Massachusetts Inland Resource Area Delineation Report

Resource Area Description

Report Date: October 16, 2018

Prepared For: Ms. Helen Fantini
Jones-Whitsett Architects
308 Main Street, 3rd Floor
Greenfield, MA 01301

Site Address/Location: Pearl Street, Gardner, MA
42.58380°N, 71.97416°W

Inspection Date(s): September 27, October 3 and 5, 2018

Regulated Inland Wetland Resource Areas:

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

Delineated Resource Area Field Numbering Sequence [as depicted on the attached Resource Map]:

Bank/LUWW: B163L-221L, B200R-251R, D400-414, L294-311
BVW: A100-187, C300-315, E500-510, F600-610, G700-729, I900-906, J100-109, K200-204,
M400-406, N500-506, O600-608, P700-707, Q800-853, R900-946
IVW: S100-106

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

The wetlands delineation was conducted by:

Robin Casioppo
Wetland Scientist/Soil Scientist
Massachusetts Inland Resource Area Delineation Report
Resource Area Description

ATTACHMENTS

- Resource Area Description
- DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Forms
- NRCS Soil Map and Soil Report
- Resource Area Sketch Map
- MassGIS: OLIVER generated FEMA Map
Introduction

Fuss & O’Neill Inc. performed a wetland resource area field inspection and delineation at an undeveloped forested parcel (“Site”) located off Pearl Street in Gardner, MA. The field inspections and delineations occurred on September 27 and October 3 and 5, 2018. The purpose of the delineation was to locate the jurisdictional limits of areas regulated under the Wetlands Protection Act (M.G.L. c. 131 sec. 40) and associated Wetlands Protection Act Regulations (310 CMR 10).

Bank and Land under Water Bodies and Waterways (LUWW) inland wetland resource areas were identified and delineated during the field investigation. Consecutively numbered flags were placed in the field to demarcate these resource area boundaries. These resource area boundary flags were then GPS located with sub-meter accuracy. The GPS located flags and corresponding resource area labels are depicted on the attached Wetland Sketch Map. Regulated Buffer Zone and Riverfront Areas on the Property are measured horizontally from the boundaries of BVWs and perennial watercourse Banks.

Maps retrieved from MassGIS were used to determine if specific regulated inland wetland resources have been mapped and/or documented on the Property. MassGIS maps do not depict Massachusetts Natural Heritage and Endangered Species Program (NHESP) Priority Habitats of Rare Species, Potential Vernal Pools or Bordering Land Subject to Flooding (see additional details regarding FEMA Flood Zones below) on the Site. An on-site Certified Vernal Pool is depicted on MassGIS mapping. A detailed description of each regulated resource area present on the Property is provided below.

Resource Areas

Bank: Regulatory Framework and Delineation Methodology

Bank is defined under 310 CMR 10.54(2)(c) as “the portion of the land surface which normally abuts and confines a water body. It occurs between a water body and a vegetated bordering wetland and adjacent flood plain, or, in the absence of these, it occurs between a water body and an upland.” Fuss & O’Neill Inc. performed a delineation of Bank within the area of interest using consecutively numbered flags placed in the field to demarcate the Bank of two perennial watercourses, Foster Brook and an unnamed perennial stream. Bank associated with an unnamed pond was also delineated during the inspection. Both perennial streams flow into the pond.

Bank: Resource Description

Bank was located in the field by the first observable break in topography between water bodies and the adjacent BVW or upland. Water bodies on the property include two perennial watercourses, Foster Brook, an unnamed perennial stream, and an unnamed pond. The
delineated Bank along the perennial watercourses coincided with the Mean Annual High-Water Line (MAHWL)/bankfull, as defined under 310 CMR 10.58 (2)(a)(2). Foster Brook flows west and south through the north and west portions property and the unnamed perennial stream flows west through the south portion of the property. Both streams empty into the unnamed pond and continue south beneath Pearl Street leading to Dunn Pond. No evidence of riverine characteristics was noted along the unnamed pond bank during the inspection (i.e., no discernible direction of flow, no evidence of scour, etc.).

