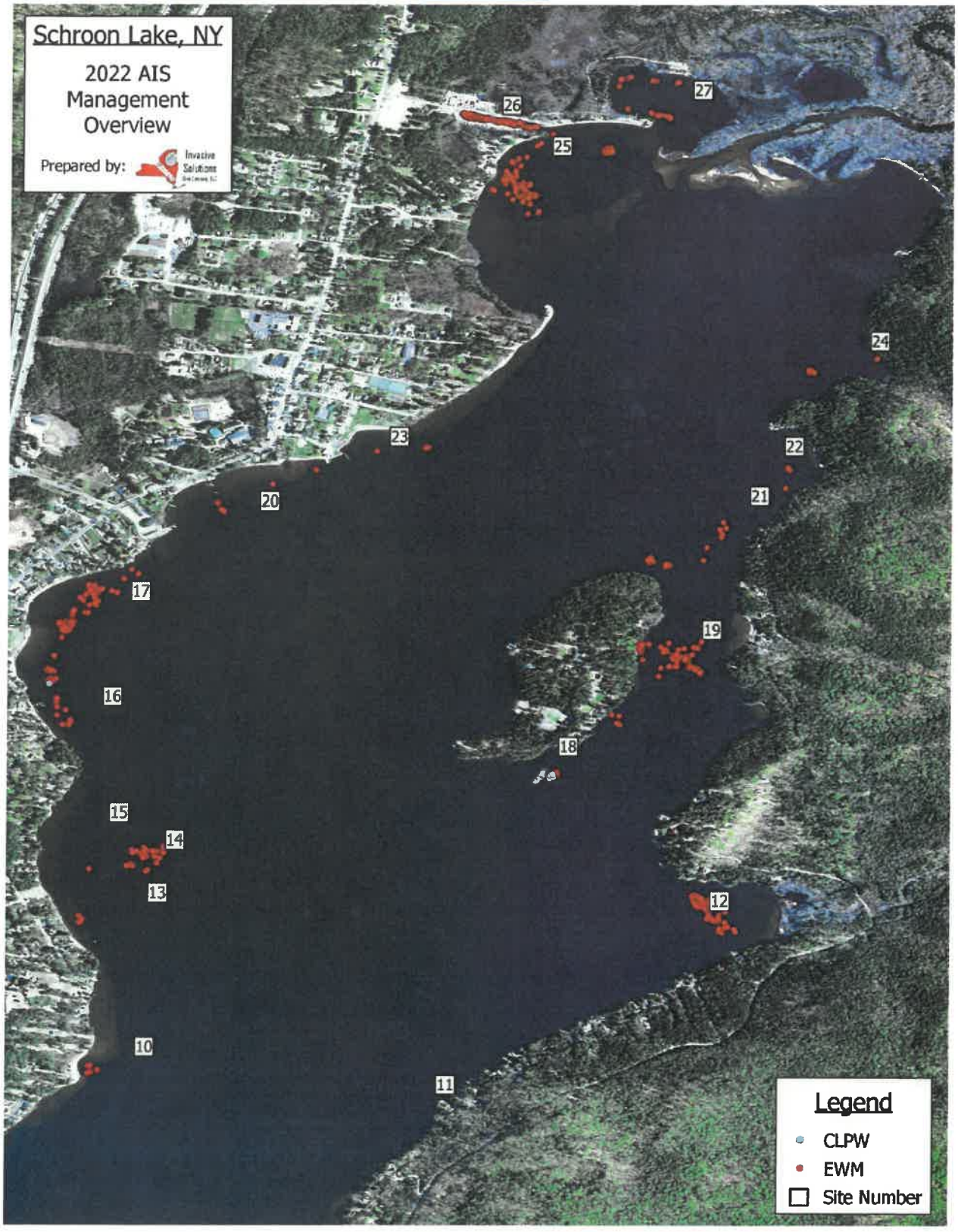
Note: This graph does not include sites without AIS (sites 2, 3, 7, 9, 11) or sites with too little AIS harvested to weigh (sites 4, 10, 12, 13, 14, 15, 18, 20, 21, 22, 24)

	Harvest Weight by Site					Site Change	
Site #	2018	2019	2020	2021	2022	2021-22	2018-22
1	111.5	237.5	12.5	56.3	81.3	44.3%	-27.1%
2	0.0	(6 AIS)	(10 AIS)	0.0	0.0	0.0%	0.0%
3	0.0	(8 EWM)	(2 EWM)	0.0	0.0	0.0%	0.0%
4	481.3	31.3	4.2	(21 EWM)	(8 EWM)	-13	-99.0%
5	5.0	87.5	1.0	100.0	50.0	-50.0%	900.0%
6	6.3	(8 EWM)	12.5	6.3	3.1	-50.0%	-50.0%
7	0.0	0.0	0.0	0.0	0.0	0.0%	0.0%
8	55.0	18.8	9.2	8.3	18.8	125.9%	-65.9%
9	0.0	0.0	0.0	0.0	0.0	0.0%	0.0%
10	(3 EWM)	(1 EWM)	0.0	(1 EWM)	(5 EWM)	+4	+2
11	0.0	0.0	(1 EWM)	0.0	0.0	0.0%	0.0%
12	11.3	6.3	6.3	(69 EWM)	(19 EWM)	-59	-99.0%
13	(1 EWM)	0.0	0.0	0.0	(4 EWM)	+4	+3
14	181.9	18.8	25.0	3.1	(33 EWM)	-99.0%	-99.0%
15	0.6	0.0	(11 EWM)	(5 EWM)	(1 EWM)	-4	-99.0%
16	6.3	(3 EWM)	(35 EWM)	(78 EWM)	3.1	99.0%	-50.0%
17	11.1	25.0	56.3	143.8	25.0	-82.6%	125.8%
18	9.4	16.7	28.1	40.6	(21 AIS)	-99.0%	-99.0%
19	21.9	31.3	17.7	14.6	287.5	1869.2%	1214.3%
20	143.8	(5 EWM)	(28 EWM)	(18 EWM)	(15 EWM)	-3	-99.0%
21	50.0	3.1	0.0	0.0	(6 EWM)	+6	-99.0%
22	12.5	(15 EWM)	(7 EWM)	(3 EWM)	(6 EWM)	+3	-99.0%
23	6.3	9.4	(3 AIS)	0.0	37.5	99.0%	500.0%
24	12.5	6.3	4.2	(21 EWM)	(31 EWM)	+10	-99.0%
25	68.8	250.0	87.5	112.5	81.3	-27.8%	18.2%
26	37.5	287.5	91.3	340.6	393.8	15.6%	950.0%
27	68.8	87.5	187.5	8.3	50.0	502.4%	-27.3%
Total	1301.3	1116.7	543.1	834.4	1031.3	23.6%	-20.8%



Note: RMNG represents the 21 remaining sites not specifically depicted in the chart.

