

**Jurisdictional Wetlands and Waters Report
U.S. Army Garrison Fort Devens
South Post Hotel Range Reconfiguration
Lancaster Township, Worcester County, Massachusetts**



Submitted By
Normandeau Associates, Inc.
400 Old Reading Pike
Building A, Suite 101
Stowe, PA 19464
610.705.5733
www.normandeau.com

July 2018



TABLE OF CONTENTS

1.0 Introduction..... 1

 1.1 Study Objectives 1

 1.2 Regulatory Summary 2

 1.3 Study Area Description..... 3

2.0 Methods..... 3

 2.1 Review of National Wetlands Inventory and Soil Mapping 3

 2.2 Wetland Delineation..... 3

3.0 Results 5

 3.1 Wetlands and Soils Mapping..... 5

 3.2 Delineation of Wetlands and Waters 7

4.0 Conclusions 9

5.0 References 11

LIST OF TABLES

Table 1 Summary of the relevant laws and regulations (“rules”).

Table 2 Wetland Indicator Status Key.

LIST OF APPENDICES

APPENDIX A Figures

Figure 1 Study Area Map

Figure 2 NWI Wetlands Map

Figure 3 Wetland Boundary and Regulated Buffer Map

Figure 4 Wetland Boundary Map and Soils Types with Photo Locations

APPENDIX B Wetland Data Forms

B1: USACE Forms 1-5

B2: MADEP Bordering Vegetated Wetlands Forms

B3: Normandeau Wetland Functions Data Forms

APPENDIX C Photographs

Appendix D Lancaster Township Wetland Regulations

D1: Chapter 306 Lancaster Township Wetland Protection Rules & Regulations

D2: Chapter 215 Wetlands Protection ByLaw

Appendix E National Wetland Inventory Classification Hierachy

DISCLOSURE STATEMENT

The data contained in all pages of this document have been submitted in confidence and contain trade secrets and/or privileged or confidential information, and such data shall be used or disclosed only for evaluation purposes, provided that if a contract is awarded to this proposer as a result of or in connection with the submission of this proposal, the client shall have the right to use or disclose the data herein to the extent provided in the contract. This document includes data that shall not be disclosed outside of the purposes of this submittal and shall not be duplicated, used, or disclosed--in whole or in part--for any purpose other than for evaluation purposes.

LIST OF ACRONYMS

Acronym	Description
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
ha	Hectare
LTCC	Lancaster Township Conservation Commission
m	meter
MassDEP	Massachusetts Department of Environmental Protection
NPS	National Park Service
NRCS	National Resources Conservation Service
NRWA	Nashua River Watershed Association
NWI	National Wetland Inventory
OBL	Obligate Wetland
ppt	Parts per thousand
PVP	Potential Vernal Pool
UPL	Obligate Upland
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Agency
USGS	U.S. Geological Survey

1.0 Introduction

1.1 Study Objectives

Fort Devens is a United States Army Garrison (USAG) located in central Massachusetts. Fort Devens is bordered primarily by the Towns of Ayer, Shirley, Harvard, and Lancaster. The training areas and opportunities on Fort Devens are vital to the sustainment of the various organizations that use them including state and local law enforcement agencies, the Federal Bureau of Investigation, and all branches of the US Armed Forces. The US Army is proposing to reconfigure a training area on Fort Devens that abuts a wetland; therefore, Fort Devens has requested a professional wetland delineation of the area to minimize encroachments into wetlands or wetland buffers to the maximum extent practicable.

Normandeau Associates, Inc. (Normandeau) was sub-contracted by Bluestone Environmental Group, Inc. (Bluestone), to delineate the jurisdictional boundaries of the wetlands adjacent to the project area (Figure 1 – Appendix A) and to provide guidance to Fort Devens as to the applicable federal, state, and local wetland protection laws and regulations. The wetland delineation study was conducted by Mr. Benjamin Griffith and Ms. Cassandra O'Brian under the supervision of Mr. Keith Maurice, Senior Scientist and Professional Wetland Scientist (PWS# 2444), and Ms. Jane O. Rowan, Senior Principal Scientist and Professional Wetland Scientist (PWS# 0170).

This report presents the findings of the 11 and 12 June 2018 delineation study and establishes boundaries within the study area for wetlands and other waters in accordance with the regulatory requirements of U.S. Army Corps of Engineers (USACE), Massachusetts Department of Environmental Protection (MassDEP), and the Town of Lancaster. The report is presented as follows:

- Federal, state, and local regulatory jurisdictions are outlined in Subsection 1.2, with local by-laws included in Appendix D.
- The project study area is identified in Subsection 1.3, and Figure 1, Appendix A.
- Wetland delineation methodologies are presented in Section 2.0,
- Results are discussed in Section 3.0.
- Conclusions are summarized in Section 4.0.
- Report figures, wetland data forms, photographs, and the Lancaster Wetlands Protection Bylaw are enclosed in Appendices A, B, C and D.

Please note that the results presented in this report is based on the opinion of the scientists that performed the field study. The information in this report regarding jurisdiction over a wetland or water body is also the opinion of the authors based on their interpretation of current regulations. All information should be verified with the regulatory agencies for an accurate understanding of the features present according to the agencies' current regulatory programs, and the activities that would be considered regulated activities under any of those regulatory programs.

1.2 Regulatory Summary

Wetlands and other waters in the Commonwealth of Massachusetts are regulated by federal, state, and local government agencies. The applicable regulatory authorities are summarized in Table 1. Development activities such as construction, removal, filling, dredging, or otherwise altering potential jurisdictional areas as well as their designated buffer zones may require regulatory approvals from local, state, and/or federal agencies.

Table 1. Summary of the relevant laws and regulations ("rules").

RULE	ADMINISTRATIVE AGENCY	PROTECTED RESOURCES	REGULATED ACTIVITIES	REGULATORY APPROVALS
Federal				
Clean Water Act Section 404	US Army Corps of Engineers (USACE) and US Environmental Protection Agency (USEPA)	"Waters of the US, including Wetlands"	Dredged and Fill Material Placement in Wetlands	Nationwide and Individual Permits
Commonwealth of Massachusetts				
Clean Water Act Section 401	Massachusetts Department of Environmental Protection (MassDEP), delegated by the USEPA	"Waters of the US, including Wetlands"	Consistency of Section 404 permitted activities with state water quality standards	Section 401 Water Quality Certification
Wetlands Protection Act	Local Conservation Commissions as delegated by MassDEP	Waters of the Commonwealth and associated resource areas	Any activities involving removal, filling, dredging, or other alteration	LCC Order of Conditions; MassDEP oversees administration of the Act and hears appeals of LCC Conditions
Town of Lancaster By-Laws (See Appendix C)				
Chapter 215, Wetlands Protection, and Chapter 306, Wetlands Protection Rules and Regulations	Lancaster Conservation Commission	Waters of the Commonwealth and associated resource areas, and added local requirements	Any activities involving removal, filling, dredging, construction or other alteration	Order of Conditions

1.3 Study Area Description

The study area is located in a largely wooded and rural landscape adjacent to Slate Rock Pond. Vegetation cover is dominated by coniferous forest, and mixed coniferous and deciduous forest. The topography is relatively level with steeper slopes (8-15% slopes) along the pond. Slate Rock Pond flows to the Nashua River near the Oxbow National Wildlife Refuge. The Nashua River is a tributary of the Merrimack River, which eventually drains to the Atlantic Ocean.

2.0 Methods

2.1 Review of National Wetlands Inventory and Soil Mapping

Prior to the field survey, Normandeau conducted a desktop review of the study area using existing maps of natural resources to determine if wetlands, hydric (poorly drained) soils, streams, and other waterbodies were present. Sources reviewed included the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping, Natural Resources Conservation Service (NRCS) soil mapping, USGS Hydrographic Mapping, MassDEP and Town of Lancaster online mapping, and aerial photography available through Google Earth®. These information sources assist delineators in focusing field efforts on areas where wetlands and waterways are most likely to be present.

2.2 Wetland Delineation

The wetlands survey was conducted following the wetland delineation methodologies presented in *Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act* (MassDEP 1995), *Corps of Engineers Wetland Delineation Manual* (USACE 1987), and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region Version 2.0* (USACE 2011). The MassDEP and USACE methodologies are similar and involve the use of vegetation, soils, and hydrologic conditions to identify and delineate wetlands. The USACE methodology specifies that a wetland must be dominated by hydrophytic vegetation (>50% of dominant species), have hydric soils, and exhibit evidence of wetland hydrology. However, the MassDEP methodology requires only the predominance of hydrophytic vegetation and evidence of wetland hydrology. The USACE and MassDEP methods were used concurrently to delineate the boundaries of wetlands within the study area. There were no differences in wetland boundaries when applying the two programs, however the programs regulate these resources differently as in applying buffers as described in the Conclusion section of this report.

Following the MassDEP and USACE methodologies, vegetation, soils, and hydrologic conditions were evaluated throughout the study area. Plant species were identified as

hydrophytic or upland preferring based on their National Wetland Plant List indicator status (see Table 2 below). Plants classified as facultative (FAC), facultative wetlands (FACW), or obligate wetlands (OBL) were considered to be hydrophytic (i.e., the plant is a hydrophyte). Plants rated as facultative upland (FACU) or obligate upland (UPL) were considered to be upland preferring (Lichvar et al. 2016).

Soil profiles were examined using an auger, checked for redoximorphic features (mottles), interpreted with Munsell soil color charts, and then evaluated for hydric soil indicators. Evidence of wetland hydrology was determined based on the presence or absence of field indicators such as surface water inundation, high water tables and saturated soils, or evidence that these conditions were recently present onsite for extended periods.

Wetland boundaries were delineated in the field, flagged every 25 to 50 feet with sequentially numbered survey ribbon, and mapped at sub-meter accuracy with a Trimble® Geo XH 6000 Global Positioning System (GPS). Each wetland was assigned a unique identification number and classified according to wetland habitat type based on the U.S. Fish and Wildlife Service Cowardin Classification System (Cowardin et al. 1979; Federal Geographic Data Committee 2013). Wetland boundaries were documented with paired upland and wetland data points using USACE and MassDEP wetland data forms (Appendix B). Wetland functions and values were evaluated with Normandeau Functions and Values Data Forms. Photographs were taken of typical wetlands and uplands habitats onsite (Appendix C).

Table 2. Wetland Plant Indicator Status Key

Indicator Status	Ecological Description	Designation
OBL = obligate wetlands	Usually is a hydrophyte, rarely in uplands.	Hydrophyte
FACW = facultative wetlands	Usually is a hydrophyte, but occasionally found in uplands.	Hydrophyte
FAC = facultative	Commonly occurs as either a hydrophyte or non-hydrophyte.	Hydrophyte
FACU = facultative uplands	Occasionally is a hydrophyte, but usually occurs in uplands.	Non-hydrophyte
UPL = obligate uplands	Rarely is a hydrophyte, almost always in uplands.	Non-hydrophyte

3.0 Results

3.1 Wetlands and Soils Mapping

Wetlands Mapping

The USFWS has developed a system of wetland classification after Cowardin, et.al. (1979) entitled Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBS-79/31, 131p. We have classified wetlands delineated according to Cowardin (ibid) and provide general information regarding the system hierarchy of wetlands in the study area herein.

The USFWS NWI mapped Slate Rock Pond and the majority of associated wetlands within the study area is classified as PABH: For example, this classification is broken out according to geomorphology, dominant plant community, and persistence of hydrology:

- System: Palustrine (P)
- Class: Aquatic Bed (AB)
- Water Regime Modifier: Permanently Flooded (H)

More information about each of the above classifications and how they apply to the study area are provided below. A full illustration of the NWI Classification System hierarchy is included in Appendix E, and the classification boundaries of onsite wetlands are identified in Figure 2, Appendix A. Below we describe each of these (System, Class, Water regime) for PABH. Please apply information found in Appendix E to wetlands classified in Section 3.2 of this section.

The Palustrine System (P) includes all nontidal wetlands dominated by trees, shrubs, persistent emergent herbaceous plants, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 parts per thousand (ppt). It also includes wetlands lacking such vegetation, but with all of the following four characteristics: (1) area less than 8 hectares (ha) (20 acres); (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2.5 meters (m) (8.2 feet) at low water; and (4) salinity due to ocean-derived salts less than 0.5 ppt.

Class Aquatic Bed (AB): Includes wetlands and deepwater habitats dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years.

In contrast to AB, the Class Unconsolidated Bottom (UB) includes a greater amount of open water with less than 30% vegetative/substrate visible. The water regimes are restricted to subtidal, permanently flooded, intermittently exposed, and semi-permanently flooded. Normandeau believes Slate Rock Pond is more appropriately considered an aquatic bed classification due to the extensive rooted and floating aquatic plants within the water body.

Water Regime Permanently Flooded (H): Water covers the substrate throughout the year in all years. (USFWS NWI 2018).

In order to describe the wetland and deepwater habitats, one or more of the water regime, water chemistry, soil, and special modifiers may be applied at the class or lower level in the hierarchy. Slate Rock Pond has clearly been affected by beaver activity resulting in a varying water table over the years. In some locations the increased water elevation has resulted in “upland” areas exhibiting some “wetland” features, and vice versa. This beaver activity (designated as “b”) obvious at the site results in the actual NWI classification being revised to PABHb.

Smaller areas of forested wetlands along the northern and southern ends of the pond were mapped as palustrine forested broadleaved deciduous seasonally flooded (PFO1C), and palustrine forested mixed broadleaved deciduous and needle leaved evergreen (PFO1/4). The water regime for both areas was classified as seasonally flooded (“C”), which indicates that “surface water may be present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface” (USFWS NWI 2018).

Soils Mapping

NRCS mapped and classified the majority of the study area as Windsor loamy sand, Whitman loam, and Raynham silt loam (NRCS 2018a). Other mapped soils include Amostown and Belgrade soils, and Ninigret fine sandy loam (Figure 3 – Appendix A). Whitman loam and Raynham silt loam are classified as hydric soils (NRCS 2018b). Please see Figure 3 in Appendix A for soil types and taxonomy, but also an overlay of the mapped soils and the delineated wetland boundaries. From this map it is clear that some of the wetlands are included in soils that were previously classified as “upland” soils.

3.2 Delineation of Wetlands and Waters

Normandeau identified and delineated five wetlands and two stream channels during the 11-12 June 2018 field study (Figure 4 – Appendix A). There are additional wetlands onsite that are not discussed in this report as they are outside the study area.

Wetland 1

Wetland 1 is a 0.29 acre forested bordering vegetated wetland (BVW) fed by a toe of slope seep located primarily on a moderate (3-5% grade) slope. However, there are several flat areas within the wetland where water pools for most of the year and therefore are potential vernal pools (PVP1). Soils were typically saturated and contained high percentages of organic matter. Vegetation is typical of forested wetlands of the region including skunk cabbage (*Symplocarpus foetidus*, OBL), highbush blueberry (*Vaccinium corymbosum*, FACW), and red maple (*Acer rubrum*, FAC). This wetland drains through a small intermittent stream (Stream 1) into Wetland 3 (See Data Point W1-WET and BVW Data Form W1 in Appendix B). Wetland 1 consists largely of wetland habitats classified as PFO1/4, PFO1/SS1 and PSS1/EM1. Wetland 1 connects to Slate Rock Pond and the Nashua River via Stream 1 and would be considered under the jurisdiction of the federal Clean Water Act. If a wetland or waterbody is considered “jurisdictional” according to the USACE, the wetland or waterbody would also fall under the jurisdiction of the State and local programs, since both are more stringent than the USACE program.

Wetland 2

Wetland 2 is 0.12 acre isolated wetland at the toe of slope of a man-made mound and is separated from Wetland 1 by a narrow berm. The majority of this wetland is a wet meadow dominated by graminoids such as soft rush (*Juncus effusus*, FACW) and fringed sedge (*Carex crinita*, OBL), as well as sensitive fern (*Onoclea sensibilis*, FACW). The forested portion is generally similar to Wetland 1 in character. Wetland 2 may not fall under federal jurisdiction because of the lack of connection to Slate Rock Pond and the Nashua River drainage basin (i.e., wetland is isolated). However, we believe both the MassDEP and Town of Lancaster have regulatory jurisdiction over Wetland 2.

Wetland 3

Wetland 3 consists of Slate Rock Pond, which is formed by the unnamed tributary to the Nashua River, and the surrounding forested wetlands. The pond is principally open water, but also contains floating leaved and submerged aquatic plants including yellow water lilies (*Nuphar advena*, OBL), and persistent and non-persistent emergent wetland plants dominated by tussock sedge (*Carex stricta*, OBL). The surrounding forested wetland has a pit and mound (hummocky) microtopography, with mounds dominated by eastern white pine (*Pinus strobus*, FACU) and red maple, and pits dominated by

more typical wetland vegetation such as skunk cabbage and northern long sedge (*Carex folliculate*, OBL).

Wetland 3 is suitable for numerous functions and values due to its large size, ability to hold water, perennial streams, and multiple cover classes (See Data Point W3-WET and BVW Data Form W3 in Appendix B). Wetland 3 would be considered a mosaic of many wetland types including, POWHb, PABHb, PFO1/4C, and PEM1B. This wetland is likely valuable to waterfowl, long-legged wading birds and reptiles/amphibians, and bats. This wetland is likely under the jurisdiction of the USACE, the MassDEP and the Town of Lancaster.

Wetland 4

Wetland 4 is a 0.03 acre isolated depression near the range access road. Vegetation cover was sparse with only occasional herbaceous stems or shrubs, including wool grass (*Scirpus cyperinus*, FACW) and winterberry (*Ilex verticillata*, FACW). This wetland may function as a vernal pool (PVP2) in some years and may not be considered federally jurisdictional because of its isolation from the Nashua River drainage system. Although no water was present during the June field visit, the presence of a sparsely vegetated concave surface indicated that open water was present less than a month earlier. This wetland likely functions principally as wildlife habitat (mostly amphibians) due to its potential to harbor vernal pool species.

Our opinion is that Wetland 4 is not under the jurisdiction of the USACE because it is isolated; however it is likely under the jurisdiction of the State of Massachusetts and the Town of Lancaster. Further consideration of jurisdiction may be appropriate by the USACE since some may consider the wetland “adjacent”. The USEPA which has primary responsibility for determining jurisdiction under the Clean Water Act defines “adjacent” wetlands, as those bordering, contiguous, or neighboring a regulated water, including, wetlands separated by constructed dikes or barriers, natural river berms, beach dunes, and the like. In addition, further consideration of Wetland 4 may be required by MassDEP. This small isolated pool may be a candidate for certification as a vernal pool. More information on vernal pools may be found at <https://www.mass.gov/service-details/vernal-pool-certification>. The Town of Lancaster regulates vernal pools whether they are certified or not.

