APPENDIX I

Summary of Public Outreach, Comments, & Response

Concord River Diadromous Fish Restoration Feasibility Study
Summary of Public Outreach, Comments, & Response

This appendix provides a summary of the public outreach process during the feasibility study phase of this project, public comments received on the draft report, changes made to the final report, and topics recommended for further analysis.

A public info session was held at the Middlesex Canal Museum & Visitor Center in Billerica, MA on August 7, 2014 to kick off the project. Meeting invitees included owners of properties abutting the lower Talbot Mills Dam impoundment, Conservation Commissions of towns along the extent of the impoundment, watershed and other environmental organizations, historical associations/commissions, regional planning agencies, state and federal agencies, members of the public, and other stakeholders.

A second public meeting was held February 23, 2016, also at the Middlesex Canal Museum & Visitor Center, to present the findings of the study and the draft feasibility report. This meeting was followed by a six-week-long public comment period during which the draft feasibility report was made available digitally and in hardcopy at the Billerica Public Library, the Middlesex Canal Museum & Visitor Center, and the Lowell Parks & Conservation Trust (LPCT).

Based on public interest, the content of the February meeting was presented again on May 4, 2016 at the Middlesex Community College in Lowell to target stakeholders in the lower half of the watershed. An offer was also extended to present the study directly to the Billerica Board of Selectmen, but they were satisfied that members of the Billerica Conservation Commission who had attended the previous meetings were the appropriate audience for the study.

The purpose of the finite comment period was simply to allow for the review and inclusion of comments in this report. However, comments received after the official deadline were still incorporated if the commenter so desired. The project partners appreciate the support and constructive feedback expressed for the Concord River Diadromous Fish Restoration Feasibility Study and encourage continued involvement in the public informational meetings that will be held as the project develops. Comments on the project will continue to be accepted by the project partners at any time throughout this process.

Following is a list of commenters in the order their comments were received. Copies of original comments are provided at the end of this appendix. Note that relevant newspaper articles have also been included as a reference for future phases of this project.

- 02/26/2016 – Bruce Lessels, Zoar Outdoor
- 03/09/2016 – Keith Morgan, Lowell Resident
- 03/11/2016 – Billerica Historical Commission
- 03/13/2016 – Marlies Henderson (Newspaper Article)
- 03/14/2016 – Middlesex Canal Commission: Billerica Section
- 03/19/2016 – David Graham, Billerica Resident
- 03/24/2016 – Mary Leach (Newspaper Article)
- 03/25/2016 – Massachusetts Division of Fisheries & Wildlife
- 03/27/2016 – Linda and Vito Couch, Billerica Residents
- 03/29/2016 – Sudbury, Assabet & Concord Wild and Scenic River Stewardship Council
- 03/29/2016 – Paul Nuccio, Billerica Resident
- 04/04/2016 – Edward Reiner, Billerica Resident
- 04/04/2016 – Rickard Parker, Billerica Resident
Following is a list of major changes that were made to the final report in response to these written comments or feedback received during the public meetings:

- Updated information about public outreach, meetings, and comment period in Section 1.3.
- Explained the process for implementing and updating fish passage plans at active hydropower projects licensed by the FERC (such as the Essex Dam or Lawrence Hydropower Project) in Section 2.1.1.
- Updated Figure 2.1.2-2 with a full image showing the detail of the Fordway Bar.
- Added Figures 2.1.2-3 and 2.1.2-4 showing historical plan and sectional views of the Billerica Mills area and the Fordway Bar.
- Added data describing the extent of water chestnut infestation in the SuAsCo watershed and Talbot Mills Dam impoundment in Section 2.1.4.
- Clarified discrepancies in the height of the Talbot Mills Dam reported in different sources in Section 2.2.3.
- Added Figures 2.2.3-4 through 2.2.3-5 (historical drawings of the Talbot Mills Dam)
- Revised Figure 2.2.3-6 (Timeline of Historical Events for the Talbot Mills Dam Site).
- Added references to various historical features and events (e.g., the Faulkner Canal, a former turbine pit, towpath drawbridge abutments, and a flywheel explosion incident) in Section 2.2.3.
- Added 2016 fish count data to Table 2.4.1-1 and Figures 2.4.1-1 through 2.4.1-3.
- Explained why fish count data is only provided for the Merrimack River in Section 2.4.1 (no similar record exists for the Concord River since the long term presence of dams with ineffective or no fish passage facilities has extirpated anadromous fish runs there).
- Fixed labeling error in Figures 3.2.1-1 and 3.2.1-2 (Map of Talbot Mills Dam Impoundment Sediment Transects & Samples).
• Clarified the run-of-river dam concept and that no changes to the flow regime downstream of the Talbot Mills Dam are anticipated with either alternative (Sections 4.3.2 and 4.3.3).

• Replaced Table 5.0-2 (the decision matrix) with a summary table of potential benefits, impacts, and other factors associated with alternatives at the Talbot Mills Dam.

• Removed references to “decommissioning unsafe infrastructure” and “improving flow regime” as potential benefits for the Talbot Mills Dam removal alternative (Sections 4.3.3 and 5). Questions raised about whether the dam meets current dam safety regulations have not been officially addressed by the ODS. Additionally, in a run-of-river dam situation, the “flow regime” improvements that are anticipated following dam removal largely consist of decreased hydraulic residence time (i.e., the amount of time water spends in the impoundment) leading to decreased water temperature, which is redundant with the water quality benefit already listed.

• Added Appendix H – Historic and Archaeological Reconnaissance Survey Report.

As recommended in the report and supported by the comments received, additional analysis would be warranted prior to implementing any preferred alternative. In particular, if the Talbot Mills Dam removal alternative (3B) is advanced to the next phase of feasibility study, additional recommended studies include, but are not limited to, the following:

• **Topographic survey** – Detailed topographic survey should be collected of the Talbot Mills Dam and vicinity, including all potential construction access and staging areas and the channel downstream of the dam.

• **Wetlands, wildlife, & botanical resources survey** – A formal wetland delineation would be needed to quantify the size, type, function, and value of the wetlands within and adjacent to the lower impoundment (up to the Pollard Street bridge). A vegetation inventory could be performed to determine existing fauna and likelihood of invasive encroachment. Additionally, state and federal agencies should be consulted to identify any potential rare, threatened, or endangered species in the project vicinity.

• **Bathymetric survey** – Bathymetric survey of the lower impoundment and extending up to the Boston Road/Route 3A bridge could be collected to capture the highest point of the Fordway Bar (above the Fordway Bar would be sufficient, but the Boston Road/Route 3A bridge would be conservative to ensure that the highest point of the bar is captured).

• **Sediment probing** – Additional sediment probing immediately upstream (about 8-12 feet) of the dam could be conducted to attempt to locate the 1798 dam structure and in the area of the highest point of the Fordway Bar (as determined by the bathymetric survey) to evaluate the potential for the bar to head cut following dam removal.

• **Ground-penetrating radar** – GPR could be conducted above the primary spillway to attempt to map the upper surface of bedrock beneath the dam for the purposes of the hydraulic model and for evaluating upstream impacts and the ability to meet target fish passage thresholds following dam removal. Additionally, GPR could be collected just upstream to attempt to locate and characterize the reportedly buried 1798 dam structure, to help inform cultural resource
mitigation approaches and for cost estimating purposes. It was noted that if a GPR survey is conducted, the MCA may be interested in expanding the coverage area to attempt to locate any historic artifacts buried in the impoundment (e.g., floating towpath structures).

- **Hydraulic modeling** – Additional hydraulic modeling could be conducted to incorporate the results of the bathymetry survey, additional probing, and GPR to refine expectations for impacts to upstream resources such as water levels, wetlands, water supply, infrastructure, cultural resources, recreation, aesthetics, etc. Associated model output tables and figures and the design plans would be updated accordingly.

- **Sediment sampling** – Additional samples will likely be needed to inform the sediment management plan. Up to 8 additional samples may be required to be collected within the impoundment to fully characterize the estimated volume of mobile sediment with one sample per 1,000 CY of sediment (for a total of 10 samples within the approximately 9,500-CY volume of mobile sediment). Samples could also be collected within areas of the impoundment expected to stabilize as floodplain wetlands post-dam removal as discussed above, such as in the areas north and south of the floating towpath peninsula. Additionally, samples could be taken in depositional areas downstream of the dam to provide context of contaminant levels in the river system compared to levels in the impoundment. Upstream of the dam’s influence, samples could be collected in either or both of the Sudbury and Assabet Rivers.

- **Pollard Street Bridge assessment** – Sediment samples would be collected at the bridge site to characterize the grain size distribution for use in the sediment transport and scour analysis (below). Additionally, visual inspection and probing could be conducted around the bridge piers/abutments to confirm whether the dense substrates indicated by the boring logs are present and would reduce the risk for scour.

- **Sediment transport and scour analysis** – If sediment quality and quantity are determined to be appropriate for stabilization or release, a sediment transport and scour analysis could optionally be performed.

- **Recreation/aesthetic study** – Optionally, a survey of recreation and aesthetic interests could be conducted to inform future uses of the site. A spring flow (e.g., average daily flow in March and/or April) could be added to the hydraulic model to help quantify the visual changes for residents who visit the Talbot Mills site to view spring flows.

- **Cultural resources mitigation planning** – While not technically a study, it will be essential to initiate planning efforts to mitigate potential impacts to historic and/or archeological impacts as early as possible in the process.

This feasibility study is not intended to identify a preferred alternative, but rather provides a critical foundation for ongoing and future restoration activities as well as a framework for continued communication between project partners and the public to determine how best to reconcile project goals with other interests. If preferred alternative(s) can be agreed upon, the project will advance to future phases of securing funding, additional feasibility work (as described above), consultation with interested parties, design, and construction to ultimately restore diadromous fish passage to the Concord, Sudbury, and Assabet Rivers.
On Wed, Mar 2, 2016 at 12:21 PM, Jane Calvin wrote:

Eric,

Bruce Lessels, the owner of Zoar Outdoor, has reviewed the study and sent me their comments. I asked if it was OK to share his comments (below) with you. If you need something more formal as an official support letter, please let him know. He trained for the world championships on the Concord and knows it well!

Jane

Jane Calvin, CFRE
Executive Director
Lowell Parks & Conservation Trust, Inc.

SCHEDULE: Monday - Thursday
Lowell Parks & Conservation Trust
mailing: PO Box 7162, Lowell, MA 01852
street address: 660 Suffolk St., Suite 120, Lowell, MA 01854
www.lowelllandtrust.org
978-934-0030
(f) 978-454-7637

From: Bruce Lessels [mailto:bruce@zoaroutdoor.com]
Sent: Friday, February 26, 2016 3:45 PM
To: Jane Calvin
Cc: Stephen Conant; Brian Pytko; Kevin McMillan
Subject: Re: FW: Public Meeting 2/23 - Concord River Diadromous Fish Restoration

Jane,

I just read over the executive summary with Kevin and it looks like the changes proposed could enhance the whitewater on the Concord. Here are our suggestions:

- Talbot Mills is well above the run, but the dam removal could create a rapid that was fun for kayakers. It's unlikely to be useful for rafters since there's a couple of miles of flatwater between Talbot Mills and the section we run.

- We assume the Centennial Falls dam will stay in place since it's critical to the hydro operation. Improvements to the fish ladder are unlikely to affect the whitewater downstream.

- Modifying the channel at Middlesex Falls could make it a more enjoyable rapid. We're especially intrigued with the possibility of opening the channel to the right of the dam. I worked with Steve years ago to propose a whitewater park in that channel. If that were built it could provide great fish passage and would greatly improve the whitewater on the river.
Thanks for sending this along. Let us know if we can help as the planning proceeds.

Hope you're having a good winter (if that's what we're calling it!)

Cheers,

Bruce

On Thu, Feb 25, 2016 at 10:11 AM, Jane Calvin <jcalvin@lowelllandtrust.org> wrote:

Hi folks,
I’ve attached the presentation from a meeting on Tuesday night regarding fish passage on the Concord, including Wamesit Falls, Middlesex Dam, and the Billerica Dam.

This link has all the files in the larger feasibility study: https://app.box.com/s/155mb74ylw8mkdfdl9sq8lodel8umil1z

Please take some time to review this and get your thoughts to me.

Thanks,
Jane

Jane Calvin, CFRE
Executive Director
Lowell Parks & Conservation Trust, Inc.

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From: Keith S. Morgan [mailto:ksnagrom@verizon.net]
Sent: Wednesday, March 09, 2016 9:22 PM
To: Jill Griffiths <jgriffiths@gomezandsullivan.com>
Subject: Concord River fish restoration study

Ms. Griffiths:

I attended your lecture on the Concord River diadromous fish restoration project held at the Middlesex Canal Association Museum on Tuesday, February 23, 2016. The overall presentation was excellent, with a thorough review of the possible fish passage scenarios presented for the dams along the Lower Concord. My only comment would be in regards to future fish passage efforts that might be considered at the Essex Dam (the Great Stone Dam) found in Lawrence, MA. As this dam remains the primary barrier to fish passage from/to the Atlantic, a future presentation at the same level of detail as the Concord River study would seem appropriate for a discussion of possible improvements to the current fish elevator and primitive eel run found at this site. Further, given the cancellation of the salmon restoration program, which included fish counts at the elevator and capture/transport of the salmon to sites above the Pawtucket Falls dam in Lowell, MA, a review of the potential for the re-design of the South Canal as a fish passage facility might also be warranted.

With respect to the dam at the Talbot Mills, I would favor the proposed fish passage design which included the repair of the dam itself. Such an enhancement could only serve to improve the upstream boating/fishing opportunities in the area. In addition, the renovation/repair of the dam would also leave open the possibility of developing a small hydro-electric facility at the mill complex.

Sincerely,

Keith S. Morgan
Billerica Historical Commission
Town Hall
365 Boston Road
Billerica, MA 01821
February 29, 2016

Jill Griffiths, PE
Gomez and Sullivan
Post Office Box 2179
Henniker, NH 03242

Dear Jill Griffiths:

The Billerica Historical Commission is vigorously opposed to the removal of the Talbot Mills Dam. Since 1708, when Christopher Osgood was granted lands on the west side of the Concord River in exchange for erecting a grist mill to grind grain for the benefits of citizens of the Town, the dam has been an integral part of the Billerica’s rich history. Throughout the centuries the structure has continued to contribute to the development of the area. It fostered the success of an early transportation system (the Middlesex Canal [“the greatest work of the kind which has been completed in the United States {Albert Gallatin, 1808}]), the beginning of Billerica’s industrial base [the Faulkner Mill {1811-1988} and the Talbot Mill {1857-1964}] and, even today, the proposed creation of the Mill Pond Park and Museum [1997-present] which will preserve this heritage for the benefit of all.

