

Little Island Pond Association (LIPA) Aquatic Weed Mitigation Program

August 18, 2023

History

People have recreated around Little Island Pond (*aka. LIP*) since the late 1800s, when the first cottages and houses were built around the pond.

Within the next few decades, much of the pond was surrounded by camps and houses. To this day many of the people around the pond have been here for generations and we have personal testimonials and stories passed on from previous generations, going back to the first half of the 20th century.

Little Island Pond has always been a very clean lake with very clear water and great for swimming, boating, and fishing.

In 2017, Little Island Pond Association (*aka. LIPA*) was formed mostly to get organized around protecting the lake from milfoil and other invasive aquatic weed species. Weed watching activities, water testing, fundraising, aquatic weed mapping and more were launched for this purpose.

Changes in the last five years.

Over the years, going back at least thirty years, aquatic weed mapping was done around LIP. Typically, this was done visually by NH DES representatives going systematically around Little Island Pond. And reported aquatic weed species by drawing markings on a paper map. Showing what types of weeds were found at various locations and documenting the variety of aquatic weeds.

In 2019, people around the pond noticed a significant increase in one specific aquatic weed. This prompted LIPA, on July 30th, 2020, to hire a freshwater conservation company (**AER – Aquatic Ecosystem Research**) to study LIP and undertake a water quality assessment. A quantitative aquatic weed community study that included mapping the location of the aquatic weeds was performed. AER did this by using a method whereby a geogrid was digitally established in GPS over LIP that contained 323 points of intercept/sample points. Aquatic weeds were identified and reported around each point by visual and rake throw/grapple methods.

By 2018, LIPA Weed Watcher officially identified an aquatic weed, which had not been present in Little Island Pond on any prior NH DES State Trophic Studies of LIP. This new plant had rooted in LIP and was proliferating around the lake speedily, year after year in both shallow and deep

water. This newly introduced weed is called Clasp Pond Weed (*aka. CPW*) has been observed in waters as deep as 12 ft and has been observed to be in excess of 15ft long in 12 ft of water. The aquatic weed does not protrude out of the water. Instead, CPW trails along the top of the water. Thus, not visible to watercraft, resulting in randomized cutting and fragmentation of CPW. When vessels proceed through the areas with CPW, this aquatic weed floats when severed from the rooted portion of the plant, while the seeds are located at the top of the plant. This results in migration and transplantation of the CPW. As well as the fragmented CPW washing up as CPW debris on the shoreline. Due to its length and lack of visibility from above the water, CPW will wrap around boat propellers, paddleboards and be ingested by jet skis' impulsion. It is then randomly expelled either intentionally or unintentionally. For example, a vessel captain may unknowingly navigate through a patch of CPW and catch CPW around the prop of their motor. Or an impulsion vessel unknowingly ingests the CPW and then shifts to neutral / reverse / forward and ejects the CPW in another location on the lake. CPW is also collected on a paddle board leashes or kayak paddles or on anchors and discarded in another section of the lake.

By 2022, LIP had a situation where very large underwater fields of this CPW developed. These fields consisted of 100% CPW, with no other weeds found amongst the CPW.

LIPA and LIP Homeowners do not know how CPW got into LIP (i.e., through the launching of visitor boats/kayaks/paddleboards/fishing gear / bird dropping, etc.). However, LIP now has CPW, which was never listed in past NH DES State Trophic Studies, section "*Aquatic weed Survey*", 2001 or prior. LIP was a blank slate and is now being engulfed and overwhelmed by a very prolific native aquatic weed.

The Concern

Homeowners around the lake were extremely concerned about the massive impact these aquatic weeds had on the ability to recreate on the lake. Not only does CPW having a major impact on the ability to swim comfortably and boat around without getting large amounts of weeds around propellers, but it has also increased to the extent that CPW impacts motors on boats. Homeowners are also extremely concerned that the lake was filling up with CPW, thus turning the lake rapidly into an unusable & unbalanced lake.

Since CPW grows in large underwater fields, consisting of 100% CPW with no other weeds in those fields, LIPA is also concerned that CPW is crowding out other weeds. Resulting in LIP losing a healthy natural balance of weeds in the lake.

