

Bare Hill Pond Watershed Management Committee
Town of Harvard
Harvard, MA 01451

August 20, 2014

Conservation Commission
Town of Harvard
Town Hall
Harvard, MA 01451

Re: 2014 Report and Fall 2014 Drawdown Plans

Dear Commissioners:

On behalf of the Bare Hill Pond Watershed Management Committee, we are pleased to submit our 2014 annual report. As discussed at our meetings this spring and summer, we will bring a recommendation to the September 4 Commission meeting regarding whether to conduct a draw down this fall based on our plant and phosphorous surveys. At the time of writing of this letter, we have two reports on phosphorous readings which indicate that phosphorous levels are below the endangered level and in the 0.20 ug/l range. A completely undeveloped watershed is normally 5-10 ug/l and it would be difficult to get much lower than 0.20 ug/l given the level of development in the watershed and the pre-existing bound phosphorous in the Pond bottom. The 1998 TDML measured the level at 0.44 ug/l and our target for the DEP/EPA grant was 0.30 ug/l. A third reading in July is being processed at the laboratory and should be available on or before the September 4 meeting. Wendy Gendron, our consulting wetlands biologist will be conducting the plant survey the last week in August so that we have current comparison data at a comparable time at the prescribed transect locations used in the prior plant surveys. The data runs back as far as 2002, and the transects were established by ENSR and used by DEP/EPA to measure our goals in the grant. As requested at the last meeting, a copy of the transect map is attached as Exhibit A. The results are compared to those results to results dating from 2004, 2005, 2007, 2009, 2010, 2011, 2013 and this summer and the TDML reading from 1998..

We also have asked Wendy to share her observations of the Pond this summer relative to the visits to the Pond she made in each of the last two summers which were accompanied by Jim Breslauer in 2012 and Wendy Sisson in 2013.

Attached as Exhibit B are interim results from Wendy Gendron from the Phosphorous and Secchi disk readings from this spring. See interim phosphorous and Secchi disk results in Exhibit A. We are also now receiving monitoring data from the Nashua River Watershed Association which at our request has included Bowers Brook in its monitoring program. I will provide a copy of their electronic report by email because it is an interactive excel spreadsheet.

Although we did not conduct a draw down this winter we also continued our volunteer monitoring activities. Tom Gormley continues to lead the frog count efforts (Exhibit C), we collected data sheets from fishing derbies, we share observations on mammalian species, and Morey Kraus counts turtles on a defined timeline and route around the pond during quiet sunny hours.

As discussed in our prior meetings, we are very interested in the invasive species data following the absence of a draw down last winter. The good news so far is that phosphorous seems to remain below the endangered levels. This suggests that the washing of the upper layer of sediment from draw downs over the past 10 years may have reduced the level of phosphorous in the pond bottom and when coupled with the storm water treatment sites, could mean that we have phosphorous under better control in the watershed. The elimination of phosphorous from lawn fertilizers this year could also be expected to help.

Anecdotal observations from residents using the Pond this year suggest that there has been a repopulation of fanwort and milfoil in patches in many of the areas that were under control in the past few years. Attached as Exhibit D is a letter from several residents who have observed the pond for many years suggesting that it is much worse than it has been over the past 5 years. I have kayaked the Pond multiple times. In the spring and even early July, I did not notice significant re-emergence of invasive species and then only in some areas where it was particularly acute. By late July, however, after hearing from residents, I observed significant patches, not necessarily uniform, of milfoil or fanwort in the outer (unexcavated swimming area), in the areas running from the beach along the southwest shoreline for a few hundred feet, in the area around the pipe for the pump house, in the area between the Girl Scout camp and Turner lane, to the southwest of Thurston cove and interestingly in the southern end of the Pond, which seemed to have the most growth, compared to the rest of the pond, of fanwort.

Last year when we visited the southern end of the Pond with Will Stevenson and Wendy Gendron to respond to concerns raised by Bowers road residents, we were surprised to find that the plant growth that was interfering with recreational use were mostly native species and not fanwort or milfoil. There were along the shoreline invasive lilies but they were not really creating the recreational issue. That suggested that the draw down was working but not addressing the resident's concerns about native species growth. Will Stevenson of Lycott Environmental did not recommend any specific action because the plants were mostly desirable for the habitat. This year, at least from my observations, the growth in this area was actually the most aggressive of all areas in the Pond. The fanwort returned and filled in much of what did not have native plants. Unlike the others areas where returning fanwort and milfoil appeared to be in patches and not whole areas, this area is now significantly worse from a plant growth perspective.

The transect data will help us know, compared to prior years, the degree to which the invasive species have repopulated the Pond.

Volunteer Monitoring:

Downstream wetlands continue to appear healthy. There are still cattails but they are not dominating the other species. As noted last year, the draw down pumping site does not appear to be gouging or impairing plant growth as there are healthy sedges and wetland plants. We did not see any significant changes this year from last year.

Tom Gormley of the Pond Committee who continued to perform annual frog counts in 2014. Tom's report is attached as Exhibit C and he did not observe significant changes in species or counts from prior years and frogs often were too numerous to count during their peak time periods.

Morey Kraus continued to observe turtles during his kayaking. I will have Morey's report for the September 4 meeting as it is still in progress. As noted last year, the shoreline in Clapps Brook is no longer a suitable site for observing turtles due to the growth of the Iris along the shoreline which either obscures their view or removes their sunning locations.

I have regularly observed mink on our Warren Ave shoreline and the remains of their bass fishing which often are some large bass. I also see otter from time to time and beaver continue to leave their mark.