Without the dam none of these beneficial endeavors would have occurred. The Talbot Mill dam is at the nexus of two National Register Properties the Middlesex Canal Historic District and the North Billerica Mills District making its preservation uniquely important. Its removal would significantly affect the area and the development of the Mill Pond Park and Museum. It appears that the extant remnants of the Middlesex Canal north and south of the Concord River would be dewatered, the spit of land which once supported the south end of the towpath would be engulfed in vegetation, and timber cove would be drained. (It is clear, from past experience, that once dewatered the emptied canal prism is rife for development.) Each, singly and collectively, contribute greatly to establishment of the Museum and Park at the site. After all isn’t “a picture worth a thousand words”?

Evidence presented in the article suggests that the removal of the dam would not significantly reduce flooding beyond the Fordway Bar, but that the main purpose of the Concord River Fish Restoration Feasibility Study was the promotion of fish and eel migration upstream not flood control. The appendix of the report is filled with useful information including a detailed
chronology of the fish and eel population at the Essex Dam in Lawrence. It lacks, however, a similar census at the Talbot Mill Dam. It seems that such a count is of primary importance prior to any action being taken. Despite this oversight, the Commission members are not unsympathetic to the objectives of the feasibility study.

If nothing is done, a dam failure, although unlikely, will be a risk to the public. If the dam is breeched the plans for the Mill Pond Park and Museum will be severely compromised to extent of abandonment. If a Technical Fishway is erected the initial cost and future maintenance will be pricey. Although more costly, the third alternative would be the “best for both worlds”: the fish and nature enthusiasts on one hand and the historical preservationist on the other.

In conclusion, even the earliest mentions of a dam at the site include references to fish passage. In fact, a fishway, if done properly, and in conjunction with the MCA and MCC, would add to the educational opportunities afforded by the Mill Pond Park. As a consequence, the Billerica Historical Commission believes that the installation of a Technical Fishway at the Talbot Mills Dam would not be detrimental to the historic character of the area and, as such, is the desired alternative.

Sincerely,

Alec Ingraham
BHC Chair
It's historic water over the Talbot Dam

By Marlies Henderson, Special to The Sun
Updated: 03/13/2016 10:16:29 AM EDT

READ UP ON the draft feasibility report yourself. There are two copies at the Billerica Public Library, two copies at the Middlesex Canal Museum & Visitor Center, and one copy at the Billerica Conservation Commission. You can also find it online at http://tinyurl.com/ConcordRiverFishStudy.

BILLERICA -- The Billerica dam over the Concord River and its waterfall are an iconic landmark. If you haven't enjoyed the scene from the little gazebo yet, go see it soon: A dam may have been there for the past 300 years, but changes are being discussed.

This most recent turn of events in the dam's story starts in the 1960s and '70s. The Nyanza Chemical Waste Dump caused deadly contamination in its environs by releasing polluted industrial wastewater into the Sudbury River, a tributary to the Concord River. Nyanza was ordered to pay Superfund settlement money to fund "river restoration," and it was eventually determined that the Concord River dam in Billerica deserves the focus of restoration attention -- because it is an obstacle for fish passage that blocks access to fish habitats in the Concord, Sudbury and Assabet rivers.

READ UP ON the draft feasibility report yourself. There are two copies at the Billerica Public Library, two copies at the Middlesex Canal Museum & Visitor Center, and one copy at the Billerica Conservation Commission. You can also find it online at http://tinyurl.com/ConcordRiverFishStudy.

The restoration work demanded a project feasibility study, the draft of which recently was presented at the Middlesex Canal Visitor Center near the falls.

As a North Billerica resident without the slightest passion for fishing, I had strong feelings about maintaining the status quo and securing environmental and historical preservation. However, the presentation about the so-called Concord River Diadromous Fish Restoration Project gave lots of food for thought.
The project is in the hands of state and federal fisheries and environmental agencies, aided by an engineering/environmental consulting firm and a historical/archeological group. The purpose of the study is "to evaluate the feasibility of restoring populations of diadromous fish to the Concord, Sudbury and Assabet rivers.

"Diadromous fish depend on passage between ocean and freshwater habitats to complete their life cycle. From a fish and fishing perspective, the Billerica Dam is an obstacle.

The Concord River evolved over 10,000 post-glacial years without a dam. Today's mill pond was a series of rapids; ideal fishing grounds with Native American encampments. In the 1600s, colonists used the fisheries, and in 1711 the first dam was constructed only to be highly contested by upstream farmers who lost meadow land to the rising water level. In 1800, the dam was raised further to form a summit pond providing water for the Middlesex Canal: It supplied the water to power 20 locks north to the Merrimack River and south to the Charles River -- an engineering feat of its day.

After the canal could no longer compete against the iron horse it helped to build, along with its railroad tracks, the Middlesex Canal Company disincorporated and sold the dam and surrounding land to the Talbot brothers in the 1850s. The dam was soon ordered removed, and the dam owner was compensated with a more reliable steam-powered generator for the mill; and yet the useless dam remained, even if its condition deteriorated, and Henry Thoreau himself called for those natural rapids to be restored.

The draft study offers three options: No action; construct a fish ladder; or breach the dam. Although doing nothing sounds attractive, it was soon pointed out that the privately owned dam has not seen maintenance since the 1850s, and may give way at a most inconvenient time -- during a flood, causing a disaster downstream. Repairs are needed.

The fish-ladder option would not guarantee a high efficiency of fish passage, yet is the most expensive option to construct -- and costly to daily maintain -- but it would preserve the early industrial development in Billerica, which colonists initiated, driving out the native population.

Interestingly, the current dam structure does not contribute to flood control. Dam removal decreases upstream water levels up to about one foot, because of the so-called Fordway Bar, a high rock ledge near the Fordway (Pollard Street) Bridge. Thus a breached dam would not affect the town drinking-water intake, or significantly lower water levels in the Elsie Avenue flood plain.

A controlled dam breach would transform the choking water-chestnut-invaded mill pond into a series of fresh-water rapids one could actually paddle, instead of having to portage around the dam!

Another advantage of removal is that the pond will be reduced to a narrow, riverine channel. Archeologists will be able to search the mucky bottom of the former mill pond for fragments of the 1944
exploded Talbot flywheel, remains of the historic floating towpath, an early lower wooden dam, and artifacts of pre-contact Native American "village" sites.

Tribal Historic Preservation offices will be involved with this archeological fieldwork, which reminds us of the sustainable land use of the Native Americans that lasted many millennia before colonists replaced it with unsustainable early industrialization, which generated profit for one century.

There is more to restore than the population of diadromous fish. With Thoreau I hope for the restoration to pre-industrial times; Mother Nature redeemed. The mill-pond drawdown is a bonus, as is the possibility to navigate the Concord all the way to Lowell.

Take Action
Dear Ms. Griffiths:

The Middlesex Canal Commission: Billerica Section members, who were present at the March meeting, are unanimously against the removal of the Talbot Mills Dam on the Concord River in North Billerica. In the absence of doing nothing, the installation of a technical fish way would be the desired alternative. Presented below is a list of excerpts from the Commission’s recent meeting.

1. The removal of the dam would summarily destroy the mill pond and subsequently derail the decade long effort to establish the Mill Pond Park at the site. During that time frame the Middlesex Canal Museum and Visitor Center was established, a charrette was held to inform the public of the endeavor as well to secure feedback, the necessary easements were secured from CRT and Pace Industries, preliminary design work for the Park was accomplished, and the process to obtain funding is underway. A professional description of the removal of the dam along with an archive of the structure is not an adequate substitute. Few individuals, if any, will ever seek out this passive information, which will eventually be lost in time. The dewatered portion of the river will yield few if any artifacts from earlier years. These would have been recorded when the mill pond was last drained.

2. The study lacked a clear explanation as to what benefit fish migration upstream of the dam would be obtained as compared with the establishment of the Park. Would anyone who caught a fish in the Concord River system actually eat it? How many canoes will bottom out at the Fordway or smash on the rocky ledges which now exist below the falls? Even in June, during a Riverfest, canoe rides upstream of the dam were limited to the mill pond. Travel toward Pollard Street was hindered by ledge submerged in the river bed. Removal of the dam would only exacerbate this situation. How far beyond the Fordway is the river navigable upstream? Is there clearance for small boats at the Rte. 3A Bridge or the River Street Bridge?

3. In the case of severe drought, it was not clear that the Town’s water intake would not be affected. No discussion of how the removal of the dam might affect the outflow from Billerica’s sewerage plant downstream.

4. There was no information provided in the report as to the type or style of the dams further upstream and how their removal might further promote fish migration.
5. There was no mention of how many municipal sewer systems upstream of the dam dump treated sewerage into the river and as to how many riparian homes in the area maintain on-site septic systems. The report was mute on how such activity might affect fish migration. The proposal was narrowly focused on the three dam complex from the confluence of the Merrimack and the Concord Rivers to the Talbot Mills Dam.

6. It was clear from the presentation that the dam was not purposed to provide flood control. Its removal would provide only a scintilla of flood relief upstream of the Fordway at the Pollard Street Bridge. Although touched upon in the report, how much sediment retarded now by the dam will be unleashed downstream if the dam is removed? What hazards might this cause downstream? How much will remain at the site and how will it affect the area?

7. At times of low-water it appeared that the Fordway would hold back sufficient water to create a marsh for some distance downstream of it, which would be a detriment to fish migrating further upstream, which is the objective of the project.

8. One advantage of removing the dam would be the elimination of the invasive water chestnut which invades the mill pond each summer. This will only be replaced by equally invasive species of plants including poison ivy, purple loose strife, and Japanese knot weed. This is not much of a trade-off.

9. The report lacked an accurate census of just how many alewife, herring, etc. actually make it to the Talbot Mill Dam. The census was taken miles away at the Essex Dam on the Merrimack. How will the fish discover that travel upstream is available?

10. The proposal was narrowly focused on the three dam complex from the confluence of the Merrimack and the Concord Rivers to the Talbot Mills Dam. Are there unanticipated obstacles upstream which might negatively influence fish migration?

11. If the dam is removed remaining sections of the canal in the area will be dewatered, as well as timber cove. This will expose the dewatered sections to development and provide an undesirable means of access to a treasured archeological site. Although scouring at the bridges in the area was judged to be insignificant, will scouring affect the piers that support one of the Pace Industry Building under which the river flows?

12. Probably the most troubling aspect of the whole proposal is the lack of any guarantee that the removal of the dam will actually promote fish migration upstream. After reading the report it appeared to some that fish migration upstream of the dam is anyone’s guess.

In the opinion of the MCC: Billerica Section members present believe that the removal of the dam is a risky experiment that cannot be rectified once done. As a consequence, the only equitable solution is the installation of a technical fishway.

Sincerely,

Alec Ingraham, Chair MCC: Billerica Section
Debra Fox and Andy Bowen
I have picked up the Draft Report at Town Hall and I have concerns regarding my property located at:

32 Seven Oaks Road

North Billerica, MA 01862

The report mentions the upstream benefits. My property borders the river on the down steam side of the dam and I'm concerned about what affect the removal of the dam and the effect it will have on the bank that is on my property. The high water that occurs during and after a major rain or after the snow melts presently creates a high water level that works its way up the bank on my property.

I will need to be assured that the study addresses the down stream affect on the properties on the Concord River. I spent a significant amount of money to contest that my property is not in the flood plain.

If the project proceeds, what are my rights to recover any damage and costs as a result of the removal of the dam?

I am hoping that preventative measures are taken to insure that there will be no damage to the down steam properties.

If you have any questions, please contact me on my cell at 978-758-7274

Thank you- David Graham
Officials seek input on Billerica's Talbot Mills Dam proposal by April 6

State and federal agencies are soliciting public comment on a preliminary proposal that could alter the face of the historic Talbot Mills Dam in North Billerica — or remove it completely — to provide migrating fish better access in the Concord River.

The Massachusetts Department of Fish and Game Division of Marine Fisheries, with support from the National Oceanic and Atmospheric Administration Restoration Center, the US Fish and Wildlife Service, and the Massachusetts Department of Environmental Protection, used funds from the settlement from the Nyanza superfund site to explore the feasibility of restoring populations of diadromous fish to the Concord, Sudbury and Assabet Rivers. The Talbot Mills Dam was reviewed as an impediment on the Concord River to these fish which migrate from fresh to salt water as part of their life cycle.

The groups presented their preliminary findings at a public meeting held on Feb. 23, the same evening as the special town meeting vote on the new high school. Their report and slides from the public meeting are available on line and at the Billerica Public Library. Residents are encouraged to review the report and offer comments by April 6.

According to the preliminary report prepared by Gomez and Sullivan Engineers, DPC, the primary impediment to fish passage in the Concord River is the Talbot Mills Dam in North Billerica. Prior to reaching the dam, fish must first navigate potential obstacles at the Essex Dam (an active hydro dam with a fish elevator and an eel ladder) on the Merrimack River in Lawrence, Middlesex Falls (a natural bedrock falls and remnants of a breached dam) on the Concord River in Lowell, and Centennial Falls Dam (a hydropower dam with a fish ladder), also on the Concord River in Lowell.

Diadromous fish, which include river herring (blueback herring and alewife), American shad, American eel, and sea lamprey, are fish that depend upon passage between marine and freshwater habitats to complete their life cycle. These fish have historically moved through the Concord River, which passes through Billerica, and face an impediment to their migration at several points including the Talbot Mills Dam, the report notes.

The engineers reviewed existing information, hydrologic and hydraulic analyses, structural assessment, evaluation of impounded sediments, and prepared conceptual design of fish passage options, The Public Archaeology Laboratory was subcontracted to conduct a cultural resources analysis.

This feasibility study, which was not intended to identify a preferred alternative, found that fish passage restoration in the Concord River is technically feasible; possible to combine two or more alternatives together, implemented simultaneously or in phases; and over 35 miles of diadromous fish habitat on the main stem rivers, plus more than 100 miles of habitat on tributaries, could be restored.

The feasibility study describes three options for the Talbot Mills Dam including doing nothing, removing part of the dam and creating a fish ladder, or removing all of the dam. The consultants note that the last two options, which alter the dam, are the only ones that will allow for fish passage. The full details of their findings on these options are included in the preliminary report.

Privately owned, the Talbot Mills Dam is listed in the National Register of Historic Places as a contributing resource to the Middlesex Canal Historic and Archaeological District, and is a potential contributing resource to the Billerica Mills Historic District. The dam is also within the North Billerica Mills Local Historic District. The first dam was erected at the location of the current Talbot Mills Dam in 1710-11 by Charles Osgood. Prior to the damming of the Concord River in North Billerica, the area was used by generations of Native Americans as an encampment and fishing grounds.

The Middlesex Canal Association's board of directors voted on March 2 to oppose the removal of the dam. The summit pond behind the dam is the center of the Middlesex Canal Park, for which the Commonwealth’s Middlesex Canal Commission has already spent thousands of dollars to bring it to the 25 percent design level, said the association's president J. Jeremiah Breen.

“Though the park has been stopped at the 25 percent level for several years, the Northern Middlesex Council of Governments still budgets $3.4 million for its future construction. With a filing deadline of April 6 for public comment on restoration of diadromous fish to the Concord, Bill Gerber has volunteered to write the polemic arguing the association's opposition to removal and in favor of the Commonwealth’s Middlesex Canal Heritage Park at the summit pond.”

