
# HOP BROOK PROTECTION ASSOCIATION

*Restoring and Preserving Sudbury's Ponds*

# ANNUAL REPORT

# 2019

**5/11/2020**

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# 2019 (and early 2020) in review

After decades of hard work, most of the Hop Brook Board of Directors chose to take well-earned retirement at the annual meeting in April 2019. However, a few of us felt HBPA's work wasn't yet done, so we canvassed for new volunteers, and soon after the annual meeting a new board was formed. Unfortunately, as a result of the transition, we were unable to do any remedial work in 2019.

The new board members were clear that our first priority was the invasive water chestnut that has overtaken our ponds. We researched different remediation techniques, talked to experts, and investigated techniques that have successfully mitigated this problem in surrounding towns. We also gave attention to the ponds' other issues (algae, high phosphorus, low oxygen) and looked into remediation techniques for those as well. We met with the Sudbury Conservation Commission (ConComm) coordinator, and attended a meeting of the water-chestnut-management subcommittee of OARS (part of CISMA) where we were able to compare notes with counterparts from several nearby towns. Ultimately, we determined that we had these options:

- Harvesting: This has been going on for years, originally to reduce the algae, and more recently to reduce the water chestnuts. However, harvesting is not sustainable; it's a difficult, time consuming and risky activity. While we benefited from the efforts of previous members who found creative ways to accomplish this task in the past, these members, their expertise, and access to required equipment are no longer available. Going forward, permits and insurance must be obtained annually, operators must be hired and trained, and equipment must be rented and reserved. Also Grist Mill Pond, one of our most iconic ponds at the Wayside Inn, was never a viable candidate for mechanical harvesting since it is rocky and shallow. Although some harvesting of Grist Mill Pond was done in the past using shallow cutters attached to small boats containing very skilled and brave operators, this was neither a safe, effective nor sustainable removal method.
- Dredging: Typically deeper ponds do not allow the water chestnuts to grow, and dredging can remove the majority of embedded seeds. Making the ponds deeper by dredging might be an option. This would also reduce the buildup of phosphorus at the bottom of the ponds, making it less fertile for non-invasives and algae. Unfortunately, dredging costs for ponds of our size, almost 100 acres in total, would be millions of dollars, which is considerably out of our reach.
- Herbicide Treatments: Many surrounding towns have had good luck with environmentally-friendly herbicide treatments to eradicate water chestnuts. Effective treatments require multiple applications over years, costing more than HBPA could itself afford. So, in addition to thorough research and discussions with current users to convince ourselves of the safety of this approach, we realized we would also have to pursue some grants.
- Water level reduction: Temporary water level reduction may be effective in reducing invasive species. In addition, some literature suggests that many of our problems may be caused by the stagnant water in our ponds. Reducing the water level enough to promote a healthy flow may be a solution, but would obviously make other changes to the eco-system and pond area appearance. Still, this approach (essentially letting the pond system revert towards its natural state) could be a long-term cost effective solution. Clearly much more investigation is needed here.

After much research and investigation, we concluded that the preferred method of controlling water chestnut is use of a specific environmentally-friendly, rapidly-decaying herbicidal treatment (Clearcast), applied annually, in decreasing amounts over a number of years. This treatment is being used successfully in Framingham, Wayland, Concord, Acton, and elsewhere, and would be used as part of a comprehensive pond

management plan that would also include monitoring and limited hand-pulling, and could be the first step to restore the ponds to class B recreational water quality standards over time.

We discussed all this with Lori Capone, the town's Conservation Coordinator, who opened a discussion with the ConComm. We agreed with the ConComm that more thorough investigation and documentation relative to safety, effectiveness and experience, would be required before they could consider approval, but they understood the dearth of alternatives and said they would seriously consider our request.

With our direction clear, we embarked on obtaining the necessary approvals. We successfully applied to the Sudbury Community Preservation Committee for 3-year $180K grant to cover the treatment and associated tasks. This still requires approval at Town Meeting later this year and we hope you will attend to support our request.

As the Town of Sudbury is a pond abutter, we made a presentation to the Selectmen outlining our plans. They were generally supportive. We also presented to the Sudbury Ponds and Waterways Committee to keep them informed.

We then filed a Notice of Intent (NOI) with the Sudbury Conservation Commission (ConComm). This proved a larger hurdle than expected since we needed to collect proof that every pond abutter was made aware of the hearing. However, with your help, we collected over 65 signatures, with the side benefit of demonstrating widespread support for our plans. After preparing several in-depth documents for their review (attached on following pages), and giving presentations across multiple meetings, the ConComm approved our NOI on March 9th, 2020. After investigating multiple providers and receiving bids, we signed a contract with our contractor (SOLitude), and are currently completing the permitting process, with initial herbicide treatment planned for July. Working in conjunction with Lori, we plan to closely monitor SOLitude's progress and activities during the execution of the contract. The ConComm approval also came with a detailed Order of Conditions that we intend to ensure is followed. We will report on the results of the process, and our plans for 2021, at the 2021 Annual Meeting.

We aborted our initial planned membership drive in March due to the Covid-19 situation. However, after much discussion we decided to restart it at the end of April. We are all volunteers, and our CPC funding (assuming our grant is approved at Town Meeting) is limited to a very specific use. The filing fees, surveys, and consulting services required to get us this far have cost several thousand dollars, and we anticipate similar ancillary costs as we move on to the next steps in cleaning up the ponds. Members can use the form attached to the end of this report, or donate online at http://www.hopbrook.org, to give what they can. We appreciate your support!

# 2019 Liaison Report

Over the course of the year, we've worked with various individuals, groups, and organizations to learn from their experience with invasive species management. The knowledge we've gained from these resources has been instrumental in our ability to move forward with water chestnut eradication.

Communication with the conservation commissions in other towns with similar invasives has been very helpful. These include Franklin, MA., Framingham, MA., Littleton, MA., and Norton, MA. These groups provided us with reports on their progress in managing invasives, shared their experience with working with groups like Solitude and using herbicides, and helped us set our expectations for what to expect moving forward (i.e. possible invasives to come). On the state level, the Massachusetts Department of Conservation - Lakes and Ponds has been a wonderful resource for us as well.

Department of Conservation - Lakes and Ponds

> *"The Lakes and Ponds Program works primarily in the DCR State Park system to protect, manage and restore valuable aquatic resources. We also provide technical assistance to communities and citizen groups as well as provide educational materials to the public about lake issues."*

The Hop Brook Protection Association has several memberships to local organizations including Mass Rivers Alliance, FARNWR, and OARS. We have also been learning from groups including CISMA and the MA COLAP.

