LAM EcoLogical
238 Wareham Road
PO Box 486
Marion, MA 02738
508-858-8678

October 16, 2020

Whitney McClees
Conservation Agent and Sustainability Coordinator
Town of Fairhaven
40 Center Street
Fairhaven, MA 02719

RE: *18 Bass Creek Road, Fairhaven, MA*
Wetland Delineation and ANRAD Filing Peer Review
Preliminary Findings

Dear Ms. McClees,

On October 10, 2020, LAM EcoLogical reviewed the ANRAD dated August 24, 2020 for 18 Bass Creek Road, Fairhaven, MA, associated July 27, 2020 plans entitled "Wetland Delineation Plan - Bass Creek Road, Fairhaven, MA for John Kalise", DEP Bordering Vegetated Wetland data sheets and the Wetland Narrative and visited the site to verify the location of the wetland flags as shown on the plans.

The wetland delineation review is being completed in accordance with the Massachusetts Wetlands Protection Act (MGL c. 31, § 40), its associated regulations (310 CMR 10.00) and DEP's "Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act Handbook" (March 1995), and the Fairhaven Wetlands Bylaw (Chapter 192 of the Code of the Town of Fairhaven) and its associated regulations.

Upon arriving at the site, the wetland flags were identified in the field and an initial transect was set n the field, starting at approximately WF BC 18 and continuing northeast into the property. The transect was set parallel to Bass Creek Road. During LAM EcoLogical's site review, the wetland flags established by Mr. Kalise's consulting team were removed from the site and as a result we were unable to complete our review. LAM EcoLogical notified Ms. McClees immediately of the situation and is submitting this preliminary findings report as requested.

PRELIMINARY FINDINGS

SITE MAPPING

The property at 18 Bass Creek Road in Fairhaven, MA is a 76,800 square foot (1.76 acre) wooded property located on West Island within the Sconticut Neck USGS 7.5 Minute Series Quadrangle (Figure 1: USGS Locus Map). The site borders on an unnamed tidal creek/marsh.

The majority of the site is within a FEMA mapped flood velocity zone and is listed as a high risk area for coastal flooding (Figure 2: FEMA National Flood Hazards and Figure 3: National Flood Hazard Layer FIRMETTE) . The site is also partly within the 100 year flood plain. The site is generally flat set at approximately elevation 17 to 20 feet NAVD 88. Evidence of coastal overwash and sand deposition was observed when investigating soils within the limits of the site.

According to MA GIS DEP Wetland Datalayer, the site is mapped as a wooded deciduous swamp bordering on a small area of shallow marsh (Figure 4: MA DEP Wetlands and ORWs).

Soils mapped on site include Ridgebury, with is classified as a hydric soil, and Woodbridge which has hydric soil inclusions (NRCS Custom Soil Resource Report for Bristol County, Massachusetts, Southern Part).

According to MA GIS, there are no Areas of Critical Environmental Concern, Outstanding Resource Waters (Figure 4: MA DEP Wetlands and ORWs) or MA Natural Heritage Endangered Species Program Priority or Estimated Habitat or Certified Vernal Pools (Figure 5: MNHESP Priority and Estimated Habitat and Vernal Pools). Mapping is attached to this report to support these findings.

EXISTING CONDITIONS

Vegetation

Dominant vegetation on site consist of facultative wetland species including red maple *(Acer rubrum*), tupelo *(Nysssa sylvatica),* pink azalea (*Rhododendron periclymenoides*) and sweet pepper bush *(Clethera alnifolia)*. Other species found on the property include red chokeberry *(Aronia abrutifolia),* high bush blueberry *(Vaccinium corymbosum),* cinnamon fern *(Osmunda cinnamomea),* swamp dewberry (*Rubus hispidus*) and common greenbrier (Smilax rotundifolia). Red oak *(Quercus rubra)* and American holly *(Ilex opaca)* and ash *(Fraxinus sp.)* are also found intermittently throughout the property.

Soils

The dominant soil on site is Ridgebury fine sandy loam, 3 to 8 percent slopes extremely stony. This soil is a very deep, somewhat poorly and poorly drained soil formed in lodgment till. This soil is classified as a hydric soil according to the Natural Resource Conservation Service. Woodbridge fine sandy loam, 0 to 8 percent slopes, extremely stony soils are mapped at the back of the property. This soil is moderately well drained loamy soils formed in lodgment till with hydric soil inclusions such as Ridgebury soils.

