Bare Hill Pond Deep Drawdown Pumping Project - Q&A

What is the problem we are trying to solve?

Bare Hill Pond is succumbing to eutrophication --- the transformation of a pond from a clear body of water to a marsh-like wetland choked with plant growth. The Pond has become highly susceptible to invasive weed growth due to its relatively shallow depths, the rich nutrients in its peaty bottom, and the continuing inflow of pollutants from its upstream wetland. This creates a vicious downward spiral as the invasive weeds flourish in the summer and then die in the fall, adding to the bottom peat, which subsequently promotes increased weed infestation the following year. We are already experiencing the resulting decline in water quality and impact on recreational use, and without timely and dramatic action will face the inevitable loss of the Pond. The situation is so critical that **in 1999, the Massachusetts Department of Environmental Protection put Bare Hill Pond on its list of endangered ponds**, making us eligible for federal funding.

How are we addressing the problem?

The Bare Hill Pond Committee has a multi-faceted strategy for addressing the invasive weed situation. Short term measures include manual weed pulls and mechanical weed harvesting in the summer to keep swimming and boating areas clear for recreational use, and pond drawdowns during the winter to kill exposed weeds. Long-term measures include mitigation efforts to reduce upstream pollutants and potential excavation of the nutrient base in the bottom of the pond.

What is the Deep Drawdown Pumping Project?

Drawdowns are is a safe and <u>proven</u> method for controlling invasive weed growth through freezing and drying of the exposed weed beds. Prior to 2002, drawdowns of Bare Hill Pond were sporadic (about 10 years apart) and had *no* lasting impact because they were not repeated on an annual basis. Starting four years ago we began annual drawdowns and measured the results per a protocol established in concert with the Conservation Commission and Massachusetts DEP. **We have seen a consistent incremental reduction in weeds in the areas exposed to freezing and drying by the drawdown**. The rate-limiting factor is drawdown depth. The dam and downstream topology limit gravity drawdowns to about 3.5 feet. While this has been effective in controlling weeds in areas shallower than 3.5 feet, the weeds are still multiplying in the deeper and wetter areas. The Deep Drawdown Pumping Project will construct a permanent pumping system to pump down the water level in the Pond as much as 6-8 feet, exposing and drying virtually all the areas where weeds now grow to the killing effects of winter drawdowns. The system is comprised of a pumping chamber buried in the ground near the dam with an intake pipe reaching into the Pond and a discharge pipe into the downstream wetlands. Controls for the electric pump are enclosed in a small shed by the underground pump chamber. The system will be turned on in the fall to assist the gravity drawdown through the dam until the desired water level reduction is achieved, and then periodically run throughout the winter to maintain that level as winter weather adds water to the Pond. The pumps will be turned off in early spring to allow the Pond to refill to its normal level.

What is the status of the project?

Construction is more than 95% complete, with a nearly finished building housing the assembled pumping structure and fully powered control system. We will be powering up the system in the April/May timeframe, months in advance of our first scheduled drawdown next September. **We are not only on schedule, but also squarely on budget.**

How is the Town paying for this?

We are building an asset for the Town that will be **worth about $850,000** when completed. Assuming passage of this year's CPC request for $30,000, **the total cost to Harvard taxpayers will be only $87,500**. We are using a Federal EPA grant of $195,000 and the matching CPC funds of $87,500 from the state to cover the bulk of the real material and contracted labor costs. We have secured significant discounts on the "big-ticket items" through the generosity of local firms that have let us leverage their buying power at no cost. The real savings, however, is the massive investment – **more than 3500 hours! – of volunteer talent and effort** during the design and construction phase that saved the Town close to $500,000 in engineering and contractor charges.

Why are we asking for an additional $30,000?

Eighteen months ago, we presented a budget for pump system construction that requested $175,000 in CPC funds to complement the $195,000 in EPA funding. CPC enthusiastically approved the request, but then was only able to award $145,000 last year due to funding limitations. The good news is that we will still meet the original schedule and budget from 18 months ago, but **we need the remaining $30,000 that was approved but went unfunded last year.** Please note that ***<u>NO OVERRIDE</u>*** funds being requested for this project.

See Other Side For Additional Information

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How do we ensure the deep drawdowns have no negative environmental impact?

Drawdowns are conducted under the regulatory oversight of the Conservation Commission and are subject to an order of conditions to ensure environmental protection through monitoring of the watershed, its wildlife, downstream wetlands and the Pond itself. We have tested our monitoring capability over the past 3 years and have not observed any untoward environmental impacts. We will proceed slowly with incremental depth increases each year to assure that the Pond and its watershed are respected. The research on drawdowns reveals that their efficacy is incremental in nature in that they do not solve the problem in a year or 2 but through repetitive use. Because of our incremental strategy, and their incremental impact, it is possible for monitoring to provide a viable means for protecting the ecosystem.

What about other options for controlling the weed problem?

Other options include long-term watershed management, application of herbicides, harvesting, dredging, and biological control (e.g. weed-eating carp).

- Watershed management is a key part of our *long-term* strategy and we have education and outreach programs underway to reduce nutrient loading in the watershed. In the short term, however, more aggressive action is needed to stabilize the Pond.
- Herbicides are highly controversial and raise serious environmental and public health concerns. The herbicides that were used in the past are now banned for these reasons. Current herbicides have lower efficacy and require repetitive application. **The cost estimates for herbicide application are in the range of $2 million for a 3-year program.**
- Underwater dredging is an ideal solution but could cost $10 to 20 million. Another potential advantage of the proposed pumping system, however, is that it can lower the water to expose shoreline areas and the beach for conventional excavation techniques, making removal of peat in these areas to be relatively straightforward and much less costly.
- Biological control may also become an option in future years. The use of fish carp in Massachusetts is not yet permitted, and they will be considered if they become lawful as a potential supplemental solution.

Do drawdowns work? Yes!

- The MA DEP Generic Environmental Impact Statement (GEIR) for lake and pond management issued in 2004 **recommends the use of drawdowns for our 2 dominant invasive species: fanwort and milfoil**.
- **Drawdowns were recommended** (along with watershed management) as a primary solution **in 2 key independent studies of Bare Hill Pond:**
  - Whitman and Howard 1987
  - Mass. DEP TMDL 1999
- **Drawdowns have been successfully employed on numerous lakes and ponds.** 3 examples include:
  - Otis Reservoir
  - Lake Lashaway, Brookfield
  - Lake Shirley, Lunenberg
- Drawdowns work through multiple mechanisms of action:
  - Freezing and drying of roots
  - Shoreline restoration – washing of sediment from shoreline to deeper parts of the pond reducing nutrients in the drawdown zone
  - Improved Water Quality – increased water turnover reduces nutrient concentrations
  - Physical disturbance of plants mechanically through by ice
- Drawdowns make excavation possible:
  - At the beach
  - Other important shoreline areas

For more information or to volunteer and help:

- **Visit the Pond Committee Table at Town Meeting.**
- **Visit the Pond Committee website:**

  www.harvard.ma.us/bhpwmc.htm
- **Come to a Pond Committee Meeting:**

  4th Wednesday of each Month, 7:30pm, Hildreth House

Town of Harvard, Bare Hill Pond Watershed Management Committee

See Other Side For Additional Information