CISMA: Cooperative Invasive Species Management Area

> *"The SuAsCo CISMA (Cooperative Invasive Species Management Area) is a partnership of organizations that intend to manage and control invasive species defined by the geography of the Sudbury, Assabet, and Concord (SuAsCo) watershed."*

MA Congress of Lake and Pond Association (MA COLAP)

> *"MA COLAP works to preserve, protect, maintain and enhance the environmental, aesthetic, recreational and economic values of Massachusetts' lakes & ponds."*

FARNWR: Friends of the Assabet River National Wildlife Refuge

> *"Established in 2000, The Friends of the Assabet River National Wildlife Refuge is a non-profit organization of dedicated and conservation-minded volunteers who work with the US Fish and Wildlife Service, Eastern Massachusetts National Wildlife Refuge Complex to protect and enhance the refuge's flora and fauna."*

Mass Rivers Alliance

> *"The Massachusetts Rivers Alliance was incorporated in 2007, and acquired its first staff in June 2009. Mass Rivers' mission is to protect and restore rivers across the Commonwealth. A related goal for us is to strengthen, connect, and empower individuals and organizations working to protect rivers in our state. Mass Rivers has grown quickly and now has over 60 organizational members."*

OARS

*"OARS is a 501(c)(3) non-profit organization whose mission is to protect, improve and preserve the Assabet, Sudbury, and Concord Rivers, their tributaries and watersheds, for public recreation, water supply, and wildlife habitat."*

Moving forward, we will continue to work closely with these groups in our efforts to protect the Hop Brook. In addition, we will continue to build our resources and relationships with similar groups.

## 2019 Membership Report

Membership applications were mailed to ~200 addresses, resulting in 40 paid memberships, a decrease of 18 from 2018. Member contributions in 2019 totaled $2,975 down from $4,405 in 2018.

A breakdown of memberships by contribution level is as follows.

| | | |
|---|---|---|
| 10 | @ | $25 |
| 1 | @ | $40 |
| 1 | @ | $45 |
| 14 | @ | $50 |
| 2 | @ | $75 |
| 1 | @ | $90 |
| 5 | @ | $100 |
| 6 | @ | $200 |
| Totals: 40 | | $2,975 |

## Hop Brook Protection Association Board Members and Terms

| Board Member | Title | term ends |
|---|---|---|
| Jeff Winston | President | 2021 |
| Kathleen Winston | Clerk, Treasurer | 2020 |
| Terry Snyder | | 2021 |
| Rick Booth | | 2020 |
| Glenn Pransky | Chief Scientist | 2021 |
| Elyse Rayney | Liaison Chairperson | 2021 |

# 2019 Treasurer's Report

| | |
|---|---|
| Beginning Balance of Free Cash: | |
| MSB - Checking end 501 | 771.50 |
| MSB - Savings end 432 | 9,247.96 |
| MSB CMPF CD 161478154 | 17,391.30 |
| MSB CD 165498570 | 15,404.71 |
| MSB - CMPF CD 85195220 | 26,550.06 |
| Total beginning cash | 69,365.53 |
| CURRENT ACTIVITY: | |
| Deposits: | |
| Memberships | 2925.00 |
| CMPF Contributions | 12,914.81 |
| Contributions - Unrestricted | 0.28 |
| Interest Income | 1,410.42 |
| Total deposits | 17,250.51 |
| Disbursements: | |
| Bank & paypal fees | 14.80 |
| Conferences | 40.00 |
| Supplies Expense | 90.48 |
| Internet and web expense | 641.83 |
| Postage and Shipping Expense | 426.00 |
| Printing Expense | 200.54 |
| Publications & Dues | 125.00 |
| Pond management & remediation | 7,170.00 |
| Tax filing fees | 78.50 |
| Liability Insurance | 722.00 |
| Directors & Officers Insurance | 846.00 |
| Workmen's Comp Insurance | (18.00) |
| Other Expense | 50.00 |
| Total disbursements | 10,387.15 |
| Net cash received (spent) | 6,863.36 |
| Ending balance of free cash: | |
| DCU savings #1 | 1,033.62 |
| DCU checking #2 | 5.69 |
| DCU LTD savings #3 | 73,990.23 |
| DCU money market #4 | 1,194.35 |
| DCU savings mem | 5.00 |
| Total ending cash | 76,228.89 |

# Appendix 1: Results of our research on Clearcast (Imazamox)

Prepared by: Glenn Pransky MD MOccH FACOEM. Visiting Scientist, Harvard School of Public Health. Associate Professor, Univ of MA Medical School, Depts of Family and Community Health and Quantitative Health Sciences, and Sudbury resident.

Reviewed by: Hotze Wijnja, Chief Agricultural Chemist for the Mass Department of Agricultural Resources

## Chemistry

This information is prepared by the Hop Brook Protection Association, based on a review in November 2019 by Glenn Pransky MD, MOccH, of several State and Federal reference documents, factsheets prepared by State and Federal agencies, several original studies, and documentation of proposed water treatment plans and follow-up surveys, as listed in the footnotes. A brief description of Clearcast (Imazamox formulated for aquatic use) is provided, along with information about safety, efficacy, and environmental impact with the intended use in the Hop Brook watershed.

## Description

Imazamox is an imizoladimine compound that is absorbed by leaves and stems, is transported to roots of plants, and inhibits a specific enzyme system that synthesizes essential amino acids in plants. Susceptible plants immediately stop growing and die in 4 – 12 weeks.

Imazamox was developed in 1969, and first registered for use with soybeans in 1997 for weed control (trade name Raptor), and since then has been approved for use on 12 more crops. It has been extensively used in the Midwest since that time for field application. Since it degrades rapidly on exposure to air or light, and does not accumulate in animal tissues, the EPA classified it as non-bioaccumulative and waived food residue tolerance requirements. After extensive research documenting low toxicity to animals, and absence of any reports of adverse human health effects, the EPA exempted it in 2003 from any requirements regarding residues in food. Testing its use for aquatic macrophyte management began in 2004, eventually expanding to registered use in 16 states. Clearcast received full EPA approval for this use in 2008.[1]

- **What are the by-products (daughter molecules) that it breaks down to?**
  When light is present, the half life is 6 hours, with degradation to different imidazole compounds, nicotinic and carboxylic acids, that are metabolized as a food source by microbes into carbon dioxide.[2] Breakdown of Clearcast requires light or oxygen, and in a dark, oxygen-poor environment, there is very little breakdown of this chemical, and the same is assumed to be true for its primary breakdown products, if they settle to the bottom of a pond with low oxygen levels. Half-lives in this situation may be around 2 years.[3] As soon as exposure to light or oxygen occurs, the breakdown process restarts. The breakdown products don't have any herbicidal effects,[4] and are regarded as same or lower toxicity than Clearcast itself – as they are similar in structure. Although the toxicity of these breakdown products has not been specifically tested, there is no evidence of adverse effects on plants or animals.[5]