Edward Reiner, a resident who lives along the river, attended the public meeting.

“I support the effort and believe dam removal is the best option. It would have the highest certainty of success in passing the most fish, and provides additional water quality and flood improvement benefits,” he said.

Written comments are welcome and encouraged. To access the full feasibility report, visit http://tinyurl.com/ConcordRiverFishStudy. Hard copies available at Billerica Public Library. Please send comments by April 6, 2016 to Jill Griffiths, PE | Gomez and Sullivan Engineers PO Box 2179 | Henniker, NH 03242 jgriffiths@gomezandsullivan.com.

March 24, 2016 12:27PM
This letter is to express the Division’s strong support for the Concord River Diadromous Fish Restoration Program. The Division recognizes the quality of the habitat and the potential for fisheries restoration that exists in the Concord River.

This project will reconnect miles of quality habitat to the Merrimack River and benefit both migratory and resident fish species. Tributaries to the Merrimack River were once important habitat for migratory fish species like American shad, Sea lamprey, Alewife, Blueback herring, and American eel. All of these species are now present in the Merrimack River at the mouth of the Concord River. Given the opportunity, it is likely that individuals of each of these species will enter the Concord River. Fisheries surveys have documented American eel in the watershed already, and it is likely that the newly opened habitat will support spawning and rearing of Sea lamprey, Alewife, Blueback herring, and possibly American Shad.

The Division supports the Draft Feasibility Study as presented and believes it contains enough information to allow the process to advance to the next step—choosing preferred alternatives:

- The Division Supports the “No Action” alternative for the Middlesex Falls—at least until many more fish are migrating up the river, at which time a better evaluation will be possible.
- The Division supports the “Fishway Improvements” alternative for the Centennial Falls Dam. The Division has been working through the FERC process to secure safe and effective fish passage at this site and will continue to do so.
- The Division supports the “Partial Dam Removal” alternative for the Talbot Mills Dam. While a technical fishway may be possible at this site, there is no guarantee that once built it will be effective. Even the best designed and constructed fishways are not 100% efficient at passing the target species and much less efficient for non target species. Fishways at non-FERC dams also pose serious concerns as no one will be legally obligated to provide the required ongoing.
operational oversight and maintenance. Without daily observation and adjustment a fishway will not maintain its effectiveness. A river without a dam will always pass fish.

I am excited about the prospect of reconnecting another tributary to the Merrimack River system. I look forward to working with you and the other project partners on this worthwhile project.

Sincerely,

Caleb Slater
Anadromous Fish Project Leader
To whom it may concern,

As residents of 30 Billerica Avenue in North Billerica, who live approximately 1/2 mile from the Talbot Mill, we are responding to the March 24 Billerica Minuteman article concerning dam alteration at the Talbot Mill.

We support fish passage options and are favor of either removing the dam or partially removing the dam and creating a fish ladder.

As former contributors and supporters of the Middlesex Canal Museum in North Billerica, we especially support the latter option in order to preserve, at least in part, the mill's historical connection and dependence upon the dam.

Best regards,
Linda and Vito Couch
3/29/16

Jill Griffiths, PE
Gomez and Sullivan Engineers
P.O.Box 2179
Henniker, NH 03242

Re: Comments of the Sudbury, Assabet and Concord River Stewardship Council and National Park Service on the Concord River Diadromous Fish Restoration Feasibility Study Draft Report

Dear Ms. Griffiths:

The National Park Service (NPS) and Sudbury, Assabet and Concord River Stewardship Council (RSC) have reviewed the Concord River Diadromous Fish Restoration Feasibility Study Draft Report (Draft Feasibility Report) and offer the following comments.

Background
Twenty-nine miles of the Sudbury, Assabet and Concord Rivers have been nationally recognized by Congress as Wild and Scenic Rivers due to their “outstandingly remarkable resource values,” including scenery, history, literature, recreation and ecology. The NPS is responsible for the long term protection of the River and administering the Wild and Scenic Rivers Act. The NPS works closely with the River Stewardship Council, which was created through the Wild and Scenic River designation as an advisory and coordinating body. The RSC is comprised of local, state and federal governments, as well as the Sudbury Valley Trustees and OARS.

Opportunity to Enhance The Free-Flow and Ecology of the Concord River
The NPS and RSC are very excited about the conclusions of the Draft Feasibility Report. The restoration of diadromous fish runs to the entirety of the Concord River would be a highly significant accomplishment, and would greatly enhance the ecological value and integrity of the SuAsCo Wild and Scenic River. In addition, the potential to restore and enhance free-flowing conditions of the Concord River mainstem is exciting in its own right. It is also significant that the Draft Feasibility Report confirmed that the Fordway Bar serves as a natural grade control structure that would prevent large scale water surface elevation changes with the designated Wild and Scenic River area. Our reading of the hydrologic data in the Draft Feasibility Report is that normal water surface elevations within the Wild and Scenic segment would be unaffected by any of the alternatives, while a slight decrease in flood elevations would be experienced. If this is correct, then we see no issues in that regard.
Historical Values

While the Talbot Mills Dam is outside of the designated Wild and Scenic River area, the NPS and RSC believe that the preservation and enhancement of the historical values associated with the Dam and Middlesex Canal is of high importance. To that end, we believe that any project undertaken to restore diadromous fish resources must also seek to protect and enhance those historical values. The Draft Feasibility Report recognizes this imperative, and proposes to advance historical preservation and interpretation within the context of whichever alternative is ultimately pursued. We support this approach.

Potential to Extend Wild and Scenic River Designation

It has long been recognized that the presence of the Centennial Falls Dam and Talbot Mills Dam, together with their effective blocking of diadromous fish runs in the Concord basin, represent obstacles to past or future consideration of extending Wild and Scenic designation beyond its current limits (Rte 3 Bridge, Billerica). The restoration of diadromous fish runs in the Concord River would remove one of these obstacles. Additional actions that might enhance free-flowing condition at all three sites (Middlesex Fall, Centennial Dam and Talbot Mills Dam) would also support a potential reconsideration of existing Wild and Scenic boundaries.

Conclusion

The NPS and RSC are supportive of the alternatives and actions within the Draft Feasibility Report which would advance the restoration of diadromous fish runs within the Wild and Scenic SuAsCo River segments. We support the “next steps” in considering and refining the feasibility of the alternatives, especially as relates to the Talbot Mills Dam site, which is clearly the most complex. The NPS and RSC will offer whatever assistance it can to the realization of diadromous fish and free-flowing river restoration, coupled with historical resource protection and enhancement. Please contact our new project manager, Sarah Bursky@nps.gov tel 617 223-5049 if you would like to discuss our letter or any related follow-up.

Sincerely,

Anne Slugg, Chair
River Stewardship Council

Sarah Bursky
National Park Service
Good morning,

I have been reading various posts regarding the dam in North Billerica. I have much interest in both the preservation of history and also fishing. It would be my hope that those involved will be able to strike a happy medium. Although I am certainly not an expert in such matters, the idea of creating a fish ladder within the dam structure, perhaps off to the side, could help to accomplish both goals. It is my opinion that removing/destroying the dam altogether would be a mistake and not in the best interest of the citizens of that area.

Thank you for the work that you do!

Best regards,

Paul Nuccio
21 Greenleaf Street
Billerica, MA 01821
(978) 670-5564
Dear Ms. Griffiths,

I want to commend you and your team for preparing a great report.

My property at 1 Pinewood Avenue in Billerica abuts the Concord River lying approximately 3 miles upstream of the North Billerica Dam. I have lived at this location since 1986, or about 30 years. During this time, I have kept track of water levels during floods and droughts using a benchmark elevation which was surveyed on my property at the top of a concrete wall. I have already provided key flood elevation information to your project team which appears to be included in your assessment. I have also marked high water marks from two floods on several of the Billerica Bridges on the Concord River. These marks can be surveyed in and used to verify the observed high water marks if needed.

I am also a Biologist employed by the federal government for 37 years evaluating federal wetland permit applications. I support the goal of restoring fish passage to the Concord River, and believe dam removal is the best option. It would have the highest certainty of success in passing the most fish, and provides additional water quality and flood improvement benefits that would not be provided with a fish ladder alternative.

I have reviewed the draft report and concur with the reports findings with respect to the elevation of the dam, lack of flood control value, lack of operational low level outlet gates, and inadequate spillway capacity. I also concur that the Fordway Bar which is located approximately 1/3 of a mile upstream of the dam, would control upstream water levels preventing any adverse impacts to the upstream river and wetlands as a result of dam removal. Fordway Bar is a natural hardened gravel and bedrock feature located both upstream and downstream of the existing Pollard Street Bridge. Measurements taken at this location have confirmed that the bar has a top elevation at approximately 107.2 feet (NAVD 88), which is approximately 12 inches below the crest of the North Billerica Dam. If the dam is removed, the maximum reduction in water levels would be limited to less than 12 inches and this would only occur during the lowest flows.

The 1/3 of a mile of river between Fordway Bar and the dam would revert a free flowing river with three rapid areas which were formerly inundated by the dam construction. Restoration of a free flowing river as would be achieved by the dam removal alternative is consistent with the Clean Water Act goal of restoring the physical, chemical, and biological integrity of our nations waters.

Most importantly to me, is the potential to slightly reduce the frequency or severity of floods by dam removal. The reduction of flooding may also be limited to about one foot. Any reduction of floods would likely be supported by upstream residents as nuisance flooding has become a frequent occurrence. Flooding in the future will likely become more severe as the upstream watershed continues to be developed with more impervious surfaces and as a result of climate change producing more frequent higher intensity storms. I concur with the report which mentioned that upstream bridges have an influence on water levels. Each bridge, including the remains of a center pier from Bridge Street affects upstream water levels. While hydraulic improvements have been made at the new Pollard
Street Bridge, the River Street Bridge, Route 3 bridge and the Nashua Road bridge (Route 4), the Route 3A bridge and the remains of the Bridge Street Center Pier likely create an impediment to flood flows.

I understand, that the dam no longer is used for either one of the two mills that historically used the water power. All of the sluice way gates at the Talbot Mill have been permanently closed and only one sluice way can be opened at the Faulkner Mill. The low level outlets or so called "Wasting Gates" were historically used to relieve flooding in Billerica. The lack of any ability to open these gates prevents any ability of the dam owner to relieve upstream flooding at present. This situation will not be remedied in the fish ladder alternative. I am also concerned that the fish ladder alternative will decrease the capacity of the spill way and increase upstream flooding as the fish ladder itself, is an intrusion in the flood way at the dam.

If the project proceeds to construction, I would expect that the dam removal can be accomplished by careful removal of the granite blocks that were installed on top of the bedrock outcrop falls. In this fashion, the natural falls or rapids can be restored at the project site. Careful draw down during the removal process will also allow for historical documentation of the legacy dam upstream of the current dam and other artifacts associated with the Canal Tow Path.

Sincerely,

Edward Reiner
1 Pinewood Ave
Billerica, MA 01821.
erreiner2@gmail.com
I support the removal of the Billerica dam.

The dam serves little purpose today. While historically it supplied power to mills and water to the Middlesex Canal it no longer does so. Although it could be treated as a historical artifact and probably will be proposed as such I doubt that it would get much maintenance and, anyway, historically the river was free flowing for thousands of years.

The dam removal will most likely reduce flooding by at least a little and this is of importance to me. I have lived on the river (upstream from the dam) for more than 30 years and I think it has had three 100-year floods in that time. I keep worrying that development upstream will eventually cause rapid rain run-off causing even more and more severe floods. In one flood I experienced here if the water level were just six inches higher I would have had water flowing through my basement windows. The removal of the dam would surely help me and other residents along the river even if it reduced water levels by a foot.

I would also appreciate the restoration of the native fish. Already I've seen formerly threatened birds in my yard and I want to see more of what the original settlers saw. Fish ladders certainly would not do the job as well as a free flowing river and would require maintenance.

My wife concurs with my views.

Rickard Parker
2 Maplewood Avenue
Billerica, MA 01821
Jill Griffith, PE
Gomez and Sullivan Engineers
PO Box 2179
Henniker, NH 03242

Dear MS Griffiths:

Please find the comments and recommendations of the Middlesex Canal Commission relative to the "Concord River Diadromous Fish Restoration Study".

You will also find a previous response to the "Billerica Historic and Archaeological Reconnaissance Survey, PAL #2929, sent to Massachusetts Historic Commission on November 17, 2014.

The Commission has not changed its complete rejection of any alteration of destruction of the Talbot Mill Dam, but is willing to consult and consider any feasible adjacent fish way.

Sincerely,

Thomas Raphael
The Middlesex Canal Commission (MCC) has advised, since the beginning, the Nyanza Chemical Waste Dump Superfund Site Restitution Settlement Committee, from which this Concord River Fish Restoration Feasibility Study has evolved, that it totally rejected any action which recommends the removal or alteration of the Talbot Mills Dam. The MCC and the Middlesex Canal Association (MCA) do not oppose an adjacent fishway which does not impact or alter the appearance and present function of the dam.

The Talbot Mill Dam which was the summit and the source of the water for the canal, maintains the water of the mill pond at the historic level, marked on an existing metal gauge, imbedded in a stone by the Faulkner Mill property. The dam and the mill pond provide the setting for the central feature of the Middlesex Canal Heritage Park.

The Middlesex Canal Commission was established by MGL, Acts of 1977, Chapter 403, for the purpose of laying out, developing and maintaining a Middlesex Canal Heritage Park. The Commission has the POWER and DUTY to assess and evaluate the remaining features and structures, prepare and implement plans to restore and develop the canal and its related structures. The Commission is responsible to the Governor, the General Court and the Chief Executive Officers of each of the nine canal municipalities.

The Middlesex Canal Heritage Park Feasibility Study, published in 1980, conducted by three eminent Archaeologists, under a grant from the Massachusetts Historical Commission, identified all of the extant remains of the canal and recommended they be restored and developed.

The Phase I, Mill Pond/Canal Park Project located on the original Canal Company properties, which passed to the Talbot Mills, Cambridge Tool and now Pace Industries and to which MCC has perpetual easement, was proposed as the center piece of the Heritage Park. It incorporates the remains or location of the Red Lock, the Raft Gate, the North Guard Lock, the Floating Towpath Anchor Stone, the Floating Towpath, the towpath Peninsular and the South Guard Gate. The Middlesex Canal Association Museum and Visitor Center is located in the adjacent Faulkner Mill. The MassDot Project #602,945, is at 25% Design and scheduled for construction with Federal and State Funding.
The remainder of the canal consists of 19 segments, ranging in size from 300' to 6,000', together add up close to 12 miles of the original 27 mile canal. There are overbuilt or neglected locations which may be acquired and added as segments. The segments have been evaluated and concept plans for restoration are presented in the Middlesex Canal Restoration PROGRAM STUDY, by the Waterfield Design Group, dated 2008. This was followed by the plotting within and approval by each municipality of the original boundaries of the complete canal in the Middlesex Canal Assessor's Plate, MAP BOOK. This, was further provided with related period properties and structures by the Massachusetts Historic Commission, and on November 19, 2009 was placed on the National Register of Historic Places. As the Middlesex Canal Historic and Archaeological District

Since the local office of NOAA, through the national headquarters is requires to avoid any adverse effects to the Middlesex Canal Historic and Archaeological District, the dam will not be allowed to be affected in any way.

