Little River Dam Removal and River Restoration
Notice of Intent

Proponent: City of Haverhill
Haverhill, Massachusetts

June 12, 2023

Preparer:

FUSS & O'NEILL

1550 Main Street, Suite 400
Springfield, MA 01103

Project No. 20170390.U30

FUSS & O'NEILL

June 19, 2023

Haverhill Conservation Commission
4 Summer Street
Haverhill, MA 01830

RE: Ecological Restoration Notice of Intent
Little River Dam Removal and River Restoration
Haverhill, Massachusetts

Dear Commission Members:

On behalf of the City of Haverhill, Fuss & O'Neill has prepared the enclosed Ecological Restoration Notice of Intent (NOI) for the Little River Dam Removal and River Restoration project located north of Winter Street in Haverhill, Massachusetts. The proposed project includes the removal of Little River Dam and the restoration of the full reach of the river within the existing dam impoundment.

A Restoration Order of Conditions is required as work will occur within Bank, Bordering Vegetated Wetlands, Land Under Water Bodies and Waterways, Bordering Land Subject to Flooding, and Riverfront Area, which are subject to protection under the Massachusetts Wetlands Protection Act M.G.L. c. 131 §40 (WPA), its implementing regulations set forth at 310 CMR §10.00 (Wetland Regulations.

The enclosed NOI application package includes the WPA Form 3A, along with the supporting project narrative, and supporting materials. With the submittal of this NOI, the Town is certifying the project meets the eligibility criteria set forth in 310 CMR 10.13

Should you have any questions or require additional information, please contact me by phone at (413) 333-5469 or email at jbusa@fando.com. Thank you for your consideration of this NOI. We look forward to discussing the project with the Haverhill Conservation Commission during the July 13th public meeting.

Sincerely,

Julianne Busa, PhD, PWS, CSE
Senior Project Manager | Senior Resilience Scientist
Fuss & O'Neill, Inc.

Cc: MassDEP, Northeast Regional Office

1550 Main Street
Suite 400
Springfield, MA
01103
t 413.452.0445
800.286.2469
f 860.533.5143

www.fando.com

California
Connecticut
Maine
Massachusetts
New Hampshire
New York
Rhode Island
Vermont

FUSS & O'NEILL

Table of Contents

Notice of Intent
Little River Dam Removal and River Restoration

WPA Form 3A – Notice of Intent of an Ecological Restoration Project

NOI Wetland Fee Transmittal Form

HCC Local Application Form 3

Table of Contents

Notice of Intent
Little River Dam Removal and River Restoration

Table of Contents

Notice of Intent
Little River Dam Removal and River Restoration

WPA Form 3A – Notice of Intent

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

Project Type

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

Check the Ecological Restoration type that applies:

☒ 1. Dam Removal

☐ 2. Freshwater Stream Crossing Repair and Replacement*

☐ 3. Stream Daylighting

☐ 4. Tidal Restoration

☐ 5. Rare Species Habitat Restoration

☐ 6. Restoring Fish Passageways

Eligibility Criteria:

☒ I am applying for a Restoration Order of Conditions and meet the General Eligibility Criteria [310 CMR 10.13(1)] as described in Section C1 and the Additional Eligibility Criteria for this Ecological Restoration Project type [310 CMR 10.13(2) through (7)] as described in Section C2.

☒ This Notice of Intent includes the required supporting documents as specified in [310 CMR 10.11, 10.12] and outlined in Appendix 1 and Appendix 2 respectively. The NOI also includes a signed Certification of Eligibility in Section G. Signatures and Submittal Requirements.

A. General Information

1. Project Location:

Little River north of Winter Street
a. Street Address

Haverhill
b. City/Town

01830
c. Zip Code

Latitude and Longitude*:

42.777645
d. Latitude

-71.08868
e. Longitude

523
f. Assessors Map/Plat Number

523-326-1
g. Parcel/Lot Number

2. Applicant:

James
a. First Name

Fiorentini
b. Last Name

City of Haverhill
c. Organization

* *If the Ecological Restoration Project involves work on a stream crossing, baseline photo-points that capture longitudinal views of the crossing inlet, the crossing outlet and the upstream and downstream channel beds during low flow conditions. The latitude and longitude coordinates of the photo-points shall be included in the baseline data.*

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

A. General Information (cont.)

4 Summer Street
d. Street Address

Haverhill | MA | 01830
e. City/Town | f. State | g. Zip Code

978-374-2300 | | mayor@cityofhaverhill.com
h. Phone Number | i. Fax Number | j. Email Address

3. Property Owner (required if different from applicant): ☒ Check and attach list if more than one owner

See attached
a. First Name | b. Last Name

c. Organization

d. Street Address

e. City/Town | f. State | g. Zip Code

h. Phone Number | i. Fax Number | j. Email Address

4. Representative (if any):

Julianne | Busa
a. First Name | b. Last Name

Fuss & O'Neill
c. Organization

1550 Main Street, Suite 400
d. Street Address

Springfield | MA | 01103
e. City/Town | f. State | g. Zip Code

413-333-5469 | | jbusa@fando.com
h. Phone Number | i. Fax Number | j. Email Address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form): Category 2 - $500

Exempt | Exempt | Exempt
a. Total Fee Paid | b. State Fee Paid | c. City/Town Fee Paid

6. Property recorded at the Registry of Deeds for:

Southern Essex |
a. County | b. Certificate # (if registered land)

38148 | 422
c. Book | d. Page Number

7. Project Narrative: Describe the project's ecological restoration goals and how it furthers at least one of the interests of the Wetland Protection Act (WPA) M.G.L. c. 131, § 40.

This is a dam removal project satisfying 310 CMR 10.53(4)(e)(1). Dam removal and river restoration includes the following elements: dredging sediment for targeted sediment cleanup, installation of fish passage structures, construction of low flow channel downstream of Winter Street Bridge, installation of bioengineered slope stabilization and scour protection, and installation of native plantings.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

B. Resource Area Impacts (Temporary & Permanent)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

1. ☒ **Inland Resource Areas**: (See 310 CMR 10.54-10.58)

Resource Area	Size of Proposed Alteration*	Proposed Replacement (if any)
a. ☒ Bank	5,100 1. linear feet	~8,100 2. linear feet
b. ☒ Bordering Vegetated Wetland	22,570 1. square feet	0 2. square feet
c. ☒ Land Under Waterbodies and Waterways	415,400 1. square feet	~162,000 2. square feet
	10,360 3. cubic yards dredged	
d. ☒ Bordering Land Subject to Flooding	10,300 1. square feet	0 2. square feet
	0 3. cubic feet of flood storage lost	0 4. cubic feet replaced
e. ☐ Isolated Land Subject to Flooding	1. square feet	
	2. cubic feet of flood storage lost	3. cubic feet replaced
f. ☒ Riverfront Area	Little River - inland 1. Name of Waterway (if available) - **specify inland or coastal**	
2. Proposed alteration of the riverfront area:		**83,730** a. total square feet

*See Table 5-3 for indirect impacts outside of limit of disturbance.

2. ☐ **Coastal Resource Areas:** (see 310 CMR 10.25-10.35)

Check all that apply below. **For coastal riverfront area, see B.1.f. above.**

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. ☐ Land Under the Ocean	1. square feet	
	2. cubic yards dredged	
c. ☐ Barrier Beach**	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☐ Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. ☐ Coastal Dunes**	1. square feet	2. cubic yards dune nourishment

** *Note: No armoring of a Coastal Dune or Barrier Beach is permitted.*

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

B. Resource Area Impacts (Temporary & Permanent) (cont.)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet 2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above 1. cubic yards dredged	
l. ☐ Land Subject to Coastal Storm Flowage	1. square feet	

3. ☐ **Restoration/Enhancement**

In addition to the square footage that has been entered in Section B1.b for BVW and B 2.h for Salt Marsh above, please enter the additional amount here for restoration/enhancement.

a. Identify the appropriate resource area(s) type/name	Square feet or linear feet
b. Identify the appropriate resource area(s) type/name	Square feet or linear feet

C. Ecological Restoration Project Description

1. Check each box below to confirm that the project complies with each Eligibility Criteria required to obtain a Restoration Order of Conditions and provide the appropriate documentation.

☒ This project will have no short term or long-term adverse effects on Estimated Habitat sites of Rare Species located within resource areas that may be affected by the project or will be carried out according to a habitat management plan approved by NHESP.

☒ The project avoids and minimizes adverse impacts to Resource Areas and the interests identified in the WPA, without impeding the achievement of the ecological restoration goals

☒ The project will utilize best management practices to prevent and minimize adverse impacts to Resource Areas and the WPA interests.

☒ This Project will cause NO significant adverse effects on the interests of flood control and storm damage prevention in relation to the built environment (i.e., the project will not result in a significant increase in flooding or storm damage affecting buildings, wells, septic systems, roads or other man-made structures or infrastructure) **and** documentation on how this is achieved.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

C. Ecological Restoration Project Description (cont.)

☒ If the Project involves the dredging of 100 cubic yards of sediment or more or dredging in an ORW, a 401 Water Quality Certification is required and attached. Requires a 401 Water Quality Certification.

☒ The Project will not substantially reduce the capacity of a Resource Area to serve the wildlife habitat functions identified in 310 CMR 10.60(2). A project will be **presumed** to meet this eligibility criteria if the NOI will be carried out in accordance with any Time of Year (TOY) restrictions or other conditions recommended by the DMF for coastal waters, and by the DFW for inland waters in accordance with 310 CMR 10.11(3), (4) and (5). A NOI for an Ecological Restoration Project that meets the requirements of 310 CMR 10.12(1) and (2) it ***is exempt from performing a wildlife habitat evaluation.***

☐ If the project involves work on a **stream crossing**, the stream crossing has been designed in accordance with 310 CMR 10.24(10) for work in coastal resource areas and 310 CMR 10.53(8) for work in inland resource areas, as applicable. See additional requirements below for Freshwater Stream Crossing Repair and Replacement Projects.

☒ The project will not result in a discharge of dredged or fill material within 400 feet of the high water mark of a Class A surface water (exclusive of its tributaries) unless the project is conducted by a public water system under 310 CMR 22.00 or a public agency or authority for the maintenance or repair of existing public roads or railways in accordance with 314 CMR 4.06(1)(d)1.

☒ The project will not result in a discharge of dredged or fill material to a vernal pool certified by the Massachusetts Division of Fisheries and Wildlife (DFW).

☒ The project will not result in a point source discharge to an Outstanding Resource Water.

☒ The project will not involve the armoring of a Coastal Dune or Barrier Beach.

☒ Describe in detail the project plan for invasive species prevention and control.

☒ Provide any TOY restrictions and/or other conditions recommended by the Division of Marine Fisheries or the Division of Fisheries and Wildlife in accordance with 310 CMR 10.11(3), (4) and (5) with attached copies of their written determinations.

☒ If the project involves the construction, repair, replacement or expansion of infrastructure, a proposed operation and maintenance plan is provided to ensure that the infrastructure will continue to function as designed;

2. Check each box as appropriate to confirm that the project complies with the Eligibility Criteria required for this Ecological Restoration Project type.

Dam Removal

☒ The Ecological Restoration Project is a dam removal project. The project meets the eligibility criteria set forth in 310 CMR 10.13(1)(d).

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

C. Ecological Restoration Project Description (cont.)

☒ The Project **is** consistent with the MassDEP guidance entitled *Dam Removal and the Wetlands Regulations*, dated December 2007, and meets the eligibility criteria set forth in 310 CMR 10.13(1).

☐ The Project is NOT consistent with MassDEP's guidance entitled Dam Removal and the Wetlands Regulations, dated December 2007 and meets the eligibility criteria set forth in 310 CMR 10.13(1).

☒ The project will not involve the removal of a dam that was constructed or is managed for flood control by a municipal, state or federal agency.

☒ The project will not adversely impact public water supply wells or water withdrawals permitted or registered under the Water Management Act, M.G.L. c. 21G, and 310 CMR 36.00 within the reach of the stream impacted by the impoundment.

☒ The project will not adversely impact private water supply wells including agricultural or aquacultural wells or surface water withdrawal points.

☒ The project provides for the removal of the full vertical extent of the dam such that no remnant of the dam will remain at or below the streambed as determined prior to commencement of the dam removal project, or if such determination cannot be made at that time, as determined during construction of the project.

☒ The project provides for the removal of enough of the horizontal extent of the dam such that after removal no water will be impounded during the 500 year flood event.

☒ The project will not involve a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license.

☒ The applicant has obtained from the Department of Conservation and Recreation Office of Dam Safety a written determination in accordance to the General Applicability requirements prior to submitting this NOI.

☐ If the project is exempt from the requirement to obtain a license or permit under 310 CMR 9.05(3)(n), the project will not have an adverse effect on navigation or on any docks, piers or boat ramps authorized under 310 CMR 9.00.

Freshwater Stream Crossing Repair and Replacement (310 CMR 10.13(3))

☐ The Ecological Restoration Project is a freshwater stream crossing repair or replacement project. In addition to the eligibility criteria set forth in 310 CMR 10.13(1), the project meets all of the following eligibility criteria that will meet the MA Stream Crossing (SC) Standards that is completely described below or in the attached:

☐ The width of the structure will be at least 1.2 times bankfull width to facilitate the movement of fish and other aquatic organisms and wildlife species that may utilize riparian corridors.

☐ The structure will be an open-bottom span where practicable or if an open-bottom span is not practicable, the structure bottom will be embedded in a substrate that matches the substrate of the stream channel and that shall be designed to maintain continuity of aquatic and benthic elements of the stream including appropriate substrates and hydraulic characteristics within the culvert (water depths, slope, turbulence, velocities, and flow patterns).

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

C. Ecological Restoration Project Description (cont.)

- ☐ The structure will have an Openness Ratio of at least 0.82 feet, or as close to 0.82 feet as is practicable.
- ☐ The project includes considerations for site constraints in meeting the SC standards, undesirable effects or risk in meeting the standard, the environmental benefit of meeting the standard compared to the cost in evaluating:
  - ☐ The potential for downstream flooding
  - ☐ Upstream and downstream habitat (in-stream habitat, wetlands);
  - ☐ Potential for erosion and head-cutting;
  - ☐ Stream stability;
  - ☐ Habitat fragmentation caused by the crossing;
  - ☐ The amount of stream mileage made accessible by the improvements;
  - ☐ Storm flow conveyance;
  - ☐ Engineering design constraints specific to the crossing;
  - ☐ Hydrologic constraints specific to the crossing;
  - ☐ Impacts to wetlands that would occur by improving the crossing;
  - ☐ Potential to affect property and infrastructure; and
  - ☐ Cost of replacement.

Stream Daylighting

- ☐ The Ecological Restoration Project is a stream daylighting project. In addition to the eligibility criteria set forth in 310 CMR 10.13(1), the project meets all of the following eligibility criteria and is completely described narrative below/attached:
  - ☐ The project will meet the applicable performance standards for Bank, 310 CMR 10.54, and Land Under Water Bodies and Waterways, 310 CMR 10.56. As set forth in 10.12(3), a person submitting a Notice of Intent that meets the requirements of 310 CMR 10.12 (1) and (2) for a stream daylighting project is exempt from the requirement to perform a wildlife habitat evaluation in accordance with 310 CMR 10.60, notwithstanding the provisions of 310 CMR 10.54(4)(a)5., 310 CMR 10.56(4)(a)4., and 310 CMR 10.60.
  - ☐ To the maximum extent practicable, the project is designed to include the revegetation of all disturbed areas with noninvasive indigenous species appropriate to the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

C. Ecological Restoration Project Description (cont.)

Tidal Restoration Project (310 CMR 10.13(5))

☐ The Ecological Restoration Project is a Tidal Restoration Project designed to restore tidal flow that has been restricted or blocked by a man-made structure. In addition to the eligibility criteria set forth in 310 CMR 10.13(1), the project meets all of the following eligibility criteria that is completely described below or in the attached:

- ☐ If the project will involve work in a Coastal Dune and/or a Coastal Beach, the project meets the applicable performance standard(s) at 310 CMR 10.27 and/or 10.28.
- ☐ The project will not include a new or relocated tidal inlet/breach through a Barrier Beach or additional armoring of a Barrier Beach, but may include the modification, replacement or enlargement of an existing culvert or inlet through a Barrier Beach.
- ☐ The project will not involve installation of new water control devices (i.e., tide gates, flash boards and adjustable weirs) or a change in the management of existing water control devices, when the existing or proposed function of said devices is to prevent flooding or storm damage impacts to the built environment, including without limitation, buildings, wells, septic systems, roads or other man-made structures or infrastructure.
- ☐ The project's physical specifications are compatible with passage requirements for diadromous fish runs identified at the project location by the Division of Marine Fisheries.
- ☐ Did the project include considerations for site constraints in meeting the SC standards, undesirable effects or risk in meeting the standard, the environmental benefit of meeting the standard compared to the cost in evaluating:
  - ☐ The potential for downstream flooding
  - ☐ Upstream and downstream habitat (in-stream habitat, wetlands);
  - ☐ Potential for erosion and head-cutting;
  - ☐ Stream stability;
  - ☐ Habitat fragmentation caused by the crossing;
  - ☐ The amount of stream mileage made accessible by the improvements;
  - ☐ Storm flow conveyance;
  - ☐ Engineering design constraints specific to the crossing;
  - ☐ Hydrologic constraints specific to the crossing;
  - ☐ Impacts to wetlands that would occur by improving the crossing;
  - ☐ Potential to affect property and infrastructure; and

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

C. Ecological Restoration Project Description (cont.)

☐ Cost of replacement.

Rare Species Habitat Restoration (310 CMR 10.13(6))

☐ The Ecological Restoration Project is a Rare Species habitat restoration project. In addition to the eligibility criteria set forth in 310 CMR 10.13(1), the project meets all of the following eligibility criteria that is completely described below or in the attached:

☐ The project is exempt from review under 321 CMR 10.00 as a project that involves the active management of Rare Species habitat for the purpose of maintaining or enhancing the habitat for the benefit of Rare Species. A project that involves the active management of Rare Species habitat and is exempt from review under 321 CMR 10.00 may include without limitation the mowing, cutting, burning or pruning of vegetation or the removal of exotic or invasive species.