[1] "Use of Aquatic Herbicide Imazamoz in NY State: Supplemental Environmental Impact Statement." (NY-SEIS) Final. AECOM Inc, Sept 2009.
[2] NY SEIS p42
[3] Imazamox Factsheet WI Dept of Natural Resources, 2002
[4] Imazamox Factsheet WI Dept of Natural Resources, 2002
[5] MA Dept of Agriculture (MA-DOA) Imazamox (2014) p 2

Both plants and animals break down ingested Clearcast into similar ring compounds that lack one or more of the parent's methyl groups. Rat studies show that most of the dose is rapidly excreted unchanged, some demethylated, with a half-life less than 7 hours.[6]

- **Why is it potentially lower risk than other initially-considered-safe products like Roundup?** A recent review on Clearcast found no evidence of animal toxicity at concentrations and durations of exposure much higher than those encountered in terrestrial or aquatic application.[7] There has been over 50 years of testing in the lab, and on land, and over 20 years extensive water use of Clearcast without reported adverse health effects on animals or humans. Conversely, Roundup is associated with potential toxicity to a wider variety of plants than Clearcast, as it is a less selective herbicide, and there is more documentation of possible animal and human toxicity.[8] Both glyphosphate (Roundup) and Clearcast require mixture with an adjuvant (soap-like) compound to facilitate dispersion and adherence to leaves in an aquatic application, and these compounds are potentially toxic for aquatic animals. However, the amounts of adjuvants required for Clearcast surface (foliar) water application are well below the thresholds for toxicity of these adjuvant compounds in aquatic use.[9] And, the adjuvant and inert compounds in the Clearcast formulation are sufficiently safe that they have been approved by EPA for application on food and non-food use.[10]

- **Are there reactants that might be found in the pond that would combine with the chemical to produce something undesired or dangerous?** There is limited research on interactions with Clearcast or its breakdown products with naturally occurring or man-made substances in the environment. Testing in typical field and aquatic situations hasn't found evidence of any such interactions.[11] Also, we have prior sediment analyses from our ponds that do not indicate the presence of anything unusual that would be a concern. The primary issues for our ponds' water quality are high concentrations of phosphorus and low amount of oxygen. The low oxygen would slow Clearcast biodegradation but would not affect degradation pathways.

- **Why is this the best choice of chemical?**
  Other herbicides are not as effective in controlling water chestnut12, and have greater toxicity to other plant and animal species, and some are more persistent in the environment. Glyphosphate is probably the most effective alternative herbicide for water chestnut control13, but there have been concerns about human health effects with this compound. In New York State, Clearcast was much more effective than other herbicides in several water chestnut-infested areas, and was successfully used to reduce water chestnut populations to a level that could be managed by harvesting and very selective herbicide application.14

  With respect to foliar (spraying on leaves) application, even the highest recommended level of spraying (2 quarts concentrate/acre) results in water concentrations of less than 50ppb, which

[6] 052-24-02a-Imazamox (USFS risk assessment), 2010, page10-12
[7] 052-24-02a-Imazamox (USFS risk assessment), 2010, page x.
[8] Glyphosphate SERA (USFS) 2010
[9] 052-24-02a-Imazamox (USFS risk assessment), 2010, page 50
[10] State of MA review of Clearcast, page 3
[11] 052-24-02a-Imazamox (USFS risk assessment), 2010, page 20
[12] NY SEIS, p73 (Table 7-3)
[13] NY SEIS, p82
[14] OARS, Water Chestnut Management Guidance and 5-Year Management Plan, page 19 (numbered page 19)

is not enough to affect submerged plant species or water quality. Imazapyr is another similar compound that does not have any effect on submerged species, but is less well tested and has not been used as extensively as Clearcast.15

Other municipalities have developed management plans that begin with Clearcast treatment to reduce the amount of water chestnut to levels that can be managed with hand-pulling and spot herbicide treatment. HBPA plans to go a similar route. Clearcast application is only the first step in a long term pond management plan, which must include transition to other methods once the current large infestation has been brought under control. 16 HBPA is developing this plan now.

**Health:**

- **What is the short/long term effect on human health?** In multiple mammalian studies there are no short or long-term effects of Clearcast even at doses many times higher than would be encountered in a pond or even commercial agricultural application. One rat study showed some acute liver toxicity, at dosage levels over 10,000 times greater than what might be encountered in water application.[17] MA Dept of Agricultural Resources and US EPA conclusions about absence of significant human health toxicity are based on multiple mammalian studies using short and long-term oral, dermal, intravenous and ocular exposures.[18] These studies were reviewed in detail by the EPA and judged to be of good quality, as they were conducted based on rigorous standards and requirements. Although some are not in the public domain, the EPA review and detailed risk assessments are publicly available. [19] [20] Based on available research and the lack of bioaccumulation in mammalian and vertebrate tissue studies, there doesn't seem to be concern about bioaccumulation and cumulative or synergistic toxicity.[21] The actual applied solution (mixture of Clearcast with an adjuvant) can cause temporary skin and eye irritation of those who are applying it, if high-level exposure occurs.[22]

- A comprehensive review by the European Union Food Safety Authority in 2016 did not identify any significant toxicologic effects, and supported conclusions by US experts about the safety of food residues, but raised concerns that the data on potential toxicity of metabolites and degradation products is incomplete.[23]

- It is important to recognize significant differences between imidazole herbicides such as Clearcast, and other chemicals (such as PFAS or TCE) that have been identified as critical water contaminants, with potential negative effects on human health. These polychlorinated or polyfluorinated compounds are biopersistent and bioconcentrated in some plants and most animals, can cause significant metabolic changes, and have evidence of mutagenic and carcinogenic effects in laboratory studies – unlike Clearcast.

[15] MA DOA Imazamox (2014) p 2
[16] NY SEIS p35
[17] Sevim, Comakli et al, An imazamox-based herbicide causes apoptotic changes in rat liver and pancreas. Toxicol Reports, 11/2018, 6: 42-50.
[18] 052-24-02a-Imazamox (USFS risk assessment), 2010, page 9
[19] www.regulations.gov , in Docket ID: EPA-HQ-OP
[20] 052-24-02a-Imazamox (USFS risk assessment), 2010, page 9
[21] 052-24-02a-Imazamox (USFS risk assessment), 2010, page 40
[22] Imazamox Factsheet, WI Dept of Natural Resources, 2002
[23] European Food Safety Authority, Peer review of the pesticide risk assessment of the active substance imazamox, 2016. P18

- **Is there any mutagenesis, carcinogenesis?** None observed in any study examining these effects – primarily short term reproduction studies in mammals.[24] The EPA classifies this compound as unlikely to be a human carcinogen.