Riverfront Area: Regulatory Framework and Delineation Methodology

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

The extent of the Riverfront Area on the Property is determined by measuring a horizontal line 200 feet from the delineated mean annual high-water line of the perennial watercourses, Foster Brook and the unnamed perennial stream. As previously noted, the mean annual high water line of the identified watercourses coincides with the delineated Bank resource. The Bank of the unnamed pond associated with both perennial streams does not show evidence of riverine influence and as such does not have a regulated Riverfront Area.

Riverfront Area: Resource Area Description

The Riverfront Area within the area of interest includes the following regulated resource areas: BVW, Bank, Land under Water Bodies and Waterways, Buffer Zone, NHESP Estimated Habitats of Rare Wildlife, and NHESP Priority Habitats of Rare Species. The Riverfront Area on the Property includes undeveloped forested land and adjacent parcels associated with Gardner Middle School and High School. Evidence of wildlife usage within the Riverfront Area was limited to sightings of common songbirds, garter snakes, various species of frog, coyote scat, deer browse and tracks, and raccoon tracks.

A certified vernal pool also is located within the Riverfront Area on the Property. Wetland delineations occurred in late September and early October; therefore, no evidence of obligate amphibian breeding was observed. However, adult wood frogs (*Rana sylvatica*), an obligate vernal pool-breeding species, were observed in various locations within upland and wetland habitats throughout the project area.
Land under Water Bodies and Waterways (LUWW)

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

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

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

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

Hydric soil determinations were made in accordance with Field Indicators for Identifying Hydric Soils in New England (NEIWPCC, 2004). The Wetland Indicator Status for plant species was ascertained using the USACE Northcentral and Northeast 2014 Regional Wetland Plant List (Lichvar et al., 2014).

BVW: Resource Area Description

Vegetation

The various BVWs on the Property associated with the two perennial streams are mainly classified as palustrine forested and/or scrub shrub wetlands. Common vegetation identified within the forested BVWs included [common name/scientific name (indicator status)]: red maple/Acer rubrum (FAC), eastern hemlock/Tsuga canadensis (FAC), highbush blueberry/Vaccinium corymbosum (FACW), common winterberry/Ilex verticillata (FACW),
American witch hazel/Hamamelis virginiana (FACU), cinnamon fern/Osmunodastrum cinnamomeum (FACW), sensitive fern/Onoclea sensibilis (FACW), and jewelweed/Impatiens capensis (FACW).

Common vegetation within the scrub shrub BVWs included: silky dogwood/Swida amomum (FACW), sensitive fern, cinnamon fern, jewelweed, royal fern/Osmunda regalis (OBL), woolgrass/Scirpus cyperinus (OBL), white meadowsweet/Spiraea alba (FACW), broad-leaved cattail/Typha latifolia (OBL), rattlesnake manna grass/Glyceria canadensis (OBL), common reed/Phragmites australis (FACW), and various sedges/Carex spp. (OBL) and Sphagnum moss/Sphagnum sp. (OBL).

Hydrology

The BVW series A100s, C300s, F600s, G700s, P700s, and Q800s on the property are hydrologically connected to Foster Brook. The BVW series J100s, K200s, M400s, N500s, and R900s are hydrologically connected to the unnamed perennial stream. The BVW series I900s and O600s are associated with the unnamed pond. Foster Brook trends west along the northern and western property boundaries to the unnamed pond. The unnamed perennial stream flows west along the south portion of the property boundary. BVWs receive overland flow from the surrounding uplands and intercept seasonally high groundwater. One defined intermittent watercourse channel was identified on the west portion of the property during the inspection. Flow within the intermittent stream is supported by stormflow off Catherine Street, as well as the BVW series E500s. Evidence of surface water and soil saturation within the wetlands include: direct observation of surface water, water stained leaves and tree trunks, sediment deposition, free water in test holes, saturated soils, and hydric soils.