The Concord River Diadromous Fish Restoration Feasibility Study states it was not intended to identify a preferred goal.
The prime reason for the study was the historical presence of target fish in the river.
There is no assurance of "connectivity" of the target fish with the habitat of the watershed.
There is no urgent or identified benefit to the local fishing industries.
There is no evaluation or consideration of the public esthetic or recreational preferences.
The often lack of public input does not translate to support.
The MCC and the MCA are in favor of and available for consultation and advice on the possibility of an adjacent Fishway.

The Middlesex Canal Commission recognizes the extensive, albeit redundant compilation of the Feasibility Study, nevertheless, recommends that the Project should advance no further than the justification of a fishway.

Executive Committee
April 4, 2016
Ms. Jill Griffiths, PE  
Gomez and Sullivan Engineers  
PO Box 2179  
Henniker, NH 03242  

Ms. Griffiths

Thank you for the opportunity to review the February 2016 Draft Concord River Diadromous Fish Restoration Feasibility Study. I have attached additional Comments and Questions to this letter.

It would be useful if you included some type of high level schedule that defines actions from the time of the 2011 Nyanza Restoration Plan, to this Feasibility Study and to the next phases leading to potential decisions to move forward with some of the alternatives in this study. If fact, providing "notional" schedules for each alternative to accompany cost opinions would provide great insight. These schedules could show the technical studies and permitting phase as well as a construction schedule for some alternatives (Channel Improvements at Middlesex Falls - Alternative 1A, Technical Fishway at Talbot Dam - Alternative 3A and Breaching Talbot Dam Alternative - 3B).

The report indicates that a stocking effort was conducted over several years at different locations in the SuAsCo Basin and that results have been inconclusive. It further indicates that there are fish counts above Essex Dam but does not mention any formal fish observations/counts upstream of Middlesex Falls or Centennial Falls. Is it possible that schedules could be developed showing when these actions might be taken? It seems this information would be critical to the Decision Maker for alternatives 3A and 3B. Hopefully it can be verified that there are fish that could take advantage of a project in the Talbot Mills Dam area before any decisions are made.

As potential plans go forward it seems some sequence like this would be reasonable:
1. Update 2002 studies for channel improvements for Middlesex Falls, do necessary environmental/cultural studies, if there are no show stoppers get permits complete the Design & Construction and establish formal fish monitoring upstream of Middlesex Falls and Centennial Fall Dams to provide information to Decision Makers for the Talbot Mill Dam area.
2. Once the viability of fish passage as far as Talbot Mills Dam is established, conduct any necessary environmental/cultural studies for Alternatives 3A and 3B so decision makers can make an informed decision about how to proceed. Then obtain permits, finalize designs and accomplish construction.

An approach like this invests resources in such a way that progress is always occurring and additional critical data can be collected and analyzed to support future decisions.

Based on reading the report, there appears to be one risk issue that probably should be identified, analyzed and tracked as studies of Alternatives move forward. For Alternative 3B (Breaching Talbot Dam) there is a risk that the two new major hydraulic controls (in the vicinity of Pollard Street and at the Talbot Dam location) that are assumed to develop "naturally" after Dam breach are not well understood. The configuration of the new natural hydraulic control cross section's
shapes, the type of materials that form them (the channel bottom), how materials that form them might be impacted by changes in the new flows they are exposed to (sediment transport, erosion, etc) and long term stability have not be analyzed and the data to make such an analysis has not been collected. If the new controls are found likely to be lower than assumed, the hydraulic modeling results would change and any decisions based on it would have to be revisited. And if Alternative 3B were selected, implemented and then the controls were to degrade, the Concord River would eventually have lower water surface elevations than expected after a non-reversible dam breach occurred. At that point, if impacts upstream of Pollard Street are significant, some permanent modification to Fordway Bar might be required to maintain appropriate low flow conditions upstream. If data is collected now, and the results of analysis indicate that Fordway Bar might not maintain upstream water surface elevations for the next 100 years as planned, the cost of permanent modification of Fordway Bar should be included with the Dam Breach Cost Opinion and included as part of that alternative. There are other lesser risks associated with this and other alternatives (e.g; owner's willingness to allow 3A or 3B at the Dam; effect of possible environment or cultural impacts, whether a fishway can be added to the dam due to different published professional engineering judgments regarding Talbot Dam's safety, how to proceed if fish counts are inconclusive to support projects upstream of Alternative 1A at Middlesex Falls, etc) and these might also benefit from a formal risk management effort. Adding a risk appendix with a standard risk matrix to the final report would probably be useful.

Many other areas are addressed in the attached comments. I would like to be informed of future report releases, public meetings and the overall progress of the project.

Bob

Robert C. LeBlanc
rcrlcrlcrl@aol.com
Questions/comments (transmitted with letter dated 5 April 16)

(on the February 2016 Concord River Diadromous Fish Restoration Feasibility Study by Gomez and Sullivan)

1. On page 57 the first paragraph states that "Under high flow (500-year flood) conditions, the difference in water surface elevations is less than 0.5 feet upstream of the Pollard Street bridge and less than 0.2 feet at the upstream extent of the Concord River." Based on the Hydraulic Modeling results shown in Appendix F it appears that the difference in water surface elevation is 1.64 feet upstream of the Pollard Street bridge and 0.74 feet at the upstream extent of the Concord River. Which values are correct?

2. Seven flow events have been used in the Hydraulic model. One event not modeled that would be useful (to many of us who visit the Dam in the Spring just to see the water flow over the dam) would be a Mean Average Daily flow for April (and possibly March). Table 3.3.1-1 on page A-46 indicates those flows would be 1092 cfs and 1045 cfs. They could be represented by their average and designated "Spring Flow". If this event were run in the hydraulic model it would fill in the gap between Normal flow (461 cfs) and Upstream Migration 5% exceedence frequency flow (1628 cfs). Showing elevations for this flow would help report readers visualize the impacts of possible changes (especially in the Summit pond area) since many people watch the spring flows at the Dam.

3a. Figure 4.3.3-1 Cross Section at Talbot Mills after possible Dam Breach (Page A-79) is quite useful as a visualization tool. As it stands, it shows only one flow event (2 year Flood; Flow= 2503 cfs; WSEL 108.97 Ft NGVD 1988). Would it be possible to add the following events?

   Low Flow; Flow = 35 cfs; WSEL = 104.17  
   U/S Migration L; Flow = 105 cfs; WSEL = 105.02  
   Normal Flow; Flow = 461 cfs; WSEL = 106.2  
   Spring Flow; Flow = 1069 cfs WSEL = Unk  
   U/SMigration H; Flow = 1628 cfs WSEL = 108.11

The resulting graphic would show how sensitive water surfaces are to getting the new hydraulic control cross section "right" in spite of unknown channel bottom materials.

3b. In Appendix D page 6 on Plan 5 "ALTERNATIVE 3B TALBOT MILLS DAM REMOVAL PLAN" the new water surface is shown in blue. It appears that the water surface follows 102 foot contour.

   a. As drawn the blue covers areas in the channel up to 108 ft - for clarity revision may be warranted  
   b. This delineation does not agree with Figure 4.3.3-1. The lowest elevation that could be shown if Fig 4.3.3-1 is correct is the Low Flow 35 cfs event at elevation 104.17. Will the new water surface with the breached dam be 102 feet or 104.17 feet NGVD 1988?

   c. For clarity Figure 4.3.3-1 and Plan 5 in Appendix D should be in agreement

4. Who would be the Decision Maker for possible courses of action at Middlesex Falls or Talbot Mills Dam?

5. How will any potential modifications be paid for at Middlesex Falls or Talbot Mills Dam?

6. The budgetary cost opinion for Talbot Dam breaching does not include a cost to acquire the dam and any possible associated water rights. How would the Dam owner be compensated if this course of action were selected?

7. What is the rationale for the February 2016 report’s recommendation for no action at Middlesex Falls rather than to implement the plans developed in the 2002 timeframe (discussed on p.19)? It seems that implementing the 2002 timeframe modifications at Middlesex Falls and conducting fish monitoring would be an appropriate action prior to decisions on any potential action at Talbot Mills Dam.
9. Have fish counts been accomplished upstream of Centennial Falls Dam? Based on the report it appears that no formal counts have been taken. If they have been, what are the results? If not, are there plans in place to conduct formal fish counts prior to making any decisions regarding actions at Talbot Dam?

10. In Table 2.4.1-1 Historical Diadromous Fish Returns for the Merrimack River at the Essex Dam are presented. 
   a. Is there a standard procedure to estimate the percentage of these fish that would go up the Concord River rather than continuing in the Merrimack? If so, has that calculation been made?
   b. If not, based on literature, analogous situations, or professional judgment what percentage would start up the Concord River?
   c. What will be the measure/criteria for "successful" fish Passage at Middlesex and Centennial Falls?
   d. If modifications were done at Talbot Mills dam, what would be the measure/criteria of "successful" fish passage?

11. The Spillway Capacity Check (pages 57 and 58) states "Therefore, the dam does not appear to meet dam safety regulations to pass the spillway design flood (see note 64). This deficiency would need to be addressed by the dam owner if the dam is maintained or altered for fish passage (e.g., by adding a fish ladder). Note 64 ODS regulations do not explicitly prohibit the overtopping of spillway abutments or embankment sections in analyzing whether the dam can pass the spillway design flood. However, ODS recommends that engineers use their best professional judgment to evaluate whether the abutments and/or embankments are structurally sound enough and designed for overtopping. Due to leakage through both abutments and the fact that the embankment section is a public road, Gomez and Sullivan does not recommend that these structures be overtopped in the spillway design flood, and therefore is of the opinion that the dam does not meet dam safety regulations.

   a. Does this mean the Fish Ladder (alternative 3B) is "off the table" as the Dam stands today?
   b. If so, could a fish ladder alternative that does not pass through the dam directly, but rather, passes through the retaining wall into the “Gazebo Park” area be developed as an executable alternative?

12. Although Gomez and Sullivan stated (on page 58) it is their engineering team's professional judgment that Talbot Dam cannot pass the spillway design flood (5,675 cfs), it is noted that as part of Geotechnical Consultants Inc’s Assessment and Recommendations section of its 6 Nov 2015 "TALBOT MILLS DAM PHASE I INSPECTION / EVALUATION REPORT" on page 17 stated that: “For the Talbot Mills Dam, the spillway capacity is adequate to pass the Spillway Design Flood (SDF) for the 100-year recurrence interval which produces a flow of 5,675 cfs.” Similar conclusions were reached in the 22 May 2009 Phase I Inspection/Evaluation Report by GCI and the 20 May 1999 Phase I Inspection/Evaluation Report by Weston & Sampson. It should be noted that all the reports are based on different assumptions and subsequent sound judgments to reach conclusions as to whether the spillway can pass a design flood of at least 5,675 cfs.

   a. Who has the responsibility to determine which Licensed Professional Engineer’s "Professional Engineering Judgment" will prevail?
   b. Has the ODS been contacted and initiated whatever actions are necessary to change/amend the 6 Nov 2015 Dam Inspection/Evaluation and previous reports to resolve this apparent inconsistency?

13. There appear to be possible minor inconsistencies in the results summary for the hydraulic model (Appendix F):

   a. For consistency, check Channel Bottom elevations for both “with” and “without” Dam conditions at stations 25129 and 25698
   b. Verify that WSELS for the normal flow event at Stations 85935 (Confluence) and 85496 (U/S of Lowell Rd) accurately reflect the Hydraulic Model
   c. Verify that the values shown for the "with" dam low flow event at stations 25129 through 33047 reflect the Hydraulic Model accurately

14. Effect of a potential Dam breach at Talbot Dam on upstream wetlands

On Page 92 the report states:
"It is possible that artificially raised water levels due to the dam’s presence may contribute to upstream bordering vegetated wetlands, such as the Great Meadows NWR along the Concord and Sudbury Rivers. However, the hydraulic modeling results indicate that the predicted drop in water surface elevation for the proposed partial dam removal is small—ranging from less than 0.1 feet under low flows to less than 1 foot for high (flood) flows at the downstream extent of the Great Meadows NWR Concord Unit. The greatest change would be for higher flood flows, when most wetlands and floodplains are already underwater. Further, the adjacent wetlands are already subjected to a broad
range of seasonal fluctuation in Concord River water levels—nearly 7 feet from low flows to 2-year flood flows at the downstream extent of the Great Meadows NWR Concord Unit, and even higher (over 12 feet) when larger floods are considered. Also, although much has changed in the hydrology and operation of the watershed since then, an 1861 study found that lowering the dam produced only a negligible drop of the water level in the upstream wetlands (Alvord et al., 1862). Therefore, it is assumed that the relatively small upstream water level reductions predicted for the proposed partial dam removal would not likely cause significant changes in wetland boundaries, vegetative composition, or value upstream of the Fordway Bar.” Similar discussions are found elsewhere in the report.

It appears that the results of the Hydraulic Modeling (shown in appendix F) done for the study calculate cumulative flood surface areas at each station. While the changes in water surface elevation are small for the various floods, it appears that flooded surface areas (inundated wetland areas) change measurably. For example, for the normal flow (491 cfs at the dam) with Talbot dam in place, the cumulative flooded surface area between Route 4 (D/S of Great Meadows National Wildlife Refuge (GMNWR)) and a location U/S of the refuge (station 80321) is about 950 acres. Without the dam, the reach has about 800 acres flooded. This is a loss of about 150 acres of flooded meadow in Great Meadows NWR (about 16% loss of flooded meadows under normal flow conditions). If the results of the model study were correctly interpreted this may or may not cause significant changes in wetland boundaries or vegetative composition within Great Meadows NWR.

15. Table 4.3.3-1: Budgetary Opinion of Cost for Partial Removal of Talbot Mills Dam (Alt 3B)

a. This Budgetary Opinion of Cost shows a cost of $4,000.00 for “Wetlands, wildlife, & botanical resources survey”. This cost may be low given that it appears from the results in the hydraulic model that with normal flows as much as 150 acres of wetland habitat Great Meadow NWR could be impacted by Dam removal. A 16% reduction in meadows inundated with normal flow may or may not be considered a measurable impact. It is known that the Blanding’s turtle (Emydoidea blandingii) a medium-sized, semi-aquatic freshwater turtle that is a threatened species in Massachusetts is found in Great Meadow National Wildlife Refuge in Concord MA and that it is an excellent habitat for them. They require a variety of wetland habitats, make frequent seasonal overland movements, and therefore suffer mortality from direct wetland habitat loss and landscape fragmentation. So there could be a need for MEPA and NEPA processes prior to any decisions. Such processes drive schedule and costs. It would probably be prudent to add such costs if Government Subject Matter Experts see a need.

b. No costs for borings upstream of Pollard St (Fordway Bar) are included. It may be that Ground Penetrating Radar will be adequate. Please insure that whatever exploration you budget for has a high probability to provide data needed to conduct analysis of Fordway Bar and the area upstream of Talbot Dam in terms of being suitable permanent hydraulic controls.

c. No costs are shown removal of sediment. Depending on substances in the sediment, “in stream disposal” may not be the only removal method needed.

d. Add cost to acquire dam and water rights if appropriate

16. An appendix showing all cross sections presented in Appendix F with calculated water surfaces plotted would help readers visualize extent of flood flows / impacts. This appendix could also show standard 7.5 minute USGS maps with sections plotted on them as a low fidelity visual aid.

