Massachusetts Inland Resource Area Delineation Report

Resource Area Description

Report Date: October 6, 2022

Prepared For: Town of South Hadley, Massachusetts
(contact: Rebekah Cornell, Conservation Administrator)
116 Main Street, South Hadley, MA 01075

Project number: 20150214.B40

Site Address/Location: Elmer Brook, at Pearl Street
42.282717° N, 72.587053° W

Inspection Date: September 8, 2022

Regulated Inland Wetland Resource Areas:

- ☒ Bank
- ☒ Land Under Water Bodies and Waterways (LUWW)
- ☒ Riverfront Area
- ☒ Buffer Zone
- ☐ Vernal Pool (Certified and/or Potential)
- ☒ Bordering Vegetated Wetland (BVW)
- ☒ Land Subject to Flooding (BLSF/ILSF)
- ☒ Estimated Habitats of Rare Wildlife
- ☒ Priority Habitats of Rare Species

Delineated Resource Area Field Numbering Sequence [see Attachment, *Sketch Map of Wetland Resource Areas*]:

Flag Series
Bank: A100-A135, C300-C335
BVW: B200-203, D400-D413, E500-E505

Wetland resource areas were delineated in accordance with applicable local, state and federal statutes, as detailed within the Resource Area Description attachment. This delineation does not constitute an official wetland boundary until such time as it is accepted and approved by local, state or federal regulatory agencies.

The wetlands delineation was conducted by:

Michael E. Soares
Wetlands Scientist

ATTACHMENTS

- Resource Areas Description
- Sketch Map of Wetland Resource Areas
- Resource Areas Mapped by the State of Massachusetts
- US Army Corps of Engineers Wetland Determination Data Forms
- Flood Insurance Rate Map for the Town of South Hadley, Massachusetts, Hampshire County; Panel 5 of 10
- NRCS Soil Map and Soil Report
- Site Photographs

Introduction

Fuss & O'Neill Inc. performed a wetland resource area field inspection and delineation of a project area containing Elmer Brook and associated wetland resource areas at the crossing of Pearl Street in South Hadley, Massachusetts ("Site"). The field inspection and delineation occurred on September 8, 2022. The purpose of the delineation was to locate the jurisdictional limits of areas regulated under the Wetlands Protection Act (M.G.L. c. 131 sec. 40) and associated Wetlands Protection Act Regulations (310 CMR 10).

The following inland wetland resource areas were identified and delineated at the Site during the field investigation: Bordering Vegetated Wetland (BVW), Bank, Land Under Water Bodies and Waterways (LUWW). Consecutively numbered flags were placed in the field to demarcate BVW and Bank (LUWW was found to be coincident with Bank). These boundary flags were then located via sub-meter GPS. Bank and BVW within approximately 200 feet upstream and downstream of Pearl Street were delineated in the field and are depicted in the attached *Sketch Map of Wetland Resource Areas*.

Other State-regulated wetland resource areas present at the Site are: Bordering Land Subject to Flooding (BLSF), Buffer Zone, Riverfront Area, Priority Habitats of Rare Species, and Estimated Habitats of Rare Wildlife. The extent of BLSF at the Site is based on Fuss & O'Neill's modelling of site hydrology under existing conditions. Riverfront Area is measured horizontally from Bank for Elmer Brook, and Buffer Zone is measured horizontally from the boundaries of BVW, Bank, or BLSF identified at the Site. Mapping retrieved from MassGIS (http://maps.massgis.state.ma.us/map_ol/oliver.php) depict regulated areas identified by Massachusetts Natural Heritage and Endangered Species Program (NHESP): Priority Habitats of Rare Species and Estimated Habitats of Rare Wildlife. These areas are located within the wetland resource areas identified and adjacent uplands north and south of Pearl Street (see Attachment, *Resource Areas Mapped by the State of Massachusetts*). MassGIS mapping does not depict Certified Vernal Pools at the Site.

As defined in Section 305-25(A) of the Town of South Hadley General By-Laws, isolated vegetated wetlands and a 100-foot buffer zone around them are subject to regulation; however, no isolated wetlands were identified at the Site. A description of each resource area present at the Site is provided below.