Soils

The Natural Resource Conservation Service (NRCS) mapped soil types on the Property include: Bucksport and Wonsqueak mucks, Becket fine sandy loam, Marlow fine sandy loam, Becket-Skerry series association, Pillsbury-Peacham series association, and Tunbridge-Lyman-Berkshire series association. Detailed information regarding each of these soil series is included within the NRCS Soil Map and Soil Report attachment. Results of the detailed field analyses of soils on the Property were generally consistent with the published NRCS soil mapping.

Buffer Zone

Buffer Zone is defined in 310 CRM 10.04 as “that area of land extending 100 feet horizontally outward from the boundary of any area specified in 310 CMR 10.02(1)(a).” Buffer Zone within the area of interest is associated with BVW and Bank. The buffer zone on the Property contains mainly upland forest. Common vegetation within the Buffer Zone includes: beech/Fagus grandifolia (FACU), red maple, red oak/Quercus rubra (FACU), eastern white
pine/\textit{Pinus strobus} (FACU), gray birch/\textit{Betula populifolia} (FAC), eastern hemlock, Virginia creeper/\textit{Parthenocissus quinquefolia} (FACU), grape/\textit{Vitis labrusca} (FACU), bittersweet, multiflora rose, brambles/\textit{Rubus spp.}, sensitive fern, and Canada mayflower/\textit{Maianthemum canadense} (FACU).

**FEMA Flood Zones**

The MassGIS National Flood Hazard Layer provided by the Federal Emergency Management Agency (FEMA) depicts areas of limited potential flooding on the Property. The on-site FEMA regulated 500-year Flood Zones are associated with Foster Brook and the unnamed perennial stream. These areas are not regulated as Bordering Land Subject to Flooding (BLSF), as they are not classified as 100-year floodzones. These areas also are not regulated as BLSF: BLSF is defined in 310 CMR 10.57 (2)(a)(1) as "an area with low, flat topography adjacent to and inundated by flood waters rising from creeks, rivers, streams, ponds or lakes. It extends from the banks of these waterways and water bodies; where a bordering vegetated wetland occurs, it extends from said wetlands."
DEP Bordering Vegetated Wetland (310 CMR 10.55)
Delineation Field Forms
## Vegetation

<table>
<thead>
<tr>
<th>Observation Plot Number: A1W1</th>
<th>Transect Number: 1</th>
<th>Date of Delineation: 9/27/18</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Sample Layer &amp; Plant Species (by common/scientific name)</td>
<td>B. Percent Cover (or basal area)</td>
<td>C. Percent Dominance</td>
</tr>
<tr>
<td>Eastern hemlock/Tsuga canadensis*</td>
<td>70</td>
<td>78</td>
</tr>
<tr>
<td>Red maple/Acer rubrum*</td>
<td>20</td>
<td>22</td>
</tr>
<tr>
<td>White or green ash/Fraxinus sp.</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>Mountain laurel/Kalmia latifolia</td>
<td>10</td>
<td>83</td>
</tr>
<tr>
<td>Cinnamon fern/Osmundastrum cinnamomeum*</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>

* 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+, 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: 3
- 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**

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

Applicant: ___________________________ Prepared by: Robin Casioppo, Fuss & O’Neill  Project location: Gardner  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 conclusion:
Number of dominant wetland indicator plants: 5  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

<table>
<thead>
<tr>
<th>A. Sample Layer &amp; Plant Species (by common/scientific name)</th>
<th>B. Percent Cover (or basal Area)</th>
<th>C. Percent Dominance</th>
<th>D. Dominant Plant (yes or no)</th>
<th>E. Wetland Indicator Category*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red maple/Acer rubrum*</td>
<td>25</td>
<td>100</td>
<td>Yes</td>
<td>FAC</td>
</tr>
<tr>
<td>Highbush blueberry/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccinium corymbosum*</td>
<td>50</td>
<td>77</td>
<td>Yes</td>
<td>FACW</td>
</tr>
<tr>
<td>Winterberry holly/Ilex verticillata*</td>
<td>15</td>
<td>23</td>
<td>Yes</td>
<td>FACW</td>
</tr>
<tr>
<td>Broad-leaved cattail/Typha latifolia*</td>
<td>5</td>
<td>50</td>
<td>Yes</td>
<td>OBL</td>
</tr>
<tr>
<td>Woolgrass/Scirpus cyperinus*</td>
<td>5</td>
<td>50</td>
<td>Yes</td>
<td>OBL</td>
</tr>
</tbody>
</table>

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

Applicant: ________________________________ Prepared by: Robin Casioppo, Fuss & O'Neill  Project location: Gardner  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.

