

SOIL SCIENCE AND ENVIRONMENTAL SERVICES, INC.

Wetland Delineations Ecological Studies Site Assessments Project Planning Soil Testing

March 26, 2014

ATTN: John Wengell
WMC Consulting Engineers
87 Holmes Road
Newington, CT 06111

Re: Wetlands Delineation Report
Main Street Bridge Over Podunk River, South Windsor, CT
SS&ES Job No. 2014-18-CT-SWI-1

Dear Mr. Wengell:

In accordance with your request, Scott D. Stevens, Soil Scientist and Jennifer L. Beno, Biologist, with Soil Science And Environmental Services, Inc. (SSES) inspected the Main Street bridge over Podunk River project area on March 25, 2014. The purpose of the inspection was to identify regulated wetlands and waters in the vicinity of the bridge replacement project area.

The project area is located at the southern portion of South Windsor just north of the East Hartford municipal boundary (Figure 1). The project area consists of a bridge that will be replaced.

Regulated waters and wetlands are present in and near the project area, including Podunk River, CT Inland Wetlands and Federal Wetlands. Definitions of waters and wetlands that are regulated by the State of Connecticut and Federal Government are presented in Appendix I. Rivers and streams are regulated by the State of CT as watercourses according to the Inland Wetlands and Watercourses Act. Rivers and streams are regulated by the Federal Government as "Waters of the U.S." Wetlands are defined differently by the State of CT and the Federal Government. CT Inland Wetlands are defined by soil types that are either poorly drained, very poorly drained, floodplain or alluvial. Federal Wetlands consist of areas that are inundated or saturated by ground or surface water at a frequency and duration sufficient to support, and that under normal conditions do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.



**SOIL SCIENCE and
ENVIRONMENTAL
SERVICES, INC.**

U.S.G.S. Topography Map
Main Street bridge over Podunk River
South Windsor, CT

Date 3/25/14

Figure No. 1

A spade and auger were used to dig test holes for soils identification during the investigation. The vegetation communities and any physical indicators of hydrology on the site were also examined. The limits of the CT Inland Wetlands (identified by others) and the Federal Wetlands were determined to be the same within and near the project area. Limits of the CT Inland Wetlands were delineated by others with consecutively numbered orange survey tapes, while we delineated the Federal Wetland boundary with consecutively numbered, blue survey tapes. Sketch maps of the delineated wetland boundaries are included as Figures 2 and 3.

CONNECTICUT INLAND WETLANDS & SOIL TYPES

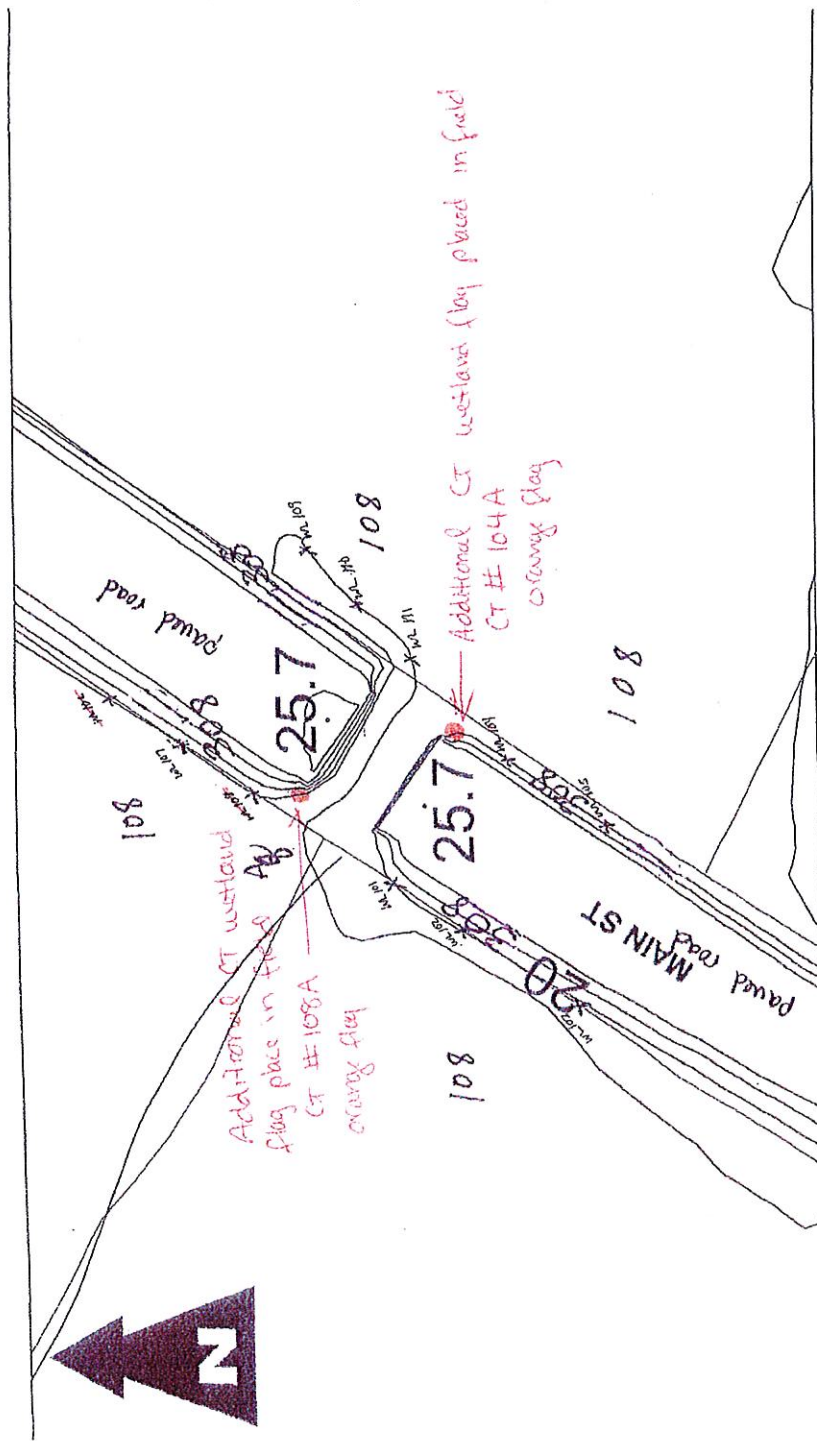
We reviewed the CT boundary delineation that was established by others within the Main Street over Podunk River bridge replacement project area and found it to be substantially correct. However, we did place two additional flags in the field in order to extend the wetland boundary to the bridge abutments. Wetland soils observed within the project area include:

Aq Aquents - This is a poorly to very poorly drained, disturbed soil where two or more feet of the original soil surface has been altered by filling, excavation and/or grading. Aquents are characterized by a seasonal to prolonged high groundwater table at or near the ground surface. Aquents are capable of supporting a prevalence of hydrophytic plants.

108 Saco silt loam (Fluvaquentic Humaquepts) – This is a deep, very poorly drained, friable, silty soil that formed in alluvial sediments derived from schist, gneiss and granite. Saco soils often possess a shallow mucky or mucky silt loam surface. Saco soils occur in nearly level floodplains and along rivers and streams which are subject to frequent flooding.

Upland soils observed within the project area include:

308 Udorthents, smoothed This is a well drained to moderately well drained soil area that has had two or more feet of the original soil surface altered by filling, excavation or grading activities. Udorthents, smoothed soils commonly occur on leveled land and fill landforms.



MAPPING PROVIDED BY SEC UNDER CONTRACT.
DATA MANAGED BY THE SOUTH WINDSOR
ENGINEERING DEPARTMENT AND IT TECHNOLOGY
DEPARTMENT.

1 inch = 30 feet

March 25, 2014

Sketch map - CT wetlands - orange flags
approx locations of 2 additional flags #104A + #108A



Figure No. 2 – Sketch of CT Wetland Locations (approximate)

FEDERAL WETLANDS

Federal wetlands were delineated along the bridge replacement project area (Figure 3). The Federal Wetland areas consist of forested floodplain community. One transect with two Federal Wetland Data Plots was established along the wetland located on the northeast side of the Main Street bridge (Data Plot 109-U and 109-W). The approximate location of the transect and data plots are shown in Figure 3. The information gathered from each data plot was recorded on Federal Wetland Data Sheets. These sheets are included with this report.



Federal Wetland data transect located northeast of Main Street bridge over Podunk River (3/25/14).

Figure No. 3 – Sketch of Federal Wetland Locations (approximate)

ORDINARY HIGH WATER MARK IDENTIFICATION

The lateral limits of U.S. Army Corps jurisdiction for non-tidal rivers, streams and water bodies extends to the ordinary high water mark (OHW), in the absence of adjacent wetlands. The Corps defines the term "ordinary high water mark" as the following: "means the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." 33 CFR 328.3(e). The Corps recommends that whenever possible the investigator should consider the former indicators along with a number of others, that include: wracking; vegetation matted down, bent or absent; sediment sorting; leaf litter disturbed or washed away; scour; deposition; multiple observed flow events; beds and banks; water staining; and change in plant community.

The above-listed indicators were utilized during the March 25, 2014 investigation for determination of ordinary high water of the Podunk River. On March 25, 2014 the ordinary high water mark (OHW) was delineated with flagging in several areas on both sides of the river channel both upstream and downstream of the Main Street bridge. Blue survey tapes were tied onto branches and plant stems at several spots alongside the river to identify the OHW elevation. The knot of the tied survey tape marks the OHW elevation. A sketch showing locations of the OHW boundary survey tapes is presented in Figure 4.

