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AE Commercial Diving Services 2019 Lake George Eurasian Milfoil Management Report

Submitted to:



The Lake George Park Commission (LGPC)
75 Fort George Rd, Lake George, NY 12845
www.lgpc.state.ny.us



The Lake George Association (LGA)
2392 New York 9N, Lake George, NY 12845
www.lakegeorgeassociation.org

THE FUND *for* LAKE GEORGE



The Fund for Lake George (FUND)
PO Box 352, Lake George, NY 12845
www.fundforlakegeorge.org



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Table of Contents

PART I: 2019 SUMMARY DATA p.3

- 1. 2019 Funding for Milfoil Control p.3**
- 2. Sites Worked (*map*) p.3**
- 3. Site Density (*maps*) p.4**
- 4. Data Analysis (*graphs*) p.5**

PART II: AECDS 2019 HARVESTING SITE TOTALS COMPARISON p.6

PART III: GENERAL SUMMARY AND INFORMATION p.7

- 1. Lake George 2019 General Summary p.7**
- 2. Description of Diver Assisted Suction Harvesting (DASH) p.7**
- 3. General Recommendations p.8**

PART IV: INDIVIDUAL SITE SUMMARIES p.9

APPENDIX 1: 2019 Pictures p.26

APPENDIX 2: Divers Alert Network Safe Boating Guidelines Brochure p.29

PART I: 2019 SUMMARY DATA

1. 2019 Funding for Milfoil Control

\$100,000: Lake George Park Commission

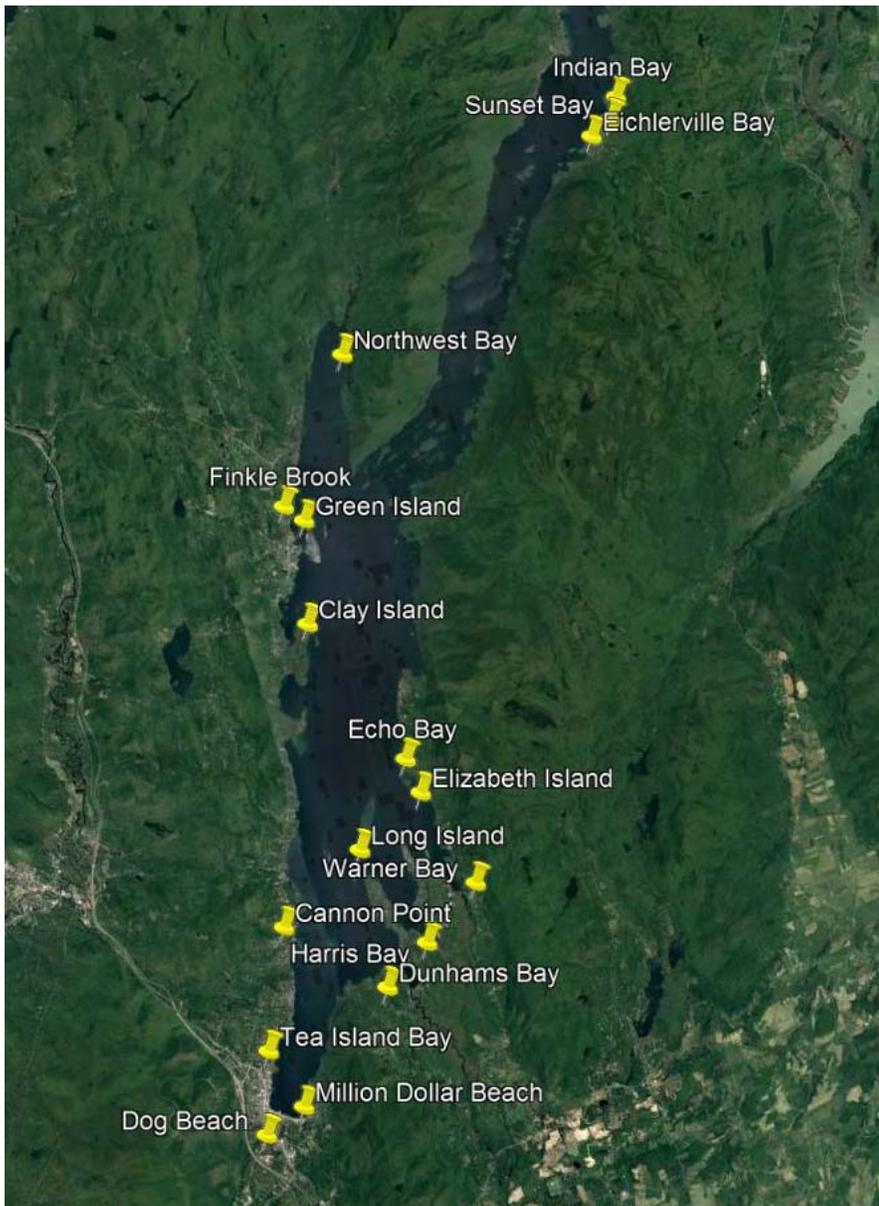
\$100,000: Lake George Association

\$60,000: Fund for Lake George

\$160,000: Warren County / DOS Grant

(\$420,000 Total for 2019)

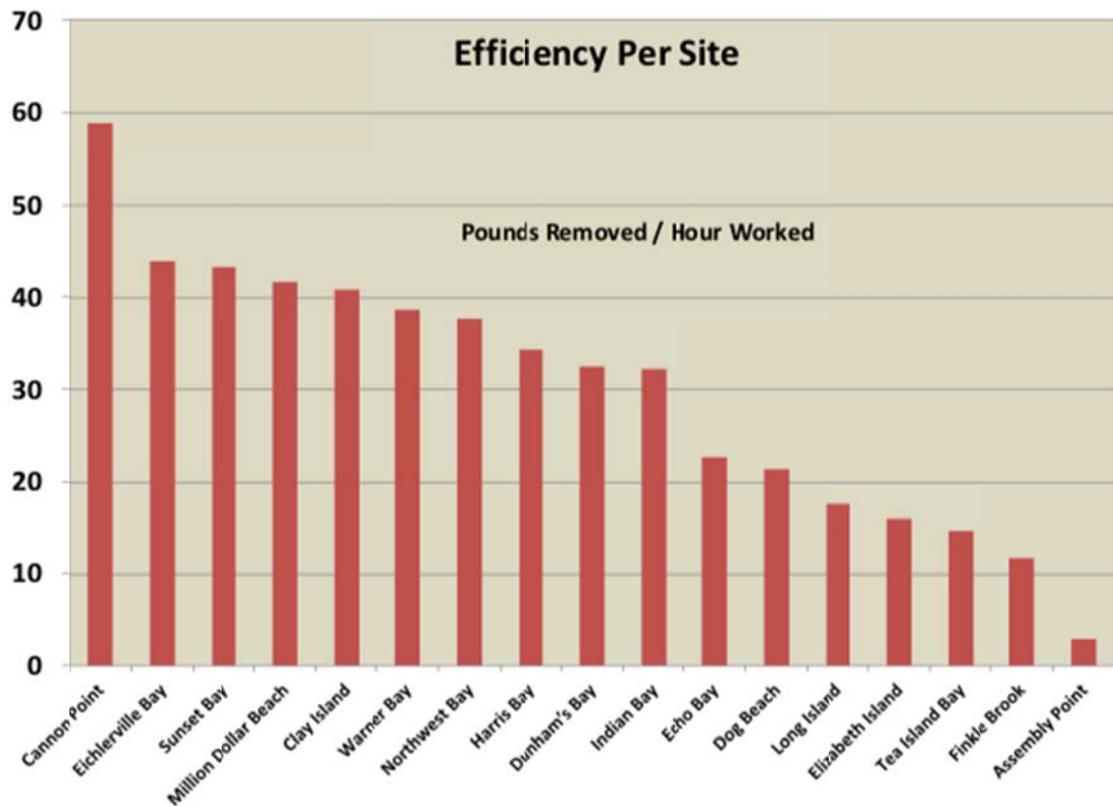
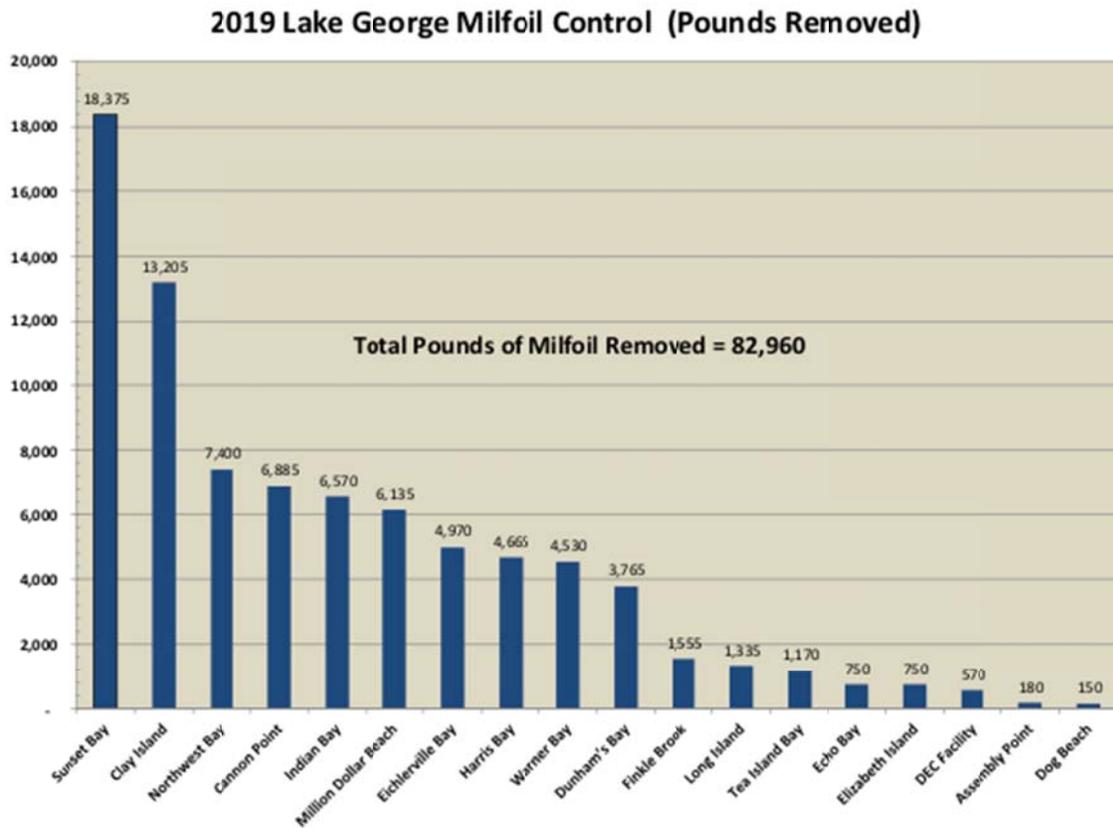
2. Sites Worked Map:



3. Site Density: (Pictures and data provided by Dave Wick, LGPC)



4. Data Analysis: (Graphs and data provided by Dave Wick, LGPC)



PART II: AE COMMERCIAL DIVING - 2019 HARVESTING SITE TOTALS COMPARISON

Sites highlighted below in gray are sites worked in 2019 (sorted from largest harvest to smallest). AE Commercial Diving was the milfoil contractor for Lake George in years 2018 and 2019. AIM was the milfoil contractor for years 2016 and 2017.

Site #	Site Name	2019 # of Crew Days	2019 pounds (AECDS)	2018 pounds (AECDS)	2017 pounds (AIM)	2016 pounds (AIM)
6	Sunset Bay	47.5	18,375	22,720	2,500	10,700
97	Clay Island	33.5	13,205			
1	North West Bay	19.5	7,400	36,750	5,600	25,125
26	Bay SW of Cannon PT	13	6,885	1,925	2,175	1,725
55	Indian Bay	21	6,570			
10	Million Dollar Beach Launch	16.5	6,135			
51	Eichlerville Bay	12	4,970			
14	Harris Bay	12	4,665	2,820	15,169	9625
11	Warner Bay	12.5	4,530	52.5	3,800	5300
19	Dunham's Bay	12	3,765	140	200	850
15	Finkle Brook Delta	9	1,555	10,135	312	
202	Long Island / Assembly Point	10	1,515	8580	2,950	
30	N. Tea Island Bay	8	1,170	700	75	325
17	Echo Bay	3.5	750			
107	Elizabeth Island	6	750		250	1,350
5	West Side Green Island	1.5	570		100	
8	Dog Beach	1	150			
4	Huddle Bay				50	
7	LG Village					525
25	Basin Bay				2,475	
43	Bolton Bay				12.5	
46	Leontine / Clay Shoal				362.5	
48	Gull Bay				2,750	10,600
117	Glenburnie				7,150	14,375
145	Juniper Island				12.5	
161	East Side Speaker Heck Island				2,100	
164	N. Leontine Shoal				100	
165	Basin Bay Shoal				400	
185	Oahu Island				500	
204	Roger's Rock Campground				650	
New	Oakley Way			525		
Year Total (Pounds)		238.5	82,960	84,333	49,706 lbs	80,500 lbs

Part III: GENERAL SUMMARY AND INFORMATION

1. Lake George 2019 General Summary:

The Eurasian Watermilfoil Control Season began June 3rd, 2019, and ended October 24th, of 2019. Four full-time Diver Assisted Suction Harvesting crews, (DASH), and one hand pulling crew worked four ten-hour days per week under the general instructions of Dave Wick from the Lake George Park Commission. General project management was led by Christopher H. Sheldon, owner and president of AE Commercial Diving Services, INC. Onsite managers and Dive Supervisors were Bennett Sheldon and Wesley Sheldon. The goals, site selection, and management methodologies were determined by the combined efforts of AE Commercial Diving Services, INC., the Lake George Park Commission, Lake George Association, and The Fund for Lake George for the 2019 season.

2. Description of DASH:

Diver Assisted Suction Harvesting, (hereby referred to as DASH), is a method applied for the removal of aquatic plants, animals, and other underwater debris. DASH requires three main components to complete: a harvesting vessel with boat tender, a suction hose, and a diver. The specially trained diver guides the 'live' end of the suction hose from the surface to the infested area. Holding the hose in place with either one arm or a handle, the diver then uses the other hand to dig into the bottom composition in order to remove the root ball of the intended plant. Then, depending on the length, age, and stem count of the plant, the diver will place the suction hose onto the top of the plant and work down towards the root ball until the entire plant has entered the suction hose.

This 'top-down' method is done especially with plants such as Eurasian Watermilfoil because they are prone to propagate due to plant fragmentation. Often, (especially with older plants), plant fragmentation is likely to happen if the root ball is removed first and stems and leaves are pulled in after. Fragmentation occurs with all ablation methods, no matter what method is used. However, it is significantly minimized when the 'top-down' method is applied with DASH.

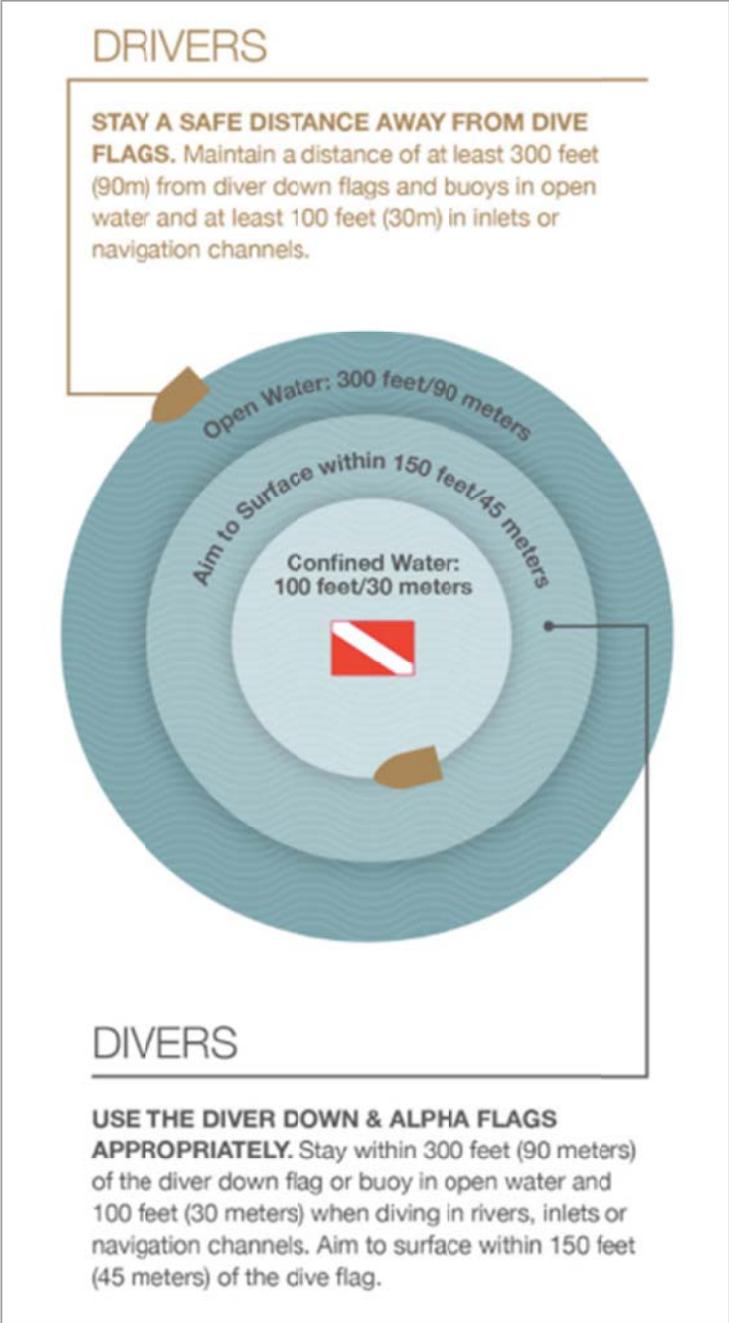
After the plant is fed into the suction hose completely, it is suctioned to the surface and emptied onto a sorting table. Water and mud which is suctioned up with the plant returns to the lake and the plant is then raked into buckets for disposal by the boat tender.