Site Maps


Schroon Lake, NY
2022 AIS Management Overview
Prepared by:
Invasive Solutions
26
27
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24
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17
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16
18
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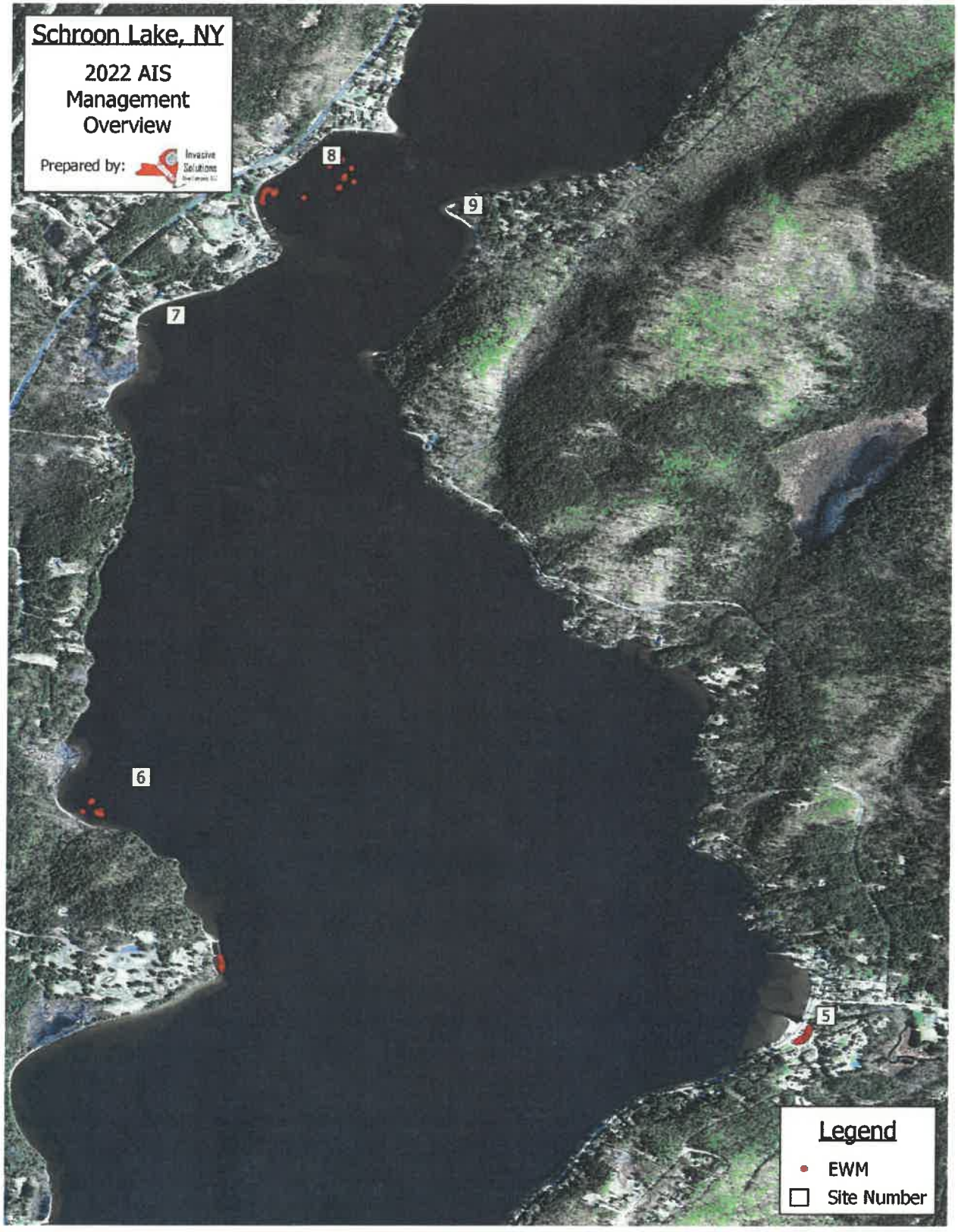
14
13
12
10
11
Legend
CLPW
EWM
Site Number


Schroon Lake, NY
2022 AIS Management Overview
Prepared by:
Invasive Solutions
8
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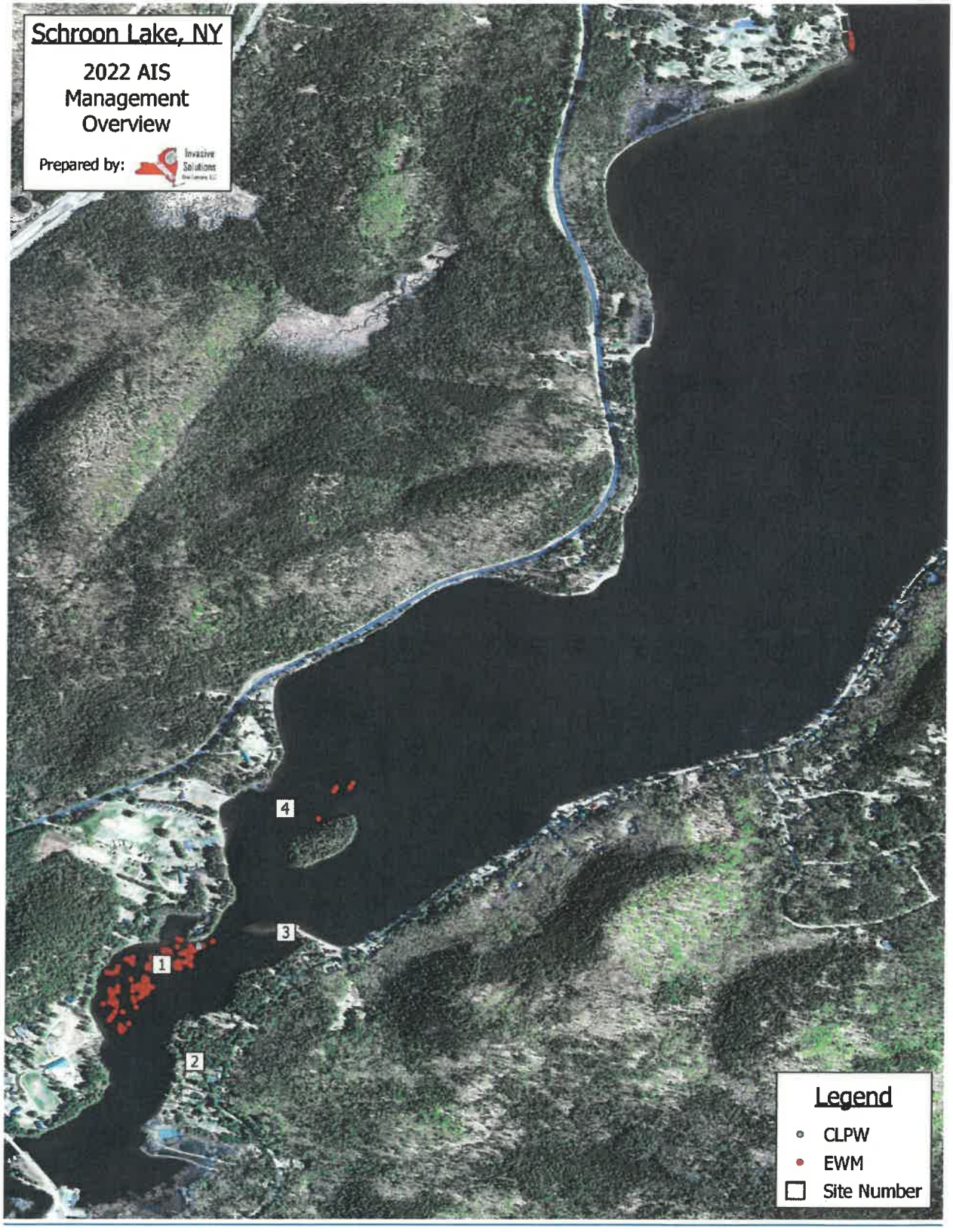
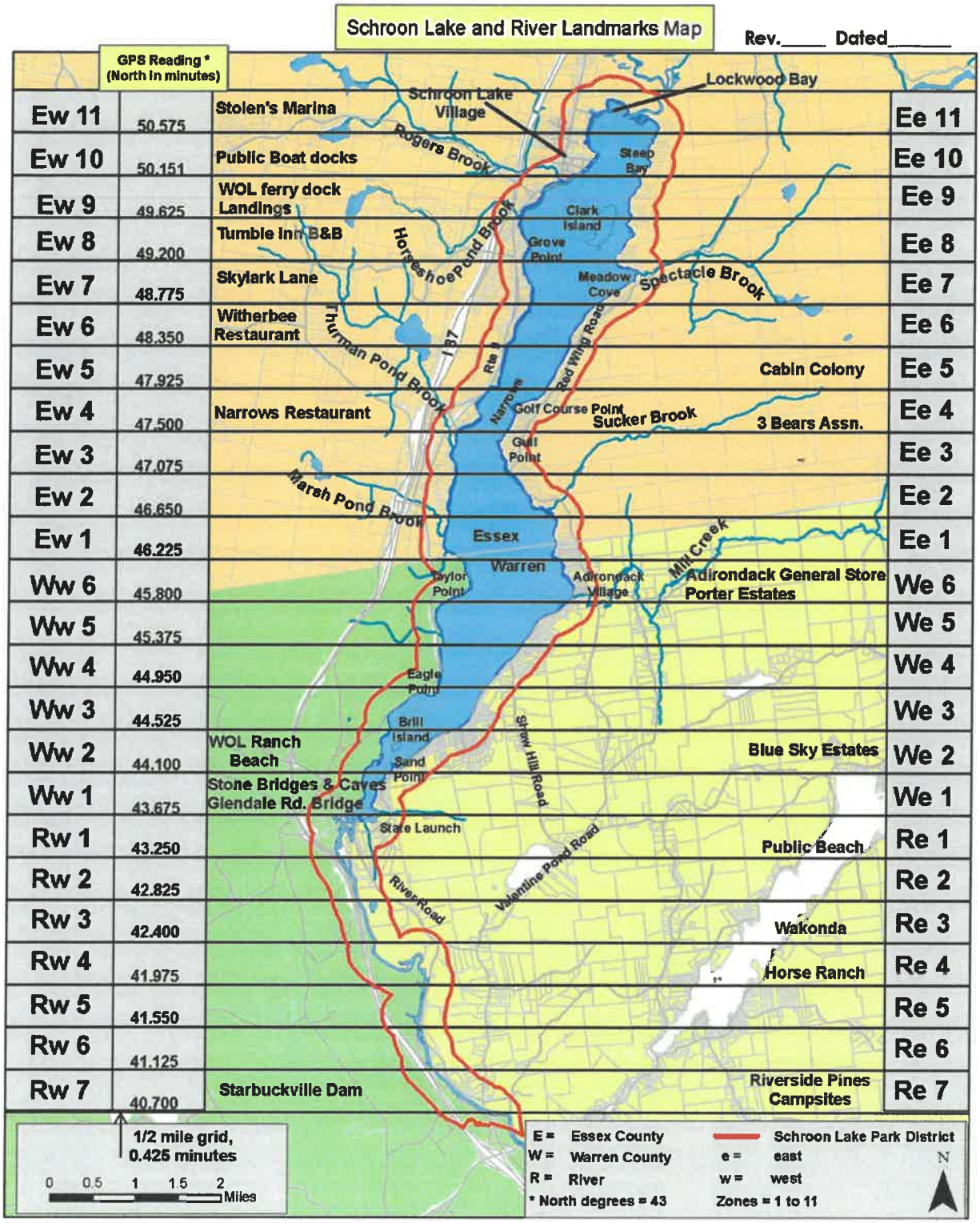
Legend
EWM
Site Number