During recent historic storm events, sands have washed over onto the site accumulated on top of the mapped soils in the area. Overtime these accumulated sands have developed hydric indicators including redoximorphic features, oxidized rhizospheres, gleying, and / or a stripped matrix with oxidized iron in the underlying horizon.

Hydrology

Evidence of hydrology is located throughout the site including pit and mound topography, drainage patterns and water stained leaves.

EVALUATION METHOD / TRANSECTS

LAM EcoLogical started to validate the accuracy of the applicant's wetland line by establishing a transect upslope from specific wetland flags. The first transect (Transect A) was established in the field, starting approximately 10 feet north of Wetland Flag BC 18 and running eastward and roughly parallel to Bass Creek Road. Soils and vegetation were analyzed at two points along the transect. Point 1 is located approximately 50 feet from the wetland line and Point 2 is located approximately 150 feet from the wetland line. Vegetation, soils and hydrology were analyzed at each point in accordance with the "Delineating Bordering Vegetated Wetlands Under the MA Wetlands Protection Act" Handbook. Wetland datasheets are attached for each point.

In general, facultative wetland vegetation is dominant at each point along the transect and soils meet the definition of hydric soils. Although, soils at Point 2 appeared to be higher in the landscape and less hydric than soils at Point 1. Hydrology was also present at each point.

Auger soil samples were analyzed at random locations on site south of Transect A (from Transect A to Bass Creek Road) in order to ascertain the limits of hydric soils within the property. Auger soil samples south of the Transect A had hydric soil indicators within approximately 12" to 18". A limited number of auger samples were taken north of Transect A.

CONCLUSION

LAM's initial interpretation of the site is that the majority of the site meets the definition of Bordering Vegetated Wetland under 310 CMR 10.55 of the Massachusetts State Wetlands Protection Act (WPA) Regulations. The north / north east part of the site meets the definition of Bordering Land Subject to Flooding under 310 CMR 10.57 of the MA WPA Regulations. The majority of the site also meets the definition of Land Subject to Coastal Storm Flowage.

The site is dominated by facultative wetland species and as a result soils and evidence of hydrology is being relied upon to identify the limits of wetlands on site. Additional investigation of soils to the north / north east of the LAM EcoLogical Transect A is needed. Point 2 along Transect A is in the general area where Ridgebury soils (hydric soils) transition into Woodbridge soils (potentially upland soils), as shown on the NRCS soils map. LAM EcoLogical recommends the Conservation Commission have the applicant reinstall their wetland flags in the field so we can complete our site investigation.

Again, LAM EcoLogical appreciates the opportunity to submit this preliminary site investigation and would like permission to reenter the site once flags are reinstalled to complete our review.

