Attachment A – Compiled Public Comments

April Talon

From: Douglas Worthen <dougworthen@gmail.com>
Sent: Wednesday, July 28, 2021 10:44 AM
To: Andrea Bodo; April Talon
Subject: Mill Pond Dam

To the Town Council,

I am putting my trust in your understanding that a vast majority of Durham residents value the Dam and the Mill Pond. I also understand that the small but determined group who would like to destroy it are trying to make the removal seem inevitable, less expensive than maintenance, and somehow creating a new and "better" ecosystem. Human enjoyment and experiences are also part of Durham's ecosystem.

Please consider that you would remove much more than the Dam itself should you vote to destroy it.

Doug Worthen

April Talon

From: Sandy Blitzer <4sandy.blitzer@gmail.com>
Sent: Wednesday, July 28, 2021 8:39 PM
To: April Talon
Subject: Durham Dam

Hello,
I would like to express my hope that Durham will acknowledge the repeated advisories to remove the dam & restore the watershed to a more natural flow. There have been repeated studies made and all have noted that the dam removal would be both the appropriate environmental & economic choice. Please accept the advice and remove the dam & allow the water flow to resume. The Exeter dam removal is a clear example of how good it is for the environment.
The current dam is not a "Historic" dam. It is a dam at an Historic site. The original dam is long gone. The concrete version present is just a replacement of a replacement of how many others at the site. It is time to remove & allow the watershed to revert to its natural state.
Thank you,
A S H Blitzer
Durham Resident since 1984

April Talon

From: Charles Blitzer <Charles@blitzer.org>
Sent: Wednesday, July 28, 2021 8:42 PM
To: April Talon
Subject: River restoration - Mill pond dam

This letter is to request the town council proceed with the obvious answer to remove the Mill Pond dam. The recent report VHB only further emphasizes that **dam removal is the only reasonable way to proceed**. I would like the council to pursue appropriate sources of supplemental funding that this river restoration will allow. When this is accomplished we can look forward to an environmental restoration that has significant recreational, economic and cultural improvements for this resource. If this is in doubt please see Exeter river. We should have an appropriate historic marker acknowledging that there was a dam (not the current dam which is barely 100 years old) on this site.
Thank you
Sincerely
Charles M Blitzer

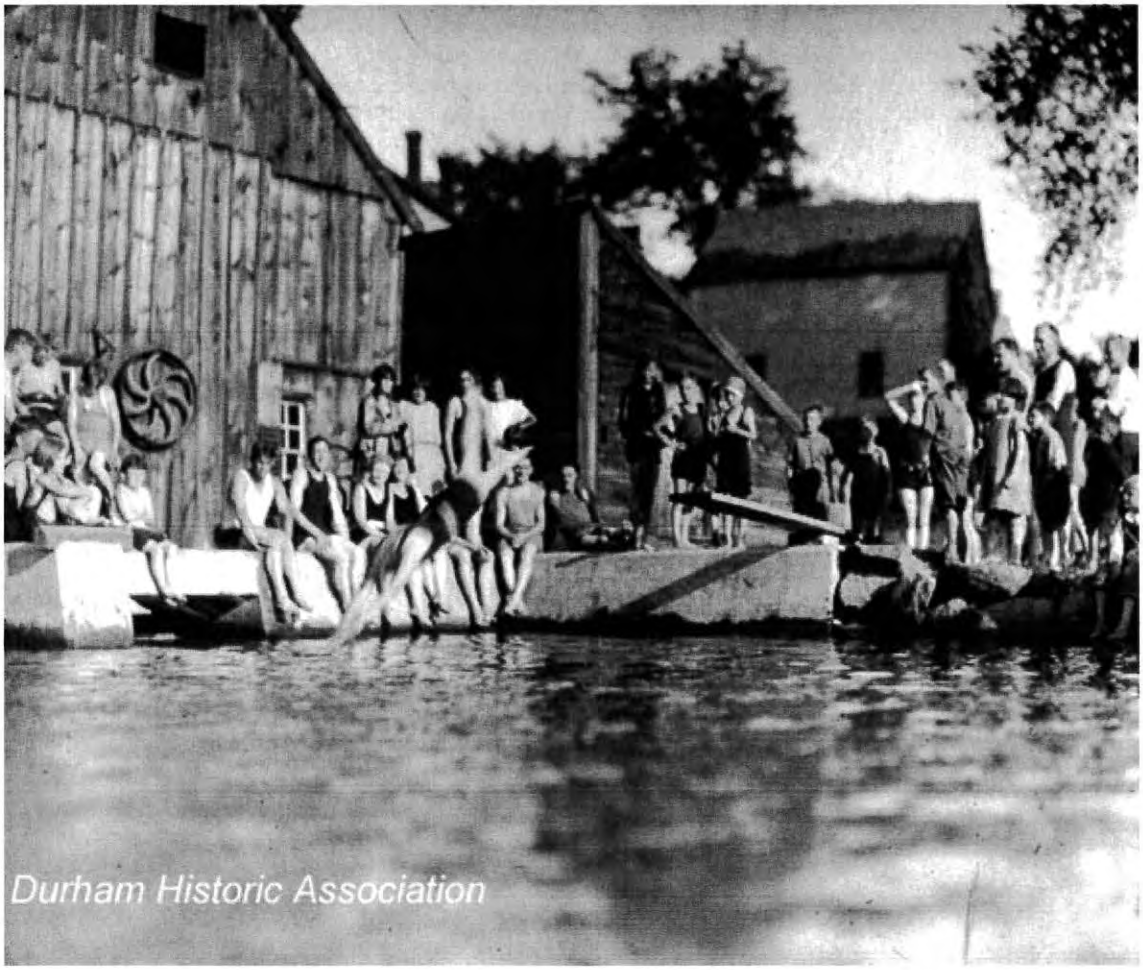
April Talon

From: Andrea Bodo <afbodo@comcast.net>
Sent: Thursday, July 29, 2021 6:05 AM
To: April Talon
Subject: PLEASE POST THIS LETTER with others in support of the dam