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Several fishing derbies reported results for spring and summer of 2014. For example, Merrimack Valley Bass Tournament included 19 anglers (14 in 2013) who caught 69 bass (69 bass in 2013) and returned 67 (69 in 2012) alive. The greatest weight was 4lbs 18 oz. (5.9 lbs in 2013). For comparison, 69 bass were caught in 2012, and bass were caught in 2011. This tournament is a regular derby, and in conversations with fishermen, they continue to report that Bare Hill Pond is one of their favorite ponds for fishing. The Merrimack Valley Bassmasters comments "New good launch with turnaround and parking; good water level; water temp 65-70 degrees; water stained; not dirty."

Rick Dickson continues to pursue invasive water chestnut plants. Due to his success over the past several years, he did not seek volunteer help for a weed pull. The water chestnuts are under control as the density of plants is low as reflected in how difficult it is to find them throughout the Pond. The dramatic reduction of

water chestnuts in Bare Hill Pond is an amazing success story. He asks us all to be vigilant for any remaining waterchestnut plants and to pull them when we see them.

Draw Down Plan

On the assumption that the anecdotal observations of invasive plant growth will be confirmed by the transect data, we will propose a draw down for this Fall to keep the invasive species from significantly increasing to a point that would be challenging to restore. We may learn for example that doing a draw down every other year is appropriate and we can as discussed use the data each year to drive decision making.

In 2012 we conducted an incrementally shallower draw down at 6 feet (compared to 6.5 feet in 2011) and had acceptable results.

If we do a drawdown this fall, we propose a 5.5 foot draw down which would provide greater flexibility in timing and preserve additional days/weeks for recreational use. If this maintains the control then it may allow us to stay below 6 feet in future years.

<u>Date</u>	<u>Depth Target</u> (Measured from the top surface of the dam)		
	<u>2014</u>	<u>2012</u>	<u>Actual Drawdown Depth in 2014</u>
9/24	22"	22"	0"
10/1	22"	34"	12"
10/15	34"	46"	24"
10/24	46"	52"	30"
10/28	52"	58"	36"
Nov 30 or freeze*	5.5'	6'	5.5'

*(measured on pipe marker)

Pumping would begin only when needed to maintain the rate during October but be necessary after reaching approximately 3 feet. The rate would not exceed 2 inches per day per the Order of Conditions. We think this approach will preserve Pond levels in September and October for recreational use (including the rowing season) and still achieve the beneficial draw down effects. If we are unable to achieve the 5.5 foot draw down by November 30, 2014 or a freeze occurs, we will stop or discuss it with the Commission if we have an alternative recommendation.

As in prior years, we would initiate the refill of the Pond on or before February 1, 2015 following notice to the Commission and the abutters. Because snowmelt timing is variable and it

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is important to timely refilling of the Pond, our experience indicates that deferring the refill beyond February 1 is unwise to ensure the habitat is restored for amphibians, fish and reptiles.

We appreciate the time the Commission has taken, and the effort made to understand, and help manage the project. We look forward to the meeting on September 4.

Sincerely,

A handwritten signature in blue ink, appearing to read 'B. Leicher', with a stylized flourish at the end.

Bruce A. Leicher

Chair, Bare Hill Pond Watershed Management Committee

Cc: Conservation Commission Members
Bare Hill Pond Watershed Management Committee Members
Board of Selectmen

Figure 3-1. Bare Hill Pond macrophyte sampling transects

(From the 2002 ENSR Report to the Conservation Commission and included in the QAAP for the MA DEP/EPA Section 319 Grant)