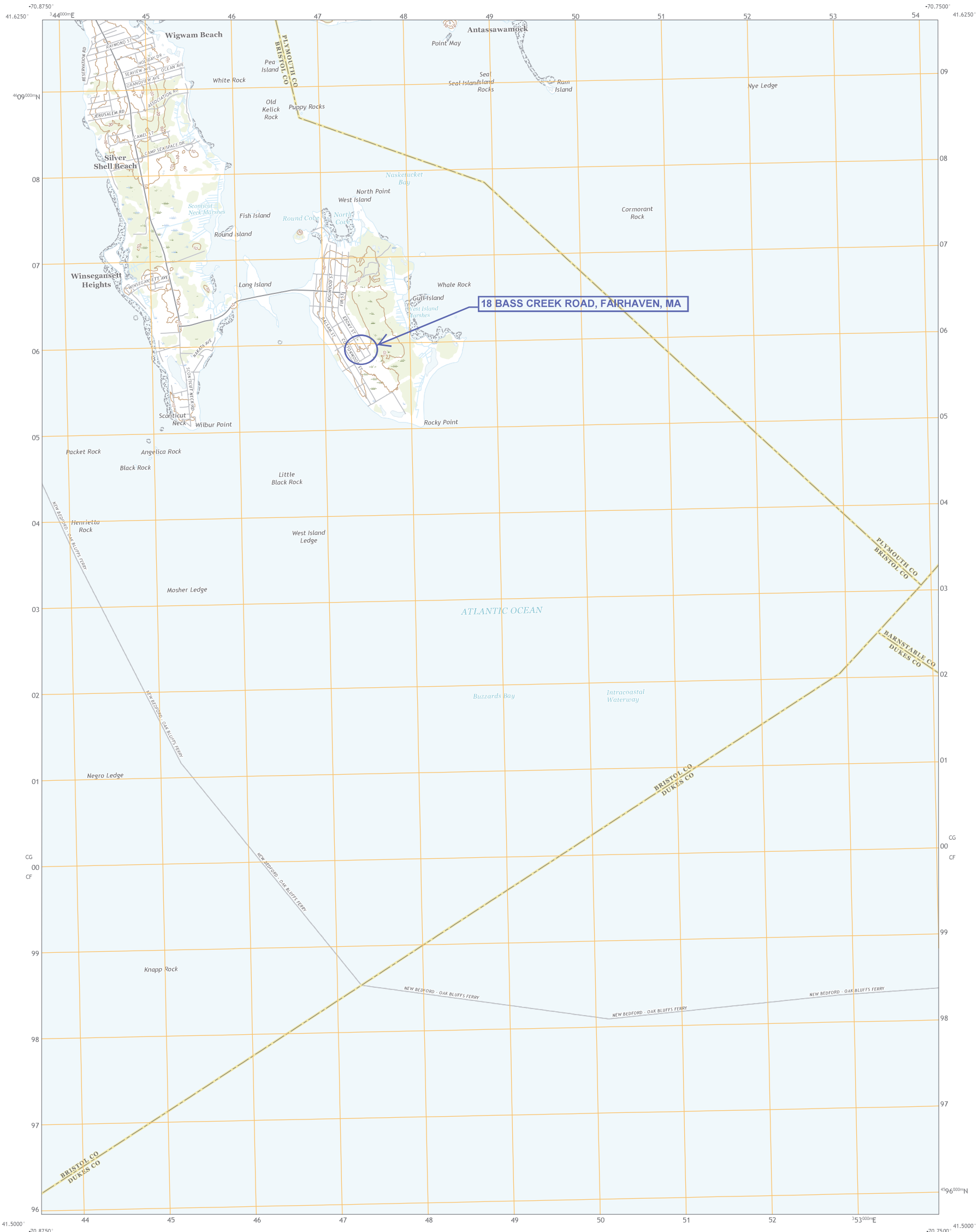
Regards,

Lori A. Macdonald, MS, PWS, CWB
Principal Environmental Scientist

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

SCONTICUT NECK QUADRANGLE
MASSACHUSETTS
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid:Universal Transverse Mercator, Zone 19T

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, July 2016 - September 2016
Roads.....U.S. Census Bureau, 2016
Names.....GNIS, 1974 - 2011
Hydrography.....National Hydrography Dataset, 2005 - 2017
Contours.....National Elevation Dataset, 2012
Boundaries.....Multiple sources; see metadata file 2016 - 2017

Wetlands.....FWS National Wetlands Inventory 2008 - 2011

UTM GRID AND 2017 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.18

QUADRANGLE LOCATION

ADJOINING QUADRANGLES
1 New Bedford North
2 Marion
3 Onset
4 New Bedford South
5 Woods Hole
6 Cuttyhunk
7 Naushon Island
8 Vineyard Haven

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

SCONTICUT NECK, MA
2018

FIGURE 1: USGS Locus Map
18 Bass Creek Road, Fairhaven, MA

FIGURE 2: FEMA National Flood Hazard MA GIS Datalayer
18 Bass Creek Road, Fairhaven, MA