Dear Town Councilors,

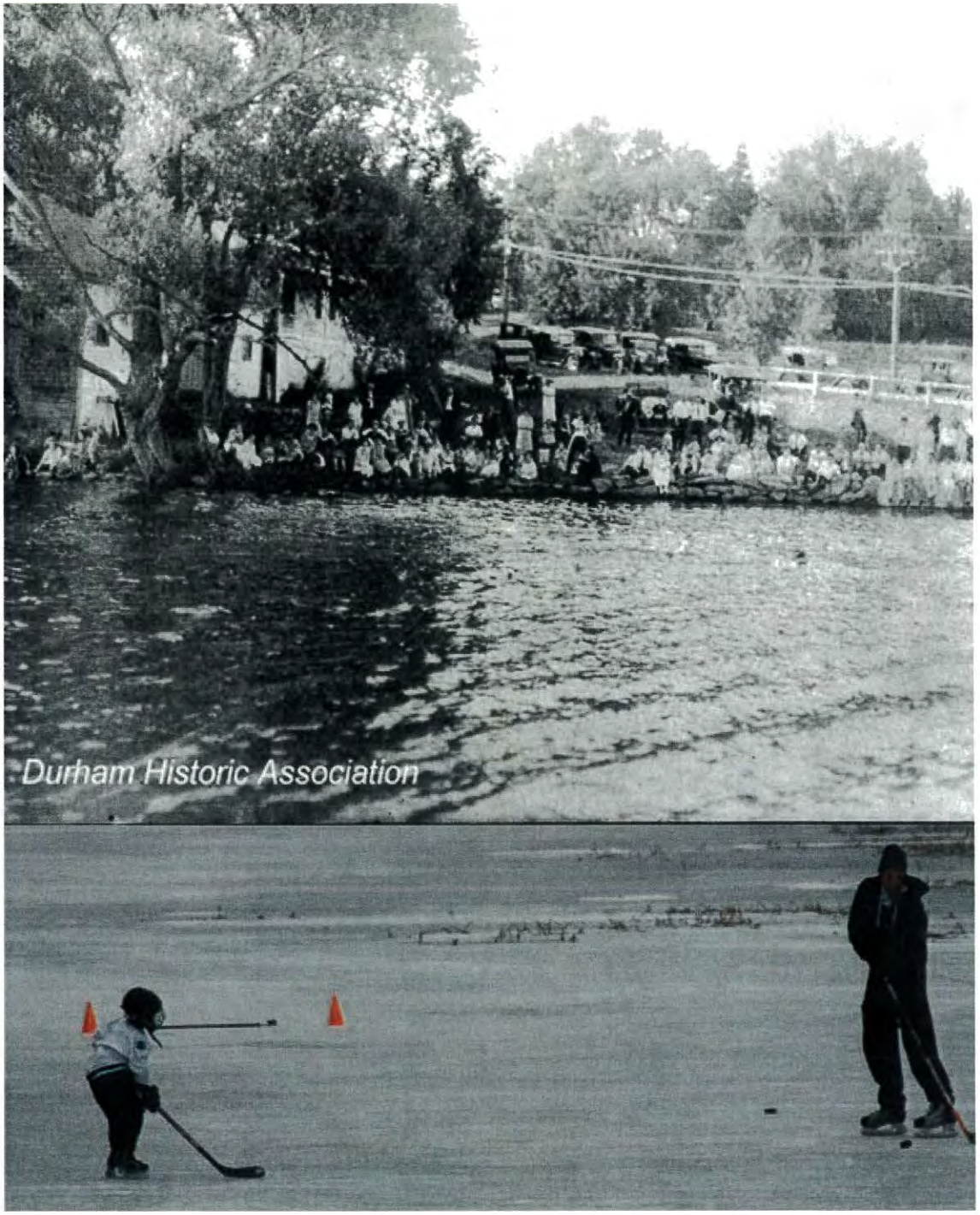
For many many years, Durham residents of all ages have been able to enjoy recreation on the beautiful historic Mill Pond. From early spring observing the first ducks, geese, birds and waterfowl residents have delighted in the beauty of nature on the Pond, the columns of ducklings and goslings..... People sit along the banks watching the activity, young children delight in the wildlife watching the turtles, beavers etc,....., writers, artists, boaters all come out to enjoy the area. People have written to me about their children's first steps on the banks of the pond, to the excitement of seeing the eagles and osprey. The Pond has been a focal point for Church Hill housing and people have told me how they can't wait to get up in the morning and see what is going on out on the Pond.....the Milne's long time residents, conservationists, nature lovers gave a beautiful parcel of land on the Pond so that others might enjoy the beauty of the Pond. When the weather is warmer, many people have kayaks and canoes on the Pond....the kids swim in the Pond ! fish in the Pond ! In Hamilton Smith's Day, there was a lit trail along the Pond where they walked in the evenings. How can you measure the value of a treasure like this ? Many towns would love to have a water feature in the middle of their town. Durham is so lucky. It has one of the most scenic ponds and vistas along the MILLS SCENIC HIGHWAY Route 108. In the winter time when the pond freezes, hundreds of kids can be seen skating on the Pond. It is quintessential New England. Sadly, the Pond has not been cared for, the gates have been closed for years, and we watch the eutrofication of a once beautiful Pond. It's fate is now before the Town Council. These places matter. "In a world that is constantly changing, old places provide people with a sense of being part of a continuum that is necessary for them to be psychologically and emotionally healthy." Please don't let the historic Mill Pond dam be lost because once it is removed, this all is gone forever.

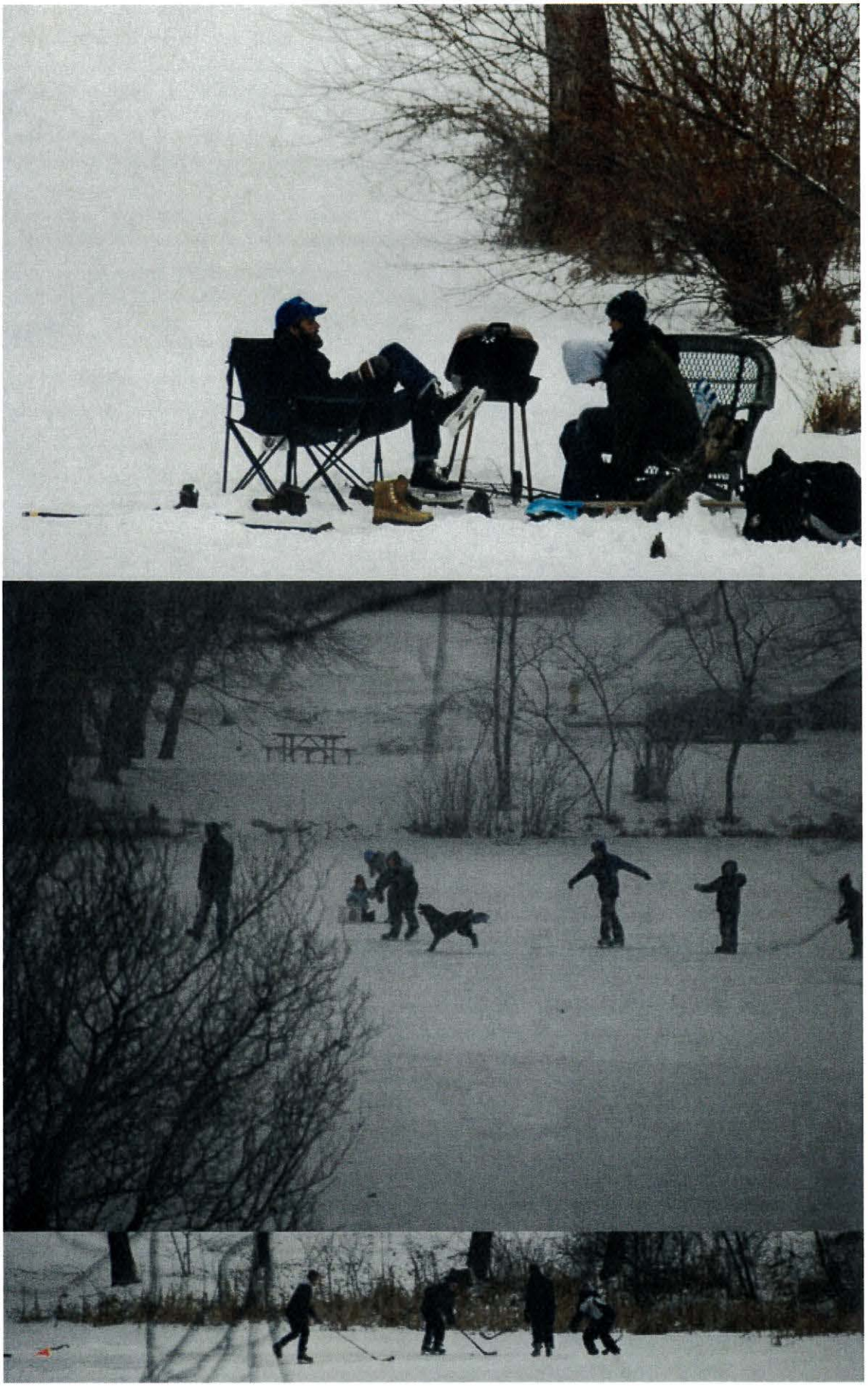
Andrea Bodo and Steve Burns, 20 Newmarket Rd