Schroon Lake, NY
2022 AIS Management Overview
Prepared by:
Invasive Solutions
4
3
1
2
Legend
CLPW
EWM
Site Number

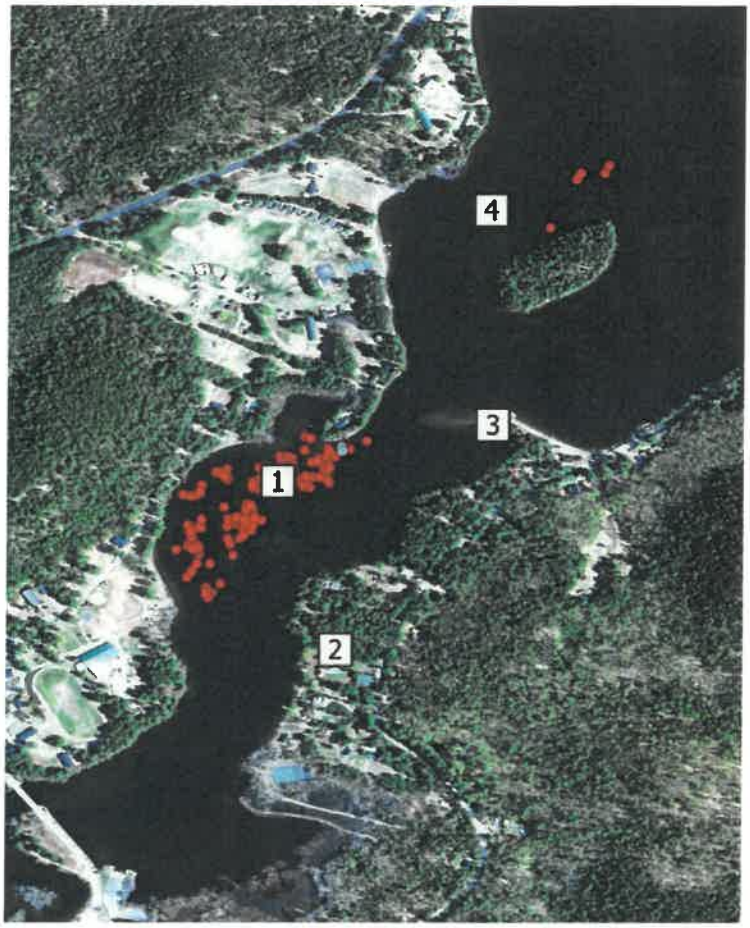
Scout Map


Schroon Lake and River Landmarks Map
Rev.____ Dated_____
GPS Reading * (North in minutes)
Ew 11 50.575 Stolen's Marina
Ew 10 50.151 Public Boat docks
Ew 9 49.625 WOL ferry dock Landings
Ew 8 49.200 Tumble Inn B&B
Ew 7 48.775 Skylark Lane
Ew 6 48.350 Witherbee Restaurant
Ew 5 47.925
Ew 4 47.500 Narrows Restaurant
Ew 3 47.075
Ew 2 46.650
Ew 1 46.225
Ww 6 45.800
Ww 5 45.375
Ww 4 44.950
Ww 3 44.525
Ww 2 44.100 WOL Ranch Beach
Ww 1 43.675 Stone Bridges & Caves Glendale Rd. Bridge
Rw 1 43.250
Rw 2 42.825
Rw 3 42.400
Rw 4 41.975
Rw 5 41.550
Rw 6 41.125
Rw 7 40.700 Starbuckville Dam
Ee 11
Ee 10
Ee 9
Ee 8
Ee 7
Ee 6
Ee 5 Cabin Colony
Ee 4 3 Bears Assn.
Ee 3
Ee 2
Ee 1
We 6 Adirondack General Store Porter Estates
We 5
We 4
We 3
We 2 Blue Sky Estates
We 1
Re 1 Public Beach
Re 2
Re 3 Wakonda
Re 4 Horse Ranch
Re 5
Re 6
Re 7 Riverside Pines Campsites
Schroon Lake Village
Lockwood Bay
Steep Bay
Clark Island
Grove Point
Meadow Cove
Spectacle Brook
Rogers Brook
Horseshoe Pond Brook
Thurman Pond Brook
I87
Rte 9
Red Wing Road
Narrows
Golf Course Point
Sucker Brook
Gull Point
Marsh Pond Brook
Essex
Warren
Taylor Point
Adirondack Village
Mill Creek
Eagle Point
Brill Island
Sand Point
Shew Hill Road
State Launch
River Road
Valentine Pond Road
1/2 mile grid, 0.425 minutes
0 0.5 1 1.5 2 Miles
E = Essex County
W = Warren County
R = River
* North degrees = 43
Schroon Lake Park District
e = east
w = west
Zones = 1 to 11
N