Due to the use of a silt curtain beneath the boat which discharges sediments closer to the lake bottom, divers seldom lose visibility as this water is returned to the lake, and work can progress without interruption.

The total pounds of Eurasian Watermilfoil harvested at any given site will vary, despite the number of days worked, due to several factors, including but not limited to plant density, native plant life, bottom composition, visibility on site, depth of water, and surface conditions.

3. General Recommendations:

One of the overarching concerns our teams had in 2019 was the hazardous conditions of boat traffic on the lake. The following graphic provided by Divers Alert Network¹ depicts the laws regarding boater and diver safety in a way we find to be helpful when instructing our own boat drivers and divers. (See Appendix for the complete publication from Diver’s Alert Network.)



While crew work days and hours were changed from five eight hour days in 2018 to four ten hour days in 2019 in order for our crews to avoid the busy boating weekends, there were still issues of safety during the week days. One incident required law enforcement assistance due to an intoxicated boater driving directly over a working diver.

Three specific areas proved to be especially dangerous, though all areas are subject to the same concerns. The first was **Northwest Bay/ Site #1**. Some local fishermen have expressed that the dense beds of milfoil make for great fishing in this area. Frequently during DASH operations, fishermen have come too close to the DASH boat, sometimes in order to transit and other times, in order to anchor.

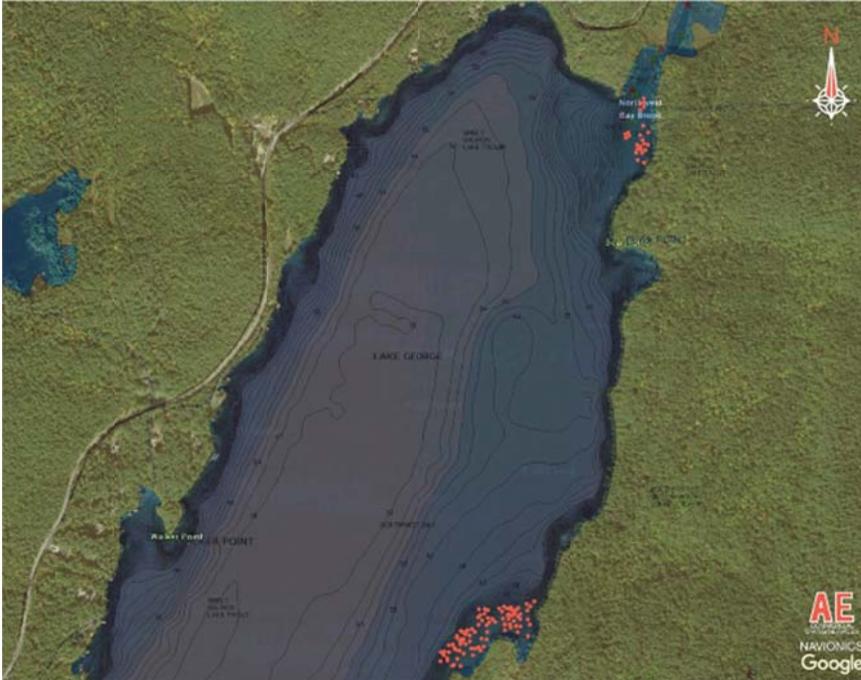
The second site that draws this concern is **Echo Bay/ Site #17**. Due to the geography of the bay, even the most cautious and experienced boaters transiting through work areas requires formidable vigilance and sometimes starting and stopping of DASH work in order to allow vessels to safely transit.

The third site is perhaps the most challenging: **Million Dollar Beach/ Site #10**. Because this area is a boat launch, it will always prove to be a challenge to work. However, we recommend a sign be placed at the boat launch detailing the Safe Boating Guidelines in order to remind boaters of these maritime laws.

¹ Divers Alert Network (DAN). *Safe Boating Guidelines. Health & Diving Reference Series: Safe Boating Guidelines*, Diversalertnetwork.org, 2020. Accessed January 1, 2020.

PART IV: INDIVIDUAL SITE SUMMARIES

- **Northwest Bay (Sites #1 and 24): Total Pounds Harvested: 7,400**



Summary:

This area was completely harvested in 2019. The areas worked furthest north in NWB, near the inlet, have had the best success. The bottom is much softer, comprised mostly of mud and native vegetation.

As you head down the east shoreline to the southern sectors of NWB the bottom composition becomes less optimal. The lake bottom becomes rockier and the soft sediment seems to shift to more of a clay base. This can cause poor visibility due to the nature of agitated clay in the water column. These southern sectors are comprised of dense beds located on large rock deposits. Therefore, the invasive plants are harder to eradicate due to the difficulty of digging roots from the rocky bottom.

Recommendations:

It is imperative that we continue to remove the invasive plants in this site, however; it is important to recognize how the changes in bottom composition from the northern sector to the southern sector of this site affect productivity. The increase in pounds of invasive Eurasian Watermilfoil removed this year as compared to last year from this site is a clear indication that progress can be made with more time on site, as the days on site increased by five. It also suggests that many contextual factors must be considered when evaluating productivity. Site to site comparison is less informative than annual data from a site contrasted against that same site's past annual data.

Additionally, there are many fishermen who frequent these areas; continued efforts to educate fishermen on how they can help to reduce fragmentation is essential, as our observations of the southern sectors of this site demonstrate a 'moving' of the main beds south-ward, which is consistent with observed fishing patterns for boaters in the areas.

- **West Side of Green Island (Site #5): *Total Pounds Harvested: 570***



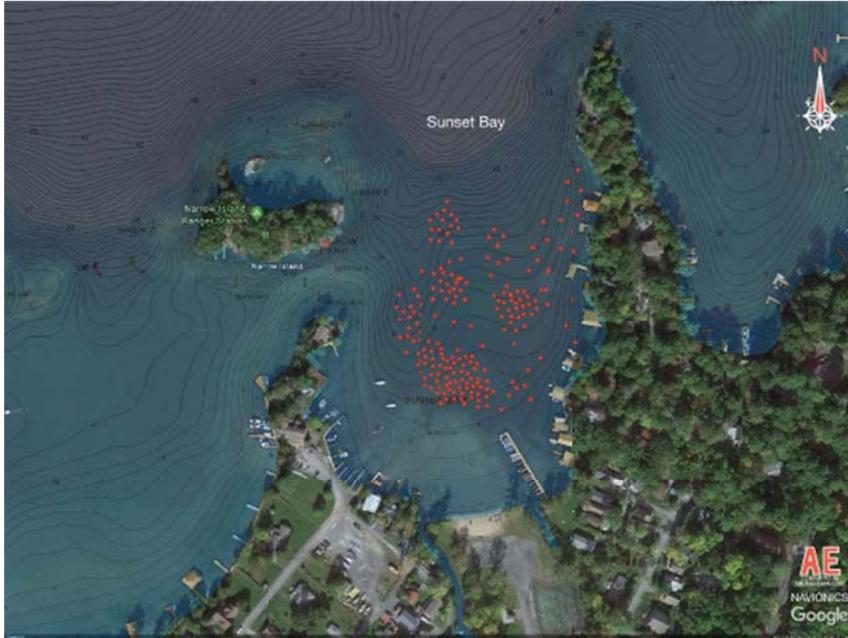
Summary:

This area was completely harvested in 2019. The West Green Island site was completed quickly. The 2019 season was the first time AED harvested the area and we only found sporadic growth with a couple small clusters of medium sized plants.