- **What is the effect on wildlife, fish, insects, birds, aquatic plants, mosquitos?** This compound has been tested in short-term studies with birds and amphibians, and in longer-term studies with fish,[25] and the MA Dept of Agricultural Resources and USFS conclusions are that it's essentially nontoxic to aquatic animals, and does not concentrate or persist in animals.[26] Limited invertebrate studies show similar results.[27] One study showed no toxicity to honeybees.[28] Removing water chestnut infestations early in the season may be an important strategy to reduce mosquito populations, as the leaves serve as a breeding area for mosquito larvae.[29] Clearcast has little direct effect on mosquito larvae.[30]

  Fairly rapid die-off of a large population of plants will result in decaying matter reaching the lake bottom, and this will temporarily lower oxygen levels, a potential threat to fish and other aquatic animals. With water chestnut, this happens naturally at the end of the growing season with the fall die-off, so treatment with a herbicide results in the same impact – only somewhat earlier in the year.[31]

- **What is the likelihood of it entering the water supply. Is that a problem?** With a standard application at the recommended concentration, the half-life in the water is less than 20 days, based on tests in 11 ponds. Since it's highly water soluble, it tends to stay in solution, and any compound that settles to the bottom can move through ground water, and would persist at low levels in this anaerobic, dark environment.[32] But some studies with agricultural applications (at a much higher level than encountered in aquatic foliar application) suggest that there is very little transport through soil into groundwater.[33] A conservative analysis by the Mass Dept of Agriculture concluded that even if drinking water was drawn directly from a treated pond, the levels of Clearcast in the water would be far lower than the EPA guidelines for allowed concentrations in drinking water.[34] One of the advantages of foliar (leaf / surface) application is that it does not develop significant concentrations of herbicide in the water column itself, and thus would not affect shoreline or submerged plants. The pond water concentration in one study with foliar application was 46ppb after foliar application.[35] At low levels (< 50 micrograms per liter in drinking water), there is no evidence of health concerns.[36] There is no information on interaction between Clearcast or its breakdown products and chlorination or other water

[24] 052-24-02a-Imazamox (USFS risk assessment), 2010, page 16-17
[25] NY SEIS p47 (table)
[26] 052-24-02a-Imazamox (USFS risk assessment), 2010, page 41
[27] MA DOA Imazamox (2014) p8
[28] MA DOA Imazamox (2014) p9
[29] Kelly and Henley, Water chestnut and culex mosquitos, E Middlesex Mosquito Control Project, 1996.
[30] Morris, Murrell et al, Effect of two commercial herbicides on life history traits of a human disease vector, Aedes Egyptii, in the laboratory setting. Ecotoxicology, Jul 2016, 25:863-70.
[31] NY SEIS p52
[32] MA DOA Imazamox (2014) p11
[33] Cessna, Elliott and Bailey. Leaching of three imidazole herbicides during sprinkler irrigation. J Environ Quality. May 2012, 41:882-92
[34] MA DOA Imazamox (2014) p6
[35] NY SEIS, p39.
[36] WA State aquatic herbicide evaluation, p44

treatment chemicals[37], but there have been no reports of adverse health effects from drinking water that may contain trace amounts of Clearcast or its breakdown products.

The Sudbury municipal wells around Hop Brook (north of Pratt's Mill Rd) draw from a large aquifer where the Hop Brook itself is only a minor contributor, so the amount of Clearcast that ends up in town water may be very low, possibly undetectable even with sensitive assays. Given the depth of town wells and the aquifer, our Water Department does not have concerns about the proposed herbicide applications.38 At low levels (<50 micrograms per liter in drinking water), there is no evidence of health concerns.

We talked to the Executive Director of the Sudbury Water Department (Vincent Roy), and he said the wells near Hop Brook were so deep that he was unconcerned about any herbicide making its way into the town water supply.

- **How much falls to the bottom of the pond? Does it stay there forever?** (see prior answer)

- **Can water chestnut become resistant to Clearcast?** Some plants can develop less sensitive forms of the acetolactate synthase enzyme, and thus become resistant to Clearcast, but that has not been reported for water chestnut.

- **What happens where the Clearcast misses its target (i.e., lands outside the pond).** Spray that falls on surrounding plants could kill them if concentrations are high enough, but this has not been reported in MA DEP applications on the Nashua or Sudbury rivers.[39]

- **What if it's a windy day? Is it dangerous for the chemical to become airborne?** This situation is probably non-optimal for application, as spray is more likely to miss its target, potentially affecting shoreline plants, and wave action can wash the Clearcast off the leaves.[40] The product label includes detailed instructions to control spray drift, and applications are prohibited if wind speeds are over 10 MPH. Our vendor has extensive experience with application in all weather, and follows strict protocols with respect to weather conditions. They routinely reschedule treatment if the proper conditions are not present.

- **What happens to other life in the pond when the shade provided by the water chestnuts is removed?** We should see a rapid increase in fish, waterfowl, and a rise in oxygen levels, as has occurred in other ponds once water chestnut was controlled. Other subsurface invasives, such as milfoil, are more likely to become prominent, especially in ponds with high nutrient loads like ours. Fortunately, there are available strategies (such as draw-downs) that can effectively manage this species.[41] HBPA will develop a long-term comprehensive management plan that will address water quality once water chestnut is controlled.

[37] European Food Safety Authority, Peer review of the pesticide risk assessment of the active substance imazamox, 2016. P18
[38] Communication from Sudbury Water District
[39] NashuaRiver18_YER_V2_Final_Combined.pdf
[40] NY SEIS, p50.
[41] Eutrophication and Aquatic Plant Management in Massachusetts, Executive Office of Environmental Affairs, 2004, p169, 183, 341

- **What have been the results of use in other towns?** For initial treatment Clearcast is extremely effective in managing water chestnut. This recent follow-up report documents the effect in the Nashua River just south of the Pepperell dam. An infestation with water chestnut covering 90% of the surface area was reduced to less than 10% coverage. [42] Similar results over a three-year period of Clearcast treatment were observed in Franklin at the Del Carte ponds, with a return of native macrophyte species.[43]

- **What have been the unintended effects in other towns?** Have not identified any so far.

- **What are the alternatives?** The NY State SEIS document has a table that compares alternative methods of invasive macrophyte control, with strengths and weaknesses of each approach (Table 7-1).[44] Other towns with similar ponds and water chestnut infestations have considered mechanical harvesting, but have also concluded that it's not likely to be successful in shallow ponds with extensive inaccessible shoreline areas, and have also concluded that using a herbicide is the best approach. Sudbury's situation is particularly unsuitable for mechanical harvesting because the most upstream pond (Grist Mill Pond) is shallow with a very rocky bottom, so standard harvesting equipment cannot be used. Drawdowns are ineffective, and dredging is too expensive.[45]

- **What happens if we use only harvesting?** One of the problems of mechanical harvesting is fragmentation and dispersion of Eurasian milfoil, a problematic invasive species that inhabits our lakes.[46] Fragmentation and dispersion is the primary means of spread for this species.[47] Once the water chestnut population is essentially eradicated, hand harvesting is preferred to manage small persistent areas.[48]

- **What happens if we use only hand-pulling?** Infeasible for such a large area of infestation, but might be an effective control strategy for small remaining infestations.