Respectfully submitted,

SOIL SCIENCE AND ENVIRONMENTAL SERVICES, INC.



Scott D. Stevens
Registered Soil Scientist



Jennifer L. Beno
Biologist

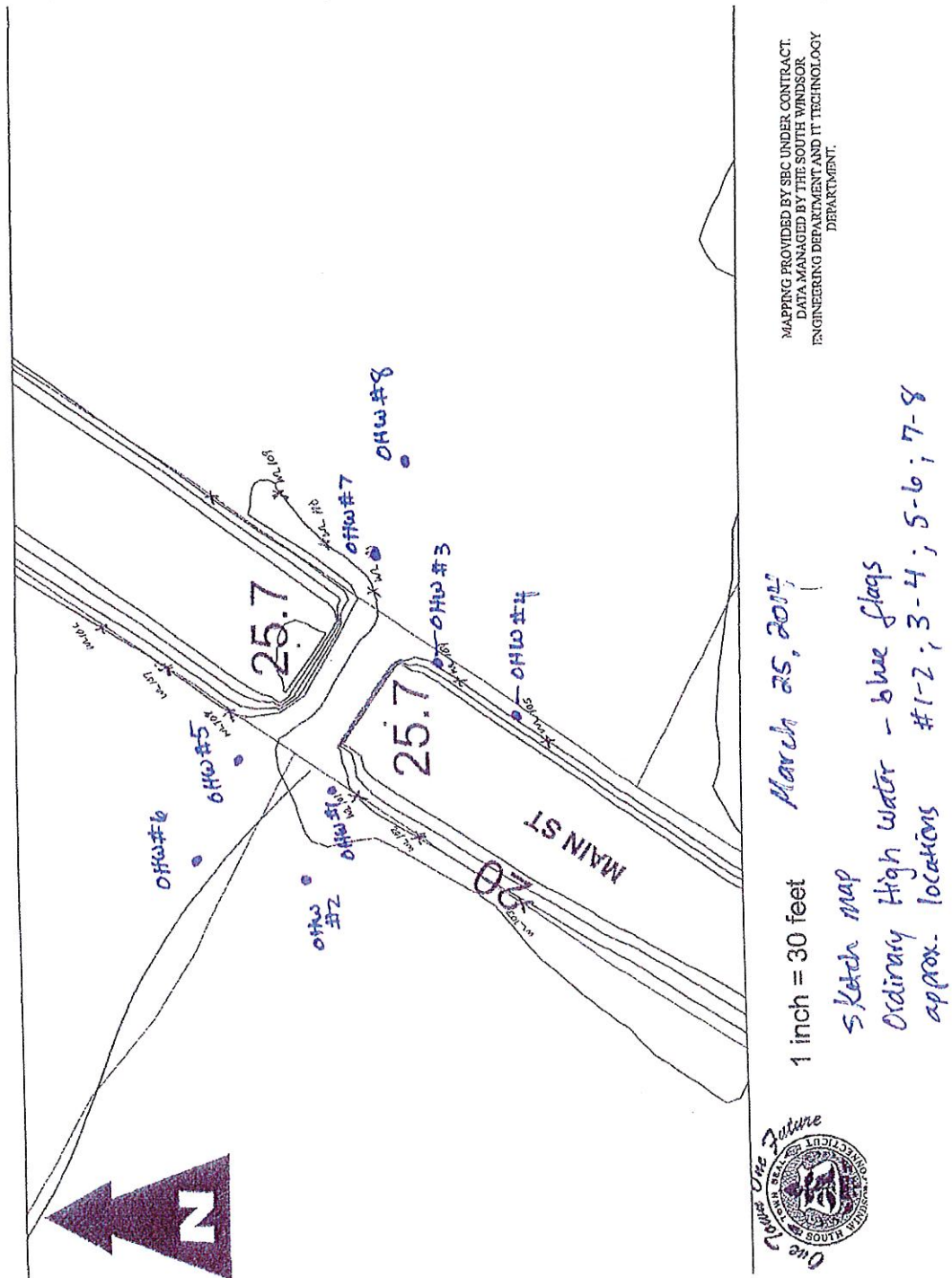


Figure No. 4 – Sketch of Ordinary High Water Locations (approximate)

APPENDIX I

REGULATED WATERS AND WETLANDS BY THE STATE OF CT AND FEDERAL GOVERNMENT

I. State of Connecticut

Wetlands and watercourses are regulated in the State of Connecticut by the Connecticut General Statutes, Chapter 440, section 22a-28 to 22a-45. These Statutes are divided into the Inland Wetlands and Watercourses Act (sections 22a-36 to 22a-45) and the Tidal Wetlands Act (sections 22a-28 to 22a-35). Definitions of the resources are provided in the statutes.