Wetland 5

Wetland 5 is a narrow bordering vegetated wetland located along the fringe of an upper perennial stream (Stream 2). This wetland is physically separated from Wetland 3 by Old Shirley Road, although the two wetlands are hydrologically connected by Stream 2. Dominant vegetation in the wetland includes skunk cabbage, spotted touch-me-not

(*Impatiens capensis*, FACW), and sedges. This wetland functions principally to stabilize the shorelines of the stream and reduce sedimentation in on-site waters (See Data Point W5-WET and BVW Data Form W5 in Appendix B). This wetland is likely under the jurisdiction of the USACE as well as State and local programs.

Stream 1

Stream 1 originates in Wetland 1 and is approximately 250 feet in length. This stream flows under the range access road via a culvert, and through Wetland 3 where it discharges via a braided drainage pattern into Slate Rock Pond and the unnamed tributary of the Nashua River. Stream 1 is bordered by wetland plants for most of its length, but in some places (up gradient of the range access road) is fairly high gradient and exhibits some indication of bed erosion. This small stream could be classified as a R4UB2, or a riverine intermittent, unconsolidated bottom made of sand. Stream 1 may be regulated by the USACE but there is some question because it appears to be intermittent and policy affecting non-perennial stream channels have been under legal contention recently. USACE should be consulted regarding their interest in regulating Stream 1. The stream is regulated by the state and local programs.

Stream 2

Stream 2 is a comparably long stream that originates outside of the study area. The stream would be considered an upper perennial stream that has indistinct wetland banks and flows slowly through swampy habitat before entering the unnamed tributary to the Nashua River through its unconsolidated, irregular, emergent wetland shore/banks. Stream 2 meets the NWI classification of R3UB3/4 or riverine upper perennial, unconsolidated sand, and mud bottom wetland. Stream 2 is likely under the jurisdiction of USACE, state and local programs.

4.0 Conclusions

In conclusion, it is the opinion of the authors that four of the five wetlands and one of the two streams delineated in the study area fall under the regulatory jurisdiction of the USACE, MassDEP and the Town of Lancaster Conservation Commission. Wetland 2 is isolated and therefore likely not regulated under the Clean Water Act. Wetlands and streams that connect to the drainage basin of a navigable water are regulated by the USACE. MassDEP and the Town of Lancaster regulate all wetlands and streams in Massachusetts and Lancaster, respectively, and do not require a connection to navigable waters for these features to be jurisdictional.

The Massachusetts Wetlands Protection Act stipulates a 100-foot buffer zone, while the Lancaster Bylaws, Chapter 215 – Wetlands Protection incorporate both a 100-foot buffer zone and 25-foot no-build or no-alteration zone for wetlands (Figure 4, Appendix A).

A review of MassDEP's online mapping indicates that none of the potential vernal pools identified in Wetland 1 (PVP1) or Wetland 4 (PVP2) are officially certified by the agency as vernal pools. However, the Lancaster Wetlands Protection Bylaw incorporates a 100-foot buffer for vernal pools regardless of certification status.

Approval of this delineation report and verification of our opinion regarding jurisdiction is required. In addition, USACE, MassDEP, and the Town of Lancaster should be informed of the proposed project and provide their determination of authority regarding their jurisdiction in and around the resources delineated, including activities in jurisdictional wetlands, streams, vernal pools, and applicable buffer zones.

5.0 References

- Cowardin, L. M., V. Carter, F. C. Golet, and E. T. Laroe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. Office of Biological Services, U.S. Fish and Wildlife Service, FWS/OBS-79-31.
- Federal Geographic Data Committee. 2013. Classification of wetlands and deepwater habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, DC.
- Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X.
- Massachusetts Department of Environmental Protection. 1995. Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act. Massachusetts Department of Environmental Protection, Boston, MA.
- Massachusetts Department of Environmental Protection. 2014. Wetlands Protection (310 CMR 10.00). Massachusetts Department of Environmental Protection, Boston, MA.
- Natural Resources Conservation Service. 1985. Soil Survey of Worcester County, Northeast Part, Massachusetts. United States Department of Agriculture, Natural Resources Conservation Service, Washington, DC.
- Natural Resources Conservation Service. 2018a. Web Soil Survey. Available URL: <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>
- Natural Resources Conservation Service. 2018b. Soil Data Access Hydric Soils List, Worcester County, Northeast Part, Massachusetts. Available URL: https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1316620.html#reportref
- Town of Lancaster. 2010. Expedited Permitting Guidebook. Town of Lancaster, Worcester County, Massachusetts.
- Town of Lancaster Code Part 1 Bylaws. 2018a. Chapter 215. Wetlands Protection. Town of Lancaster, Worcester County, Massachusetts.

Town of Lancaster Code Part 2 Rules and Regulations. 2018a. Chapter 306. Wetlands Protection Rules and Regulations. Town of Lancaster, Worcester County, Massachusetts.

U. S. Fish and Wildlife Service. 2018. National Wetlands Inventory Wetlands Mapper. Available URL: <http://www.fws.gov/wetlands/Data/Mapper.html>.

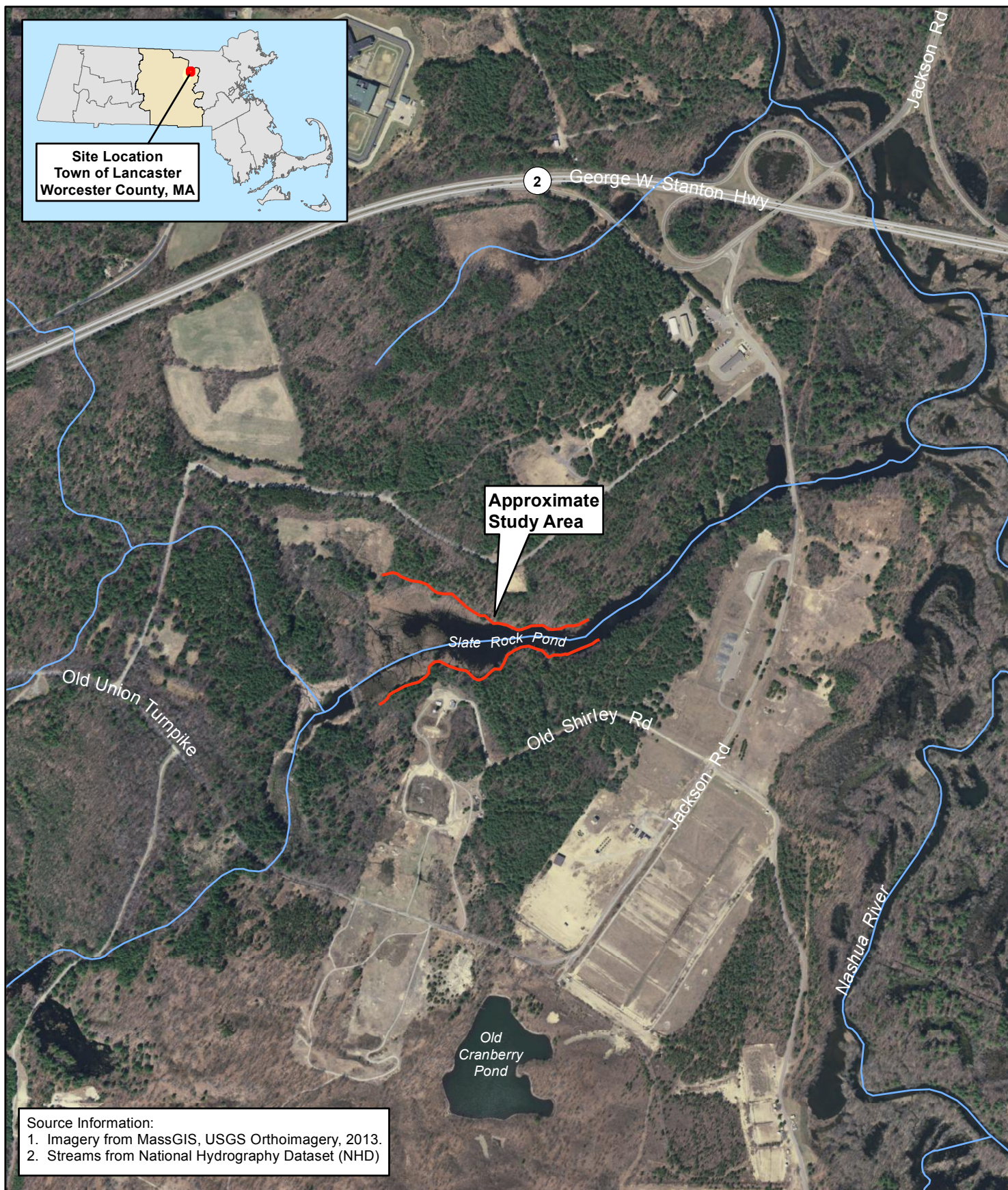
U.S. Army Corps of Engineers. 1987. Corps of Engineers Wetland Delineation Manual. Technical Report Y-87-1, U.S. Army Engineer Experiment Station, Vicksburg, Mississippi.

U.S. Army Corps of Engineers. 2011. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region Version 2.0, ed. J. S. Wakeley, R. W. Lichvar, C. V. Noble and J. F. Berkowitz. ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

U.S. Army Corps of Engineers. 2016. State of Massachusetts 2016 Wetland Plant List. Available URL: <http://rsgisias.crrel.usace.army.mil/NWPL/#>

Appendix A

Report Figures



Source Information:
 1. Imagery from MassGIS, USGS Orthoimagery, 2013.
 2. Streams from National Hydrography Dataset (NHD)



— Approximate Study Area
 — Streams

0 500 1,000 2,000 Feet



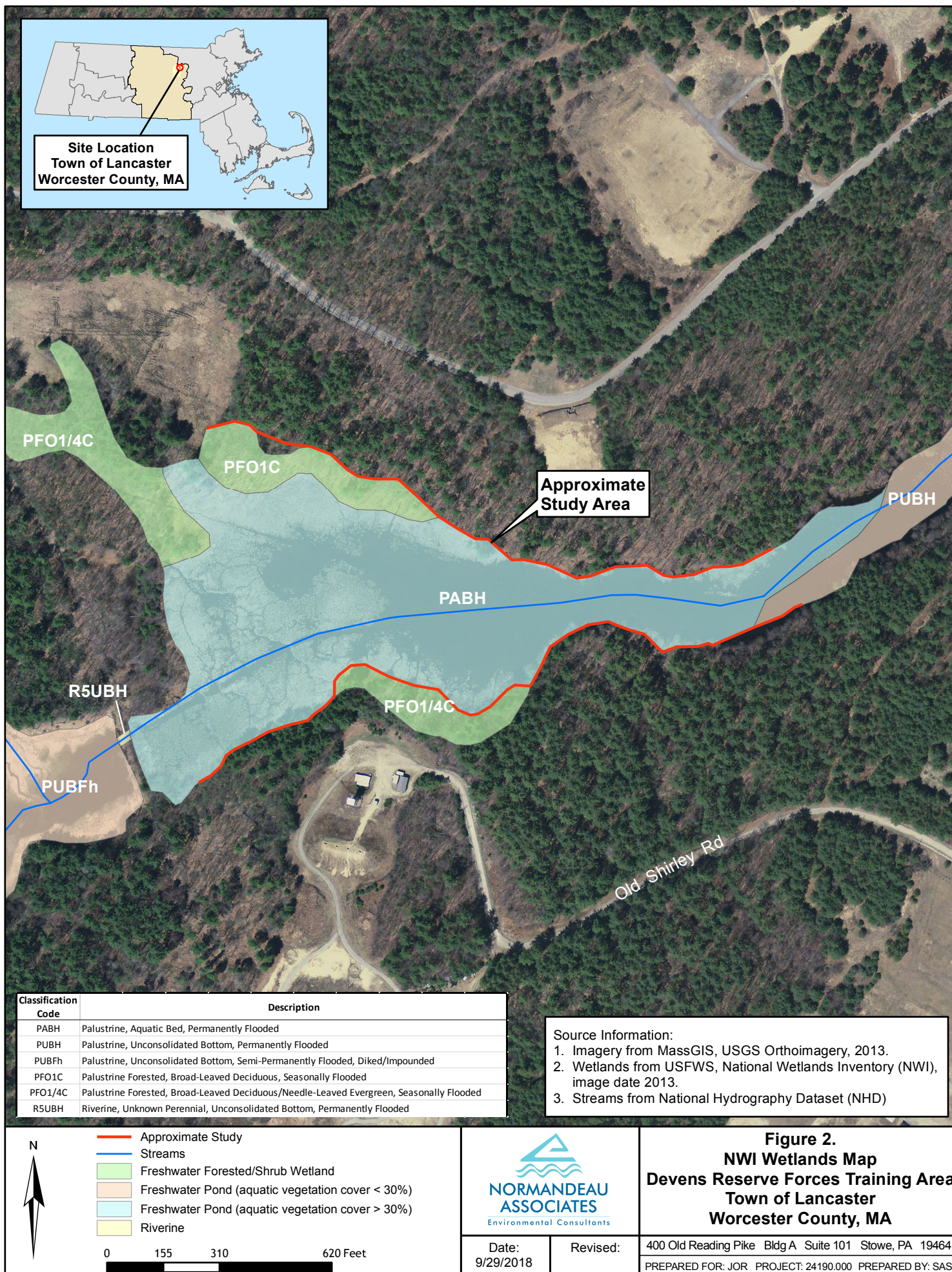
Date:
9/29/2018

Revised:

Figure 1.
Study Area Map
Devens Reserve Forces Training Area
Town of Lancaster
Worcester County, MA

400 Old Reading Pike Bldg A Suite 101 Stowe, PA 19464
 PREPARED FOR: JOR PROJECT: 24190.000 PREPARED BY: SAS



Path: J:\Projects\DevensMA_24190\MXD\Fig1_StudyArea_FortDevens_092918.mxd



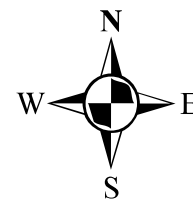
Soil Type	NRCS Map Designation	Drainage Class	Taxonomy	Mapped Hydric?	Parent Geology	Field Delineated Wetlands found in this mapped Soil Type?
Amostown and Belgrade soils, 3-8 % slopes	248B	Moderately Well-drained-both components	Amostown- Typic dystrochrepts Belgrade- Aquic dystric eutrochrept	NO	<i>friable coarse-loamy glaciofluvial deposits derived from metamorphic rock over hard coarse-silty glaciolacustrine deposits- Belgrade- hard coarse-silty glaciolacustrine deposits</i>	Wetland 3
Ninigret fine sandy loam, 0 to 3 percent slopes	276A	Moderately Well-drained	Aquic dystrudepts	NO	<i>coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from gneiss, granite, schist, and/or phyllite</i>	Wetland 1, Wetland 2, Wetland 4, Stream 1
Raynham Silt Loam, 0-3% Slopes	30A	Poorly Drained	Aeric haplaquepts	YES	<i>soft coarse-silty lacustrine deposits</i>	Wetland 3
Windsor Loamy Sand, 3-8%	255 B	Excessively Drained	Typic udipsammments	NO	<i>loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss</i>	Wetland 3
Windsor Loamy Sand, 8-15%	255 C	Excessively Drained	Typic udipsammments	NO	<i>loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss</i>	Wetland 3
Whitman Loam, 0-3% slopes	72A	Very Poorly Drained	Typic humaquepts	YES	<i>friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from granite and gneiss</i>	Wetland 3



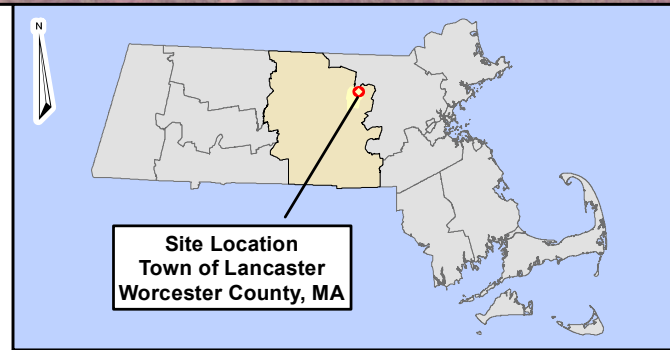
- Potential Vernal Pool
- Data Point
- ↑
① Photo Location and Orientation

-  Approximate Study Area
 Delineated Watercourse
 Delineated Wetland Boundary

- Amostown and Belgrade soils
- Ninigret fine sandy loam
- Raynham silt loam
- Water
- Whitman loam
- Windsor loamy sand



0 100 200 400 Feet



Index Map - 1:2,500,000

Figure 3.
Wetland Boundary and Soil Types
with Photo Locations
Devens Reserve Forces Training Area
Town of Lancaster
Worcester County, MA
Date: 9/29/2018



Source Information:	Windsor loamy sand
<ol style="list-style-type: none"> 1. Imagery from MassGIS, USGS Orthoimagery, 2013. 2. Boundaries of Wetlands and Streams were delineated June 11 - 12, 2018 by Normandeau Associates, Inc. 3. Soils from U.S. Department of Agriculture, Natural Resources Conservation Service, Soil Survey (SSURGO) database for Worcester County, MA, Northwestern part, 2005-2017. 	

J:\Projects\DevensMA_24190MXD\Fig4_Wetlands_RegulatedBuffers_092918.mxd

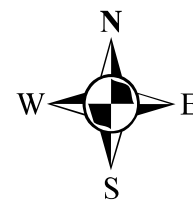


Source Information:

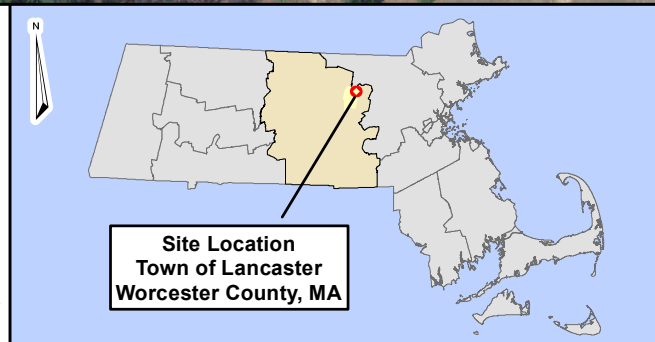
1. Imagery from MassGIS, USGS Orthoimagery, 2013.
2. Boundaries of Wetlands and Streams were delineated June 11 - 12, 2018 by Normandeau Associates, Inc.
3. The 100-foot wetland buffer is required by the Massachusetts Wetlands Protection Act. The 25-foot No-build or No-Alteration Zone is required by the Town of Lancaster Bylaws Chapter 215 – Wetlands Protection.