Site Reference Sheet

AIS Site Quick Reference List				
Scout ID	Site #	Description	Latitude	Longitude
Ww2	1	Word of Life Bay	43.733821	-73.806834
Ww1	2	Area S of Word of Life Bay	43.730379	-73.806063
We2	3	Sandy cove NE of Word of Life Bay	43.735174	-73.802347
Ww2	4	WOL Ranch/ west of Brill Island	43.73969	-73.802587
We6	5	ADK lodges	43.736233	-73.759102
Ew1	6	Taylor Point (Ww6) to cove N of T. Point	43.772513	-73.788131
Ew3	7	cove due W of Gull Point	43.791644	-73.786752
Ew4	8	West Narrows	43.79764	-73.778423
Ww4	9	East Narrows	43.795927	-73.773426
Ew6	10	western point N of Narrows	43.81325	-73.768001
Ee7	11	E shore N of Narrows	43.811917	-73.756675
Ee7	12	Meadow Cove	43.818627	-73.746396
Ew7	13	Skylark S	43.818865	-73.768096
Ew7	14	Skylark	43.820483	-73.766383
Ew8	15	S of Grove Point	43.821197	-73.768905
Ew8	16	N of Grove Point	43.825623	-73.769667
Ew9	17	The Landings N	43.829287	-73.768905
Ee8	18	Clark Island S	43.823719	-73.752392
Ee8 & Ee9	19	Clark Island narrows and N shore	43.827859	-73.747395
Ew9	20	WOL Island Dock to Rogers Brook	43.832666	-73.764004
Ee9	21	N of Narrows to Steep Point Cove	43.832285	-73.745824
Ee9	22	Steep Point Cove	43.83476	-73.744206
Ew9	23	Town of Schroon Boat Launch N	43.83476	-73.759007
Ee10	24	Steep Bay and surrounding shores	43.837853	-73.741589
Ew11	25	Terra Alta	43.844706	-73.753724
Ew11	26	Schroon Lake Marina	43.846324	-73.754628
Ew11	27	Lockwood Bay	43.846562	-73.748489

Site Summaries

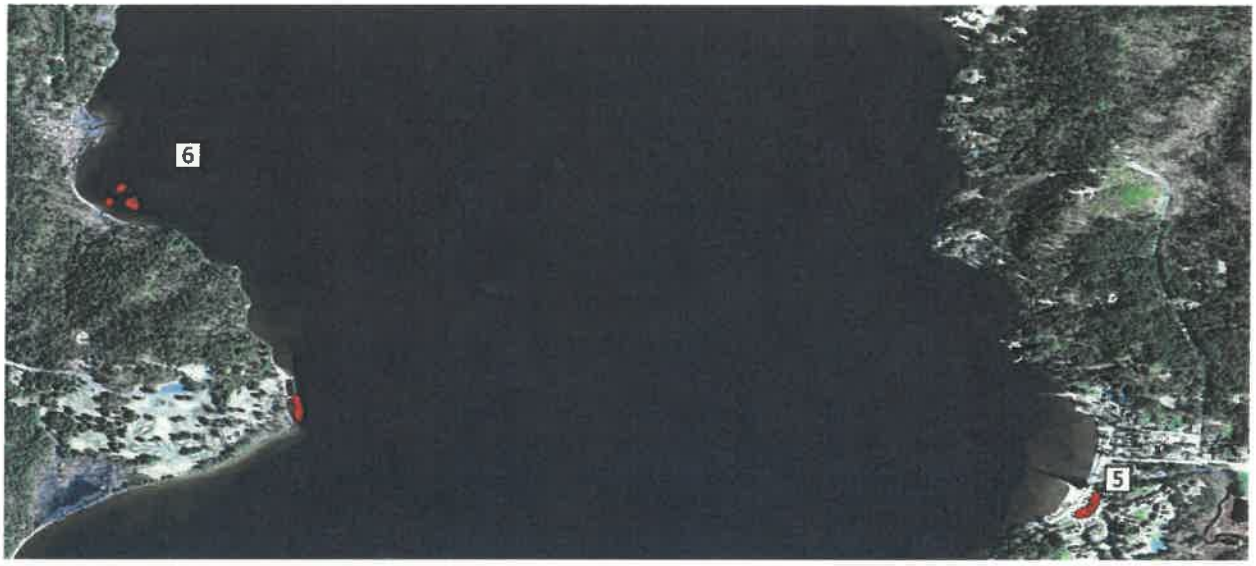


Site 1- Word of Life Bay (Ww2)- This season we harvested 81.3 lbs. of EWM, which is an increase from the previous year's 56.3 lbs. Notably, during the first week of harvesting, the Crew found large plants, some of which had been chopped close to surface with accompanying fragments and small new growth found within the area. The first week's harvest produced over half of the year's total harvest volume, with two follow ups completed throughout the year. Overall, the site is very large which sees an increase in boating traffic due to its proximity to both the Word of Life camp and the Warren County state launch. Though the numbers remain well below year highs within the site (i.e., 237.5 lbs. in 2019) it should remain high on the priority list in the coming season to ensure there isn't the opportunity for AIS to trend upwards, particularly due to its size and time requirements for harvesting. Additionally, there were three Curly-leaf Pondweed (CLPW) plants harvested within the site, where CLPW benefits from an early season harvest before the plants begin to die back.

Site 2- Area south of Word of Life Bay (Ww1)- This site is a large area with varying densities of native vegetation and low numbers of CLPW and EWM. This site is searched when harvesting other sites in the region, with a focus on the historically producing areas. Although this site was searched twice throughout the season, no AIS was located.

Site 3- Sandy Cove NW of Word of Life Bay (We2)- This site tends to produce very low EWM numbers in native vegetation on the edge of the littoral area, even though the vegetation tracks further into the shallows. This site was searched twice when harvesting other sites in the region and no AIS was located.

Site 4- Word of Life Ranch/ west of Brill Island (Ww2)- This site has historical EWM growth in an elevated littoral area north of the island, with occasional EWM growth found close along the northwestern shore of the island. Altogether, there were seven EWM plants harvested within the littoral north of the island, and one plant located close to shore. This site has experienced a decrease in plants harvested each year, with a high of 481.3 lbs. in 2018, to eight plants total this year. With the lack of plants being located at this site it is increasingly quick to monitor and inspect for new growth



Site 5- ADK Lodges (We6)- This site has lush native vegetation which harbors EWM throughout much of the site, with the highest EWM density along the shoreline near the docking areas. Because of the high boat traffic and shallower waters in the site, the site experiences high plant fragmentation, and in turn Crews find EWM throughout various stages of its growth cycle with the native vegetation. Crews work to harvest EWM but often notes the challenges of finding plant fragmentation within the dense native vegetation.

This site is typically worked early in the season to harvest plants before they've grown close to surface where they are easily fragmented by boat traffic. When time allows, Crews return to the site to do a follow-on harvest to harvest any re-growth which can be located. This year the site was harvested in the second week of harvesting, with the Crew harvesting two bags of EWM (50% reduction from 2021,) noting due to plant fragmentation found within the site a return harvest would be advisable if time were to allow. The Crew was unable to return to this site for a follow-up harvest.

Site 6- Taylor Point to cove north of Taylor Point (Ww6)- This site consists of two separate areas, the larger cove northwest of Taylor Point by a small stream, and the dock area just north of the point.

Within both areas, Crews search the historical growth spots and the surrounding area, though EWM is generally only ever found within these historically producing spots. After the initial harvest, Crews work to perform follow-up inspections, with their focus on the high producing spots to allow for very quick and efficient follow-up inspections.