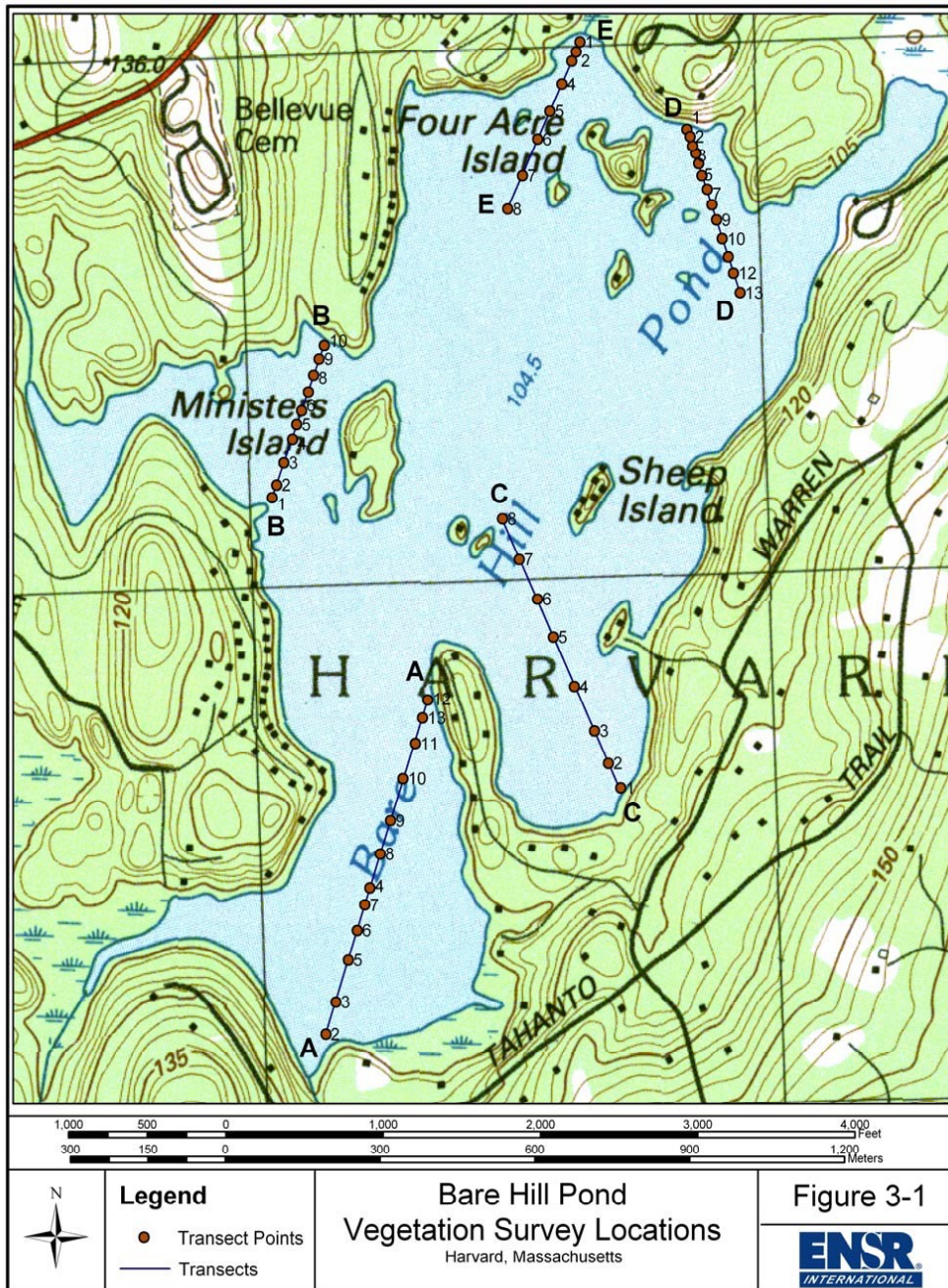


Exhibit B

W. Gendron Interim Report



18 Sunset Drive

Ashburnham, MA 01430

Phone: 508-253-1111

June 14, 2014

Bare Hill Pond Watershed Management Committee
Attn: Bruce Leicher
Town of Harvard
99 Ann Lee Road
Harvard, MA 01451

Mr. Leicher,

The following represent draft data results for the 2014 sampling program at Bare Hill Pond. Overall there are no substantial changes from this time last year. In-lake total and dissolved phosphorus values are low and consistent with 2013 data.

In response to emails sent to the Conservation Commission, we inspected the northern area of the lake proximal to the dam due to plant density complaints. There is an abundance of yellow and white water lilies and watershield. These plants are native and can be a nuisance for recreation because they have floating leaves on the water's surface. We also observed dense patches of variable milfoil along the outlet pipe. These patches did not reach the surface but they occupied half of the water column (approximately three feet tall within six feet of water). It is difficult to determine if this is an indicator of worsening conditions since the prior plant observations were conducted later in the summer. We do not have any specific data for comparison. We are scheduled to conduct the plant survey in late August 2014 and will compare those data to prior years.

Please let me know if you have any questions or comments regarding this interim progress report. I look forward to assisting the Committee with continuing improvements and outreach activities for Bare Hill Pond.

Sincerely,

A handwritten signature in black ink, appearing to read "Wendy C. Gendron".

Wendy C. Gendron, CLM
Aquatic Ecologist

In-Lake Sampling

Dry weather in-lake sampling was conducted on May 21 and June 11, 2014. In-situ water depth profile measurements of temperature, dissolved oxygen (DO), pH and specific conductivity were recorded at two locations: shallow south basin BHP-1 and the deep hole in the north basin BHP2. These data are presented in Table 1. Figure 1 provides a graphical representation of temperature and DO data for the deep station (BHP-2).

The temperature and DO profiles suggest that the lake is weakly stratified. Oxygen concentrations begin to decrease rapidly at ten feet below water surface. June DO concentrations were below the desirable level for fish [5 - 6 milligrams-per-liter (mg/L)] at 14 feet in June (4.1 mg/L). DO was extremely low below 16 feet. These data are consistent with prior year's data. The surface pH level is neutral to slightly basic at the surface and generally becomes more acidic with water depth. Specific conductivity is within a desirable range [<200 microsiemens-persecond (us/cm)]; values above 200 us/cm can be indicative of elevated dissolved pollutants and high productivity. It is common to have increased conductivity near the water-sediment interface where suspended solids increase conductivity. Surface and mid-depth values were comparable between the two stations.

Table 2 provides phosphorus and other water quality variables measured during the surveys. Overall, 2014 phosphorus concentrations are comparable to previous years and are generally lower than samples collected prior to 2009. Figure 2 displays the in-lake measured phosphorus at the deep location (BHP-2) for both surface and bottom samples. May Secchi disk transparency is comparable to 2013 (Figure 3) and transparency in June was quite good at 9.5 feet the clearest since 2010.

Table 1. Bare Hill Pond Water Depth Profiles - 2014.

BHP-1										
May 21, 2014					June 11, 2014					
Depth (ft)	Temp (C)	DO (mg/L)	pH (SU)	Spec Cond (us/cm)	Depth (ft)	Temp (C)	DO (mg/L)	pH (SU)	Spec Cond (us/cm)	
0	21	8.93	7.05	192	0	22.98	8.34	7.17	191	
2	21.1	8.98	7.03	192	2	23.01	8.3	7.35	192	
4	18.9	9.14	7.04	192	4	23	8.29	7.25	192	
5.5	18.9	7.59	6.95	194	5	22.98	7.96	7.15	192	
BHP-2										
April 17, 2013					June 25, 2013					
Depth (ft)	Temp (C)	DO (mg/L)	pH (SU)	Spec Cond (us/cm)	Depth (ft)	Temp (C)	DO (mg/L)	pH (SU)	Spec Cond (us/cm)	
0	20.3	9.2	7.59	194	0	22.71	8.43	7.34	193	
2	20.3	9.3	7.42	194	2	22.8	8.39	7.3	193	
4	20.2	9.3	7.37	194	4	22.78	8.39	7.29	193	
6	20.1	9.29	7.29	194	6	22.78	8.4	7.27	193	
8	19.7	9.28	7.23	193	8	22.37	8.23	7.18	194	
10	18.4	9.26	7.16	193	10	19.66	7.82	6.96	191	
12	17.9	8.39	6.89	193	12	17.7	5.73	6.59	191	
14	14.3	6.92	6.45	189	14	16.46	4.07	6.39	191	
16	12.4	6.02	6.28	190	16	14.89	2.31	6.24	191	
18	11.9	5.09	6.22	191	18	13.1	1.61	5.98	191	
20	11.5	4.26	6.16	193	20	11.85	0.89	5.95	195	
22	11.1	2.4	6.1	200	22	11.25	0.29	6.33	222	
23.5	10.8	1.04	6.5	205	23	11.04	0.16	6.56	233	