Legend

- Potential Vernal Pool
- Data Point
- Approximate Study Area
- Delineated Watercourse
- Delineated Wetland Boundary
- - - 100 ft Wetland Buffer
- 25 ft No-Build or No-Alteration Zone



0 112.5 225 450 Feet



Index Map - 1:2,500,000

Figure 4.
Wetland Boundary
and Regulated Buffer Map
Devens Reserve Forces Training Area
Town of Lancaster
Worcester County, MA
Date: 9/29/2018

NORMANDEAU
ASSOCIATES
Environmental Consultants

Appendix B

Wetland Data Forms

B1: USACE Forms 1-5

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Fort Devens City/County: Lancaster Sampling Date: 6/11/2018
 Applicant/Owner: DPW-Environmental State: Massachusetts Sampling Point: W1-Up
 Investigator(s): Ben G. Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex
 Slope (%): 5 Lat.: 42.5103219 Long.: -71.6449293 Datum: _____
 Soil Map Unit Name Ninigret fine sandy loam, 0-3% slopes NWI Classification: Upland Forest
 Are climatic/hydrologic conditions of the site typical for this time of the year? Yes (If no, explain in remarks)
 Are vegetation _____, soil _____, or hydrology _____ significantly disturbed? Are "normal
 Are vegetation _____, soil _____, or hydrology _____ naturally problematic? circumstances" present? Yes
 (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? <u>No</u> Hydric soil present? <u>Yes</u> Indicators of wetland hydrology present? <u>No</u>	Is the sampled area within a wetland? <u>No</u> If yes, optional wetland site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

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

VEGETATION - Use scientific names of plants

Sampling Point: W1-Up

Tree Stratum					Plot Size (30)		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Acer rubrum</i>					30	Y	FAC	
2	<i>Betula papyrifera</i>					20	Y	FACU	
3	<i>Betula populifolia</i>					20	Y	FAC	
4									
5									
6									
7									
8									
9									
10									
						70	= Total Cover		
Sapling/Shrub Stratum					Plot Size (15)		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Acer rubrum</i>					20	Y	FAC	
2	<i>Quercus rubra</i>					10	Y	FACU	
3									
4									
5									
6									
7									
8									
9									
10									
						30	= Total Cover		
Herb Stratum					Plot Size (5)		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Dennstaedtia punctilobula</i>					90	Y	UPL	
2	<i>Osmunda cinnamomea</i>					10	N	FACW	
3	<i>Maianthemum canadense</i>					5	N	FACU	
4	<i>Trientalis borealis</i>					5	N	FAC	
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
						110	= Total Cover		
Woody Vine Stratum					Plot Size ()		Absolute % Cover	Dominant Species	Indicator Status
1									
2									
3									
4									
5									
						0	= Total Cover		

50/20 Thresholds

	20%	50%
Tree Stratum	14	35
Sapling/Shrub Stratum	6	15
Herb Stratum	22	55
Woody Vine Stratum	0	0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

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

Percent of Dominant Species that are OBL, FACW, or FAC: 50.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	75	x 3 =	225
FACU species	35	x 4 =	140
UPL species	90	x 5 =	450
Column totals	210	(A)	835 (B)
Prevalence Index = B/A =		<u>3.98</u>	

Hydrophytic Vegetation Indicators:

☐ Rapid test for hydrophytic vegetation

☐ Dominance test is >50%

☐ Prevalence index is ≤3.0*

☐ Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)

☐ Problematic hydrophytic vegetation* (explain)

*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 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? No

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

SOIL

Sampling Point: W1-Up

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

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-2	10YR2/1	100						
2-8	10YR4/1	80	10YR4/4	20	C	PL	Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histisol (A1) | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> Stratified Layers (A5) | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Redox Depressions (F8) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | |
| <input type="checkbox"/> Sandy Redox (S5) | |
| <input type="checkbox"/> Stripped Matrix (S6) | |
| <input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B) | |

Indicators for Problematic Hydric Soils:

- | |
|---|
| <input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B) |
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L) |
| <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L) |
| <input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L) |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R) |
| <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B) |
| <input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B) |
| <input type="checkbox"/> Red Parent Material (F21) |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Other (Explain in Remarks) |

*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

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Fort Devens City/County: Lancaster Sampling Date: 6/11/2018
 Applicant/Owner: DPW-Environmental State: Massachusetts Sampling Point: W1-wet
 Investigator(s): Ben G. Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave
 Slope (%): 0 Lat.: 42.5102169 Long.: -71.6445256 Datum: _____
 Soil Map Unit Name Ninigret fine sandy loam, 0-3% slopes NWI Classification: PFO1
 Are climatic/hydrologic conditions of the site typical for this time of the year? Yes (If no, explain in remarks)
 Are vegetation _____, soil _____, or hydrology _____ significantly disturbed? Are "normal
 Are vegetation _____, soil _____, or hydrology _____ naturally problematic? circumstances" present? Yes
 (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? <u>Yes</u> Hydric soil present? <u>Yes</u> Indicators of wetland hydrology present? <u>Yes</u>	Is the sampled area within a wetland? <u>Yes</u> If yes, optional wetland site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Roots (C3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Recent Iron Reduction in Tilled <input type="checkbox"/> Inundation Visible on Aerial <input type="checkbox"/> Soils (C6) <input type="checkbox"/> Imagery (B7) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Sparsely Vegetated Concave <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery <input type="checkbox"/> (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Microtopographic Relief (D4)
Field Observations: Surface water present? Yes <u> </u> No <u>X</u> Depth (inches): _____ Water table present? Yes <u>X</u> No <u> </u> Depth (inches): <u>2</u> Saturation present? Yes <u>X</u> No <u> </u> Depth (inches): <u>0</u> (includes capillary fringe)	Indicators of wetland hydrology present? <u>Yes</u>
Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION - Use scientific names of plants

Sampling Point: W1-wet

Tree Stratum					Plot Size (30)		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Acer rubrum</i>						5	Y	FAC
2									
3									
4									
5									
6									
7									
8									
9									
10									
						5	= Total Cover		
Sapling/Shrub Stratum					Plot Size (15)		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Vaccinium corymbosum</i>						10	Y	FACW
2	<i>Spiraea alba</i>						10	Y	FACW
3									
4									
5									
6									
7									
8									
9									
10									
						20	= Total Cover		
Herb Stratum					Plot Size (5)		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Carex stricta</i>						60	Y	OBL
2	<i>Spiraea alba</i>						5	N	FACW
3	<i>Lycopus americanus</i>						6	N	OBL
4	<i>Onoclea sensibilis</i>						5	N	FACW
5	<i>Thelypteris palustris</i>						2	N	FACW
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
						78	= Total Cover		
Woody Vine Stratum					Plot Size ()		Absolute % Cover	Dominant Species	Indicator Status
1									
2									
3									
4									
5									
						0	= Total Cover		

50/20 Thresholds

	20%	50%
Tree Stratum	1	3
Sapling/Shrub Stratum	4	10
Herb Stratum	16	39
Woody Vine Stratum	0	0

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: 100.00% (A/B)

Prevalence Index Worksheet
 Total % Cover of:
 OBL species 66 x 1 = 66
 FACW species 32 x 2 = 64
 FAC species 5 x 3 = 15
 FACU species 0 x 4 = 0
 UPL species 0 x 5 = 0
 Column totals 103 (A) 145 (B)
 Prevalence Index = B/A = 1.41

Hydrophytic Vegetation Indicators:
☐ Rapid test for hydrophytic vegetation
☒ Dominance test is >50%
☒ Prevalence index is ≤3.0*
 Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
 Problematic hydrophytic vegetation* (explain)
*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 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

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

SOIL**Sampling Point:** W1-wet

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

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-4	10YR2/1	100					Mucky Peat	
4-8	10YR3/1	90	10YR5/2	10	D	PL	Sandy Loam	
8-16	10YR5/2	60	10YR3/2		C	PL		
-								
-								
-								
-								
-								
-								
-								

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ☐ Histisol (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) (**LRR R, MLRA 149B**)

- ☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ 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)

Indicators for Problematic Hydric Soils:

- ☐ 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**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ 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)

*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

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Fort Devens City/County: Lancaster Sampling Date: 6/12/2018
 Applicant/Owner: DPW-Environmental State: Massachusetts Sampling Point: W3-up
 Investigator(s): Ben G. Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None
 Slope (%): 1 Lat.: 42.5123823 Long.: -71.6416638 Datum: _____
 Soil Map Unit Name Windsor loamy sand, 3-8% slopes NWI Classification: Upland Forest
 Are climatic/hydrologic conditions of the site typical for this time of the year? Yes (If no, explain in remarks)
 Are vegetation _____, soil _____, or hydrology _____ significantly disturbed? Are "normal
 Are vegetation _____, soil _____, or hydrology _____ naturally problematic? circumstances" present? Yes
 (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? <u>No</u> Hydric soil present? <u>No</u> Indicators of wetland hydrology present? <u>No</u>	Is the sampled area within a wetland? <u>No</u> If yes, optional wetland site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

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

VEGETATION - Use scientific names of plants

Sampling Point: W3-up

Tree Stratum					Plot Size (30)		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Pinus strobus</i>					50	Y	FACU	
2	<i>Quercus velutina</i>					20	Y	UPL	
3	<i>Acer rubrum</i>					15	N	FAC	
4									
5									
6									
7									
8									
9									
10									
						85	= Total Cover		
Sapling/Shrub Stratum					Plot Size (15)		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Gaylussacia frondosa</i>					50	Y	FAC	
2	<i>Hamamelis virginiana</i>					10	N	FACU	
3									
4									
5									
6									
7									
8									
9									
10									
						60	= Total Cover		
Herb Stratum					Plot Size (5)		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Vaccinium angustifolium</i>					30	Y	FACU	
2	<i>Gaylussacia frondosa</i>					20	Y	FAC	
3	<i>Pteridium aquilinum</i>					10	N	FACU	
4	<i>Cornus canadensis</i>					5	N	FAC	
5	<i>Betula lenta</i>					5	N	FACU	
6	<i>Rubus hispidus</i>					2	N	FACW	
7									
8									
9									
10									
11									
12									
13									
14									
15									
						72	= Total Cover		
Woody Vine Stratum					Plot Size ()		Absolute % Cover	Dominant Species	Indicator Status
1									
2									
3									
4									
5									
						0	= Total Cover		

50/20 Thresholds

	20%	50%
Tree Stratum	17	43
Sapling/Shrub Stratum	12	30
Herb Stratum	14	36
Woody Vine Stratum	0	0

Dominance Test Worksheet
 Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across all Strata: 5 (B)
 Percent of Dominant Species that are OBL, FACW, or FAC: 40.00% (A/B)

Prevalence Index Worksheet
 Total % Cover of:
 OBL species 0 x 1 = 0
 FACW species 2 x 2 = 4
 FAC species 90 x 3 = 270
 FACU species 105 x 4 = 420
 UPL species 20 x 5 = 100
 Column totals 217 (A) 794 (B)
 Prevalence Index = B/A = 3.66

Hydrophytic Vegetation Indicators:
☐ Rapid test for hydrophytic vegetation
☐ Dominance test is >50%
☐ Prevalence index is ≤3.0*
☐ Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
☐ Problematic hydrophytic vegetation* (explain)
*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 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? No

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

SOIL

Sampling Point: W3-up

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

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-3	10YR2/1	100					Fine Sand	
3-12	10YR5/8	100					Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

☐ Histisol (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) (**LRR R, MLRA 149B**)

☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
☐ 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)

Indicators for Problematic Hydric Soils:

☐ 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**)
☐ Dark Surface (S7) (**LRR K, L**)
☐ 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)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? No

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Fort Devens City/County: Lancaster Sampling Date: 6/12/2018
 Applicant/Owner: DPW-Environmental State: Massachusetts Sampling Point: W3-wet
 Investigator(s): Ben G. Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None
 Slope (%): 4 Lat.: 42.5123051 Long.: -71.6415006 Datum: _____
 Soil Map Unit Name _____ NWI Classification: _____
 Are climatic/hydrologic conditions of the site typical for this time of the year? Yes (If no, explain in remarks)
 Are vegetation _____, soil _____, or hydrology _____ significantly disturbed? Are "normal
 Are vegetation _____, soil _____, or hydrology _____ naturally problematic? circumstances" present? Yes
 (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? <u>Yes</u> Hydric soil present? <u>Yes</u> Indicators of wetland hydrology present? <u>Yes</u>	Is the sampled area within a wetland? <u>Yes</u> If yes, optional wetland site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

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 checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Roots (C3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Recent Iron Reduction in Tilled <input type="checkbox"/> Inundation Visible on Aerial <input type="checkbox"/> Soils (C6) <input type="checkbox"/> Imagery (B7) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Sparsely Vegetated Concave <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery <input type="checkbox"/> (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Microtopographic Relief (D4)
Field Observations: Surface water present? Yes <u> </u> No <u>X</u> Depth (inches): _____ Water table present? Yes <u>X</u> No <u> </u> Depth (inches): <u>1</u> Saturation present? Yes <u>X</u> No <u> </u> Depth (inches): <u>0</u> (includes capillary fringe)	Indicators of wetland hydrology present? <u>Yes</u>
Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION - Use scientific names of plants

Sampling Point: W3-wet

Tree Stratum					Plot Size (30)		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Acer rubrum</i>					20	Y	FAC	
2	<i>Pinus strobus</i>					5	Y	FACU	
3									
4									
5									
6									
7									
8									
9									
10									
						25	= Total Cover		
Sapling/Shrub Stratum					Plot Size (15)		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Chamaedaphne calyculata</i>					60	Y	OBL	
2	<i>Alnus incana</i>					5	N	FACW	
3	<i>Spiraea tomentosa</i>					5	N	FACW	
4									
5									
6									
7									
8									
9									
10									
						70	= Total Cover		
Herb Stratum					Plot Size (5)		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Carex lacustris</i>					40	Y	OBL	
2	<i>Carex stricta</i>					15	Y	OBL	
3	<i>Symplocarpus foetidus</i>					15	Y	OBL	
4	<i>Calamagrostis canadensis</i>					15	Y	OBL	
5	<i>Hypericum virginicum</i>					5	N	OBL	
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
						90	= Total Cover		
Woody Vine Stratum					Plot Size ()		Absolute % Cover	Dominant Species	Indicator Status
1									
2									
3									
4									
5									
						0	= Total Cover		

50/20 Thresholds

	20%	50%
Tree Stratum	5	13
Sapling/Shrub Stratum	14	35
Herb Stratum	18	45
Woody Vine Stratum	0	0

Dominance Test Worksheet
 Number of Dominant Species that are OBL, FACW, or FAC: 6 (A)
 Total Number of Dominant Species Across all Strata: 7 (B)
 Percent of Dominant Species that are OBL, FACW, or FAC: 85.71% (A/B)

Prevalence Index Worksheet
 Total % Cover of:
 OBL species 150 x 1 = 150
 FACW species 10 x 2 = 20
 FAC species 20 x 3 = 60
 FACU species 5 x 4 = 20
 UPL species 0 x 5 = 0
 Column totals 185 (A) 250 (B)
 Prevalence Index = B/A = 1.35

Hydrophytic Vegetation Indicators:
☐ Rapid test for hydrophytic vegetation
☒ Dominance test is >50%
☒ Prevalence index is ≤3.0*
 Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
 Problematic hydrophytic vegetation* (explain)
*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 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

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

SOIL**Sampling Point:** W3-wet

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

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-36	10YR2/1	100					Peaty Muck	
-								
-								
-								
-								
-								
-								
-								
-								
-								

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ☒ Histisol (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) (**LRR R, MLRA 149B**)

- ☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ☐ 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)

Indicators for Problematic Hydric Soils:

- ☐ 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**)
- ☐ Dark Surface (S7) (**LRR K, L**)
- ☐ 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)

*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

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Fort Devens City/County: Nantes Sampling Date: 6/12/2018
 Applicant/Owner: DPW-Environmental State: France Sampling Point: W5-up
 Investigator(s): Ben G. Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex
 Slope (%): 10 Lat.: 42.509878 Long.: -71.641257 Datum: _____
 Soil Map Unit Name Windsor loamy sand, 8-15% slopes NWI Classification: Upland Forest
 Are climatic/hydrologic conditions of the site typical for this time of the year? No (If no, explain in remarks)
 Are vegetation _____, soil _____, or hydrology _____ significantly disturbed? Are "normal
 Are vegetation _____, soil _____, or hydrology _____ naturally problematic? circumstances" present? No
 (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? <u>No</u> Hydric soil present? <u>No</u> Indicators of wetland hydrology present? <u>No</u>	Is the sampled area within a wetland? <u>No</u> If yes, optional wetland site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

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

VEGETATION - Use scientific names of plants

Sampling Point: W5-up

Tree Stratum					Plot Size (30)		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Pinus strobus</i>					40	Y	FACU	
2	<i>Quercus alba</i>					20	Y	FACU	
3	<i>Acer rubrum</i>					10	N	FAC	
4									
5									
6									
7									
8									
9									
10									
						70	= Total Cover		
Sapling/Shrub Stratum					Plot Size (15)		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Acer rubrum</i>					5	Y	FAC	
2	<i>Pinus strobus</i>					2	Y	FACU	
3									
4									
5									
6									
7									
8									
9									
10									
						7	= Total Cover		
Herb Stratum					Plot Size (5)		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Carex pensylvanica</i>					10	Y	UPL	
2	<i>Dendrolycopodium obscurum</i>					5	Y	FACU	
3	<i>Trientalis borealis</i>					2	N	FAC	
4	<i>Rubus hispidus</i>					2	N	FACW	
5	<i>Quercus rubra</i>					2	N	FACU	
6	<i>Maianthemum canadense</i>					1	N	FACU	
7									
8									
9									
10									
11									
12									
13									
14									
15									
						22	= Total Cover		
Woody Vine Stratum					Plot Size ()		Absolute % Cover	Dominant Species	Indicator Status
1									
2									
3									
4									
5									
						0	= Total Cover		

50/20 Thresholds

	20%	50%
Tree Stratum	14	35
Sapling/Shrub Stratum	1	4
Herb Stratum	4	11
Woody Vine Stratum	0	0

Dominance Test Worksheet
 Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)
 Total Number of Dominant Species Across all Strata: 6 (B)
 Percent of Dominant Species that are OBL, FACW, or FAC: 16.67% (A/B)

Prevalence Index Worksheet
 Total % Cover of:
 OBL species 0 x 1 = 0
 FACW species 2 x 2 = 4
 FAC species 17 x 3 = 51
 FACU species 70 x 4 = 280
 UPL species 10 x 5 = 50
 Column totals 99 (A) 385 (B)
 Prevalence Index = B/A = 3.89

