



HOP BROOK PROTECTION ASSOCIATION

Restoring and Preserving Sudbury's Ponds

Box 707, Sudbury, MA 01776

Alternatives Review

Hop Brook Protection Association, 3/5/20

- **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.¹ Fragmentation and dispersion is the primary means of spread for this species.² 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.³

- **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 dollars⁴. 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

¹ Sudbury River NOI package, Page 42

² NY-SEIS Page 27

³ NY-SEIS . Page 36

⁴ ESS Group. Ecological and Management Study of the Del Carte Ponds, Franklin MA. 2016

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 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.⁵ 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).⁶

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)⁷.
- The 2017 OARS Watershed Management Report⁸ has a table comparing all the approaches discussed here (Table 1)⁸.

⁵ Sudbury River NOI pages 44-45

⁶ "Water Chestnut: An Exotic Invasive Plant" MA DCR, 2002 and Kelly and Henley, Water chestnut and culex mosquitos, E Middlesex Mosquito Control Project, 1996.

⁷ NY SEIS, p62

⁸ 2017 OARS Water Chestnut Management Guidance & Five-Year Management Plan for the Sudbury, Assabet, and Concord River Watershed, Page 12.