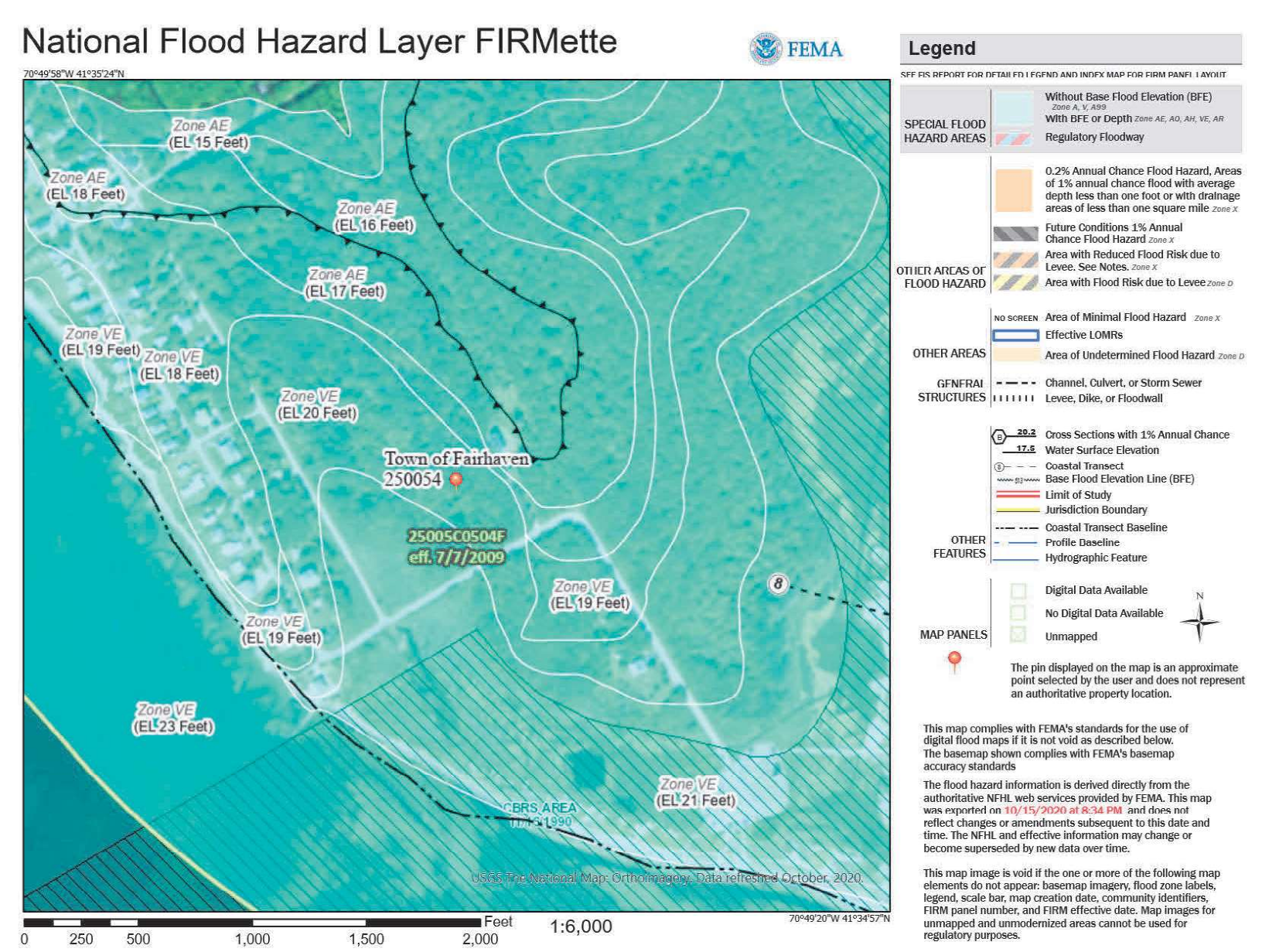


FIGURE 3: FEMA National Flood Hazard Layer FIRMette
18 Bass Creek Road, Fairhaven, MA