Hydrophytic Vegetation Indicators:
☐ Rapid test for hydrophytic vegetation
☐ Dominance test is >50%
☐ Prevalence index is ≤3.0*
☐ Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
☐ Problematic hydrophytic vegetation* (explain)
*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 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? No

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

SOIL

Sampling Point: W5-up

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

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-3	10YR2/1	100					Loamy Sand	
3-8	10YR4/4	100					Loamy Sand	
8-12	10YR5/6	100					Loamy Sand	
-								
-								
-								
-								
-								
-								
-								

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

☐ Histisol (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) (**LRR R, MLRA 149B**)

☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
☐ 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)

Indicators for Problematic Hydric Soils:

☐ 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**)
☐ Dark Surface (S7) (**LRR K, L**)
☐ 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)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? No

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Fort Devens City/County: Lancaster Sampling Date: 6/12/2018
 Applicant/Owner: DPW-Environmental State: United States Sampling Point: W5-Wet
 Investigator(s): Ben G. Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): Concave
 Slope (%): 2 Lat.: 42.5099367 Long.: -71.641788 Datum: _____
 Soil Map Unit Name _____ NWI Classification: _____
 Are climatic/hydrologic conditions of the site typical for this time of the year? Yes (If no, explain in remarks)
 Are vegetation _____, soil _____, or hydrology _____ significantly disturbed? Are "normal
 Are vegetation _____, soil _____, or hydrology _____ naturally problematic? circumstances" present? Yes
 (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? <u>Yes</u> Hydric soil present? <u>Yes</u> Indicators of wetland hydrology present? <u>Yes</u>	Is the sampled area within a wetland? <u>Yes</u> If yes, optional wetland site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

HYDROLOGY

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 checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Roots (C3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Recent Iron Reduction in Tilled <input type="checkbox"/> Inundation Visible on Aerial <input type="checkbox"/> Soils (C6) <input type="checkbox"/> Imagery (B7) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Sparsely Vegetated Concave <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery <input type="checkbox"/> (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Microtopographic Relief (D4)
Field Observations: Surface water present? Yes <u> </u> No <u>X</u> Depth (inches): _____ Water table present? Yes <u>X</u> No <u> </u> Depth (inches): <u>2</u> Saturation present? Yes <u>X</u> No <u> </u> Depth (inches): <u>0</u> (includes capillary fringe)	Indicators of wetland hydrology present? <u>Yes</u>
Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION - Use scientific names of plants

Sampling Point: W5-Wet

Tree Stratum					Plot Size (30)		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Acer rubrum</i>					10	Y	FAC	
2									
3									
4									
5									
6									
7									
8									
9									
10									
						10	= Total Cover		
Sapling/Shrub Stratum					Plot Size (15)		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Vaccinium corymbosum</i>					10	Y	FACW	
2	<i>Carpinus caroliniana</i>					5	Y	FAC	
3									
4									
5									
6									
7									
8									
9									
10									
						15	= Total Cover		
Herb Stratum					Plot Size (5)		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Symplocarpus foetidus</i>					60	Y	OBL	
2	<i>Galium asprellum</i>					20	Y	OBL	
3	<i>Osmunda cinnamomea</i>					15	N	FACW	
4	<i>Impatiens capensis</i>					10	N	FACW	
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
						105	= Total Cover		
Woody Vine Stratum					Plot Size ()		Absolute % Cover	Dominant Species	Indicator Status
1									
2									
3									
4									
5									
						0	= Total Cover		

50/20 Thresholds

	20%	50%
Tree Stratum	2	5
Sapling/Shrub Stratum	3	8
Herb Stratum	21	53
Woody Vine Stratum	0	0

Dominance Test Worksheet
 Number of Dominant Species that are OBL, FACW, or FAC: 5 (A)
 Total Number of Dominant Species Across all Strata: 5 (B)
 Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet
 Total % Cover of:
 OBL species 80 x 1 = 80
 FACW species 35 x 2 = 70
 FAC species 15 x 3 = 45
 FACU species 0 x 4 = 0
 UPL species 0 x 5 = 0
 Column totals 130 (A) 195 (B)
 Prevalence Index = B/A = 1.50

Hydrophytic Vegetation Indicators:
☐ Rapid test for hydrophytic vegetation
☒ Dominance test is >50%
☒ Prevalence index is ≤3.0*
 Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)
 Problematic hydrophytic vegetation* (explain)
*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 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

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

SOIL

Sampling Point: W5-Wet

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

[illegible]

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- _____ Histisol (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) (**LRR R, MLRA 149B**)

Indicators for Problematic Hydric Soils:

Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
 Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
 Loamy Mucky Mineral (F1) (**LRR K, L**)
 Loamy Gleyed Matrix (F2)
 X Depleted Matrix (F3)
 Redox Dark Surface (F6)
 Depleted Dark Surface (F7)
 Redox Depressions (F8)

☐ 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**)
☐ Dark Surface (S7) (**LRR K, L**)
☐ 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)

*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

Remarks:

B2: MADEP Bordering Vegetated Wetlands Forms

MassDEP Field Data Form and Instructions

The Department of Environmental Protection's field data form should be used when delineating the boundary of a Bordering Vegetated Wetland (BVW) under the Massachusetts Wetlands Protection Act (M.G.L. Chapter 131, Section 40) and regulations (310 CMR 10.55). It should be used whether the boundary is delineated by vegetation alone or by vegetation and other indicators of wetland hydrology. Note: if detailed vegetative assessment is not necessary for the site, make a note on the data form and submit it. The field data form should be submitted with a Request for Determination of Applicability or a Notice of Intent. Details on the criteria for delineating a BVW boundary and the terminology used in this field data form are described in the handbook, *Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act* (MA Department of Environmental Protection, Division of Wetlands and Waterways, 1995).

INSTRUCTIONS

The data form includes a section on project identification, including the applicant's name, the name of the person performing the delineation, project location, and the MassDEP file number, if available. If vegetation alone is presumed adequate to delineate the BVW boundary, mark the first box, complete Section I of the data form, and submit the document. If vegetation and other indicators of hydrology are used to delineate the BVW boundary, mark the second box, complete Sections I and II of the form, and submit the document. MassDEP has selected the dominance test as the preferred method of vegetation analysis at sample plot locations. The information gathered for that method should be recorded on the form. If a method other than the dominance test is used, mark the third box and explain the method and why it was used.

Section I: Vegetation

Section I should be used to record information about the vegetation within an observation plot and on a transect used to delineate the BVW boundary. Note the date of the delineation. Submit a separate data form for each observation plot. Attach supplemental sheets if more space is needed.

A. Sample Layer and Plant Species

Record each plant species using common and scientific names for the following layers:

Ground Cover: woody vegetation less than 3 feet in height (seedlings), non-climbing woody vines less than 3 feet in height, and non-woody vegetation (including mosses) of any height within a 5-foot radius plot; Shrubs: woody vegetation between 3 feet and 20 feet in height within a 15-foot radius plot;

Saplings: woody vegetation over 20 feet in height with a diameter at breast height (dbh) greater than or equal to 0.4 inches to less than 5 inches within a 15-foot radius plot; (note: dbh is measured 4.5 feet from the ground);

Climbing woody vines: woody vines that are attached, rooted, or climbing on trees, saplings, or shrubs within a 30-foot radius plot; and

Trees: woody vegetation with a dbh of 5 inches or greater and over 20 feet in height within a 30-foot radius plot.

If you do not recognize a plant species or do not know a plant's name, call it a generic name. Unknown plants need to be identified only if they are determined to be dominant plants. In that case, a plant identification book or key may be used to determine the species.

B. Percent Cover

Determine percent cover (or basal area for trees) for each plant species in each layer by visual analysis or measurement. (See handbook for information about determining percent cover, page 12.)

C. Percent Dominance

Determine percent dominance for each plant species by dividing the percent cover or basal area for each plant species by the total percent cover or basal area for the layer. (See handbook for information about the dominance test, pages 15-19.)

D. Dominant Plants

1. Identify the dominant plants. Dominant plants are:

- plants with a percent dominance of 50 percent or greater, or plants whose percent dominance add up to immediately exceed 50 percent;
- plants with a percent dominance of 20 percent or greater;
- plants with a percent dominance equal to a plant already listed as a dominant species.

2. Determine common and scientific names for any unknown plants identified as dominant plants.

E. Wetland Indicator Category

1. Identify the Wetland Indicator Category for all dominant plant species using the *National List of Plant Species That Occur in Wetlands: Massachusetts*.

2. Use an asterisk to mark the wetland indicator plants. Wetland indicator plants are any of the following:

- plant species listed in the Wetlands Protection Act;
- plants in the genus *Sphagnum*;
- plants listed as Facultative (FAC), Facultative+ (FAC+), Facultative Wetland (FACW-), Facultative Wetland (FACW), Facultative Wetland+ (FACW+) or Obligate (OBL);
- plants with morphological or physiological adaptations (such as buttressed or fluted trunks, shallow roots, or adventitious roots).

If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk (e.g. White pine, *Pinus strobus*, FacU*/shallow roots, buttressed trunks).

Vegetation Conclusion

List the number of dominant wetland indicator plants and the number of dominant non-wetland indicator plants. If the number of dominant wetland indicator plants is equal to or greater than the number of non-wetland indicator plants, and vegetation alone is presumed adequate for the delineation, the plot is located in a BVW.

If vegetation alone has been chosen for the delineation at this site, complete only Section I and submit the form with a Request for Determination of Applicability or a Notice of Intent. Otherwise, continue the delineation process and record information for Section II on the second page of the form.

Section II: Indicators of Hydrology

Section II should be used to record information on indicators of hydrology in those areas where vegetation alone is not presumed adequate to delineate the BVW boundary, or to overcome the presumption that vegetation alone is adequate.

Hydric Soil Interpretation

1. Soil Survey: Record information about the site from the Soil Survey Report prepared by the U.S. Natural Resources Conservation Service (NRCS) - formerly called the Soil Conservation Service.
2. Soil Description: Record information based on observations at a soil test hole located within the vegetation observation plot. Describe the soil profile of each soil horizon, noting the depth. Identify the matrix and mottles colors by hue, value, and chroma (information from Munsell Soil Color Charts). For example, 10YR 5/2. Notes on soil texture and other soil characteristics may be recorded in the Remarks section.
3. Other: note any additional information used to determine if hydric soil is present, such as regional field indicator guides.

Conclusion: Indicate whether the soil is hydric based on information observed in the field. (See list of Hydric Soil Indicators in the handbook, page 29.)

Other Indicators of Hydrology

Record observations of other indicators of hydrology. Check and describe all that apply. Due to their seasonal or temporal nature, these other indicators generally are used in conjunction with vegetation and soils to determine the location of the BVW boundary.

Vegetation and Hydrology Conclusion

Determine if the observation plot is in a BVW. The observation plot is in a BVW if the number of dominant wetland indicator plants is equal to or greater than the number of dominant non-wetland indicator plants, and if hydric soil or other indicators of hydrology are present.

For an observation plot located in a disturbed area, any one of the three indicators is sufficient to determine that the sample location is in a BVW. In that case, make a note on the form about that conclusion.

Submit the completed form with a Request for Determination of Applicability or a Notice of Intent.

MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: DPW-Environmental Prepared by: Benjamin Griffith, Normandeau Associates Project location: Fort Devens, Lancaster, MA
 DEP File #: _____

Check all that apply:

- ☐ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- ☒ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- ☐ Method other than dominance test used (attach additional information)

Section I.

Vegetation	Observation Plot Number: W1		Transect Number:	Date of Delineation: 6/11/2018
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*

Trees:

*Red maple (Acer rubrum)	5% cover	100%	Yes	FAC
---------------------------------	-----------------	-------------	------------	------------

Sapling/Shrub:

*Highbush blueberry (Vaccinium corymbosum)	10% cover	50%	Yes	FACW
*Meadowsweet (Spiraea alba)	10% cover	50%	Yes	FACW

Herbs:

*Tussuck sedge (Carex stricta)	60% cover	77%	Yes	OBL
*Meadowsweet (Spiraea alba)	5% cover	7%	No	FACW
*American water horehound (Lycopus americanus)	5% cover	7%	No	OBL
*Sensitive fern (Onoclea sensibilis)	5% cover	7%	No	FACW
*Marsh fern (Thelypteris palustris)	2% cover	2%	No	FACW

* Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:

Number of dominant wetland indicator plants: **4**

Number of dominant non-wetland indicator plants: **0**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? **yes** no

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? **yes** no
title/date:
map number:
soil type mapped:
hydric soil inclusions:

Are field observations consistent with soil survey? yes no
Remarks:

2. Soil Description

Horizon Depth Matrix Color Mottles Color

A	0-4"	10YR2/1	
Bg1	4-8"	10YR3/1	10YR5/2
Bg2	8-16"	10YR5/2	10YR3/2

Remarks:

3. Other:

Conclusion: Is soil hydric? **yes** no

Other Indicators of Hydrology: (check all that apply & describe)

- ☐ Site Inundated: _____
- ☒ Depth to free water in observation hole: _____
- ☒ Depth to soil saturation in observation hole: ____0____
- ☐ Water marks: _____
- ☐ Drift lines: _____
- ☐ Sediment Deposits: _____
- ☐ Drainage patterns in BVW: _____
- ☐ Oxidized rhizospheres: _____
- ☐ Water-stained leaves: _____
- ☐ Recorded Data (streams, lake, or tidal gauge; aerial photo; other):

- ☐ Other: _____

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ # of non-wetland indicator plants	__X__	____
Wetland hydrology present:		
Hydric soil present	__X__	____
Other indicators of hydrology present	__X__	____
Sample location is in a BVW	__X__	____

Submit this form with the Request for Determination of Applicability or Notice of Intent.

MassDEP Field Data Form and Instructions

The Department of Environmental Protection's field data form should be used when delineating the boundary of a Bordering Vegetated Wetland (BVW) under the Massachusetts Wetlands Protection Act (M.G.L. Chapter 131, Section 40) and regulations (310 CMR 10.55). It should be used whether the boundary is delineated by vegetation alone or by vegetation and other indicators of wetland hydrology. Note: if detailed vegetative assessment is not necessary for the site, make a note on the data form and submit it. The field data form should be submitted with a Request for Determination of Applicability or a Notice of Intent. Details on the criteria for delineating a BVW boundary and the terminology used in this field data form are described in the handbook, *Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act* (MA Department of Environmental Protection, Division of Wetlands and Waterways, 1995).

INSTRUCTIONS

The data form includes a section on project identification, including the applicant's name, the name of the person performing the delineation, project location, and the MassDEP file number, if available. If vegetation alone is presumed adequate to delineate the BVW boundary, mark the first box, complete Section I of the data form, and submit the document. If vegetation and other indicators of hydrology are used to delineate the BVW boundary, mark the second box, complete Sections I and II of the form, and submit the document. MassDEP has selected the dominance test as the preferred method of vegetation analysis at sample plot locations. The information gathered for that method should be recorded on the form. If a method other than the dominance test is used, mark the third box and explain the method and why it was used.

Section I: Vegetation

Section I should be used to record information about the vegetation within an observation plot and on a transect used to delineate the BVW boundary. Note the date of the delineation. Submit a separate data form for each observation plot. Attach supplemental sheets if more space is needed.

A. Sample Layer and Plant Species

Record each plant species using common and scientific names for the following layers:

Ground Cover: woody vegetation less than 3 feet in height (seedlings), non-climbing woody vines less than 3 feet in height, and non-woody vegetation (including mosses) of any height within a 5-foot radius plot; Shrubs: woody vegetation between 3 feet and 20 feet in height within a 15-foot radius plot;

Saplings: woody vegetation over 20 feet in height with a diameter at breast height (dbh) greater than or equal to 0.4 inches to less than 5 inches within a 15-foot radius plot; (note: dbh is measured 4.5 feet from the ground);

Climbing woody vines: woody vines that are attached, rooted, or climbing on trees, saplings, or shrubs within a 30-foot radius plot; and

Trees: woody vegetation with a dbh of 5 inches or greater and over 20 feet in height within a 30-foot radius plot.

If you do not recognize a plant species or do not know a plant's name, call it a generic name. Unknown plants need to be identified only if they are determined to be dominant plants. In that case, a plant identification book or key may be used to determine the species.

B. Percent Cover

Determine percent cover (or basal area for trees) for each plant species in each layer by visual analysis or measurement. (See handbook for information about determining percent cover, page 12.)

C. Percent Dominance

Determine percent dominance for each plant species by dividing the percent cover or basal area for each plant species by the total percent cover or basal area for the layer. (See handbook for information about the dominance test, pages 15-19.)

D. Dominant Plants

1. Identify the dominant plants. Dominant plants are:

- plants with a percent dominance of 50 percent or greater, or plants whose percent dominance add up to immediately exceed 50 percent;
- plants with a percent dominance of 20 percent or greater;
- plants with a percent dominance equal to a plant already listed as a dominant species.

2. Determine common and scientific names for any unknown plants identified as dominant plants.

E. Wetland Indicator Category

1. Identify the Wetland Indicator Category for all dominant plant species using the *National List of Plant Species That Occur in Wetlands: Massachusetts*.

2. Use an asterisk to mark the wetland indicator plants. Wetland indicator plants are any of the following:

- plant species listed in the Wetlands Protection Act;
- plants in the genus *Sphagnum*;
- plants listed as Facultative (FAC), Facultative+ (FAC+), Facultative Wetland (FACW-), Facultative Wetland (FACW), Facultative Wetland+ (FACW+) or Obligate (OBL);
- plants with morphological or physiological adaptations (such as buttressed or fluted trunks, shallow roots, or adventitious roots).

If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk (e.g. White pine, *Pinus strobus*, FacU*/shallow roots, buttressed trunks).

Vegetation Conclusion

List the number of dominant wetland indicator plants and the number of dominant non-wetland indicator plants. If the number of dominant wetland indicator plants is equal to or greater than the number of non-wetland indicator plants, and vegetation alone is presumed adequate for the delineation, the plot is located in a BVW.

If vegetation alone has been chosen for the delineation at this site, complete only Section I and submit the form with a Request for Determination of Applicability or a Notice of Intent. Otherwise, continue the delineation process and record information for Section II on the second page of the form.

Section II: Indicators of Hydrology

Section II should be used to record information on indicators of hydrology in those areas where vegetation alone is not presumed adequate to delineate the BVW boundary, or to overcome the presumption that vegetation alone is adequate.