17. Table 5.0-2: Decision Matrix for Talbot Mills Dam Restoration Alternatives

General Observations:

a. Assessment of this matrix should probably be re-accomplished with a more diverse group
b. The rating elements should be reviewed to insure they deal with single issues and elements broken into subparts as needed.

c. additional elements may be needed (possibly environmental issues, complexity of potential legal issues/agreements etc)

Specific Observations:
a. Upstream Passage of target species - 3A Technical Fishway should be High (green). Page ES -6 states "Alternative 3A including a Denil ladder, eel ramp, and downstream bypass notch—would provide effective passage for target species."

b. What does the phrase "Environmental Justice for Nyanza" mean?

c. What is the rational for Fishway Alt 3A being Low and Breached Dam Alt 3B High for Environmental Justice for Nyanza?

d. Restoration of natural wetland habitat - how can that be high for the 3B Dam breach alternative? Breaching it will reduce some wetlands that have been in place for 187 years

e. Improved water quality and aquatic habitat - At a minimum separate these two into two rating elements: the fishway probably should be green high for aquatic habitats since it is opening new aquatic habitats to the target species

f. Passage of other species - For No Action, shouldn't it be None.

g. Upstream Passage of target species - For the No Action Alternative what is the rational for low rather than none? Is it because one or two of the Target Species have been observed upstream?

h. Decommissioning of aging infrastructure only applies to one alternative - it is unclear that this criteria belongs in the matrix

i. Impairment of water quality - explain rationale of how adding a fishway impairs water quality

j. Fragmentation of aquatic habitat - explain rationale of how adding a fishway fragments aquatic habitat

k. Artificial Upstream flooding - explain rationale of how adding a fishway is rated red high for artificial upstream flooding

18. Potential new Hydraulic Controls if Talbot Mills Dam is Breached

At different locations in the report, cross sections that may become hydraulic controls for reaches upstream of them if Talbot Dam is breached, are shown or discussed. Two areas are involved; Summit Pond area and the rest of the river upstream of Pollard Street. However, based on the discussion in the report it appears the actual channel bottom composition at cross section is usually not known. If that is the case, the final channel bottom elevations after potential unknown erosion/sediment transport occurs are not known and the report may be showing higher water surface elevations than would occur if Talbot Dam is breached. One area is in the vicinity (upstream) of the Pollard St Bridge. This is referred to as the Fordway Bar "location". Examples for Fordway Bar discussions and references include figure 2.3.3-1 (section at Talbot Dam after breach) on page A-76 and Transects 1 and 3 on pages A-53 and A-55 respectively. Any of which could potentially contribute to control if Talbot Mill Dam is breached and any erosion or sediment transport occurs. Note 62 on page 57 addresses uncertainty of the materials that make up the channel bottom at various cross sections.

It may be that estimates of potential material transport and final section geometry will not be able to be completed without borings at select locations. For the Fordway bar, a "Not lower than" cross section may be adequate to support analysis of upstream wetland changes. At the Talbot Dam, steps should be taken to verify that Figure 4.3.3-1 (section at Talbot Dam after breach) on page A-76 and Transects 1 and 3 on pages A-53 and A-55 respectively. Any of which could potentially contribute to control if Talbot Mill Dam is breached and any erosion or sediment transport occurs.
An appendix that just discusses "Potential New Hydraulic Controls if Talbot Dam is breached" might provide clarity. All the discussion and cross sections from other areas of the report could be presented in this appendix. The control sections for Summit Pond and Fordway bar that were used in the current February 2016 Hydraulic Model could be shown with all calculated WSELs on them for enhanced reader understanding. Some general discussion about velocities and transportability of the material believed to make up the channel bottom that the water will run on could be presented along with preliminary engineering analysis or judgments on stability of the channel bottom at the new control sites. It could also present WSELs from a sensitivity analysis based modifying the cross sections used in the current model at the breached dam and the upstream control somewhere near Pollard St to reflect possible lower channel elevations at the control cross sections. This analysis could develop new control cross section configurations based on judgment and whatever channel bottom data is available or just arbitrarily drop the control sections 1.5 feet in 0.5 foot increments to reflect unknown unknown variation in channel bottom materials and how they might be transported.

19. The following paragraph is from page ES 6 of the Executive Summary (italics added):

"The proposed partial removal of the Talbot Mills Dam (Alternative 3B) would provide effective passage for target species as well as significant benefits for other resources. Water quality, aquatic habitat connectivity, and natural riverine sediment and flow regimes would be restored. Increased upstream flooding resulting from the dam would be reduced. Aging and unsafe infrastructure would be decommissioned, eliminating ongoing operation, maintenance, and liability costs and concerns. Recreation and aesthetic resources may improve as well, although these benefits are subject to individual preferences of the members of the public using the resources. **With the exception of cultural resources, few impacts to other resources are anticipated.** As such, partial removal of the Talbot Mills Dam is a feasible alternative for restoring diadromous fish in the Concord River that could be further evaluated in future phases of this project."

Comments and questions on these three areas are shown below. It should be noted that these phases, or phrases like them, occur throughout the report and even are in Table 5.0-2: Decision Matrix for Talbot Mills Dam Restoration Alternatives. Sometimes when they are used, there may be a lack of precision that could cause confusion or lack of clarity. This could result in the reader misunderstanding the data.

- Water quality, aquatic habitat connectivity, and natural riverine sediment and flow regimes would be restored.
- Aging and unsafe infrastructure
- With the exception of cultural resources, few impacts to other resources are anticipated

1. Water quality, aquatic habitat connectivity, and natural riverine sediment and flow regimes would be restored [to conditions that existed over 187 years ago].

Section 2.1.4 Water Quality & Aquatic Habitat page 13 discusses many issues in the Assabet, Sudbury and Concord rivers but does not appear to directly link any of them to Talbot Dam.

a. Please add a discussion of water quality issues have been directly caused by Talbot Dam and how breaching the dam would alleviate them.

It is noted that in this section you link, "Invasive aquatic plants are also a problem throughout the watershed. The Sudbury River has a long history of invasive water chestnut (Trapa natans) problems and efforts to remediate those problems", directly to the Talbot Dam Impoundment. "Significant water chestnut infestations are also on the Concord River, particularly in the Talbot Mills Dam impoundment, and the Assabet River."

For clarity it is important for readers to understand the scope of "significant" as used to describe water chestnut infestation in the Talbot Dam Impoundment.

b. Approximately how many acres of water chestnut infestation are in the Talbot Dam Impoundment?
c. Approximately how many acres of water chestnut infestation are in the SuAsCo river system and its associated wetlands?
d. If the action of Breaching Talbot Dam eliminated the current water chestnut growth, what would prohibit it from re-establishing itself in the post breach environment?"
In the same section "natural streamflow regime" is discussed. "A natural streamflow regime (i.e., range, duration, and timing of streamflow) throughout the year is critical to supporting fish and other aquatic life."

e. Since Talbot Dam is a run of river project and passes all flows as they come how will breaching it restore flow regimes as described above?

Paragraph 2.1.5 Potential for Sediment Contamination states that: "Many contaminants released into rivers and streams in the form of industrial wastes, accidental spills, or urban runoff commonly adhere to solids suspended in the water column of a stream and ultimately accumulate in slow moving environments, such as impoundments behind dams. ... Although less obvious, sediment contamination should also be a consideration for restoration alternatives that leave a dam intact, including the “no action” alternative. Contaminants trapped in sediment behind dams are often considered buried, but they cannot be assumed to be immobile. Some contaminants are easily exchanged between bottom sediment and the overlying water column, allowing them to become biologically available under certain environmental conditions. ... Additionally, benthic organisms, which live on or within the bottom sediment, may be directly exposed to hazardous levels of these contaminants and, in turn, indirectly expose fish and other wildlife to the contaminants through food-web magnification.

f. If Talbot Mills Dam were breached would similar sediment related issues occur approximately 3000 feet upstream at Fordway Bar or may they already be present there?

2. Aging and unsafe infrastructure

Built in 1828 to replace an earlier dam built in 1798 (that is believed to be still in place slightly upstream of the current structure), everyone would agree that it is aging. It is still doing the job it was built to do 187 years ago. While this report declares it to be unsafe, past Phase I Dam Inspection and Evaluation Reports (6 Nov 15, 22 May 2009, 20 May 1999) do not reach that conclusion. Excerpts from the most recent investigation:

"In general, the Talbot Mills Dam was found to be in fair condition primarily due to the lack of any operation or maintenance plan. Structurally, we found no indications of instability or seepage which comprise the integrity of the dam and appurtenant structures. The spillway appears to be adequately sized for the Spillway Design Flood (SDF). Some operational deficiencies exist and include:

• Minor seepage in the spillway abutment particularly at the left abutment.
• Trees located on the upstream side of the left embankment near the former intake gates to the Talbot Mills complex.
• Lack of an operable low level outlet and emergency bypass in the event of flooding.

[The report] recommends the following actions be taken to address the deficiencies found at the dam during this inspection and evaluation:

• Prepare and implement “routine” inspection and maintenance plans for the operation and maintenance of this dam.
• Inspect the interior of the of the Talbot Mills complex, particularly the downstream end of the former intake structures.
• Repair/replace the sluiceway and stilling basin gates so that the gates are operational and can provide emergency bypass control.
• Repair/replace the left spillway abutment to provide an operational low level outlet and provide emergency bypass control.

g. Given that there appear to be differences in profession engineering judgments regarding Talbot Dam safety, is there some way to resolve the difference prior to publishing a report that states the dam is unsafe? Failing that, could suitable caveats like "aging infrastructure that could become unsafe if not inspected periodically and repaired as needed" be used rather than definitive statements of engineering judgments?

3. With the exception of cultural resources, few impacts to other resources are anticipated

As written this implies there are no impacts on wildlife or critical wetland habitats. This may not be the case as upstream wetlands might be impacted for various flow regimes.

END
Jill Griffiths, PE
Gomez and Sullivan Engineers

Dear Ms. Griffiths:

Attached is a compromise alternative for restoring diadromous fish to the Concord River. It is adapted from the "President's Message" in Towpath Topics, the bulletin of the Middlesex Canal Association, Vol. 54, No. 3.

J. Jeremiah Breen
president, Middlesex Canal Association
On February 23, 2016, the final presentation to the public of the engineer's draft report on the restoration of diadromous fish to the Concord River was made in the Reardon Room of the Middles exCanal Visitor Center/Museum. The sponsor of the report, the state Division of Marine Fisheries, is likely to favor removal of the granite dam built in 1828 by the Middlesex Canal Company. On March 2, the directors of the Middlesex Canal Association voted to oppose removal of the dam. Director Bill Gerber has volunteered to write the opposition to removal, emailing it before the end of public comment, April 6th.

The summit pond behind the dam is the center of the Middlesex Canal Heritage Park, for which the Middlesex Canal Commission has already spent several hundred thousand dollars to bring to the 25% design level. Though the park has been stopped at the 25% level for several years, the Northern Middlesex Council of Governments still budgets ~$3.4 million for its future construction. To keep the dam and summit pond, a fishway from down river of the dam to the level of the summit pond could be built using the existing Faulkner Canal.

The mill canal is 380' long on the yellow line in the Google Earth view. Photos of it are on pages B-20 through -24 of the Feb 2016 report prepared for the MA Division of Marine Fisheries. It is 12'± wide, measured in Google Earth. The owner of the mill inspects the canal under the building by walking in it during during low flow in the river. The fishway in the report, Appendix D, drawing 4, is a 4'x4' waterway 100' long with a difference in water elevation of 10.3', all ±. As concrete construction built on the bed of the river to withstand the force of floods, it is massive. Report, E-3. The same fishway
built using the canal need only be strong enough to withstand the weight of the water in it. Ideally, the fishway would be in the basement of the Faulkner Mill with an opening in the wall at the high level and one in the floor for downstream. The basement is 156' x 53' x 10'. A 4' x 4' x 100' trough fits easily. If made of glass, a 360° video record of the interaction of the migrating herring with the structural features of the fishway could be made under varying conditions. The basement could be an experimental workshop for fishway design.

Use of the Faulkner Canal for a fishway is not in the report. Instead, a fish bypass alternative using the canal was discussed on page 99 of the report. "This alternative was not fully developed for this feasibility analysis in part because drawings or dimensions of the channel under the building could not be obtained. An internal survey would require permission from and coordination with the mill owner." After more than $200,000 and two years, the practical alternative of using the existing canal was not fully developed because it "would require permission from and coordination with the mill owner." A fishway fits easily and a bypass with difficulty in the 380' canal plus 156' x 53' x 10' basement but neither would be a likely choice of the Division of Marine Fisheries.

The mill canal at Billerica Falls has a long history. A predecessor is mentioned in March 1794 when the Middlesex Canal Company purchased land up to Timothy Sprague's ditch. Sprague was the successor to Joseph Ruggles who operated a fulling mill at the dam by 1748. The adaptive reuse of parts of what was the oldest woolen mill when production ended in 1987 would be another attraction to the Billerica Mills Historic District.

Visitors attracted to the Billerica Falls Park by the dam, beaver and eel in the canal, would now also have shad, alewives, and blueback herring within easy view from either side of the canal and from either side of the fishway in the basement during the migration period, April 15 to July 15.

Notes
1. Billerica Falls Dam, not Talbot. While the dam was built in 1828 by the Middlesex Canal Company not the Talbots, Henry Thoreau wrote in *A Week on the Concord and Merrimack Rivers*, 1839, "But now at length we heard this staid and primitive river rushing to her fall, like any rill. We here left its channel, just above the Billerica Falls, and entered the canal, which runs, or rather is conducted, six miles through the woods to the Merrimack at Middlesex, and as we did not care to loiter in this part of our voyage, while one ran along the tow-path drawing the boat by a cord, the other kept it off the shore with a pole, so that we accomplished the whole distance in little more than an hour. This canal, which is the oldest in the country, and has even an antique look beside the more modern railroads, is fed by the Concord, so that we were still floating on its familiar waters." Thus Billerica Falls is name by which the location was known by a person who knew history and the Concord.
2. The identification Faulkner Canal is preferred to sluice or mill race as the latter two are technical and as sluice is likely unpronounceable by those who don't know the word. The 1861 engineers' report identifies it as Faulkner's Canal.
3. Where the visible canal ends at the main entrance to the Faulkner Mill is likely the former turbine pit for the 1862/1886 main mill. The report, p. 24, identifies it as a stilling basin.