Durham Historic Association


Durham Historic Association


Durham Historic Association


Durham Historic Association

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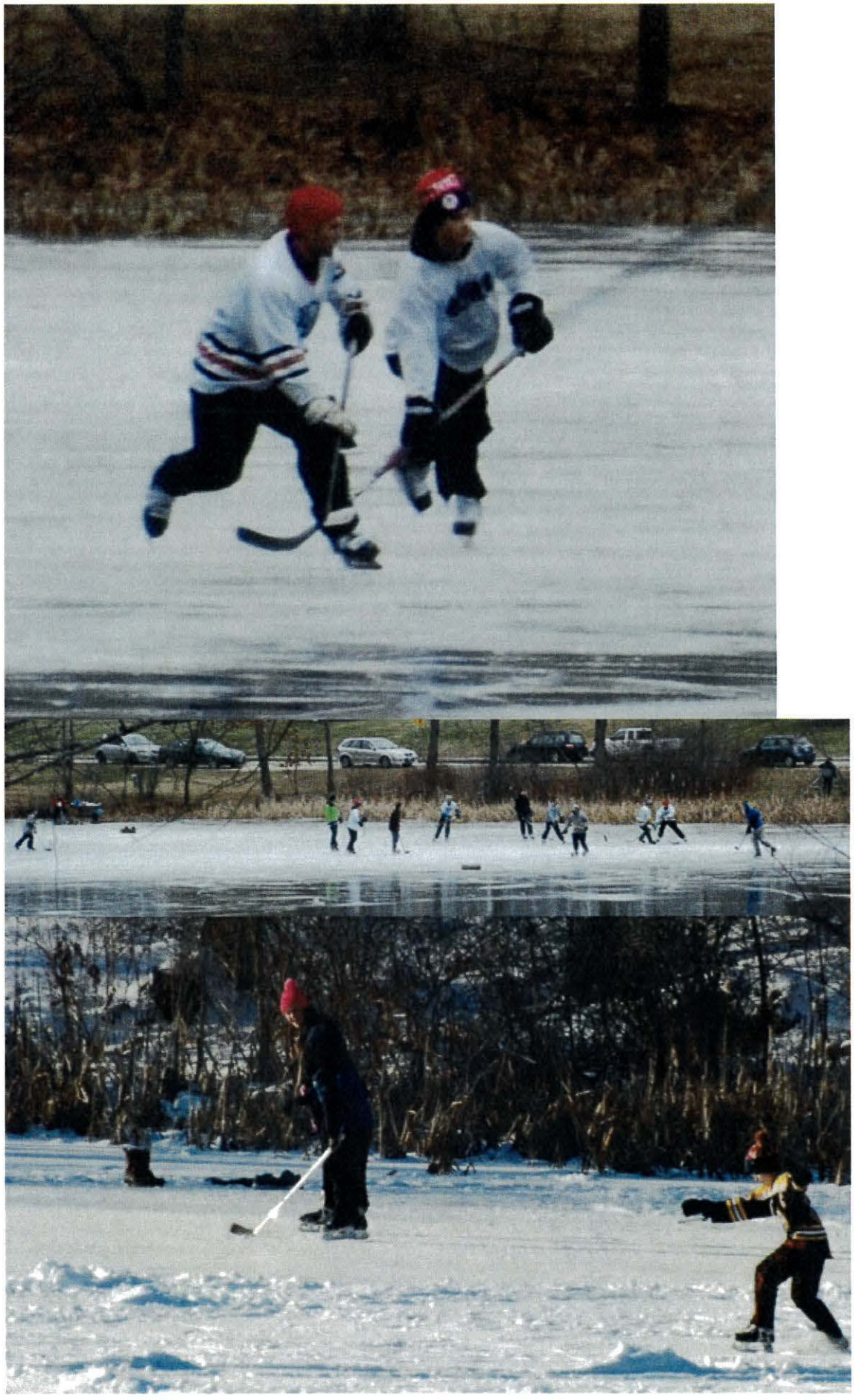



CAMPUS RECREATION

April Talon, Town Engineer
Town of Durham
8 Newmarket Road
Durham, NH 03824
29 July 2021

Dear Ms. Talon:

I am submitting my questions pertaining to the removal of the Mill Pond Dam. Please excuse the duplication if these have already been submitted.

1. Have Council members made a site visit to the upper reaches of the Hammel Brook – Oyster River - extent of the water in summer, in winter? Did they note its use for recreation in all seasons?

2. With potential exposure to salt water has the evolution of the pond into a saltwater mosquito breeding marsh been considered?

3. What preparation/mitigation will be made for a repeat of the Mothers' Day flood of a decade ago? Where will all the silt go? What effect will that have on oyster culture and other activities?

4. Has the Council considered simply 'maintaining' the Mill Pond Dam as with any other facility of the town?

Thank you for your consideration.

Sincerely,

Suzy Loder
14 Stone Quarry Dr. Apt 323
Durham, NH 03824

Former resident of Mast Road from 1974 who made family use of the pond for skating and skiing.

April Talon

From: Scot Calitri <smcalitri@gmail.com>
Sent: Thursday, July 29, 2021 1:52 PM
To: April Talon
Subject: Question for the Dam

Thanks again April for dealing with us passionate souls. This is a crossroads for our town and the time for us to walk the talk with regards to sustainability, respecting modern science and listening to our Indigenous peoples.

One key question that should help most involved understand the financial impacts:

After the recent supplemental study, it seems that we're back to two choices: **Remove the Dam** or **Repair the Dam with Dredging**.

Can you outline the costs associated with each of these two options, including invasive species mitigation estimates, ongoing dredging and dam repair needs, etc? Even more importantly, what would the cost per Durham household be for these two remaining options?

Greatly appreciated!

April Talon

From: Diane Freedman <Diane.Freedman@unh.edu>
Sent: Thursday, July 29, 2021 3:32 PM
To: April Talon
Subject: hello

Dear April,

I hope you are well and thank you for recent Mill Pond-related correspondence.

I am under the impression that questions based on the supplement report to the Mill Pond Feasibility Study are best submitted, to you, by tomorrow or end of today. I have many growing questions myself. But I am slogging through the report only now so it is premature for me send them (and I need more time to express them clearly, in any case).

As, alas, I pointed out in a kind of reality-check 😊, protesting email earlier, I was and continued to be out of the country and without internet enough to read documents. Others also expressed dismay for the July 12 meeting without time to review the materials—but even now, more time is needed for the length of the report, a full reading of which is necessary if one is to understand the presentation or even executive summary.

I myself have just gotten back from my remote travels and am digging in, but I (and many others, I imagine) need more time, in part because the report is technical and throws around a lot of acronyms, not all of which are defined and most of which terms, when defined, are defined after the master summary. But also because the report is long and, not being paid to be consultants, most of us have competing jobs and lives.

Quick feedback: More photographs rather than charts (and more actual and very recent studies rather than charts based on models) would be very helpful to the Council members and most others, including of prior drawn-downs with water widths indicated from those times and arrows showing projected ultimate usual and seasonal water widths—sorry my own prose here is so boggy!

I would hope everyone urges the Council members to reread prior correspondence, especially because the supplemental report or supplement to the report completely leaves out the context of the value and cost to and of history, scenery, recreation, access, the existing diverse ecosystem, and property-values.

**I myself hope/intend to send a(nother) letter—to you, for VHB and for the Council, with better articulated queries, but I am wondering if there is more time to do so and wishing there were, certainly.