Hydric Soil Interpretation

1. Soil Survey: Record information about the site from the Soil Survey Report prepared by the U.S. Natural Resources Conservation Service (NRCS) - formerly called the Soil Conservation Service.
2. Soil Description: Record information based on observations at a soil test hole located within the vegetation observation plot. Describe the soil profile of each soil horizon, noting the depth. Identify the matrix and mottles colors by hue, value, and chroma (information from Munsell Soil Color Charts). For example, 10YR 5/2. Notes on soil texture and other soil characteristics may be recorded in the Remarks section.
3. Other: note any additional information used to determine if hydric soil is present, such as regional field indicator guides.

Conclusion: Indicate whether the soil is hydric based on information observed in the field. (See list of Hydric Soil Indicators in the handbook, page 29.)

Other Indicators of Hydrology

Record observations of other indicators of hydrology. Check and describe all that apply. Due to their seasonal or temporal nature, these other indicators generally are used in conjunction with vegetation and soils to determine the location of the BVW boundary.

Vegetation and Hydrology Conclusion

Determine if the observation plot is in a BVW. The observation plot is in a BVW if the number of dominant wetland indicator plants is equal to or greater than the number of dominant non-wetland indicator plants, and if hydric soil or other indicators of hydrology are present.

For an observation plot located in a disturbed area, any one of the three indicators is sufficient to determine that the sample location is in a BVW. In that case, make a note on the form about that conclusion.

Submit the completed form with a Request for Determination of Applicability or a Notice of Intent.

MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: DPW-Environmental Prepared by: Benjamin Griffith, Normandeau Associates Project location: Fort Devens, Lancaster, MA
 DEP File #: _____

Check all that apply:

- ☐ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- ☒ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- ☐ Method other than dominance test used (attach additional information)

Section I.

Vegetation	Observation Plot Number: W3		Transect Number:	Date of Delineation: 6/12/2018
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*

Trees:

*Red maple (<i>Acer rubrum</i>)	20% cover		Yes	FAC
White Pine (<i>Pinus strubus</i>)	5% cover		Yes	FACU

Sapling/Shrub:

*Leatherleaf (<i>Chamaedaphne calyculata</i>)	60% cover		Yes	OBL
*Speckled alder (<i>Alnus incana</i>)	5% cover		No	FACW
*Steeplebush (<i>Spiraea tomentosa</i>)	5% cover		No	FACW

Herbs:

*Lake Sedge (<i>Carex lacustris</i>)	40% cover		Yes	OBL
*Tussuck sedge (<i>Carex stricta</i>)	15% cover		Yes	OBL
*Skunk cabbage (<i>Symplocarpus foetidus</i>)	15% cover		Yes	OBL
*Blue joint grass (<i>Calamagrostis canadensis</i>)	15% cover		Yes	OBL
*Marsh St. Johnswort (<i>Hypericum virginicum</i>)	5% cover		No	OBL

* Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c. 131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:

Number of dominant wetland indicator plants: **6**

Number of dominant non-wetland indicator plants: **1**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? **yes** no

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? **yes** no
title/date:
map number:
soil type mapped:
hydric soil inclusions:

Are field observations consistent with soil survey? yes no

Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
---------	-------	--------------	---------------

	0-36"	10YR2/1	

Remarks:

Histisol (A1)

3. Other:

Conclusion: Is soil hydric? **yes** no

Other Indicators of Hydrology: (check all that apply & describe)

- ☐ Site Inundated: _____
- ☐ Depth to free water in observation hole: _____
- ☐ Depth to soil saturation in observation hole: _____
- ☐ Water marks: _____
- ☐ Drift lines: _____
- ☐ Sediment Deposits: _____
- ☐ Drainage patterns in BVW: _____
- ☐ Oxidized rhizospheres: _____
- ☐ Water-stained leaves: _____
- ☐ Recorded Data (streams, lake, or tidal gauge; aerial photo; other):

- ☐ Other: _____

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ # of non-wetland indicator plants	<u> X </u>	<u> </u>
Wetland hydrology present:		
Hydric soil present	<u> X </u>	<u> </u>
Other indicators of hydrology present	<u> X </u>	<u> </u>
Sample location is in a BVW	<u> X </u>	<u> </u>

Submit this form with the Request for Determination of Applicability or Notice of Intent.

MassDEP Field Data Form and Instructions

The Department of Environmental Protection's field data form should be used when delineating the boundary of a Bordering Vegetated Wetland (BVW) under the Massachusetts Wetlands Protection Act (M.G.L. Chapter 131, Section 40) and regulations (310 CMR 10.55). It should be used whether the boundary is delineated by vegetation alone or by vegetation and other indicators of wetland hydrology. Note: if detailed vegetative assessment is not necessary for the site, make a note on the data form and submit it. The field data form should be submitted with a Request for Determination of Applicability or a Notice of Intent. Details on the criteria for delineating a BVW boundary and the terminology used in this field data form are described in the handbook, *Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act* (MA Department of Environmental Protection, Division of Wetlands and Waterways, 1995).

INSTRUCTIONS

The data form includes a section on project identification, including the applicant's name, the name of the person performing the delineation, project location, and the MassDEP file number, if available. If vegetation alone is presumed adequate to delineate the BVW boundary, mark the first box, complete Section I of the data form, and submit the document. If vegetation and other indicators of hydrology are used to delineate the BVW boundary, mark the second box, complete Sections I and II of the form, and submit the document. MassDEP has selected the dominance test as the preferred method of vegetation analysis at sample plot locations. The information gathered for that method should be recorded on the form. If a method other than the dominance test is used, mark the third box and explain the method and why it was used.

Section I: Vegetation

Section I should be used to record information about the vegetation within an observation plot and on a transect used to delineate the BVW boundary. Note the date of the delineation. Submit a separate data form for each observation plot. Attach supplemental sheets if more space is needed.

A. Sample Layer and Plant Species

Record each plant species using common and scientific names for the following layers:

Ground Cover: woody vegetation less than 3 feet in height (seedlings), non-climbing woody vines less than 3 feet in height, and non-woody vegetation (including mosses) of any height within a 5-foot radius plot; Shrubs: woody vegetation between 3 feet and 20 feet in height within a 15-foot radius plot;

Saplings: woody vegetation over 20 feet in height with a diameter at breast height (dbh) greater than or equal to 0.4 inches to less than 5 inches within a 15-foot radius plot; (note: dbh is measured 4.5 feet from the ground);

Climbing woody vines: woody vines that are attached, rooted, or climbing on trees, saplings, or shrubs within a 30-foot radius plot; and

Trees: woody vegetation with a dbh of 5 inches or greater and over 20 feet in height within a 30-foot radius plot.

If you do not recognize a plant species or do not know a plant's name, call it a generic name. Unknown plants need to be identified only if they are determined to be dominant plants. In that case, a plant identification book or key may be used to determine the species.

B. Percent Cover

Determine percent cover (or basal area for trees) for each plant species in each layer by visual analysis or measurement. (See handbook for information about determining percent cover, page 12.)

C. Percent Dominance

Determine percent dominance for each plant species by dividing the percent cover or basal area for each plant species by the total percent cover or basal area for the layer. (See handbook for information about the dominance test, pages 15-19.)

D. Dominant Plants

1. Identify the dominant plants. Dominant plants are:

- plants with a percent dominance of 50 percent or greater, or plants whose percent dominance add up to immediately exceed 50 percent;
- plants with a percent dominance of 20 percent or greater;
- plants with a percent dominance equal to a plant already listed as a dominant species.

2. Determine common and scientific names for any unknown plants identified as dominant plants.

E. Wetland Indicator Category

1. Identify the Wetland Indicator Category for all dominant plant species using the *National List of Plant Species That Occur in Wetlands: Massachusetts*.

2. Use an asterisk to mark the wetland indicator plants. Wetland indicator plants are any of the following:

- plant species listed in the Wetlands Protection Act;
- plants in the genus *Sphagnum*;
- plants listed as Facultative (FAC), Facultative+ (FAC+), Facultative Wetland (FACW-), Facultative Wetland (FACW), Facultative Wetland+ (FACW+) or Obligate (OBL);
- plants with morphological or physiological adaptations (such as buttressed or fluted trunks, shallow roots, or adventitious roots).

If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk (e.g. White pine, *Pinus strobus*, FacU*/shallow roots, buttressed trunks).

Vegetation Conclusion

List the number of dominant wetland indicator plants and the number of dominant non-wetland indicator plants. If the number of dominant wetland indicator plants is equal to or greater than the number of non-wetland indicator plants, and vegetation alone is presumed adequate for the delineation, the plot is located in a BVW.

If vegetation alone has been chosen for the delineation at this site, complete only Section I and submit the form with a Request for Determination of Applicability or a Notice of Intent. Otherwise, continue the delineation process and record information for Section II on the second page of the form.

Section II: Indicators of Hydrology

Section II should be used to record information on indicators of hydrology in those areas where vegetation alone is not presumed adequate to delineate the BVW boundary, or to overcome the presumption that vegetation alone is adequate.

Hydric Soil Interpretation

1. Soil Survey: Record information about the site from the Soil Survey Report prepared by the U.S. Natural Resources Conservation Service (NRCS) - formerly called the Soil Conservation Service.
2. Soil Description: Record information based on observations at a soil test hole located within the vegetation observation plot. Describe the soil profile of each soil horizon, noting the depth. Identify the matrix and mottles colors by hue, value, and chroma (information from Munsell Soil Color Charts). For example, 10YR 5/2. Notes on soil texture and other soil characteristics may be recorded in the Remarks section.
3. Other: note any additional information used to determine if hydric soil is present, such as regional field indicator guides.

Conclusion: Indicate whether the soil is hydric based on information observed in the field. (See list of Hydric Soil Indicators in the handbook, page 29.)

Other Indicators of Hydrology

Record observations of other indicators of hydrology. Check and describe all that apply. Due to their seasonal or temporal nature, these other indicators generally are used in conjunction with vegetation and soils to determine the location of the BVW boundary.

Vegetation and Hydrology Conclusion

Determine if the observation plot is in a BVW. The observation plot is in a BVW if the number of dominant wetland indicator plants is equal to or greater than the number of dominant non-wetland indicator plants, and if hydric soil or other indicators of hydrology are present.

For an observation plot located in a disturbed area, any one of the three indicators is sufficient to determine that the sample location is in a BVW. In that case, make a note on the form about that conclusion.

Submit the completed form with a Request for Determination of Applicability or a Notice of Intent.

MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: DPW-Environmental Prepared by: Benjamin Griffith, Normandeau Associates Project location: Fort Devens, Lancaster, MA
 DEP File #: _____

Check all that apply:

- ☐ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- ☒ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- ☐ Method other than dominance test used (attach additional information)

Section I.

Vegetation	Observation Plot Number: W5	Transect Number:	Date of Delineation: 6/12/2018
A. Sample Layer & Plant Species (by common/scientific name)	B. Percent Cover (or basal Area)	C. Percent Dominance	D. Dominant Plant (yes or no) E. Wetland Indicator Category*

Trees:

*Red maple (Acer rubrum)	10% cover		Yes	FAC
---------------------------------	------------------	--	------------	------------

Sapling/Shrub:

*Highbush blueberry (Vaccinium corymbosum)	10% cover		Yes	FACW
*American hornbeam (Carpinus caroliniana)	5% cover		Yes	FAC

Herbs:

*Skunk cabbage (Symplocarpus foetidus)	6% cover		Yes	OBL
*Rough bedstraw (Galium asprellum)	20% cover		Yes	OBL
*Cinnamon fern (Osmunda cinnamomea)	15% cover		Yes	FACW
*Jewelweed (Impatiens capensis)	10% cover		No	FACW

* Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:

Number of dominant wetland indicator plants: **6**

Number of dominant non-wetland indicator plants: **0**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? **yes** no

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? **yes** no
title/date:
map number:
soil type mapped:
hydric soil inclusions:

Are field observations consistent with soil survey? yes no
Remarks:

2. Soil Description

Horizon Depth Matrix Color Mottles Color

	0-4"	10YR2/1	
	4-10"	10YR4/2	10YR5/6

Remarks:
Depleted Matrix (F3)

3. Other:

Conclusion: Is soil hydric? **yes** no

Other Indicators of Hydrology: (check all that apply & describe)

- ☐ Site Inundated: _____
- ☐ Depth to free water in observation hole: _____
- ☐ Depth to soil saturation in observation hole: _____
- ☐ Water marks: _____
- ☐ Drift lines: _____
- ☐ Sediment Deposits: _____
- ☐ Drainage patterns in BVW: _____
- ☐ Oxidized rhizospheres: _____
- ☐ Water-stained leaves: _____
- ☐ Recorded Data (streams, lake, or tidal gauge; aerial photo; other):

- ☐ Other: _____

Vegetation and Hydrology Conclusion

	Yes	No
Number of wetland indicator plants ≥ # of non-wetland indicator plants	__X__	____
Wetland hydrology present:		
Hydric soil present	__X__	____
Other indicators of hydrology present	__X__	____
Sample location is in a BVW	__X__	____

Submit this form with the Request for Determination of Applicability or Notice of Intent.

B3: Normandeau Wetland Functions Data Forms



☐ Enrich./Calc. Seepage Swamp ☐ Floodplains/FP Forest ☐ Peatland (bogs & fens) ☐ Freshwater Marsh ☐ Unique Basin Swamp/Marsh, which often include: ☐ Black Ash ☐ Silver Maple ☐ Vegetated Shallow

Wetlands Functions & Values Data Sheet

Wetland ID: W02 **Date:** June 11, 2018 **Delineator:** Benjamin G
Number of Flags: _____ **Town:** Lancaster **Project:** Fort Devens
Wetland: Closed **Notes:** _____
Open Water Component?: No
Wetland Associated w/ Stream?: No
Vernal Pool Identified?: No **GPS Unit/Tech Initials:** Green/O'Brian **GPS Survey Complete:** Yes
Cowardin Classes (Dominant(%)/others (%)): PEM1E/PFO1E

<u>Water Regime</u>		<u>Special Modifiers</u>	
D- Temp. flooded	F- Semipermanently flooded	b- Beaver	x- excavated
E- Saturated	G- Intermittently exposed	d- Partially drained/ditched	s- spoil
F- Seasonally flooded	H- Permanently flooded	f-farmed	
F- Seasonally flooded/ saturated	J- Intermittently flooded	h-diked/impounded	
	K- Artificially flooded	r- artificial	

Functions and Values:			
F/V:	Suitable		Principal (Check)
	Y	N	
Groundwater Rech/Disch.			X
Floodflow Alteration		X	
Fish/Shellfish Habitat		X	
Sed/Tox Retention	X		
Nutrient Removal		X	
Sed/Shore Stabilization		x	
Production Export		X	
Wildlife Habitat		x	
Recreation		X	
Educate/Science Value		X	
Uniqueness/Heritage		X	
Visual Qual/Aesthetic		X	
End/Threatened Species		X	
Other:		X	

Notes:

Depression separated from bordering vegetated wetland by berm.

Dominant Plants:

Tree: Acer rubrum

Sapling/Shrub: Vaccinium corymbosum, Spiraea alba

Herb/Seedling: Carex stricta, Onoclea sensibilis,

Woody Vine: _____

Invasives: _____

Soils:

Texture: Sandy Loam

If mineral - Parent Material: Till

Restrictive Layer? None Observed

Sketch Map:

☐ Enrich./Calc. Seepage Swamp
 ☐ Floodplains/FP Forest
 ☐ Peatland (bogs & fens)
 ☐ Freshwater Marsh
 ☐ Unique Basin Swamp/Marsh, which often include:
 ☐ Black Ash
 ☐ Silver Maple
 ☐ Vegetated Shallow

Wetlands Functions & Values Data Sheet

Wetland ID: <u>W03</u>		Date: <u>June 12, 2018</u>		Delineator: <u>Benjamin G</u>	
Number of Flags: _____		Town: <u>Lancaster</u>		Project: <u>Fort Devens</u>	
Wetland: <u>Closed</u> Notes: _____					
Open Water Component?: <u>No</u>					
Wetland Associated w/ Stream?: <u>Yes (S01 and S02)</u>			Type: <u>Intermittent (S01)/Upper Perennial (S02)</u>		
Vernal Pool Identified?: <u>No</u>			GPS Unit/Tech Initials: <u>Green/O'Brian</u> GPS Survey Complete: <u>Yes</u>		
Cowardin Classes (Dominant(%)/others (%)): <u>PUB2Hb (60%)/PFO1E(30%)/PEM1,2F(10%)</u>					

<u>Water Regime</u>		<u>Special Modifiers</u>	
G- Temp. flooded	F- Semipermanently flooded	b- Beaver	x- excavated
H- Saturated	G- Intermittently exposed	d- Partially drained/ditched	s- spoil
I- Seasonally flooded	H- Permanently flooded	f-farmed	
G- Seasonally flooded/ saturated	J- Intermittently flooded	h-diked/impounded	
	K- Artificially flooded	r- artificial	

Functions and Values:			
F/V:	Suitable		Principal (Check)
	Y	N	
Groundwater Rech/Disch.			X
Floodflow Alteration			X
Fish/Shellfish Habitat		X	
Sed/Tox Retention		X	
Nutrient Removal		X	
Sed/Shore Stabilization		X	
Production Export		X	
Wildlife Habitat			X
Recreation		X	
Educate/Science Value		X	
Uniqueness/Heritage		X	
Visual Qual/Aesthetic		X	
End/Threatened Species		X	
Other:		X	

Notes:
Large beaver flowage with wooded fringe and small perennial stream adjacent

Dominant Plants:
 Tree: Acer rubrum, Pinus strobus

 Sapling/Shrub: Acer rubrum, vaccinium corymbosum

 Herb/Seedling: Carex stricta, Onsmunda cinnamomea, Parathelypteris novaboracensis, Symplocarpus foetidus, Nuphar luteum, Carex folliculata

 Woody Vine: _____
 Invasives: _____
Soils:
 Texture: Sandy Loam
 If mineral - Parent Material: Till

Sketch Map:

☐ Enrich./Calc. Seepage Swamp
 ☐ Floodplains/FP Forest
 ☐ Peatland (bogs & fens)
 ☐ Freshwater Marsh
 ☐ Unique Basin Swamp/Marsh, which often include:
 ☐ Black Ash
 ☐ Silver Maple
 ☐ Vegetated Shallow

Wetlands Functions & Values Data Sheet

Wetland ID: W04 **Date:** June 11, 2018 **Delineator:** Benjamin G
Number of Flags: _____ **Town:** Lancaster **Project:** Fort Devens
Wetland: Closed **Notes:** _____
Open Water Component?: No
Wetland Associated w/ Stream?: Yes (S01) **Type:** Intermittent
Vernal Pool Identified?: No **GPS Unit/Tech Initials:** Green/O'Brian **GPS Survey Complete:** Yes
Cowardin Classes (Dominant(%)/others (%)): PSS1E