☐ The project is carried out in accordance with a Habitat Management Plan that has been approved in writing by the Natural Heritage and Endangered Species Program and submitted with this Notice of Intent.

Restoring Fish Passageways (310 CMR 10.13(7))

☐ The Ecological Restoration Project involves the restoration or repair of a fish passageway as identified by the Division of Marine Fisheries in its Marine Fisheries Technical Reports, TR 15 through 18, dated 2004. In addition to the eligibility criteria set forth in 310 CMR 10.13(1), the project meets all of the following eligibility criteria that is completely described below or in the attached:

☐ Proof of submission of a Fishway Permit Application to the Division of Marine Fisheries, pursuant to M.G.L. c. 130, §§ 1 and 19, and 322 CMR 7.01(4)(f) and (14)(m); and

☐ The fish passageway will be operated and maintained in accordance with an Operation and Maintenance Plan approved by the Division of Marine Fisheries.

D. Other Applicable Standards and Requirements

A person submitting a Notice of Intent for an Ecological Restoration Project that meets the requirements of 310 CMR 10.12(1) and (2) and that contains either a written determination from the Natural Heritage Endangered Species Program (NHESP) that the project will have no short or long term adverse effects on the habitat of the local population of state-listed species, or a Conservation and Management Permit issued by NHESP pursuant to the Massachusetts Endangered Species Act (MESA) Regulations at 321 CMR 10.00 for the project, or a habitat management plan for the project approved in writing by NHESP, will be deemed to have satisfied the requirements in 310 CMR 10.37 and 310 CMR 10.59 of sending the Notice of Intent for the same project for a determination by NHESP. For the purposes of this guidance, the “same project” means either there have been no changes to the project reviewed by NHESP in making its determination or that any subsequent changes to the project since the initial review by NHESP have been reviewed and approved in writing by NHESP.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

D. Other Applicable Standards and Requirements (cont.)

Compliance with the above NHESP-related requirements may be demonstrated by providing the following applicable documentation. See Appendix 1 for a complete description of these requirements. Check the applicable box below.

☒ The project is not within Estimated Habitat of State-Listed Rare Wetlands Wildlife as shown on the most recent Estimated Habitat Maps of State-Listed Rare Wetlands Wildlife published by the Natural Heritage and Endangered Species Program.

☐ The NHESP has issued the attached written determination that the project will have no short or long term adverse effects on the habitat of the local population of state-listed species.

☐ The NHESP has issued the attached written approval of the attached habitat management plan for this project, which makes it an eligible Rare Species habitat restoration project under 310 CMR 10.13(6).

☐ The NHESP has issued pursuant to the MESA Regulations at 321 CMR 10.00 the attached Conservation and Management Permit for this project.

☐ There have been no changes to the project reviewed by NHESP in making its determination, or if so, any subsequent changes to the project have been reviewed and approved in writing by NHESP and attached hereto.

1. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

   a. ☐ Not applicable – project is in inland resource area only

   b. ☐ Yes ☐ No

   If yes, include proof of mailing, hand delivery, or electronic delivery of written determination to either:

   South Shore – Cohasset to Rhode Island border, and the Cape & Islands:
   Division of Marine Fisheries –
   South Coast Field Station
   Attn: Environmental Reviewer
   836 South Rodney French Blvd
   New Bedford, MA 02744
   Email: DMF.EnvReview-South@state.ma.us

   North Shore – Hull to New Hampshire border:
   Division of Marine Fisheries –
   North Shore Field Station
   Attn: Environmental Reviewer
   30 Emerson Avenue
   Gloucester, MA 01930
   Email: DMF.EnvReview-North@state.ma.us

2. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

   a. ☐ Yes ☒ No

   If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP website for ACEC locations).

   b. ACEC

3. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

   a. ☐ Yes ☒ No

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

D. Other Applicable Standards and Requirements (cont.)

4. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?

   a. ☐ Yes ☒ No

5. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

   a. ☐ Yes ☒ No

   If yes, attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

   ☐ Proprietary BMPs are included in the Stormwater Management System.

6. ☐ If the Ecological Restoration Project involves the construction, repair, replacement or expansion of infrastructure, an operation and maintenance plan has been submitted to ensure that the infrastructure will continue to function as designed.

7. ☒ The project involves the dredging of 100 cubic yards or more of sediment, or dredging of any amount in an Outstanding Resource Water, and a Water Quality Certification issued by the Department pursuant to 314 CMR 9.00 is attached.

8. ☐ The Ecological Restoration Project involves work on a stream crossing. Sufficient information has been provided to demonstrate that the design meets the requirements in 310 CMR 10.24(10) for work in coastal resources, and 310 CMR 10.53 (8) for work in an inland resource area.

E. Additional Information

Check each box for required documents that are attached to this Notice of Intent (NOI). See instructions for details.

1. ☒ Maps and Plans identifying the location of proposed activities relative to the boundaries of each affected resource area [http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/nwi.html]

2. ☒ List the titles and dates for all plans and other materials submitted with this NOI.

   Little River Dam Removal and River Restoration
   a. Plan Title

   Fuss & O'Neill
   b. Prepared By

   c. Signed and Stamped by

   June 30, 2022
   d. Final Revision Date

   1"=30'
   e. Scale

   f. Additional Plan or Document Title

   June 30, 2022
   g. Date

3. ☐ Attach proof of Natural Heritage and Endangered Species Program written determination, if needed.
4. ☒ Attach proof of mailing for Massachusetts Division of Marine Fisheries Time of Year written determination, if needed.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

E. Additional Information (cont.)

5. ☒ Attach NOI Wetland Fee Transmittal Form.

6. ☐ Attach Stormwater Report, if needed.

F. Fees

1. ☒ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

   Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

2. Municipal Check Number	3. Check date
4. State Check Number	5. Check date
6. Payor Name on Check: First Name	7. Payor Name on Check: Last Name

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

G. Signatures and Submittal Requirements

Certification of Ecological Restoration Project Notice of Intent

I hereby certify under penalties of perjury that **the Ecological Restoration Project Notice of Intent application meets the Eligibility Criteria set forth in 310 CMR 10.13.** I also certify that I am familiar with the information contained in this Notice of Intent application and that the accompanying plans, documents, and supporting data are to the best of my knowledge and belief true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities.

I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

1. Signature of Applicant or Authorized Agent

Julianne Busa, Fuss & O'Neill
2. Printed Name of Applicant or Authorized Agent

6/19/23
3. Date

**please see additional signature pages and authorization letters in Appendix I
4. Signature of Property Owner – Tess Paganeli, MBTA

5. Date

6. Signature of Representative (if any)

7. Date

The certification must be signed by the applicant; however, it may be signed by a duly authorized agent (named in Item 6) if this form is accompanied by a statement by the applicant designating the agent and agreeing to furnish upon request, supplemental information in support of the application

For Conservation Commission:
Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:
One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:
The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

Appendix 1: Ecological Restoration Notice of Intent (WPA 3a) - Required Actions (310 CMR 10.11)

Complete the Required Actions before submitting a Notice of Intent Application for an Ecological Restoration Project and submit a completed copy of this Checklist with the Notice of Intent.

☒ **Environmental Monitor /Massachusetts Environmental Policy Act (MEPA)**
http://www.mass.gov/eea/agencies/mepa/submitting-notices-to-the-environmental-monitor.html

☒ Submit written notification at least 14 days **prior** to the filing of a Notice of Intent (NOI) to the *Environmental Monitor* for publication. A copy of the written notification is attached and provides at minimum:

- ☒ A brief description of the proposed project.
- ☒ The anticipated NOI submission date to the conservation commission.
- ☒ The name and address of the conservation commission that will review the NOI.
- ☒ Specific details as to where copies of the NOI may be examined or acquired **and** where to obtain the date, time, and location of the public hearing.

☐ **Massachusetts Endangered Species Act (MESA) /Wetlands Protection Act Review**

☐ Preliminary Massachusetts Endangered Species Act Review from the Natural Heritage and Endangered Species Program (NHESP) has been met and the written determination is attached.

☐ Supplemental Information for Endangered Species Review has been submitted.

1. ☐ Percentage/acreage of property to be altered:
   a. Within Wetland Resource Area _____ Percentage/acreage
   b. Outside Wetland Resource Area _____ Percentage/acreage
2. ☐ Assessor's Map or right-of-way plan of site
3. ☐ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work.
4. ☐ Project description (including description of impacts outside of wetland resource area & buffer zone)
5. ☐ Photographs representative of the site
6. ☐ MESA filing fee (fee information available at http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_fee_schedule.htm)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

Appendix 1: Ecological Restoration Notice of Intent (WPA 3a) - Required Actions (310 CMR 10.11)

Make check payable to "Commonwealth of Massachusetts - NHESP" and mail to NHESP:

Natural Heritage & Endangered Species Program
MA Division of Fisheries & Wildlife
1 Rabbit Hill Road
Westborough, MA 01581

7. Projects altering 10 or more acres of land, also submit:

   a. ☐ Vegetation cover type map of site

   b. ☐ Project plans showing Priority & Estimated Habitat boundaries

OR Check One of the Following:

1. ☐ Project is exempt from MESA review.

Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/mass-endangered-species-act-mesa/; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59 – see C4 below)

2. ☐ Separate MESA review ongoing.

   a. NHESP Tracking # _____ b. Date submitted to NHESP _____

3. ☐ Separate MESA review completed. Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

☐ **Estimated Habitat Map of State-Listed Rare Wetlands Wildlife**

If a portion of the proposed project is located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP), complete the portion below. To view habitat maps, see the **Massachusetts Natural Heritage Atlas** or view the maps electronically at: http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review

☐ A preliminary written determination from Natural Heritage and Endangered Species Program (NHESP) must be obtained indicating that:

- ☐ Project will NOT impact an area located within estimated habitat indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetlands Wildlife published by *NHESP.*
- ☐ Project will impact an area located within estimated habitat indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetlands Wildlife published by NHESP. A copy of NHESP's written preliminary determination in accordance with 310 CMR 10.11(2) is attached. This specifies:
  - ☐ Date of the map: _____

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

Appendix 1: Ecological Restoration Notice of Intent (WPA 3a) - Required Actions (310 CMR 10.11)

☐ If the Rare Species identified is/are likely to continue to be located on or near the project, and if so, whether the Resource Area to be altered is in fact part of the habitat of the Rare Species.

☐ That if the project alters Resource Area(s) within the habitat of a Rare Species:

☐ The Rare Species is identified;

☐ NHESP's recommended changes or conditions necessary to ensure that the project will have **no** short or long term adverse effect on the habitat of the local population of the Rare Species is provided; **or**

☐ An approved NHESP habitat management plan is attached with this Notice of Intent.

Send the request for a preliminary determination to:
Natural Heritage & Endangered Species Program
MA Division of Fisheries & Wildlife
1 Rabbit Hill Road
Westborough, MA 01581

☒ **Division of Marine Fisheries**

☐ If the project will occur within a coastal waterbody with a restricted Time of Year, [see Appendix B of the Division of Marine Fisheries (DMF) Technical Report TR 47 "Marine Fisheries Time of Year Restrictions (TOYs) for Coastal Alteration Projects" dated April 2011 http://www.nae.usace.army.mil/Portals/74/docs/regulatory/StateGeneralPermits/NEGP/MADMFTR-47.pdf].

☒ Obtain a DMF written determination stating:

☐ The proposed work does NOT require a TOY restriction.

☒ The proposed work requires a TOY restriction. Specific recommended TOY restriction and recommended conditions on the proposed work is attached.

☒ If the project may affect a diadromous fish run [re: Division of Marine Fisheries (DMF) Technical Reports TR 15 through 18, dated 2004: http://www.mass.gov/eea/agencies/dfg/dmf/publications/technical.html]

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

Appendix 1: Ecological Restoration Notice of Intent (WPA 3a) - Required Actions (310 CMR 10.11)

☒ Obtain a DMF written determination stating:

☒ The design specifications and operational plan for the project are compatible with the passage requirements of the fish run.

☐ The design specifications and operational plan for the project are not compatible with the passage requirements of the fish run.

Send the request for a written determination to:

South Shore – Cohasset to Rhode Island border, and the Cape & Islands:
Division of Marine Fisheries –
South Coast Field Station
Attn: Environmental Reviewer
836 South Rodney French Blvd
New Bedford, MA 02744
Email: DMF_EnvReview.South@state.ma.us

North Shore – Hull to New Hampshire border:

Division of Marine Fisheries –
North Shore Field Station
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: DMF_EnvReview.North@state.ma.us

☒ **Division of Fisheries and Wildlife –** http://www.mass.gov/eea/agencies/dfg/dfw/

☐ Projects that involve silt-generating, in-water work that will impact a non-tidal perennial river or stream and the in-water work will ***not*** occur between May 1 and August 30.

☐ Obtain a written determination from the Division of Fisheries and Wildlife (DFW) as to whether the proposed work requires a TOY restriction.

☐ The proposed work does NOT require a TOY restriction.

☐ The proposed work requires a TOY restriction. The DFW determination with TOY restriction and other conditions is attached.

☒ **MassDEP Water Quality Certification**

☒ Project involves dredging of 100 cubic yards or more in a Resource Area or dredging of any amount in an Outstanding Resource Water (ORW). A copy and proof of the MassDEP Water Quality Certification pursuant to 314 CMR 9.00 is attached to the NOI.

☒ This project is a Combined Permit Application for 401 Dredging and Restoration (BRP WW 26).

☐ **MassDEP Wetlands Restriction Order**

Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?

☐ Yes ☒ No

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

Appendix 1: Ecological Restoration Notice of Intent (WPA 3a) - Required Actions (310 CMR 10.11)

☒ **Department of Conservation and Recreation**

Office of Dam Safety

☒ For Dam Removal Projects, obtain a written determination from the Department of Conservation and Recreation Office of Dam Safety that the dam is not subject to the jurisdiction of the Office under 302 CMR 10.00, a written determination that the dam removal does not require a permit under 302 CMR 10.00 or a permit authorizing the dam removal in accordance with 302 CMR 10.00 has been issued.

Areas of Critical Environmental Concern (ACECs)

Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations).

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

Appendix 2: Ecological Restoration Notice of Intent (WPA 3a) - Minimum Required Documents (310 CMR 10.12)

Complete the Required Documents Checklist below and provide supporting materials before submitting a Notice of Intent Application for an Ecological Restoration Project.

☒ This Notice of Intent meets all applicable requirements outlined in for Ecological Restoration Projects in 310 CMR 10.12. Use the checklist below to insure that all documentation is included with the NOI.

At a minimum, a Notice of Intent for an Ecological Restoration Project shall include the following:

☒ Description of the project's ecological restoration goals;

☒ The location of the Ecological Restoration Project;

☒ Description of the construction sequence for completing the project;

☒ A map of the Areas Subject to Protection Under M.G.L. c. 131, § 40, that will be temporarily or permanently altered by the project or include habitat for Rare Species, Habitat of Potential Regional and Statewide Importance, eel grass beds, or Shellfish Suitability Areas.

☒ The method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.) is attached with documentation methodology.

☒ List the titles and dates for all plans and other materials submitted with this NOI.

Little River Dam Removal and River Restoration
a. Plan Title

Fuss & O'Neill
b. Prepared by

c. Signed and Stamped by

June 30, 2022
d. Final Revision Date

1" = 30'
e. Scale

f. Additional Plan or Document Title

June 30, 2022
g. Date

☒ If there is more than one property owner, attach a list of these property owners not listed on this form.

☒ Attach NOI Wetland Fee Transmittal Form.

☒ An evaluation of any flood impacts that may affect the built environment, including without limitation, buildings, wells, septic systems, roads or other man-made structures or infrastructure as well as any proposed flood impact mitigation measures;

☒ A plan for invasive species prevention and control;

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands Program

WPA Form 3A - Notice of Intent for an Ecological Restoration Project

MassDEP File Number

Haverhill
City or Town

Appendix 2: Ecological Restoration Notice of Intent (WPA 3a) - Minimum Required Documents (310 CMR 10.12)

☐ The Natural Heritage and Endangered Species Program written determination in accordance with 310 CMR 10.11(2), if needed; **Not Applicable**

☒ Any Time of Year restrictions and/or other conditions recommended by the Division of Marine Fisheries or the Division of Fisheries and Wildlife in accordance with 310 CMR 10.11(3), (4), (5), if needed;

☒ Proof that notice was published in the *Environmental Monitor* as required by 310 CMR 10.11(1;

☒ A certification by the applicant under the penalties of perjury that the project meets the eligibility criteria set forth in 310 CMR 10.13;

☒ If the Ecological Restoration Project involves the construction, repair, replacement or expansion of infrastructure, an operation and maintenance plan to ensure that the infrastructure will continue to function as designed;

☒ If the project involves dredging of 100 cubic yards or more or dredging of any amount in an Outstanding Resource Water, a Water Quality Certification issued by the Department pursuant to 314 CMR 9.00;

☐ If the Ecological Restoration Project involves work on a stream crossing, information sufficient to make the showing required by 310 CMR 10.24(10) for work in a coastal resource area and 310 CMR 10.53(8) for work in an inland resource area; and **Not Applicable**

☐ If the Ecological Restoration Project involves work on a stream crossing, baseline photo-points that capture longitudinal views of the crossing inlet, the crossing outlet and the upstream and downstream channel beds during low flow conditions. The latitude and longitude coordinates of the photo-points shall be included in the baseline data. **Not Applicable**

☐ This project is subject to provisions of the MassDEP Stormwater Management Standards. A copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) is attached. **Not Applicable**

☒ Provide information as the whether the project has the potential to impact private water supply wells including agricultural or aquacultural wells or surface water withdrawal points.

NOI Wetlands Fee Transmittal Form

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A. Applicant Information

1. Location of Project:

Little River north of Winter Street	Haverhill
a. Street Address	b. City/Town
Fee Exempt	
c. Check number	d. Fee amount

2. Applicant Mailing Address:

James	Fiorentini	
a. First Name	b. Last Name	
City of Haverhill		
c. Organization		
4 Summer Street		
d. Mailing Address		
Haverhill	MA	01830
e. City/Town	f. State	g. Zip Code
978-374-2300		mayor@cityofhaverhill.com
h. Phone Number	i. Fax Number	j. Email Address

3. Property Owner (if different):

See Attached		
a. First Name	b. Last Name	
c. Organization		
d. Mailing Address		
e. City/Town	f. State	g. Zip Code
h. Phone Number	i. Fax Number	j. Email Address

B. Fees

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).