Inland Wetlands, "means land, including submerged land, not regulated pursuant to sections 22a-28 to 22a-35, inclusive, which consist of any of the soil types designated as poorly drained, very poorly drained, alluvial, and floodplain by the National Cooperative Soils Survey, as may be amended from time to time, of the Natural Resources Conservation Service of the United States Department of Agriculture" section 22a-38(15).

Watercourses "means rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private which are contained within, flow through or border upon this state or any portion thereof, not regulated pursuant to sections 22a-28 to 22a-35, inclusive. Intermittent watercourses shall be delineated by a defined permanent channel and bank and the occurrence of two or more of the following characteristics: (A) Evidence of scour or deposits of alluvium or detritus, (B) the presence of standing or flowing water for a duration longer than a particular storm incident, and (C) the presence of hydrophytic vegetation" section 22a-38(16).

Tidal Wetlands are defined as "those areas which border on or lie beneath tidal waters, such as, but not limited to banks, bogs, salt marsh, swamps, meadows, flats, or other low lands subject to tidal action, including those areas now or formerly connected to tidal waters, and whose surface is at or below an elevation of one foot above local extreme high water; and upon which may grow or be capable of growing some but not necessarily all, of the following:" (includes plant list) section 22a-29(2).

II. Federal Government

The Federal Government regulates waters and wetlands in accordance with the Code of Federal Regulations, Title 33, Parts 320 through 330 (33 CFR parts 320 to 330). Regulated areas include navigable waters; interstate waters; tributaries to navigable and interstate waters, including adjacent wetlands; and certain other waters and wetlands of the U.S. The United States Army Corps of Engineers has been authorized to regulate these waters and wetlands by Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. Definitions of wetlands and watercourses that are regulated by the Corps are found in Parts 328 and 329 of the Code.

Waters of the United States as defined in Part 328 means, " (1) all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (2) all interstate waters including interstate wetlands; (3) all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce; (4) all impoundments of waters otherwise defined as waters of the U.S. under the definition; (5) tributaries of waters identified in 1 thru 4; (6) territorial seas; and (7) wetlands adjacent to waters that were identified in 1 thru 6. Waters of the United States do not include prior converted cropland" (33 CFR Part 328.3 (a)).

Wetlands are a subset of waters of the United States and are defined as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33CFR Part 328.3(b)). The 1987 U.S. Corps of Engineers Delineation Manual and the Draft Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (dated July 2008) provide information and procedures for conducting Federal Wetland delineation. The methodology established by the Federal Government uses a three parameter approach utilizing hydrologic indicators, hydrophytic vegetation and hydric soils for identifying Federal Wetlands.

Navigable waters of the United States as defined in Part 329 mean "those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce" (33CFR Part 329.2).

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Main Street Bridge over Podunk River City/County: South Windsor / Hartford Sampling Date: 3/25/14
 Applicant/Owner: WMC Engineers / Town of South Windsor State: CT Sampling Point: 109-W
 Investigator(s): Scott Stevens / Jenn Beno - SSES Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 0-5
 Subregion (LRR or MLRA): LRR Lat: ±41°48'10.38" Long: ±72°37'40.68" Datum: ±20'
 Soil Map Unit Name: Saco silt loam NWI classification: PFO1E

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? ☒ No Are "Normal Circumstances" present? Yes ☒ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? ☒ No (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 <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:		
Surface Water Present? Yes _____ No <input checked="" type="checkbox"/>	Depth (inches): _____	
Water Table Present? Yes <input checked="" type="checkbox"/> No _____	Depth (inches): <u>3</u>	
Saturation Present? Yes <input checked="" type="checkbox"/> No _____	Depth (inches): <u>0</u>	
(includes capillary fringe)		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION – Use scientific names of plants.

Sampling Point: 109-W

Tree Stratum (Plot size: <u>±30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Fraxinus pennsylvanica</u>	<u>30</u>	<u>Y</u>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
2. <u>Ulmus rubra</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Catalpa bignonioides</u>	<u>10</u>	<u>N</u>	<u>UPL</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>70</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>±15'</u>)				
1. <u>Cornus amomum</u>	<u>50</u>	<u>Y</u>	<u>FACW</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>50</u> = Total Cover				
Herb Stratum (Plot size: <u>±15'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Oenoclea sensibilis</u>	<u>10</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Boehmeria cylindrica</u>	<u>10</u>	<u>Y</u>	<u>FACW+</u>	
3. <u>Toxicodendron radicans</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>30</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>±30'</u>)				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.
1. <u>Toxicodendron radicans</u>	<u>70</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Vitis labrusca</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>75</u> = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.)				

Sampling Point: 109-W

Sampling Point: 109-W

[illegible]²Location: PL=Pore Lining, M=Matrix.