In addition to the field delineation of resource areas, an inspection of Elmer Brook and the surrounding habitats was conducted. Elmer Brook is a mapped, perennial watercourse that flows in a southerly direction through the project area. It then joins Batchelor Brook 0.9+/- miles south of the Site, which flows westerly to the Connecticut River (in addition, it has been identified as a Coldwater Fishery Resource by the Massachusetts Department of Fish and Wildlife). It is possible that the brook was straightened or otherwise altered due to the history of surrounding agricultural land use. Upstream of Pearl Street, the brook is relatively narrow and bankfull width ranges from 13 to 20 feet. Downstream of the road crossing, bankfull width ranges from 20 to 36 feet. Green frogs and small fish measuring about two inches in length, presumably a species of dace (*Rhinichthys sp.)*, were observed throughout the inspected reach of Elmer Brook. Several species of birds common to riparian areas were also observed, including: mallard duck, northern flicker, downy woodpecker, crested nuthatch, blue jay, cardinal, red-tail hawk, and turkey vulture. Tracks of raccoon and beaver chew (2+ years old) were seen sporadically along the brook. Adjacent to the river-left bank, the floodplain is dominated by fields managed for hay or pasture. Upstream of Pearl Street, the river-right bank is adjacent to wooded and scrub-shrub BVW; below Pearl Street is a broad floodplain which is currently a meadow but was likely an agricultural field in the recent past. The riparian corridor connects habitats at the Site to a relatively large and diverse assemblage of wetland and terrestrial habitats located to the north and south.

Resource Areas

Bank: Regulatory Framework and Delineation Methodology

Bank is defined under 310 CMR 10.54(2)(c) as "*the portion of the land surface which normally abuts and confines a water body. It occurs between a water body and a vegetated bordering wetland and adjacent flood plain, or, in the absence of these, it occurs between a water body and an upland*."

Fuss & O'Neill Inc. performed a delineation of Bank within the area of interest using consecutively numbered flags placed in the field to demarcate Bank along a portion of Elmer Brook at the Pearl Street crossing.

Bank: Resource Description

Bank was located in the field by the first observable break in topography between the waterbodies or waterways and adjacent upland. The delineated Bank was observed to coincide with the MAHWL, as defined under 310 CMR 10.58 (2)(a)(2). Bank slopes at the Site are generally moderate to steep. In some locations, a bank are nearly vertical or have been undercut. Overall, Bank is well vegetated by deciduous trees and shrubs, pastured grasses, and other non-cultivated grasses and emergent vegetation.

Land under Water Bodies and Waterways (LUWW)

LUWW is defined under 310 CMR 10.56 (2)(a) as "*the land beneath any creek, river, stream, pond or lake. Said land may be composed of organic muck or peat, fine sediments, rocks or bedrock.*" The boundary of LUWW is defined as the mean annual low water level (310 CMR 10.56 (2)(c). LUWW was not specifically field delineated. For the intents and purposes of this resource area delineation, locations of Bank as described previously are considered to be analogous to the limits of LUWW.

Riverfront Area: Regulatory Framework and Delineation Methodology

Riverfront Area is defined under 310 CMR 10.58(2)(a) as "*the area of land between a river's mean annual high water line and a parallel line measured horizontally*." 310 CMR 10.58(2)(a)(1) defines rivers as, "*any natural flowing body of water that empties to any ocean, lake, pond or other river and which flows throughout the year. Rivers include streams (see 310 CMR 10.04: Stream) that are perennial because surface water flows within them throughout the year. Intermittent streams are not rivers as defined herein because surface water does not flow within them throughout the year*." 310 CMR 10.58(2)(a)(2) further specifies that "*The Riverfront Area is the area of land between a river's mean annual high-water line measured horizontally outward from the river and a parallel line located 200 feet away, …*" continuing with exceptions that are not applicable at the Site.

The extent of the Riverfront Area at the Site was determined by measuring a horizontal line 200 feet from the locations of Bank delineated in the field along Elmer Brook.

Riverfront Area: Resource Area Description

Riverfront Area at the Site is associated with Elmer Brook. It is comprised mainly of agricultural fields managed for hay or pasture, with some mature upland hardwood forest on moderate and steep slopes. Common vegetation identified within the Riverfront Area includes [common name (*scientific name*), wetland indicator status]: red maple (*Acer rubrum*), FAC; cherry birch (*Betula lenta*), FACU, eastern hemlock (*Tsuga canadensis*), FAC; northern red oak (*Quercus rubra*) FACU; sugar maple (*Acer saccharum*), FACU; eastern white pine (*Pinus strobus*); honeysuckle (*Lonicera sp*.), FACU; multiflora rose (*Rosa multiflora*), speckled alder (*Alnus incana*), FACW; highbush blueberry (*Vaccinium corymbosum*), FACW; wrinkle-leaved goldenrod (*Solidago rugosa*), FAC; jewelweed (*Impatiens capensis*), FACW; stinging nettle (*Urtica dioica*), FAC; and Asiatic bittersweet (*Celastrus orbiculatus*), UPL, and a variety of upland grasses in the agricultural fields managed for hay or pasture.

Riverfront Area at the Site includes the following regulated resource areas: BVW, BLSF, and Buffer Zone. In addition, NHESP Priority Habitats of Rare Species and Estimated Habitats of Rare Wildlife are included. No vernal pools or isolated vegetated wetlands were observed within the Riverfront Area at the Site.