Fee should be calculated using the following process & worksheet. ***Please see Instructions before filling out worksheet.***

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract $12.50. To calculate the city/town share of the fee, divide the total fee in half and add $12.50.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Fee Exempt			

Step 5/Total Project Fee: _____

Step 6/Fee Payments:

Total Project Fee: EXEMPT
a. Total Fee from Step 5

State share of filing Fee: _____
b. 1/2 Total Fee **less $**12.50

City/Town share of filling Fee: _____
c. 1/2 Total Fee **plus** $12.50

C. Submittal Requirements

a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection
Box 4062
Boston, MA 02211

b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

To MassDEP Regional Office (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

HCC Local Application Form 3

City of Haverhill Conservation Commission

HCC Local Application Form 3
Notice of Intent

A. STATUTE APPLICABILITY

This application is being filed with the Commission in accordance with the following (check all that apply):

X Massachusetts Wetlands Protection Act, M.G.L. Chapter 131, Section 40
X Haverhill Municipal Ordinance Chapter 253

B. GENERAL INFORMATION

Applicant City of Haverhill
Property Owner See attached list
Representative Julianne Busa, Fuss & O'Neill, Inc
Location (Street Address) Little River north of Winter Street
Assessor's Parcel Identification 649-611-7, 523-326-1, 601-453-1, 307-2-4, 307-2-10, 307-2-9, 516-304-1

C. APPLICATION CHECKLIST

The Commission requires the submittal of this original, completed Form; ten (10) paper copies of site plans; and one (1) paper copy of all other materials. Additionally, the Commission requires the submittal of individual PDFs of this Form and all listed application materials. If practical, related items may be combined into a single PDF. PDFs should not mix larger format sheets (e.g. site plans) with smaller sheets (e.g. letters). These submittal requirements also apply to supplemental information provided during the public hearing. The following materials shall be submitted with this form:

- ❑ X Completed, current WPA Form 3, 3A, or 4 and NOI Wetland Fee Transmittal Form
- ❑ X Project Narrative with description of resource areas & delineation methodology and demonstration of compliance with pertinent Performance Standards
- ❑ X Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan
- ❑ X Site Plans clearly describing the location and nature of the work, including such information as site boundaries, wetlands, topography, existing and proposed conditions, vegetation cover, soils, erosion & sedimentation controls, Title 5 compliance, flood storage calculations…(24" x 36" max. sheet size)
- ❑ X MassDEP Bordering Vegetated Wetland Delineation Field Data Forms, as appropriate
- ❑ X Wetland Resource Area Impact Mitigation Plan prepared in accordance with MA Inland Wetland Replication Guidelines, if applicable
- ❑ Demonstration of compliance with MA River & Stream Crossing Standards, if applicable (The HCC applies the General Standards to all resource area crossings for wildlife passage.) Not Applicable
- ❑ Simplified or Detailed Wildlife Habitat Evaluation (Appendix A or B), if applicable (See "MA Wildlife Habitat Protection Guidance for Inland Wetlands") Not Applicable
- ❑ Demonstration of compliance with MA Stormwater Management Standards, including but not limited to Not Applicable
  - ❑ Stormwater Report with pertinent calculations based on NOAA Atlas 14 rainfall data
  - ❑ Checklist for Stormwater Report
  - ❑ Long-Term Pollution Prevention Plan
  - ❑ Operation and Maintenance Plan

- ❑ Illicit Discharge Compliance Statement
- ❑ X 8½" x 11" sections of the following maps with project location clearly identified
  - ❑ X USGS Quadrangle
  - ❑ X MassGIS Orthophoto
  - ❑ X City of Haverhill Parcel ID Map, also identifying properties within 300' of subject property
  - ❑ X NRCS Soils Map and Resource Report
  - ❑ X FEMA Flood Insurance Rate Map, if applicable
  - ❑ MA NHESP Estimated Habitats of Rare Wildlife and Priority Habitats of Rare Species, if applicable Not Applicable
  - ❑ MassDEP/UMass-Amherst Habitat of Potential Regional or Statewide Importance, if applicable Not Applicable
- ❑ Proof of NOI filing with the MA Natural Heritage & Endangered Species Program, if applicable Not Applicable
- ❑ Exempt Appropriate Filing Fees, payable to the City of Haverhill, under the Act and Ordinance
- ❑ Other: _____

D. LOCAL PERMIT DOCUMENTATION

In accordance with 310 CMR 10.05(4)(e), list all obtainable permits, variances, and approvals required by local ordinance with respect to the proposed activity and status of same: Local permits and approvals include: Notice of Intent for Ecological Restoration Project, Notice of Intent for Recreational Improvements, and Haverhill Planning Board Development Review. State permits and approvals include: Expanded Environmental Notification Form / Single Environmental Impact Report, 401 Water Quality Certification (BRP WW26) Chapter 91 Waterways License, Fishway Construction Permit, Chapter 253 Dam Safety Permit, MA Department of Transportation Access Permit, MBTA Permit, Massachusetts Historical Commission EENF/ Project Notification Form, MA Board of Underwater Archaeological Resources EENF/ Project Notification Form, and Tribal Historic Preservation Officers EENF/ Project Notification Form. Federal permits and approvals include: Section 404 Pre-Construction Notification and US EPA National Pollutant Discharge Elimination System 2022 Construction General Permit

E. APPLICATION CERTIFICATION

I have read the Department of Environmental Protection's "Instructions for Completing Application" and the City's Municipal Ordinance under Chapter 253, with all applicable regulations and policies, for the filing of this application with the Haverhill Conservation Commission and agree to its terms and conditions, as amended. I understand the submitted NOI, its plans, and all its supporting materials are public records and may be uploaded to the City's website for public review. As required by the Commission, the wetland resource area(s) are flagged, the corners of proposed structures are staked, and the centerline of proposed roadway(s) and/or driveway(s) are marked, as appropriate, to facilitate site inspections by Commissioners and Conservation Staff.

Signed: _____ (APPLICANT) 6/19/23 (DATE)

**please see additional signature pages and authorization letters in Appendix I

F. SITE ACCESS ACKNOWLEDGEMENT

I hereby grant the Haverhill Conservation Commission and its officials permission to enter upon my property at Cashman Park to review the filed Notice of Intent and future site conditions for compliance with the issued Order of Conditions. The sole purpose of this acknowledgement is to allow the Commission and its officials to perform their duties under the Massachusetts Wetlands Protection Act and the City's wetlands protection ordinance.

Signed: _____ 6/19/23
(PROPERTY OWNER) (DATE)

**please see additional signature pages and authorization letters in Appendix I

H. ABUTTER NOTIFICATION FORM

In accordance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40 (the Wetlands Protection Act) and Haverhill Municipal Ordinance Chapter 253, Section 5, you are hereby notified of the following:

1. The name of the applicant is Mayor James Fiorentini
2. Brief Project Description: The proposed project is a dam removal and river restoration project in the Little River. The aim is to remove the Little River Dam to restore the Little River corridor to a free-flowing state and eliminate the public health and safety concerns associated with the dam. Dam removal and river restoration includes the following elements: dredging sediment for targeted sediment cleanup, installation of fish passage structures, construction of low flow channel downstream of Winter Street Bridge, installation of bioengineered slope stabilization and scour protection, and installation of native plantings.
3. The applicant has filed a Notice of Intent ("NOI") with the Haverhill Conservation Commission seeking permission to remove, fill, dredge or alter an Area Subject to Protection Under the Wetlands Protection Act and/or Haverhill Municipal Ordinance Chapter 253 and/or to perform work within the buffer zone of such an Area.
4. The address of the lot where the activity is proposed is See attached Property Owners List
   (INCLUDE ASSESSOR'S MAP/BLOCK/LOT)
5. Copies of the NOI may be examined at *the Haverhill Conservation Department Office* between the hours of *8am and 4pm* from *Monday through Friday*. Contact information is below. You may also find helpful application materials on the "Projects Under Review" section of the Commission's website.
6. Copies of the NOI may be obtained from either (check one) the applicant _____, or the applicant's representative Julianne Busa, by calling this telephone number (413) 333-5469 between the hours of 9:00 AM and 5:00 PM on the following days of the week Monday through Friday
7. Information regarding the *date, time, and place* of the public hearing may be obtained from the *Haverhill Conservation Department Office* between the hours of *8am and 4pm* from *Monday through Friday*. Contact information is below. You may also consult the "Agenda" section of the Commission's website.

NOTE: Notice of the public hearing, including its date, time and place, will be published at least five (5) days in advance in the *Haverhill Gazette newspaper*.

NOTE: Notice of the public hearing, including its date, time, and place, will be posted in Haverhill City Hall not less than forty-eight (48) hours in advance.

NOTE: You may contact the Haverhill Conservation Department for more information about this application, the Wetlands Protection Act, and Haverhill Municipal Ordinance Chapter 253. Please note the Department has only one staff person; every effort will be made to assist you in a timely manner.

Website: http://www.cityofhaverhill.org/departments/conservation_commission/index.php.
Email: conservation@cityofhaverhill.com
Phone: 978.374.2334

NOTE: For additional information about this application and the Act, you may contact the MA Department of Environmental Protection Northeast Regional Office Service Center.

Website: http://www.mass.gov/eea/agencies/massdep/about/contacts/northeast-region.html
Phone: 978.694.3200

I. LOCAL ORDINANCE FEE CALCULATION FORM

ACTIVITY	LOCAL ORDINANCE FEE	# of Activities or Measurement	Subtotal
***Abbrev. Notice of Resource Area Delineation (ANRAD)**			
Single Family House Project	$1/linear foot, first 100'; $0.50/lf, second 100'; $0.10/lf, each additional foot		
All Other Projects	***$1/linear foot, first 1000'; $0.50/lf, second 1000'; $0.10/lf, each additional foot		Exempt
%*Notices of Intent (NOI)			
Category 1 Activity	$100		Exempt
Category 2 Activity	$250		Exempt
Category 3 Activity	$525		Exempt
Category 4 Activity	$725		Exempt
Category 5 Activity	$2/foot		Exempt
Category 6 Activity - If no ANRAD was filed for the project site, then a local Cat. 6 fee must be paid in accordance with the ANRAD fee schedule	See ANRAD fee schedule		Exempt
Resource Area Alterations			
Buffer Zone, 75'-100' from resource area boundary	$0.05 / square foot		Exempt
Buffer Zone, 35'-75' from resource area boundary	$0.10 / square foot		Exempt
Buffer Zone, 0'-35' from resource area boundary	$0.25 / square foot		Exempt
Bordering Vegetated Wetland	$0.50 / square foot		Exempt
Bank	$5 / linear foot		Exempt
Land Under Water	$0.50 / square foot		Exempt
Land Subject to Flooding	$0.05 / square foot		Exempt
Riverfront Area	$0.05 / square foot		Exempt
Riverfront Area with the watershed of a potable water supply	$0.50 / square foot		Exempt
Land within 100' of a Certified Vernal Pool	$0.25 / square foot		Exempt
Local-only Jurisdictional Resource Area	$0.25 / square foot		Exempt
Land within 200' of a potable water supply	$0.50 / square foot		
		ADVERTISING FEE*	$45
		LOCAL ORDINANCE FEE TOTAL	$45
		For filings resulting from enforcement action, double the Local Ordinance Fee Total	

NOTES:

*****Application is subject to an additional $45 Local Advertising Fee payable to the City of Haverhill prior to **EACH** advertising

***Local Ordinance Fee maximum of $100 for applications exceeding 1000'. Commission requires review by outside consultant under M.G.L. Ch. 44, sec. 53G for projects exceeding 1000'. Applicant shall post escrow in accordance with HCC Rules for Hiring Outside Consultants. Cap passed by a 5-0 vote of the Commission on March 7, 2019.

%Local Ordinance Fees for RDA, NOI, & RMOC increase 50% when project is also proposed within a Riverfront Area

Local Ordinance Fees passed by a 7 – 0 vote of the Commission on October 28, 2010, effective January 1, 2011

1 Introduction

On behalf of the City of Haverhill, this Ecological Restoration Notice of Intent (NOI) is being submitted pursuant to the Massachusetts Wetlands Protection Act M.G.L. c. 131 §40 (MAWPA), the Massachusetts Wetland Protection Regulations 310 CMR §10.00 (Wetland Regulations), and the City of Haverhill Wetlands Ordinance (Chapter 253) for the removal of Little River Dam and restoration of the Little River from approximately winter street to the MBTA bridge to the north. Filing of a Ecological Restoration Notice of Intent is required because of proposed site work within Inland Bank, Bordering Vegetated Wetlands (BVW), Land Under Water Bodies and Waterways (LUW), Bordering Land Subject to Flooding (BLSF), and Riverfront Area. In addition, the Wetlands Ordinance protects resource areas beyond MAWPA. The proposed project also impacts the 25-foot no-build no-disturbance zone, 25 to 50-foot no-build zone protected under the City of Haverhill's local Wetlands Ordinance.

The location of the site is shown on the Site Location Map, *Figure 1*, and the proposed work is shown on the Site Plans provided as *Appendix A*.

The dam removal and river restoration is expected to take place in phases across two construction seasons. Pending funding, the construction is anticipated to begin in the summer of 2024 and be substantially complete during the summer of 2025. This timeline may be extended if more time is needed to obtain project funds.

In addition to an Order of Conditions from the Haverhill Conservation Commission, the following additional permits and approvals are required for the project:

- Review under the Massachusetts Environmental Policy Act (MEPA), consisting of an Expanded Environmental Notification Form and Single Environmental Impact Report
    - The MEPA Certificate was issued on April 3, 2023.
- 401 Water Quality Certification (WQC) from MA Department of Environmental Protection
    - Under review
- Chapter 91 Waterways License from MA Department of Environmental Protection
    - Under review
- Chapter 253 Dam Safety Permit from the Office of Dam Safety (MA Department of Conservation and Recreation)
    - Issued April 18, 2023
- Section 404 Pre-Construction Notification Authorization from the U.S. Army Corps of Engineers
    - Under review
- Fishway Construction Permit from MA Division of Marine Fisheries
- City of Haverhill Development Review
- National Pollutant Discharge Elimination System (NDPES) permit for stormwater discharges from a construction site of over one acre from the U.S. Environmental Protection Agency (USEPA)

Please also note that at the recommendation of DEP during the MEPA process, community amenities that are proposed in parallel to this project to increase river access are being proposed in a second, related NOI which will be reviewed separately from this Ecological Restoration NOI.

2 Project Location and Existing Conditions

The Project Site (i.e., limit of disturbance) spans approximately 3,600 linear feet of Little River from south of Winter Street (Route 97; 42.777199, -71.088156) to the MBTA Bridge (42.777199, -71.091984). The Project Site includes a total of 12 acres.

Approximately 10 acres of the Project Site is located within Little River and approximately 1 acre is located within Cashman's Field.

Little River Dam (NID ID#: MA00739) is a privately-owned stone masonry dam with a granite block crest approximately 75 feet in length. The dam is located approximately 70 feet upstream of Winter Street (Route 97) and approximately 240 feet west of the intersection with Stevens Street. The dam consists of a cascading granite block masonry gravity structure with a maximum height of 12 feet. The downstream face of the dam consists of granite blocks or cobbles, over which the spillway flow cascades to dissipate energy before continuing into the downstream channel. The dam is immediately adjacent to the Stevens Mill Building (aka Pentucket Mill), the foundation of which is integrated with the left dam abutment. On river right, the dam abuts a vertical channel wall which extends approximately 6 feet above the dam crest. A parking lot and convenience store lie beyond the wall.

The Little River Dam is a relic of the City's industrial legacy. It was a source of mechanical hydropower to power the adjacent mill in the 1800's if not earlier. The mill was expanded several times over its history and mechanical hydropower was replaced with hydroelectric power generation. Within the last 40 years the mill ceased to operate and the dam was no longer needed for power generation. Prior to the installation of the Little River Dam, the Little River had been a free flowing tidally influenced river. The dam installation became the first barrier to fish passage from the tide waters of the Merrimack River.

Since that time in the early 1800's or earlier, the dam has blocked aquatic organism passage, has accumulated sediments, and has backed up water, causing greater flood levels to be experienced upstream during most flood events than would be seen without the dam. The industrial legacy of the areas draining to the river has resulted in the accumulation of sediments with some contaminants. The quality of water within the impoundment became further degraded with the installation of the dam due to the warmer water temperatures of an impoundment as opposed to the cooler waters of a shaded river corridor, and therefore oxygen levels have dropped, resulting in poor habitat for cold water fishery species such as trout. The impoundment instead harbors warm water species and is subject to algal blooms, further depleting oxygen levels.

The watershed is composed of approximately 10 percent waterbodies and wetlands, 50 percent forest, and 40 percent developed lands, almost 16% of which is impervious surfaces. The narrow, linear impoundment extends upstream approximately 0.5 miles. The MBTA railroad tracks cross the river north of the dam. Further upstream, the Rosemont Street bridge and I-495 bridges cross the Little River

before the New Hampshire border. Significant areas of wetlands border the river, particularly on river left, north of the MBTA bridge. These include shrub swamps, wooded deciduous swamp, and shallow marsh meadow/fen areas. Several tributaries feed into the Little River upstream of the dam. The west side of the river is primarily developed, with residential neighborhoods and a large cemetery abutting the river corridor. The area below the dam is tidally influenced. The Little River enters an approximately 2,000 foot-long flood conduit approximately 700 feet downstream of the dam which conveys the Little River the rest of the distance between the dam and the Merrimack River.