Indicators for Problematic Hydric Soils³:

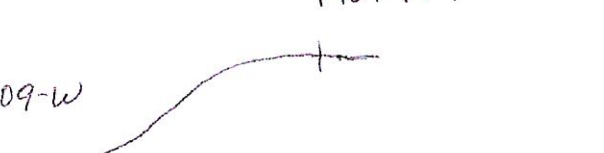
- | | | |
|---|--|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B) | <input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B) | <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L) | <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Dark Surface (S7) (LRR K, L) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Depleted Matrix (F3) | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L) |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6) | <input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Dark Surface (F7) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Redox Depressions (F8) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | | <input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B) |
| <input type="checkbox"/> Sandy Redox (S5) | | <input type="checkbox"/> Red Parent Material (F21) |
| <input type="checkbox"/> Stripped Matrix (S6) | | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B) | | <input type="checkbox"/> Other (Explain in Remarks) |

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

Hydric Soil Present? Yes ✓ No

Depth (inches): _____

Remarks:



Plot 109-W

Plot 109-V

15'

Slope 25%

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Main Street Bridge over Pedunk River City/County: South Windsor / Hartford Sampling Date: 3/25/14
 Applicant/Owner: WMC Engineers / Town of South Windsor State: CT Sampling Point: 109-U
 Investigator(s): Scott Stevens / Jenn Bono - SSFS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): fill slope Local relief (concave, convex, none): convex Slope (%): 25
 Subregion (LRR or MLRA): LRR Lat: ±41°48'10.55" Long: ±72°37'40.87" Datum: ±24'
 Soil Map Unit Name: Udorthents, smoothed NWI classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ 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 <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	
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) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) _____ Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)		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 <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION – Use scientific names of plants.

Sampling Point: 109-4

Tree Stratum (Plot size: <u>±30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Catalpa bignonioides</u>	<u>20</u>	<u>Y</u>	<u>UPL</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>9</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>44%</u> (A/B)
2. <u>Ulmus rubra</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Fraxinus pennsylvanica</u>	<u>10</u>	<u>N</u>	<u>FACW</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
_____	_____	_____	_____	
Sapling/Shrub Stratum (Plot size: <u>±15'</u>) _____ = Total Cover				
1. <u>Cornus amomum</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
Herb Stratum (Plot size: <u>±5'</u>) _____ = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Solidago canadensis</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Hemerocallis fulva</u>	<u>30</u>	<u>Y</u>	<u>IAPL</u>	
3. <u>Toxicodendron radicans</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	
4. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
Woody Vine Stratum (Plot size: <u>±30'</u>) _____ = Total Cover				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.
1. <u>Toxicodendron radicans</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Vitis labrusca</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Celastrus orbiculata</u>	<u>20</u>	<u>Y</u>	<u>UPL</u>	
4. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: 109-11

[illegible]

SOIL SCIENCE AND ENVIRONMENTAL SERVICES, INC.

Wetland Delineations Ecological Studies Site Assessments Project Planning Soil Testing

August 20, 2020

ATTN: John Wengell
WMC Consulting Engineers
87 Holmes Road
Newington, CT 06111

Re: Verify Previous Wetland Delineation
Main Street Over Podunk River, South Windsor, CT

Dear Mr. Wengell:

In accordance with your request, Scott D. Stevens, Registered Professional Soil Scientist and Jennifer L. Beno, Biologist/Wetland Scientist, with Soil Science And Environmental Services, Inc. (SSES) inspected the project area on August 17, 2020. The purpose of the inspection was to verify whether or not if the previously delineated wetland boundaries within the bridge project area had changed since our original delineation. We utilized the plan sheet (3 of 22) titled "Rehabilitation of the Main Street Bridge Over Podunk River, Existing Conditions Plan," prepared by WMC Consulting Engineers, dated 00/00/2020, that was provided for our use when verifying the wetland boundaries. We also utilized the plan sheet to document and provide measurements where any changes to flag locations were necessary. The CT and Federal wetlands were previously delineated, and the Ordinary High Water identified, by our firm in 2014. See our report dated March 26, 2014.

We encountered very dense vegetation along the wetland boundaries during our August 17, 2020 inspection. Numerous trees had fallen or had been cut down recently within the project area near the roadway. Very few wetland delineation flags remain in the project area. Therefore, we relied on the plan sheet provided to us to determine the approximate locations of our old wetland delineation flags based on known points and existing topography.

During our inspection we observed that the wetland delineation boundary lines shown on the plan sheet were substantially correct, except for wetland flags #104A and #110.

We utilized a 25-foot metal measuring tape to measure the new flag location distances from known points shown on the plan sheet. Flag #104A should be moved approximately 2 feet towards the west to the top edge of the brownstone block wall. Flag #110 should be moved westward to a location approximately 15 feet from the brownstone block wall and approximately 10 feet from the trunk of the 24" tree located closest to the river. Also, the flag labelled #108A on the northeast side of the bridge should be labelled #108B as designated during our 2014 wetland delineation. See attached sketch maps.