Recommendations:

This area should be monitored due to a new patch discovered in the channel, however, we believe it will continue to prove to be one of the less-challenging sites in 2020.

- **Sunset Bay (Site #6): Total Pounds Harvested: 18,375**



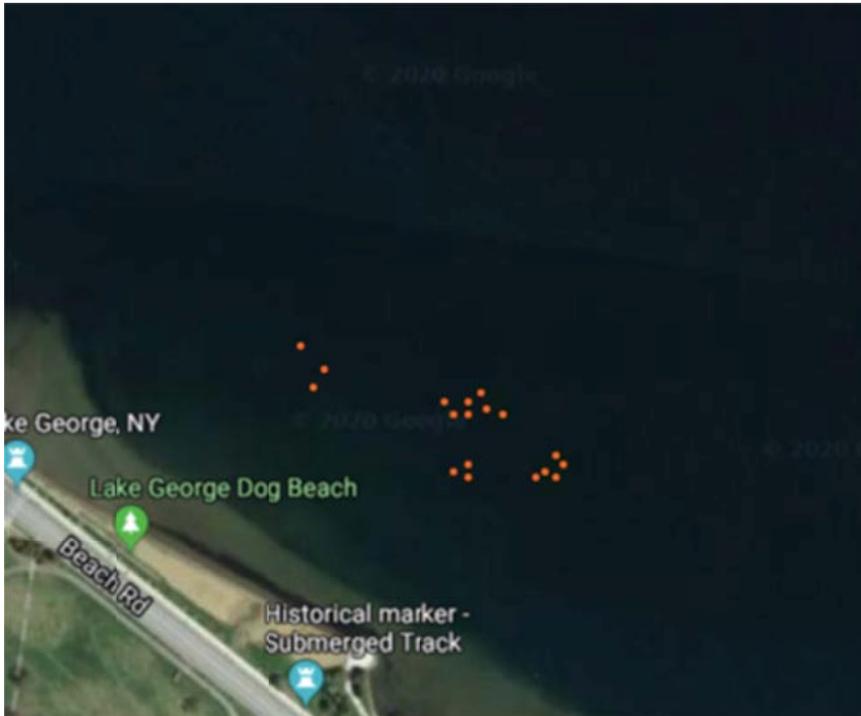
Summary:

This area was completely harvested in 2019. Two harvesters and an occasional hand pulling crew worked in Sunset Bay in the 2019 season. We put a good deal of time and effort into the bay in 2018 and made a good deal of progress. We increased our efforts in 2019, which pushed progress along. The bottom composition is ideal for the removal of root systems and there is an abundance of native vegetation that can, (and often will), take over once invasive Eurasian Watermilfoil is removed. Because of these conditions, we expected to see additional progress in the 2020 season.

Recommendations:

There is a good chance that there is a dense bed of Eurasian Watermilfoil located north of Sunset Bay that is seeding further infestation. We recommend a survey of the area early in the season to determine if this is indeed contributing to the sparse to moderate growth we observed in roughly 50% of the bay.

- **Dog Beach (Site #8): *Total Pounds Harvested: 150***



Summary:

This area was not completed in 2019. This site proved to be a very challenging area to perform DASH at. The bottom composition was mostly loose sediment on a steep grade, which made it difficult to anchor properly at the site. Wind was also a factor in keeping anchored. While visibility was good most of the time, it was very difficult for crews to work into the good visibility due to the above-mentioned anchoring issues.

Recommendations:

This site will continue to prove challenging to work but is an essential area of infestation to work away at given its location in a high traffic area. Further discussion is required to determine how to proceed with this site.

- **Million Dollar Beach/Boat Launch (Site #10): Total Pounds Harvested: 6,135**



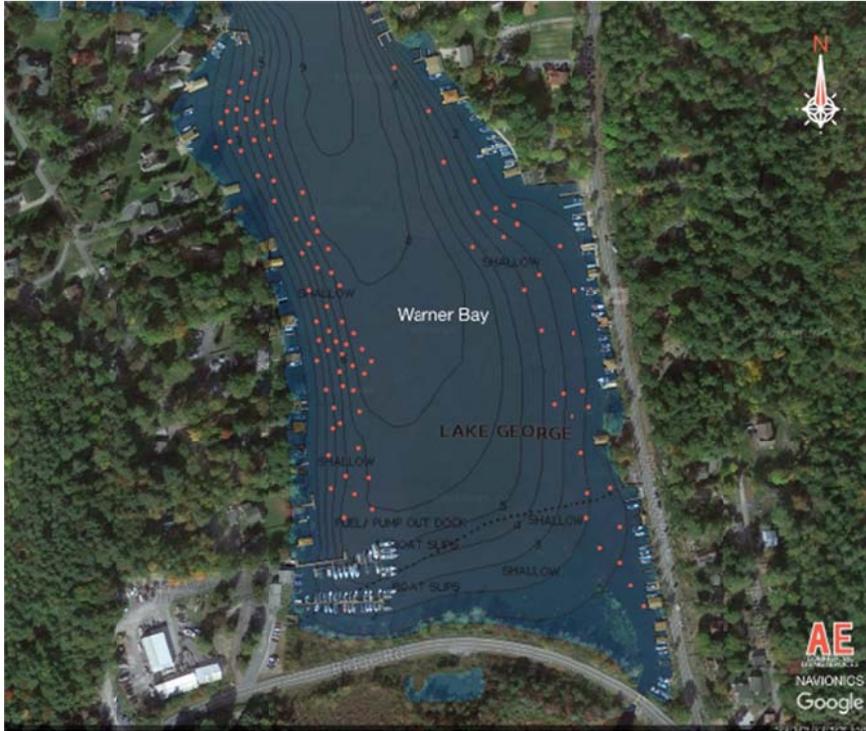
Summary:

This area was completely harvested in 2019. The boat launch at Million Dollar Beach harbored a large dense patch of Eurasian Watermilfoil. The patch began due east of the launch and extended northward up the shore. The bottom composition at this site was ideal for harvesting, consisting of a soft sediment. Because of the almost complete removal of the Eurasian Watermilfoil, (seeds and roots may be still present in the bottom), we expect that the site to be greatly improved for the beginning of the 2020 boating season. However, due to the nature of it being a boat launch where sediment is stirred by launching vessels, vessels possibly bringing Eurasian Milfoil back from other parts of the lake to the site when preparing to exit, and strong winds naturally pushing any fragmentation towards that corner of the lake, we fully anticipate a flare up of infestation after the season has begun.

Recommendations:

We recommend a survey of this area early in the season to remove any regrowth prior to the heavier traffic days that come with warmer weather. We also recommend periodic surveys throughout the season to detect any growth for the reasons given in the summary.

- **Warner Bay (Site #11): Total Pounds Harvested: 4,530**



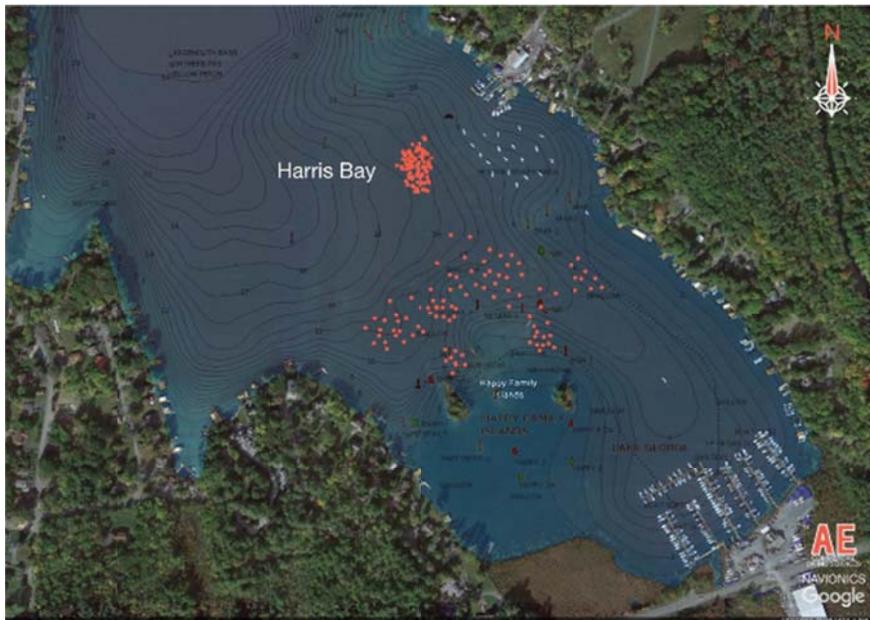
Summary:

This area was completely harvested in 2019. Warner Bay has sporadic growth down both the east and west shorelines. The middle of the bay, when surveyed, appeared to be free of Eurasian Watermilfoil, as it has in past years. We visited Warner Bay throughout the summer with a hand pulling crew, and a harvester was brought in to help remove areas that would have been too time consuming for hand pulling crews a couple of times. The inlet into Warner Bay creates a low visibility situation for the dive crews.