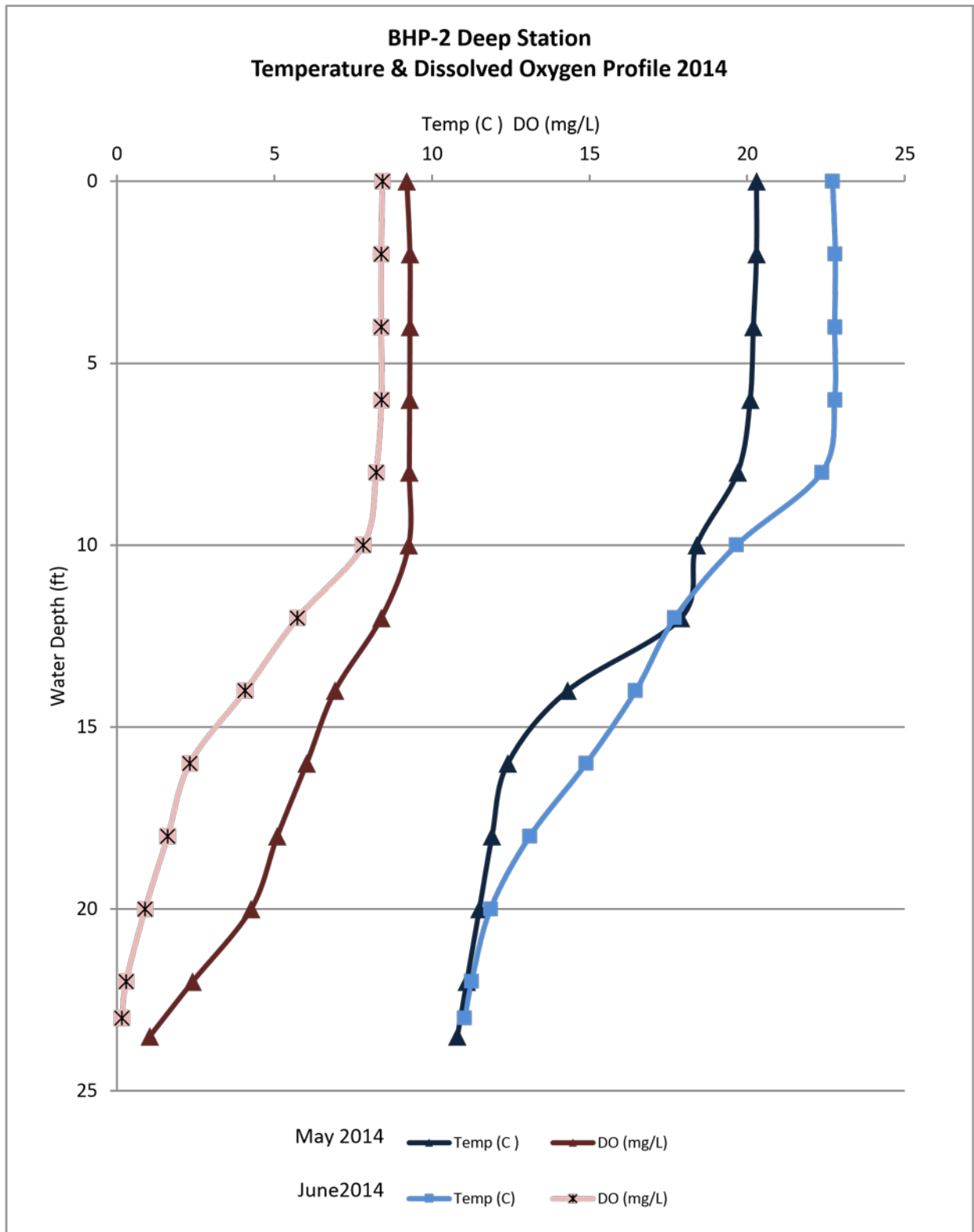


Figure 1. 2013 Temperature and Dissolved Oxygen Profiles.**Table 2. Bare Hill Pond In-lake Water Quality Data.**