2.1 Environmental Resources Not Present

The following environmental resources are not present within the Project Site:

- Natural Heritage and Endangered Species Program (NHESP) Estimated Habitats of Rare Wildlife
- NHESP Priority Habitats of Rare Species
- Areas of Critical Environmental Concern
- Surface Water Supply Protection Areas (Zones A, B, C)
- MassDEP Wellhead Protection Ares (Zone II, Zone I, IWPA)
- Local Historic District
- Preservation Restriction
- Massachusetts Historic Landmark

2.2 Wetlands and Waters of the United States

2.2.1 Methodology of Resource Area Investigation

On September 27, 2021 and April 29, 2022 Fuss & O'Neill conducted the wetland delineation within the Project Site. The wetland delineation was conducted in conformance with state and federal guidelines, including the Wetlands Protection Act (M.G.L. c. 131 sec. 40) and associated Wetlands Protection Regulations (310 CMR 10); Delineating Bordering Vegetated Wetlands under the MA Wetlands Protection Act (1995), the 1987 Corps of Engineers Wetlands Delineation Manual; the Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Northcentral and Northeast Region (2012); and Field Indicators for Identifying Hydric Soils in New England (Version 4, 2020).

In addition to conducting field investigations, Fuss & O'Neill reviewed the FEMA Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) for the general area within the City of Haverhill, Essex County, and other publicly available information (e.g., MassGIS).

2.2.2 Description

The following wetland resource areas identified within the Project Site are subject to jurisdiction under MAWPA and the Wetlands Ordinance.

- Inland Bank, which was generally found to be coincident with the Mean Annual High Water of Little River
- Bordering Vegetate Wetlands
- Land Under Water Bodies and Waterways
- Bordering Land Subject to Flooding
- Riverfront Area

A summary of resource areas delineated by flag series is presented in *Table 3-1* below. Refer to the Wetland Delineation Report in *Appendix B* for representative photographs in the Wetland Delineation Report.

Table 3-1
Summary of Wetland Resource Ares by Flag Series

Flag Series	Flags	Delineation Date	Resource Area	Cowardin Classification[1]	Description
A/G	A100-A247 G700-G741	9/27/21 4/29/22	Inland Bank	R2UBH	Little River – Perennial West Bank/MAHW/OHW East Bank/MAHW/OHW
B	B200-B203	9/27/21	BVW	PSS1E/PEM1F	Flooded wetland on west Bank
C	C300-C309	9/27/21	BVW	PSS1E/PEM1F	Flooded wetland on west Bank
D	D400-D402	9/27/21	BVW	PSS1E/PEM1F	Flooded wetland on west Bank
E	E500-E506	9/27/21	BVW	PFO1E	On west Bank
F	F600-F607	4/29/22	BVW	PSS1F/PFO1E	Near RR crossing, on west Bank
H	H800-H804	4/29/22	BVW	PSS1E	Fringe wetland on east Bank and north of mill

[1]Classification of Wetlands and Deepwater Habitats of the United States, Cowardin et al. 1979. R= Riverine, PFO = Palustrine Forested wetland; PSS = Palustrine Scrub-Shrub wetland; PEM = Palustrine Emergent wetland.

2.2.2.1 Inland Bank / Mean Annual High Water of Little River

The bank and mean annual high water are generally coincident within the project area. Some portions of the armored bank downstream of the dam are deteriorated and continuing to shed stone and sediment into the river. Where armoring or development is absent from the river's edge, banks are generally well vegetated and range from upland forest assemblage to shrubs, depending on the slope and local conditions. Bank was located in the field by the first observable break in topography between the waterway and the adjacent upland.

2.2.2.2 Bordering Vegetated Wetlands

The BVWs identified at the Site are classified as (in order of predominance) palustrine scrub-shrub, emergent, and forested wetlands. Common vegetation identified within these wetlands [common name (*scientific name*, wetland indicator status)] are listed below:

Scrub-shrub BVW (PSS)

- silky dogwood (*Cornus amomum,* FACW)
- Tatar's honeysuckle (*Lonicera tatarica,* FACU) (Rosa multiflora)
- jewelweed (*Impatiens capensis,* FACW)
- sensitive fern (*Onoclea sensibilis,* FACW)
- skunk cabbage (*Symplocarpus foetidus,* OBL*)*

Emergent BVW (PEM)

- cattail (Typha *angustifolia,* OBL)
- purple loosestrife (*Lythrum salicaria,* OBL)
- sensitive fern (*Onoclea sensibilis,* FACW)
- skunk cabbage (*Symplocarpus foetidus,* OBL*)*

Forested BVW (PFO)

- red maple (*Acer rubrum,* FAC)
- American elm (*Ulmus americana,* FACW)
- silky dogwood (*Cornus amomum,* FACW)
- Tatar's honeysuckle (*Lonicera tatarica,* FACU)
- jewelweed (*Impatiens capensis,* FACW)
- skunk cabbage (*Symplocarpus foetidus,* OBL*)*
- fox grape (*Vitis labrusca,* FACU)
- poison ivy (*Toxicodendron radicans,* FACU)

2.2.3 Land Under Water Bodies and Waterways

LUW is associated with Littler River. Upstream of the dam, LUW generally consists of a layer of organic silt (occasionally overlain by fine gravel) which was underlain by a native channel bottom horizon consisting of sandy silt.

2.2.4 Bordering Land Subject to Flooding

According to the most recent Flood Insurance Rate Maps (FIRM) provided by the Federal Emergency Management Agency (FEMA) on panels 25009C0089C (effective July 19, 2018) and 25009C0087F (effective July 3, 2012), the proposed project is within the limits of the 100-year flood zone associated with Little River. The base flood elevation determined by FEMA ranges from 22 feet to 25 feet within the Project Site. The limits of limits of the 100-year flood zone were modified on the plans based on the results of a more details topography and Hydraulic Analysis using HEC-RAS. The modified limits of BLSF are shown on the Site Plans.

2.2.5 Riverfront Area

The 200-foot Riverfront Area at the Site is associated with Little River. It is comprised mainly of urbanized land use (residential/commercial/industrial buildings, yards, and parking; municipal roads, railroad); in some locations, particularly near the dam and downstream of it, development of Riverfront goes right to the water line of the Little River. Where applicable, common vegetation identified within the Riverfront Area includes [common name (*scientific name*), wetland indicator status]: red maple (*Acer rubrum*), FAC; shagbark hickory (*Carya ovata*), silver maple (*Acer saccharinum*), FACW; Norway maple (*Acer platanoides*), UPL; American beech (*Fagus grandifolia*), FACU; black cherry (*Prunus* serotina), FACU; northern red oak (*Quercus rubra*), FACU; white oak (*Quercus alba*), FACU; American ash (*Fraxinus americana*), FACU; multiflora rose (*Rosa multiflora*), FACU; Tatar's honeysuckle (*Lonicera tatarica*), FACU; silky dogwood (*Swida amomum*), FACW; sweet pepperbush (*Clethra alnifolia*), FAC; burning bush (*Euonymus alatus*), not classified; Japanese knotweed (*Fallpopia japonica*), FACU, cattail (*Typha sp.),* OBL ; oriental bittersweet (*Celastrus orbiculatus*), UPL; fox grape (*Vitis labrusca*), FACU; and poison ivy (*Toxicodendron radicans*), FAC. Riverfront Area at the Site includes the following regulated resource areas: BVW, BLSF, and Buffer Zone.

3 Project Description

The proposed project consists of the removal of Little River Dam, and associated river restoration. As noted above, this Ecological Restoration NOI only includes ecological restoration elements. A separate NOI is being submitted for recreational improvements. Therefore, proposed work described below includes activities associated with the dam removal and river restoration. Key elements of the restoration project are outlined below.

Dam removal and river restoration includes the following elements:

- Dredging sediment for targeted sediment cleanup
- Installation of fish passage structures
- Construction of low flow channel downstream of Winter Street Bridge
- Installation of bioengineered slope stabilization and scour protection
- Installation of native plantings
-

3.1 Ecological Restoration Goals

The City of Haverhill proposes an Ecological Restoration Project on approximately 3,600 linear feet of Little River from south of Winter Street (Route 97; 42.777199, -71.088156) to the MBTA Bridge (42.777199, -71.091984). Removal of the Little River Dam and subsequent restoration of this river reach will restore the natural flow of the river, removing the existing impoundment, and thereby lower flood elevations in the adjacent EJ neighborhood. Removing the dam also removes a barrier in the river which currently impedes the passage of fish and many other aquatic organisms.

While the Little River flood conduit between the Little River Dam and the Merrimack River restricts passage of some species, there are no dams downstream of the Little River Dam prior to outletting to the Merrimack River or upstream to the New Hampshire State line. The removal of the Little River Dam would eliminate the first barrier to anadromous fish passage on the Little River and would open approximately an additional 4 river miles within Massachusetts upstream of the Little River Dam all the way to the New Hampshire border. This would significantly extend the available spawning habitat that begins at the Atlantic Ocean.

The project furthers five of the eight interests of the Wetlands Protection Act (Act): flood control, storm damage prevention, prevention of pollution, protection of fisheries, and protection of wildlife habitat.

3.1.1 Flood Control and Storm Damage Prevention

Removal of the Little River Dam will restore the natural flow of the river, removing the existing impoundment, and thereby lower flood elevations in the adjacent Environmental Justice (EJ) neighborhood. Removal of the artificial impoundment will restore land area along the river's edge, creating additional floodplain storage (which is not currently available as it is perpetually under water). Details on reductions in base flood elevation under various conditions are included in the section on flood impacts. In addition to providing flood protection, this recovered land can provide additional space in a densely developed urban environment in which to establish healthy, native, riparian corridors, plant trees for shade provision to help counteract urban heat island effects, and stabilize the river's banks.

Increasing frequency of high intensity storms is a concern in a changing climate. Design for this project used projections for the frequency and intensity of storms and sea level rise under modelled 2070 conditions. The proposed restoration project will result in water surface elevations upstream of the dam that are lowered for all storm conditions, however the water surface elevation reductions for higher frequency events like the 10-year and below are more dramatic. For example, for the section of river between the Dam to MBTA Railroad Bridge, the 10-year reduction is between 6.3 feet to 2.4 feet, the 50-year reduction is between 3.8 feet to 1.7 feet, while the 100-year reduction is between 1.8 feet 0.2 foot. Even with these reductions, the surrounding communities will still have flood risks associated with them, but the overall water surface elevations have decreased.

The project also incorporates scour protections at locations of existing infrastructure to lessen the potential for storm damage in these areas.

3.1.2 Prevention of Pollution

Legacy contamination from the site's past industrial history has resulted in contaminated sediment on-site within areas of the impoundment. Removal of contaminated sediment and proper disposal will remediate this historic contamination related to the past operations of adjacent industrial land uses.

3.1.3 Protection of Fisheries

The important benefits of restoring fish passage through dam removal have received significant attention by regulatory agencies, elected officials, and the public. Fish passage may be accomplished by using either engineered structures (e.g., concrete pool-weirs or fish ladders) or, as proposed here, more natural channel designs (i.e., partial or total dam removal). Natural designs generally focus on restoring channel geomorphology by providing stable dominant-discharge geometry to properly transport sediments and pass flood flows (100-year events). The objectives are to remove obstructions to upstream and downstream migration; restore natural riverine habitat; restore natural seasonal flow variations; eliminate siltation of spawning and feeding habitat above the dam; allow debris, small rocks and nutrients to pass below the dam, creating healthy habitat; and eliminate unnatural temperature variations below the dam.

Removal of the Little River Dam will expand potential habitat for anadromous fish by reconnecting tidal reach to approximately 4 miles of upstream river corridor and additional mileage on tributary streams. Ongoing volunteer monitoring of fish at the base of the dam has helped to inform understanding of which fish should be the focus of fish passage considerations during channel design. The Little River is the site of State DFG trout stocking activities and this dam removal will enhance the quality of habitat for trout and will expand their resident range by allowing downstream movement.

Dam removal will eliminate the impounded water environment that is much more susceptible to high temperature extremes, sediment deposition, low oxygen levels and excessive aquatic plant growth, replacing it with a free flowing, more well-shaded, cooler temperature, higher oxygen level water condition.

While the Little River flood conduit between the Little River Dam and the Merrimack River restricts passage of some species, there are no dams downstream of the Little River Dam prior to where the Little River outlets to the Merrimack River, nor upstream to the New Hampshire State line. The removal of the Little River Dam would eliminate the first barrier to anadromous fish passage on the Little River and would open approximately an additional 4 river miles within Massachusetts upstream of the Little River Dam all the way to the New Hampshire border. This would significantly extend the available spawning habitat that begins at the Atlantic Ocean.

3.1.4 Protection of Wildlife Habitat

The proposed project area is not mapped as Priority Habitat for State-listed endangered or threatened species, and is therefore not subject to Massachusetts Endangered Species Act review under 321 CMR 10.18. The project will restore what is currently a ½ mile long dammed reach of the Little River to a free flowing condition. Riparian habitat will be expanded at the river's edge and within larger newly exposed floodplain expanses.

Restoration and anchoring of the banks with native vegetation will help to shade and cool the stream. Tree growth and tree planting will sequester carbon and it is anticipated that the exposed river banks will be repopulated with native riparian forest vegetation along much of the length of the existing impoundment, using species that are expected to perform well under future climate conditions.

3.2 Dam Removal

The proposed removal of the Little River Dam includes demolition of 65 feet of the 75-foot long dam. The dam will be removed to a minimum of 2 feet below the proposed channel elevation. This will leave a portion of the lower part of the dam. Based on the results of a structural inspection, complete removal of the dam up to the Stevens Mill building will likely jeopardize the integrity of the foundation. Therefore, approximately 10 feet of the dam will remain on river left to continue to provide structural support to the building foundation. Refer to the Figure 4-1 below for the configuration of the dam to remain.

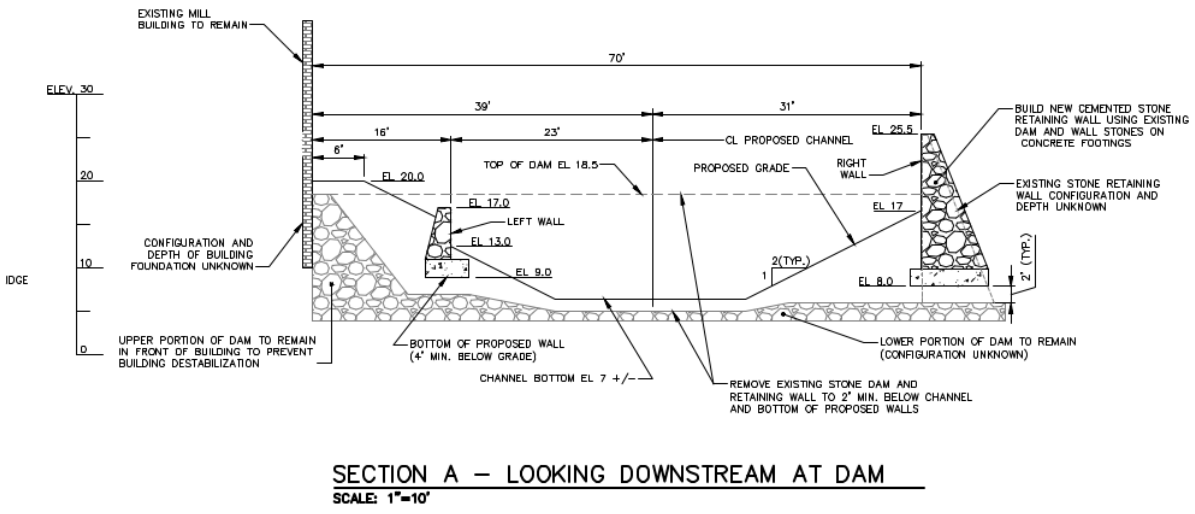


Figure 4-1 Cross section of the Little River Dam removal

The dam removal and restoration will occur in two phases over 2 years. An overview of the proposed dam removal phasing is described below. Refer to the construction sequence in Sheets CW-101 and CW-102 in the Site Plans for a detailed description of the dam removal phasing.

3.2.1 Drawdown

A detailed water control and construction sequence plan has been developed and is provided on Sheets CW-101 and CW-102 in the Site Plans in *Appendix A*. Dewatering will be conducted in a controlled manner over two years. As described in *construction sequence*, water level will be lowered at the dam from 18.6 feet to 12 feet during Phase 1. The new baseflow will stabilize following completion of the proposed dam removal during Phase 2.

3.2.2 Sediment Management

Based on the results of the November 2020 and September 2021 sediment sampling and characterization, the majority of the accumulated sediment in the impoundment does not represent a hazard to humans or the aquatic environment since it is reflective of background conditions within the highly industrialized corridor of the Little River and the Merrimack River. It is anticipated that at least one area sampled and characterized contains concentrations of hazardous materials, specifically Polychlorinated Biphenyls (PCBs), that will require removal and offsite disposal:

- Within the vicinity of Transect #2 (2020)
    - Refer to Sheet CP-102 in *Appendix A* for the area of contaminated sediment to be removed

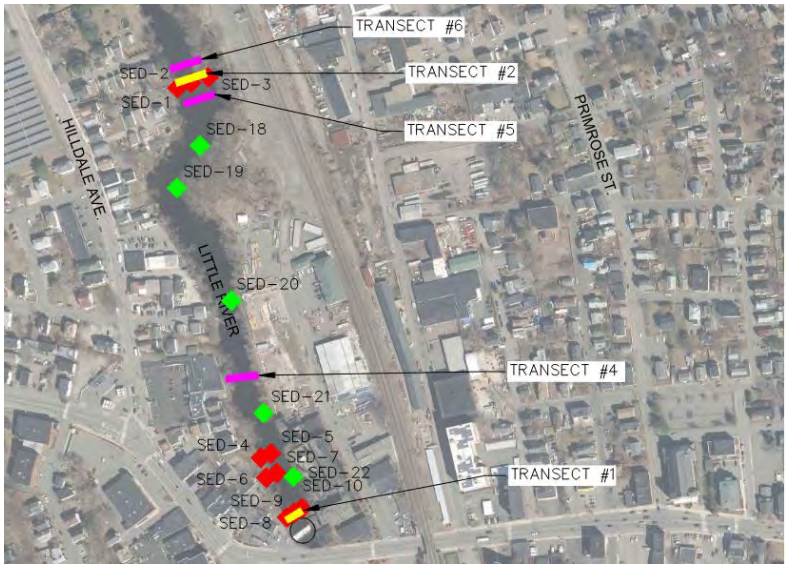


Figure 4-2 Location of sediment sampling transects within the vicinity of the Litter River Dam.