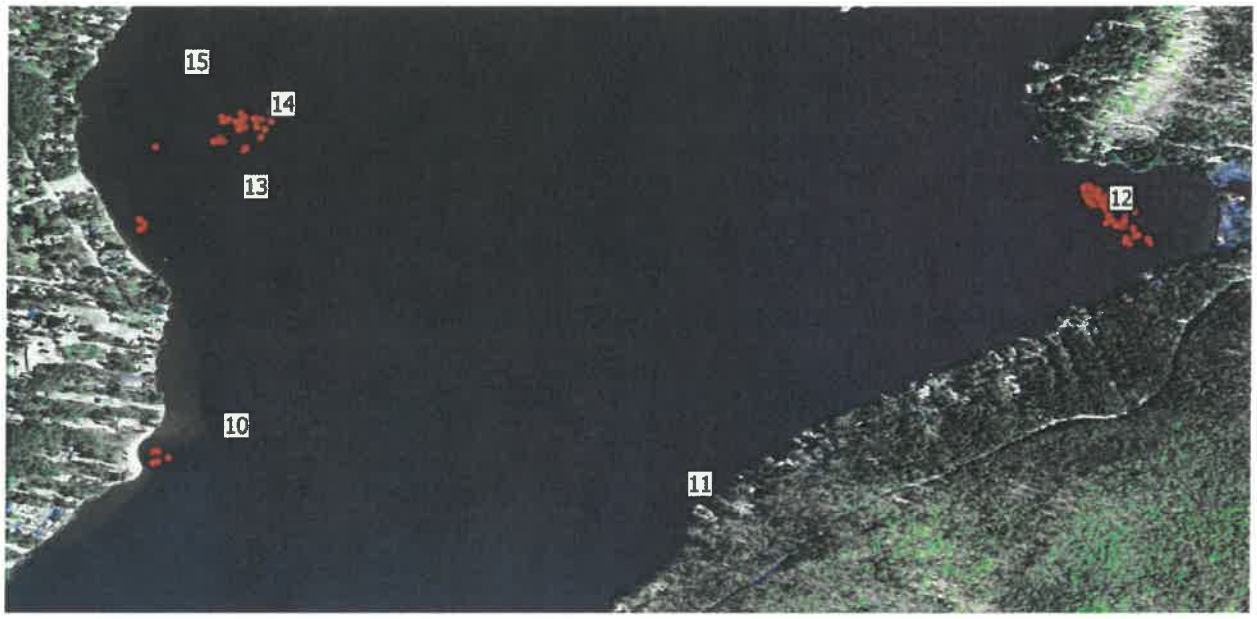
Overall, the site saw a 50% reduction in EWM harvested from 2021 (which was a 50% reduction from 2020,) with a total of 3.1 lbs. this year. This 3.1 lbs. harvested came from the first site inspection, with only 12 plants found during follow-up inspections (which is too little plant mass to weigh.)

Site 7- Cove due west of Gull Point (Ew3)- This site is a small cove with multiple docks and a native plant bed area which gets searched. This site does not produce AIS yearly and is considered non-priority. No AIS located.

Site 8- West Narrows (Ew4)- This site consists of a large littoral with dense native vegetation throughout and historically produces EWM within two main sections, the main center area which stretches the almost the length of the site, and a small pocket in the southwest corner of the site nearby docks.

Overall, this site saw an increase of EWM harvested, with 18.8 lbs. harvested, up from 2020's 8.3 lbs. The bulk of the EWM harvested came from a dense localized cluster in this southwestern section of the site, though the larger main area accounts from most of the time spent within the site.

Site 9- East Narrows (Ww4)- This small site is located east of site 8 and focuses around two docks and the shoreline running south through native vegetation. This southern littoral area sees surface observations and targeted diving if plants are located, mainly due to fragmentation which has been found within the site in the past. No AIS located.



Site 10- Western point north of Narrows (Ew6)- This site consists of a strip of native vegetation nearby docks which historically produces no or very few EWM yearly. This year five EWM were harvested, up from 2020's one plant, with the plants continuing to be found in the historically producing section and nowhere else within the littoral.

Site 11- East shore north of Narrows (Ee7)- This site consists of lower density native vegetation which generally parallels shore, with most of the attention focused in areas by boats and docks. This site often produces no AIS, with no AIS located this year.

Site 12- Meadow Cove (Ee7)- This is a large site with a healthy native plant population which historically produces AIS within the deeper edge of the littoral. Due to the site's size and abundant native plant populations, it is a time-consuming site to work. This site has seen a decrease in AIS harvested each year since 2018 (11.3 lbs.), with 19 EMW harvested this year, down from 2020's 69 plants.

Site 13- Skylark south (Ew7)- This site consists of a strip of native vegetation close to the shoreline, south of site 15, which inconsistently harbors EWM. This year there were four EWM plants harvested which were all local to one another.

Site 14- Skylark Area (Ew7)- This site is a large area located east of sites 13 and 15 and is situated in open water, up to approximately 400 yards from shore. With the location of the site, extra caution is taken to set a highly visible work area which often gets broken into sections to minimize Crew exposure, and occasionally search patterns are halted to allow for safe passing of boat traffic.

This site produces EWM scattered throughout the native plant populations which are generally contained within the area due to deep water on all sides of the site. This site has seen dramatic reductions in EWM harvested each year since 2018 (181.9 lbs.,) with 33 plants harvested this year, down from 2020's 3.1 lbs.

Site 15- South of Grove Point (Ew8)- This site consists of a native plant bed located west of site 14 which inconsistently harbors EWM, generally in the south half of the site. 1 EWM harvested.

Site 16- North of Grove Point (Ew8)- This site is a continuation of the thin native plant bed following the bathymetry from site 17, which runs along the outskirts of the docks near the littoral edge. This year the site saw an increase in plants harvested, with 3.1 lbs. of AIS, up from 2021's 78 EWM plants. There were two small, localized clusters of EWM found in the north end of the site which accounts for the majority of the increase seen.

With this site's close proximity to site 17 to the north, this site tends to reflect on a smaller scale the growth in 17, which is a much higher producing area. Throughout the 2021 season, Crews worked sites 16 and 17 multiple times in response to the upward trend seen within the sites. During their last week of harvesting (in 2021,) Crew located a EWM patch near the northern end of site 17, which seemed like a probable source of the continual reinfestation within the sites. With this in consideration, this year site 16 (and 17) saw management activities in the first week of harvesting to get ahead of any possible regrowth within the sites, with follow-on harvesting taking place. With this increased monitoring and

harvesting of the sites as a whole, both sites should see the harvesting numbers trend down in the coming years.

Site 17- The Landings north (Ew9)- This site is located outside the Word of Life ferry dock landings and stretches from an area south of Horseshoe Pond Brook, north, with native plants throughout the littoral. AIS is found throughout the native vegetation, which is closer to shore on the north end, and runs south to site 16, where it tends to follow the deeper edge of the littoral. AIS weights had been increasing within the site since 2018 with 11.1 lbs. harvested, up to 143.8 lbs. harvested in 2021. In the last week of harvesting of site 17 in 2021, Crew located an area of EWM in the northern deeper section of littoral. Crew harvested though this area then continued with inspections and harvesting throughout the remainder of the site.

This year we saw an 82.6% decrease in harvested weight within the site with a total of 25 lbs. harvested. Upon return to the small northern area located the year prior, Crew only harvested a few EWM plants, with a large decrease in AIS prevalence throughout the remainder of the site. Though this site should remain a top priority in the following year due to the site's large number of docks, increased boat traffic, and the productive ability of the site, with continued monitoring of the expanded harvest area we would expect to see lower numbers within the site, and in turn site 16.

Site 20- WOL Island Dock to Rogers Brook (Ew9)- This site has a band of native plants approximately 100 yards off the shoreline near the littoral edge which runs north towards Rogers Brook and becomes sparse at times. This site sees small populations of EWM which are quickly addressed when located. In 2018, there was 144 lbs. of EWM harvested in a concentrated area east of the WOL beach, though EWM has been found sparingly since. This site has produced 28 or less plants each year since 2019, with 15 EWM harvested this year.

Site 23- Town of Schroon Boat Launch N (Ew9)- This site has historically focused on three main areas, a plant bed just outside the Schroon Beach Swimming Area, near the public boat launch/ dock area, and the littoral just west of the boat launch. This year a dense EWM patch was found on the edge of the littoral approximately 150 yards east of the swim area nearby a hazard buoy. This area produced 37.5 lbs. of EWM, with only one EWM located throughout the remainder of the site. With the high density harvested from this location it would be advisable to perform an early follow-up inspection to look for any possible re-growth.