References
1. *Concord River Diadromous Fish Restoration Feasibility Study* prepared by Gomez and Sullivan, engineers, for MA Division of Marine Fisheries, draft report presented to the public at the Middlesex Canal Visitor Center/Museum, Billerica MA, February 23, 2016. In particular, "Technical Fishway", Section 4.3.2, pp. 75-88; *Fishway Plan*, Appendix D, drawing 4; photos of Faulkner Canal, Appendix
Hello Jill,

Please allow me to introduce myself, my name is Mark Boermeester and I am a concerned local citizen and active outdoorsman who enjoys, uses and appreciates the concord river watershed. I was just recently informed of the latest article published from the Billerica Minute Man newspaper about the activities involving the Talbot Mills Dam in which I am highly interested in. Born in 1964, I lived just downstream of the dam with my parents and have spent much of my entire life on this great river. I currently live in Billerica while my Father still resides just a few hundred yards downstream of the dam. Needless to say we have been around the river for some time and have a great deal of experience in regards to the fish and wildlife populations at and below the dam.

After reading the article I would like to make inputs as to the future activities involving the dam and a fish passage. I suggest that the best plan would be to keep the dam in place and to install a simple fish ladder to allow the river herring, American Shad, yellow eel and sea lamprey to continue with their upstream migration. The dam as is has generated a unique ecosystem for the native fish and wildlife in which is mostly unknown to the general public. I would very much enjoy sharing this information with anyone interested. Removal of the dam would destroy this ecosystem completely. As with any new project, cost is always an important consideration. I would imagine that the most expensive option as listed in the article would be to remove the dam. Adding a new fish ladder would be the best cost effective means of allowing diadromous fish passage at this location. For ideas as to what type of fish ladder to be installed, I would suggest looking at the system the state of Maine is using on the Roach River (Kokadjo), at the dam on First Roach Pond. This type of ladder could be an effective, low cost and unmanned means of allowing fish passage. It could be placed at a strategic location atop the dam or and most interestingly could be placed at the Talbot mills feed canal. The feed canal was used to generate mechanical power years ago for the textile mill and flows from above the dam to under the mills and then returning to the main body of river. My lifelong dream since early adulthood was to have a fish passage exactly at this location. The potentials of having a fish passage at this feed canal location is unlimited.

Last spring, I had the privilege to be a seasonal fisheries technician at the Lawrence Essex Dam fish lift on the Merrimac River working for the MA Fish and Wildlife team. Contributing to this effort and to experience the anadromous and diadromous fish migration first hand has been a lifelong dream for me. The resultant fish count for the 2015 season was record breaking for both river herring and shad. Due to the multi-agency (MA F&W, NH F&G and US F&W) continuous effort of restoring these fish species we have experienced the highest fish returns since the 1980’s. There is no time like the present to keep this effort moving forward. Imagine what the fish counts could be in the future by simply adding a fish passage to the concord river Talbot Mills Dam? This is without a doubt something that I would very much like to be involved with. Please keep me informed of any new and future developments of this project for I would like to be part of the decision making. Also please note that if there is a need for an on-site caretaker of the fish passage I am your man.

Thank you Jill for taking the time to read my comments and to also share with the active parties involved.
Please let me know on how I can contribute going forward.  
By the way, I’ll be managing the fish count again in Lawrence this season with great expectations.

Thank you,

Mark Boermeester  
13 Porter St  
Billerica, MA 01821  
978-761-9680  
sablaney@comcast.net
April 5, 2016

Jill Griffiths, PE
Gomez and Sullivan Engineers
PO Box 2179
Henniker, NH 03242

jgriffiths@gomezandsullivan.com

Dear Ms. Griffiths,

Thank you for the opportunity to comment on the draft Concord River Diadromous Fish Restoration Feasibility Study and for the informative public presentation on the study in February.

OARS is the watershed organization for the Assabet, Sudbury, and Concord Rivers, their tributaries and watershed, founded in 1986. Our mission is to protect and restore the health of these rivers and to increase public awareness of the rivers’ value as important natural resources. OARS serves the over 400,000 residents of the 31-town watershed. OARS uses science-based advocacy, education and recreation to implement its mission with four program areas: Water Science; Stewardship; Policy Advocacy; and Community Outreach and Education. OARS is recognized for its well-respected water quality, biomass and streamflow monitoring, invasive aquatic species mapping and control, and river cleanup programs. Stewardship and recreation activities have focused on bringing people to the three rivers to experience their beauty and complexity and engage them in stewardship.

We were impressed by the thoroughness of the draft report and have found it very useful in evaluating the options. There is a tremendous amount of detail in the Technical Assessment section, which in general corroborates our own understanding, and we will restrict ourselves to comments on the Alternatives Analysis.

In general, OARS supports the restoration of the free flow in rivers, recognizing that in some cases there may be site-specific reasons to not remove dams. At Middlesex Falls, where the dam is breached it is not clear that channel modifications would improve diadromous fish passage. OARS supports the “no action” alternative and evaluation of fish migration at the Centennial Falls dam unless and until channel modifications are shown to improve fish passage and recreation.

Due to the existence of functioning hydropower facilities at Centennial Falls and installed fish passage, we support fishway improvements and volunteer coordination (2A and 2B) at the Centennial Falls dam, with the following provisos: (1) The hydropower facility at Centennial Falls dam must be equipped with effective means of diverting and protecting eels that are migrating downstream, if they are not already in place. Hydroelectric turbines are notorious for killing these very long fish. Enabling upstream migration does not confer much benefit if the eels are not able to migrate downstream to spawn. Mortality of eels should be monitored. (2) The recommended enhancements at the Centennial Falls dam should be monitored to ensure that they in fact work well for both fish passage and local recreational use.
The option to create a simple fishway (Sec. 4.2.3) at Middlesex Falls, or a more natural fishway such as a bypass channel or rock ramp (Sec. 4.2.4) at Centennial Falls should be revisited if full passage of the target or other important species is not restored by the selected options.

In the case of the Talbot Mills dam, we strongly support the restoration of free flow through the partial dam removal option (3B). We would support the preservation of a dam abutment or a means of creating a falling water feature, if the owner so chooses, to provide a visual reminder of the dam’s important historical role. Option 3B provides the full benefit of unimpeded connectivity for aquatic life, particularly diadromous fish, major benefits in terms of nuisance invasive aquatic plant control, major benefits for recreational use of the river, and in our assessment is the most cost-effective approach to restoring the health of the river while meeting dam safety needs.

The benefits of partial dam removal at the Talbot Mills dam are numerous, as described below.

1. **Restoring continuity for aquatic life:** The importance of providing unimpeded passage for all aquatic life at this site cannot be overstated. This dam is the final block in the continuity of the SuAsCo river system to the ocean. As noted in the report, this river basin is one of the first Merrimack River tributaries that can provide extensive breeding habitats to diadromous fish. These fish play an important role in the northeast US coastal ecology and are just now staging a comeback due to heavy investment in habitat restoration. It is well documented that fish “ladders” are only effective for some species, and only pass a portion of the fish attempting to use them; an effective fish ladder also requires active management and upkeep. The fact that anadromous fish have been observed and counted in the Concord River downstream of the Talbot Mills dam is evidence that effective fish passage is now needed at the dam. It should be noted that dam removal also benefits other aquatic species by opening up continuity for more localized migration for breeding, foraging and finding refuge from predators and high temperatures. Current aquatic conditions in parts of the dam’s impoundment during the summer are very poor, with fish observed “piping” at the surface for air due to the lack of dissolved oxygen in the water under the cover of invasive water chestnut. Also note that, following the completion of upgrades to the wastewater treatment plants along the Assabet River (serving Westborough, Shrewsbury, Marlborough, Northborough, Hudson, and Maynard), water column phosphorus and dissolved oxygen concentrations in much of the Assabet River are significantly improved. The Assabet contributes approximately half of the flow of the Concord River. The towns of Concord and Billerica have similarly improved their wastewater discharges to the Concord River.

2. **Restoring continuity for recreational use.** Option 3B will significantly improve recreational use of the Concord River by eliminating the need for portages, creating an interesting rapids section, and eliminating obstruction by invasive water chestnut plants. This may increase public use of this site and afford more exposure to the significant industrial and Native American history located there. As noted above, there has been major public investment in improving the water quality which is increasing the recreational use of the river and the health of its wildlife.

3. **Reducing flooding:** Riverine floodplains are increasingly valuable as precipitations patterns are changing due to an increase in intensity of rain events and thus flooding under current climate predictions. A rule of thumb now is to consider the 500-year flood level to be the 1% (100-year) flood of the near future. While this study uses the 500-year flood delineation as the “high” flow level, in fact the high flows may be significantly higher. Since FEMA is barred from using precipitation projections in its flood flow calculations, the calculated flood delineations are by definition historical and will underestimate the extent of future flooding. Dam removal would significantly expand the available floodplains available between the Talbot Mills dam and the Fordway bar upstream, and thus reduced the damaging effects of river flooding in that segment and, to some degree, upstream and downstream. The controlling role of the Fordway Bar in maintaining water elevations upstream means that there would be insignificant negative effects of dam removal on water levels upstream of the Fordway Bar.

4. **Invasive aquatic plant control.** The extensive water chestnut infestation of the impoundment created by the Talbot Mills dam needs to be addressed by the owners of the impoundment and its shoreline (see Figure 1).
This infestation, of about 4 acres, severely impacts the quality of aquatic habitat in the impoundment, resulting in very low water column dissolved oxygen under the vegetation which damages aquatic life, and near complete loss of sunlight penetration. During the summer the appearance of the impoundment, which contains the historic canal towpath feature, is significantly degraded by nearly total coverage of all water surfaces by this plant. This deviates far from its natural and historical appearance. In addition, navigation of the impoundment by boat is near impossible by August due to the plant growth which limits recreational use of the river. Further, the water chestnut population in the impoundment creates a seedbed which spreads the invasive plant downstream in the shallow areas along the length of the Concord River. It is considered futile to attempt to manage the spread of the water chestnut downstream if this source area is not eliminated. Partial dam removal, as suggested in Option 3B would virtually eliminate this problem by lowering the water level in the shallow impounded areas on the eastern side of the river and creating new wetland habitat there. Hand-pulling the remaining pockets of water chestnut plants along the shoreline could be done by volunteers. The alternative is mechanical or chemical (herbicide) control of water chestnut, which is expensive and difficult in this shallow impoundment which contains over 5-foot-deep sediment. Intensive management of 4-6 years would be required to bring the water chestnut population under control (the seeds can be viable for 12 years) with ongoing maintenance in perpetuity.

5. Historic and cultural preservation and interpretation. There have been many successful dam removal projects that have enhanced the public’s access to and enjoyment of historical sites. S sensitively designed river restoration projects can increase the visibility and opportunities for interpretation of the historic mills and waterfront areas, and encourage public exploration of the area by enhancing recreational use of the river. The proposed partial dam removal would open up possibilities for a canoe landing, trails, and historic interpretive panels, and expose features that have been hidden underwater to public view and research exploration.

In conclusion, OARS supports the “no action” alternative at Middlesex Falls, fishway improvements and volunteer coordination (2A and 2B) at Centennial Falls, and strongly supports the restoration of free flow through the partial dam removal option at the Talbot Mills Dam (3B) to provide the benefits of unimpeded connectivity for aquatic life, invasive aquatic plant control, recreational use of the river, and dam safety needs in the most cost-effective way possible. OARS’ monitoring program shows that water quality in the rivers has improved significantly with recent investments in control of wastewater pollutant discharge. However the challenge of the growing populations of invasive water chestnut on all three rivers, and the impacts of climate change on river flow and habitat quality, mean that efforts to restore and protect fish habitat need to be redoubled. The partial removal of the Talbot Mill dam, in particular, would bring significant wildlife, recreation and water quality improvements to this section of the Concord River while providing the opportunity to enhance appreciation of the site’s significant history. The different requirements of the only catadromous species in the study, the American eel, should be considered in all designs and monitoring.

We hope these comments are useful. Please don’t hesitate to contact us if you have any questions or we may be of assistance.

Yours sincerely,

Alison Field-Juma

Cc: Billerica Conservation Commission
    Jane Calvin, Lowell Parks & Conservation Trust
    Libby Herland, US Fish & Wildlife Service
    Sarah Bursky, National Park Service
    Middlesex Canal Association
    Middlesex Canal Commission
Figure 1: Water chestnut coverage, Concord River, North Billerica
April 6, 2016

From: Middlesex Canal Association and Middlesex Canal Commission

To: Gomez and Sullivan Engineers
Attn: Jill Griffiths, PE
PO Box 2179
Henniker, NH 03242

Dear Ms. Griffiths,

The purpose of this letter is to state the position of the Middlesex Canal Association (MCA) on the ‘Concord River Diadromous Fish Restoration Feasibility Study’, dated February 2016, particularly regarding the information and options presented for the Talbot Mill Dam (aka the Summit Pond Dam).

The MCA has no objection to the restoration of the fish and eel species, cited in the report, to the Concord River. Also, we have no objections to two of the three options presented - i.e., to do nothing, or to construct a fish ladder at the Summit Pond Dam. However, we totally reject the third set of options - i.e., dam removal or breaching in any form.

Background:

The Middlesex Canal was a key component of a 120+ mile network of canals and navigable waterways that, for more than 50 years, provided heavy lift transportation services north of Boston. Availability of the network began in about 1797, with the opening of the Merrimack River for the transportation of ‘boats, rafts and masts’ from the NH border to tidewater. Thereafter the network expanded progressively with the opening of the Middlesex Canal in 1804, opening the following year of the Mill Creek Canal across Boston and a Branch Canal from the M’sex Canal to the Mystic River, in Medford; opening of the upper Concord River in about 1810; and opening the Merrimack River to and above Concord NH by 1815. Thereafter, additions were made to the network in 1826, which added access to the Nashua River, and again in 1837, which provided access to the lower Concord River as far as the south end of Centennial Island.
For half a century, the canal and river network made very significant contributions to the growth of the area economy. Countless boatloads of cordwood heated homes and commercial furnaces. Timber and other wood products were used for the construction of homes and businesses, the shipping of goods, etc. Along the Mystic River alone, shipyards that began with the opening of the canal constructed 465 ships, mostly ocean-going sailing vessels, during the years the canal was open. Farm goods were routine cargos, including those that carried hay to the Haymarket. Prominent buildings, among them the Charlestown Prison, Massachusetts General Hospital’s Bulfinch Building (its first building), University Hall at Harvard University, Faneuil Hall Market Place, the Massachusetts Bank, and countless homes and businesses were all constructed of granite from quarries in both Chelmsford MA and Concord NH. Initially, loads of granite and brick and timber were carried to build the textile mills of Lowell, Nashua and Manchester; and in the decade and more thereafter, cotton bales by the boatload were transported to keep the mills operating, and to carry their myriad products to market.