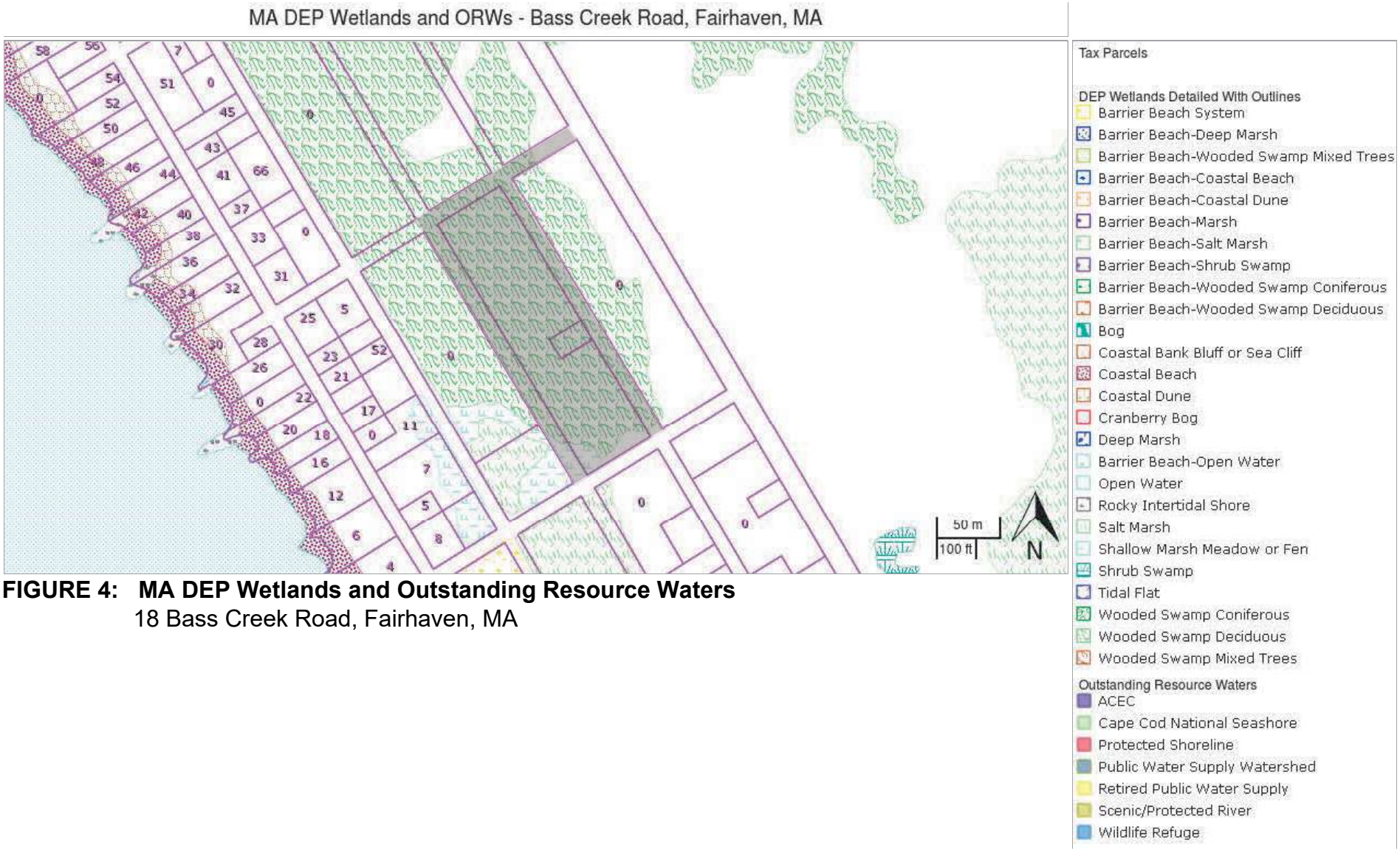


FIGURE 4: MA DEP Wetlands and Outstanding Resource Waters
18 Bass Creek Road, Fairhaven, MA