Site 18- Clark Island south (Ee8)- Site 18 consists of the southeast section of Clark Island, generally from the barge area and south, the southern end of Clark Island and the area nearby a large boulder emerged from the water. The southern end produces limited EWM and CLPW, though when found its within the same general area and therefore sees yearly monitoring. The section nearby the barge has consistently been a higher producing area since 2018, peaking in harvested weight last year with 40.6 lbs. harvested. However, due to this upward trend (to include consistent AIS production in site 19 to the north,) inspections and harvests have been increased in time and frequency. This year, we saw a dramatic decrease in harvested AIS with a total of 21 plants, which is too little to weigh.

Although the site saw a drastic decrease in AIS harvested, this site should continue to be priority in the coming years. With their proximity to one another, sites 18 and 19 are often harvested in tandem, as site 19 to the north is the most likely source of reinfestation for site 18. Furthermore, with the barge traffic within the area, it is important to keep ahead of the plant growth to limit plant height to limit fragmentation within the site.

Site 19- Clark Island narrows (Ee8) and the north shore (Ee9)- This site covers the northeastern side of Clark Island, east through channel to the eastern mainland shore, and this year a high producing area on the north side of the island. Due to the size of the site and the challenge of inspecting and harvesting across the channel, this site sees increased surface observations, helping to put Crews on the current growth areas and limiting their exposure to open waters and high boat traffic.

Site 19 has consistently produced EWM and limited CLPW throughout the site since 2018, likely contributing to high site production in site 18 (to the south.) In 2020 we planned additional harvest time to allow for expansion of our search areas to search for any new AIS beds or areas. We expanded our searches across the channel to the east, finding AIS throughout the channel and within the eastern mainland littoral zone. For 2021, we continued to manage these areas, and though we saw a decrease in harvest numbers with increased time, we continued to consistent AIS production, leading us to believe we had not found all sources of site infestation.

This season, we planned additional time within the sites helping to allow for inspections throughout a wider area searching for any outlying AIS beds. Continuing to expand the search area northward, and with a tip from an AIS scout report, the Crew found two large beds on the north side of the island. These beds accounted for over 95% of the total weight harvested within site 19 throughout the year. Overall, we harvested 287.5 lbs. from site 19 as a whole, but only 12.5 lbs. from the historical harvest areas within the site (down from 14.6 lbs. harvested in 2021.) With the location, density, and size of the two large beds located, it seems plausible these EWM beds have been a source of repropagation of the historical harvest areas to their south.

With the addition of these harvest areas, more time will be needed for harvesting and monitoring within the site the following season(s). However, as these new beds come under better management, we expect to see a decrease in overall site production (to include site 18,) which in turn should allow for a decreased harvest time in successive years.

Site 21- North of Narrows to Steep Point Cove (Ee9)- This site extends from north of the narrows on the east shore, north, through a rocky area with generally limited native vegetation. This site inconsistently produces EWM year-to-year, with a site high of 50 lbs. in 2018 and only 6 EWM harvested this year.

Site 22- Steep Point Cove (Ee9)- EWM is typically located in low numbers within native vegetation in a central area of the site. Each year since 2019 there have been less than 15 EWM harvested, with a total of 6 this year.

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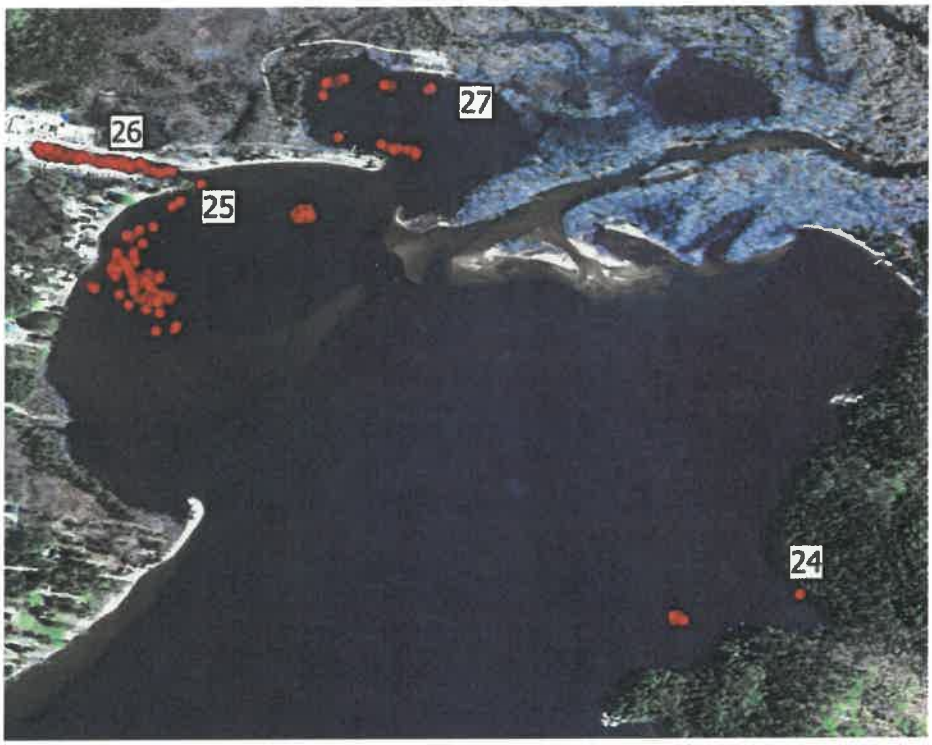


Site 24- Steep Bay (Ee10)- This bay has diverse native vegetation with AIS generally found peppered throughout the deep edge of the littoral, sometimes found in small, localized clusters. This site has seen dramatic decreases in EWM since the site high of 12.5 lbs. in 2018, with a total of 31 EWM harvested this year.

Site 25- Terra Alta (Ew11)- Terra Alta is a large area located south of the Schroon Lake Marina entrance which consistently harbors EWM and CLPW and is annually among the highest producing sites. Harvest totals are as follows: 2018- 68.8 lbs., 2019- 250.0 lbs. (first year working east along south of the site), 2020- 87.5 lbs., 2021- 112.5 lbs., and 2022- 81.3 lbs. This site has generally poor visibility (tannic water) which makes for slower harvesting throughout the site. To the south of the harvest areas is very dense native vegetation which tends to act as a catch for plant fragmentation along the edge and limits diver or boat movements within. To the east is a sandbar area with limited plant growth, and to the north the littoral drops off quickly limiting plant growth as a whole. Because this site is generally contained within itself, and a large slower site to harvest, it gets classified lower on the priority list. This site would need intensive harvesting to greatly reduce AIS numbers and generally sees bulk harvesting each year.

The western shore and the area nearby the entrance to the Schroon Lake Marina are the main focus areas within this site. These areas are worked to reduce the likelihood of plant fragmentation from boating traffic to and from docking areas, helping to reduce the chances of fragment transportation into the main lake. The southern and western portions of the harvesting areas see limited boating traffic and therefore receive bulk harvesting with less emphasis on tight, thorough harvest patterns in consideration of time.

Site 26- Schroon Lake Marina (Ew11)- This site sees fluctuations in harvested AIS which is closely tied to the amount of harvest time within the site. The site produces dense plant growth, both native and invasive, throughout most of the bay. Overall, the bay is shallow and experiences high surface plant

disruption and fragmentation from boating activity. It can be challenging harvesting around the many dock spaces and boats, and dives are often stopped or shifted due to boat activity. Throughout most of the year EWM is found with a high variance in height, finding plants less than one foot to grown to surface. The plant variance is likely due to the cycle of plant growth, surface disruption and repropagation of the surrounding area. Furthermore, the dense native vegetation throughout the site makes plant fragments very challenging to locate. Due to this cycle of repropagation, the site would need to be harvested each week to see large, long-term reductions in AIS numbers.