Today, little remains of this once important artery of commerce. Although Pawtucket Canal remains largely intact, it is only with considerable difficulty that a few artifacts can be found at points along the Merrimack River. About 10 of the original 27 miles of the Middlesex Canal can be traced from such resources as Google Earth, but two-thirds of the canal length, including both ends, together with the Mill Creek and Medford Branch Canals have all been filled in and built over. Of related structures along the length, only a few remain recognizable - i.e., one relatively intact lock keepers house in Wilmington, and the 1832 toll house now on Chelmsford Common.

However, several of the most important surviving remnants can be found within and adjacent to the Summit Pond in Billerica. These include the eastern
and western canal “cuts”, where the canal met the river; also the peninsula component of the iconic floating towpath that once spanned the Concord River; the abutments for the drawbridge (shown above), one of which also served as the eastern anchor point for the floating towpath, together with the stone that anchored its western end; the up-stream end of the western guard lock/raft lock; and, of course, the two dams (the earlier dam situated immediately behind the observable Summit Pond Dam) that are highlighted in the report. Several buildings within the adjacent village, and the Rogers House on the east side, also date to the era of the canal.

Rationale for opposing breaching or removing the dam

The dam is listed in the Register of Historical Places (RHP), having been so designated on at least four occasions - once when the extant portions of the Middlesex Canal were placed in the RHP in 1972; again in 1983 as part of placing the Billerica Mills Historic District in the RHP; once more in 1990 as part of a Local District filing; and most recently in 2009 when the entire length of the canal was registered in the RHP. NHRP listing automatically places it on the State Register of Historic Places as well. As such, the dam should enjoy a very substantial measure of protection from development or destruction. Attempted use of Federal funding, licensing, or permitting for breaching or removal of the dam would trigger compliance with the National Historic Preservation Act. In addition to the MCA and MCC, such alteration of the dam and attendant draining of Summit Pond will likely be strongly opposed by several other organizations and many individuals.

The Summit Pond, behind the dam, was the principal source of water to operate the canal throughout its operational life. It is still the source of water to flood the extant remains of the channel on either side of the river. A drawdown or depletion of the Summit Pond would leave these segments dry, or nearly so, such that they would soon be overgrown and unrecognizable for the important role they once played in the development of Boston and the communities to the north. Constructed, as they are, primarily of timber and rubble stone, the peninsula and the drawbridge abutments of the floating towpath, noted above, would be left exposed and, almost certainly, would soon disintegrate and be lost forever.

Together with MCA advocacy, the MCC has been working for many years to restore the extant parts of the canal to public use. Their plan includes
construction of an educational park on the west side of the river, adjacent to where the first shovelful of earth was turned to initiate canal construction in 1794. The plan was further enhanced by the recent acquisition of the Talbot Mills cloth warehouse, to provide a future home for the Middlesex Canal Museum. The Summit Pond is part of the authorized Middlesex Canal Heritage Park (Mass. Acts 1977, ch. 403) with much of the land on both banks of the river controlled by Middlesex Canal Commission. Today, in support of this plan, the MCA, MCC and Billerica own or hold easements on about 80% of the land surrounding the Summit Pond.

Archaeology - At the diadromous fish restoration study presentation in February, 2016, a proposal was made to document the remaining artifacts, apparently in recognition that what little remains submerged will soon deteriorate and pass into oblivion. This would leave the MCA, MCC and town of Billerica with a report in place of the artifacts themselves. Obviously, a report gathering dust on a shelf somewhere is an unacceptably poor substitute for the few artifacts we still have.

Comments related to the Report

Aside from historical references to the types of fish that were found in the Concord River more than three centuries ago, what is the justification for attempting to restore them now? Other than historic precedence, nowhere in the Feasibility Study is any justification presented for the restoration of Diadromous Fish, by the New England Fishing Industries or anyone else. And why should such restoration efforts take priority over the more recent development and current status of the the river and its environs?

What if you ripped out the dam, and the fish didn’t come? What assurance is there that the desired species can be restored; or that undesirable species won’t be introduced additionally or in their stead? E.g., what are the sensitivities of the species of fish and eels that you hope to reintroduce to the effects of climate change? The charts for herring and shad, in the slide entitled “Target Species” don’t look all that impressive. What are the prospects for Alewife and the American Eel, which are not even shown? What other species might be newly introduced, including undesirable species?
River obstacles and related considerations - fish and eels need to negotiate the Essex Dam (i.e., the Great Stone Dam at Lawrence), Middlesex Falls and the dam at Centennial Falls (actually named Wamesit Falls) on the Concord (as discussed in the report) before reaching the Summit Pond Dam. Along the way, they pass the confluence of Hale’s Brook. Would it not be appropriate to determine if the desired species of fish, and others, have already populated Hale’s Brook, before considering any action at the Summit Pond Dam?

Are the hydrological projections for the post dam removal levels of the Concord River correct? In one tabulation that we’ve seen, it appears that the elevation of the bottom of the Concord River, upstream of the Summit Pond Dam, is less than half-a-foot below the elevation of the river bottom at the confluence of the Sudbury and Assabet Rivers, more than 11 miles away. Also, the elevation of the river bottom at Billerica’s water intake appears to be less than a foot below the river bottom at the dam. It would seem therefore, that with dam removal or breaching, there is very little elevation differential to work with along this entire length. During a summer of drought, some years back, a cynical assessment was that the only water left in the river was provided by the effluent from the prison in West Concord. E.g., at times of low water or drought, Billerica might be left without an acceptable source of water in terms of both quantity and quality.

On page ES-5, and elsewhere, the height of the dam is given as 10.2 feet. But the 2009 dam registration gives the height of the dam as 12.5’. (Copy provided at the end of this letter.) What’s the explanation for this discrepancy? Will this discrepancy have any impact on the hydrological projections? E.g., could it mean that the river will be drawn down farther than the study projects?

In the slide entitled “ANALYSIS - Hydraulics” - upstream of the Fordway Bar near Billerica’s Pollard Street bridge, the reduction in normal water level due to dam removal is projected to be about 0.8 feet. This appears to be based on the assumption of a constant height for the Fordway Bar. However, in about 1810, the Middlesex Canal Company cut through a portion of this bar, and two others on the Concord River, to facilitate the passage of boats. (And there is historical evidence that this enabled commercial traffic on the river.) If the bars were again scoured out to the level of the 1810 cuts, what effect would this additional lowering have on the projected level of the river? It seems likely that it would at least have
slight influence on the normal level, and tend to draw the river down considerably more during times of low water.

How much effect will a lowered water level have on the width of the Concord River throughout its length? And what effect, in turn, will this have on the currently established recreational appeal of the river? In many places upstream, the bottom of the river exhibits a very gentle slope, thus even a small lowering of the level of the river should result in a considerable reduction in the width of the river. What will the effect of this be at the various public access points - e.g., from Routes -117, -126/Lowell Road (north of Concord), -225, and -4? What effect will it have on businesses such as the South Bridge Boat House in Concord, to the marina and the rowing club in Billerica, and to those who run private boats? Within the Summit Pond itself, no doubt the effect would be dramatic for a proposed access via the Middlesex Canal Park, to the point of making such an access point effectively useless.

Decision Matrix’s Evaluation Criteria, page A-86. This chart is seriously disturbing. It appears to have been gratuitously, and not at all subtly, inflated throughout to throw the weight of decision greatly in favor of dam removal. We recommend that this chart be completely eliminated from the report, or thoroughly revised with adoption of objective criteria for each category to be evaluated, together with criteria for each evaluation, and with adversarial participation in all reassessments.

E.g., for the category “Reduction of invasive species”, why does dam removal rate “High”, when “Fishway” rates “None”? What’s the rationale behind this assessment?

Also why are the same assessments made for “Restoration of natural wetland habitat”? Given that the principal effect of dam removal will be to lower the water level in the Summit Pond for only about the quarter of a mile between the dam and the Fordway Bar, and the river upstream by less than a foot under normal flow conditions, how can such an assessment disparity even conceivably be justified?

Considering that there are, effectively, two dams at this site, with a great amount of fill between them, we question the assessed cost of dam removal.
Estimates of the cost of dam removal or of operating a fish ladder appear not to have considered the cost of the loss of or use of “Water Power Rights”. Past MCA/MCC efforts to acquire ownership of the dam have failed partly because these have been retained by the owners of the dam. The value of their loss should be considered in the report as part of the cost of dam breaching or removal, also as part of the operation of a fish ladder.

Fish ladder - the “Conceptual rendering of a fish ladder at Talbot Mills dam” on page E-3 and elsewhere, seems almost grotesque. Photos of fish ladders at other dam sites, as well as the conceptual discussion in pages 76 through 79, suggest that an effective fishway can be constructed that is far less intrusive. Furthermore, if a fishway were to be executed as a bypass, it should be done in a manner consistent with the historical nature of the dam; or could it in some way be integrated into the MCC’s plan for a MC park?

Bottom line

Today, the Summit Pond Dam site in Billerica serves as the location of the largest concentration of surviving elements of this historically significant transportation corridor and its historical interpretation. A drawdown or depletion of the Summit Pond would greatly reduce the effectiveness of the park as a venue for public education. The same can be said for the current and future Middlesex Canal Museum. As such its preservation is highly warranted.

signed

William E. Gerber
Member, Board of Directors
for the
Middlesex Canal Association
Commonwealth of Massachusetts  
Department of Conservation and Recreation  
Office of Dam Safety  
DAM REGISTRATION CERTIFICATE  
Issued in Accordance with MGL Chapter 253  
Sections 44-59 and 392 CMR 10.05  

CERTIFICATE NUMBER MA00774-R1

As required by MGL Chapter 253, and for the purpose of creating a public record of the subject dam, the Office of Dam Safety hereby issues this Dam Registration Certificate, to be recorded by the dam owner at the Registry of Deeds in the county where the dam lies.

### Section I: Dam Information

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<tr>
<td>Dam Name</td>
<td>TALBOT MILLS DAM (AKA FALKNER MILLS DAM)</td>
</tr>
<tr>
<td>Name of Impoundment</td>
<td>CONCORD RIVER</td>
</tr>
<tr>
<td>Location (City/Town)</td>
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<td>Height</td>
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<td>Hazard Potential Rating</td>
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<td>National Dam ID No.</td>
<td>MA00774</td>
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<tr>
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<tr>
<td>Longitude</td>
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</tbody>
</table>

### Section II: Registry of Deeds Information for the Property of which the Dam Lies

- **Property/Dam Owner(s):** CRT DEVELOPMENT REALTY, LLC
- **Registry Location (County Name):** MIDDLESEX
- **Registry of Deeds Book No.:** 17958
- **Registry of Deeds Page No.:** 85

### Section III: Town/City Assessor’s Office Information for the Property on which the Dam Lies

- **Property/Dam Owner Name:** CRT DEVELOPMENT REALTY, LLC
- **Mailing Address:** 6 NICHOLAS CIRCLE
- **Town/Zip:** ANDOVER, MA 01810-4278
- **Lot No.:** 10

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**COMMUNWEALTH OF MASSACHUSETTS - EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS**

Department of Conservation and Recreation  
Office of Dam Safety  
John Augustine Hall  
180 Beacon Street  
West Boston, MA 02153  
508-792-7716 508-792-7718 FAX  
www.mass.gov/dtcr

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**Please return to:**  
DAVAGIAN & ASSOCIATES  
ATTORNEYS AT LAW  
365 BOSTON POST ROAD, SUITE 200  
SUDbury, MA 01776-3023
CERTIFICATE NUMBER MA00774-R1

Section IV: Transfer of Ownership Notification Requirement

In accordance with M.G.L. c. 253, the dam owner shall notify the Commissioner by registered or certified mail, of the proposed transfer of legal title of such dam 30 days prior to any such transfer. Upon receipt of such notice, a new Certificate of Registration will be issued. Such Certificate shall contain any outstanding obligations of the registered owner under M.G.L. c. 253, §§ 44 through 50.

The Department of Conservation and Recreation

By: ____________________________
William C. Saloman, Director
Office of Dam Safety

Date Issued: ____________________________
December 9, 2008

Suffolk, ss. Commonwealth of Massachusetts

On this __________ day of December, 2008, before me, the undersigned notary public, personally appeared William C. Saloman, proved to me through satisfactory evidence of identification, which was personally known to me, to be the person whose name is signed on the preceding document, and acknowledged to me that he signed it voluntarily, in his capacity as Director of the Office of Dam Safety with the Department of Conservation and Recreation, for its stated purpose.

______________________________
Artiada L. Johnson
Notary Public
My Commission Expires
August 13, 2015
Re: Concord River Diadromous Fish Restoration Feasibility Study

Dear Ms. Griffiths,

I am writing in reference to the Concord River Diadromous Fish Restoration Feasibility Study draft report dated February 2016. I would like to offer the following comments to the project team.

Our organization is involved in a number of river restoration projects in the nearby Ipswich River watershed. Much of our work focuses on restoring connectivity and river processes with a goal of improving conditions for resident and diadromous fish species. Diadromous fishes are important regional resources and we recognize that healthy, resilient populations of these species depend on habitat availability across multiple watersheds. We strongly support efforts to restore habitat connectivity and diadromous fish populations throughout the region and are encouraged to see that significant restoration potential appears feasible in the SuAsCo watershed.

Based on a review of the alternatives analysis in the report, we strongly encourage the project team to pursue the partial removal of the Talbot Mills Dam (Alternative 3B). As outlined in the report, this alternative would provide the most effective passage for the target species while restoring more natural river processes to benefit the broader ecosystem. Additionally, this alternative removes a safety concern from the river and eliminates ongoing maintenance and liability associated with keeping the aging structure in place. A technical fishway at this location would be a less effective and potentially more costly solution to pass diadromous fish and lacks the added benefits of reducing risk, restoring riverine conditions, and reconnecting habitat for the full suite of native aquatic species in the Concord River.

We recognize that the Talbot Mills site is historically significant. Regardless of which alternative is chosen for this site, the rich past of the river as well as its industrial and pre-industrial history should be properly honored. This dam is an aging structure and will only remain in place for a limited time regardless of whether it is actively removed as part of a restoration effort. The proposed partial removal of the Talbot Mills Dam can be an opportunity to permanently honor the unique history of the site as part of a proactive project to restore the historically important diadromous fish runs to the river. While the dam no longer serves the purpose for which it was constructed, healthy fish runs are part of the site’s history and hopefully its future as well.

I look forward to following this project in the coming years. I am very encouraged at the possibility of such a significant improvement to diadromous fish habitat in our region. Thanks for the opportunity to provide these comments.

Sincerely,

Brian Kelder

Restoration Program Manager
Dear Ms. Griffiths,

The Merrimack River Watershed Council (MRWC) would like to thank you for the opportunity to comment on the draft Concord River Diadromous Fish Restoration Feasibility Study. The MRWC would like to thank the National Oceanic and Atmospheric Administration (NOAA) for being the project lead of the Concord River Diadromous Fish Restoration Feasibility Study, and to thank Gomez and Sullivan Engineers for serving as primary consultants for the report. We have found the study to be well-researched and the findings to be well-reasoned.