Bordering Vegetated Wetlands (BVW): Regulatory Framework and Delineation Methodology

As stated in 310 CMR (2)(a), "*Bordering Vegetated Wetlands are freshwater wetlands which border on creeks, rivers, streams, ponds and lakes. The types of freshwater wetlands are wet meadows, marshes, swamps and bogs. Bordering Vegetated Wetlands are areas where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants. The ground and surface water regime and the vegetation community which occur in each type of freshwater wetland are specified in M.G.L. c 131 sec. 40*."

Fuss & O'Neill Inc. inspected the Site for bordering vegetated wetlands in accordance with methodology provided in the Massachusetts DEP (MA DEP) handbook, *Delineating Bordering Vegetated Wetlands under the Massachusetts Wetlands Protection Act*, (March 1995), the 1987 *Corps of Engineers Wetlands Delineation Manual*, and the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Northcentral and Northeast Region* (Version 2.0. January 2012). Data regarding vegetation, soils, and hydrology were gathered to complete the required MA DEP BVW delineation field forms. Wetlands are categorized in accordance with *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979).

Hydric soil determinations were made in accordance with *Field Indicators for Identifying Hydric Soils in New England*, *Version 4* (New England Hydric Soils Technical Committee, 2018). The Wetland Indicator Status for plant species was ascertained using the U.S. Army Corps of Engineers *Northcentral and Northeast 2020 Subregional Regional Wetland Plant List* (U.S. Army Corps of Engineer, National Wetlands Plant List, version 3.5, 2020).

BVW: Resource Area Description

Vegetation

The majority of BVW identified at the Site are classified as palustrine forested and scrub-shrub wetlands. Common vegetation identified within these wetlands includes [common name (*scientific name*), wetland

indicator status]: red maple (*Acer rubrum*), FAC; eastern hemlock (*Tsuga canadensis*), FAC; speckled alder (*Alnus incana*), FACW; honeysuckle (*Lonicera sp*.), FACU; woolgrass (*Scirpus cyperinus*), OBL; American burr-reed (*Sparganium americanum*), OBL; wrinkle-leaved goldenrod (*Solidago rugosa*), FAC; and Canada clearweed (*Pilea pumila*), FACW.

Hydrology

The Site is located within the local drainage basin of Elmer Brook, a perennial stream that joins Batchelor Brook approximately one mile downstream (to the south). These streams are within the major watershed basin of the Connecticut River.

At the Site, this reach of Elmer Brook is a well-defined perennial stream with a bankfull width ranging from 13 to 36 feet. Upstream of the Pearl Street crossing, the brook has a drainage area of 3.61 square miles (according to USGS StreamStats: streamstats.usgs.gov/ss). No tributaries join the brook near the Site; however, the hydrology of the forested and scrub-shrub BVW identified north of Pearl Street (flag series D400-D413 and E500-E505) is partially supported by what appeared to be an unnamed intermittent stream that enters from the north.

Soils

Soil types mapped by the Natural Resource Conservation Service (NRCS) at the Site include: Rippowam fine sandy loam, Limerick silt loam, and Windsor-Scitico-Amostown complex. Detailed information regarding each of these soil series is included within the Attachment *NRCS Soil Map and Soil Report*. Results of the detailed field analyses of soils at the Site were generally consistent with the published NRCS soil mapping with minor exceptions.

Buffer Zone

Buffer Zone is defined in 310 CMR 10.04 as "*that area of land extending 100 feet horizontally outward from the boundary of any area specified in 310 CMR 10.02(1)(a)*." Buffer Zone at the Site is associated with Bank, BVW, and BLSF delineated during the field inspection. Buffer Zone at the Site is comprised mainly of agricultural fields managed for hay or pasture, with some mature upland forest typical of central Massachusetts.

Common vegetation identified within the Buffer Zone includes: red maple (*Acer rubrum*), FAC; cherry birch (*Betula lenta*), FACU, eastern hemlock (*Tsuga canadensis*), FAC; northern red oak (*Quercus rubra*) FACU; sugar maple (*Acer saccharum*), FACU; eastern white pine (*Pinus strobus*); honeysuckle (*Lonicera sp*.), FACU; multiflora rose (*Rosa multiflora*), speckled alder (*Alnus incana*), FACW; highbush blueberry (*Vaccinium corymbosum*), FACW; wrinkle-leaved goldenrod (*Solidago rugosa*), FAC; jewelweed (*Impatiens capensis*), FACW; stinging nettle (*Urtica dioica*), FAC; and Asiatic bittersweet (*Celastrus orbiculatus*), UPL; and a variety of upland grasses in the agricultural fields managed for hay or pasture.

Bordering Land Subject to Flooding (BLSF): Resource Area Description

A Flood Insurance Rate Map (FIRM), provided by FEMA and dated August 15, 1979, depicts land around Elmer Brook within Flood Zone A13, which designates areas likely to experience flooding in 100-year storm events

(see attached *Flood Insurance Rate Map for the Town of South Hadley, Massachusetts, Hampshire County; Panel 5 of 10*). A more accurate depiction of the 100-year flood zone is based on Fuss & O'Neill's recent modelling of site hydrology under existing conditions. It is my professional opinion that the 100-year flood zone determined in the model accurately represents the lateral extent of BLSF at the Site.