Right now I just want to register my intent and also disappointment about relatively tight deadlines/meetings (when I first heard that the Council would not be meeting again on action til September, I certainly thought I and others had more time).

Sincerely (and hurriedly),

Diane Freedman

April Talon

From: Larry Harris <larry.harris@unh.edu>
Sent: Friday, July 30, 2021 2:32 PM
To: April Talon
Subject: Letter concerning the Mill Pond and dam.
Attachments: Dam Draft.docx

Dear April,
I have attached a letter concerning issues and questions relating to the VHB reports and presentations. It is addressed to the Town Council Members, but hopefully it can be shared more broadly. Thank you. All the best, Larry
Larry G. Harris, 56 Oyster River Road.

Dear Town Council Members, 30 July 2021

I listened to the VHB presentation on the follow-up report and read the document. As with the initial report, it is obvious that there is a bias towards dam removal (Option 5) and the report leaves of number of issues that have not been addressed or the implications discussed. Following are a series of thoughts and questions about the VHB report and presentation.

1. **Tidal incursion.** The presentation and report talk about tidal incursion into the Mill Pond with dam removal. However, the power point presentation by Peter Walker in the original presentation showed an artist rendition of restoration at the dam site that included grass and shrubs that could not survive saltwater influxes. None of the drawdowns beginning with the installation of the fish ladder in 1974 have either mentioned tidal influx or seen it. Why is it so emphasized in the presentations and where is the evidence?
2. **Sediments.** The reports detail how the sediments contain high levels of toxic chemicals and are overly high in nutrients. The current pond does sequester some of those nutrients and toxic chemicals, but dam removal would result in flushing of much of the sediments. The channel modification proposed as part of Option 5 will also require dredging, which will destabilize the sediments and result in flushing during fall storms. How is dam removal going to impact the tidal portion of the Oyster River and Great Bay, including the oyster farms adjacent to Wagon Hill?
3. **Fish runs**. One of the primary reasons given for dam removal is to restore Alewife and Blueback Herring runs. However, the report describes very limited water levels in the main pond and backwater up through Hamel Brook. There will be no vegetated quiet areas without the pond, which is what Alewives need for spawning. The only area of running water with hard substrate which Blueback Herring use will be above Thompson Lane; that stretch is short and narrow and has a resident population of Fall Fish (*Semotilus corporalis*), a large and predatory minnow, along with perch, bass and pickerel. (1) How will the juveniles of the herring survive until they are due to migrate down to the estuary in late summer? (2) How will dam removal do anything to improve fish runs instead of eliminating them?
4. **The Notch**. The report did have a very short section on a notch to allow migratory herring and their young to depart the pond during low flow periods. 2020 was not unique as a low flow year. Die-offs of both herring species have been occurring due to lack of water flowing over the dam for many years without any effort to address this issue either with a notch or a fish ladder that would allow exit of migratory herring species. Why was this issue not addressed since it has been a recurring problem and is one of the reasons given for dam removal (see section 3)?
5. **Pond ecosystem**. The current pond and backwater support a diverse and rich assemblage of wildlife, including frogs, turtles, fish, birds and mammals. The projected width and depths of the pond and backwater will not support that community, but the exposed areas of the former pond will support a rich growth of invasive species (observe College Brook adjacent to the Mill Plaza for a preview). Why did the report say nothing about what the impact of dam removal would be on the current aquatic ecosystem?

6. **Recreation**. The Executive Summary mentions recreational activities on the pond, but the report says nothing about them. The pond and backwater provide a diversity of recreational activities that are most obvious in the winter when ice skating, snow shoeing and crosscountry skiing are in evidence. Fishing, kayaking, canoeing and paddle boarding are available the rest of the year, not to mention wildlife viewing. Why was the loss of all these recreational activities not addressed?

The initial report does not have the artist's representation of restoration next to the dam presented by Peter Walker in the original power point and one has to go to the very end of the appendices to find a few of the images on the impact of dam removal on the pond system presented by Andrew Walker in the follow-up presentation after many pages of compressed profiles. One cannot help but conclude that the reports were not balanced and informative as they should be for an unbiased decision-making process. Your decision will have long term consequences for the Town. I hope you will seriously consider the issues raised by those of us who support retention of the dam and Mill Pond system.

Respectfully submitted,

Larry G. Harris, Emeritus Professor of Biological Sciences, 56 Oyster River Road, Durham.

April Talon

From: janet.mackie@comcast.net
Sent: Friday, July 30, 2021 3:22 PM
To: April Talon
Cc: 'Beth Olshansky'; 'Marie Harris'; 'Diane Freedman'; 'Coleen Fuerst'; 'Larry Harris'; 'Scott Bogle'; 'Sean Harrison'; 'Pele Harrison'; 'Andrea Bodo'
Subject: Questions for VHB re Supplemental Study

Dear April, Please forward these questions to VHB. Thank you!

Water Aeration to improve oxygenation and lower water temperature:

1-Why was only one method of Mill Pond aeration discussed, when there are other methods that are more practical, useful and inexpensive to improve oxygenation and lower temperature?

Water Starvation of the Mill Pond caused by the UNH Oyster River Reservoir dam:

2-Why was a formula invented to show there is no water starvation of the Mill Pond caused by the Oyster River Reservoir dam, when Durham residents witness periods when no water flows over the crest of the UNH dam and the level of the Mill Pond falls below its dam?

3-Why is there no graph illustrating the 2015-2020 data filed at DES by UNH showing the days when no water tops the crest of the UNH Oyster River Reservoir Dam?

Phosphorus Pollution:

4-Why was phosphorus pollution dismissed as an impossible-to-remedy situation when many houses near the river have public sewer, not septic systems?

5-Why was phosphorus pollution dismissed as an impossible-to-remedy situation when phosphates were eliminated from household detergent products many years ago?

6-Why was phosphorus pollution dismissed as an impossible-to-remedy situation when USGS maps show the Oyster River watershed is not a source of phosphorus from naturally occurring minerals?

7-Why was phosphorus pollution dismissed as an impossible-to-remedy situation when most stormwater in Durham is collected by the sewer system and discharged into the Oyster River below the Mill Pond dam?

8-Why were no specific point sources of agricultural phosphorus pollution considered, such as the huge Moore fields on Mast Road farmed by UNH?

Mill Pond characterizations:

9-What data supports VHB's statement at the TC presentation that the amount of water flowing through the Mill Pond does not alter the characteristics of the water around the vegetation outside the main channel?

10-What data supports VHB's continued characterization of the Mill Pond as a lake, with emphasis on its size relative to the size of the watershed, when the Mill Pond only exhibits certain characteristics of a lake during the late summer when the river flow is cut off by the UNH dam?

Comparisons to the Exeter River dam:

11-Why is there no discussion that the Exeter River is still classified as an Impaired Water by DES after the removal of the Exeter dam?

12-Will the Oyster River still be classified as Impaired by DES if the Mill Pond dam is removed?

April Talon

From: Todd Selig
Sent: Saturday, July 31, 2021 8:42 AM
To: Richard Reine; April Talon; Peter Walker
Subject: Fwd: Comment & Questions on VHB Supplemental Study - Feedback/Questions from Scott Bogle
Attachments: BogleLetter-MillPondDamQuestions-7-30-21.pdf

Dear April, Rich, and Peter,
For your general information and for the public file.
Todd

Todd Selig
Durham, NH USA
Cell: 603.817.0720
Sent from my IPhone.
~~ Please pardon typographical errors.