Station	Date	Time	TP (mg/L)	DP (mg/L)	TSS (mg/L)	Secchi (ft)
2S	9/16/2004	11:01	0.022	0.016		12
2B	9/16/2004	11:04	0.046	0.014		
1S	9/16/2004	8:59	0.022	0.022		
1B		9:01	0.022	0.022		
2S	<u>9/16/2004</u>			0.019		10.8
	<u>10/4/2005</u>	12:50	0.040			
2B	10/4/2005	13:11	0.032	0.022		
1S	10/4/2005	12:25	0.027	0.019		8.7 (bottom)
1B	10/4/2005	12:29	0.032	0.022		
2S	11/3/2005	12:50	0.035	0.029		11
2B	11/3/2005	13:06	0.032	0.024		
1S - Duplicate	11/3/2005	11:25	0.024	0.024		
1S	11/3/2005	11:25	0.029	0.024		
1B	<u>11/3/2005</u>			<u>0.024</u>		
BHP-BK	<u>8/28/2007</u>		11:29	<0.010		
			9:30			
BHP-2S	8/28/2007	13:14	0.024	0.015		6.5
BHP-2B	8/28/2007	13:15	0.377	0.259		
BHP-1S-DUP	8/28/2007	12:11	0.024	<0.010		
BHP-1S	8/28/2007	12:10	0.031	0.01		4.5 (bottom)
BHP-1B	8/28/2007	12:12	0.039	0.016		
BHP-2S	9/7/2007	14:01	0.093	0.074		5.8