- **What happens if we do nothing?** Water chestnut will continue to spread over 80% or more of the ponds' surface areas each year. Each acre of infestation will contribute as much as 20 cubic yards of organic matter, all setting to the pond bottom. This will further decrease water quality, resulting in lower oxygen levels, shallower pond depth, a repugnant smell, poor fish and bird habitat, and reduced habitat for native macrophytes.[49] A very significant concern, given the recent EEE outbreak, is that water chestnut infestations lead to higher levels of mosquitos, as they create optimal conditions for mosquito larvae. This does not seem to occur with other surface plant species (such as water lilies). [50]

[42] NashuaRiver18_YER_V2_Final_Combined.pdf
[43] ESS Group. Del Carte Ponds 2019 year-end report
[44] NY SEIS, p62
[45] ESS Group. Ecological and Management Study of the Del Carte Ponds, Franklin MA. 2016
[46] Sudbury River NOI package, p 42
[47] NY-SEIS Page 27
[48] NY-SEIS . Page 36
[49] Sudbury River NOI pages 44-45
[50] "Water Chestnut: An Exotic Invasive Plant" MA DCR, 2002 and Kelly and Henley, Water chestnut and culex mosquitos, E Middlesex Mosquito Control Project, 1996.

- **What happens if it succeeds? What replaces the water chestnuts?** Once more light is available in the water column, previously suppressed invasive plants such as milfoil are likely to become dominant. As noted above, HBPA intends to develop a long-term management strategy to address this concern.

- **Is our contractor the most experienced in applications in our situation?** Solitude has many years of experience using Clearcast in many ponds in adjoining towns and around the state. Attached [TBD] are references we obtained from several other municipalities in the immediate area.

- **Do we have a water management plan?** A comprehensive long-term integrated plant management plan, using a variety of different strategies as needed (hand-pulling, draw-downs,[51] etc) is being developed by HBPA, which we will review with the Conservation Commission.

- **After the water chestnut is controlled, it is possible that there will be an expansion of Eurasian Milfoil. What are the strategies for controlling this invasive plant?**

  Eurasian watermilfoil (Myriophyllum spicatum) is a submerged, rooted plant that grows for most of the year. It has long stems and fine leaves near the surface, small flowers that rise above the surface, but reproduces primarily by dispersion of fragments. It can take root in water as deep as 20 feet. The leaves and upper stems die each year, but the roots remain viable over the winter if they do not freeze. It was brought to the US in the early 1900s, and has spread to 45 states. Just a few plants can lead to a major lake infestation within 2 years, preventing swimming or boating, and reducing water quality. Although some waterfowl eat this plant, it's not a preferred part of their diet. There are other milfoil species native to the US, but they do not create a monoculture infestation like this species.

  HBPA is aware that a milfoil invasion is a possible outcome of our current plan to treat water chestnut with Clearcast, and we are committed to creating a plan that insures that the milfoil is properly managed, should it become problematic, so that the project does not result in the replacement of one invasive for another.

  Hop Brook Protection Association's plan will include annual pre- and post- vegetation mapping, focused on not only on the effectiveness of water chestnut treatment, but also on locating and quantifying milfoil and any other invasive species, noting population locations and densities within each pond. Based on this effort, HBPA will consult with our vendor and the town Conservation Coordinator to form a plan that will likely include one or more of the following options, which we identified by our review of experience in similar ponds in Massachusetts and New York:

  - Draw-downs have been used successfully to manage milfoil infestation in eastern Massachusetts (for ex., Bare Hill Pond in Harvard, Cedar Lake in Sturbridge). Drawdowns are most effective if done regularly in the winter, but only when particular circumstances (below-freezing weather with no snow cover) occur. We know that the

[51] bare hill pond harvard strategy

dams for at least Grist Mill Pond and Stearns Mill Pond are equipped to permit draw-down.

Draw-down effectiveness for milfoil increases as the amount of water remaining in the pond after the drawdown is decreased. This method also has the advantage of gradually washing shoreline sediment into deeper parts of the pond, thus reducing nutrients available for weed growth near the shoreline. If water levels are reduced gradually, this results in less disruption of aquatic wildlife, but there are potential concerns about fish habitat so consultation with MA Fish and Wildlife would be necessary (although our ponds are so eutrophic this may be less of a concern).

- Hand harvesting – The most effective approach uses a diver who can remove the plant at its base. This approach would be infeasible for a large infestation, but can be effective for small remaining stands (< 400 plants/ acre) of milfoil after a more systemic effort, or to eliminate milfoil from a specific small area (such as a beach). Some hand harvesting was used by Natick to control small areas of milfoil in several of the Cochituate ponds.

- Herbicides are an option used successfully by several Towns to control milfoil, especially in ponds with designated swimming areas. For example, Natick used Diquat to control milfoil in Lake Cochituate in 2015, with good results, no negative impact on native plant species, and no appearance of the chemical in nearby town wells. A similar approach was recommended for DelCarte Ponds in Franklin.

  Clearcast (instilled in the water column) is also effective to control milfoil, but only at higher concentrations which are quite costly. Most users seek to transition from herbicides to selective hand-pulling and other methods after 2-3 years, although some towns have used spot treatments with chemicals to control small recurrent milfoil infestations.

  HBPA would consider herbicides only if other approaches (hand-pulling, draw-downs, etc.) were considered inadequate (for example, if the populations were not small enough for hand-harvesting to be accomplished easily and/or if populations are found to be too extensive to manage manually). In that event the HBPA would seek an Amendment to their existing Order of Conditions to control milfoil before its population became unmanageable.

For completeness, less popular techniques of controlling milfoil are listed briefly below.

- Dredging an entire pond is quite costly, but partial dredging could be a solution to create a small weed-free area. Removing the layer of organic sediment by itself creates an environment that is much less likely to support milfoil growth. Excavation after a significant reduction in water level is a much less costly approach to achieving the same result.

- Milfoil weevils are a native species, whose larvae eat into milfoil stems and leaves, causing them to sink to the bottom and die. They do not appear to harm native species. Stocking lakes with weevils has had variable results in controlling milfoil. Effectiveness is reduced with lack of natural shoreline overwintering sites (matted leaves), high levels of fish predation (especially from sunfish), and deeper lakes. Weevil stocking can be expensive, with inconsistent results, and therefore it is still regarded as experimental by most funding agencies.

- Herbivorous fish – Grass carp have been used to reduce milfoil infestations, and can be effective. Sterile fish are introduced to insure that they do not reproduce and threaten native species. They can grow quite large (up to 4 feet) and live for up to 10 years. We believe that they may be currently prohibited in Massachusetts.