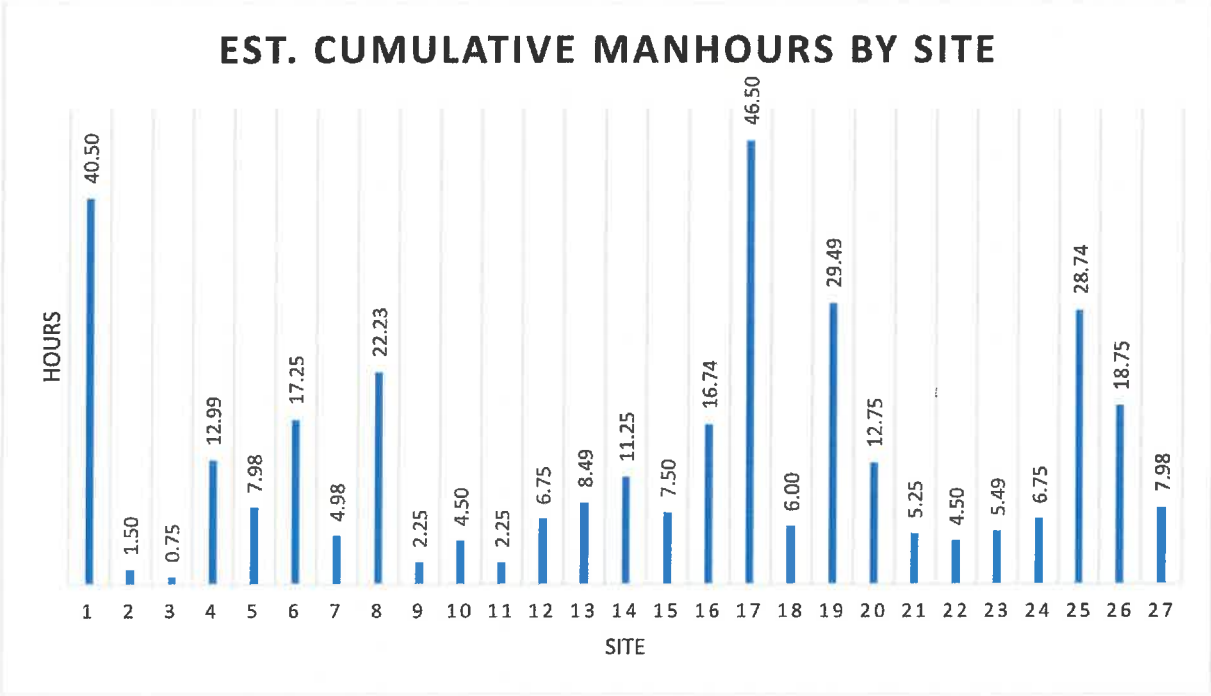
As such, this site is first harvested early in the year to minimize plant density and height before peak boating season, then sees return harvest(s) as time allows. This year Crew performed two main harvests throughout the site, harvesting a total of 393.8 lbs.

Site 27- Lockwood Bay (Ew11)- Lockwood Bay has EWM found throughout native vegetation in a band around the bay which widens near the mouth. The water within the bay appears darker, or more tannic than water outside of the bay, likely indicating a slower flushing rate. Additionally, this site tends to see lower boat traffic than many other areas of the lake. With overall time constraints of the harvest season, and considering the above factors, this site is often lower in site priority each year. This year, the entire perimeter of the site was worked the second week of harvesting, with a total of 50 lbs. harvested. This is up from 8.3 lbs. from the previous year, though due to seasonal site conditions and time constraints, harvesting was focused within the entrance of the bay in 2021.

Time Estimates

Throughout the week, the Crew performs various activities in support of harvesting activities (boat travel, boat gassing, worksite setup, AIS offloading, decontamination, etc.) or in the aid of the performance of their work, (AIS scout report follow-ups, Crew site planning, public communication, etc.) which does not occur in regular/ predictable intervals and time required varies depending on the specific circumstances for each item. Because of the fast-paced, highly demanding, ever-evolving nature of the work, Crewmembers are advised to focus on the task on hand rather than get distracted trying to record each task specific minute throughout a day. In turn, we find roughly four hours (twelve manhours) per week do not get assigned to a specific site and is not included in the graph below.

Provided below is the breakdown of hourly estimations for major program activities and generalized worksite activity. With a 3-person dive team (Crew,) each crew-hour is represented as 3 manhours. Time is recorded in 15 or 20 minute Crew blocks throughout the year for ease of tracking.



Cumulative Manhour Estimates	
Harvesting activities	340.1
Meal periods/ decompression breaks	66.0
Lost time due to inclement weather	25.0

Discussion and Recommendations

This year's harvest schedule was slightly different than our normal scheduling from past years. In past years we've schedule one early week in June, two back-to-back weeks mid-July, then the final harvest week in the latter half of August. This year we were unable to schedule the early week in June, so instead performed three consecutive weeks during high growth (July/ August) with a final week in late August. Although the scheduling seemed to have made little short-term differences, it could create some long-term effects which should be considered in the following season.

One drawback to this scheduling was we found CLPW was further through its lifecycle in many areas where it was located. This included the development of turions on many plants and more abundant growth via rhizomes. During harvesting, Crews first identified if plants had developed turions, and if so, either removed the turions first or worked to ensure the turions were not separated from the plant during harvesting, then searched the area for any which could have already settled in the substrate. Although this had little impact on harvested weight, turions will lay dormant in the substrate, begin germinating in the fall, then continue to grow throughout the winter. In the following harvest season, consideration should be given to areas where CLPW has been found this year to address the possibility of new growth from the turions.

An additional drawback to the scheduling was EWM growth was further along, and in some areas, plants were grown to surface and plant tops had been cut, with fragments found in the local area. Although this is found within some sites almost yearly, this season fragmentation was observed at a higher rate in shallow, high trafficked areas, particularly marinas.

Working within site 5 and 26 (marinas), Crews observed a high number of plants which had been disturbed with abundant plant fragments in the area. Although this isn't uncommon within these sites, this appeared to happen at a higher rate this season. Moreover, both these sites have abundant native plant growth which makes fragment clean up particularly challenging and time consuming. Given these sites productive ability, coupled with the increased rate of plant fragmentation, these sites could see work each harvesting week, but are limited by overall time availability. These sites would need consistent, intensive harvesting if we were to see drastic long-term reductions in plant numbers. With all in mind, these sites should continue to see early season harvests to get ahead of plant growth helping to limit plant fragmentation, with follow-up harvests as time allows.

Of the sites which saw increases this year, those which stand out the most will be discussed further below.

Site 1 saw a total of 81.3 lbs. harvested, up from 2021's 56.3 lbs., though still down dramatically from the site high of 237.5 lbs. in 2019. Site 8 saw a total of 18.8 lbs. harvested, up from 2021's 8.3 lbs., but again down drastically from the high of 55.0 lbs. in 2018. Both of these sites have large littorals which take thorough search patterns to maintain lower harvest weights. These sites tend to see fluctuations in harvest weights each year, which dictates how the sites get prioritized for follow-up harvesting throughout the course of the season. This year, both sites saw their highest producing harvest in their first week of harvesting, with fragmented plants (particularly site 1) found within the sites. In turn, both sites saw repeat harvests, with each successive harvest producing less harvest weight. These sites benefit from a scheduled early harvest with a late season follow-up, and harvests between depending on the

seasonal finds. Planning an early and late season harvest helps to reduce AIS early, which reduces site productivity throughout the year, and the late harvest to minimize the likelihood of overwintering plants. This is especially effective for these sites due to their size, which require thorough, time-consuming patterned searches to reduce AIS throughout.

Site 19 saw a drastic increase in harvested weight this season, with 287.5 lbs. harvested (site high,) up from 2021's 14.6 lbs. Site 23 also saw a drastic increase with 37.5 lbs. harvested (site high,) with no plants harvested in 2021, and the previous high of 9.4 lbs. in 2019. However, within both sites, a new area was found and harvested, which accounted entirely for the increase in harvest weights. As previously discussed in their respective site description, these new harvest areas will be added to the yearly inspection and harvest areas within the sites. It is likely these areas have been sources of reinfestation within the site and nearby sites, and in the long-term, these added inspections should prove to decrease AIS prevalence within the areas.