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<th>Vegetation</th>
<th>Observation Plot Number: A1W3</th>
<th>Transect Number: 3</th>
<th>Date of Delineation: 10/05/18</th>
<th>A. Sample Layer &amp; Plant Species (by common/scientific name)</th>
<th>B. Percent Cover (or basal Area)</th>
<th>C. Percent Dominance</th>
<th>D. Dominant Plant (yes or no)</th>
<th>E. Wetland Indicator Category*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red maple/Acer rubrum*</td>
<td>40</td>
<td>85</td>
<td>Yes</td>
<td>FAC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American beech/Fagus grandifolia</td>
<td>2</td>
<td>4</td>
<td>No</td>
<td>FACU</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern hemlock/Tsuga canadensis*</td>
<td>5</td>
<td>11</td>
<td>No</td>
<td>FAC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highbush blueberry/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccinium corymbosum*</td>
<td>2</td>
<td>50</td>
<td>Yes</td>
<td>FACW</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winterberry/Ilex verticillata*</td>
<td>2</td>
<td>50</td>
<td>Yes</td>
<td>FACW</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Royal fern/Osmunda regalis*</td>
<td>20</td>
<td>27</td>
<td>Yes</td>
<td>OBL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cinnamon fern/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Osmundastrum cinnamomeum*</td>
<td>50</td>
<td>67</td>
<td>Yes</td>
<td>FACW</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wood fern/Dryopteris sp.</td>
<td>5</td>
<td>6</td>
<td>No</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Vegetation conclusion:
Number of dominant wetland indicator plants:
Number of dominant non-wetland indicator plants:

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

Applicant: ___________________________ Prepared by: Robin Casioppo, Fuss & O’Neill  Project location: Gardner  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.

<table>
<thead>
<tr>
<th>Vegetation</th>
<th>Observation Plot Number: C1W1</th>
<th>Transect Number: 1</th>
<th>Date of Delineation: 9/27/18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Layer &amp; Plant Species</td>
<td>B. Percent Cover (or basal Area)</td>
<td>C. Percent Dominance</td>
<td>D. Dominant Plant (yes or no)</td>
</tr>
<tr>
<td>Red maple/Acer rubrum*</td>
<td>50</td>
<td>100</td>
<td>Yes</td>
</tr>
<tr>
<td>Winterberry/Ilex verticillata*</td>
<td>30</td>
<td>94</td>
<td>Yes</td>
</tr>
<tr>
<td>Meadowsweet/Spiraea alba*</td>
<td>2</td>
<td>6</td>
<td>No</td>
</tr>
<tr>
<td>Cinnamon fern/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Osmundastrum cinnamomeum*</td>
<td>60</td>
<td>92</td>
<td>Yes</td>
</tr>
<tr>
<td>Wood fern/Dryopteris sp.</td>
<td>5</td>
<td>8</td>
<td>No</td>
</tr>
</tbody>
</table>

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Vegetation conclusion:
Number of dominant wetland indicator plants: 3
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.
**MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form**

Applicant: ___________________________ Prepared by: Robin Casioppo, Fuss & O’Neill Project location: Gardner 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.**