Hydro-raking and mechanical harvesting are not recommended for milfoil, as either approach disperses plant pieces in the water that spread the infestation to a larger area, and milfoil regrows rapidly. For example, in Lake Buel (Monterey, MA), a harvester was able to temporarily remove milfoil growth to a depth of 5 feet, but by the summer the plants had regrown to cover the surface within 3 weeks after harvesting. Other towns have used this approach to clear swimming areas, but find that regrowth in successive years is the same or greater. Monterey experimented with a hydro-raking approach (harvesting milfoil down to the lake bottom to remove the roots) and planting native species after milfoil removal, with some success in shallow areas.

- **What is the long-term plan?** HBPA is developing a long term plan for the ponds. Our desire is to move to a sustainable paradigm where herbicidal treatments are no longer needed, but which might include some adjustments to the characteristics (size, water level, flow, etc.) of the ponds. We have much to research and learn here, but what we have discovered is that no matter what path we take, they all start with controlling and significantly eradicating the water chestnut.

# Appendix 2: Review of Alternatives to Herbicidal Treatment

**Hop Brook Protection Association, 3/5/20**
**Prepared by Glenn Pransky at the request of Sudbury ConComm**

**Harvesting** This has been used in past years, but does not provide any progressive reduction of the infestation as the effect completely wears off after several weeks, and the inevitable remaining plants are able to generate a new crop of seeds for the following year. The process also requires a lot of coordination and planning. Permits must be obtained, operators must be hired and trained, equipment must be reserved and rented, and insurances must be obtained. In the past some of this was done informally, but with today's regulations and liability issues it must be done properly, which is quite expensive (an RFQ published by the town in 2019 had no bidders).

Other towns with similar ponds and water chestnut infestations have considered, and in the past used, mechanical harvesting, but they have also concluded that it's unlikely to be successful in shallow ponds with extensive inaccessible shoreline areas like ours. Sudbury's situation is particularly unsuitable for mechanical harvesting because the most upstream pond (Grist Mill Pond) is shallow with a very rocky bottom, so standard harvesting equipment cannot be used.

Another significant problem with mechanical harvesting is fragmentation and dispersion of Eurasian milfoil, a problematic invasive species that inhabits our lakes.[52] Fragmentation and dispersion is the primary means of spread for this species.[53] However, once the water chestnut population is essentially eradicated by surface herbicide treatment, hand harvesting of water chestnut is preferred to manage small persistent areas.[54]

**Hand-pulling:** Hand-pulling is infeasible for such large areas of infestation, but might be an effective control strategy for small remaining infestations after a high level of control has been achieved by herbicidal treatment.

**Hydroraking**: This process, which requires ample access or a crane (neither available to us) to physically remove plants before seeds drop, is known to cause even more fragmentation and dispersion of Eurasian milfoil than harvesting. It also creates much more disruption of the bottom of the pond, dispersing phosphorus-laden sediments and disturbing plants and animals. Also, unless the removal process is essentially complete, the remaining plants will prosper and rapidly re-spread.

**Dredging**: Previous quotes obtained by HBPA for dredging were for many millions of dollars[55]. In addition, this would be very disruptive to the eco-systems of the waterways.

**Drawdown:** Temporary water level reduction is effective for some invasives, but has not been found to be particularly effective in reducing water chestnut population as the correct timing is difficult and the seeds are quite durable. Further, drawdowns can be quite disruptive to the waterways' eco-systems.

Some literature suggests that many of our problems may be caused by the stagnant water in our ponds. Reducing the water level enough to promote a healthy flow (i.e, significantly lowering, or

[52] Sudbury River NOI package, Page 42
[53] NY-SEIS Page 27
[54] NY-SEIS . Page 36
[55] ESS Group. Ecological and Management Study of the Del Carte Ponds, Franklin MA. 2016

removing the dams) may be a solution, but would obviously make other significant changes to the eco-system and pond area appearance, and may meet significant resistance from the abutters and the Wayside Inn.

**Build cofferdams, reroute the system, and leave the ponds dry for 2 years:** This is another hugely expensive proposition (similar to dredging). It would require a tremendous amount of material to be moved to create a stable alternative pathway for Hop Brook, and would likely meet the same resistance from abutters as mentioned above. In addition, the "dry" areas would collect stagnant water which would provide excellent breeding grounds for mosquitoes, and areas of standing water outside the dammed areas would support ongoing water chestnut growth

**Dye**: Dyes are sold to help minimize algae and submerged plant growth by blocking UV rays. There is scant literature as to its effectiveness, but what exists suggests it can be used to reduce plant growth *after* removing an infestation. We have encountered no other town or organization using a dye product to control water chestnut, probably because this approach is not very effective for this species.

**Benthic barriers:** These are large mats placed on the bottom of a pond that prevent any plant growth originating from the bottom of the pond. They require full pond drainage to place properly, and have a major impact on all native plants and animals that live on the pond bottom. This approach is only feasible for low-flow ponds or limited beach areas with small surface areas.

**Biological Control:** Introducing other non-native species to reduce the water chestnut population is an unproven method still in the research stages, and is not yet approved for use in Massachusetts. Further, it obviously introduces significant risk of disruption to the eco-system.

**Do nothing:** In the absence of remedial activity, water chestnut will continue to spread over 80% or more of the ponds' surface areas each year. Each acre of infestation will contribute as much as 20 cubic yards of organic matter, all setting to the pond bottom. This will further decrease water quality, resulting in lower oxygen levels, shallower pond depth, a repugnant smell, poor fish and bird habitat, and reduced habitat for native macrophytes.[56] A very significant concern, given the recent EEE outbreak, is that water chestnut infestations lead to higher levels of mosquitos, as they create optimal conditions for mosquito larvae. This does not seem to occur with other surface plant species (such as water lilies). [57]

Further information on alternatives:

- The NY State SEIS document has a table that compares alternative methods of invasive macrophyte control, with strengths and weaknesses of each approach (Table 7-1)[58].
- The 2017 OARS Watershed Management Report[59] has a table comparing all the approaches discussed here (Table 1)[59].

[56] Sudbury River NOI pages 44-45
[57] "Water Chestnut: An Exotic Invasive Plant" MA DCR, 2002 and Kelly and Henley, Water chestnut and culex mosquitos, E Middlesex Mosquito Control Project, 1996.
[58] NY SEIS, p62
[59] 2017 OARS Water Chestnut Management Guidance & Five-Year Management Plan for the Sudbury, Assabet, and Concord River Watershed, Page 12.