Begin forwarded message:

From: Scott Bogle <scottbogle@yahoo.com>
Date: July 30, 2021 at 11:57:00 PM EDT
To: Todd Selig <tselig@ci.durham.nh.us>, Durham Town Council <council@ci.durham.nh.us>
Cc: public works common <publicworks@ci.durham.nh.us>
Subject: Comment & Questions on VHB Supplemental Study

Dear Todd and Members of the Town Council,

Please consider the attached letter highlighting VHB's continued pattern of cherry picking data, downplaying information that doesn't support their viewpoint and framing questions to yield desired results rather than offering an objective assessment to the Council and residents to support informed decision-making.

I hope you'll review the information in the attachment and read the VHB reports (the full reports not just the Executive Summaries) with a critical eye as you decide how you'll vote on the question of dam removal.

Respectfully,

Scott Bogle
4 Croghan Lane
Durham, NH

Scott Bogle
4 Croghan Lane
Durham, NH 03824

July 30, 2021

Mr. Todd Selig, Town Administrator
Town of Durham
8 Newmarket Road
Durham, NH 03824

Dear Todd and Members of the Town Council,

In March I wrote the Council with a list of five examples where the report, executive summary and other communication from VHB on the Mill Pond Dam omitted pertinent information, gave figures without context or framed data in such a way as to downplay information supporting dam stabilization, downplay adverse effects of dam removal and likely overstate benefits of dam removal. Along with that I submitted a number of follow-up questions for VHB. Many of those are ostensibly answered in their supplemental report from July 2021, but the pattern of cherry picking data to support a seemingly predetermined conclusion continues in the latest report. As before they take excellent science from Dr. Will Wollheim and others but downplay results that don't support their viewpoint and frame questions carefully to yield desired answers.

Here are six examples of this obfuscation and follow-up questions:

VHB continues to avoid modeling and providing information on true drought conditions for the Oyster River. The "extreme drought" scenario they model in the Supplemental Report averaged flow data for the Oyster River for July, August and September 2020. However the severity of the 2020 drought didn't really show up in water flow data for the Oyster River until August and September. Flow for July 2020 was 51% of the 20 year mean for that month according to the USGS flow gauge, while flows for August and September were 7.9% and 7.3% respectively relative to the mean for those months.

By taking this average, the flow rate for "extreme drought conditions" used in their Mass Balance model was 2.5 CFS. The USGS flow gauge averages for August and September 2020 were 0.501 CFS and 0.398 CFS respectively. Roughly speaking the mass balance model appears to increase the USGS Oyster River flow gauge volume numbers by a factor of about 1.6x accounting for inflow below the reservoir and other factors. Given that, the numbers to model for Aug and Sep drought flow would presumably be about 0.8 CFS for August 2020 and 0.6 CFS for September 2020.

> Questions: If Hamel Brook at the juncture with the Oyster River is only 4 feet wide at 2.5 CFS flow how wide and deep is it at 0.6 CFS – less than a quarter of the modeled flow rate? How wide and deep are the Brook higher up where it is connected to the Foss Farm trail system, and the River between the Hamel Brook split and the Milne Sanctuary at 0.6 CFS? How hospitable are those further diminished waters to herring young that remain in fresh water until late summer and fall, and to the broad range of other aquatic life that currently live in the impoundment?

USGS Flow Gauge Data for the Oyster River 2000-2021

https://nwis.waterdata.usgs.gov/usa/nwis/dvstat/?site_no=01073000&por_01073000_63971=1266780,00060,63971

USGS 01073000 OYSTER RIVER NEAR DURHAM, NH

Latitude 43°08'55", Longitude 70°57'56" NAD27

YEAR	00060, Discharge, cubic feet per second, Monthly mean in ft3/s (Calculation Period: 2000-01-01 -> 2021-04-30) Period-of-record for statistical calculation restricted by user												ANNUAL MEAN	September Mean Flow Factored by 1.6X to approximate Mass Balance Model
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
2000	15.2	20.2	54.8	53	23	10.4	3.44	3.97	2.22	5.15	14.1	15.6	18.4	3.5
2001	7.28	10.5	63.8	60.5	6.51	10.3	2	0.649	1.07	0.554	0.934	3.09	16.2	1.7
2002	4.13	7.52	19.8	21.6	27.2	18.6	2.29	0.564	0.397	2.66	11.1	20.8	12.7	0.6
2003	10.6	12.4	58.4	45	21.1	11.4	1.47	3.25	5.16	15.6	18.2	29.2	15.4	8.0
2004	10.7	4.65	18.1	72.7	32.9	10.2	3.64	8.11	9.8	6.43	12.7	31.7	18.9	15.3
2005	22	23	39.7	59	47.4	25.1	9.63	1.64	1.31	59	42.5	43	24.8	2.0
2006	43.9	35.6	17.5	23	111	54.3	10.3	4.92	3.33	22.6	53.2	31.1	32.7	5.2
2007	29.9	6.65	38.4	104.4	31.2	42.1	10.3	2.79	1.73	4.09	10.9	10	29.3	2.7
2008	26.6	59.6	79.5	60.9	17.7	9.26	23.5	35.6	33.3	26.1	31.8	56.5	31.4	51.9
2009	20.5	28.3	55.9	46.6	20.6	25.1	30.7	17.8	4.04	10.4	22.2	34.2	32.4	6.3
2010	25.6	65.2	133.5	47.3	10.6	8.08	3.44	3.24	0.89	4.83	14.9	24.5	27.4	1.4
2011	9.18	12.3	87	47.3	36.2	11	1.96	6.7	6.79	20.6	31.8	37.7	27.1	10.6
2012	23.6	20.7	26.4	15.1	21.4	24.4	3.58	2.21	1.29	5.39	8.24	17.4	19.9	2.0
2013	15.3	19.5	49.1	32	19.5	26.7	13.4	3.74	19.4	3.58	8.79	13.4	16.4	30.3
2014	23.5	18.2	34.6	65.8	21	6.19	5.55	8.54	1.94	4.21	7.98	40.1	19.3	3.0
2015	12.2	8.37	24.2	58.8	6.54	12.4	6.62	2.55	1.63	3.83	6.41	16.2	16.6	2.5
2016	24.8	34.1	34.2	23.7	8.63	3.47	1.64	0.454	0.363	5.71	7.44	18.2	13.4	0.6
2017	25.6	24.3	33.3	62.3	36.6	17.4	5.34	3.79	3.6	8.29	10.9	9.37	16.8	5.6
2018	27.3	38.2	35.2	49.9	13.6	4.97	4.39	14.1	11	16.9	73.9	38.8	23.7	17.2
2019	27.3	21.1	31.1	45.5	22.9	15.9	9.83	7.45	3.18	9.03	16.8	42.3	24.2	5.0
2020	33.7	31.2	35.3	44.8	18.6	2.96	3.91	0.501	0.398	1.35	3.57	29	19.1	0.6
2021	19.3	11.7	22.6	29.4										
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Mean of monthly Discharge	21	23	45	49	26	17	7.5	6.3	5.4	11	19	27	21.43333	

= Eight (8) years with mean September flows at or below VHB's "once in a generation" "extreme drought" category of 2.5 CFS

VHB continues to disingenuously downplay the frequency of drought conditions similar to 2020. Both Peter Walker and Andrew Walker from VHB stated at the Council meeting on July 12th that the low flows of 2020 hadn't been seen in the prior 20 years. One called the 2020 drought at "once in a generation" event. In fact the USGS flow gauge readings for the Oyster River were lower in Aug-Sep 2016 (0.454 CFS and 0.363 CFS respectively) than they were in 2020, and just about as low in 2002 (0.564 CFS and 0.397 CFS respectively). So that's three times in 20 years. With climate change it seems unlikely that we will see less frequent droughts in the coming decades. Actually if one applies the rough 1.6x multiplication factor identified above to September flow averages from the USGS gauge since 2000 you get flow rates at or below their 2.5 CFS "Extreme Drought" figure in 8 out of the past 20 years.