Recommendations:

While sporadic growth can often be best addressed through hand pulling, the large, spread-out nature of the bay, coupled with visibility concerns and boat traffic, have led us to believe that suction harvesting would be a more effective control method for this site. We recommend this change be implemented in 2020.

- **Harris Bay/ Site #14: Total Pounds Harvested: 4,665**



Summary:

This area was completely harvested in 2019. Harris Bay has proven to be a tricky site to the wide variety of bottom composition, topography, and sediment. The area surrounding the islands consists of boulders and rocks, making it difficult to remove plants *and* their entire root systems. As a result, the risk for regrowth is high, and will require monitoring.

As you move away from the islands, some sectors of Harris Bay shift dramatically to soft sediment with clusters of native vegetation. These areas are showing the most improvement and are more easily controlled.

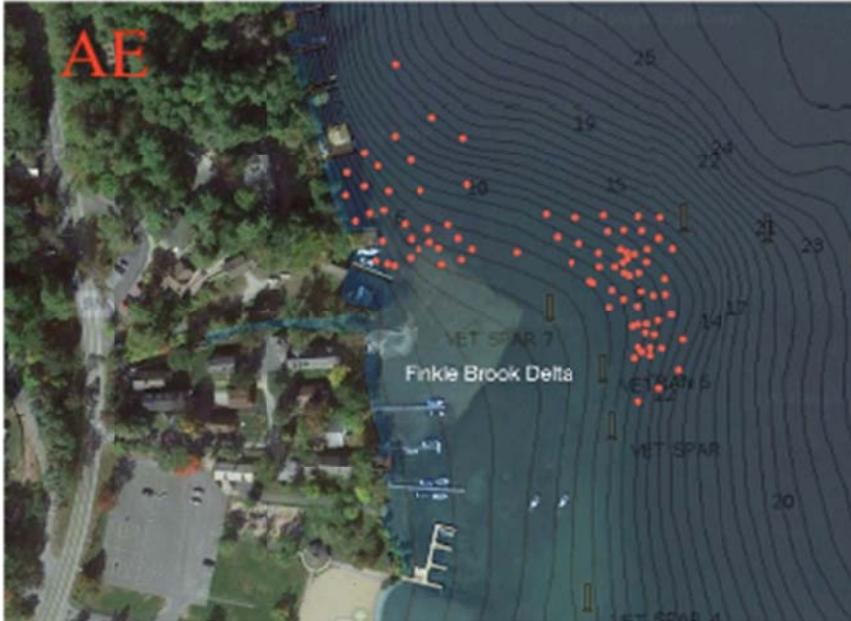
Farther still from the islands, however, large flat sectors open-up with a depth ideal for invasive Eurasian Watermilfoil to proliferate. These open ‘plane-like’ sections make conditions ideal for the invasive plants to take over quickly in large, dense beds if left unchecked.

Progress is being made but at a much slower pace than was hoped. Areas worked in 2018 remained open in 2019 but new spots continue to pop up due to the conditions described above. Despite this, work was completed.

Recommendations:

Harris Bay is complex and requires vigilance. Ongoing discussion regarding the site is recommended to ensure progress is not undone.

- **Finkle Brook Delta (Site #15): *Total Pounds Harvested: 1,555***



Summary:

This area was completely harvested in 2019. The Finkle Brook Site is broken into two distinct sectors: the delta and the offshore sector adjacent to the beach park. Work completed in the delta in 2018 has proven to have a positive effect on the reduction of invasive Eurasian Watermilfoil. Very little regrowth was found near the inlet of Finkle Brook or the immediate area of the delta in 2019.

The offshore sector had slightly more new growth than the inlet, but still showed a reduction due to work completed in 2018.

Recommendations:

We believe growth in the offshore sector of Finkle Brook may be related to regrowth in part. However, a patch discovered a few hundred meters southeast is suspected to be contributing to regrowth in the area due to fragmentation. We recommend a survey in the spring in order to determine harvesting needs as well as if removal of the aforementioned patch has reduced regrowth or not.

- **Echo Bay (Site #17): Total Pounds Harvested: 750**



Summary:

This area was completely harvested in 2019. Usually combined with Elizabeth Island, this site was separated out this year due to its contextual challenges. The site was moderate infested with Eurasian Watermilfoil at the mouth of the bay that spread southward around the point and islands. This created challenges for our crews to anchor, dive, and transit safely given the high boat traffic in an out of work zone. Transiting and working around the point southward was also hazardous for these reasons. The bottom composition was also challenging; a rocky bottom layered upon with mud made it challenging to remove the root balls of the Eurasian Watermilfoil. A steady current around the point and islands stirred up the mud and made visibility tricky.

Recommendations:

Going forward, it will also be important for geography of the site to be recognized as a formidable challenge for the safety and productivity of our crews; even the safest boaters following the strictest guidelines for diver safety create a potential danger to crews because of the small mouth of the bay and depth. Further discussion is recommended regarding these concerns.

- **Dunham's Bay (Site #19): Total Pounds Harvested: 3,765**



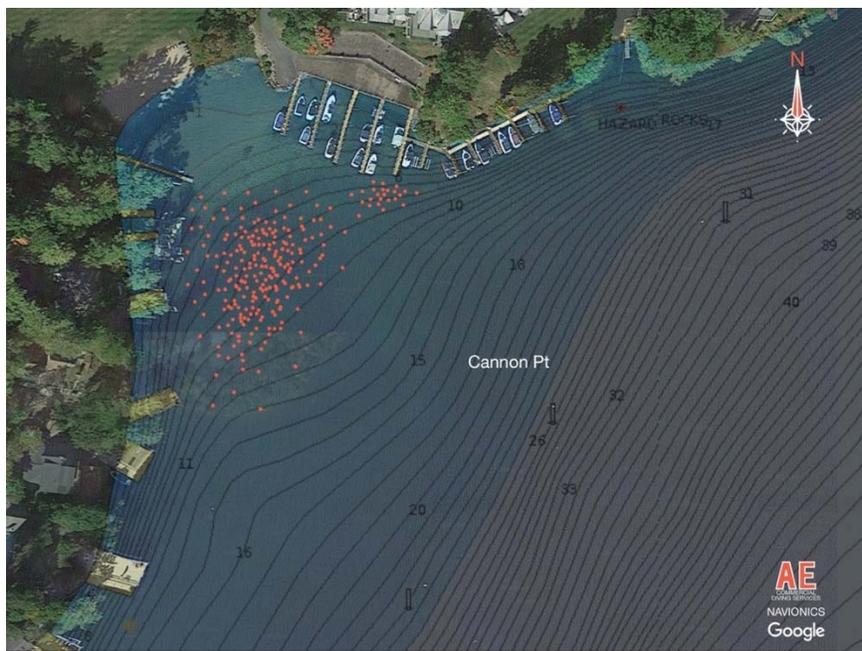
Summary:

This area was completely harvested in 2019. Overall, Dunham's Bay looked very good. There was a sporadic vein of milfoil along roughly 60% of the eastern shore. The western shore revealed very little growth of Eurasian Watermilfoil, with only a few plants along its entirety. The bulk of harvesting efforts in Dunham's Bay was in the center of the bay in roughly 20 - 25 feet of water. The bed was small but dense. It was located at an old bottom barrier site.

Recommendations:

In the coming season, it will be very important to monitor Dunham's Bay, as there is a very busy marina on site. Though most of the dense growth was away from the marina, boat traffic could lead to fragmentation and spread of Eurasian Watermilfoil quickly. We recommend continued DASH as well as frequent surveys in order to keep Dunham's Bay on a trajectory towards optimum containment and control.