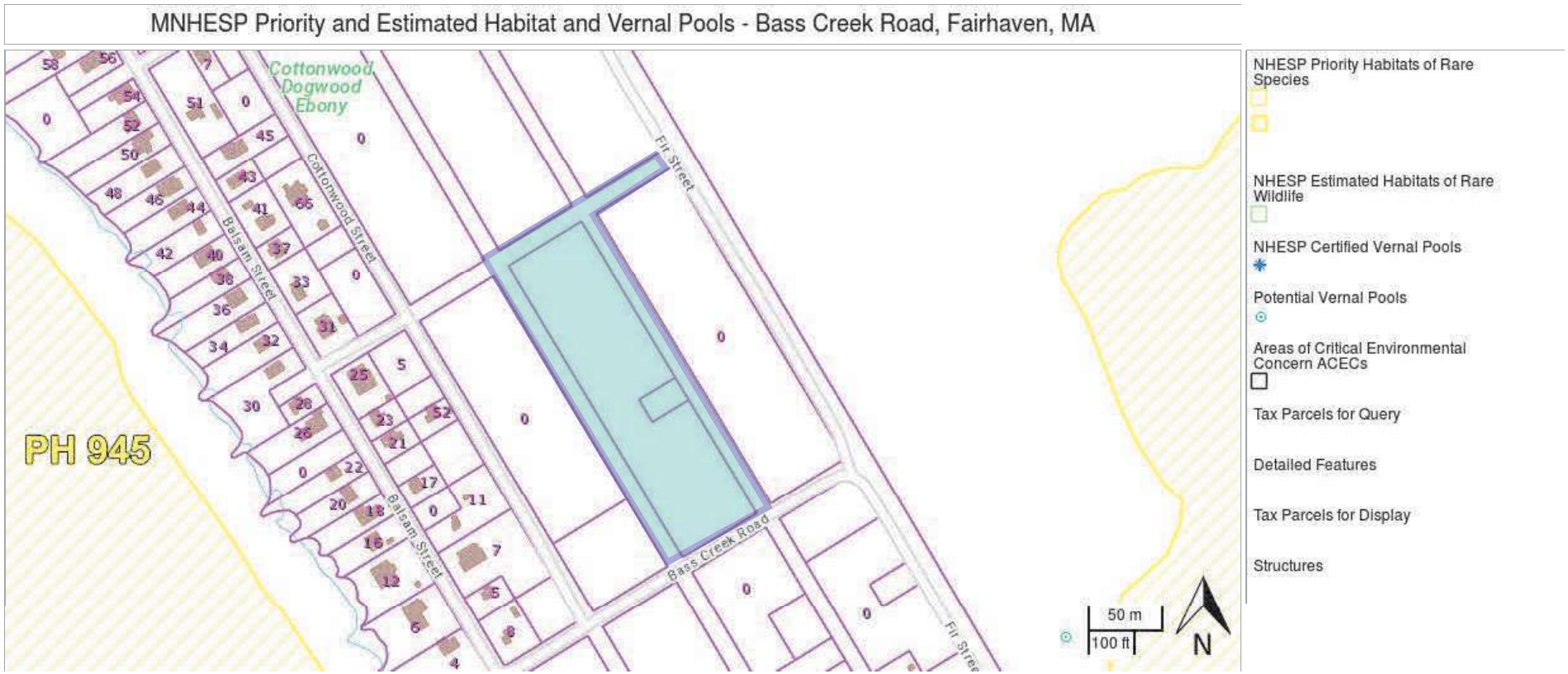


FIGURE 5: MA Natural Heritage Endangered Species Program Priority and Estimated Habitat and Certified and Potential Vernal Pools
18 Bass Creek Road, Fairhaven, MA

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Bristol County, Massachusetts, Southern Part

18 Bass Creek Road, Fairhaven, MA

October 15, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,030 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

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

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

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

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

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

Soil Survey Area: Bristol County, Massachusetts, Southern Part
Survey Area Data: Version 14, Jun 9, 2020

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

Date(s) aerial images were photographed: Dec 31, 2009—Jul 3, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
71A	Ridgebury fine sandy loam, 0 to 3 percent slopes, extremely stony	1.1	61.9%
312B	Woodbridge fine sandy loam, 0 to 8 percent slopes, extremely stony	0.7	38.1%
Totals for Area of Interest		**1.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The

delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Bristol County, Massachusetts, Southern Part

71A—Ridgebury fine sandy loam, 0 to 3 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2w69b
Elevation: 0 to 1,480 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Ridgebury, extremely stony, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ridgebury, Extremely Stony

Setting

Landform: Depressions, drumlins, drainageways, hills, ground moraines
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 6 inches: fine sandy loam
Bw - 6 to 10 inches: sandy loam
Bg - 10 to 19 inches: gravelly sandy loam
Cd - 19 to 66 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 15 to 35 inches to densic material
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F144AY009CT - Wet Till Depressions
Hydric soil rating: Yes

Minor Components

Whitman, extremely stony
Percent of map unit: 7 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Woodbridge, extremely stony
Percent of map unit: 7 percent
Landform: Drumlins, hills, ground moraines
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Crest, base slope
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Paxton, extremely stony
Percent of map unit: 1 percent
Landform: Drumlins, hills, ground moraines
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Hydric soil rating: No

312B—Woodbridge fine sandy loam, 0 to 8 percent slopes, extremely stony

Map Unit Setting
National map unit symbol: 2t2qs
Elevation: 0 to 1,580 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition
Woodbridge, extremely stony, and similar soils: 82 percent
Minor components: 18 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodbridge, Extremely Stony

Setting
Landform: Ground moraines, drumlins, hills
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave

Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 9 inches: fine sandy loam
Bw1 - 9 to 20 inches: fine sandy loam
Bw2 - 20 to 32 inches: fine sandy loam
Cd - 32 to 67 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 20 to 43 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 19 to 27 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C/D
Ecological site: F144AY037MA - Moist Dense Till Uplands
Hydric soil rating: No

Minor Components

Paxton, extremely stony

Percent of map unit: 10 percent
Landform: Drumlins, hills, ground moraines
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Ridgebury, extremely stony

Percent of map unit: 8 percent
Landform: Hills, ground moraines, depressions, drumlins, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

A1

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

FAIRHAVEN CONS. COMMISSION

Applicant: (KALISZ ANRAD) Prepared by: L. MACDONALD Project location: 18 BASS CREEK DEP File #:

Check all that apply: REVIEW

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

Section I.