VHB uses annual and multi-year averages to obscure the impacts of water withdrawals from the UNH/Oyster River Reservoir. The Executive Summary on page ES-4 states that "Drinking water withdrawals from the Oyster River Reservoir have a negligible impact on inflows to Mill Pond during a 'typical year'". They note that this can be different during a drought year like 2020, but provide data only for monthly averages. Councilor Lawson in March 2021 analyzed daily water withdrawals from the reservoir vs. daily flow readings from the USGS gauge above the reservoir for June-September for a ten-year period from 2010-2020. While I have seen only charts from this analysis and not the underlying spreadsheet, the charts appear to show the following:

- 2010 – 18 days where water withdrawals exceeded inflow resulting in no flow over the dam
- 2011 – 12 days without flow over the dam
- 2012 – 31 days " " " " "
- 2013 – 9 days " " " " "
- 2014 – 3 days " " " " "
- 2015 – 17 days " " " " "
  Spruce Hole Well comes online in September 2015 reducing but not eliminating withdrawals
- 2016 – 23 days without flow over the dam
- 2020 – 5 days without flow over the dam

VHB asserts that 2020 was uniquely extreme and obscures the impacts of water withdrawals by modeling only monthly averages. USGS gauge readings and the daily record of water withdrawals refute that.

> Question: What does the Mass Balance Model show for channel depths and widths when late summer water withdrawals leave no flow over the upper dam and removal of the Mill Pond dam leaves no water impounded?
>
> Question: How would one day of no water flow below the dam in August and September impact juvenile herring and other fish living in the river and brook in the absence of impounded water? Three successive days? Five successive days?
>
> Question: Can we reliably say that extreme low flows related to drought conditions observed in 2002, 2016 and 2020 will not happen more frequently than every 20 years given accelerating climate change? Is the Town Council willing to bet on that?

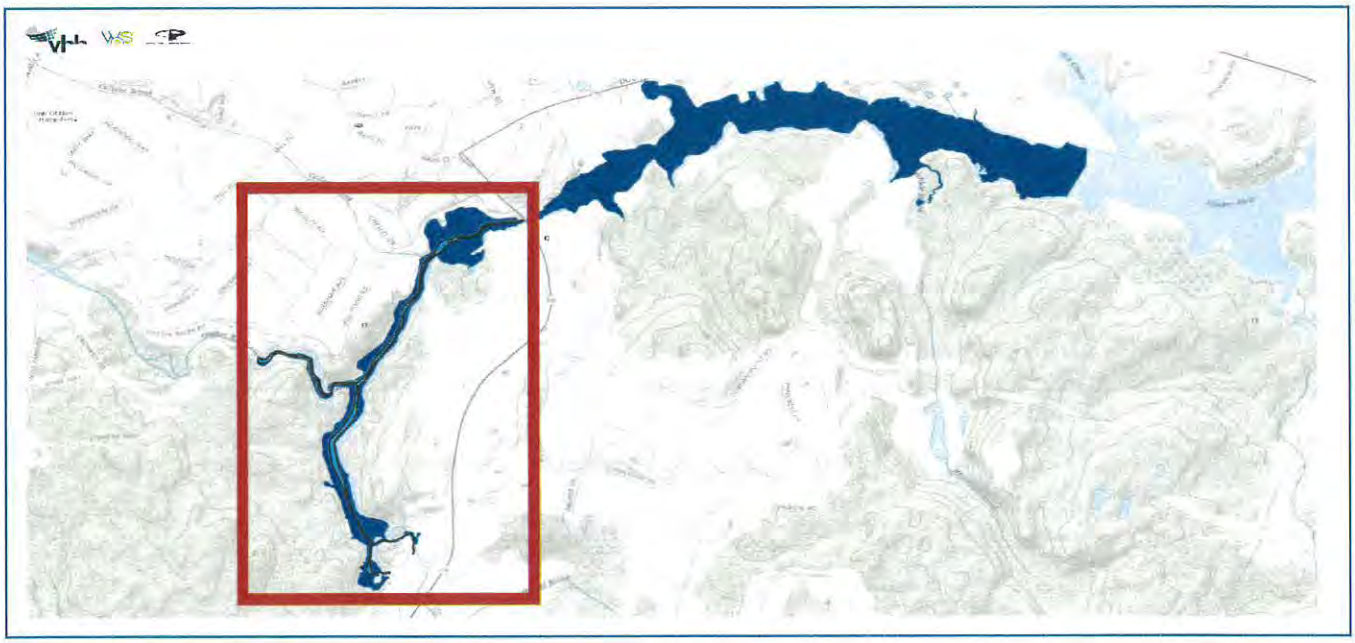
VHB has not provided any examples of sustainable anadromous fish runs on rivers as small and with seasonal flows as low as the Oyster River. The primary rationale for removing the dam in the minds of many who support removal is to restore anadromous fish runs. According to USFWS adult herring enter fresh water, spawn and leave in spring and early summer, while their young remain in fresh water into the

fall. What if there's not much fresh water left in the river in August and September given low drought flows and water withdrawals?

> Question: Given anticipated lows for flow, channel depth and width identified above during August and September and water withdrawal periods, and without the water volume of the impoundment, please identify 2-3 other tidal rivers in the eastern United States with approximately those conditions and their annual herring runs over the past 10 years.

Graphics comparing the extent of water coverage under different dam alternatives and water flow scenarios seem designed to obscure differences. The supplemental report (Pages 176-181) includes a series of graphics that ostensibly illustrate differences in channel width between various scenarios. Andrew Walker showed these briefly at the Council meeting on July 12th. The relevant area of the impoundment being compared across the scenarios takes up only about 1/6 of the image, which extends geographically from well above the UNH dam to well into Little Bay. This very small scale seems calculated to minimize visible differences among the scenarios.

> Question: Please provide revised comparative graphics that: 1) focus only on the area of the impoundment to achieve a scale suitable to better show differences in the scenarios; and 2) include a true extreme drought low flow scenario equivalent to flow levels from September 2020 (or September 2016 or September 2002).



VHB continues to emphasize the impairment of the pond while downplaying the viability of most of the rest of the impoundment as habitat for a wide range of species. The data on dissolved oxygen (DO) on the Middle Impoundment (Milne sanctuary to Hamel split) and on Hamel Brook showed DO levels in those portions of the impoundment were significantly better than in the pond itself below College Brook. Interpretation of dissolved oxygen data on page 11 of the full report notes that for the mainstem of the Oyster River between Milne Sanctuary and Hamel Brook "DO levels were generally similar to that observed at the upstream Oyster River station (ORR) and higher than at the dam." Figure 1-5 shows 13 of 15

dissolved oxygen measurements taken in the impoundment above College Brook were above 75% percent (the NH Standard for Class B waters). The section similarly notes higher DO levels on much of Hamel Brook, with the exception of one area at the extreme end of the brook near Route 108 (HMM2). However the Executive Summary omits this information and instead trumpets the bold section heading "Poor water quality, typified by low dissolved oxygen and high water temperatures, occur throughout the impoundment, not just at the dam site."

While VHB emphasizes the inhospitality of the water chemistry in the Pond itself, particularly the portions closest to Mill Pond Road, a wide range of species live and function in the impoundment above the pond. Canoeing on the river and Hamel Brook in the impoundment this summer I've observed fall fish, yellow perch, painted turtles, beaver, kingfishers, great blue herons, cormorants, wood ducks and a bald eagle. People I know who fish in the river routinely catch or observe fall fish, yellow perch, pickerel, pumpkinseed, large mouth bass, American eels and Lamprey eels as well as herring.