Wetlands Functions & Values Assessment

During the field inspection, a function & values assessment was conducted of the wetland resource areas delineated in the project area. The assessment is largely based on the procedure outlined in the U.S. Army Corps of Engineers "Highway Methodology Work Book: Supplement. Wetland Functions and Values: A Descriptive Approach" (1999, NAEEP-360-1-30a). This methodology is descriptive and does not rely upon semi-quantitative numerical models to identify principal functions and values. In addition, other assessment methods were incorporated (e.g. Wisc. DNR, 1992, "Rapid Assessment Methodology for Evaluating Wetland functions and Values." and Ammann, et al., 1996) as well as professional experience.

Table 1 provides a summary of the principal and secondary functions and values identified for each resource area at the Site. Definitions for the primary and secondary functions and values listed below can be found in the Attachment *Explanation of Terms Used in Wetlands Function and Values.*

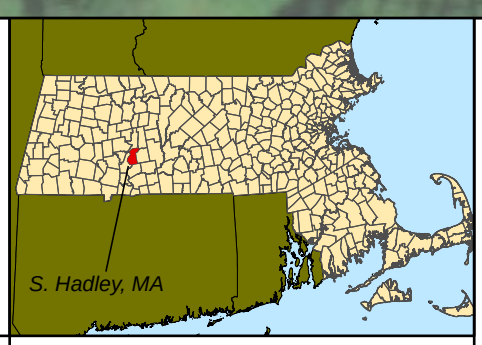
Wetland Resource Areas

Functions & Values	Elmer Brook	BVW north of Pearl St	BVW south of Pearl St
Groundwater Recharge/Discharge	P (discharge)	S (recharge)	-
Floodflow Alteration	*n/a*	S	S
Fish and Shellfish Habitat	P	-	-
Sediment, Pollutant, & Nutrient Removal	-	S	-
Production Export	*n/a*	S	-
Wildlife Habitat	S	S	-
Educational, Scientific, & Recreation Value	S	S	-
Uniqueness/Heritage[1]	-	-	-

Table 1. Summary of wetlands functions & values assessments. Field assessments yielded the identification of resource areas as having Principal ("P") or Secondary ("S") functions or values.
[1]All Wetland Resource Areas are within NHESP's mapping of Priority Habitats of Rare Species and Estimated Habitats of Rare Wildlife and may or may not contain state-listed rare species.

Legend

- BVW
- Bank
- Resource Area flag



Sketch Map of
Wetland Resource Areas

Pearl Street at Elmer Brook

South Hadley Massachusetts

Project #: 20150214.B40

Date: October 2022

Disclaimer: This map is not the product of a Professional Land Survey. It was created by Fuss & O'Neill, Inc. for general reference and is not a legally authoritative source as to location of natural or manmade features. The resource areas depicted in this sketch were identified and delineated in the field by Michael E. Soares, Wetlands Scientist (Fuss & O'Neill) on September 8, 2022.