<u>Water Regime</u> J- Temp. flooded K- Saturated L- Seasonally flooded H- Seasonally flooded/ saturated F- Semipermanently flooded G- Intermittently exposed H- Permanently flooded J- Intermittently flooded K- Artificially flooded	<u>Special Modifiers</u> b- Beaver d- Partially drained/ditched f- farmed h- diked/impounded r- artificial x- excavated s- spoil
--	--

Functions and Values:			
F/V:	Suitable		Principal (Check)
	Y	N	
Groundwater Rech/Disch.		X	
Floodflow Alteration	X		
Fish/Shellfish Habitat	X		
Sed/Tox Retention	X		
Nutrient Removal	X		
Sed/Shore Stabilization	X		
Production Export		X	
Wildlife Habitat			X
Recreation		X	
Educate/Science Value		X	
Uniqueness/Heritage		X	
Visual Qual/Aesthetic		X	
End/Threatened Species		X	
Other:		X	

Notes:

Small depression may be a vernal pool, but hydroperiod likely too short

Dominant Plants:

Tree: Acer rubrum

Sapling/Shrub: Vaccinium corymbosum, Liburnum lentago

Herb/Seedling: Scirpus cyperinus, Osmunda cinnamomea,

Woody Vine: _____

Invasives: _____

Soils:

Texture: Sandy Loam

If mineral - Parent Material: Till

Restrictive Layer? None Observed

Sketch Map:

☐ Enrich./Calc. Seepage Swamp
 ☐ Floodplains/FP Forest
 ☐ Peatland (bogs & fens)
 ☐ Freshwater Marsh
 ☐ Unique Basin Swamp/Marsh, which often include:
 ☐ Black Ash
 ☐ Silver Maple
 ☐ Vegetated Shallow

Wetlands Functions & Values Data Sheet

Wetland ID: W05 **Date:** June 12, 2018 **Delineator:** Benjamin G
Number of Flags: _____ **Town:** Lancaster **Project:** Fort Devens
Wetland: Closed **Notes:** _____
Open Water Component?: No
Wetland Associated w/ Stream?: Yes (S02) **Type:** Intermittent
Vernal Pool Identified?: No **GPS Unit/Tech Initials:** Green/O'Brian **GPS Survey Complete:** Yes
Cowardin Classes (Dominant(%)/others (%)): PFO1E

<u>Water Regime</u> M- Temp. flooded N- Saturated O-Seasonally flooded I- Seasonally flooded/ saturated F- Semipermanently flooded G- Intermittently exposed H- Permanently flooded J- Intermittently flooded K- Artificially flooded	<u>Special Modifiers</u> b- Beaver d- Partially drained/ditched f-farmed h-diked/impounded r- artificial x- excavated s- spoil
---	--

Functions and Values:			
F/V:	Suitable		Principal (Check)
	Y	N	
Groundwater Rech/Disch.			X
Floodflow Alteration		X	
Fish/Shellfish Habitat	X		
Sed/Tox Retention	X		
Nutrient Removal	X		
Sed/Shore Stabilization			X
Production Export	X		
Wildlife Habitat	X		
Recreation		X	
Educate/Science Value		X	
Uniqueness/Heritage		X	
Visual Qual/Aesthetic		X	
End/Threatened Species		X	
Other:		X	

Notes:
_Wetland fringe on stream S02

Dominant Plants:
 Tree: Acer rubrum

 Sapling/Shrub: Vaccinium corymbosum, Ilex verticillata

 Herb/Seedling: Symplocarpus foetidus, Impatiens capensis
Carex crinita, Carex debilis, Gallium asprellum
 Woody Vine: _____
 Invasives: _____
Soils:
 Texture: Sandy Loam
 If mineral - Parent Material: Till
 Restrictive Layer? None Observed
 Sketch Map:

☐ Enrich./Calc. Seepage Swamp
 ☐ Floodplains/FP Forest
 ☐ Peatland (bogs & fens)
 ☐ Freshwater Marsh
 ☐ Unique Basin Swamp/Marsh, which often include:
 ☐ Black Ash
 ☐ Silver Maple
 ☐ Vegetated Shallow

Appendix C

Photographs



Photo # 1: Wetland 2 Section dominated by emergents.



Photo # 2: Wetland 2 Section of palustrine forest.



Photo # 3: Young forest upland habitat between Wetland 1 & Wetland 2.



Photo # 4: Wetland 1 Hummocky palustrine forest, with emergent wetland groundcover.



Photo # 5: Wetland 4 Delineated boundary between upland and wetland, view is northwest.



Photo # 6: Wetland 4 Arrow indicates approximate boundary between upland and wetland, view is northeast.



Photo # 7: Wetland 3 Transition to open water of Slate Rock Pond affected by beaver activity.



Photo # 8: Wetland 3 Includes open water, aquatic bed and irregular shoreline of Slate Rock Pond affected by beaver activity.



Photo # 9: Wetland 3 Beaver lodge
and persisting flooded tree
indicating water elevation changes.



Photo # 10: Wetland 3 - Adjacent upland habitat
and slope contiguous to wetland boundary.



Photo # 11: Wetland 3 palustrine emergent, sedge dominated wetland.

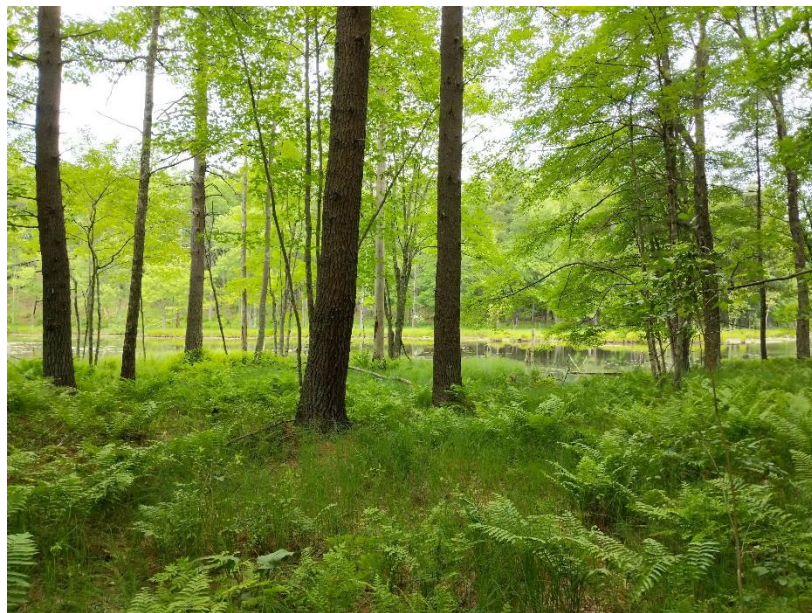


Photo # 12: Wetland 3 - Boundary Flag 12 Palustrine forested/emergent wetland PFO/EM with OW tributary in background.



Photo # 13: Wetland 3 - Boundary Flag 12 Vicinity Looking East.



Photo # 14: Wetland 5 Forested and emergent wetland habitat with diffuse flow of Stream 2.



Photo # 15: Stream 2 diffuse flow in heavy emergent vegetation made up of skunk cabbage and ferns. View is northwest.



Photo # 16: Stream 2 Diffuse flow in heavy emergent vegetation, skunk cabbage and sedges/grasses—View is southwest.



Photo # 17: Wetland 5 - Upland forested area adjacent to Wetland 5 with no groundcover or shrub layers.

Appendix D

Lancaster Township Wetland Regulations

D1: Chapter 306 Wetland Protection Rules & Regulations

Chapter 306. Wetlands Protection Rules and Regulations

[HISTORY: Adopted by the Conservation Commission of the Town of Lancaster January 2008; revised July 2008, January 2009 and July 2009. Subsequent amendments noted where applicable.]

GENERAL REFERENCES

Wetlands protection — See Ch. 215.

§ 306-1. General provisions.

- A. Authority and purpose: These regulations are promulgated by the Town of Lancaster Conservation Commission to which authority is granted under the Lancaster Wetlands Protection Bylaw^[1] (hereinafter called the “bylaw”). These regulations complement the bylaw and provide additional details in order to implement it. The purpose of the bylaw is to protect the wetlands, wildlife, water resources, flood-prone areas, and adjoining upland areas in the Town of Lancaster by controlling activities deemed by the Conservation Commission to have a significant or cumulative effect on resource area values, as outlined in § 215-1 of the Wetlands Protection Bylaw.
[1] Editor’s Note: See Ch. 215, Wetlands Protection.
- B. The definition of terms in § 215-3, Definitions, of the bylaw shall apply to terms used in these regulations.
- C. These regulations apply to all activities in accordance with § 215-2, Jurisdiction, of the bylaw.
- D. The Conservation Commission, in its judgment, may waive strict compliance with the bylaw if, after an alternatives analysis shows that there are no feasible alternatives that would allow the proposed activity to proceed in compliance with said regulations, an unconstitutional taking without compensation has occurred, or there is an overriding public interest.
- E. The exemptions and exceptions that are listed in § 215-5 of the bylaw shall apply in these regulations.
- F. In cases where a waiver is granted, the Conservation Commission may request that the applicant provide mitigation to offset impacts to the wetlands resource areas. Such mitigation must serve the interest of the bylaw by maintaining or improving the natural functioning of the resource area or its associated upland buffer zone or riverfront area.

§ 306-2. Application and fees.

- A. Written application shall be filed with the Conservation Commission to perform activities affecting resource areas protected by the Lancaster Wetlands Protection Bylaw^[1] (hereinafter “bylaw”) and under which these regulations are promulgated. The permit application shall include such information and plans as are deemed necessary by the Commission to describe proposed activities and their effects on the resource areas protected by the bylaw. No activities shall commence without receiving and complying with a permit issued pursuant to the bylaw.
[1] Editor’s Note: See Ch. 215, Wetlands Protection.
- B. The Commission, in an appropriate case, may accept as the application and plans under this bylaw any application and plans filed under the Wetlands Protection Act (MGL c. 131, § 40) and regulations (310 CMR 10.00), but the Commission is not obliged to do so.

- C. Any person desiring to know whether or not a proposed activity or an area is subject to the bylaw may in writing request a determination from the Commission. Such a request for determination of applicability (RDA) or abbreviated notice of resource area delineation (ANRAD) filed under the Act shall include information and plans as are deemed necessary by the Commission.
- D. At the time of an application, the applicant shall pay a filing fee. The fee is in addition to that required by the Wetlands Protection Act and regulations.
- E. Pursuant to MGL c. 44, § 53G, the Commission may impose reasonable fees upon applicants for the purpose of securing outside consultants, including engineers, wetlands scientists, wildlife biologists or other experts in order to aid in the review of proposed projects. Such funds shall be deposited with the Town Treasurer, who shall create an account specifically for this purpose. Additional consultant fees may be requested where the requisite review is more expensive than originally calculated or where new information requires additional consultant services. Only costs relating to consultant work done in connection with a project for which a consultant fee has been collected shall be paid from this account, and expenditures may be made at the sole discretion of the Commission.
- F. Any consultant hired under this provision shall be selected by, and report exclusively to, the Commission. The Commission shall provide applicants with written notice of the selection of a consultant, identifying the consultant, the amount of the fee to be charged to the applicant, and a request for payment of that fee. Notice shall be deemed to have been given on the date it is mailed or delivered. The applicant may withdraw the application or request within five business days of the date notice is given without incurring any costs or expenses.
- G. The entire fee must be received before the initiation of consulting services. Failure by the applicant to pay the requested consultant fee within 10 business days of the request for payment shall be cause for the Commission to declare the application administratively incomplete and deny the permit without prejudice, except in the case of an appeal. The Commission shall inform the applicant and the Department of Environmental Protection (DEP) of such a decision in writing.
- H. The applicant may appeal the selection of an outside consultant to the Board of Selectmen, who may disqualify the consultant only on the grounds that the consultant has a conflict of interest or is not properly qualified. The minimum qualifications shall consist of either an educational degree or three or more years of practice in the field at issue, or a related field. The applicant shall make such an appeal in writing, which must be received within 10 business days of the date that request for consultant fees was made by the Commission. Such appeal shall extend the applicable time limits for action upon the application.

§ 306-3. Notice and hearings.

- A. Any person filing a permit (notice of intent) with the Conservation Commission shall at the time give written notice by certified mail (return postage requested) or by hand delivery to all abutters at their mailing addresses on the most recent applicable tax list of the assessors, including owners of land directly opposite on any public or private street or way, and abutters to the abutters within 300 feet of the property line of the applicant, including any in another municipality or across a body of water. The notice shall state a brief description of the project or other proposal and the date of any Commission hearing or meeting date if known. The notice to abutters also shall include a copy of the application or request, with plans, or shall state where copies may be examined and obtained by abutters. An affidavit of the person proving such notice, with a copy of the notice mailed or delivered, shall be filed with the Commission.
- B. The Commission shall conduct a public hearing on any permit application, RDA or ANRAD with written notice given at the expense of the applicant, at least five business days prior to the hearing, in a newspaper of general circulation in the municipality.
- C. The Commission shall commence the public hearing within 21 days from receipt of a completed permit application, RDA or ANRAD unless an extension is authorized by the applicant. The Commission shall have authority to continue the hearing to a specific date announced at the hearing, for reasons stated at the hearing, which may include the need for additional information from the applicant or others as deemed

necessary by the Commission in its discretion, based on comments and recommendations of the boards and officials listed in § 306-4.

- D. The Commission shall issue its permit, other order or determination within 21 days of the close of the public hearing thereon unless an extension is authorized by the applicant.
- E. The Commission, in an appropriate case, may combine its hearing under this bylaw with the hearing conducted under the Wetlands Protection Act (MGL c. 131, § 40) and regulations (310 CMR 10.00).

§ 306-4. Coordination with other boards.

Any person filing a permit application, RDA or ANRAD with the Conservation Commission shall provide 10 copies thereof at the same time, by certified mail (return receipt requested) or hand delivery, to the Conservation Agent. The Agent will, in turn, distribute copies to the Board of Selectmen, Planning Board, Board of Appeals, Board of Health and Building Commissioner. A copy shall be provided in the same manner to the Conservation Commission of the adjoining municipality, if the application or RDA/ANRAD pertains to property within 300 feet of that municipality. An affidavit of the person providing notice, with a copy of the notice mailed or delivered, shall be filed with the Commission. The Commission shall not take final action until the above boards and officials have had 14 days from receipt of notice to file written comments and recommendations with the Commission, which the Commission shall take into account but which shall not be binding on the Commission. The applicant shall have the right to receive any comments and recommendations, and to respond to them at a hearing of the Commission, prior to final action.

§ 306-5. Security.

As part of a permit issued under the Bylaw, in addition to any security required by any other municipal or state board, agency or official, the Conservation Commission may require that the performance and observance of the conditions imposed thereunder (including conditions requiring mitigation work) be secured wholly or in part by one or both of the methods described below:

- A. By a proper bond, deposit of money or negotiable securities under a written third-party escrow arrangement, or other undertaking of financial responsibility sufficient, in the opinion of the Commission, to be released in whole or in part upon issuance of a certificate of compliance for work performed pursuant to the permit.
- B. By accepting a conservation restriction, easement, or other covenant enforceable in a court of law, executed and duly recorded by the owner of record, running with the land to the benefit of this municipality whereby the permit conditions shall be performed and observed before any lot may be conveyed other than by mortgage deed. This method shall be used only with the consent of the applicant.

§ 306-6. Enforcement.

- A. No person shall remove, fill, dredge, build upon, degrade, or otherwise alter resource areas protected by the bylaw, or cause, suffer, or allow such activity, or leave in place unauthorized fill, or otherwise fail to restore illegally altered land to its original condition, or fail to comply with a permit or an enforcement order issued pursuant to this bylaw.
- B. The Conservation Commission, its agents, officers, and employees shall have authority to enter upon privately owned land for the purpose of performing their duties under this bylaw and may make or cause to be made such examinations, surveys, or sampling as the Commission deems necessary, subject to the constitutions and laws of the United States and the commonwealth.
- C. The Commission shall have authority to enforce the bylaw, its regulations, and permits issued thereunder by letters, phone calls, electronic communication and other informal methods, violation practices, noncriminal citations under MGL c. 40, § 21D, and civil and criminal court actions. Any person who violates provisions of

this bylaw may be ordered to restore the property to its original condition and take other action deemed necessary to remedy such violations, or may be fined, or both.

- D. Upon request of the Commission, the Board of Selectmen and Town Counsel shall take legal action for enforcement under civil law. Upon request of the Commission, the Police Chief shall take legal action for enforcement under criminal law.
- E. Municipal boards and officers, including any police officer or other officer having police powers, shall have authority to assist the Commission in enforcement.
- F. Any person who violates any provision of the bylaw, regulations, permits or administrative orders issued thereunder shall be punished by a fine of not more than \$300 each day, or portion thereof, during which a violation continues. In addition, any unauthorized fill or other alteration that remains in place shall constitute a separate offense.
- G. As an alternative to criminal prosecution in a specific case, the Commission may issue citations with specific penalties pursuant to the noncriminal disposition procedure set forth in MGL c. 40, § 21D, which has been adopted by the Town of Lancaster in Chapter 1, Article I, Noncriminal Disposition, of the Code of the Town of Lancaster.

§ 306-7. Large land development and appurtenances.

- A. Notice of intent plan contents. The plan shall contain sufficient information to describe the nature and purpose of the proposed development, pertinent conditions of the site and the adjacent areas.
 - (1) The names and addresses of the person(s) responsible for operation and maintenance.
 - (2) The person(s) responsible for financing maintenance and emergency repairs.
 - (3) Locus map, taken at 1:25 from USGS. This map should include abutters' properties.
 - (4) Delineation of all wetlands, rivers, streams, brooks, intermittent streams, ponds, lakes and all riparian areas.
 - (5) Lines of delineation of twenty-five-foot "no-build" zone; 50 feet from wetlands, 100 feet from wetlands and 200 feet from wetlands.
 - (6) Drainage area map showing drainage area and stormwater flow paths.
 - (7) A maintenance schedule for all drainage structures, including swales and ponds.
 - (8) A list of all existing and proposed easements with the purpose and location of each.
 - (9) Location of existing and proposed underground utilities.
 - (10) Location of all existing and proposed stormwater utilities, including structures, swales and detention basins and easements.
 - (11) Topographic survey showing existing and proposed contours.
 - (12) Soils investigation, including soil types, borings or test pits, for areas where construction of infiltration practices will occur.
 - (13) Description of all watercourses, impoundment, and wetlands on or adjacent to the site or into which stormwater flows.
 - (14) Delineation of one-hundred-year floodplains, if applicable.
 - (15) Groundwater levels at the time of probable high groundwater elevation (October to May) in areas to be used for stormwater retention, detention or infiltration.