<table>
<thead>
<tr>
<th>A. Sample Layer &amp; Plant Species (by common/scientific name)</th>
<th>Observation Plot Number: E1W1</th>
<th>Transect Number: 1</th>
<th>Date of Delineation: 9/27/18</th>
<th>E. Wetland Indicator Category*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red maple/Acer rubrum*</td>
<td>20</td>
<td>100</td>
<td>Yes</td>
<td>FAC</td>
</tr>
<tr>
<td>Winterberry/Ilex verticillata*</td>
<td>80</td>
<td>84</td>
<td>Yes</td>
<td>FACW</td>
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<tr>
<td>Witch hazel/Hamamelis virginiana</td>
<td>15</td>
<td>16</td>
<td>No</td>
<td>FACU</td>
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<tr>
<td>Cinnamon fern/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Osmundastrum cinnamomeum*</td>
<td>15</td>
<td>100</td>
<td>Yes</td>
<td>FACW</td>
</tr>
</tbody>
</table>

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**Vegetation conclusion:**
Number of dominant wetland indicator plants: 3
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.
MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: ___________________________ Prepared by: Robin Casioppo, Fuss & O’Neill Project location: Gardner DEP File #: ________________

Check all that apply:
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Section I.

Vegetation Conclusion:

<table>
<thead>
<tr>
<th>Observation Plot Number</th>
<th>Transect Number</th>
<th>Date of Delineation</th>
<th>A. Sample Layer &amp; Plant Species (by common/scientific name)</th>
<th>B. Percent Cover (or basal Area)</th>
<th>C. Percent Dominance</th>
<th>D. Dominant Plant (yes or no)</th>
<th>E. Wetland Indicator Category*</th>
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<tbody>
<tr>
<td>G1W1</td>
<td>1</td>
<td>10/03/18</td>
<td>Red maple/Acer rubrum*</td>
<td>70</td>
<td>82</td>
<td>Yes</td>
<td>FAC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yellow birch/Betula alleghaniensis*</td>
<td>15</td>
<td>18</td>
<td>No</td>
<td>FAC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>White or green ash/Fraxinus sp.</td>
<td>5</td>
<td>100</td>
<td>Yes</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cinnamon fern/Osmundastrum cinnamomeum*</td>
<td>30</td>
<td>100</td>
<td>Yes</td>
<td>FACW</td>
</tr>
</tbody>
</table>

* 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: 2
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.
**MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form**

Applicant: ________________________  Prepared by: Robin Casioppo, Fuss & O'Neil  Project location: Gardner  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.

<table>
<thead>
<tr>
<th>Vegetation</th>
<th>Observation Plot Number/I1W1</th>
<th>Transect Number:1</th>
<th>Date of Delineation: 10/03/18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red maple/Acer rubrum*</td>
<td>30</td>
<td>75</td>
<td>Yes</td>
</tr>
<tr>
<td>White pine/Pinus strobus</td>
<td>10</td>
<td>25</td>
<td>Yes</td>
</tr>
<tr>
<td>Glossy buckthorn/Frangula alnus*</td>
<td>15</td>
<td>27</td>
<td>Yes</td>
</tr>
<tr>
<td>Speckled alder/Alnus incana*</td>
<td>15</td>
<td>27</td>
<td>Yes</td>
</tr>
<tr>
<td>Highbush blueberry/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccinium corymbosum*</td>
<td>15</td>
<td>27</td>
<td>Yes</td>
</tr>
<tr>
<td>Northern dewberry/Rubus flagellaris</td>
<td>10</td>
<td>19</td>
<td>No</td>
</tr>
<tr>
<td>Rough-leaved goldenrod/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solidago rugosa*</td>
<td>5</td>
<td>33</td>
<td>Yes</td>
</tr>
<tr>
<td>Sensitive fern/Onoclea sensibilis*</td>
<td>10</td>
<td>67</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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

Applicant: ___________________________ Prepared by: Robin Casioppo, Fuss & O'Neill  Project location: Gardner  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.**