FUSS & O'NEILL
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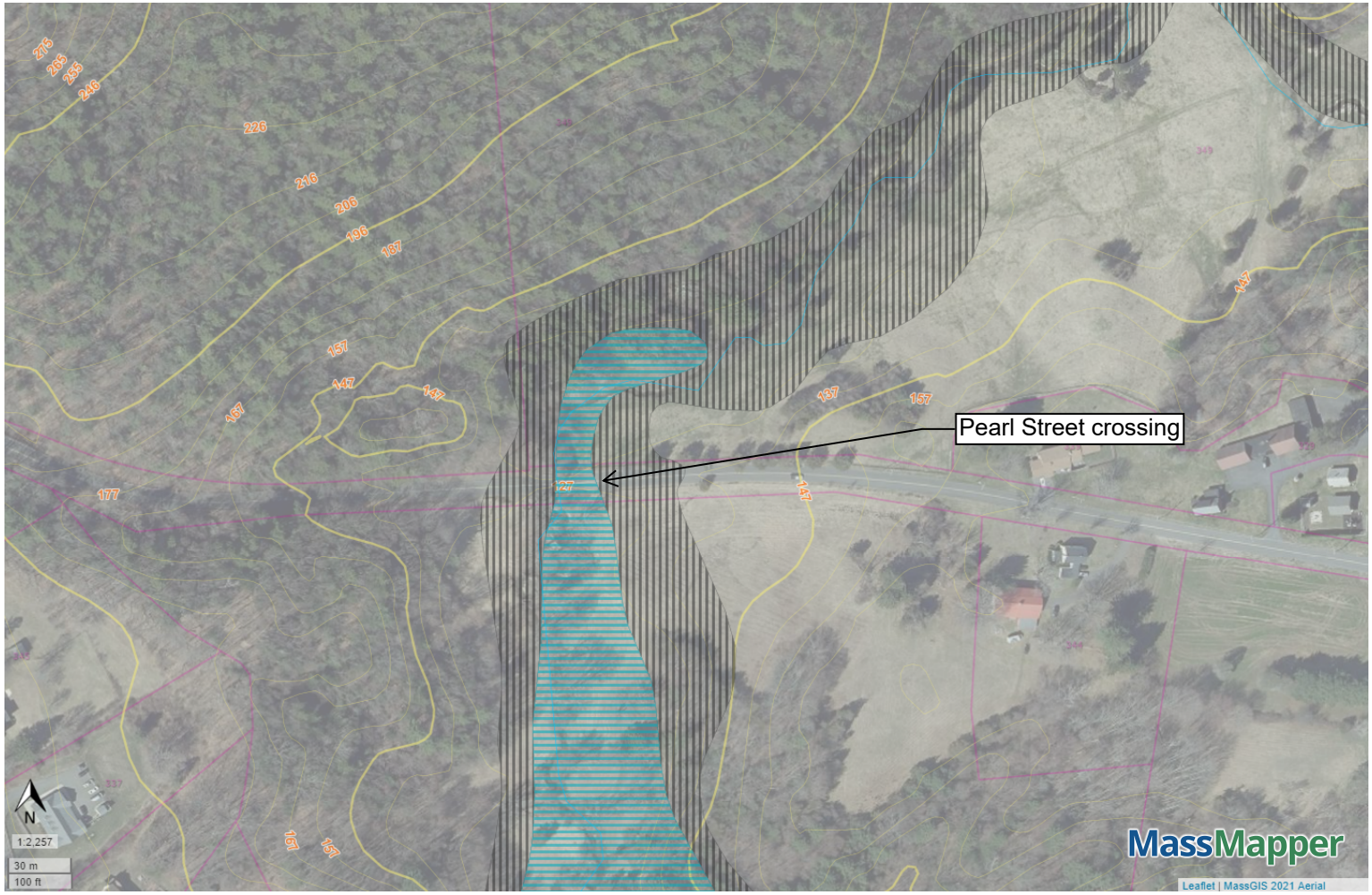
Pearl Street (S. Hadley MA)



USGS Rivers and Streams 25k

Q3 Flood Zones (from Paper FIRMs, All Available Areas)

- A
- AE
- AE Floodway
- AH
- AO
- D
- V
- VE
- Area Not Included
- X500

Contours 3m Labels Feet

Contours 3m Lines

- 15M INTERVAL

Property Tax Parcels

The figure above was downloaded from MassMapper (https://maps.massgis.digital.mass.gov/MassMapper/MassMapper.html) on September 29, 2022.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Elmer Brook at Pearl Street City/County: South Hadley Sampling Date: 09/08/22

Applicant/Owner: Town of South Hadley State: MA Sampling Point: BW1

Investigator(s): Michael Soares Section, Township, Range: Hampshire County

Landform (hillside, terrace, etc.): low terrace Local relief (concave, convex, none): level Slope (%): 0

Subregion (LRR or MLRA): LRR R, MLRA 145 Lat: 42.28256087397984 Long: -72.58711595951043 Datum: WGS 84

Soil Map Unit Name: Rippowan fine sandy loam NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**	
Hydric Soil Present?	Yes X	No ____	**within a Wetland?**	**Yes** X **No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- ____ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- X Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):	____
Water Table Present?	Yes X	No ____	Depth (inches):	2
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches):	0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: BW1

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Herb Stratum (Plot size:)			
1. *Scirpus cyperinus*	25	Yes	OBL
2. *Equisetum arvense*	10	Yes	FAC
3. *Sparganium americanum*	5	No	OBL
4. *Persicaria sagittata*	5	No	OBL
5. *Solidago rugosa*	5	No	FAC
6. *Impatiens capensis*	5	No	FACW
7.			
8.			
9.			
10.			
11.			
12.			
	55 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	x 1 =	35
FACW species	5	x 2 =	10
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	55 (A)		90 (B)

Prevalence Index = B/A = 1.64

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: BW1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/1						Mucky Sand	
2-8	10YR 4/1						Loamy/Clayey	
8-10	10YR 4/1						Sandy	
10-18	10YR 4/1						Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- X Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ? Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** x **No** ___

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to reflect the NRCS Field Indicators of Hydric Soils version 7.0 March 2013 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Elmer Brook at Pearl Street City/County: South Hadley Sampling Date: 09/08/22

Applicant/Owner: Town of South Hadley State: MA Sampling Point: DW1

Investigator(s): Michael Soares Section, Township, Range: Hampshire County

Landform (hillside, terrace, etc.): terrace Local relief (concave, convex, none): level Slope (%): 0

Subregion (LRR or MLRA): LRR R, MLRA 145 Lat: 42.28315253279709 Long: 72.58724465523028 Datum: WGS 84