The proposed project is anticipated to result in a total of 10,680 cubic yards of dredging within Little River. Off-site management and redistribution within the site are discussed below. A description of sediment characterization was provided in the Sediment Management Report.

3.2.2.1 Off-Site Disposal

A total of approximately 5,500 cubic yards of sediment will be disposed off-site as hazardous or regulated waste in accordance with local, state, and/or federal regulations.

- Approximately 1,000 cubic yards (approx. 1,500 dry tons) of PCB-impacted material from the area around Transect #2 will be excavated and disposed of offsite as hazardous waste.
- Approximately 4,500 cubic yards of sediment that is not suitable for reuse onsite will be disposed of in lined landfills within the State or at another approved disposal facility.

3.2.2.2 Redistribution and Downstream Migration

The remaining sediment upstream of the dam, can be redistributed within the site.

- Approximately 4,820 cubic yards of non-hazardous sediment is anticipated to be reused within the (former) impoundment area.

The levels of metals, Polycyclic Aromatic Hydrocarbons (PAH) and petroleum hydrocarbons are broadly consistent with urban background conditions and do not pose a unique ecological risk to the receiving waterways.

According to the Hydrologic and Hydraulic Modelling Analysis, approximately 360 cubic yards of sediment that exists within the section of the River between the Dam and the MBTA Railroad could potentially become mobile following dam removal.

3.2.3 River Channel Construction

The Little River channel will be constructed to a width of +/-18 feet at the toe of the bank. During proposed baseflow water level conditions, the river is anticipated to be +/-24 feet wide. The channel will generally be located within the center of the currently impounded area. The streambed elevation will range from an elevation of 13.50 feet at the most upstream extent (MBTA bridge) to 6.0 feet at downstream extent at the Winter Street Bridge. The channel bottom will consist of native materials if the required size/gradation criteria is met unless determined in the field by the engineer to need scour protection. Then the channel bottom shall be 8 inches of 3- to 8- inch stone filled with existing sediment material. The stone is proposed for scour protection for the riverbed outside of scour pools and the nature-like fishway.

3.2.3.1 Scour Protection

Scour protection will be installed beneath Winter Street Bridge as a countermeasure for the expected higher velocities beneath the bridge. The scour protection will consist of non-woven geotextile fabric overlain by 18-inch to 48-inch riprap filled with sediment. The stone size was determined based on the U.S. Department of Transportation Federal Highway Administration's *Hydraulic Engineering Circular No. 23, Bridge Scour and Stream Instability Countermeasures: Experience, Selection, and Design Guidance-Third Edition Volume 2* (September 2009). Refer to the Hydrologic and Hydraulic Modelling Analysis memorandum for additional details on scour protection design. The riprap will be installed to match into the downstream end of the nature-like fishway. Refer to Sheet CD-502 for the detail of scour protection.

3.2.3.2 Low-Flow Channel

A low-flow channel/area will be constructed within the new streambed to facilitate recreational boater access from the existing location of the private residential docks at the end of Leblanc Street and also east of 145 Hilldale Avenue. Approximately 125-feet of and 170-feet of low flow channel is proposed to provide access to the mainstem of Little River from Leblanc Street and Hilldale Avenue, respectively.

3.2.3.3 Retaining Wall

Two retaining walls will be constructed in the vicinity of Little River Dam to improve structural stability and protect adjacent development. Granite and stone from the demolished dam will be re-used to construct the approximately 175 linear feet retaining wall adjacent to Stevens Mill (river left). The materials from the dam are being reused to maintain the aesthetic character along Stevens Mills. A portion of the dam (approximately 10 linear feet) connected to Stevens Mill will remain since removal of this portion of the dam may compromise the building foundation.

Unstable sections of the existing retaining wall along Sam's Food Stores property (89 Lafayette Street property; Parcel 516-304-1) will be reconstructed and extended as necessary to provide scour protection/stability for the existing developed land use. The total length of retaining wall including replacement sections will be approximately 115-foot.

3.3 River Restoration

The dam removal alone drives a significant portion of the river restoration objective as it allows the river to revert to a natural unobstructed flow. In addition to dam removal, site features were incorporated into the design to further promote an ecologically diverse habitat appropriate for fish migration and spawning as well as terrestrial habitat.

Fish passage design, including the low-flow channel and the grade control and fish passages described below incorporates requirements for fish species known and/or expected to utilize the restored river. These species, identified by MA Division of Fisheries (DMF) during the pre-application meeting. include alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*) and American eel (*Anguilla rostrata*). The size of these species and preferred conditions (i.e., channel depth and width, flow velocity) and were all considered during the design of the fish passage features.

3.3.1 Nature-like Fishway

Based on the hydraulic analysis, flow velocity is anticipated to exceed cruising speed of fish for a 300 to 400 linear feet stretch of Little River in the vicinity of the dam. To reduce velocities and provide appropriate conditions for fish migration, a nature-like fishway is proposed. This fishway consists of a series of energy dissipation/resting pools and nature-like fishway boulder weirs. The energy dissipation resting pools will consist of sediment filled riprap sized to match the Winter Street bridge scour countermeasure material. These pools provide low-velocity areas for fish to rest, and also serve as scour protection in the vicinity of the bridge. The boulder weirs contain a 2.5-foot wide notch for fish passage. Refer to the Site Layout and Grading Plan (Sheet CG-101) for the location of the nature-like fishway and Sheet CD-503 for the detail.

3.3.2 Grade Control Structures

In addition to increasing flow velocity, proposed dam removal will reduce channel depths. In order to maintain adequate depth for recreational activities and fish passage, six grade control structures are

proposed upstream of the fishway. The grade control structures consist of a row of boulders across the channel. The boulders will protrude above the channel bed and will include a 3.5+/- foot wide notch to allow for kayak/canoe and fish passage. The structures are designed to maintain a depth of 12 inches of water, even during low flow periods.

3.3.3 Bioengineered Slope Stabilization / Restoration

Significant riverbank grading is anticipated to construct the new channel and its banks. The toe of the bank is designed at elevations ranging from 14 feet to 8 feet, depending on the location. The top of bank ranges from elevation 14 to 18 feet.

Lower river slope stabilization is proposed within the area expected to fill with water at the bankfull conditions. Where deemed necessary to prevent scour or unacceptable migration of the channel (e.g. where shifting of the channel would impact infrastructure), lower slope stabilization includes compacted native material overtopped with non-woven geotextile material and 24 inches of 6-inch to 20-inch soil filled stone. Live stakes will be installed and seed mixes applied according to the River Restoration Plan in *Appendix A*. A biodegradable coir log will be staked along the slope, just above bankfull flow conditions.

Upper river slope stabilization is proposed above the bankfull flow conditions. This area will be stabilized with plantings and seed mixes as described in *Section 4.7*.

3.4 Restoration Seed Mixes & Live Stakes

Multiple native seed mixes were selected for the restoration, depending on expected hydrology, wildlife benefits, shade tolerance, land use, aesthetic value, and viewsheds. The five seed mixes below will be applied within the former impounded area and Cashman's Park. The first four seed mixes are supplied by New England Wetland Plants, Inc. (NEWP). Seed mixes include:

1. New England Wetland Seed Mix
    a. Location: Within the lower river slope stabilization areas
2. New England Conservation / Wildlife Mix
    a. Location: Within the upper river slope stabilization areas
3. New England Semi-Shade Grass and Forbs Mix
    a. Location: Adjacent to the gravel pedestrian trail
4. New England Showy Wildflower Mix
    a. Location: Select locations in Cashman's Park near the fishing platform
5. Upland/Park Seed Mix
    a. Location: Cashman's Park

For seeding anticipated between September and November, areas will be overseeded with an annual Winter Rye to promote stabilization through winter and spring.

Live stakes will be installed within the lower river slope stabilization areas. Species include willows, alders, and dogwoods to be planted every three feet. Live stake plantings are proposed along the entirety of river left, but only in select locations along river right. Live stakes were not proposed within these areas to provide viewsheds for residents adjacent to the river and members of the community visiting Cashman's Park. Refer to the River Restoration Plan in *Appendix A* for a detailed list of species and locations for seed mix application and live stakes.

3.5 Landscape Plantings – Plugs, Shrubs, and Trees

Native plantings are proposed along the entire river corridor. Plantings include native plugs, shrubs, and trees. Species and locations were selected based on expected hydrology, wildlife benefits, shade tolerance, land use, aesthetic value, and viewsheds.

3.5.1 River Restoration Plantings

Plantings within the former impoundment area/proposed riparian corridor include approximately 222 large shade trees, 258 ornamental/understory trees, and 1,050 shrubs. The riparian areas are anticipated to include a mixture of upland and wetland areas that will be flooded intermittently. Tree planting along the river's edge will increase shade and cooling for the river and habitat and food for wildlife. The tree and shrub species were selected from the Native Trees and Shrubs for Riparian Buffers table[1]. The trees and shrubs were selected based on their light preference, soil preference, flood tolerance, wildlife habitat and food value, and ornamental value. The goal of the restoration design is to provide a diverse array of native species, with the understanding that some species will establish more successfully than others. The selection of shrubs and trees are intended to provide a range of species likely to survive a range of conditions. Trees and shrubs are proposed in clusters to provide/promote a diversity of habitat zones, with some areas dominated by emergent vegetation, and others by trees and shrubs. Refer to the Landscape and Planting Plan in *Appendix A* for a detailed list of species and locations for plantings.

3.6 Anticipated Construction Sequence & Phasing Plan

The proposed dam removal is anticipated to occur over two years. Although construction is subject to the means and methods of the selected contractor, the construction for the proposed project will consist generally of the following elements:

Phase 1 will commence at the start of the first low-flow season and includes:

1. Install temporary erosion control measures
2. Install temporary construction access road from 89 Lafayette Square (Parcel 516-304-1)
3. Lower the impoundment approximately 12 inches per day until water elevation reaches 14.5 feet using siphons and/or pumps

[1] Berkshire Regional Planning Commission, *The Massachsuetts Buffer Zone Manual*, 2003

   a. Assuming no precipitation, this is anticipated to take 4 days
4. Lower a 50-foot section of the dam from 18.6 feet to 14.5 feet
5. Allow for water level to stabilize at 15 feet resulting from the partial dam removal
6. Construct a temporary access road along the dewatered portion of Little River. Access road will be constructed from Cashman's Park
7. Install temporary coffer dams and remove contaminated sediment
8. Lower dam crest from 14.5 feet to 12 feet
9. Perform river channel improvements in upstream extent (Project Site between Little River Street and MBTA bridge)
   a. Improvements include channel grading, installation of grade control weirs 1 through 5, lower and upper slope stabilization, and vegetative restoration according to the restoration and landscaping plan

Phase 2 will commence at the start of the second low-flow season and includes:

1. Construct temporary access road and river crossings within the southern limits of the Project Site
2. Remove the remaining section of the dam to approximately two feet below proposed grade
   - Maintain a minimum of 10 feet of the dam at the building connection with Stevens Mill
3. Relocate the turbidity curtain downstream of the Winter Street bridge
4. Install coffer dams, and dewatering pumps to isolate work areas for remaining river channel improvements
5. Perform channel improvements in downstream extent
   - Improvements include: scour countermeasures, retaining walls, nature-like fishway, remaining grade control weirs, lower and upper slope stabilization, and vegetative restoration according to the restoration and landscaping plan
6. Restore remaining disturbed areas according to the restoration and landscaping plan

Refer to Sheet GI-002 for the General Construction Sequence and Sheets CW-101 and CW-102 for the Water Control and Construction Phasing Plan.

3.7 Best Management Practices

Impacts to wetland resource areas were minimized to the extent practicable by minimizing the work area and implementing the following best management practices outlined below.

3.7.1 Construction Timing – Time of Year Restriction

Construction start date of later summer/early fall is proposed as the least impactful time of year based on low flow stream conditions. In water work will be sequenced to occur during periods of low flow stream conditions in the Little River (i.e. July 1 – October 31) as recommended by MA DMF. The proposed project will occur in accordance with the recommended time of year (TOY) restriction for in water work from March 1 to June 30 to minimize impacts to diadromous fish resources in the adjacent

Merrimack River from sedimentation and turbidity. Construction is anticipated to begin the summer of 2024, pending regulatory approvals and commence winter 2026.

3.7.2 Construction Phasing

The proposed dam removal will occur in two phases to allow for a controlled and incremental drawdown of Little River and to minimize the area of disturbance at one time. Phase 1 focuses on select dam removal, targeted sediment removal, and upstream improvements. Phase 2 focuses on remaining dam removal and downstream improvements. Refer to *Section 3.6* for an overview of construction sequence.

3.7.3 Erosion, Sediment, Turbidity Controls

Erosion and sediment controls are proposed to minimize sediment migration form uplands into Little River, and also to minimize the turbidity within Little River during construction. Temporary perimeter controls include:

- Silt fence
- Biodegradable Logs

Controls to minimize turbidity during construction include:

- Turbidity curtain
- Coffer dams

Sedimentation from dewatering will be minimized with use of a temporary dewatering basin with filter bag. Proposed erosion and sediment controls are shown on the Site Plans in *Appendix A*.

3.7.4 Water Control Plan

The large aerial extent of the project within a relatively narrow river corridor necessitates the careful consideration of water control and construction sequencing. The detailed Water Control and Construction Sequencing Plan outlining multiple sequencing steps and water control measures is provided in *Appendix A*. A summary of water control measures included in the plan is listed below:

- Siphons and/or Pumps for dewatering
- Coffer Dams to isolate work areas
- Temporary River Crossings with Culverts to maintain flow
- Turbidity Curtain to minimize sediment transport downstream

In order to control water during dam removal and maintain continuous flow of the river, work will occur in one segment of the river at a time. In general, coffer dams will be placed within the center of the river to isolate work to half of the river width. Flow will be maintained within the remaining half of the river. Where the temporary haul crosses the river, 48-inch diameter culverts will be installed to maintain flow.

3.7.5 Construction and Demolition Waste

The project will generate solid waste from the dam removal. Materials will be re-used to the extent practicable. The contractor(s) will be responsible for proper disposal/ recycling of materials in accordance with Massachsuetts solid waste regulations.

3.7.6 Stockpile and Sediment Management

Dredged sediment will be drained/dewatered within the existing Little River channel before transport to the maximum extent practicable to minimize the time materials need to be stored on the project site for dewatering prior to off-site transport and disposal. Dredged sediment stockpiling and dewatering (including of sediment containing hazardous materials) is proposed either within the G&C Concrete Construction, Inc property located at 30 Stevens Street, on the Stevens Street Mill Property, or on City property at the back of Cashman's Field. The industrial sites are preferred for this purpose and the City is engaged in ongoing negotiation of construction access agreements with the private landowners. If storage at the rear of Cashman's Field is necessary, it will be conducted within the soil storage areas identified in the site plans, and enclosed with security fencing.

Dredged material containing hazardous materials will be stockpiled with extra protective measures. This may include placement on an impermeable barrier with appropriate perimeter controls and application of additives to lock up free liquids. Stockpiled sediment will be surrounded by erosion control barriers and covered prior to inclement weather. If sufficiently dry, sediment may also be live-loaded for off-site disposal. Dredged material will be disposed off-site as hazardous or regulated waste in accordance with local, state, and/or federal regulations.

3.8 Invasive Species Management

The spread of invasives will be avoided to the maximum extent practicable. Measures will be implemented to reduce the potential for introduction or spread of invasive species within the project area. These measures include:

- The source of any imported soils or similar material will be evaluated for the presence of invasive species and appropriately decontaminated before use in construction; all straw bales and erosion control materials will be specified as weed free
- Vehicles, equipment, and tools will be cleaned of loose soils and plant materials before mobilization to the site
- Vehicles, equipment, and tools that have direct contact with invasive species or loose soils during construction will be cleaned or treated before leaving the project area

Most of the restoration area is currently inundated by the impoundment created by Little River Dam. Any existing invasive vegetation within the active restoration area will be grubbed and removed from site prior to earth moving operations (formation of restored channel and banks). Post-restoration monitoring and management of invasive species is proposed as part of the project. The restoration

planting plan has been designed to provide quick establishment of native vegetation in the restoration area, but some emergence of invasives is expected. Seasonal monitoring and early treatment/removal will be completed for a period of at least 3 years post-construction.

Invasive species removal methods included in the management plan were selected to minimize wetland impacts by conducting the work using hand-cutting and stump treatment with an Imazapyr-based herbicide. Broadcast or spray herbicides will be used on an as-needed basis to control herbaceous plants. Any chipping and/or loading of cut vegetation will be conducted within upland areas and vegetation material will be disposed of off-site.

To promote success of the restoration plantings and minimize available niches for invasive plants, proposed restoration plantings were selected based on site conditions at different portions of the site, including soils, exposure to sunlight, and predicted frequency of inundation (based on elevation after re-grading work at the site). All selected species are native species.

Seed mix will be used in disturbed areas to achieve a target of 75% vegetated cover and to increase diversity throughout the wetland enhancement area. Proposed seed mixes shall be supplied by New England Wetland Plants, Inc., or similar, as detailed in the Site Plans. Restored areas will be seeded/planted in phases, immediately following site disturbance, unless delays are necessary for better survival and/or establishment.

An Invasive Species Control Plan has been developed and is provided in *Appendix D*.

4 Alternatives Analysis

Multiple alternatives were considered for various elements of this project. The preferred alternatives provide a balance between environmental benefits, climate resilience, public benefits (including EJ communities), and projects costs. The alternatives presented below are described in two categories: overall dam management and channel establishment.

4.1 Dam Management

Four alternatives for the management of the Little River dam were considered including no action, dam removal, and two dam rehabilitation options. *Table 3-1* below provides a summary of dam removal and rehabilitation alternatives. Alternatives are also described in *Sections 3.1.1* through *Sections 3.1.4* below.