Respectfully submitted,

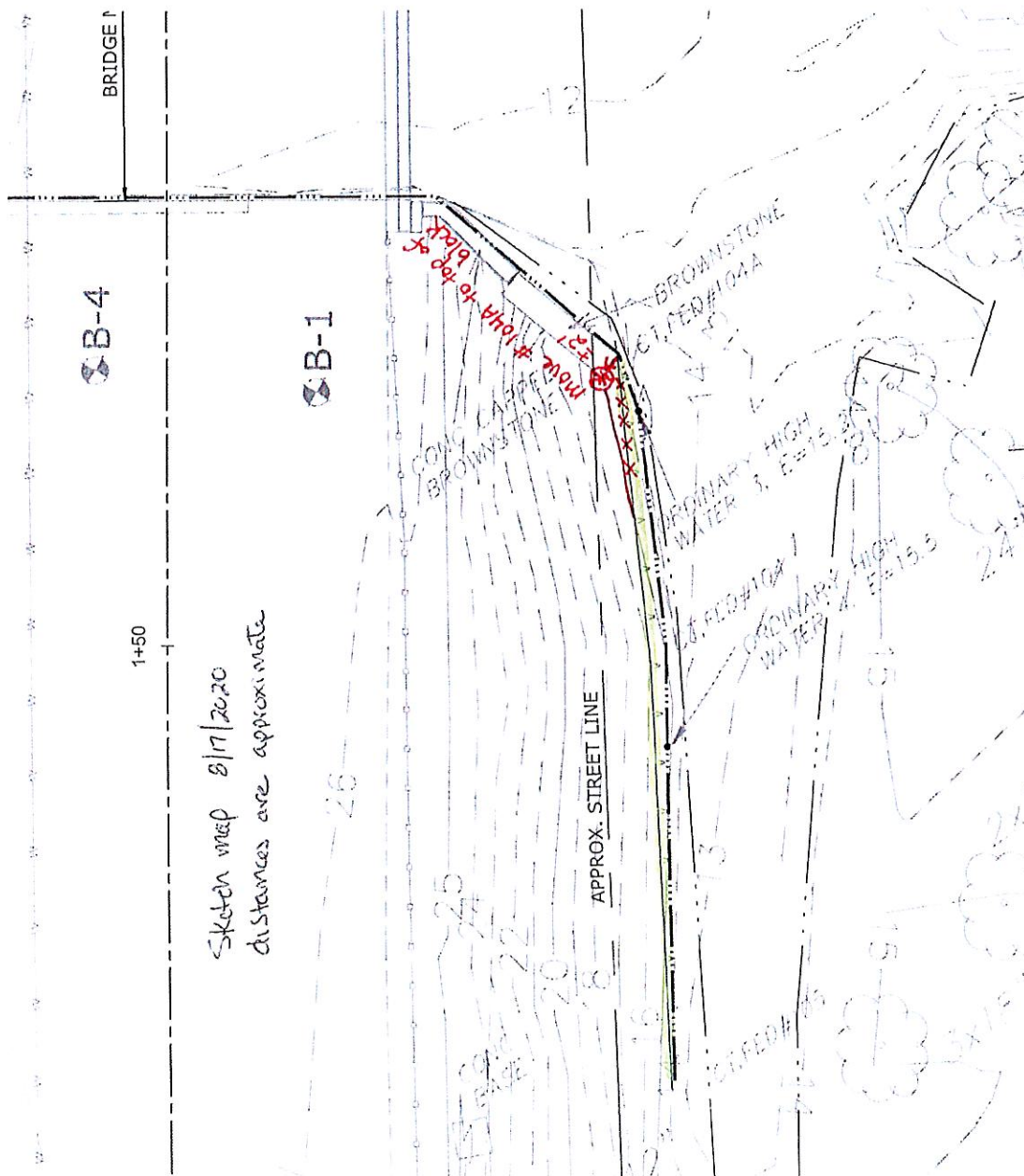
SOIL SCIENCE AND ENVIRONMENTAL SERVICES, INC.