Soil Map Unit Name: Rippowan fine sandy loam NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**		
Hydric Soil Present?	Yes X	No ____	**within a Wetland?**	**Yes** X	**No** ____
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID:		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	X Water-Stained Leaves (B9)	___ Aquatic Fauna (B13)
X High Water Table (A2)	___ Marl Deposits (B15)	___ Hydrogen Sulfide Odor (C1)
X Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)	___ Presence of Reduced Iron (C4)
X Water Marks (B1)	___ Recent Iron Reduction in Tilled Soils (C6)	___ Thin Muck Surface (C7)
___ Sediment Deposits (B2)	___ Other (Explain in Remarks)	
X Drift Deposits (B3)		
___ Algal Mat or Crust (B4)		
___ Iron Deposits (B5)		
___ Inundation Visible on Aerial Imagery (B7)		
X Sparsely Vegetated Concave Surface (B8)		

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
X Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
X Stunted or Stressed Plants (D1)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):	
Water Table Present?	Yes X	No ____	Depth (inches):	3
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches):	0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DW1

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	25	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	25	=Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. *Alnus incana*	15	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	15	=Total Cover	
Herb Stratum (Plot size:)			
1. *Pilea pumila*	20	Yes	FACW
2. *Impatiens capensis*	15	Yes	FACW
3. *Carex lupulina*	5	No	OBL
4. *Symplocarpus foetidus*	5	No	OBL
5. *Rumex crispus*	5	No	FAC
6. *Urtica dioica*	5	No	FAC
7.			
8.			
9.			
10.			
11.			
12.			
	55	=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	50	x 2 =	100
FAC species	35	x 3 =	105
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		215 (B)

Prevalence Index = B/A = 2.26

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DW1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 3/1	100					Mucky Sand	
7-14	2.5Y 3/1	95	10YR 6/4	5	C	M	Mucky Sand	Prominent redox concentrations
14-22	10YR 3/1	100					Mucky Sand	
22-23	2.5Y 4/1	80	10YR 5/4	20	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- X Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ? Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to reflect the NRCS Field Indicators of Hydric Soils version 7.0 March 2013 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Elmer Brook at Pearl Street City/County: South Hadley Sampling Date: 09/08/22

Applicant/Owner: Town of South Hadley State: MA Sampling Point: B-UPL

Investigator(s): Michael Soares Section, Township, Range: Hampshire County

Landform (hillside, terrace, etc.): backslope Local relief (concave, convex, none): level Slope (%): 15

Subregion (LRR or MLRA): LRR R, MLRA 145 Lat: 42.28257231693627 Long: -72.58729752214694 Datum: WGS 84

Soil Map Unit Name: Rippowan fine sandy loam NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**		
Hydric Soil Present?	Yes ____	No X	**within a Wetland?**	**Yes** ____	**No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID:		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: B-UPL

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer saccharum*	10	Yes	FACU
2. *Fraxinus sp*	5	Yes	
3. *Ulmus americana*	5	Yes	FACW
4.			
5.			
6.			
7.			
	20	=Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. *Rosa multiflora*	5	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	5	=Total Cover	
Herb Stratum (Plot size:)			
1. *Solidago rugosa*	40	Yes	FAC
2. *Solidago altissima*	10	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	50	=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	40	x 3 =	120
FACU species	25	x 4 =	100
UPL species	0	x 5 =	0
Column Totals:	70 (A)		230 (B)

Prevalence Index = B/A = 3.29

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: B-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 4/2	100					Loamy/Clayey	fsl
1-16	10YR 5/3	100					Sandy	gravelly sand
16-18	10YR 5/4	100					Sandy	gravelly sand

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to reflect the NRCS Field Indicators of Hydric Soils version 7.0 March 2013 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Elmer Brook at Pearl Street City/County: South Hadley Sampling Date: 09/08/22

Applicant/Owner: Town of South Hadley State: MA Sampling Point: D-UPL

Investigator(s): Michael Soares Section, Township, Range: Hampshire County

Landform (hillside, terrace, etc.): backslope Local relief (concave, convex, none): level Slope (%): 15

Subregion (LRR or MLRA): LRR R, MLRA 145 Lat: 42.283190825155536 Long: 72.58735714739406 Datum: WGS 84

Soil Map Unit Name: Windsor-Scitico-Amostown complex NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes ____	No X	**within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: D-UPL

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga canadensis*	50	Yes	FACU
2. *Betula lenta*	20	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	70	=Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
Herb Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
		=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	70	x 4 =	280
UPL species	0	x 5 =	0
Column Totals:	70 (A)		280 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: D-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 5/3	100					Loamy/Clayey	fsl
6-17	10YR 6/3	100					Loamy/Clayey	fsl