BHP-2B	9/7/2007	14:02	0.292	0.197		
BHP-1S	9/7/2007	13:10	0.091	0.086		4.5 (bottom)
BHP-1B	9/7/2007	13:11	0.092	0.069		
BHP-2S	9/20/2007	9:30	0.029	<0.010		6.5
BHP-2B	9/20/2007	9:32	0.079	0.037		
BHP-1S	9/20/2007	9:10	0.037	0.018		4.8 (bottom)
BHP-1B		9:11	0.037	<0.010		
2S	<u>9/20/2007</u>			NA	<5	
	<u>8/30/2009</u>	15:15	0.011			
2B	8/30/2009	15:00	0.054	NA	51	
2S	6/21/2010	19:15	0.019	0.015	1	11.8
2B	6/21/2010	19:15	0.147	0.047	14	
1S	6/21/2010	18:48	0.022	0.015	0.5	11.5
BH01 (EPA; close to BHP-1S)	7/19/2011	14:29	0.007			
BHP02 (EPA)	7/19/2011	14:48	0.0056			
BHP03 (EPA; close to BHP-2S)	7/19/2011	15:06	0.0086			
BHP030 (EPA; Dup of BHP03)	7/19/2011	15:06	0.011			
BHP04 (EPA)	7/19/2011	15:15	0.012			

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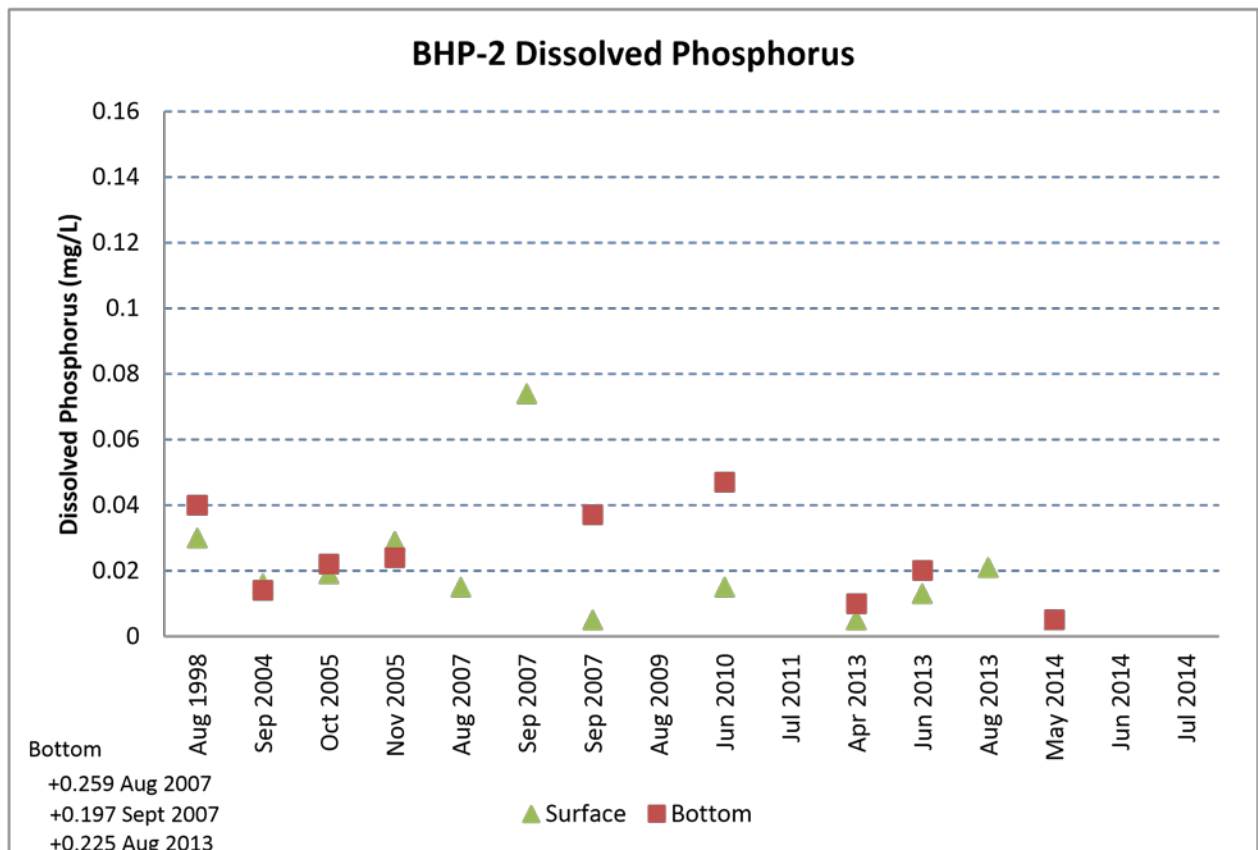
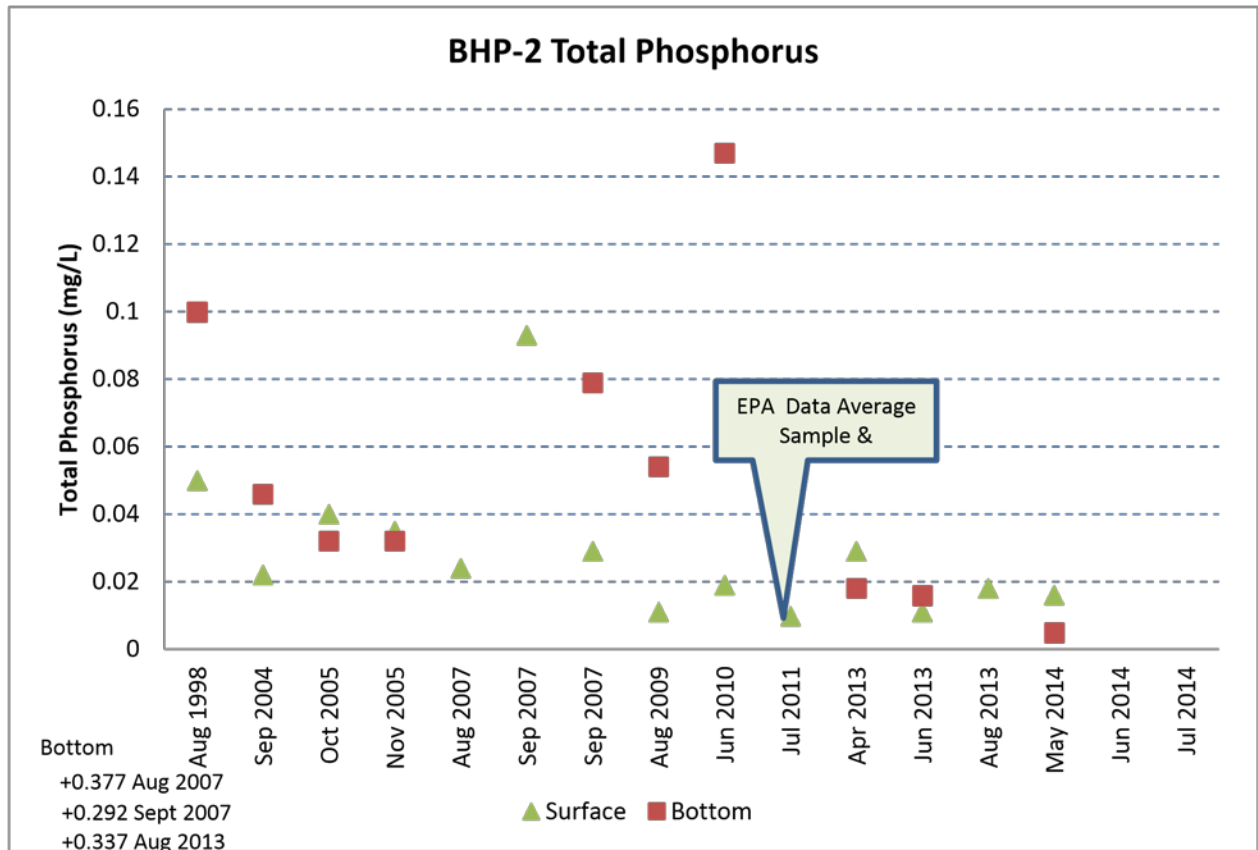