- **Cannon Point (Site #26): Total Pounds Harvested: 6,885**



Summary:

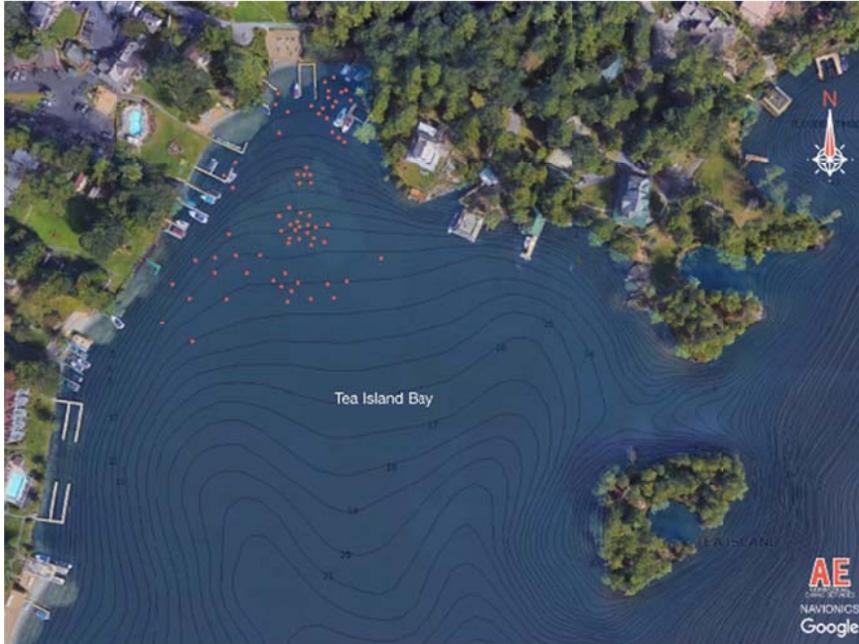
This area was completely harvested in 2019. When we began work at Cannon Point in 2019, we found that it resembled how it had looked before commencing work in 2018: a dense bed of invasive Eurasian Watermilfoil was located southwest of the point, in roughly the same place as 2018, though the bed had shifted slightly to the east.

There are several contributing factors to why work in this area has only held the advancement of the Eurasian Watermilfoil at bay rather than reduce it. First, the lake bottom at this site is a dense sandy base that encourages deep root growth. Removing the entire root ball of the invasive Eurasian Watermilfoil plants that grows here is time consuming and difficult, though clearly imperative. Next, this site is thick with native plant life that is punctuated with Eurasian Watermilfoil. Removing the invasive plant without damage or destruction of these native plants is very difficult and leads to a situation where divers are sorting through stems at the bottom of the lake in poor visibility conditions. Finally, Cannon Point is rife with boat traffic and we suspect the perpetual traffic is leading to a rapid regrowth potential through fragmentation.

Recommendations:

We recommend that this site received a continued strong effort in order to keep progress moving forward. It is crucial that the dense bed of Eurasian Watermilfoil be held in check to reduce movement of the bed into areas south of Cannon Point, as was observed occurring between 2018 and 2019, or beyond. The increase of days allotted to this site, (5 in 2018 to 13 in 2019), allowed for a more robust removal of invasive Eurasian Watermilfoil and must continue in order to control this site's infestation.

- **Tea Island Bay (Site #30): Total Pounds Harvested: 1,170**



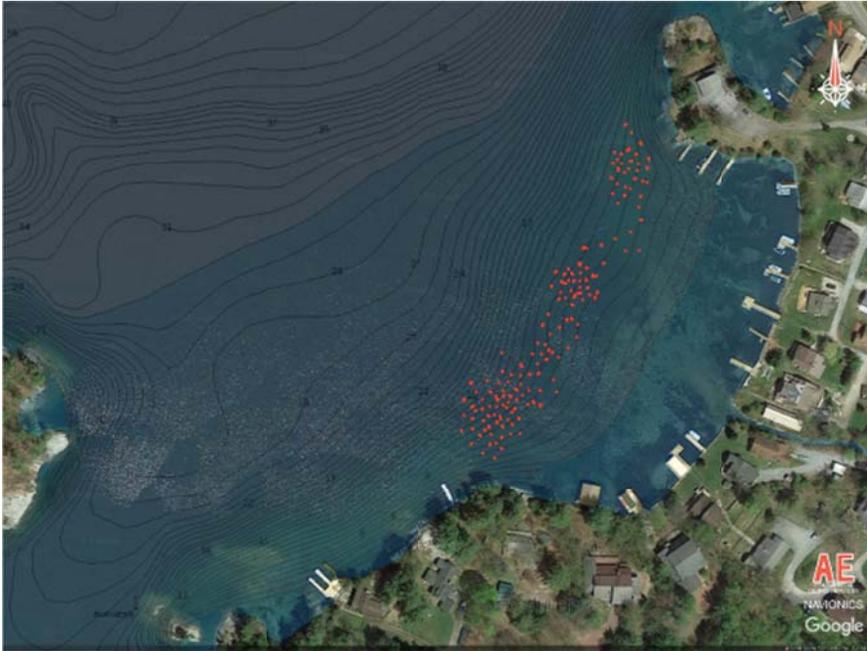
Summary:

This area was completely harvested in 2019. The initial survey prior to the commencement of work in 2019 revealed that work in 2018 on the Tea Island site was successful in significantly reducing the infestation of Eurasian Watermilfoil. This made for quick work at the site. However, the shallow areas of the site, especially in the areas around the resorts and their docks, revealed new growth that was more complicated to remove.

Recommendations:

New growth at this site, (most likely due to fragmentation caused by a high tempo of boat traffic), is in areas where DASH work is much harder to conduct, such as under and around docks and moorings. We recommend that close attention be paid to the trend of regrowth at this site in order to prevent a relapse into a denser area of infestation, especially in shallow areas.

- **Eichlerville Bay (Site #51): Total Pounds Harvested: 4,970**



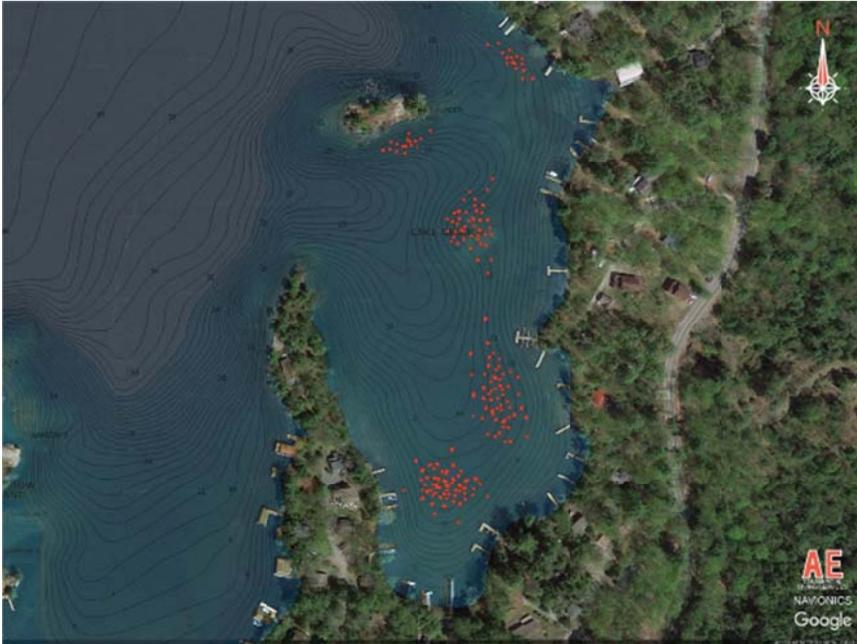
Summary:

This area was completely harvest in 2019. Eichlerville Bay revealed two dense beds of Eurasian Watermilfoil connected by a smaller line of moderate growth. Two DASH crews worked the large patches towards each other and through to each other in the areas of moderate growth. Harvesting was completed in this area; however, the varied bottom composition causes concerns to potential regrowth. Because the site was done late in the season, it was not possible to check for regrowth after harvesting in 2019. A rocky bottom composition layered with mud on top, Eichlerville Bay was a complex site to remove invasive Eurasian Watermilfoil from, with a great deal of uncertainty if complete root removal was accomplished.

Recommendations:

Because this site was completed at the end of the DASH season in 2019, we recommend that it be revisited earlier in the 2020 season in order to check regrowth and eliminate the potential for fragmentation into other areas, (which is possible in this high traffic site).