Consequences of the invasion of CPW and actions taken

The impact of the massive invasion of CPW was enormous. Swimming and boating have been significantly impacted. Homeowners are notably concerned of the consequences if the CPW is allowed to continue to grow without management efforts.

The LIPA membership demanded action and doing nothing was not considered an option. Two immediate steps were taken:

1. LIPA formed a weed mitigation team to investigate what could be done and to take steps to mitigate the situation.
2. LIPA seriously stepped-up fundraising to have the resources to be able to implement the plan that was devised in concert with NH DES.

The weed mitigation team initiated the following activities:

1. Met with other lake associations to see what they had run into and what they were doing about issues similar to the issue we were trying to deal with.
2. Talked to commercial companies who help lake associations and companies with weed problems.
3. Opened a dialogue with the NH DES to get their advice and discuss options for dealing with CPW and to discuss LIPA's findings of our aquatic weeds.
4. Partnered with many organizations such as UNH Lakes Lay Monitoring Program, NH LAKES and others. And used those relationships to try to get insight on LIP's rapid & uncontrollable increase in CPW.
5. Researched methods for dealing with the CPW, (i.e., harvesting CPW, benthic mats, chemicals, and cutting) to control the CPW growth.
6. LIPA Board regularly updated the membership and made PowerPoint presentations reviewing findings and options considered.

The decision was made early 2022, that the weed mitigation team could pursue the least disruptive method to manage CPW. Which is to cut & harvest the CPW without disturbing the lake bottom (benthic layer) or cause turbidity.

In May of 2022, NH DES informed LIPA that a permit is not needed for the cutting of the CPW with the strict guideline that LIP weed mitigation team did not cause turbidity in the water during harvesting.

LIPA invested in a couple of manual aquatic weed mowers/cutters, called "Weed Shears". During the June-September period of 2022, the weed mitigation team went out twice a week for several hours. With a team of specifically trained volunteers to cut CPW and collect the CPW debris generated from the cutting efforts. Our findings were:

- The Weed Mitigation Team went out 21 times and invested approximately 500 person hours.
- The Weed Mitigation Team made some difference by thinning the tops of the weeds in the areas the Weed Mitigation Team was able to cut.
- Even though the Weed Mitigation Team worked very hard for many hours, it was evident many of CPW clusters were left untouched and would need to be thinned out. The conclusion was that the Weed Mitigation Team's impact was minimally impactful and was very labor intensive, using the manual Weed Shears. The weed mitigation team was looking to find a better way to cut the CPW for future efforts.

- In areas that the weed mitigation team cut & harvested, it was found that 99% of the cut debris was CPW.
- Each of the 21 weed cutting events were documented and these documents are available for LIPA members who want to review them. The weed mitigation team kept track of the dates/times, people involved, weeds cut (always 100% CPW) and the area of the lake which CPW was cut during each outing.
- The conclusion was that it was hard for a layman to see that the Weed Mitigation Team had made much impact. And the challenge of fighting the proliferation of CPW required more than the Weed Mitigation Team was able to do using the Manual Weed Shears.

2023 Weed mitigation efforts:

In June of 2023, LIPA agreed to acquire the WaterGator. After a thorough investigation of the WaterGator by the LIPA Board, a LIPA board vote approved the purchase of the WaterGator. Then went to the LIPA membership to vote and was approved. The WaterGator is a machine which navigates over the lake and will cut the CPW up to a water depth of 3ft and simultaneously harvest the cut material debris. This decision was made since the impact in 2022 using the manual cutting of CPW, was scant, despite a huge effort.

The WaterGator will make cutting CPW less laborious and more accurate with less depth variables. It is expected that the WaterGator will allow LIPA to attempt to put a dent in the unrelenting growth and proliferation of the CPW. The LIPA membership overwhelmingly was asking for more actions and overwhelmingly supported the WaterGator acquisition.

Resulting in 2023, LIPA has a record number of members and raised a record amount in funding. There are 117 individual properties on the lake. LIPA now has more than 110 members, with many of the LIPA member's homes directly on LIP. The LIPA membership is eager to see LIPA regain the unhindered use of LIP and find relief from the increased growth of CPW which is taking over LIP. Concurrently, the LIPA board sees this as a great opportunity to continue its well-rounded educational initiatives and reach more homeowners.