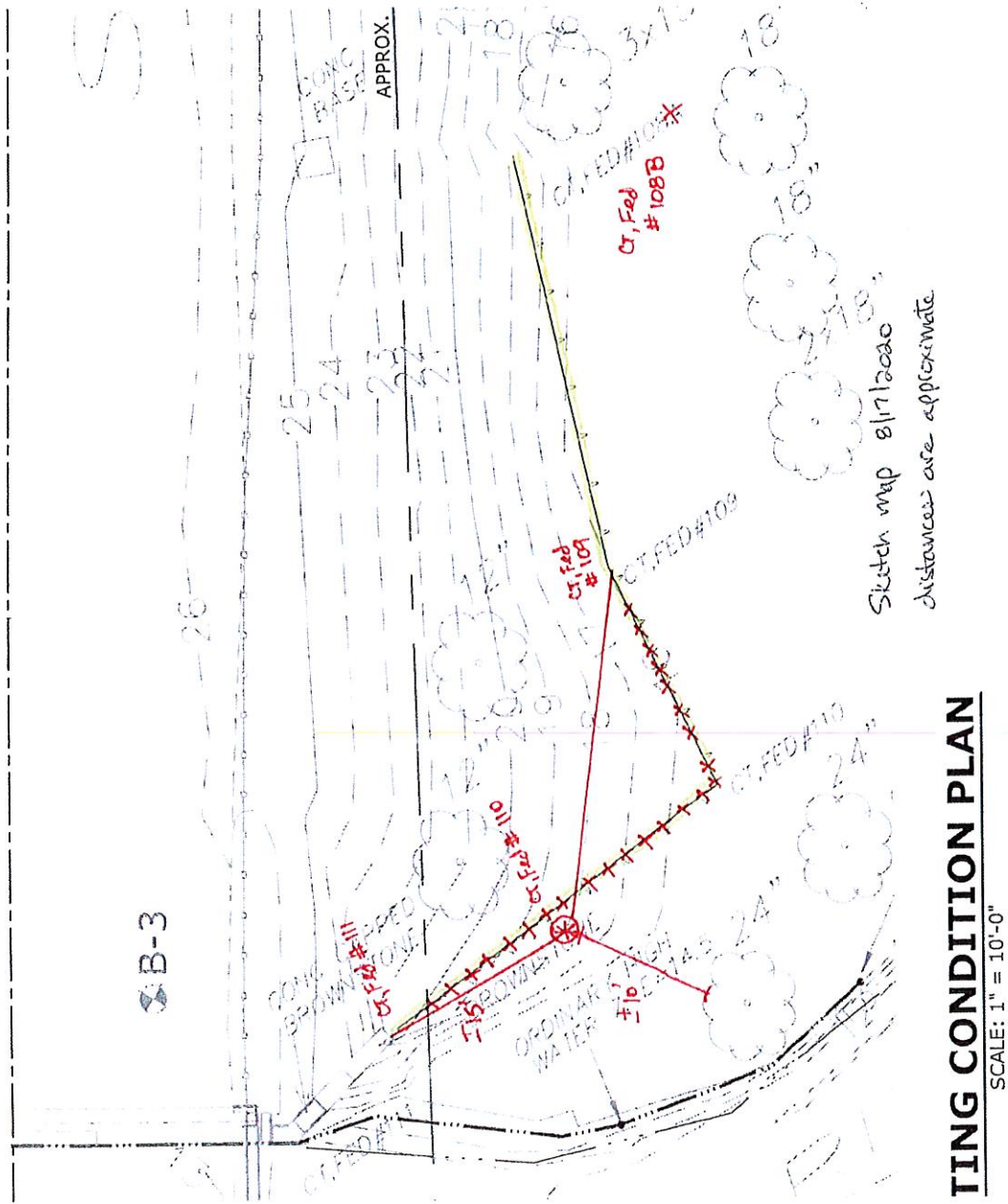


Scott D. Stevens
Registered Professional Soil Scientist



Jennifer L. Beno
Biologist/Wetland Scientist





May 14, 2015

Dwarf Wedgemussel Survey and Habitat Assessment Main Street Bridge over the Podunk River, South Windsor, Connecticut

Biodrawiversity LLC conducted a freshwater mussel survey in the Podunk River upstream and downstream from the Main Street Bridge in South Windsor, CT. The survey was a follow-up to a habitat assessment that was performed in February 2015; this report integrates the habitat assessment and the survey data. The primary target species was the federally endangered Dwarf Wedgemussel (*Alasmidonta heterodon*) that is known to occur elsewhere in the Podunk River. Two state-listed mussel species, Eastern Pondmussel (*Ligumia nasuta*) and Tidewater Mucket (*Leptodea ochracea*), were also considered for both the habitat assessment and survey.

In Connecticut, Dwarf Wedgemussel occurs in low gradient meandering streams in the lower Connecticut River watershed, such as Muddy Brook and Stony Brook near Suffield, the Podunk River (where its known range is several miles upstream from the Main Street Bridge), and the lower Farmington River. The Eastern Pondmussel occurs in similar habitats as the Dwarf Wedgemussel, though can tolerate more lentic conditions and occurs in several ponds in Connecticut. In Connecticut, the Tidewater Mucket occurs primarily in the Connecticut River mainstem but is infrequently found in low-gradient tributaries.