4.1.1 No Action

The No Action alternative would maintain habitat and hydrologic discontinuity of the Little River. The contaminated sediment would remain, and sediment (potentially with hazardous concentrations) would continue to accumulate behind the dam. This could result in increased cost for maintenance and for future dam removal due to sediment management. The liability associated with the dam would remain with the dam owner and owner of the Stevens Mill building; this liability has heretofore discouraged

redevelopment of this property. Although No Action would not result in short-term environmental impacts, this system would remain in a degraded state with poor water quality, limited biodiversity, and river discontinuity. No Action would not address climate change hazards threatening surrounding EJ communities including increased flooding, sea level rise, and more days with temperatures above 90°F. The No Action alternative also does not address the risk of catastrophic dam failure which would impact the Winter Street Bridge and downstream flood conduit.

4.1.2 Dam Removal

Dam removal is the preferred alternative as it meets multiple objectives of the City for climate change mitigation, contamination cleanup, infrastructure protection, recreational enhancement, economic redevelopment, and ecological restoration. During the planning and design phase, the City has considered input from multiple stakeholders including the public, regulators, and state agencies. The design includes a balanced approach to meet the needs of the City's inhabitants to the extent practicable, while considering short-term and long term environmental and community benefits.

Although the dam removal will result in significant environmental impacts, the net ecological benefit of restoring the natural flow of the river outweighs the impacts. In addition, impacts have been minimized to the extent practicable. Refer to *Section 2.6* for best management practices.

4.1.3 Dam Rehabilitation

Dam rehabilitation consists of long-term repairs to improve the useful life of the dam to a minimum of 50 years, and potentially up to 100 years. Rehabilitation includes comprehensive repairs and upgrades to the dam to bring it closer to current standards of design, operation, and risk management. Repairs include abandoning the mill race, reconstructing training walls and the spillway, installing downstream scour protection and a low-level outlet, dredging and disposing of sediment accumulated against the dam, rechinking and repointing the stone masonry, and flood proofing of Stevens Mill Building. The proposed rehabilitation reduces the risk of flood damage to the bridge and flood culvert and MBTA bridge downstream, but does not eliminate this risk.

Preserving the dam may continue to discourage redevelopment of the adjacent Stevens Mill building due to liability associated with the dam which is attached to the building. Upstream flood risk remains and the dam would continue to restrict passage of aquatic organisms. Based on the expense of rehabilitation, continued need for dam inspections and maintenance, continued liability associated with the dam, and continued barriers to aquatic movement, this alternative was discarded from consideration.

4.1.4 Dam Rehabilitation and Habitat Connectivity Features

Rehabilitation paired with habitat connectivity features like fish ladders or a bypass fishway do improve habitat connectivity, but are typically preferred when dam removal is not an option due to active use or other reasons. Construction of a fish ladder or bypass fishway would at best require easements or land taking of a significant portion of adjacent properties on river right and may not be feasible at all due to

the constraints of adjacent infrastructure (e.g., Winter Street Bridge). In addition, these features would add long term costs for maintenance and repair. Although these features will improve fish passage, dam removal would provide the greatest benefits to habitat connectivity to fish species and other aquatic organisms. This alternative also would not address the goals of flood resilience. Therefore, this alternative was discarded from consideration.

Table 3-1
Dam Management Alternative Analysis

	No Action	Dam Removal (Preferred)	Dam Rehabilitation	Dam Rehabilitation and Habitat Connectivity Features
Description	Dam remains in current condition.	Remove 55 lf of the dam.	Conduct extensive repairs to the dam, training walls, spillway, and downstream.	Construct fish ladder, bypass fishway, or other connectivity features. Dam would remain. Conduct dam repairs recommended in the Phase I inspection.
Feasibility	Results in no short term costs, although maintenance to improve compliance with dam safety regulations should be conducted. No repairs or maintenance may result in dam failure. Approx Cost: $0	The City has been awarded MVP Action grants for FY21, FY22, and FY23 for planning, design, and permitting phases of the dam removal. The City is actively pursuing funding for construction. Approx Cost: $6.6M to $10M	Rehabilitation would cost less than removal in the short term, but costs associated with dam maintenance and inspections would result in long term cost. Preserving the dam may continue to discourage redevelopment of the adjacent Stevens Mill building. This alternative does not meet the goals of the City. Approx. Cost: 2.6M to $5.6	Rehabilitation would cost the least in the short term. Long term costs associated with dam maintenance and inspections would remain. Preserving the dam may continue to discourage redevelopment of the adjacent Stevens Mill building due to liability associated with the dam which is attached to the building. This alternative does not meet the goals of the City. Approx. Cost: $4.5 to $8.6M
Ecological Restoration	Dam would continue to impede natural flow and restrict aquatic passage. Poor water quality driven by impounded water would remain.	Restores a free-flowing system for aquatic passage. Improves water quality by reducing stagnant water. Increases biodiversity.	Will not change from existing conditions. Dam would continue to impede natural flow and restrict aquatic passage. Poor water quality	Dam would continue to impede natural flow, but the fish ladder or bypass fishway would facilitate aquatic passage. Poor water quality

Table 3-1
Dam Management Alternative Analysis

	No Action	Dam Removal (Preferred)	Dam Rehabilitation	Dam Rehabilitation and Habitat Connectivity Features
			driven by impounded water would remain.	driven by impounded water would remain.
Habitat Connectivity	Dam would continue to restrict passage of aquatic organisms.	Significantly increases habitat connectivity.	Dam would continue to restrict passage of aquatic organisms.	Provides increased habitat connectivity especially for fish, but may restrict connectivity for other aquatic organisms.
Climate Resilience	Will not change from existing conditions. Anticipated increases in precipitation and sea level rise due to climate change will exacerbate flooding upstream of the dam.	Tree plantings for shade helps counteract urban heat island effects. Increases carbon sequestration potential in project site due to conversion of impoundment to stream and forested system.	Will not change from existing conditions. Anticipated increases in precipitation and sea level rise due to climate change will exacerbate flooding upstream of the dam.	Will not change from existing conditions. Anticipated increases in precipitation due to climate change will exacerbate flooding upstream of the dam.
Public Health & Safety	Increases potential for failure and catastrophic downstream impacts in the event of a dam failure.	Reduces risk of dam failure and catastrophic downstream impacts anticipated with dam failure. Reduces likelihood of harmful algal blooms. Removes contaminated sediment.	Reduces risk of dam failure and catastrophic downstream impacts anticipated with dam failure. Contaminated sediment would remain. No reduction of harmful algal blooms.	Reduces risk of dam failure and catastrophic downstream impacts anticipated with dam failure. Contaminated sediment would remain. No reduction of harmful algal blooms.
Potential for Upstream and Downstream Flooding	Surrounding properties within the 100-year floodplain will continue to be susceptible to flood	Reduces potential for upstream flooding. Does not change downstream flooding potential due to	Will not change from existing conditions. Surrounding properties within the 100-year floodplain will continue to be	Will not change from existing conditions. Surrounding properties within the 100-year floodplain will continue to be

Table 3-1
Dam Management Alternative Analysis

	No Action	Dam Removal (Preferred)	Dam Rehabilitation	Dam Rehabilitation and Habitat Connectivity Features
	events. A greater number of properties/larger portion of the neighborhood is likely to be impacted by flooding as climate change progresses. Potential remains for downstream flooding due to catastrophic failure of the dam.	presence of flood conduit to the Merrimack.	susceptible to flood events. A greater number of properties/larger portion of the neighborhood is likely to be impacted by flooding as climate change progresses. Potential remains for downstream flooding due to catastrophic failure of the dam.	susceptible to flood events. A greater number of properties/larger portion of the neighborhood is likely to be impacted by flooding as climate change progresses. Potential remains for downstream flooding due to catastrophic failure of the dam.
Aesthetics	The impoundment would remain, and seasonal algal blooms will likely continue.	Improves aesthetics by removing debris, restoring native vegetation in river corridor. Reduces potential for algal blooms and restores free-flowing river. Adds significant native vegetation to create a green corridor through the City.	The impoundment would remain, and algal blooms will likely continue. Select vegetation removal will provide greater visibility of the dam.	The impoundment would remain, and seasonal algal blooms will likely continue. Select vegetation removal will provide greater visibility of the dam.

Table 3-1
Dam Management Alternative Analysis

	No Action	Dam Removal (Preferred)	Dam Rehabilitation	Dam Rehabilitation and Habitat Connectivity Features
Environmental Impacts	No direct impacts to wetland resource areas, but preserving the dam continues to impede natural flow and restrict aquatic passage.	Overall results in net environmental benefit by restoring natural flow of the river and allowing for aquatic passage. Portions of the current impoundment will be converted to wetland, resulting in more diverse habitat along the river corridor. Indirect impacts to wetlands upstream of the project are anticipated due to lowering of groundwater elevation from dam removal.	Direct impacts to wetland resource areas are significantly lower compared to dam removal, but preserving the dam continues to impede natural flow and restrict aquatic passage. Dam rehabilitation does not result in direct environmental benefits, although rehabilitating the dam will reduce potential of dam failure that could result in downstream environmental degradation.	Restoration of aquatic passage improves habitat connectivity, but preserving the dam continues to impede natural flow. Rehabilitating the dam will reduce potential of dam failure that could result in downstream environmental degradation.

4.2 Channel Establishment

Two alternatives have been considered for the reestablishment of the stream channel through the former impoundment. Dam removal will result in higher velocity flows that will allow the finer silty sediments to be moved downstream. The alternatives in *Table 3-2* below include options to let the stream channel naturally develop (passive management) or actively manage the stream channel (designed channel). Sediment with concentration of hazardous materials would be removed for both options.

4.2.1 Designed Channel (Preferred)

The designed channel includes a more active approach to the stream alignment within the former impoundment. A designed channel is preferred as it provides the opportunity to include grade control structures to maintain water within a low-flow channel, nature-like fishway, scour protection at bridge crossings, and proper alignment of the stream at the approach to the Winter Street Bridge. The nature-like fishway and low-flow channel were incorporated into the design to enhance fish passage and aquatic organism movement during all seasons.

4.2.2 Passive Management

A passive management approach includes minimal grading post-dam removal. The natural stream alignment may not yield a suitable alignment to protect from scour at Winter Street bridge. Structure failure from scour and undermining could result in public safety concerns. Natural channel development may or may not provide appropriate depths and velocities for target fish species or recreational use. This option was not preferred as it does not properly protect from infrastructure damage to the bridge that could result in public safety issues and it does not guarantee conditions appropriate for fish passage or recreational use.

Table 3-2
Channel Establishment Alternatives Analysis

	Designed Channel (Preferred)	Passive Management
Description	Design and construct the size and alignment of the stream channel and its banks. Includes stabilizing sediment to some extent for a controlled migration downstream.	Allow for sediment to be transported downstream after dam removal without any restrictions. Allow for natural formation of the stream channel during construction.
Feasibility	Requires a significant increase in project complexity. Requires more design and construction for channel creation and phasing for actively managed sediment release.	Eliminates the need for design of the upstream channel restoration and reduces construction within Little River.
Ecological Restoration	Likely results in a less sinuous channel than would occur naturally in order to provide necessary protection of infrastructure and built-up land uses. Includes re-use of native streambed material. Design provides for appropriate depths and velocities for target fish species.	Promotes ecological restoration of natural state of stream based on current flow regimes. Natural channel development may or may not provide appropriate depths and velocities for target fish species or recreational use for kayakers and canoers.
Climate Resilience	Promotes protection of infrastructure susceptible to erosion during high precipitation and flow events. Reduces likelihood of stream meandering and undermining downstream bridge on Winter Street.	The natural stream alignment may not be suitable alignment to maintain the structural integrity of the Winter Street during high precipitation and flow events.
Public Health & Safety	By protecting infrastructure, this alternative reduces likelihood of potential public safety impacts resulting from infrastructure failure. Sediment with concentration of hazardous materials will be removed and properly disposed of.	The natural stream alignment may not be suitable alignment. Structure failure from scour and undermining could result in public safety concerns. Sediment with concentration of hazardous materials will be removed and properly disposed of.

Table 3-2
Channel Establishment Alternatives Analysis

	Designed Channel (Preferred)	Passive Management
Potential for Upstream and Downstream Flooding	This aspect of dam removal is not anticipated to significantly affect flooding.	This aspect of dam removal is not anticipated to significantly affect flooding.
Aesthetics	Tree planting and revegetation of the banks and former impoundment will improve the aesthetic character along the river corridor. Native plantings will enhance diversity of vegetative strata compared to existing conditions.	Tree planting and revegetation of the banks and former impoundment will improve the aesthetic character along the river corridor. Native plantings will enhance diversity of vegetative strata compared to existing conditions. May result in increased stream sinuosity.
Environmental Impacts	Based on H&H analysis, the flood conduit can safely pass the volume of sediment proposed for controlled release. Discharge of sediment into the Merrimack River is not anticipated to have a significant effect on the river.	May result in large amounts of sediment migration within a short period of time. Based on H&H analysis the flood conduit can safely pass the sediment. Discharge of sediment into the Merrimack River is not anticipated to have a significant effect on the river.

5 Impacts to Wetland Resource Areas

5.1 Wetland Resource Area Impacts

Resource area impacts have been reduced to the maximum extent practicable. Due to site constraints including the location of the existing dam, proximity to wetland resource areas, and the nature of restoration work, impacts to wetland resource areas are unavoidable.

Impacts are considered permanent if they change the use, elevation, or function of a resource area. Indirect impacts are assumed to be permanent. Permanent impacts associated with this project include changing the location of the Bank and extent of LUWW. Permanent impacts may also include the conversion of wetland type.

Impacts are considered temporary if they include activities which change the resource area in the short-term, but the original function and value will be restored.

Direct impacts are considered as disturbance or alterations within the limit of work. These impacts are anticipated from the removal of Little River Dam, dewatering of a portion of Little River during construction, dredging and removal of contaminated sediment, grading of the former impoundment area, and installation of a retaining wall and scour protection.

Wetland Resource Area Impacts

Resource Area	Extent of Impact
Bank	5,100 lf
Bordering Vegetated Wetland	22,570 sf (0.5 ac)
Land Under Water Bodies and Waterways	415,400 sf (9.5 ac) 10,360 cy dredging
Bordering Land Subject to Flooding	10,300 sf (0.2 ac)
Riverfront Area	83,730 sf (1.9 ac)

Proposed mitigation measures to avoid, minimize, or offset potential adverse impacts are summarized in Table 7-1.

5.1.1 Indirect Impacts

Indirect impacts for this project are anticipated from the lowering of surface water and groundwater levels, primarily upstream. The removal of the dam and subsequent drawdown of the impoundment will

permanently lower base flow water level within the Project Site, by 3.75 to 8.29 feet. Because of this changed hydrology resulting from dam removal, wetlands and surface waters within the vicinity of the dam are anticipated to change. These indirect impacts may result in conversion of wetland type to another wetland type (e.g., emergent wetland to scrub shrub wetland) or conversion of wetlands to uplands. This conversion is allowable under an Ecological Restoration Order of Conditions given the overall benefits accrued through dam removal and restoration of the free flowing river system. The aerial extent of streams or other surface water bodies may be reduced due to the lowering of water level.

5.2 Flood Impacts

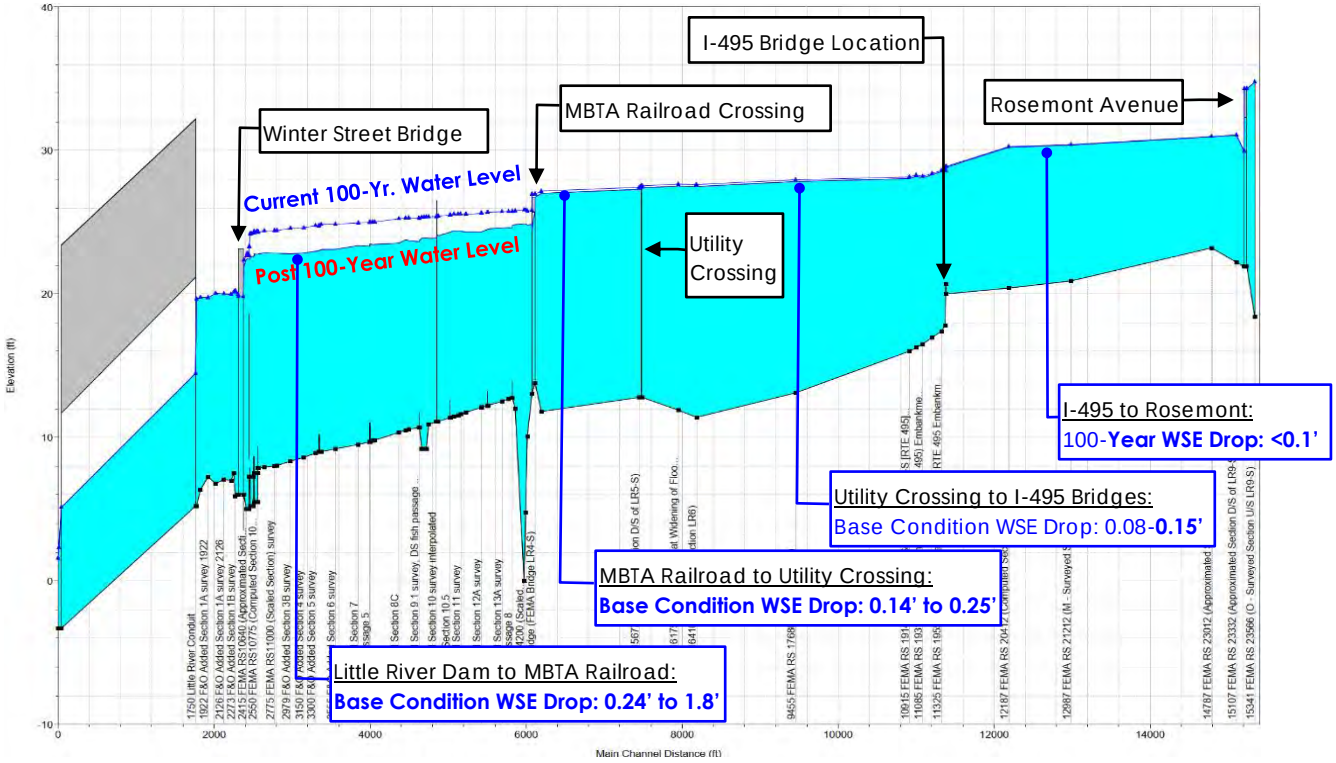
Flood resilience is a primary goal of this project. Fully removing the Dam will result in a notable reduction in upstream water levels during flood events up to Rosemont Avenue. The following table provides a summary of the range of upstream flood level reductions during the 10%, 2%, 1%, and 0.2% Annual Chance Flood Events commonly referred to as the 10-, 50-, 100-, and 500-year flood events. It is assumed that these are inland flood events with no coastal storm surge. This assumption was made to conservatively approximate changes in flood velocities since assuming storm surge elevations will result in more backflow impacts and lower flow velocities which would result in an underestimation of peak flow velocities that would result during inland flood events.