# Appendix 3: Experience of Nearby Towns with Clearcast (Imazamox)

**Hop Brook Protection Association, 12/7/19, Rev 1.00**

1) Framingham had a study performed for them for the Sudbury River, recommending Clearcast. https://www.framinghamma.gov/DocumentCenter/View/24290/Notice-of-Intent-Application---Sudbury-River-Aquatic-Management-Program

   We subsequently obtained feedback from Tom Flannery, MA department of conservation and recreation lakes and ponds program:

   *"This past summer was our first experience using it on chestnut. We did two large projects, the biggest being the Nashua River at approximately 100 acres of chestnut give or take. Where the product was applied we saw 100% control. Drawback was that the "rows" the boat drove over during application need to be treated on follow up treatments as the product must stay on the dry plants. We had to do numerous treatments and although a success overall, we did not get probably 25% of the plants."*

   Also, the 2018 City of Framingham Annual Report (page 84) noted:
   *"In 2018, the Conservation Division continued its fiveyear program to manage nuisance aquatic vegetation in the impounded section of the Sudbury River. In the month of June, the Division's lake management contractor completed two treatments of the river using the herbicide Clearcast and achieved approximately 70 percent control of invasive water chestnut (Trapa natans) at the surface."*

   Finally, the *friendsofsaxonville.org* group noted:
   *"The Conservation Commission worked thoughtfully to create a five-year plan to help remediate this crisis on the river. The first year is now complete. Solitude Lake Management implemented a three-part application of the state and regionally approved herbicide "Clearcast", during the summer of 2017. The result looks promising. Waterfowl presence has increased and recreational use has improved."*

2) ESS corporation prepared a study of the DelCarte Ponds in Franklin MA. Their situation was similar to ours, and the recommendations section is worth review. The initial study and progress report are below.

   https://www.franklinma.gov/sites/franklinma/files/pages/delcarte_ponds_ecological_and_management_study.pdf

   https://drive.google.com/file/d/0B4vYtFIqWbqGTFlHbmNZQWV1WVE3LTRhY3lzUDQ1aC1XS19N

   According to the progress report:
   "*The results indicate that SLM's treatment of water chestnut in Del Carte Ponds is effectively decreasing the extent and density of this aquatic invasive species in the system."*

*3)* In Littleton, Clearcast was used on Doleful Pond. Littleton's overall plan and analysis are below. https://www.littletonma.org/sites/littletonma/files/uploads/littletonpds_project_descriptions_1-22-18.pdf

   According to Corey Godfrey, Environmental Analyst, Littleton Water Department:
   *"Clearcast has been very effective at controlling the Water Chestnut in Doleful Pond. We have also been happy with Solitude's performance over the many years we have been working with them."*

4) In Norton, Clearcast was used in Chartley Pond and Barrowsville Pond. See Figures 7 & 19 and Figures 10 & 23 respectively for their results in their report below.

   https://www.nortonma.org/sites/nortonma/files/uploads/norton_ponds_-_2017_annual_report_reduced_103017.pdf

   According to the above report:
   *"The treatment appeared to result in very good control of water chestnut growth and seed set."* (p. 43)

5) The Nashua River Watershed Association is also using Clearcast. See their current report below. Comparing figures 1 and 3 provides a good example of treatment results.

   https://drive.google.com/open?id=1gip9xs4MLV1Jv14IQZAMOSeSNC-pt2jx

# Appendix 4: Answers to questions from Lori Capone

**(Sudbury Conservation Coordinator), by Hop Brook Protection Association, 12/23/19**

[lightly edited to make it current]

1. I didn't see any information on what the Hop Brook Association has done in the past regarding water chestnut besides mentioning the harvester. I think informing the Commission on how many years you have tried the harvester and/or supplemented with hand pulling would be helpful. How many years this was done, how much material was removed, and how successful or not it was will help inform that as to why you are proposing chemicals.

HBPA: We have been targeting water chestnut with harvesting for decades. However, we weren't particularly successful. Harvesting has also become somewhat of a non-starter since

a) you can't use a harvester in Grist Mill Pond
b) we no longer have access to the danger-loving small-boat people who did it in the past
c) we now know it spreads other invasives.

Also, in the past, the other two ponds were harvested by borrowing equipment and using volunteers, neither of which are available to us anymore. Harvesting using proper channels is very expensive if you can find someone to do it (DPW's RFQ in 2019 went unanswered). Hand pulling can help, and it was used to a limited degree in conjunction with harvesting in the past, but you would need an army of hand-pullers to have an impact now.

It's also possible that HBPA used this inadequate solution for so long because until recently, safer herbicides like Clearcast were neither available nor proven.

It's useful to note this answer from the attached 2018 report *"It is clear that a more permanent solution is necessary at all of the ponds or we will eventually lose the ponds and their surrounding ecosystems."*

2. Would you consider sequencing where you treat the upper pond and make your way done to the other ponds in subsequent years as the upstream water chestnut are brought under control?

HBPA: The goal is to kill as much as possible in order to deplete the seed bank. So, if you eradicate water chestnut in Grist Mill Pond and then begin to treat Carding Mill Pond, you'll extend the treatment for a decade or more, as the downstream seeds last for up to a decade. The downstream ponds will also get much worse during the delay.

3. Is there any treatment of the Hop Brook itself or just the ponds, and if so, how would that effect the success of your program?

HBPA: Just the ponds. Wherever the water moves quickly and/or the channel is deep there isn't a problem. This was observed in Heard Pond in Wayland

4. In the list of experience from nearby town, your citation for Framingham is the Notice of Intent application, this is not a study.

HBPA: That's true. We're looking for followup information. However, there's a great series of photos that tell a good story and a nice summary here: http://friendsofsaxonville.org/initiatives/river-stewards/

5. I think the Commission may have concerns with the fact that the inert product information and MSDS sheets are not available, as a proprietary product. And that the toxicity of breakdown products has not been specifically tested but relies on antidotal evidence of no adverse impacts on plants or animals.

HBPA: The MSDS sheet is quite similar to the detailed product information, but neither lists the exact formulation of the inert ingredients and adjuvants used for water surface application. That was the reason that a detailed risk review of the actual inert and adjuvant ingredients was conducted by the Mass Dept of Agricultural Resources (State of MA Clearcast.pdf). They concluded that the recommendations and restrictions on the product label were sufficient to insure safety of its use.

Actually, some toxicity studies have been done. All of the field studies using imazamox and Clearcast would have also included exposure to the breakdown products, the same breakdown products that we would see in Hop Brook. That's why the lack of any observed toxicity in real-life use is directly relevant to both the compound itself and the breakdown products.

6. I think the Commission will also have concerns with the likelihood of the product not breaking down due to the shallow, oxygen-poor environment in the ponds. It would be good to have some comparative information of how these ponds are similar or dissimilar in depth to the other area ponds that were treated with Clearcast to compare apples to apples.