Detail on the WaterGator:

- Runs on batteries and can run for up to 8 hours with fully charged batteries.
- Moves 3-5 miles per hour.
- Remotely controlled –the operator can move it around, lower/raise the cutters. Also, the belt that is collecting the cut CPW can move.
- A camera sends video to a screen on the controller unit.
- A trailer is used to move and store the unit on land.
- The cutters cleanly cut the CPW and simultaneously collect the cut CPW. The lower part of the plant is left intact and fish are not impacted.
- Made in Minnesota USA.

Process, methods, organization, and documentation

The focus & attention of the CPW cutting is on the **areas** where boats, especially pontoon boats, tour around LIP and areas where people used to swim.

CPW cutting is done during “**Weed cutting outings**”. For each outing the Weed Mitigation Team has been operating with one or two boats. One boat focuses on managing the WaterGator and the second boat focuses on collecting any CPW that is spilled and is not collected by the WaterGator. Typically present are 4 to 6 trained volunteers per outing. An outing has been approximately 3 hours in total time (i.e., Preparing the team, executing the cutting, and returning to land). The weed mitigation team gathers the cut CPW and disposes the debris on land away from the lake.

The weed mitigation team **documents** who participated at each outing and where the cutting of the CPW occurred. The weed mitigation team continually inspects and finds that the debris cut is 100% CPW.

Analysis

LIPA Board members have talked to NH DES, Universities we collaborate with, commercial companies specializing in lake health issues, NH LAKES, other lake associations, the Weed Mitigation Team members, and homeowners around LIP. After conducting much research and inquiries, LIPA’s conclusion is that nobody knows **the exact cause** of the introduction of the CPW to LIP.

There is speculation and there are hypotheses as to the introduction, but LIPA has negligible data to point at a specific cause of the introduction of CPW. A possible reason for the expedited growth of CPW may be climate change because many bodies of water all around the US, and all around the world, are having sudden increases in aquatic weeds.

Little Island Pond is in good shape. There are a couple of data points, notably the amount of phosphorous and the fact of 0% dissolved oxygen at deeper levels in the pond, that are somewhat concerning, but we don’t even understand fully how to relate that to our issues. Other than those two datapoints, the water is very clear and in good shape. There are still quantities of fish, turtles, otters, beavers, loons, and other creatures in LIP as before the increase in CPW.

LIPA is **committed to investing in research** and other activities that will help obtain more data on why we have the extensive growth in CPW and to help figure out what we can do to create balance. In the meantime, LIP cannot afford to allow CPW to slant the scales of balance and ultimately impact the use and recreational benefits of LIP. LIPA is committed to the CPW mitigation efforts and restoring balance.

Results of 2022 weed cutting, ongoing 2023 activities and future plans:

The results of our efforts of **2022** are:

1. With over 500 person hours working on CPW cutting, the impact was minimal and hard to see by visual inspection; unless you were part of the weed mitigation team and/or could check the areas that were cut.
2. A year later, July 2023, the weed mitigation team does not see much residual impact of the CPW cuttings from last year. However, it is possible that the CPW could be worse if LIPA had not performed the cutting last year. This is obviously hard to establish.
3. LIPA concluded there is a need to find ways to improve the CPW cutting.
4. LIPA continues to review the overall impact of the CPW cutting efforts.

The results of efforts in **2023** as of the end of July (1st full month of WaterGator use) are:

1. Learning how to optimally use the new WaterGator.
2. Learning how big an area can be cut per outing and per week.
3. The WaterGator clearly allows for increased efficiency.
4. Reviewing & restructuring the way the Weed Mitigation Team is set up & functions to optimize resources.
5. Looking at some enhancements to the WaterGator which will significantly increase efficiency. Several engineering changes are being investigated.

The plans for the **future** are:

1. Enhance the WaterGator so a single person can use it during a CPW cutting outing.
2. Organize the Weed Mitigation team into smaller teams which can take turns weed cutting outings.
3. Create a better way to handle the waste (cut CPW debris). Currently using ad hoc solution for disposal each week.
4. Establish exact metrics for what can be done in a single outing and establish a schedule for areas of intended CPW cutting.
5. Restore BALANCE to LIP aquatic weed community.