Vegetation WETLAND	Observation Plot Number: 1		Transect Number: A-PL 1	Date of Delineation: 10/10/2020
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)	63%	100%	Y	FAC*
SAPLINGS				
Red maple (ACER RUBRUM)	10.5%	100%	Y	FAC*
SHRUBS				
Sweet Pepperbush (CLETHRA ALNIFOLIA)	63%	79%	Y	FAC*
Pink azalea (Rhododendron periclymenoides)	10.5%	13%	N	FAC
Highbush blueberry (VACCINIUM CORYMBOSUM)	3%	4%	N	FACW
Red Chokeberry (ARONIA PRUNIFOLIA)	3%	4%	N	FACW
GROUND COVER				
CINNAMON FERN (OSMUNDA CINNAMOMEA)	10.5%	77%	Y	FACW*
Wild Sarsaparilla (ARALIA NUDICAULIS)	3%	22%	N	FACU

* *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.*

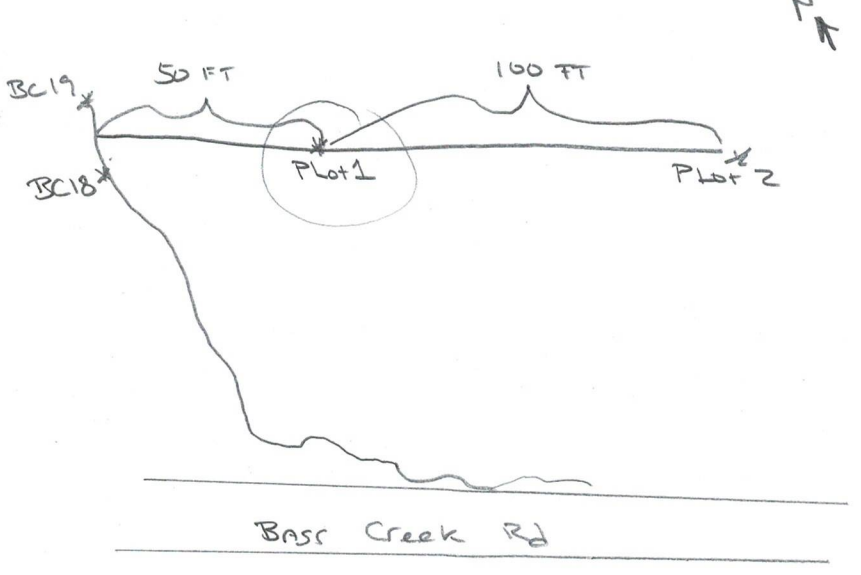
Vegetation conclusion:

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

TRANSECT A (APPROX PARALLEL TO BASS CREEK RD)
STARTED 10 FT WEST FROM BC 18



A1

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? (yes) no
title/date: Bristol County MA South
map number:
soil type mapped: Ridgebury
hydric soil inclusions: yes

Are field observations consistent with soil survey? yes (no)
Remarks:
Sandy Deposits From Historical tidal action On top of Mapped Soil

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
O	6"-0"		
E (Sand)	0-6"	GL1 3/N OR 2.5N	
B (Loamy Sand)	6"-12"	10YR 5/1 Stripped matrix Partly cemented	@ 16" 10yr 3/6 10yr 2/1 (ORG Streaking)

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: _____
- ☐ Water marks: _____
- ☐ Drift lines: _____
- ☐ Sediment Deposits: _____
- ☒ Drainage patterns in BVW: Pit & mound topo
- ☐ 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.

AZ

FAIRHAVEN CON COM (ANRAD REVIEW)

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

Applicant: John Kaiser Prepared by: L. Macdonald (LAM ECOLOGICAL) Project location: 18 Bass Creek Rd, Fairhaven 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 usedto delineateBVW boundary: fill out Sections I and II
- ☐ Method other than dominance test used (attach additional information)

Section I.