HBPA: The ponds listed in our "HBPA Experience of Nearby Towns" document are similar. For example, look at Del Carte in Franklin – size in the 20 - 40 acre range, shallow (< 5 ft), mucky bottom, and they all drain into the Charles River watershed, which is a water supply for several towns. There is a similar situation in Littleton as well. Given the very low amounts of Clearcast being used, and the slow nature of transport through muck, there haven't been such concerns in these towns.

7. Also concerning is that only acute effects were evaluated and not chronic, which is normal for this type of product, but the Commission is concerns with the potential long-term impacts of introducing a chemical into the environment, as well as the short-term impacts and benefits.

HBPA: Some of the imazamox studies were long-term chronic studies that evaluated carcinogenesis and mutagenesis. The results are described in detail in the NY State document. Given all this data, it seems unlikely that a serious problem is going to emerge with the proposed low-level use. Remember that this herbicide has been used at far greater concentrations in soybean production, for decades, without any reports of adverse health effects.

On the other hand, inaction in dealing with the water chestnut problem contributes to a favorable environment for mosquito larvae, and thus higher risk of EEE virus transmission. We already have a significant problem with EEE in Sudbury.

8. Permitting herbicide treatment to remove one invasive, just for a second invasive, milfoil, to fill that void, and how that will be managed will cause concern. I know you say that a plan will be developed to address this, but with milfoil, chemical treatment is again the primary management tool. Particularly as Carding and Grist Mill ponds don't presently have milfoil, according to Solitude Vegetation Survey. Was Hop Brook, in between the three ponds evaluated as part of this vegetation survey?

HBPA: It's likely that milfoil or something else will take the place of water chestnut. The water is shallow, the sediment loaded with phosphorus and nitrogen, so it's an ideal environment for plant overgrowth. Chemical treatment has been one of the main approaches used for milfoil, but other approaches may be effective, including draw-downs, pond size reduction, limited dredging, and focused aeration. In actuality, we need to take care of the water chestnuts and then see where we are.

9. How do you address to concerns about impact on nontarget macrophytes?

HBPA: SOLitude tells us: "The first thing to think about when discussing non-target impacts is herbicide choice. Through the foliar application of Clearcast we don't have to worry about impact to any native pondweeds or submersed species as it won't be effective on those. Clearcast through foliar application is however effective on other floating leafed species such as waterlilies, and emergent species such as cattails for instance. A few things to think about with these types of species: 1) our biologists are educated in recognizing the target species and can try to be somewhat selective. By choosing a non-windy day without precipitation, we can fairly easily avoid the herbicide contacting emergent species. If an area is solely lilies for instance we can minimize any non-target impact there by simply not treating that area. If lilies (for example) are completely mixed in with water chestnut I'd expect they'll be impacted. With this specific example it's important to note that water chestnut is so aggressive that the Hop Brook Ponds are virtually already taken over by water chestnut and b) if there were any remaining lilies co-mingled with water chestnut, they'll be outcompeted by the water chestnut soon; therefore managing the water chestnut is the best thing you can do. Once the water chestnut densities decline it allows both submersed and native floating leafed species to recolonize; this is when we can look to smaller scale strategies such as hand-pulling."

We would add that there is extensive research showing no effect on submerged plants, insects or animals, and many floating plants are not susceptible to this compound either. The NY SEIS has an extensive list of susceptible and non-susceptible water plants.

# Appendix 5: 2019 Annual Meeting Minutes

HBPA's Annual Meeting convened in the Ford Room of Sudbury's Historic Wayside Inn. Vice-President Ursula Lyons began the 7:30 PM meeting welcoming all on behalf of current Board Members. She recognized past Board Officers and Members for their contributions through the years dating back to HBPA's initial letter (January, 1987) announcing the organization's creation.

Through the years, Board leadership sustained pressure for compliance of new effluent standards for Marlborough Wastewater Treatment and the building of a new "start of the art" Easterly Wastewater Treatment Plant in 2015. Early on, annual harvesting of invasive species became central to getting sustained involvement, particularly from abutters of the three ponds located in Sudbury. This became critical especially after the arrival of the invasive water chestnut. Then through the years, HBPA commissioned and sponsored many studies of the ponds beginning in 1986 and more recently water dredging studies of the three ponds.

For the past few years, Board Members have been keenly aware that the organization needed a fresh new look to energize community involvement.

As original neighborhood abutters on ponds fed by Hop Brook moved on, it had always been a challenge to get new abutters involved. Now definitely seemed the time to seek new directions. This all came to a head when Susan Collins, our stalwart Harvesting Coordinator (a title far underplaying Sue's contributions) announced that she and her husband would be leaving Sudbury. Word was circulated that something drastic was needed if the Association were to continue in existence. On this point, we have to thank the Board's Treasurer, Kathy Winston. She shared the organization's plight with Jeff, Kathy's husband. Almost immediately, Jeff, who is definitely blessed with so many innovative ideas, jumped into action. Using the press (Middlesex News and its local publication, TheTown Crier) and various electronic media, HBPA's message was urgent. We needed an immediate infusion of new talent for preserving our very special ponds. His net was large, capturing much enthusiastic interest, particularly from folks flush with new ideas.

On April 22nd, the Board met with Jeff requesting that he become an immediate Board Member. The Board's endorsing vote was unanimous. At this meeting, Jeff gave a comprehensive rundown of a new little list of those willing to serve in the soon to be vacated Board positions. In addition to filling Board member vacancies, the list included those who might be willing to serve in other roles as they evolve in the re-energized HBPA.

At tonight's Annual Meeting (April 25), the Treasurer's and Harvesting Coordinator's reports were abbreviated allowing Jeff to share with members the initial energizing steps he has taken. Jeff announced that, following the official closing of the 2018 Annual Meeting, he would have a short get-together with those attendees expressing interest in taking on either leadership or supportive roles in the re-invigorated HBPA.

Before officially adjourning the Annual Meeting, both Frank Lyons (outgoing Association President) and Ursula Lyons (outgoing Vice President) again gave special recognition to all those who have served through the years and all those who have now stepped forward to sustain preservation of Hop Brook-fed ponds. Applause given to all.

Meeting adjourned at 8:30 PM. Recorder - John Iberg

# Membership Form

==========cut here ==========

## HOP BROOK PROTECTION ASSOCIATION

**2020 MEMBERSHIP APPLICATION / RENEWAL**

Name(s) _____

Address _____

City _____ State _____ Zip _____

Phone _____ **Email** _____

Interests _____

Make checks payable to **HBPA.** Thank you for your contribution. Donations are tax deductible and will be acknowledged at the end of the calendar year. **Donate online** at *http://www.hopbrook.org*.

**Membership Level**

- ☐ Associate..... $25
- ☐ **Partner**..... **$50**
- ☐ Patron ..... $100
- ☐ Protector..... $200
- ☐ Gold ..... $500
- ☐ **Other** .....$_____

**Clip this form and mail with check to**
**HBPA**
**P.O. Box 707**
**Sudbury, MA 01776**