- (16) Existing and proposed locations, profiles of all brooks, streams, drainage swales and the method of stabilization.
 - (17) Proposed improvements, including location of buildings, percentage of impervious surfaces and storm drainage facilities, if applicable.
 - (18) Structural detail for all components of the proposed drainage systems and stormwater management facilities.
 - (19) An erosion and sediment control plan, as described in § 306-8 of these regulations.
 - (20) Timing schedules and sequences of development, including clearing, stripping, rough grading, construction, final grading and vegetative stabilization.
 - (21) An operation and maintenance plan, as described in § 306-7C of these regulations.
 - (22) Notes on drawings specifying materials to be used, construction specifications.
 - (23) Location of areas to be cleared of more than 30% of the vegetation.
 - (24) Plans must be stamped and certified by a qualified Professional Engineer registered in Massachusetts.
- B. An erosion and sediment control plan. An erosion and sediment control plan shall be submitted as part of the application for a notice of intent permit. The plan shall contain sufficient information to describe the proposed erosion and sedimentation controls.
- (1) Design requirements. The design requirements of the erosion and sediment control plan are:
 - (a) No disturbance to any wetland resource area.
 - (b) Reduced impervious area (redevelopment only).
 - (c) Sequence activities to minimize simultaneous areas of disturbance.
 - (d) Use best management practices.
 - (e) Show review of low-impact development.
 - (f) Minimize peak rate of runoff in accordance with the Massachusetts stormwater policy.
 - (g) Minimize soil erosion and control sedimentation during construction, provided that prevention of erosion is preferred over sedimentation control.
 - (h) Divert uncontaminated water around disturbed areas.
 - (i) Maximize groundwater recharge.
 - (j) Install and maintain all erosion and sediment control measures in accordance with the manufacturer's specifications and good engineering practices.
 - (k) Prevent off-site transport of sediment.
 - (l) Protect and manage on- and off-site material storage areas (overburden and stockpiles of dirt, borrow areas, or other areas used solely by the permitted project are considered a part of the project).
 - (m) Comply with applicable federal, state and local laws and regulations, including waste disposal, sanitary sewer or septic system regulations, and air quality requirements, including dust control.
 - (n) Prevent significant alteration of habitats mapped by the Massachusetts Natural Heritage and Endangered Species Program as endangered, threatened or of special concern, estimated habitats of rare wildlife and certified vernal pools, and priority habitats of rare species from the proposed activities.

- (o) Institute interim and permanent stabilization measures, which shall be instituted on a disturbed areas as soon as practicable but no more than 14 days after construction activity has temporarily or permanently ceased on that portion of the site.
 - (p) Properly manage on-site construction and waste materials.
 - (q) Prevent off-site vehicle tracking of sediments.
- (2) Erosion and sediment control plan contents. The Plan shall contain the following information:
- (a) Names, addresses and telephone numbers of the owner, applicant, and person(s) or firm(s) preparing the plan;
 - (b) Title, date, North arrow, names of abutters, scale, legend, and locus map;
 - (c) Location and description of natural features, including:
 - [1] Watercourses and water bodies, wetland resource areas and all floodplain information, including the one-hundred-year flood elevation based upon the most recent Flood Insurance Rate Map, or as calculated by a professional engineer for areas not assessed on these maps;
 - [2] Existing vegetation, including tree lines, canopy layer, shrub layer, and ground cover, and trees with a caliper of 12 inches or large, noting specimen trees and forest communities;
 - [3] Habitats mapped by the Massachusetts Natural Heritage and Endangered Species Program as endangered, threatened or of special concern, estimated habitats of rare wildlife and certified vernal pools, and priority habitats of rare species within 500 feet of any construction activity.
 - (d) Lines of existing abutting streets showing drainage and driveway locations and curb cuts within the wetland buffers;
 - (e) Existing soils, volume and nature of imported soil materials within the wetland buffers;
 - (f) Topographical features, including existing and proposed contours at intervals no greater than two feet with spot elevations provided when needed;
 - (g) Surveyed property lines showing distances and monument locations, and the delineation and number of square feet of the land area to be disturbed;
 - (h) Drainage patterns and approximately slopes anticipated after major grading activities (construction phase grading plans);
 - (i) Location and details of erosion and sediment control measures with a narrative of the construction sequencing/phasing of the project, including both operation and maintenance for structural and nonstructural measures, interim grading, and materials stockpiling areas within the wetland buffers;
 - (j) Path and mechanism to divert uncontaminated water around disturbed areas, to the maximum extent practicable;
 - (k) Location and description of industrial discharges, including stormwater discharges from dedicated asphalt plants and dedicated concrete plants, which are covered by this permit;
 - (l) Stormwater runoff calculations in accordance with the Department of Environmental Protection's stormwater management policy;
 - (m) Location and description of and implementation schedule for temporary and permanent seeding, vegetative controls, and other stabilization measures;
 - (n) A description of construction and waste materials expected to be stored onsite. The plan shall include a description of controls to reduce pollutants from these materials, including storage practices to minimize exposure of the materials to stormwater, and spill prevention and response;

- (o) A description of provisions for phasing the project where one acre of area or greater is to be altered or disturbed;
 - (p) Plans must be stamped and certified by a qualified professional engineer registered in Massachusetts or a certified professional in erosion and sediment control; and
 - (q) Such other information as is required by the Conservation Commission.
- C. Operation and maintenance plan. An operation and maintenance plan (OMP) is required at the time of application for all projects. The OMP shall be designed to ensure compliance with the permit, the bylaw and the Massachusetts Surface Water Quality Standards, 314 CMR 4.00, and that they are met in all seasons and throughout the life of the system. The Conservation Commission shall make the final decision of what maintenance option is appropriate in a given situation, and will consider natural features, proximity of site to water bodies and wetlands, extent of impervious surfaces, size of the site, the types of stormwater management structures, and potential need for ongoing maintenance activities when making this decision. The OMP shall remain on file as a part of the order of conditions and shall be a perpetual condition.
- (1) The OMP shall include long-term pollution prevention, including:
 - (a) Good housekeeping practices.
 - (b) Vehicle washing controls.
 - (c) Spill prevention and response plans.
 - (d) Provisions for maintenance of lawns, gardens, and other landscaped areas.
 - (e) Provisions for operations and maintenance of septic systems.
 - (f) Requirements for storage and use of fertilizers, herbicides and pesticides.
 - (g) Snow removal and disposal plans relative to wetlands resource areas.
 - (h) Winter road salts and/or sand use and storage restrictions.
 - (i) Street sweeping schedules and disposals.
 - (j) Provisions for prevention of illicit discharges to the stormwater management system.
 - (2) Operation and maintenance plan contents.
 - (a) The name(s) of the owner(s) for all components of the system.
 - (b) Maintenance agreements that specify:
 - [1] The names and addresses of the person(s) responsible for operation and maintenance.
 - [2] The person(s) responsible for financing maintenance and emergency repairs.
 - [3] A maintenance schedule for all drainage structures, including swales and ponds.
 - [4] A list of easements with the purpose and location of each.
 - [5] The signature(s) of the owner(s).
 - (3) Changes to operation and maintenance plans.
 - (a) The owner(s) of the stormwater management system must notify the Conservation Commission of changes in ownership or assignment of financial responsibility.
 - (b) The maintenance schedule in the maintenance agreement may be amended to achieve the purposes of this bylaw by mutual agreement of the Conservation Commission and the responsible parties. Amendments must be in writing and signed by all responsible parties. Responsible parties shall include the owner(s), persons with financial responsibility, and persons with operational responsibility.

D. Inspections and site supervision.

- (1) Preconstruction meeting: Prior to starting any clearing, excavation, construction or land-disturbing activity, the applicant, the applicant's technical representative, the general contractor or any other person with authority to make changes to the project shall meet with the Conservation Agent to review the permitted plans and their implementation.
- (2) Board inspection: The Conservation Commission, or its agent, shall make inspections as hereinafter required and shall either approve that portion of the work completed or shall notify the permittee wherein the work fails to comply with the order of condition as approved.

E. Commercial and housing development addendum. On home/commercial development projects with wetlands/riverfront buffers, wildlife easements or other restrictions, orders of conditions will be written to include the following:

- (1) Mark buffers/restrictions before any residential or commercial project commences.
- (2) Post a sign at all residential property entrances that informs potential buyers of wetland restrictions that may affect their homeownership. This disclaimer must also be clearly included in all promotional material, including advertising and marketing collateral.
- (3) The developer will be required to have from the home purchaser a signed affidavit stating that the purchase understands that he/she is purchasing property with wetlands, riparian areas or wetlands buffers on the property. A copy of this affidavit will be submitted to the Lancaster Conservation Commission within two weeks of sale.

§ 306-8. Burden of proof.

The applicant for a permit shall have the burden of proving by a preponderance of the credible evidence that the work proposed in the permit application will not have unacceptable significant or cumulative effect upon the resource area values protected by this bylaw. Failure to provide adequate evidence to the Conservation Commission supporting this burden shall be sufficient cause for the Commission to deny a permit or grant a permit with conditions.

§ 306-9. Appeals.

A decision of the Conservation Commission shall be reviewable in the Superior court in accordance with MGL c. 249, § 4.

§ 306-10. Severability.

The invalidity of any section or provision of this bylaw shall not invalidate any other section or provision thereof, nor shall it invalidate any permit, approval or determination which previously has been issued.

§ 306-11. Effective date.

These regulations shall take effect upon approval of the Lancaster Conservation Commission.

D2: Chapter 215 Wetlands Protection Bylaw

Chapter 215. Wetlands Protection

[HISTORY: Adopted by the Town of Lancaster 10-15-2007 STM by Art. 3. Amendments noted where applicable.]

GENERAL REFERENCES

Conservation Commission — See Ch. 17, Art. V.

Boats and boating — See Ch. 23.

Stormwater control — See Ch. 170.

Zoning — See Ch. 220.

Subdivision of land — See Ch. 301.

Wetlands protection rules and regulations — See Ch. 306.

§ 215-1. Purpose.

- A. The purpose of this bylaw is to protect the wetlands, wildlife, water resources, flood-prone areas, and adjoining upland areas in the Town of Lancaster by controlling activities deemed by the Conservation Commission likely to have a significant or cumulative effect on resource area values, including but not limited to the following:
- (1) Public or private water supply;
 - (2) Groundwater supply;
 - (3) Flood control;
 - (4) Erosion and sedimentation control;
 - (5) Storm damage prevention;
 - (6) Water quality;
 - (7) Prevention and control of pollution;
 - (8) Fisheries;
 - (9) Forests;
 - (10) Wildlife habitat;
 - (11) Rare or threatened species habitat, whether plant or animal (according to the Natural Heritage and Endangered Species Program);
 - (12) Vernal pools;
 - (13) Agriculture;
 - (14) Aquaculture; and
 - (15) Recreational values.
- B. This bylaw is intended to utilize the Home Rule authority of this municipality so as to protect the resource areas under the Wetlands Protection Act (MGL c. 131, § 40; the "Act") to a greater degree, to protect additional resource areas beyond the Act recognized by the Town as significant, to protect all resource areas for their additional values beyond those recognized in the Act, and to impose in local regulations and

permits additional standards and procedures stricter than those of the Act and Regulations thereunder (310 CMR 10.00), subject, however, to the rights and benefits accorded to agricultural uses and structures of all kinds under the laws of the commonwealth and other relevant bylaws of the Town of Lancaster.

§ 215-2. Jurisdiction.

- A. Except as permitted by the Conservation Commission, no person shall commence to remove, fill, dredge, build upon, degrade, discharge into, or otherwise alter the following resource areas:
- (1) Any wetlands;
 - (2) Marshes;
 - (3) Wet meadows;
 - (4) Bogs;
 - (5) Swamps;
 - (6) Vernal pools;
 - (7) Springs;
 - (8) Banks;
 - (9) Reservoirs;
 - (10) Lakes;
 - (11) Ponds of any size;
 - (12) Lands under water bodies;
 - (13) Lands adjoining these resources out to a distance of 100 feet, known as the buffer zone;
 - (14) Rivers;
 - (15) Streams, brooks and creeks, whether perennial or intermittent;
 - (16) Lands adjoining these resource areas out to a distance of 200 feet, known as the riverfront area;
 - (17) Lands subject to flooding or inundation by groundwater or surface water;
 - (18) Floodplain Overlay District (as established in Chapter **220**, Zoning, of the Code of the Town of Lancaster); and
 - (19) Twenty-five-foot no-build or no-alteration zone.
- B. The jurisdiction of this bylaw shall not extend to uses and structures of agriculture that enjoy the rights and privileges of laws and regulations of the commonwealth governing agriculture, including work performed for normal maintenance or improvement of land in agricultural or aquacultural uses as defined by the Wetlands Protection Act Regulations found at 310 CMR 10.04.

§ 215-3. Definitions.

The following definitions shall apply in the interpretation and implementation of this bylaw:

AGRICULTURE

Refers to the definition as provided by MGL c. 128, § 1A.

ALTER

Includes, without limitation, the following activities when undertaken to, upon, within or affecting resource areas protected by this bylaw:

- A. Removal, excavation or dredging of soil, sand, gravel, or aggregate materials of any kind;
- B. Changing of preexisting drainage characteristics, flushing characteristics, salinity distribution, sedimentation patterns, flow patterns or flood retention characteristics;
- C. Drainage or other disturbance of water level or water table;
- D. Dumping, discharging or filling with any material which may degrade water quality;
- E. Placing of fill, or removal of material, which would alter elevation;
- F. Driving of piles and erection, expansion or repair of buildings or structures of any kind;
- G. Placing of obstructions or objects in water;
- H. Destruction of plant life, including cutting or trimming of trees and shrubs;
- I. Changing temperature, biochemical oxygen demand or other physical, biological, or chemical characteristics of any waters;
- J. Any activities, changes or work which may cause or tend to contribute to pollution of any body of water or groundwater;
- K. Incremental activities which have, or may have, a cumulative adverse impact on the resource areas protected by this bylaw.

BANK

Includes the land area which normally abuts and confines a water body; the lower boundary being the mean annual low-flow level, and the upper boundary being the first observable break in the slope or the mean annual flood level, whichever is higher.

BUFFER ZONE

Includes twenty-five-foot no-build or no-alteration area surrounding any type of wetland or vernal pool. It shall also include all lands within 100 feet of a wetland or floodplain resource area, and within 200 feet of a riverfront area, whether perennial or intermittent.

INTERMITTENT STREAM

Includes a body of water, including brooks and creeks, which moves in a definite channel due to a hydraulic gradient, and which flows within, into or out of areas subject to protection under the Wetlands Protection Act.^[1] An intermittent stream, or ephemeral stream, does not flow year round. It may flow in all seasons except during the driest summer months, or only after precipitation, or when groundwater levels or water from snowmelt are high. An ephemeral stream may have a fish population.

PERENNIAL STREAM

Includes a body of water, including brooks and creeks, which moves in a definite channel due to a hydraulic gradient, and which flows within, into or out of areas subject to protection under the Wetlands Protection Act. A perennial stream flows all year, except during periods of drought, or unless it is subject to withdrawals or controlled by dams or other restricting structures.

PERSON

Include any individual, group of individuals, association, partnership, corporation, company, business organization, trust, estate, the commonwealth or political subdivision thereof to the extent subject to Town bylaws, administrative agency, public or quasi-public corporation or body, this municipality, and any other legal entity, its legal representatives, agents, or assigns.

POND

Follow the definition of 310 CMR 10.04 except that the size threshold of 5,000 square feet shall apply.

RARE SPECIES

Includes, without limitation, all vertebrate and invertebrate animals and all plant species listed as endangered, threatened, or of special concern by the Massachusetts Division of Fisheries and Wildlife and the National Heritage Endangered Species Program (NHESP), regardless whether the site in which they occur has been previously identified by the Division or Program.

VERNAL POOL

Includes, in addition to scientific definitions found in the regulations under the Wetlands Protection Act, any confined basin or depression not occurring in existing lawns, gardens, landscaped areas or driveways which, at least in most years, holds water for a minimum of two continuous months during the spring and/or summer, contains at least 200 cubic feet of water at some time during most years, is free of adult predatory fish populations, and provides essential breeding and rearing habitat functions for amphibian, reptile or other vernal pool community species, regardless of whether the site has been certified by the Massachusetts Division of Fisheries and Wildlife. The boundary of the resource area for vernal pools shall be 100 feet outward from the mean annual high-water line defining the depression, but shall not include existing lawns, gardens, landscaped or developed areas.

[1] *Editor's Note: See MGL c. 131, § 40.*

§ 215-4. Presumptions.

- A. Buffer zones are presumed significant to the protection of wetland resources and interests because activities undertaken in close proximity to resource areas have a high likelihood of adverse impact upon the wetland or other resources, either immediately, as a consequence of construction, or over time, as a consequence of daily operations or maintenance of such activities. Such adverse impacts from construction and use include, without limitation, erosion, siltation, loss of groundwater recharge, degradation of water quality and loss of wildlife habitat.
- B. Vernal pools are presumed to provide essential breeding and rearing habitat functions, which in the case of any seasonal wetland, may not been certified as a vernal pool by the state. It may be that the depression or area does not provide the habitat functions specified for identification of noncertified vernal pools.

§ 215-5. Exemptions and exceptions.

- A. Notwithstanding any provision of this chapter to the contrary, the alteration of any residential, business or institutional building or customary appurtenance thereto, such as lawns, gardens, landscaped or other developed areas, where such structure or appurtenance existed prior to the effective date of this bylaw, shall not be subject to this bylaw but shall be regulated exclusively by the provisions of MGL c. 131, § 40 (the Wetlands Protection Act).
- B. The applications and permits required by this bylaw shall not be required for work performed for normal maintenance or improvement of land in agricultural and aquacultural use as defined by the Wetlands Protection Act Regulations at 310 CMR 10.04.
- C. The applications and permits required by this bylaw shall not be required for maintaining, repairing, or replacing, but not substantially changing or enlarging, an existing and lawfully located structure or facility used in the service of the public to provide electric, gas, water, telephone, telegraph, or other telecommunications services, provided that written notice has been given to the Conservation Commission prior to commencement of work, and provided that the work conforms to any performance standards and design specifications in regulations adopted by the Commission.
- D. The applications and permits required by this bylaw shall not be required for emergency projects necessary for the protection of the health and safety of the public, provided that the work is to be performed by or has been ordered to be performed by an agency of the commonwealth or a political subdivision thereof; provided that advance notice, oral or written, has been given to the Commission prior to commencement of work or within 24 hours after commencement; provided that the Commission or its agent certifies the work as an emergency project; provided that the work is performed only for the time and place certified by the Commission for the limited purposes necessary to abate the emergency; and provided that within 21 days of

commencement of an emergency project a permit application shall be filed with the Commission for review as provided by this bylaw. Upon failure to meet these and other requirements of the Commission, the Commission may, after notice and a public hearing, revoke or modify an emergency project approval and order restoration and mitigation measures.