Question: What can be expected to happen to fish and other fauna that depend on the current aquatic habitat if that habitat is reduced by 75%-80% with elimination of the dam (and more in true drought conditions as exemplified by August and September 2020)?

Question: If poor water quality was in fact an issue throughout the impoundment how is it that these species seem to be functioning just fine? Are these species of fish more tolerant of sub-optimal water quality than herring? Do they simply avoid those sections of the impoundment with more impaired water quality?

Understand that a vote by the Town Council to remove the dam will be a vote to:

- Demolish a historic resource individually eligible for the National Register of Historic Places that is a character defining feature of Durham's Historic District;
- Largely eliminate current recreational uses of the pond and river including paddling in the summer and skating in the winter;
- Reduce the river to a trickle in August and-September - I use "trickle" because that was how Lorus and Margery Milne described what remained of the Oyster River in the 1974 Town Report during the drawdown of the pond to build the fish ladder;
- Eliminate existing habitat for a broad range of species in the impoundment above the pond;
- Reduce values of abutting property and accompanying property tax revenue to the Town.

In return the Town gets a promise (unsupported by evidence from any comparably sized river) of herring whose young will be challenged to survive August and September in the anemic remains of the River.

To conclude, here are two sets of photographs:

1) The first group of photos were taken last week paddling on Hamel Brook and the Oyster River behind Smith Chapel. It was a beautiful day on a beautiful stretch of water.
2) The second group of photos show the Oyster River and Hamel Brook as they appeared during the September 2008 drawdown of the pond. In looking at the channel widths please keep in mind that water flow rates at the USGS gauge that month were the highest for September in the past 20 years at 33.3 CFS: more than six times the 20-year average, and more than 80 times the mean flow rate for September 2020.

I hope each member of the Council will read the VHB report critically, and review data VHB excludes, in considering your vote.

Sincerely,

Scott Bogle
4 Croghan Lane
Durham, NH

Paddling on Hamel Brook and the Oyster River Behind Smith Chapel – July 24, 2021

Hamel Brook, July 2021

Hamel Brook, July 2021

Oyster River Mainstem between Milne Sanctuary and Hamel Split, July 2020

The Oyster River During Drawdown in September 2008 - a very wet month

Note that average monthly water flow rate at the USGS gauge for the Oyster River in September 2008 was the highest for September in the past 20 years at 33.3 cubic feet per second (33.3 CFS). That is more than six times the 20-year average for September, and more than 83 times the average flow rate at the USGS gauge for September 2020 (0.398 CFS). What would these channel widths have looked like in September 2020?

Confluence of the Oyster River with Hamel Brook, September 2008

Near confluence of the Oyster River with Hamel Brook, September 2008

Middle Impoundment behind Smith Chapel, September 2008

Mill Pond and Dam during Drawdown, September 2008

Attachment B – Drawdown Photos


2008/09/20


2008/09/20

2008/09/20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Hamel Brook
Impounded Reach
11/11/2020


Hamel Brook
Impounded Reach
11/26/2019

Hamel Brook
Unimpounded Reach
11/26/2019

Hamel Brook
Unimpounded Reach
11/26/2019

Hamel Brook
Above Beaver Dam
11/26/2019

Attachment C – Inundation Maps

Figure 1.1

0 100 200 400 Feet

Limit of Inundation

Existing Condition, Alternative 1 - Dam in Place

Oyster River Feasibility Study | Durham, New Hampshire

Source: NHDES, VHB, ArcGIS Online, Weston & Sampson

Limits of Inundation
Alternative 3 – Dam Stabilization
Low Tide, Median Annual Flow

Figure 1.2

0 100 200 400 Feet

Limit of Inundation

Existing Condition, Alternative 1 - Dam in Place

Oyster River Feasibility Study | Durham, New Hampshire

Source: NHDES, VHB, ArcGIS Online, Weston & Sampson

Limits of Inundation
Alternative 3 – Dam Stabilization
Low Tide, Median Annual Flow

Figure 2.1

0 100 200 400 Feet

Limit of Inundation

Existing Condition, Alternative 1 - Dam in Place

Oyster River Feasibility Study | Durham, New Hampshire

Source: NHDES, VHB, ArcGIS Online, Weston & Sampson

Limits of Inundation
Alternative 5 – Dam Removal
Low Tide, Median Annual Flow

Figure 2.2

0 100 200 400 Feet

Limit of Inundation

Existing Condition, Alternative 1 - Dam in Place

Oyster River Feasibility Study | Durham, New Hampshire

Source: NHDES, VHB, ArcGIS Online, Weston & Sampson

Limits of Inundation
Alternative 5 – Dam Removal
Low Tide, Median Annual Flow

Figure 3.1

0 100 200 400 Feet

Limit of Inundation

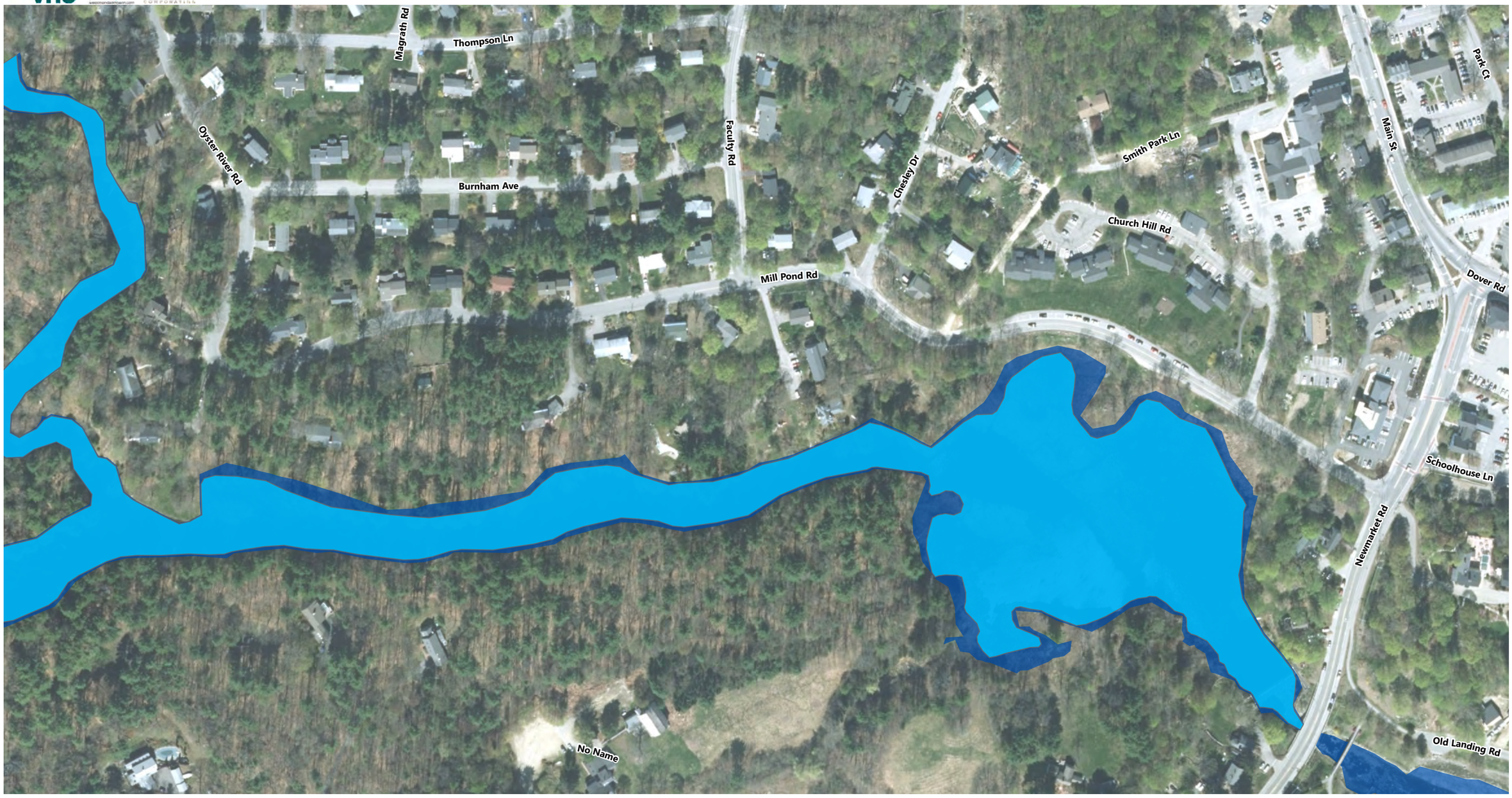
Existing Condition, Alternative 1 - Dam in Place