Flood Level Reductions During the 10%, 2%, 1%, and 0.2% Annual Chance Flood Events

Section of River	10-Year Flood Level Reduction Range (Minimum to Maximum, feet)	50-Year Flood Level Reduction Range (Minimum to Maximum, feet)	100-Year Flood Level Reduction Range (Minimum to Maximum, feet)	500-Year Flood Level Reduction Range (Minimum to Maximum, feet)
Dam to MBTA Railroad Bridge	6.3-2.4 feet[1]	3.8–1.7 feet[1]	0.2-1.8 feet[1]	Less than 0.6 feet[1]
MBTA Railroad Bridge to Utility Crossing	1.6-1.2 feet	0.8-0.9 feet	0.1-0.3 feet	Less than 0.1 feet
Valley Pipe Crossing to I-495 Bridges	0.4-1.2 feet	0.4-0.8 feet	0.1-0.2 feet	Less than 0.1 feet
I-495 Bridges to Rosemont Avenue	Less than 0.5 feet	Less than 0.5 feet	Less than 0.1 feet	Less than 0.1 feet

1 Reductions will be less during coastal storm events. As reflected in the FIS, storm surge elevations in the Merrimack River were approximated to be El. 15.3 feet, El. 19.5 feet, El. 22.4 feet, and El. 28.7 feet during the 10-Year, 50-Year, 100-Year, and 500-Year flood events, respectively.

The figure below illustrates the reduction in flood levels during the 100-year flood event during an inland flood event. While these flood benefits will be realized during inland flood events, it is not anticipated that dam removal will have a significant impact on flood insurance rates for properties

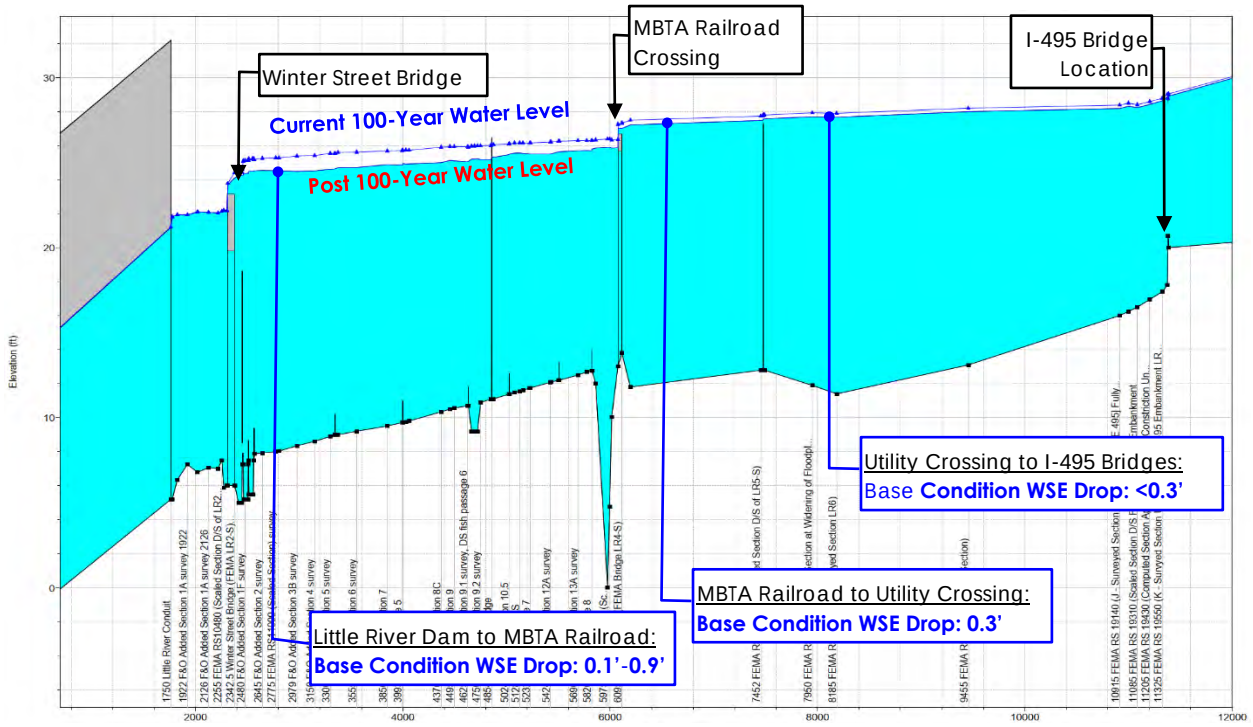


100-Year Water Surface Elevation Reductions During Inland Flood Event

currently located within the floodplain. This is because the flood insurance rates are conservatively based on a 100-year flood event coupled with a storm surge scenario as reflected in the current FIS for Essex County. When applying backwater impacts from the Merrimack River during a coastal flood, 100-year flood reductions between the Dam and the MBTA Railroad will only range 0.1 and 0.9 feet as shown below.

It is important to note that with these reductions in flood elevations during inland storm events, there will be increases in flow velocities throughout the River between the Dam and the Rosemont Avenue Bridge. Such increases will be greatest just upstream of the Dam (e.g. the maximum increase in velocity is 3.4 ft/s approximately 30 feet upstream of the current location of the dam during the 10-year flood) and immediately downstream of the MBTA Railroad and I-495 Bridges. These increases in velocities at these specific locations may increase the potential for scour during flood events and require the installation of scour countermeasures (as previously mentioned in this memorandum).

Reductions in flood elevations during inland storm events may also leave banks vulnerable to undercutting and collapse in some locations upstream of the Dam. Based on the results of the pre- versus post-dam removal results for the 10-year, 50-year, 100-year, and 500-year inland storm events, it appears that reductions in flood elevations (coupled with increased flow velocities) will primarily occur between the Dam and the MBTA Bridge. As a result, bank stabilization is necessary along both sides of



100-Year Water Surface Elevation Reductions During Coastal Flood Event

the River within this stretch of the River. Stabilization measures are shown on the Site Layout and Grading Plan and consist of a combination of natural erosion control blanketing, biodegradable coir fascine with fast-growing native live stakes, lower river slope stabilization with stone, and native wetland/conservation seed mix.

Climate Change Applicability

Should climate change predictions documented within the State Hazard Mitigation and Climate Action Plan (*SHMCAP)* become realized, it is anticipated that annual precipitation will increase up to 16% (or 7.3 inches), days with rainfall accumulation of greater than one inch will increase by 57% (or 4 days), the number of consecutive dry days will increase by 18 percent, and summer precipitation will decrease. It is also anticipated that there will be an increase in the intensity and frequency of larger storm events and a rise in sea levels.

Due to the removal of the dam, the limits of tidal inundation (during high tide conditions) will continuously extend further upstream than currently exists. Mean high water is anticipated to potentially rise to El. 5.8 feet (NAVD88) by the year 2070 based on the "high" scenario for Boston as documented within the SHMCAP. This 'high' scenario is recommended since sea-level rise is projected to be greater than the global average along the New England coast. In terms of in-river impacts, with the dam

removed, high tide will extend approximately 1,400 feet upstream of the dam's current location in 2070 (up to Apple Street). The nature-like fishway installed in the vicinity of the dam will likely be inundated during mean high water conditions during 2070, but will continue to operate as designed under mean tide and mean low water conditions. As high tide levels continue to rise, more and more of the River will begin to experience inundation. This, however, will not adversely impact passage.

The table below reflects the impact to flood flows conveyed by the Little River at the project site as projected for 2070, using a flood flow magnification factor of 1.27 for 100-year design storm, and 1.2 for more frequent design storms per RMAT guidelines. In addition, for the climate change analysis a high tide water surface elevation of 5.8 feet (equivalent to the 2070 projected high tide) was assumed for the downstream boundary condition.

Peak Flood Event Inflow Rates Projected for 2070

Location	Present-Day 10-Year Flood (cfs)	Projected 10-Year Flood (cfs)	Present-Day 50-Year Flood (cfs)	Projected 50-Year Flood (cfs)	Present-Day 100-Year Flood (cfs)	Projected 100-Year Flood (cfs)
RS 15341 - Upstream Limit of Model	980	1,176	1,640	1,968	1,990	2,527
RS 11387 – Upstream of I-495 Bridges	1,160	1,392	1,920	2,304	2,330	2,959

In general, climate change will lead to increased flow velocities during flood flows, which will increase scour potential throughout the project area. Flood elevations will also typically increase whether or not the Dam is removed. However, under a climate change scenario the removal of the Dam will reduce flood risks to upstream structures during analyzed flood events between Winter Street and the I-495 bridges. Flood reductions are most significant immediately upstream of the dam and during the smaller, more frequent flood events such as the 10-year flood event. Flood reductions are less significant during the larger, more infrequent flood events such as the 50- and 100-year flood events.

Peak Flood Elevation Comparison Between Present-Day and Projected Flood Conditions

Location	Present 10-Year WSE (feet) With Dam	Projected 10-Year WSE (feet) With Dam	Projected 10-Year WSE (feet) Without Dam	Present 50-Year WSE (feet) With Dam	Projected 50-Year WSE (feet) With Dam	Projected 50-Year WSE (feet) Without Dam	Present 100-Year WSE (feet) With Dam	Projected 100-Year WSE (feet) With Dam	Projected 100-Year WSE (feet) Without Dam
RS 2645 – Just Upstream of Little River Dam	22.26	22.73	17.64	23.7	24.36	22.96	24.39	26.42	25.95
RS 4060 – In Vicinity of Little River Road	22.61	23.14	19.01	24.24	24.97	23.52	25.01	26.95	26.38
RS 6195 – Upstream of MBTA Railroad	23.94	24.68	23.31	26	27.13	26.96	27.16	28.41	28.35
RS-7488 – Upstream of Valley Pipe Support Structure	24.21	24.96	23.82	26.34	27.49	27.34	27.53	28.77	28.72
RS 12187 – Upstream of I-495 Bridges	27.16	27.84	27.7	29.23	30.21	30.16	30.26	31.59	31.58

6 Maintenance and Operation Plan

The restored channel and nature-like fishway have been designed to operate autonomously when properly maintained. The following maintenance/repair measures are recommended for the restored channel and fishway structure.

- Remove accumulated sediment and debris
- Remove woody vegetation obstructing flow
- Repair eroded areas
- Reset or replace dislodged boulders

Maintenance and repair activities should be completed as needed to re-establish elevations, dimensions and surface conditions (i.e., vegetated, armored) consistent with conditions depicted on design drawings (Attachment A). The City should assess the need for any repairs or other non-maintenance rehabilitation measures, and shall implement such repairs under the supervision of a qualified professional to assure successful (safe, timely and effective) restoration and fish passage.

Native suspended and bedload sediment carried in the river will pass through the restored channel and nature-like fishway and may accumulate within pools at different rates under different seasonal, storm- and flood-related flow conditions.

While normal flows following depositional events will likely re-mobilize accumulated sediment, it may be necessary to actively remove sediment from the pools to maintain sizes conducive to upstream passage of migratory fish. In general, the bottom elevations and dimensions of each fishway pool and the entrance channel should be maintained as close to design conditions as possible to maintain optimal fish passage and access for recreational boating.

Potential methods and controls to remove accumulated sediment and debris from the fishway are briefly outlined below.

In-Stream Management

- Manual re-suspension of excessive accumulated sediment in a manner that mimics natural processes and does not cause excessive turbidity or exceed the assimilative sediment-carrying capacity of the river's flows at the time of resuspension, may be permissible to regulatory bodies and agencies.
- If one or more in-stream management methods are used, it should be noted that resuspended excessive accumulated sediment from upper portions of the fishway could be deposited in lower portions of the fishway, depending on the rate of resuspension. As a result, work should proceed from upper to lower portions of the fishway.
- In-stream management of debris shall be limited to small, natural materials (i.e., non-woody vegetative debris, or small sticks or branches). Any man-made/foreign debris shall be removed and properly disposed.

Removal and Disposal

- Excessive accumulated sediment can be removed using equipment or hand-tools and removed from the site in containers. Any method used shall not create excessive turbidity in the river; protective measures such as deployment of turbidity curtains may be required to avoid/minimize discharge of turbid water from the immediate work area.
- If using powered equipment to remove excessive accumulated sediment, care shall be taken to avoid removing or otherwise displacing the position of rocks and boulders placed along the fishway's banks, within the pools or forming the riffles and notches.
- Sediment removed from the pools or downstream entrance channel shall be dewatered (drained) prior to transport from the site. Dewatering shall be performed using appropriate best management practices to avoid/minimize impacts to wetland and aquatic habitat.
- Large woody debris and man-made/foreign debris shall be removed and properly disposed.

6.1 Nature-like Fishway

A Division of Marine Fisheries Fishway Construction Permit is required for the dam removal project. A formal operation and maintenance plan will be developed and approved in collaboration with DMF as part of the Fishway Construction Permit.

In general, minimal maintenance is expected for the nature-like fishway in the Little River channel. Placed boulders in the weirs, walls, and channel could shift over time. Observations of boulder shifts

that are unfavorable to fish passage should be recorded and followed up with coordinated efforts between Division of Marine Fisheries and the City of Haverhill to make any necessary manual adjustments during low flow periods.

The nature-like fishway, which includes riffle pools and boulder weirs with low-flow notches should be inspected semi-annually for any deficiencies which could lead to inadequate water depths and/or excessive velocities through the fishway that may prevent or limit safe, effective, and timely passage of migratory species through the site. Such deficiencies include but are not limited to: entrained large debris, accumulated sediment in riffle pools, shifted or missing rocks/boulders, eroded riverbanks, excessive vegetation within the fishway that constricts or otherwise obstructs flows conducive to fish passage.

Inspections of the fishway shall be completed as generally described below. Since seasonal flows/water levels in March may prevent or limit safe access and ability to check all items listed, the inspection should also be performed during annual seasonal low water conditions in summer/fall when bottom areas of the fishway are more exposed and can be accessed safely.

- Observe all boulders along riverbanks and comprising riffles for signs of movement.
- Observe riverbanks for signs of erosion.
- Observe each riffle notch, pool, and the downstream entrance channel for excessive vegetation.
- Measure the depth of sediment at each pool and notch for excessive accumulation; sediment
- depth (to underlying stone armor scour protection) should be no more than 18-inches.
- Periodically (e.g., every 3-5 years) survey elevations in notches, pools and the entrance channel
- to confirm elevations are consistent with as-built conditions.
- Document observations and measurements (on the inspection form and by photographic/video
- digital media).
- Coordinate necessary maintenance and/or repairs.

6.2 Stone Retaining Walls

Stone masonry walls immediately upstream of Winter Street and adjacent to the mill building foundation should be inspected annually, at a minimum, to identify deficiencies that can lead to collapse and cause damage to other infrastructure. The frequency of inspections will vary depending on the severity of observed conditions. In particular, if significantly damaged wall sections are observed, more frequent inspections should be conducted (and warning barricades/signage installed) until the wall is stabilized or repaired.

Potential deficiencies include, but are not limited to, the following:

- Missing or displaced stones
- Excessive gaps between wall stone (e.g., loss of chink stones and/or mortar)
- Sinkholes or depressed areas behind walls (indicating loss of subsoils behind walls through the
- wall faces)
- Leaning, misaligned, or collapsing/failing walls
- Scour along the base of walls
- Woody vegetation growing behind (along top of), on or along the bottom of walls

An inspection of all walls should be completed promptly after heavy rainfall or severe storms.

7 Regulatory Compliance

7.1 Ecological Restoration Project

The proposed project meets the general eligibility criteria set forth in 310 CMR 10.13(1) and the additional eligibility criteria for dam removal projects set forth in 310 CMR 10.13 (2) as described below. In addition, the project furthers five of the eight interests of the Wetlands Protection Act: flood control, storm damage prevention, prevention of pollution, protection of fisheries, and protection of wildlife habitat.

Headings	Here
310 CMR 10.13(1) An Ecological Restoration Project shall be permitted by a Restoration Order of Conditions if it meets all of the following eligibility criteria:	
(a) The project is an Ecological Restoration Project as defined in 310 CMR 10.04, is a project type listed in 310 CMR 10.13(2) through (7), and the applicant has submitted a Notice of Intent that meets all applicable requirements of 310 CMR 10.12.	The project is an Ecological Restoration Project as defined under 10.13(2) – Dam Removal.
(b) The project will further at least one of the interests identified in M.G.L. c. 131, § 40.	The project furthers five of the eight interests of the Wetlands Protection Act (Act): flood control, storm damage prevention, prevention of pollution, protection of fisheries, and protection of wildlife habitat. See Section 3.1
(c) The project will not have any short-term or long-term adverse effect, as identified by the procedures established by 310 CMR 10.11, on specified habitat sites of Rare Species located within the Resource Areas that may be affected by the project or will be carried out in accordance with a habitat management plan that has been approved in writing by the Natural Heritage and Endangered Species Program and submitted with the Notice of Intent.	The proposed project area is not mapped as Priority Habitat for State-listed endangered or threatened species, and is therefore not subject to Massachusetts Endangered Species Act review under 321 CMR 10.18.
(d) To the maximum extent practicable, the project will:	
1. avoid adverse impacts to Resource Areas and the interests identified in M.G.L. c. 131, § 40, that can be avoided without impeding the achievement of the project's ecological restoration goals;	Impacts within resource areas have been avoided to the extent possible while meeting the ecological restoration goals.
2. minimize adverse impacts to Resource Areas and the interests identified in M.G.L. c. 131, § 40, that are necessary to the achievement of the project's ecological restoration goals; and	The impacts of the project have been minimized to the extent possible while meeting the ecological restoration goals.