Vegetation WETLAND	Observation Plot Number: 2		Transect Number: A	Date of Delineation: 10/10/2026
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)	10.5%	12.5%	N	FAC*
Tupelo (Nyssa Sylvatica)	63%	75%	Y	FAC*
Red Oak (Quercus Rubra)	10.5%	12.5%	N	
Saplings				FACU
Red Maple (Acer Rubrum)	38%	100%	Y	FAC*
SHRUBS				
Tupelo (Nyssa Sylvatica)	10.5%	13%	Y	FAC*
Red Maple (Acer Rubrum)	10.5%	13%	Y	FAC*
Sweet pepper bush (Clethra alnifolia)	38%	47.5%	Y	FAC*
Highbush Blueberry (Vaccinium corymbosum)	10.5%	13%	Y	FACW*
Pink Azalea (Rhododendron periclymenoides)	10.5%	13%	Y	FAC*
GROUND COVER				
Cinnamon Fern (Osmunda cinnamomea)	10.5%	18%	N	FACW
Sweet Pepper Bush (Clethra alnifolia)	38%	64%	Y	FAC*

* *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.*

Swamp Dewberry (Rubus Hispidus) 10.5% 18% N FACW

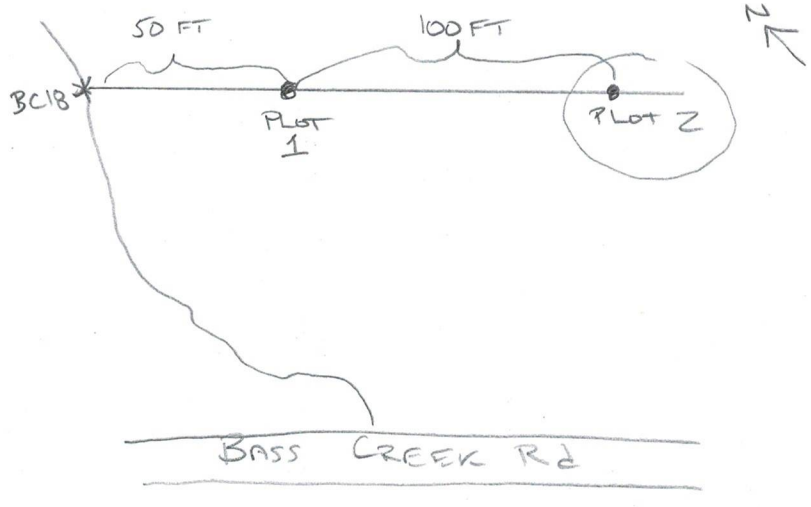
Vegetation conclusion:

Number of dominant wetland indicator plants: 8 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

TRANSECT A ~ PARALLEL TO BASS CREEK RD
STARTED 10 FT WEST FROM BC18



84'S

A2

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? (yes) no
title/date: Bristol County MA, South
map number:
soil type mapped: Ridgebury Fine Sandy loam
hydric soil inclusions: yes

Are field observations consistent with soil survey? yes (no)
Remarks:
Sandy Deposits From Historic tidal action on top of mapped soil

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
O	2"-0		
E (SAND)	0-10"	10yr 7/1 (stripped matrix	
B (Sandy Loam)	10"-16"	10yr 5/1	Concentrated @ 4") 10yr 4/4
Stone/Cobble Starts @ 8"		10yr 2/1	10yr 6/1

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: _____
- ☐ Water marks: _____
- ☐ Drift lines: _____
- ☐ Sediment Deposits: _____
- ☒ Drainage patterns in BVW: Pit & Mound topo
- ☒ Oxidized rhizospheres: _____
- ☒ Water-stained leaves: _____
- ☐ Recorded Data (streams, lake, or tidal gauge; aerial photo; other): _____
- ☒ Other: Oak on Hummock

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.

Transect A, Plot 1 Soils

Sandy soils with evidence of gleying, more than 10% stripped sand particles and what appears to be organic streaking above a B layer with high chroma (bright) soils where iron has accumulated below the sand layer and oxidized. Sandy soils partly cemented at 6".

Transect A – Plot 2 Soils

Sandy soils with three chroma matrix and some evidence of stripped sandy particles over a buried, sandy loam, A horizon. Oxidized rhizospheres and cemented soils within 4".