Figure 2. BHP-2 Total and Dissolved Phosphorus Concentrations

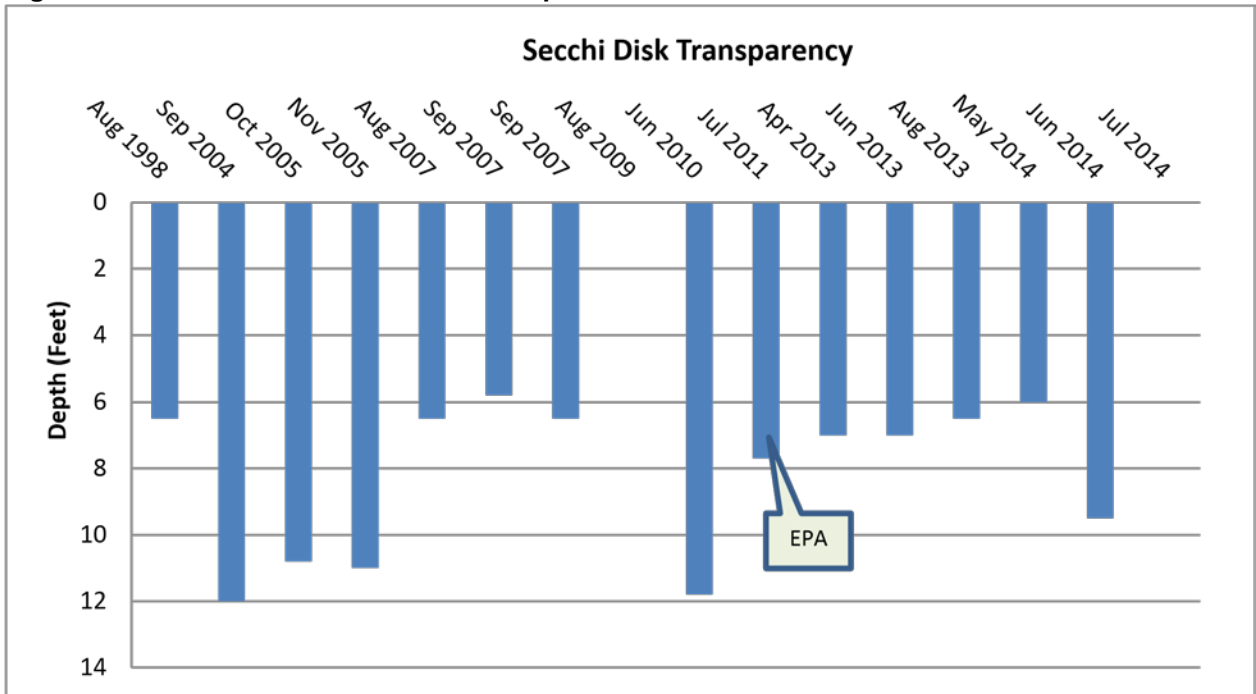


Figure 3. Bare Hill Pond (BHP-2) Secchi Disk Transparency

Watershed Sampling

ARC conducted pre- and post-detention basin construction sampling to evaluate existing stormwater inputs at the northeastern end of the lake near the ball fields. Dry weather samples were collected in the tributary (receiving water for the soccer field detention basin). Wet weather samples were collected in the tributary and at several stormwater discharge locations pre- and post-treatment basin construction.

We conducted dry weather sampling at the tributary downstream of Pond Road and downstream of the stormwater detention basin discharge confluence (BHP-T1) on June 9, 2010 and May 21, 2014. Samples were analyzed for total phosphorus (TP), dissolved phosphorus (DP) and total suspended solids (TSS). We also recorded in-situ measurements of temperature, dissolved oxygen (DO), pH and specific conductivity.

Wet weather sampling was conducted on April 27, 2010 and April 15, 2014 to represent pre- and post-construction conditions. See Table 3 for site descriptions. In-situ measurements of temperature, DO, pH and specific conductivity were recorded at all but one location (BHPSF-1). The flow at sample location BHPSF-1 was very low and the drainage channel did not contain enough water to immerse the sampling equipment. We collected grab samples at all flowing locations for analysis of TP, DP and TSS. Table 3 summarizes these results. A total of 0.18 inches of precipitation was measured at the Fitchburg Airport during the April 2010 rain event and 0.60 inches on April 15, 2014.

The dry weather tributary samples were comparable (BHP-T1). DO concentrations are supportive of aquatic life (>6.0 mg/L) and phosphorus concentrations were low. Wet weather conditions also contained ample oxygen and pH was slightly higher but phosphorus and TSS concentrations were much greater than dry weather conditions. Concentrations for phosphorus & TSS in 2010 were almost twice that of 2014. The small pipe draining to the tributary (BHP-SFP) does contain relatively low phosphorus in comparison to other stormwater discharge stations and flow from this pipe was low during both sample events.

The detention discharge does contribute phosphorus and solids to this tributary, as evident by comparing the upstream and downstream outlet confluence data (BHP-T2 and BHP-T1). Upstream TP concentrations in 2014 were 0.017 mg/L vs 0.042 mg/L downstream. A similar pattern is apparent for DP and TSS; 0.013 and 0.021 mg/L DP upstream vs downstream and <5 and 7.6 mg/L TSS.

2014 data show that the soccer field detention basin is reducing phosphorus and TSS loading to the tributary. The detention basin inlet (BHPSF-DI) TP concentration was 0.160 mg/L vs 0.076 mg/L at the outlet (BHOSF-DO), resulting in a 53% decrease in TP. A similar pattern is present for DP but the reduction is less (24%). This is not unexpected since it is more difficult to reduce the dissolved form of nutrients. The outlet concentration of TSS was significantly decreased (76%).

The small buried pipe proximal to the baseball diamond (BHPSF-1) contained elevated phosphorus and TSS in 2010. The flow through this pipe was minimal, however. A detention basin was constructed in this area to treat stormwater runoff from the field. This detention basin outlet was sampled in 2014 and also revealed elevated nutrients but concentrations were generally lower than those discharging from the larger detention basin by the soccer field draining into the tributary. A duplicate sample was collected at this location. These data demonstrate the high variability of TP in stormwater samples. The relative percent difference (RPD) was 101% for TP. DP and TSS concentrations were more comparable and had RPDs $<15\%$.

Results for the detention basin outlet behind the school (BHPBS-2) in 2010 and 2014 were comparable with slightly higher TSS in 2014. Of all stormwater samples, the sheetflow runoff behind the school (BHPBS-1) showed the highest concentrations of nutrients and solids, demonstrating the need to collect runoff and mitigate concentrations to the greatest extent practical before this water enters Bare Hill Pond.

Overall, the results of this sampling effort show that nutrient and solid concentrations are likely reduced by the detention basins. As with all treatment devices, these detention basins require routine maintenance to ensure efficacy.

Table 3. Bare Hill Pond Watershed Sampling Results.

2010	2014	Description
BHP-T1	BHP-T1	Tributary downstream of Pond Road, downstream of soccer field pipe confluence in 2010 (BHP-SFP) and downstream of detention basin outlet
	BHP-T2	Tributary downstream of Pond Road, upstream of soccer field pipe and detention basin outlet
BHP-SFP		Small soccer field drainage pipe discharging to tributary; not sampled in 2014 due to low flow
	BHPSF-DI	Soccer field detention basin inlet; No sample in 2010 - detention basin not constructed
	BHPSF-DO	Soccer field detention basin outlet; No sample in 2010 - detention basin not constructed
BHPSF-1		Soccer field behind fence at baseball diamond - small buried pipe discharge; Pipe no longer present. Compare sample to BHP-T1
	BHP-BFDO	Baseball field detention basin outlet; No sample in 2010 - detention basin not constructed
BHPBS-1		Behind School - Parking lot sheetflow runoff; no sheetflow in 2014
BHPBS-2	BHPBS-2	Behind School - Detention basin outlet

Dry Weather

Station	BHPT-1	
Year Sampled	2010	2014
Temp (C)	14.1	14.4
DO (mg/L)	8.6	9.5
pH (SU)	7.7	6.8