The mission of the Merrimack River Watershed Council is to protect, improve, and conserve the Merrimack River Watershed for people and wildlife through education, recreation, advocacy, and science. Created in 1976, we have devoted our efforts over the past 40 years in restoring the health of the river and the ecosystem at large. Together with our federal, state, municipal, and nonprofit partners, we have made great strides in recent decades as the river and watershed is once more home to vibrant wildlife and can be utilized for recreation.

The Merrimack River Watershed Council supports actions to expand the available habitats for diadromous fish. We are a partner to the Atlantic Coastal Fish Habitat Partnership (ACFHP); I am the head of the Science and Data Committee for ACFHP. Historically the Merrimack River served as a valuable economic and cultural resource due to its fish populations as well as its potential for industrial utilization. Both Native Americans and the colonialists relied on the extensive fish runs. Today, the Merrimack River is one of the three most important rivers in terms of migratory fish populations, according to the 2012 Assessment of Atlantic Coast Watersheds for River Herring and Diadromous Fish Conservation (Dawaulter, 2012). Migratory fish are a critical aspect of the total ecological makeup, serving as a valuable source of prey for marine, terrestrial, and freshwater predators, as well as an import aspect of aquatic recreation in terms of fishing. The Merrimack River has seen an impressive restoration of migratory fish populations over the past 20 years, which has accompanied a resurgence of endangered species along the Merrimack River Watershed, not the least of which is a rapidly growing bald eagle population.

Unfortunately, the Merrimack River watershed is now home to 847 dams. The Nature Conservancy considers a number of our dams to be in the top 10% for their impact on fish connectivity. These dams, many of which are in severe disrepair, serve as barriers to migratory fish population, preventing fish from traveling to spawning grounds and barring them from moving to otherwise viable habitats in which they could thrive. The unsafe dams are also a hazard to local residents. Additionally, the dams block off large portions of the waterway for recreational users.
The Talbot Mills Dam prohibits migratory fish access to over 35 miles worth of waterways along the length of the Concord River and its tributaries. This dam was initially constructed in the 1700's to serve as a water supply for the adjacent mill complex and has received many modifications over the years, including the construction and filling in of fish passages. Fishing has been a critical aspect of the local industry since the area's settling, and free passage of fish has been a controversial subject since the dam's initial construction.

The MWRC supports actions that facilitate the free passage of migratory fish to and from viable habitats. While we recognize the benefits of both options 3A (installation of a technical fish passage) and 3B (partial removal of the dam structure), we strongly favor option 3B, partial dam removal, as this will ensure the greatest degree of fish passage over time. We agree with the conclusion that the dam, in its current form, is an impediment to the ecological health of the Concord River and the Merrimack River Watershed as a whole. Additionally, the MWRC recognizes the cultural benefit of option 3B, in that it will open up continuous tracts of waterway for recreational purposes and aid investigation into the lives of the natives and settlers who inhabited the Mill Pond area. We are cognizant of the historical value of the dam, but confident that a solution can be reached that enables fish passage while providing outstanding historical interpretation.

While preserving the cultural legacy of past structures and landscape features, we also look forward to making our own cultural mark on the landscape, one that will show future generations how we value our natural resources, understand and work with - not against- our ecosystem, and work to live in harmony with the people and animals who share our rivers with us.

Sincerely,

Dr. Caroly Shumway
Executive Director, MRWC
April 6, 2016

Jill Griffiths, PE
Water Resources Engineer
Gomez and Sullivan Engineers
PO Box 2179
Henniker, NH 03242

Dear Jill,

The Lowell Parks & Conservation Trust (LP&CT) is pleased to have the opportunity to respond to your Concord River Diadromous Fish Restoration Feasibility Study (Draft Report, Feb. 2016). LP&CT’s commitment to, protection of, and programming along the lower reach of the Concord River has been a core component of our mission since our founding in 1990. We have conducted biodiversity inventories, numerous river clean-ups, and collected oral histories to document historic land use along the corridor. Ecological restoration activities have included Brownfield clean-ups, invasives removal, encroachment mitigation, native species plantings, and extensive land protection.

As an urban land trust, providing access to the river for public recreation and enjoyment has driven much of our work, including the creation of the first public park within the Lowell reach, Jollene Dubner Park. Since the early 1990’s we have been involved with recreational paddling on the Concord River below the Billerica Dam. This includes competitive kayaking, flatwater kayaking, and whitewater rafting. Finally, LP&CT has been committed to the establishment of the Concord River Greenway, a critical link in the regional trail network, since 2000. The Greenway includes public art, multi-lingual signage, and an outdoor classroom curriculum.

LP&CT began conducting fish restoration activities in 1999 on the Concord River, including outreach, coordination of volunteer monitors, training, adult & youth education programs, and transfers of fish species between the SuAsCo and other watersheds. Our approaches have been responsive to the species’ populations and the most current science. We have been fortunate to have strong partnerships with local dam owners, state wildlife staff, and the US Fish & Wildlife Service. The sharing of local site-based knowledge has been instrumental to conveying up-to-date information across agencies and with the public. This document recognizes that the recent herring restoration activities has resulted in increased populations, including citings at Centennial Dam in 2015. We look forward to contributing to the redevelopment of this monitoring program.

Since the late 1990’s LP&CT has been an active participant in discussions around fish passage enhancements at both Middlesex Falls and Centennial Falls Dam. We agree with the recommended approaches at both locations.

Improving fish passage at Middlesex Falls would also enhance recreational access here because at low water (<825 cfs) whitewater rafting boats cannot get over this
breached dam site. Improvements recommended in the feasibility site at these two locations are relatively simple, straightforward and inexpensive. The feasibility study has been reviewed by our rafting partner, Zoar Outdoor, and we concur with them that modifying the channel at Middlesex Falls would improve the rafting experience. In addition, we encourage agencies to look strongly at improving the bypass channel for fish passage. This channel has been included in plans for an Olympic whitewater venue, would provide an alternative passage at low water, and significantly enhance upstream fish passage. The removal of the eye beams would be critical for safe recreational access and would reduce access to the island which can provide cover for unwanted activities.

At Centennial Falls Dam, LP&CT supports the coordination of both alternatives 2A (Fishway improvements) and 2B (Volunteer Coordination). Public engagement in monitoring at this location will only help to document the need for and support possible changes at the Talbot Dam. It is not clear in 4.2.2 how monitoring the fishways operations plan will occur. We currently have a very cooperative dam owner, but this study should include written recommendations for how the plan’s activities are monitored on an ongoing basis.

We are particularly interested in seeing fish passage at Talbot Mills Dam after supporting years of documentation of fish passage in the lower reaches of the Concord. The Talbot Mills Dam is well above our rafting run, but dam removal could create a recreational rapid for kayakers. We appreciate the clear documentation of the underlying geology of this area to demonstrate the historic channel flow, but acknowledge the strong connection that the community has with this physical structure, including the perception that removal of the dam would reduce water quality, among other concerns. Currently, the dam does prevent the downstream flow of invasive plants which would be difficult to manage on the section of the Concord below Talbot Mills that is not easy to access. To fully restore the watershed’s ecosystem would require the removal of the Talbot Mills Dam to provide natural flow at this location. Providing fish passage as an intermediary step in the near future will help open the door to further community conversation about the implications of such a historic change.

LP&CT will be hosting a public outreach program in Lowell on May 4, 2016. At that point, we anticipate providing further feedback on this draft document, incorporating public input received at the meeting.

Thank you for all the hard work on the feasibility study and we look forward seeing some of the recommendations happen on the ground.

Sincerely,

Jane L. Calvin
Executive Director
I thought that you should know I have some severe reservations about the proposal. I like the idea in concept but a lot is riding on the stability of Fordaway Bar and nobody has seen it for 200 years. BTW I live between the river and the MBTA station and have been kayaking on the river for 5 years, so I know the ground and water intimately. The hydrogeos and geologists in my office agree that before anything is done to further the proposal, the bar needs a study. If it can withstand the flow and scouring from 500 year first flush flow, a partial removal is feasible. But if the bar can't keep the water level up without damage, the only option is a fish ladder. This could substantially impact Billerica's water intakes and every well, public and private that draws from the aquifer influenced by the river. Losing a foot of water could at a minimum impact the Seadoo dealer in Rt 4 and the Old Bridge Boathouse in Concord, that doesn't mention what a full 10 foot drop would do if the Bar erodes.

Tim Boyle
Billerica Resident
Hi,

Bob LeBlanc and I attended the subject meeting, sponsored by Lowell Parks and Conservation Trust.

Unlike the February meeting, the results of the ‘Feasibility of Restoring Diadromous Fish to the Concord River Study’ were presented by Eric Hutchins from the National Oceanic and Atmospheric Administration. Also present in official or semi-official capacity were: Caleb Slater from Massachusetts Fish and Wildlife; Mike Bailey, from US F&W; and Karen (who’s last name I didn’t catch), representing Environmental Protection. Jill Griffiths, the study director for the contractor, Gomez and Sullivan (G&S), who made the presentation in February, was not present. There might have been a dozen or so other attendees, I didn’t count them, but among them was the owner of the Concord River dam and fish ladder at the southern end of Centennial Island; regrettably, I didn’t catch his name either.

Early on, Mr. Hutchins invited the attendees to continue to submit comments on the study through the contractor, G&S. I thought this a bit strange, considering that a firm end-date for submitting comments was initially given as April 6th. I don’t know what the legal aspects of soliciting and receiving comments after the end date are (certainly we’d have subjected ourselves to severe legal scrutiny if we’d attempted to do this with any of the Department of Defense projects I worked on), but clearly the ethics of doing so are suspect. (Thinking about this, I now wonder if too many of the comments submitted within the allowable period tended to be negative, certainly ours were as they pertained to breaching or removing the dam, and now the contracting authority is fishing around for some that are more favorable to their thinly disguised intention to breach or remove the dam.)

Given that comments are still being accepted, then I think it would be proper and most appropriate for G&S and its sponsors to give a presentation of the study results to a gathering of business and recreational interests that use the river. The marina, boathouse and restaurant near where Rt. 4 crosses the Concord, South Bridge Boat House, where Rt. 62 crosses the Concord in Concord, Sudbury Assabet Concord Wild & Scenic River Stewardship Council, OARS, AMC and other canoeists and kayakers, and all boat owners who live along and/or use the river should all be invited to such a session and urged to submit comments.

One of the arguments driving this restoration movement seems to be that the types of fish to be restored are those which were known to and ‘harvested' by the native American people and early settlers some 300 years ago. But, of course, there are few native Americans around who desire to do this today; and at least one contemporary business owner, who regularly spends time on the river, indicated that very few people can be found fishing anymore, at any time. In the meantime, a totally different culture has replaced that of the native Americans, and current uses of the river are quite substantially different.
The types of fish that the promoters hope to restore to the Concord received a modicum of discussion. Slides that showed the number of fish that have ascended the Merrimack (via the fish elevator at the Essex Dam in Lawrence) may be encouraging, but they are inconsistent and far from impressive. I asked what the F&W people would consider a “good year” in terms of fish passages. The answer was on the order of 120,000 Herring and/or 80,000 Shad. (I trust that they would like to see those numbers repeated in a number of successive years.)

During the discussion, someone noted that the numbers of fish that reach the Amoskeag Dam, by Manchester NH, are very disappointing, suggesting that very few are getting by Pawtucket Dam at Lowell. Apparently the type of fish elevator that works at Lawrence, does not work very well at Lowell.

One of the points that Mr. Hutchins made, that surprised me, is that the owner of our Summit Pond Dam (aka Talbot Mills Dam) is aware of and favors the continuation of the study, also that he’d like to find a buyer for the dam!

At one point, Mr. Hutchins showed a chart that presented the history of the Summit Pond Dam, over which were superimposed subjective curves suggesting greatly increased concern with such things as the structural integrity of the dam and the build up of silt behind it, as a function of time — and these curves are subjectively suggestive that some sort of critical decision point is here or rapidly approaching. These subjective curves are difficult to reconcile considering that the dam is built of granite, it is backed up by an earlier timber-crib and rubble stone dam, and together these have stood, pretty much trouble free for more than 200 years. With regard to concerns about silt, the results of probes to determine the extent of the its build up were presented in a later slide, which essentially showed that there is very little, in fact almost no, significant build up of silt behind the dam.

A small issue was made of the flood control potential of our Summit Pond Dam, or the lack thereof. To the best of our knowledge, historically, flood control was never considered to be a function of the dam. Certainly the relatively paltry 140 acre-feet of surge capacity which a pre-storm depletion of the impoundment behind the dam might provide, would have little or no impact on any but the smallest of flood conditions.

I don’t recall where I’ve seen it, but I recall reading where James B. Francis (Chief Engineer for the Lowell system of power canals) built a fishway into the Pawtucket Dam that attempted to emulate a natural rapid. I don’t know what the experience was with that approach, regarding the passage of fish, but it certainly had a far more visual appeal than the types of fish ladders that have been suggested in the report. I recommend that Mr. Francis’s approach be investigated and considered for the Summit Pond Dam, if a fishway is seriously considered as a solution.

I raised a question about the adequacy of the amount of the quantity and quality of water that would be available to Billerica during drought conditions if the dam were breached or removed. The presenter and F&W people indicated that they didn’t see that as a problem. I disagree, I think that the amount of water, reduced by both dam breaching or removal, and drought, would seriously compromise the quantity and quality of water available.

During the presentation, Mr. Hutchins again drew attention to the ‘Decision Matrix’, so called, that I so vehemently objected to in the official MCA response (submitted before closure of the comment period). IMHO, this matrix is replete with non-relevant and indefensible entries, the sole purpose of which is
clearly to elicit a dam removal decision over any of the other options. This matrix is outrageous and should be stricken from the report in its entirety.

Regarding the historical importance of the Summit Pond Dam and adjacent canal segments, it occurred to me that there was one more feature of the Concord River Crossing that was unique, and the remains of some of which might conceivably be found. Considering all of the early canals across most of the USA and Canada, and even parts of the rest of the world, to the best of my knowledge, the Middlesex is the only canal that employed “Raft Locks” (see “... What’s a Raft Lock” in http://middlesexcanal.org/towpath/towpathtopicsApr2009.htm).

In a short discussion that we had following the meeting, Bob LeBlanc pointed out to me (as he had once before but I hadn’t picked up on it) that if the surface level of the river was lowered, as described if the Summit Pond Dam were removed, something on the order of 150 acres of wetland, i.e., about 15% of wetland area, might be lost to the Great Meadows Wildlife Refuge alone. One wonders how much wetland/swampland might be lost from other places as well, e.g., along the Sudbury River in the areas on either side of Rt. 117. Whatever these losses might be, no doubt they would have a deleterious effect on many species of wildlife, including a reduction of the area available for diadromous fish growth and reproduction.

Overall I have serious misgivings about the honesty and objectivity of the ‘Feasibility of Restoring Diadromous Fish to the Concord River Study’. I recommend, most vociferously, that the analytical and derivative portions of it be completely revised and that this be done in a manner that includes adversarial participation.

B