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock

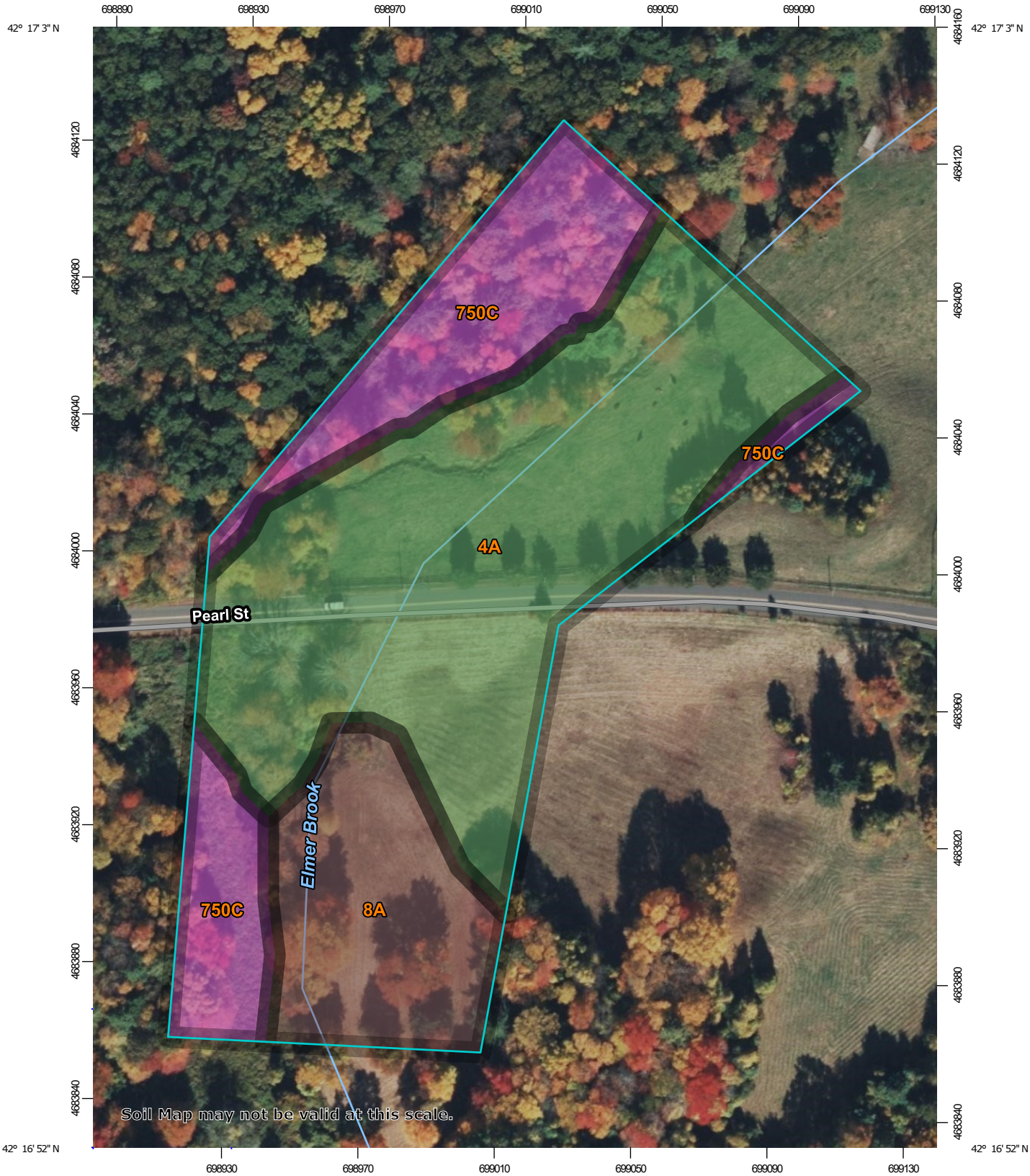
Depth (inches): 17

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to reflect the NRCS Field Indicators of Hydric Soils version 7.0 March 2013 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

Hydrologic Soil Group—Hampshire County, Massachusetts, Central Part
(Pearl St., South Hadley MA)



Map Scale: 1:1,600 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hampshire County, Massachusetts, Central Part
Survey Area Data: Version 16, Sep 3, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 15, 2020—Oct 31, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
4A	Rippowam fine sandy loam, 0 to 3 percent slopes, frequently flooded	A/D	3.9	56.6%
8A	Limerick silt loam, 0 to 3 percent slopes, frequently flooded	B/D	1.2	18.3%
750C	Windsor-Scitico-Amostown complex, 0 to 15 percent slopes	A	1.7	25.0%
Totals for Area of Interest			**6.8**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Site Photographs: Elmer Brook and associated Resource Areas
South Hadley, MA
Date of field investigation: September 8, 2022

Photo 1. A reach of Elmer Brook, located approximately 400 feet downstream of the crossing at Pearl Street. Looking south (downstream) near flag A100.

Photo 2. A reach of Elmer Brook, located approximately 400 feet downstream of the crossing at Pearl Street. Looking north (upstream) near flag A100.