3. utilize best management practices such as erosion and siltation controls and proper construction sequencing to prevent and minimize adverse construction impacts to Resource Areas and the interests identified in M.G.L. c. 131, § 40	Best management practices are described in Section 3.7.
(e) The project will not have significant adverse effects on the interests of flood control and storm damage prevention in relation to the built environment (i.e., the project will not result in a significant increase in flooding or storm damage affecting buildings, wells, septic systems, roads or other human-made structures or infrastructure)..	The project will result in significant benefits for the interests of flood control and storm damage prevention in relation to the built environment. See Section 3.1 and 5.2.
(f) If the project will involve the dredging of 100 cubic yards of sediment or more or dredging of any amount in an Outstanding Resource Water, the Notice of Intent includes a Water Quality Certification issued by the Department in accordance with 314 CMR 9.00: 401 Water Quality Certification for Discharge of Dredged or Fill Material, Dredging, and Dredged Material Disposal in Waters of the United States Within the Commonwealth.	A Water Quality Certification has been applied for in accordance with 314 CMR 9.00.
(g) The project will not substantially reduce the capacity of a Resource Area to serve the habitat functions identified in 310 CMR 10.60(2). A project will be presumed to meet this eligibility criteria if the project as proposed in the Notice of Intent will be carried out in accordance with any time of year restrictions or other conditions recommended by the Division of Marine Fisheries for coastal waters, and by the Division of Fisheries and Wildlife for inland waters in accordance with 310 CMR 10.11(3) through (5). As set forth in 310 CMR 10.12(3), a person submitting a Notice of Intent for an Ecological Restoration Project that meets the requirements of 310 CMR 10.12(1) and (2) is exempt from the requirement to perform a wildlife habitat evaluation in accordance with 310 CMR 10.60.	The project will be carried out in accordance with the conditions recommended by Division of Marine Fisheries and Division of Fisheries and Wildlife. Correspondence from both agencies is provided with this NOI.
(h) If the Ecological Restoration Project involves work on a stream crossing, the stream crossing has been designed in accordance with 310 CMR 10.24(10) for work in coastal resource areas and 310 CMR 10.53(8) for work in inland resource areas, as applicable.	N/A

(i) The Ecological Restoration Project will not result in a discharge of dredged or fill material within 400 feet of the high water mark of a Class A surface water (exclusive of its tributaries) unless the project is conducted by a public water system under 310 CMR 22.00: Drinking Water or a public agency or authority for the maintenance or repair of existing public roads or railways in accordance with 314 CMR 4.06(1)(d)1.	
(j) The Ecological Restoration Project will not result in a discharge of dredged or fill material to a vernal pool certified by the Division of Fisheries and Wildlife.	There are no vernal pools within the project area.
(k) The Ecological Restoration Project will not result in a point source discharge to an Outstanding Resource Water.	There are no new point source discharges associated with the project, nor is Little River an Outstanding Resource Water.
(l) The Ecological Restoration Project will not involve the armoring of a Coastal Dune or Barrier Beach.	N/A

310 CMR 10.13(2)	
Additional Eligibility Criteria for Dam Removal Projects. If the Ecological Restoration Project is a dam removal project, the project shall be presumed to meet the eligibility criteria set forth in 310 CMR 10.13(1)(d), if the project is consistent with the Department's guidance entitled Dam Removal and the Wetlands Regulations, dated December 2007. If the Ecological Restoration Project is a dam removal project, the Ecological Restoration Project shall be approved by a Restoration Order of Conditions, provided that in addition to the eligibility criteria set forth in 310 CMR 10.13(1), the project meets all of the following eligibility criteria:	
(a) The project will not involve the removal of a dam that was constructed or is managed for flood control by a municipal, state or federal agency	Little River Dam was not constructed for flood control and the structure does not have the capability of being managed for flood control.

(b) The project will not adversely impact public water supply wells or water withdrawals permitted or registered under the Water Management Act, M.G.L. c. 21G, and 310 CMR 36.00: Massachusetts Water Resources Management Program within the reach of the stream impacted by the impoundment.	Confirmed. There are no water supply wells in the vicinity of the project area which will be impacted.
(c) The project will not adversely impact private water supply wells including agricultural or aquacultural wells or surface water withdrawal points.	Confirmed. There are no water supply wells in the vicinity of the project area which will be impacted.
(d) The project provides for the removal of the full vertical extent of the dam such that no remnant of the dam will remain at or below the streambed as determined prior to commencement of the dam removal project, or if such determination cannot be made at that time, as determined during construction of the project.	Confirmed. The project will remove the full vertical extent of the dam and to 2 feet below streambed grade.
(e) The project provides for the removal of enough of the horizontal extent of the dam such that after removal no water will be impounded during the 500 year flood event.	Hydraulic modeling has confirmed that water will not be impounded during the 500-year flood event under proposed conditions. A 10 foot section of the dam will remain solely to act as support to the foundation of the adjacent mill building.
(f) The project will not involve a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license.	Confirmed.
(g) The applicant has obtained from the Department of Conservation and Recreation Office of Dam Safety a written determination that the dam is not subject to the jurisdiction of the Office under 302 CMR 10.00: Dam Safety, a written determination that the dam removal does not require a permit under 302 CMR 10.00: Dam Safety or a permit authorizing the dam removal in accordance with 302 CMR 10.00: Dam Safety has been issued.	A permit authorizing the dam removal in accordance with 302 CMR 10.00: Dam Safety has been issued for the project as of April 18, 2023.
(h) If the project is exempt from the requirement to obtain a license or permit under 310 CMR 9.05(3)(n), the project will not have an adverse effect on navigation or on any docks, piers or boat ramps authorized under 310 CMR 9.00: Waterways.	The project is not exempt from 310 CMR 9.05 and will receive a Chapter 91 License before proceeding to construction.
(i) The Ecological Restoration Project will not result in a discharge of dredged or fill material within 400 feet of the high water mark of	Confirmed.

a Class A surface water (exclusive of its tributaries) unless the project is conducted by a public water system under 310 CMR 22.00: Drinking Water or a public agency or authority for the maintenance or repair of existing public roads or railways in accordance with 314 CMR 4.06(1)(d)1.	
(j) The Ecological Restoration Project will not result in a discharge of dredged or fill material to a vernal pool certified by the Division of Fisheries and Wildlife.	There are no vernal pools within the project area.
(k) The Ecological Restoration Project will not result in a point source discharge to an Outstanding Resource Water.	There are no new point source discharges associated with the project, nor is Little River an Outstanding Resource Water.
(l) The Ecological Restoration Project will not involve the armoring of a Coastal Dune or Barrier Beach.	N/A

7.2 Stormwater Management

The project will not include creation of additional impervious area, addition of any new point source discharges, or expansion of a drainage system for increased collection. Per the recommended final decision issued on July 29, 2016 in the Matter of Berkshire Community College Docket # WET-2015-023 from the MassDEP Office of Appeals and Dispute Resolution, it was ruled that 310 CMR 10.05(6)(k) through (q) does not apply to a project that does not propose a "point source" or "stormwater discharge" within resource areas or their Buffer Zones.

Construction-period Best Management Practices will be implemented for erosion and sedimentation control including installation of sediment control barriers, and installation of a temporary pump settling basin and other water control measures as appropriate. A Stormwater Pollution Prevention Plan (SWPPP) pursuant to the requirements of EPA's Construction General Permit will be prepared prior to construction detailing appropriate stormwater management practices.

Ultimately the restoration project will result in stormwater benefits by increasing the ecosystem's natural capacity to attenuate stormwater.

7.3 Abutter Notification

In accordance with 310 CMR 10.05(4) and Haverhill Wetlands Ordinance, abutter notifications will be mailed to abutters within 300 feet at least seven days prior to the public hearing. A copy of the Site Plans list and notification is included as *Appendix A*

8 Rare Species and Fisheries

8.1 Federal Endangered Species

According to the Official Species List generated through the Information for Planning and Consultation (IPaC), two threatened, endangered, or candidate species may be present in the area of the proposed action. These species include:

- Northern Long-eared Bat (*Myotis septentrionalis*; Endangered)
- Monarch Butterfly (*Danus plexippus*; Candidate)

No critical habitats were identified within the project area. Although the NLEB may be present, the NHESP No. Long-eared Bat Locations Map Viewer (last updated June 12, 2019) shows no maternity roost trees or hibernacula within 5 miles of the project area. The closest mapped hibernacula is approximately 17 miles to the south in Lynnfield and Reading. The closest mapped maternity roost trees are located 76 miles to the southeast in Sandwich.

Results from the ESA Section 7 Mapper indicate that the Little River is not within mapped ESA Section 7 areas, but the portion of the Merrimack River where Little River converges with the Merrimack River (downstream of the project area) is mapped for two species:

- Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*, Endangered)
- Shortnose Sturgeon (*Acipenser brevirostrum*, Endangered)

This portion of the Merrimack is also mapped as in or near critical habitat.

8.2 State-listed Rare Species

The project area is not located within an area mapped as Natural Heritage and Endangered Species Program (NHESP) Priority Habitat of Rare Species ("Priority Habitat") and is therefore not subject to MESA review under 321 CMR 10.18.

8.3 Fisheries

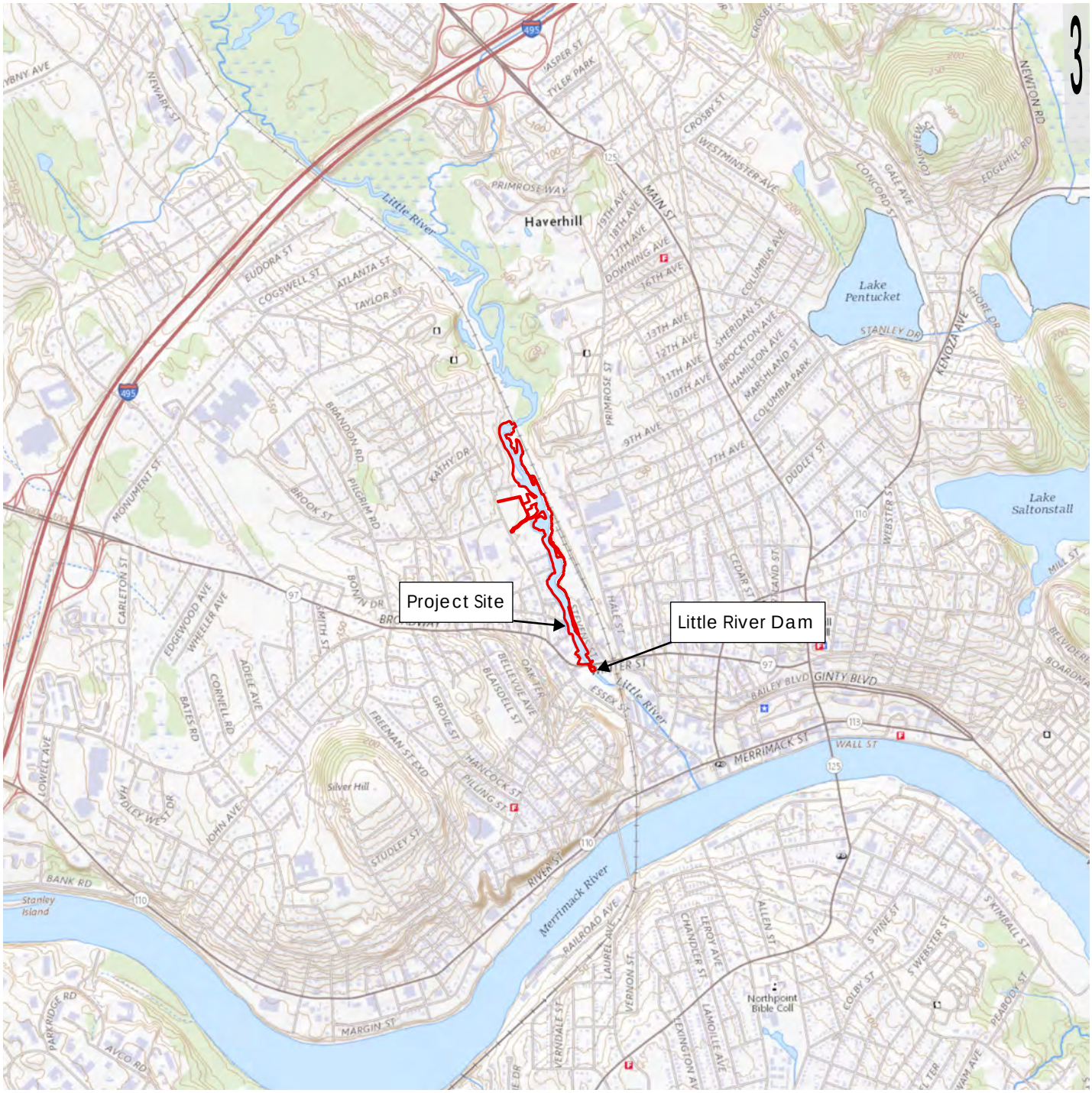
The Massachusetts Division of Marine Fisheries has reviewed the proposed project and issued a determination requesting a TOY restriction of March 1 to June 30 with in water work sequenced to occur during periods of low from stream conditions (i.e. July 1- October 31).

9 Water Supply Wells

The Proposed Project does not have the potential to negatively impact private water supply wells, including agricultural or aquacultural wells or surface water withdrawal points.

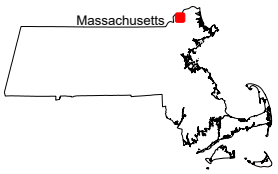
Figures

Site Location Map
MassGIS Orthophoto Map



MAP REFERENCE: USGS Topo
Accessed on : 7/29/2022
From: https://basemap.nationalmap.gov/arcgis/rest/services/USGSTopo/MapServer

USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed June, 2022.



Map Reference Location

0 1,000 2,000
GRAPHIC SCALE

SCALE: 1:24,000

FUSS & O'NEILL

Little River Dam Removal and River Restoration

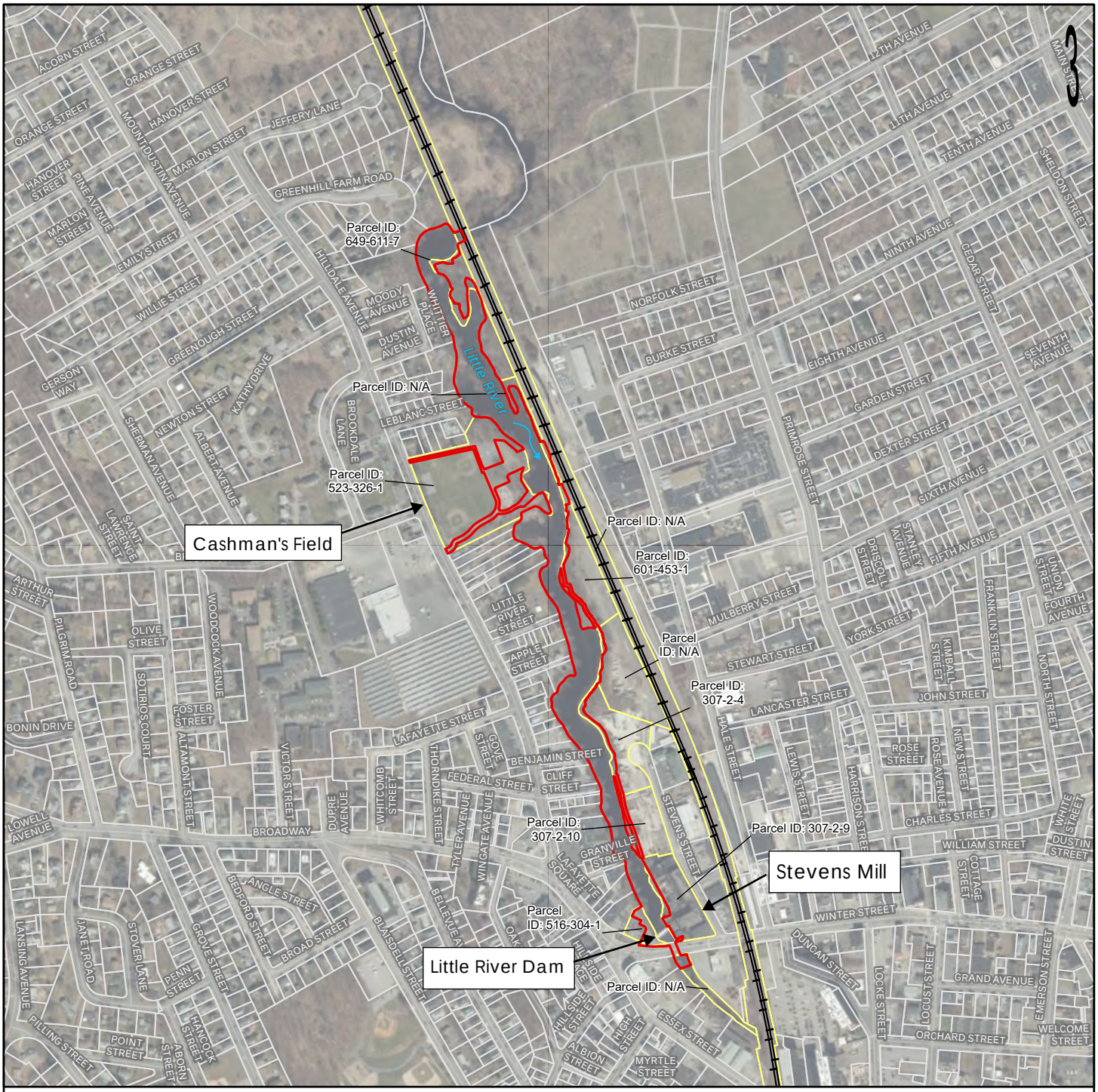
SITE LOCATION MAP

Haverhill, MA

PROJ No.: 20170390.U30

DATE: Jul 2022

FIGURE 1



0 150 300 600

GRAPHIC SCALE

SCALE: 1:8,000

FUSS & O'NEILL

Little River Dam Removal and River Restoration

SITE OVERVIEW

Haverhill, MA

PROJ No.: 20170390.U30

DATE: Jul 2022

FIGURE 2