Oyster River Feasibility Study | Durham, New Hampshire

Source: NHDES, VHB, ArcGIS Online, Weston & Sampson

Limits of Inundation
Alternative 3 – Dam Stabilization
Low Tide, Typical Summer Low Flow

Figure 3.2



0 100 200 400 Feet

Limit of Inundation

Existing Condition, Alternative 1 - Dam in Place

Oyster River Feasibility Study | Durham, New Hampshire

Source: NHDES, VHB, ArcGIS Online, Weston & Sampson

Limits of Inundation
Alternative 3 – Dam Stabilization
Low Tide, Typical Summer Low Flow

Figure 4.1

0 100 200 400 Feet

Limit of Inundation

Existing Condition, Alternative 1 - Dam in Place

Oyster River Feasibility Study | Durham, New Hampshire

Source: NHDES, VHB, ArcGIS Online, Weston & Sampson

Limits of Inundation
Alternative 5 – Dam Removal
Low Tide, Typical Summer Low Flow

Figure 4.2

0 100 200 400 Feet

Limit of Inundation

Existing Condition, Alternative 1 - Dam in Place

Oyster River Feasibility Study | Durham, New Hampshire

Source: NHDES, VHB, ArcGIS Online, Weston & Sampson

Limits of Inundation
Alternative 5 – Dam Removal
Low Tide, Typical Summer Low Flow

0 100 200 400 Feet

Limit of Inundation

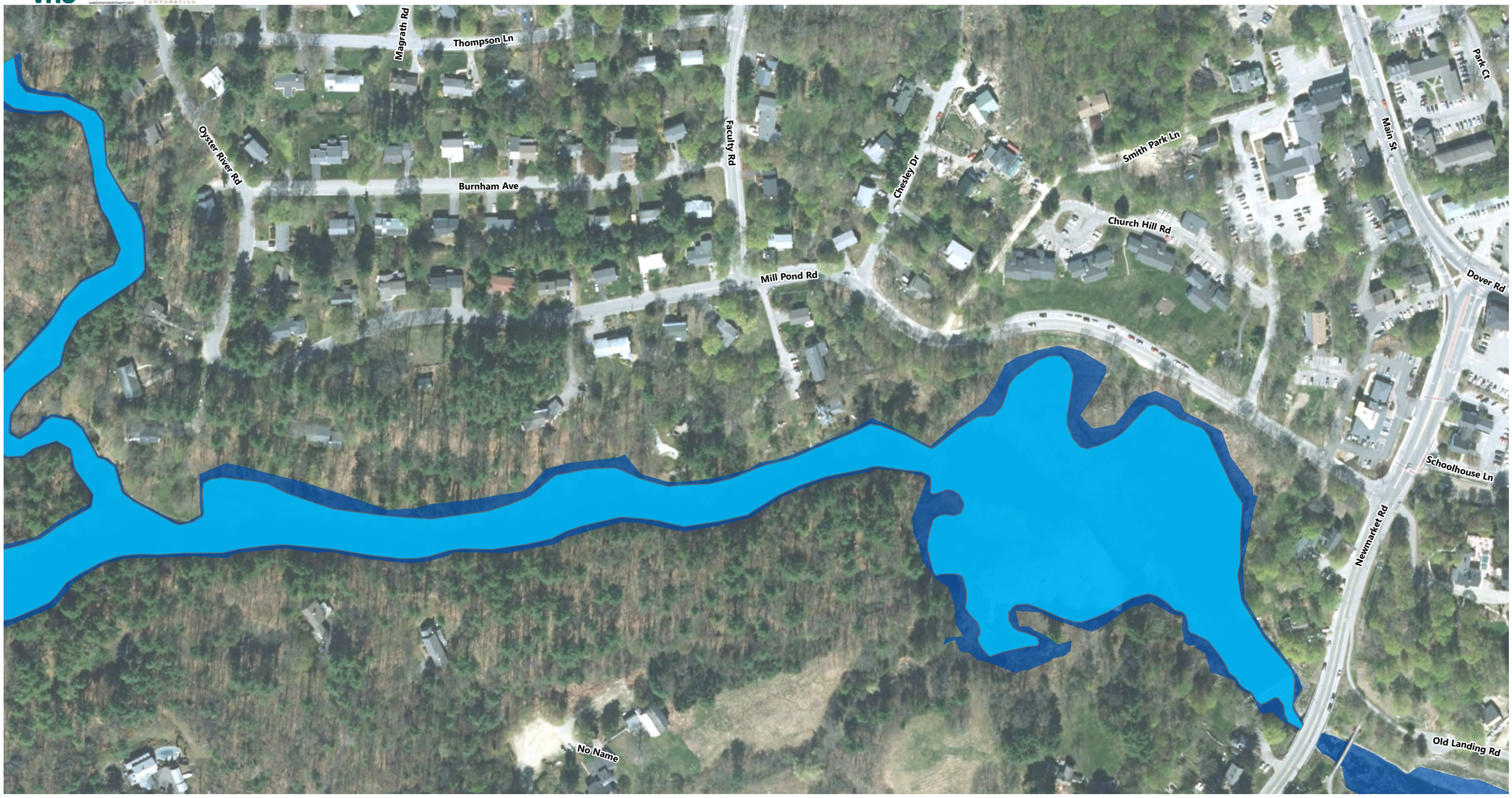
Existing Condition, Alternative 1 - Dam in Place

Oyster River Feasibility Study | Durham, New Hampshire

Source: NHDES, VHB, ArcGIS Online, Weston & Sampson

Limits of Inundation
Alternative 3 – Dam Stabilization
Low Tide, Very Low Flow

Figure 5.2



0 100 200 400 Feet

Limit of Inundation

Existing Condition, Alternative 1 - Dam in Place

Oyster River Feasibility Study | Durham, New Hampshire

Source: NHDES, VHB, ArcGIS Online, Weston & Sampson

Limits of Inundation
Alternative 3 – Dam Stabilization
Low Tide, Very Low Flow

Figure 6.1

0 100 200 400 Feet

Limit of Inundation

Existing Condition, Alternative 1 - Dam in Place

Oyster River Feasibility Study | Durham, New Hampshire

Source: NHDES, VHB, ArcGIS Online, Weston & Sampson

Limits of Inundation
Alternative 5 – Dam Removal
Low Tide, Very Low Flow

Figure 6.2

0 100 200 400 Feet

Limit of Inundation

Existing Condition, Alternative 1 - Dam in Place

Oyster River Feasibility Study | Durham, New Hampshire

Source: NHDES, VHB, ArcGIS Online, Weston & Sampson

Limits of Inundation
Alternative 5 – Dam Removal
Low Tide, Very Low Flow