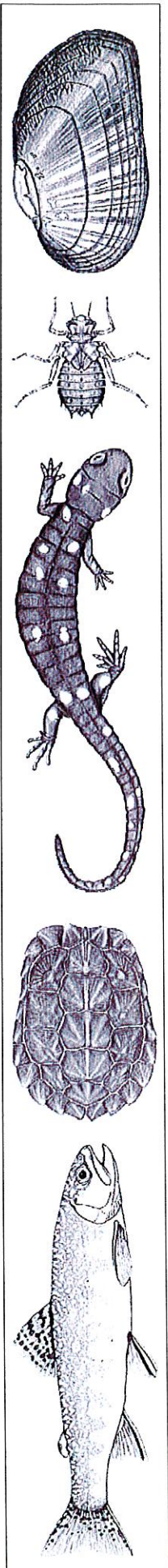
The habitat assessment was completed on February 19, 2015, at a time when much of the river was iced over and the adjacent riparian areas were covered with snow. Therefore, the visit yielded little insight on instream habitat conditions. Although an instream survey could not be conducted in February 2015 due to ice cover, Ethan Nedeau conducted a mussel survey downstream from this bridge in the summer of 2000 for the Connecticut Department of Energy and Environmental Protection (CTDEEP) as part of a river-wide survey for Dwarf Wedgemussel. Dwarf Wedgemussel were not found at this location during the 2000 survey. However, one Tidewater Mucket was found in the pool downstream from the bridge. Based on the 2000 record of Tidewater Mucket, and the potential for three target mussel species to occur in this area, the February report recommended a mussel survey be completed in May 2015.

On May 7, 2015, two biologists used snorkel and SCUBA gear to survey an area from 100 meters downstream to 50 meters upstream from the bridge. They conducted visual surveys for mussels at the surface, and excavated 60 0.25m² quadrats to a depth of 5-10 cm to detect buried mussels. Biologists also recorded habitat conditions and took photographs. Water temperature on the day of the survey was 61F, water was clear, and flows were low due to a prolonged dry period.

RESULTS

Mussel Survey: None of the three target species, live or dead, were found. Approximately 200 live Eastern Elliptio were observed, and one dead Creeper (*Strophitus undulatus*) was also found. Asian clams (*Corbicula fluminea*), an invasive species that has been documented elsewhere in the Podunk River, were numerous. Most mussels were detected with visual surveys; excavation revealed only a small number of juvenile Eastern Elliptio and Asian clams.

Habitat Description: In this area, the Podunk River is a low-gradient, slow-flowing stream with an incised channel that meanders through an extensive floodplain forest. Floodplain vegetation includes a deciduous overstory (red maple, boxelder, cottonwood, sycamore) with an understory of multiflora rose, honeysuckle, poison ivy, and buckthorn. Wetlands are prevalent in the floodplain, especially upstream from the bridge. Streambank are steep to vertical, often undercut, and comprised of fine-grained sediment (clay, mud, sand, and gravel), detritus, and large amounts of large woody material. Instream substrate is mostly clay and sand, with silt and detritus prevalent close to streambanks and in backwater/depositional areas, and gravel in areas with stronger flows. Water depth is variable but usually shallow (less than 2 feet), but with isolated deeper (>8 ft) areas formed by complex hydraulics associated with the meandering chan-



nel and accumulations of large woody material. Fish observed during the survey include tessellated darter, American eel, white sucker, dace, rock bass, and some small minnows that were not identified.

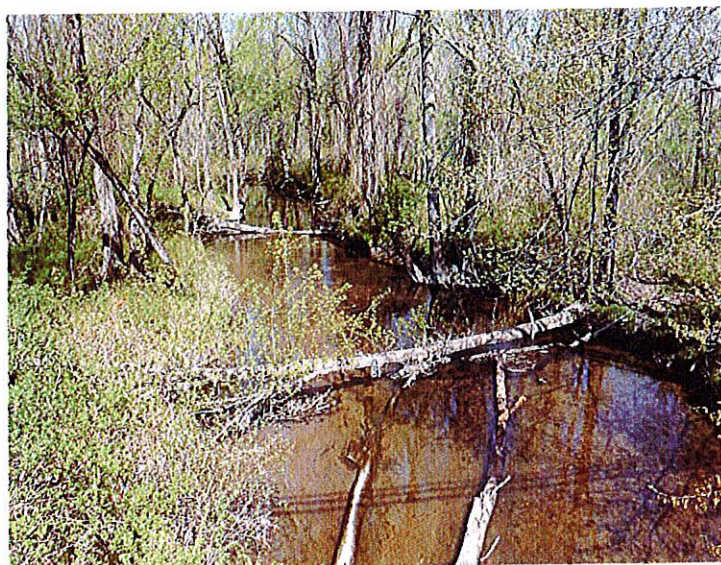
RECOMMENDATION

Based on survey results, it does not appear that Dwarf Wedgemussel, or other state-listed mussel species, occur in an area that might be affected by construction. Standard best management practices for these types of construction projects should be adequate to preserve the quality and quantity of mussel habitat in this reach.

Please let me know if you have any questions about this assessment or survey.



Podunk River, looking upstream from the Main Street Bridge.



Podunk River, looking downstream from the Main Street Bridge.