Station	BHPT-1		BHP-T2		BHP-SFP		BHPSF-DI		BHPSF-DO	
Year Sampled	2010	2014	2010	2014	2010	2014	2010	2014	2010	2014
Temp (C)	10.2	11.6	NS	12.4	8.5	NS	NS	11	NS	10.9
DO (mg/L)	9.9	10.6	NS	10.7	10.2	NS	NS	10.4	NS	10.5
pH (SU)	8.5	7.5	NS	7.8	7.8	NS	NS	7.1	NS	6.8
Spec Cond (us/cm)	273	393	NS	312	750	NS	NS	351	NS	320
Total Phosphorus (mg/L)	0.556	0.042	NS	0.017	0.022	NS	NS	0.160	NS	0.076
Dissolved Phosphorus	0.065	0.021	NS	0.013	0.018	NS	NS	0.041	NS	0.031
TSS (mg/L)	136	7.6	NS	<5.0	<1	NS	NS	80	NS	19
Spec Cond (us/cm)	423		393							
Total Phosphorus (mg/L)	0.025		<0.010							
Dissolved Phosphorus	0.011		<0.010							
TSS (mg/L)	1		<5							

Wet Weather

Table 1 continued.

Wet Weather

Station	BHPSF-1	BHP-BFDO*	BHPBS-1	BHPBS-2
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Year Sampled	2010	2014	2010	2014	2010	2014	2010	2014
Temp (C)	NIS	NS	NS	13.6	12	NS	11.8	14.4
DO (mg/L)	NIS	NS	NS	9.3	8.8	NS	8.8	9.3
pH (SU)	NIS	NS	NS	6.7	8	NS	7.7	6.1
Spec Cond (us/cm)	NIS	NS	NS	968	105	NS	1075	839
Total Phosphorus (mg/L)	0.063	NS	NS	0.027/0.083	1.293	NS	0.041	0.045
Dissolved Phosphorus	0.030	NS	NS	0.019/0.017	0.150	NS	0.022	0.01
TSS (mg/L)	26	NS	NS	<5.0/<5.0	344	NS	6	14

NS = not sampled; NIS = no in-situ sample (water level too low)

* Duplicate sample collected in 2014 for QC both samples reported

Report of Tom Gormley on Frog Counts

Exhibit C

Bare Hill Pond Frog Counts – 2014

We held three counts on April 22, May 12, and June 11, with and collected 21 individual observations on those evenings. We had 7 volunteers counting with us this year, including 3 new volunteers who received training at the Gormley's home. Although we had a long, heavy winter and snow still on the ground in April, we had our first count this year two weeks earlier than last year which had been particularly cold. Overall there were no significant changes in the six species or quantities of frogs we counted.

Count #1

On April 22, we had four volunteers (including two first-timers) in two teams visit four of our regular counting locations. The sky was cloudy, temp in the mid 60s F, with a moderate breeze, and we'd had no precipitation in the prior 48 hours. Strong choruses of peepers were heard at all locations. We also heard numerous pickerel calls at Bowers Rd and the beach and dam. These were very similar to the species and quantities of 2013.

Count #2

On May 12, we had five volunteers in two teams cover four locations, with temps in the high 70s, clear sky and no wind. We again heard loud choruses of peepers and many pickerel calls. The pickerel frogs were active with calls at the B level at the beach and Bowers brook locations, where we also heard less frequent (A) calls from wood frogs and American toads. At the dam and tennis courts we also heard less frequent (A) wood frogs and gray tree frogs.

Count #3

On our last call of the season on June 11th, we covered 4 locations with 3 volunteers on a night with temps in the low 60s, a light wind and cloud skies. At the dam we heard a few green frogs calling, while at the tennis courts we heard nothing. At the beach and Bowers Brook locations our counters logged light calling from green frogs and bull frogs.

Exhibit D

Concerned Turner Lane Association Members
Turner Lane
Harvard, Mass.

June 14, 2014

The Pond Committee
Harvard, Mass.

Dear Pond Committee:

The Turner Lane residents signed below are concerned about the Bare Hill Pond Committee policy of not lowering the pond in the fall. This change in procedure has caused problems for Turner Lane residents and other users of the pond.

We are aware that the pond committee is experimenting with the best way to manage the pond and that the committee is interested in on the ground feedback from pond users. We have seen the following problems occur already this year as a result of not lowering the pond as has been done in the past.

1. Serious damage to docks. The damage to docks in some cases has been significant and expensive to repair. Several docks are not designed to be removed from the water. Alternatives to dock removal include installing electrical aerators which would run all winter. This may not be a good environmental choice.
2. Invasive weeds have already been disturbing swimmers. These are new weeds that were not there in other years. At this point swimmers find this unpleasant. In the future these aggressive weeds could actually be dangerous to children and adults that become entangled in them while swimming. New underwater weeds are being spotted by gardeners from the shore.
3. It has been customary for residents to rake up weeds and dead leaves in swimming areas in the fall and winter. Several of us also pick up trash along the shores and in the coves in areas that are only accessible on foot in the fall and winter with a lowered pond. This fall clean-up provides for a cleaner and safer pond for our children. We weren't able to do this last fall and winter. Our swimming areas are murkier this year.

We are asking that you consider the information presented above when making your decision regarding lowering the pond in the future. The Turner Lane Association members who have signed below ask the pond committee to reinstate lowering of the pond this fall.

Thank you for your work in making Bare Hill Pond a safe, enjoyable and beautiful place for all.

Signed, Rose P Ruze 31 Turner Lane rosep@verizon.net 778364-2396
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Elizabeth M. Ruze 31 Turner Lane ruze@hawaii.edu