Lastly, site 27 saw a sharp increase in harvested weight, with 50.0 lbs. harvested this year, up from 2021's 8.3 lbs., yet far below 2020's 187.5 lbs. Overall, this site sees lower boating activity than many sites, and has very tannic water within the bay. With the drastic difference in water clarity within the site compared to the majority of the lake, it is likely this site sees a lower flushing rate which helps to limit the ability of AIS to spread to nearby sites. Couple this with lower boating activity, this site remains lower on the priority list each year.

This year there was a full site inspection performed, whereas the previous year, due to very degraded water quality, harvesting only occurred near the entrance of the site. This difference in area harvested between the two years is likely the biggest contributing factor to the increase in harvest weight experienced this year. Furthermore, even with the increase in harvest weight, the total from this year is below previous harvest totals in years where the site saw a full site harvest.

Of the sites which saw decreases this year, some which stand out the most will be discussed further below.

Site 4 had a total of 8 EWM plants harvested, down from 2021's 21, and far below the site high of 481.2 lbs. in 2018. This site consists of a sandier littoral area along the western side of the island and further west into the channel over a high spot. After the heavy harvest in 2018, this site has seen minimum AIS harvested within the site each successive year. Although this site may not be the most conducive to AIS growth, it helps show once all infestations within an area have been located and managed, the site as a whole produces greatly reduced harvest numbers which lends to easier management of a site.

Site 14 had a total of 33 EWM plants harvested this season, a sharp decrease from 2021's 3.1 lbs., and down drastically from the site high of 181.9 lbs. in 2018. Due to this site's location, out in open water in high-speed boating lanes, one of the biggest challenges for this site is diver safety. Although the site is heavily flagged when working the area because it is far from shore where your typical harvesting occurs, much attention has to be given to control of the site, rerouting boats as they pass. Given the increased traffic, we have found this site benefits from "opportunistic" harvesting, or working the site when boating conditions are less than ideal. This helps to minimize boat traffic as a whole, and in turn allows for less interruptions during harvesting. With the adoption of opportunistic harvesting within the site, Crews have been able to continue to decrease numbers within the site. Nevertheless, this site is generally large and requires thorough patterned searches to find sporadic AIS growth within native plants to keep site numbers low.

Site 17 saw a drastic decrease in harvested weight this year with a total of 25.0 lbs., down from last year's 143.8 lbs. (site high). This site was experiencing a slow increase in harvested weight each year since 2018, which peaked in harvested weight last year. With the consistent increase in harvested weight being experienced, the site saw increased harvest time with the assumption there was an outlying area(s) which was likely helping to continually reseed the site. Last year Crews continued to expand their searches further north, finding localized clusters in the northern end of the site. This year, the northern section was added to their routine inspections and harvesting with an increase in overall time spent within the site, and in turn we saw the dramatic decrease in harvest weight.

Lastly, site 18 experienced what we would consider perhaps the most dramatic decrease in harvested weight within any site this season. Site 18 (southeastern side of Clark Island) has consistently produced AIS since 2018 (9.4 lbs.) with a peak of 40.6 lbs. in 2021, and a total of 21 AIS plants found this year. It seems likely the biggest source of reinfesation within the site was from the north in site 19, which also produces consistent AIS. Due to the consistency of AIS harvested within these sites, they have seen more time spent in search of what could be the overall source of infestation of the area as a whole.

As previously discussed, this year having found what we assume to be the source of reinfestation for site 19 (area located in the northern end of 19) and in turn site 18, we should see harvest numbers within site 18 (and 19) decrease as the new area comes under management. As these sites come under better management, the goal is to reduce time needed for the sites as a whole, which could be especially impactful for the lake as these two sites often account for the greatest share of manhours each year.

In the coming season it would be advisable to give priority to high traffic and high producing sites early with a follow-on harvest(s.) Sites 5 and 26 are high producing sites, generally shallow, and see high boat traffic throughout the year and benefit from earlier harvests, even more so with the increase in plant fragmentation found this year. The northern section in site 19 will need follow-up due to the high density EWM which was found and harvested, particularly with the assumption there are plant fragments which would have already been settled into the substrate for future growth. With consistency within this area in the following season, this area can come under better management, and in turn it should help improve site conditions in 19 and 18 to its south.

Site 23 had an isolated section of dense EWM growth which would benefit from an early follow-up to harvest any regrowth from fragmentation which had likely settled into the substrate in the area. Furthermore, Crew was pushed off the lake due to a thunderstorm during the harvesting of this section, and a follow-up harvest was not possible. Due to the small size of the area, a follow-up in this section can be accomplished in minimum time maximizing its benefit.

Other sites which would benefit from early harvesting would be sites 1, 8, 16 and 17. In general, these are all large sites which require more time for inspections, and by performing early harvests, it allows time between follow-up inspections, which helps increase efficiency throughout the sites. These sites get a higher prioritization because of their size and productive ability, where staying ahead of AIS establishment is the best approach; proactive not reactive.

Sites 16 and 17 have seen increased AIS over recent years and as such remain higher on the priority list. Although there was large reduction in AIS in site 17, which is the most likely source of infestation for 16, earlier harvesting should continue to help keep the area as a whole under better management, eventually reducing the time needed within the sites, opening up additional time for other sites on the lake.

Conclusion

Overall, we saw a 23.6% increase in total harvested weight from 2021 to 2022, though we're at a net decrease of 20.8% since we first started managing the lake in 2018. Furthermore, this year's total harvest weight includes two new areas which produced high volume EWM, and without the weight from these two areas we would be at a 13.9% decrease in harvest weight from 2021, or 44.8% reduction from 2018.

With these two new areas included in yearly inspections moving forward, we should see nearby sites produce less AIS, which should help to trend the lake as a whole down further. With consistent harvesting and tracking of sites, we are better able to identify if there appears to be outlying areas which are not being managed, helping Crews expand their search area. With targeted expanded searches, we have been able to identify outlying areas which have likely contributed to the consistency in harvested weights within certain sites, which in turn should reduce future AIS growth within these areas. With continued management of these expanded sites, we will continue to monitor harvest trends, which helps identify where additional work or searches need to take place throughout the lake.

Fluctuations in numbers are typical in AIS management, but with the overall number of sites seeing reduced AIS abundance (or no AIS,) we are on a positive trajectory for lake wide management. There remains hard work to be done, but reduced numbers over the long-term within most sites show the harvest methods are working. In planning for the future, we will continue to evaluate the data collected and identify trends, which help prioritize sites, laying the foundation for the harvesting around the lake.

One growing trend around the lake is the expansion of sites, where we work to explore outside our typical harvest areas searching for unknown AIS beds, in consideration of site conditions and previous findings. As we explore new areas, we have continued to find additional spots which require follow-up in the successive years, taking from the total available time, making follow-ups on previously harvested sites more challenging, or sometimes not possible. This can lead to yearly fluctuations within sites, for example sites 5, 26, and 27, where often the total yearly volume is reflected in available time for harvest. Conversely, as we reign in all AIS locations within a site (ex. site 19,) we aim to reduce the prevalence of AIS, in turn reducing time needed to manage a site, which should help increase time available for management within other sites.

All considered, it would be advisable to explore the option of adding a fifth harvest week to the season. This would allow time not just for required planned site inspections/ harvesting/ management, but to allow for better site searches and exploration. With this additional time, we would be better suited to identify all AIS bed locations and reduce any possible overwintering of AIS within sites where time did not allow for follow-ups. Ultimately, by reducing AIS abundance and productive ability, we can reduce both site weights and time requirements over the long term. Note, the last week of the season is often the, if not one of the highest producing weeks of the season. An additional week would allow crews to better monitor sites and address yearly highs, as well as address all reported AIS sightings in a more time sensitive manor, helping to prevent sites from trending up in the future, and minimizing the see-saw effect seen within sites from year-to-year.