- **Indian Bay (Site #55): Total Pounds Harvested: 6,570**



Summary:

This area was not completed in 2019. Indian Bay contained several isolated dense beds of Eurasian Watermilfoil, with sporadic growth throughout the shallows. The sandy bottom composition made harvesting easier for the two DASH crews and the hand pulling team. However, this site was worked last in the season and was not completely harvested before the season ended.

Recommendations:

We recommend that Indian Bay be revisited earlier in the 2020 season in order to eliminate the potential for fragmentation out of *and* inside of this site that is probable due to the high-traffic nature of the bay.

- **Clay Island (Site #97): Total Pounds Harvested: 13,205**



Summary:

This area was completely harvested in 2019. The Clay Island site consisted of a large dense bed on the western shore of Clay Island. The site was worked with two harvesters and occasionally a hand pulling crew. The harvesters started on opposite ends of the dense bed and worked to reach each other in the center. After completion, the site seemed to hold for the remainder of the summer. However, the bottom composition consisted of sand and clay. This makes eradicating root systems more troublesome.

Recommendations:

This site should be revisited earlier in 2020 to survey potential regrowth and ensure its removal as quickly as possible. The clay/sand bottom composition will continue to make this site a priority each year.

- **Elizabeth Island (Site #107): *Total Pounds Harvested: 750***



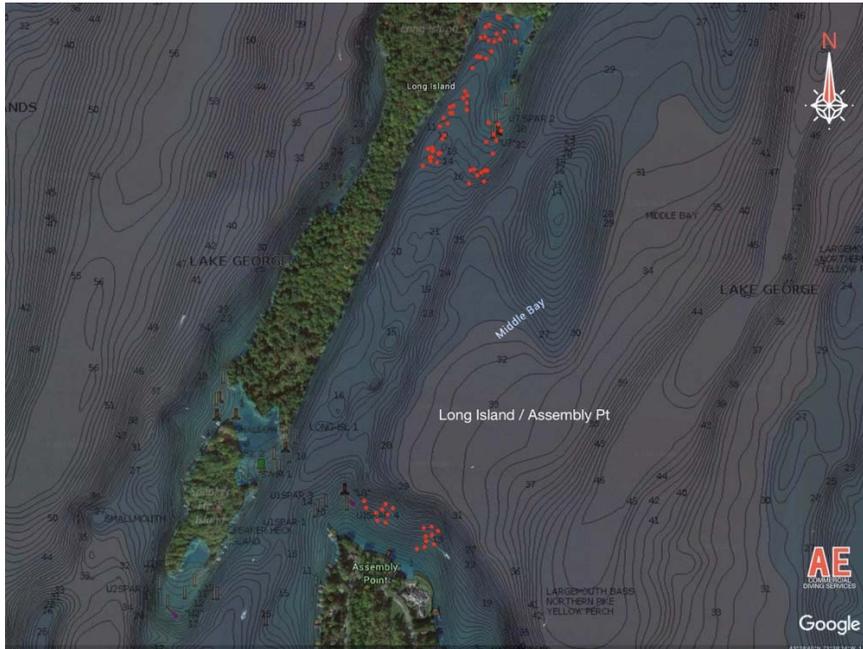
Summary:

This area was completely harvested in 2019. The Elizabeth Island site, (new to us in 2019), was completed faster than anticipated. There were only a few small dense beds in areas of shallow water, and the crews had no problem finding them and removing them.

Recommendations:

Though the work was fast and straightforward at this site, the dense beds were located on rocky deposits which make for a difficult removal of the Eurasian Milfoil root ball. In addition to continued DASH work, we recommend a site survey of the area in 2020 to ensure the beds have not moved or become larger.

- **Long Island/Assembly Point (Site #202): Total Pounds Harvested: 1,515**



Summary:

This area was completely harvested in 2019. The Long Island site looked to be greatly improved as compared to when it was initially observed, (prior to DASH in 2018). Due to the rocky bottom composition, we expected to find regrowth, but were happy to see a serious decline. The northern and southern sectors each prove to have their own challenges, but overall, the site work here was done more easily than expected.

Recommendations:

We recommend that a hand pulling crew continue to monitor the site throughout the season for any potential DASH needs that may arise.

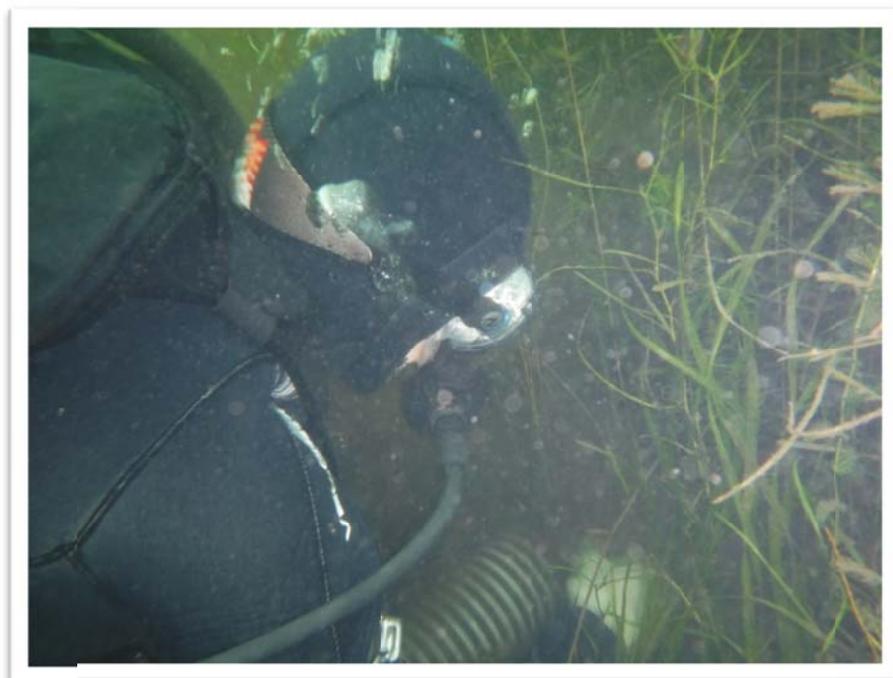
APPENDIX 1: 2019 Pictures



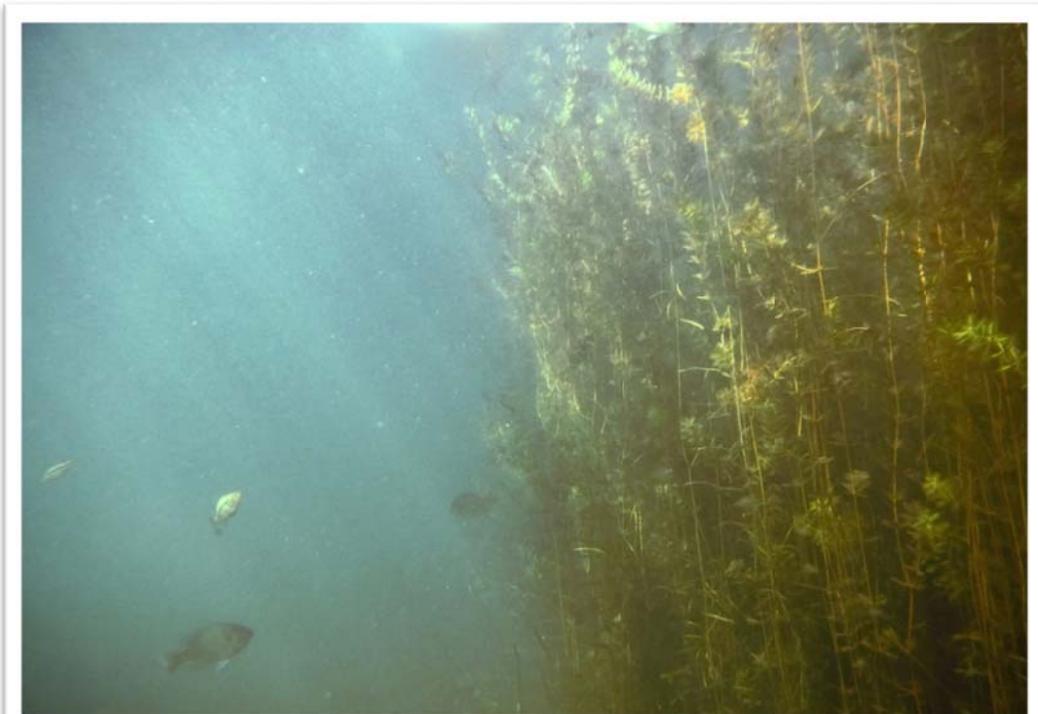
1. Eurasian Watermilfoil Close-Up
(Northwest Bay, June 2019)
© 2019 AECDS All rights reserved.