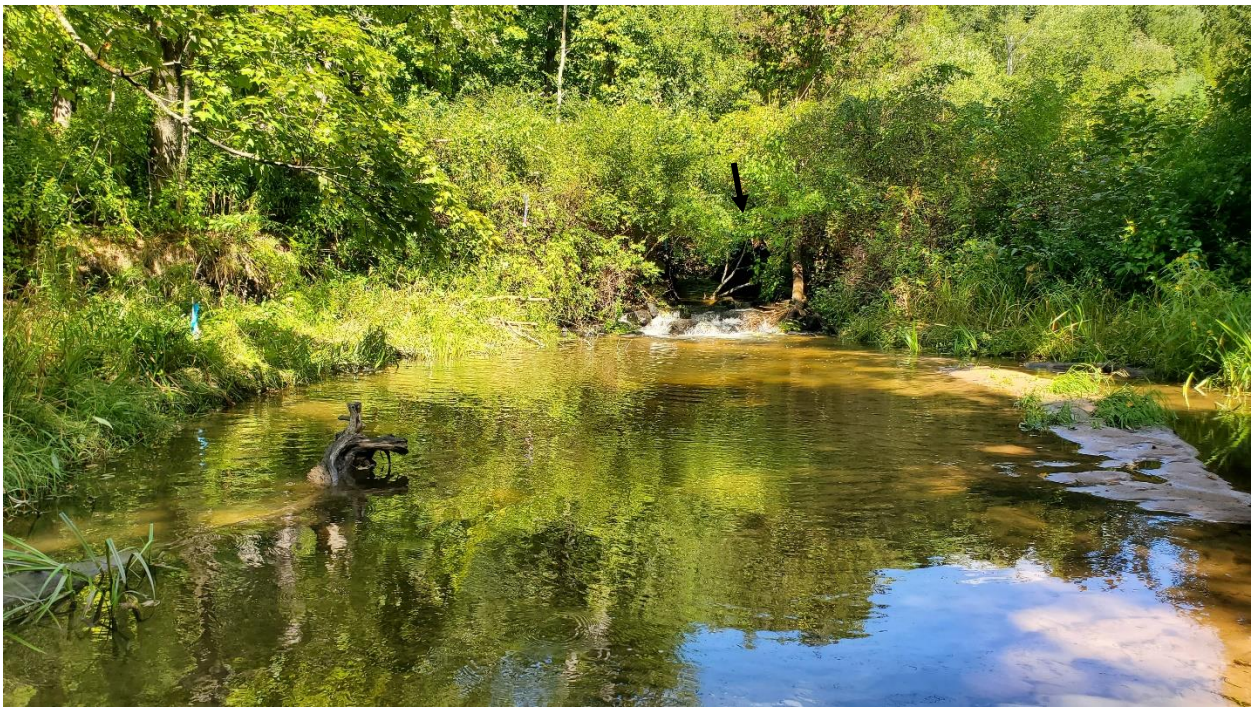


Photo 3. A reach of Elmer Brook, located approximately 100 feet downstream of the crossing at Pearl Street; the arrow indicates location of the culvert outlet. A small BVW (flag series B200-B203) is at left. Looking north (upstream) near flag A115.

Photo 4. A reach of Elmer Brook, located approximately 100 feet downstream of the crossing at Pearl Street. Looking south (downstream) near flag A115.

Photo 5. A reach of Elmer Brook, located approximately 10 feet upstream of the crossing at Pearl Street; the culvert inlet is at center. Looking south (downstream) near flag C314.

Photo 6. A reach of Elmer Brook, located approximately 60 feet upstream of the crossing at Pearl Street. Looking northeast (upstream) near flag A123.

Photo 7. A reach of Elmer Brook, located approximately 230 feet upstream of the crossing at Pearl Street. Looking west (downstream) near flag C304.

Photo 8. A reach of Elmer Brook, located approximately 230 feet upstream of the crossing at Pearl Street. Looking east (upstream) near flag C304.

Photo 9. Forested portion of BVW located north of Elmer Brook (flag series D400-D414 and E500-E505). Looking northeast near flag D404.

Photo 10. Forested portion of BVW located north of Elmer Brook (flag series D400-D414 and E500-E505). Looking southwest near flag D404.

Photo 11. At center, a drainage swale that is an extension of the BVW located north of Elmer Brook (flag series D400-D414 and E500-E505). The swale conveys surface water into the delineated area between flags D414 and E500. Looking northwest near flag E501.

Photo 12. Floodplain located along the river-left, or western, bank of Elmer Brook south of Pearl Street. Looking north-northwest near flag A101.

Photo 13. Floodplain located along the river-right, or eastern, bank of Elmer Brook south of Pearl Street. Looking north near flag C333.

Photo 14. Hatchling of a snapping turtle (*Chelydra serpentina)*, observed swimming downstream in Elmer Brook near flag A109.