- E. Other than stated in this bylaw, the exceptions provided in the Wetlands Protection Act (MGL c. 131, § 40) and Regulations (310 CMR 10.00) shall not apply under this bylaw.

§ 215-6. Permits and conditions.

- A. If the Conservation Commission, after a public hearing, determines that the activities which are subject to the permit application, or the land and water uses which will result therefrom, are likely to have a significant individual or cumulative effect on the resource area values protected by this bylaw, the Commission, within 21 days of the close of the hearing, shall issue or deny a permit for the activities requested. The Commission shall take into account the extent to which the applicant has avoided, minimized and mitigated any such effect. The Commission also shall take into account any loss, degradation, isolation and replacement or replication of such protected resource areas elsewhere in the community and the watershed, resulting from past activities, whether permitted, unpermitted or exempt, and foreseeable future activities.
- B. If it issues a permit, the Commission may impose conditions which the Commission deems necessary or desirable to protect said resource area values, and all activities shall be conducted in accordance with those conditions.
- C. Where no conditions are adequate to protect said resource area values, the Commission is empowered to deny a permit for failure to meet the requirements of this bylaw.
 - (1) It may also deny a permit:
 - (a) For failure to submit necessary information and plans requested by the Commission;
 - (b) For failure to comply with the procedures, design specifications, performance standards, and other requirements in regulations of the Commission; or
 - (c) For failure to avoid, minimize or mitigate unacceptable significant or cumulative effects upon the resource area values protected by this bylaw.
 - (2) Due consideration shall be given to any demonstrated hardship on the applicant by reason of denial, as presented at the public hearing.
- D. The Commission may waive specifically identified and requested procedures, design specifications, performance standards or other requirements set forth in its regulations, provided that:
 - (1) The Commission finds in writing after said public hearing that there are no reasonable conditions or alternatives that would allow the proposed activity to proceed in compliance with said regulations;
 - (2) That avoidance, minimization and mitigation has been employed to the maximum extent feasible; and
 - (3) That the waiver is necessary to accommodate an overriding public interest or to avoid a decision that so restricts the use of the property as to constitute an unconstitutional taking without compensation.
- E. In reviewing activities within the one-hundred-foot buffer zone to a wetland and the twenty-five-foot no-build or no-alteration zone, the Commission shall presume these areas are important to the protection of other resource areas because activities undertaken in close proximity have a high likelihood of adverse impact, either immediately, as a consequence of construction, or over time as a consequence of daily operation or existence of the activities.
 - (1) These adverse impacts from construction and use can include, without limitation:
 - (a) Erosion;
 - (b) Siltation;

- (c) Contamination;
 - (d) Loss of groundwater recharge;
 - (e) Poor water quality; and
 - (f) Loss of wildlife habitat.
- (2) The Commission may establish in its regulations design specifications, performance standards, other measures and safeguards, and other work limits for protection of such lands, including without limitation, strips of continuous, undisturbed vegetative cover, unless the applicant convinces the Commission that the area or part of it may be disturbed without harm to the values protected by the bylaw.
- F. In reviewing activities within the two-hundred-foot buffer zone to a riverfront, the Commission shall presume the riverfront area is important to all the resource area values unless demonstrated otherwise, and no permit issued hereunder shall permit any activities unless the applicant, in addition to meeting the otherwise applicable requirements of this bylaw, has proved by a preponderance of the evidence that 1) there is no practicable alternative to the proposed project with less adverse effects, and that 2) such activities, including proposed mitigation measures, will have no significant adverse impact on the areas or values protected by this bylaw. The Commission shall regard as practicable an alternative which is reasonably available and capable of being done, after taking into consideration the proposed property use, the overall project purpose (e.g., residential, institutional, commercial, or industrial), logistics, existing technology, costs of the alternatives and overall project costs.
- G. To prevent resource area loss, the Commission shall require applicants to avoid alteration wherever feasible, to minimize alteration, and where alteration is unavoidable and has been minimized to provide full mitigation. The Commission may authorize or require replication of wetlands as a form of mitigation, but only with specific plans, professional design, proper safeguards, adequate security, and professional monitoring and reporting to assure success, because of the poor performance of earlier replication technologies.
- H. The Commission may require a wildlife habitat study of the project area, to be paid for by the applicant, whenever it deems appropriate, regardless the type of resource area or the amount or type of alteration proposed. The decision shall be based upon the Commission's estimation of the importance of the habitat area considering, but not limited to, such factors as proximity to other areas suitable for wildlife, importance of wildlife corridors in the area, or actual or possible presence of rare plant or animal species in the area. The work shall be performed by an individual who at least meets the qualifications set out in the wildlife habitat section of the Wetlands Protection Act Regulations (310 CMR 10.60).
- I. The Commission shall presume that all areas meeting the definition of vernal pools, including the adjacent wetland buffer zone and twenty-five-foot no-build or no-alteration zones, perform essential habitat functions. This presumption may be overcome only by the presentation of credible evidence which, in the judgment of the Commission, demonstrates that the basin or depression does not provide essential habitat functions. Any formal evaluation should be performed by an individual who at least meets the qualifications under the wildlife habitat section of the Wetlands Protection Act Regulations (310 CMR 10.60). The Commission holds the right to assign its own consultant for review.
- J. A permit, determination of applicability (DOA) or order of resource area delineation (ORAD) shall expire three years from the date of issuance. Notwithstanding the above, the Commission, in its discretion, may issue a permit expiring five years from the date of issuance for recurring or continuous maintenance work, provided that annual notification of time and location of work is given to the Commission. Any permit may be renewed once for an additional one-year period, provided that a request for a renewal is received in writing by the Commission prior to expiration. Notwithstanding the above, a permit may identify requirements which shall be enforceable for a stated number of years, indefinitely, or until permanent protection is in place, and shall apply to all present and future owners of the land.
- K. For good cause, the Commission may revoke any permit, DOA, ORAD or any other order, determination or other decision issued under this bylaw after notice to the holder, the public, abutters within 300 feet, and Town boards (Select Board, Planning Board, Board of Appeals, Board of Health, and Building Commissioner),

and after a public hearing. Amendments to any permits, DOA or ORAD shall be handled in the manner set out in the Wetlands Protections Act Regulations and policies thereunder.

- L. The Commission, in an appropriate case, may combine the decision issued under this bylaw with the order of conditions, determination of applicability, order of resource area delineation or certificate of compliance issued under the Wetlands Protection Act and Regulations.
- M. No work proposed in any application shall be undertaken until the permit, DOA or ORAD issued by the Commission, with respect to such work, has been recorded in the Registry of Deeds or, if the land affected is registered land, in the registry section of the land court for the district wherein the land lies, and until the holder of the permit certifies in writing to the Commission that the document has been recorded. If the applicant fails to perform such recording, the Commission may record the documents itself and require the applicant to furnish the recording fee therefor, either at the time of recording or as a condition precedent to the issuance of a certificate of compliance, or issue a cease work order until evidence of such recording is received by the Commission.

§ 215-7. Regulations.

- A. After public notice and public hearing, the Conservation Commission shall promulgate rules and regulations to effectuate the purposes of this bylaw, effective when voted and filed with the Town Clerk. Failure by the Commission to promulgate such rules and regulations or a legal declaration of their invalidity by a court of law shall not act to suspend or invalidate the effect of this bylaw.
- B. At a minimum the regulations shall reiterate the terms defined in this bylaw, define additional terms not inconsistent with the bylaw, and impose filing and consultant fees.

§ 215-8. Relation to statute.

This bylaw is adopted under the Home Rule Amendment of the Massachusetts Constitution and the Home Rule statutes, independent of the Wetlands Protection Act (MGL c. 131, § 40) and Regulations (310 CMR 10.00) thereunder. It is the intention of this bylaw that the purposes, jurisdiction, authority, exemptions, regulations, specifications, standards and other requirements shall be interpreted and administered as stricter than those under the Wetlands Protection Act and Regulations.

§ 215-9. Severability.

The invalidity of any section or provision of this bylaw shall not invalidate any other section or provision thereof, nor shall it invalidate any permit, approval or determination which previously has been issued.

§ 215-10. Transitional provisions.

Applicants that have filed an application (notice of intent, request for determination of applicability, or abbreviated notice of resource area delineation) prior to the effective date of this bylaw shall not be subject to this bylaw, but shall be regulated exclusively by the provisions of the Wetlands Protection Act (MGL c. 131, § 40).

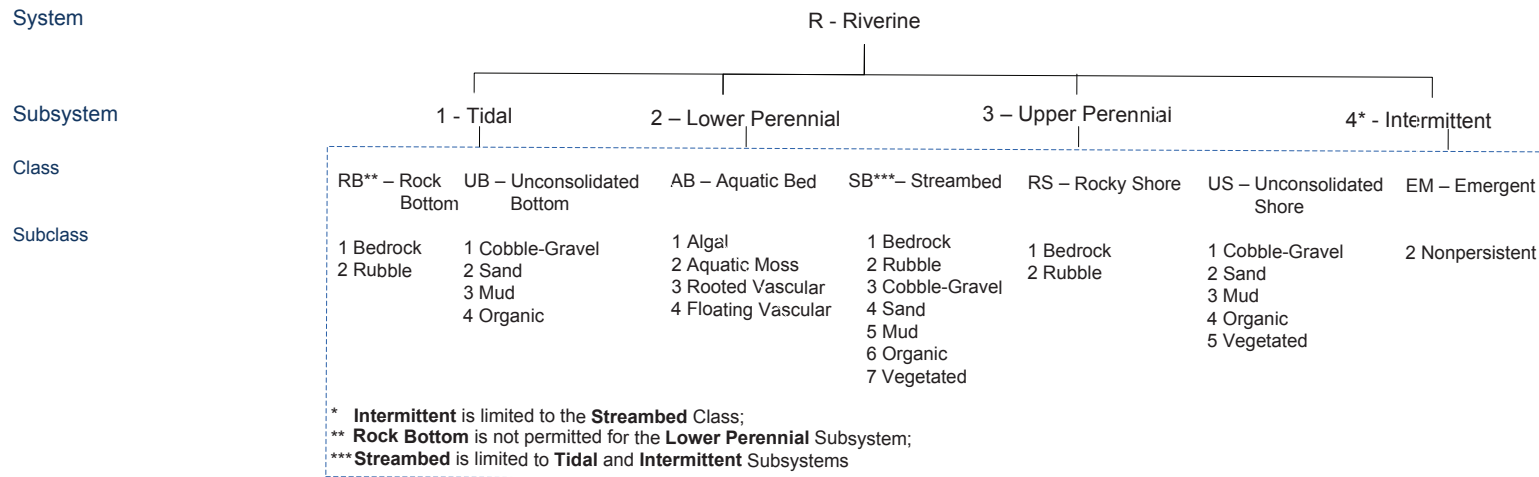
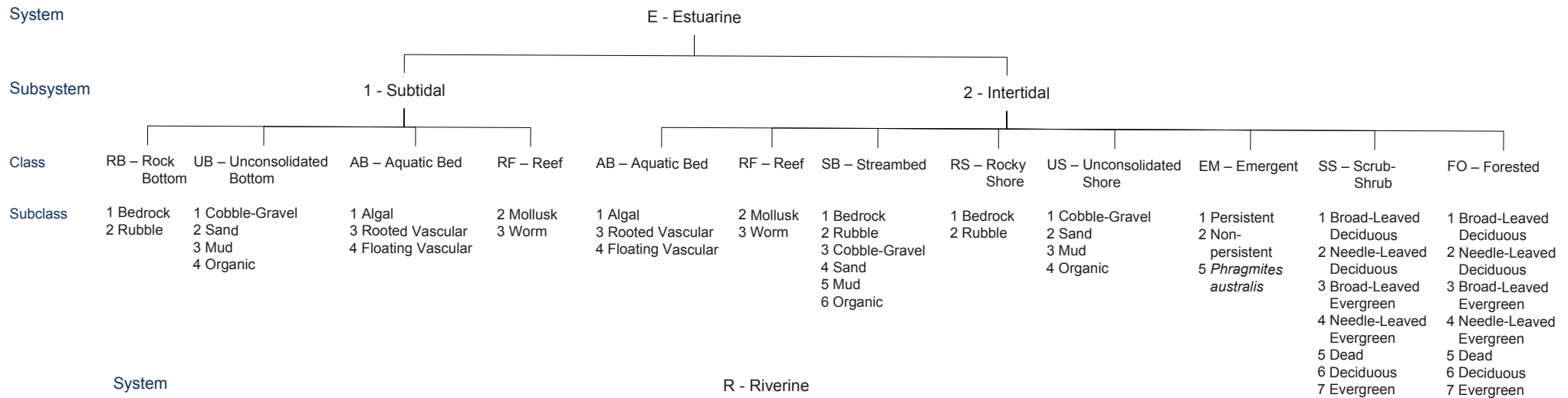
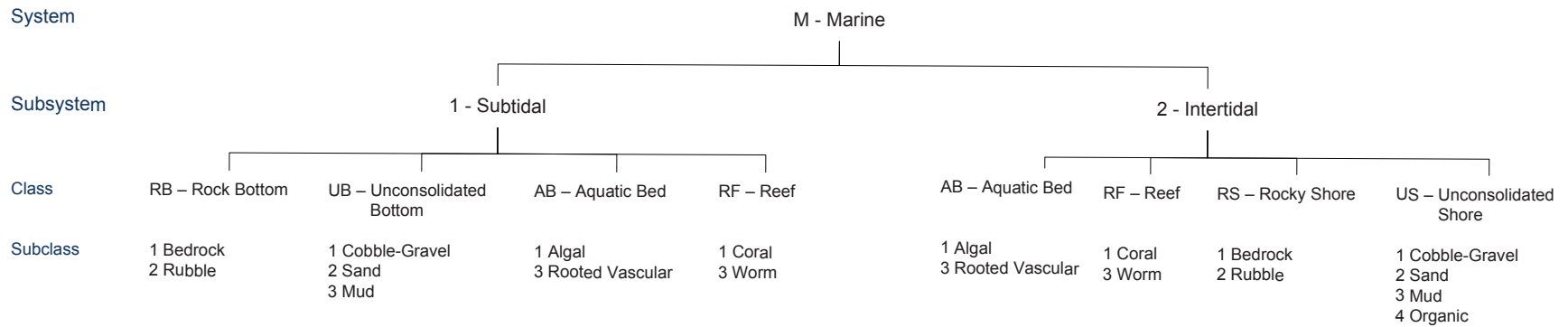
§ 215-11. Effective date.

This bylaw shall take effect upon approval of the Attorney General, and after the bylaw has been posted, in accordance with MGL c. 40, § 32.

Appendix E

National Wetland Inventory Classification Hierarchy

NWI Wetlands and Deepwater Map Code Diagram



NWI Wetlands and Deepwater Map Code Diagram

System

L - Lacustrine

Subsystem

1 - Limnetic

2 - Littoral

Class

RB – Rock
Bottom

UB – Unconsolidated
Bottom

AB – Aquatic Bed

RB – Rock
Bottom

UB – Unconsolidated
Bottom

AB – Aquatic Bed

RS – Rocky
Shore

US – Unconsolidated
Shore

EM – Emergent

Subclass

1 Bedrock
2 Rubble

1 Cobble-Gravel
2 Sand
3 Mud
4 Organic

1 Algal
2 Aquatic Moss
3 Rooted Vascular
4 Floating Vascular

1 Bedrock
2 Rubble

1 Cobble-Gravel
2 Sand
3 Mud
4 Organic

1 Algal
2 Aquatic Moss
3 Rooted Vascular
4 Floating Vascular

1 Bedrock
2 Rubble

1 Cobble-Gravel
2 Sand
3 Mud
4 Organic
5 Vegetated

2 Nonpersistent

System

P - Palustrine

Class

RB – Rock
Bottom

UB – Unconsolidated
Bottom

AB – Aquatic Bed

US – Unconsolidated
Shore

ML – Moss-Lichen

EM – Emergent

SS – Scrub-Shrub

FO – Forested

Subclass

1 Bedrock
2 Rubble

1 Cobble-Gravel
2 Sand
3 Mud
4 Organic

1 Algal
2 Aquatic Moss
3 Rooted Vascular
4 Floating Vascular

1 Cobble-Gravel
2 Sand
3 Mud
4 Organic
5 Vegetated

1 Moss
2 Lichen

1 Persistent
2 Nonpersistent
5 *Phragmites australis*

1 Broad-Leaved Deciduous
2 Needle-Leaved Deciduous
3 Broad-Leaved Evergreen
4 Needle-Leaved Evergreen
5 Dead
6 Deciduous
7 Evergreen

1 Broad-Leaved Deciduous
2 Needle-Leaved Deciduous
3 Broad-Leaved Evergreen
4 Needle-Leaved Evergreen
5 Dead
6 Deciduous
7 Evergreen

MODIFIERS

In order to more adequately describe the wetland and deepwater habitats, one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy.

Water Regime			Special Modifiers	Water Chemistry		Soil
Nontidal	Saltwater Tidal	Freshwater Tidal		Halinity/Salinity	pH Modifiers for Fresh Water	
A Temporarily Flooded	L Subtidal	S Temporarily Flooded- Fresh Tidal	b Beaver	1 Hyperhaline / Hypersaline	a Acid	g Organic
B Seasonally Saturated	M Irregularly Exposed	Q Regularly Flooded-Fresh Tidal	d Partly Drained/Ditched	2 Euhaline / Eusaline	t Circumneutral	n Mineral
C Seasonally Flooded	N Regularly Flooded	R Seasonally Flooded-Fresh Tidal	f Farmed	3 Mixohaline / Mixosaline (Brackish)	i Alkaline	
D Continuously Saturated	P Irregularly Flooded	T Semipermanently Flooded-Fresh Tidal	m Managed	4 Polyhaline		
E Seasonally Flooded / Saturated		V Permanently Flooded-Fresh Tidal	h Diked/Impounded	5 Mesohaline		
F Semipermanently Flooded			r Artificial Substrate	6 Oligohaline		
G Intermittently Exposed			s Spoil	0 Fresh		
H Permanently Flooded			x Excavated			
J Intermittently Flooded						
K Artificially Flooded						