2. Eurasian Watermilfoil Dense Growth
(Northwest Bay, June 2019)
© 2019 AECDS All rights reserved.



3. AECDS Diver performing DASH
(Northwest Bay, June 2019)
© 2019 AECDS All rights reserved.



4. Eurasian Watermilfoil ‘Wall’

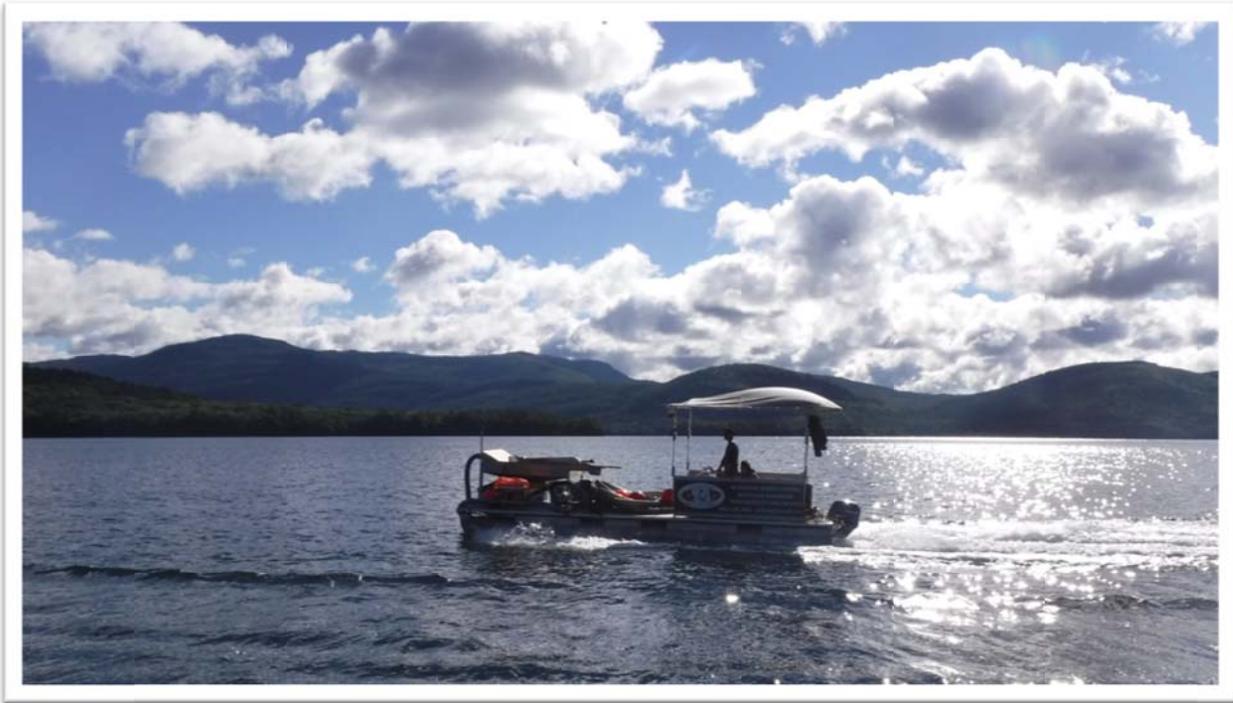
(On the left is an area cleared by divers the day before in Northwest Bay, June 2019. The right side shows the density and height of the plants. Very little to no native plant life was observed in this dense patch.)

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5. Eurasian Watermilfoil Behind Harvested Area

(Careful harvesting by AECDS Divers ensures native plant life is retained and able to reclaim the area.) © 2019 AECDS All rights reserved.



6. DASH Boat (AECDS Patent Pending)

(Transiting Lake George reminds all the crew what a beautiful and vital body of water we are privileged to care for)

© 2019 AECDS All rights reserved.



7. Running Boat Loaded with Milfoil

(Taking full buckets of Eurasian Watermilfoil to be disposed of)

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APPENDIX 2: Divers Alert Network Safe Boating Guidelines Brochure
(Available at <https://www.diversalertnetwork.org/health/PSA-BoatingSafety/index.html>)

DIVE FLAGS

When diving, fly the flag. Ensure the flags are stiff, unfurled and in recognizable condition.

DIVER DOWN FLAG

This flag explicitly signals that divers are in the water and should always be flown from a vessel or buoy when divers are in the water. When flown from a vessel, the diver down flag should be at least 20 inches by 24 inches and flown above the vessel's highest point. When displayed from a buoy, the flag should be at least 12 inches by 12 inches.

ALPHA FLAG

Internationally recognized, this flag is flown when the mobility of a vessel is restricted, indicating that other vessels should yield the right of way. The alpha flag may be flown along with the diver down flag when divers are in the water.

SURFACE MARKER BUOYS

When deployed during ascent, a surface marker buoy (SMB) will make a diver's presence more visible. In addition to a SMB, divers may also use a whistle or audible signal, a dive light or a signaling mirror to notify boaters of their location in the water.

REPORT DIVING INCIDENTS ONLINE AT DAN.ORG/INCIDENTREPORT.



DAN
DIVERS ALERT NETWORK
6 West Colony Place
Durham, NC 27705 USA

PHONE: +1-919-684-2948
DAN EMERGENCY HOTLINE: +1-919-684-9111

HEALTH & DIVING REFERENCE SERIES

**SAFE BOATING
GUIDELINES**



Part #: 013-1-004 Rev. 3.27.15

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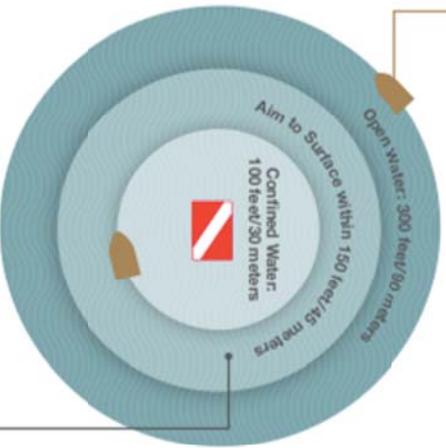


SAFE BOATING GUIDELINES

To prevent injuries and death by propeller and vessel strikes, divers and boaters must be proactively aware of one another. Check local regulations.

DRIVERS

STAY A SAFE DISTANCE AWAY FROM DIVE FLAGS. Maintain a distance of at least 300 feet (90m) from diver down flags and buoys in open water and at least 100 feet (30m) in inlets or navigation channels.



DIVERS

USE THE DIVER DOWN & ALPHA FLAGS APPROPRIATELY. Stay within 300 feet (90 meters) of the diver down flag or buoy in open water and 100 feet (30 meters) when diving in rivers, inlets or navigation channels. Aim to surface within 150 feet (45 meters) of the dive flag.



DIVERS

Take steps to enhance your safety in the water. Make sure you are visible and adhering to local laws.

- + Create an emergency action plan. Prior to arriving at a dive site, make a plan for how you would respond to and evacuate a diver who was injured by a boat or propeller.
- + Establish clear communication with the boat operator and others onboard. Pay attention to the boat procedures and dive briefing. Wait until the boat operator indicates the engine is off, and it is safe to enter the water; follow the established safety procedures for entering and exiting the boat.
- + Never assume you are visible in the water. Use diver down flags to signal your position to boaters and use surface markers buoys while topside.
- + Maintain vigilance. During your safety stop scan for boat traffic.
- + Remain clear of the propeller at all times. Even a disengaged propeller can cause injuries.



DRIVERS

Boat operator inexperience and negligence are contributing factors to boat and propeller strikes on divers.

- + Constantly look for people in the water. Operator attentiveness is an effective way to prevent accidents.
- + Do not assume divers are always visible. Glare from the sun, waves, passengers, weather conditions and other factors can make diver visibility challenging.
- + Be prepared. Make sure you have appropriate equipment to respond to an emergency including first aid kits, oxygen units, communication devices and emergency first aid training.
- + Observe safety protocols. Ensure the engine is off and the propeller is still before allowing boarding or disembarking. Do not allow people on the swim platform while the engine is in gear. Before starting the boat, make sure no one is swimming or diving near or under the boat.
- + Establish clear communication with divers and swimmers. Instruct divers and swimmers to stay clear of the propeller at all times, even when it is not moving (an immobile propeller may still cause injury).