<table>
<thead>
<tr>
<th>Vegetation</th>
<th>Observation Plot Number: M1W1</th>
<th>Transect Number: 1</th>
<th>Date of Delineation: 10/03/18</th>
<th>E. Wetland Indicator Category*</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Sample Layer &amp; Plant Species (by common/scientific name)</td>
<td>B. Percent Cover (or basal Area)</td>
<td>C. Percent Dominance</td>
<td>D. Dominant Plant (yes or no)</td>
<td></td>
</tr>
<tr>
<td>Yellow birch/Betula alleghaniensis*</td>
<td>60</td>
<td>38</td>
<td>Yes</td>
<td>FAC</td>
</tr>
<tr>
<td>Red maple/Acer rubrum*</td>
<td>60</td>
<td>37</td>
<td>Yes</td>
<td>FAC</td>
</tr>
<tr>
<td>Eastern hemlock/Tsuga Canadensis*</td>
<td>40</td>
<td>25</td>
<td>Yes</td>
<td>FAC</td>
</tr>
<tr>
<td>Highbush blueberry/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccinium corymbosum*</td>
<td>5</td>
<td>71</td>
<td>Yes</td>
<td>FACW</td>
</tr>
<tr>
<td>Striped maple/Acer pensylvanicum</td>
<td>2</td>
<td>29</td>
<td>Yes</td>
<td>FACU</td>
</tr>
<tr>
<td>Wood fern/Dryopteris sp.</td>
<td>5</td>
<td>100</td>
<td>Yes</td>
<td>NA</td>
</tr>
</tbody>
</table>

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**Vegetation conclusion:**

Number of dominant wetland indicator plants: 4

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

Applicant: _________________________ Prepared by: Robin Casioppo, Fuss & O'Neill  Project location: Gardner  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:N1W1  Transect Number:1  Date of Delineation:10/03/18

<table>
<thead>
<tr>
<th>A. Sample Layer &amp; Plant Species (by common/scientific name)</th>
<th>B. Percent Cover (or basal Area)</th>
<th>C. Percent Dominance</th>
<th>D. Dominant Plant (yes or no)</th>
<th>E. Wetland Indicator Category*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red maple/Acer rubrum*</td>
<td>75</td>
<td>94</td>
<td>Yes</td>
<td>FAC</td>
</tr>
<tr>
<td>Eastern hemlock/Tsuga canadensis*</td>
<td>2</td>
<td>3</td>
<td>No</td>
<td>FAC</td>
</tr>
<tr>
<td>White pine/Pinus strobus</td>
<td>2</td>
<td>3</td>
<td>No</td>
<td>FACU</td>
</tr>
<tr>
<td>Cinnamon fern/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Osmundastrum cinnamomeum*</td>
<td>40</td>
<td>40</td>
<td>Yes</td>
<td>FACW</td>
</tr>
<tr>
<td>Wood fern/Dryopteris sp.</td>
<td>60</td>
<td>60</td>
<td>Yes</td>
<td>NA</td>
</tr>
</tbody>
</table>

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Vegetation conclusion:
Number of dominant wetland indicator plants: 2  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.
MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: _________________________ Prepared by: Robin Casioppo, Fuss & O’Neill  Project location: Gardner 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.

<table>
<thead>
<tr>
<th>Vegetation</th>
<th>Observation Plot Number: R1W1</th>
<th>Transect Number: 1</th>
<th>Date of Delineation: 10/15/18</th>
<th>E. Wetland Indicator Category*</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Sample Layer &amp; Plant Species (by common/scientific name)</td>
<td>B. Percent Cover (or basal Area)</td>
<td>C. Percent Dominance</td>
<td>D. Dominant Plant (yes or no)</td>
<td></td>
</tr>
<tr>
<td>Red maple/Acer rubrum*</td>
<td>75</td>
<td>100</td>
<td>Yes</td>
<td>FAC</td>
</tr>
<tr>
<td>Witch hazel/Hamamelis Virginia</td>
<td>5</td>
<td>17</td>
<td>No</td>
<td>FACU</td>
</tr>
<tr>
<td>Highbush blueberry/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccinium corymbosum*</td>
<td>25</td>
<td>83</td>
<td>Yes</td>
<td>FACW</td>
</tr>
<tr>
<td>Cinnamon fern/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Osmundastrum cinnamomeum*</td>
<td>15</td>
<td>17</td>
<td>Yes</td>
<td>FACW</td>
</tr>
<tr>
<td>Sedge/Carex sp.*</td>
<td>75</td>
<td>83</td>
<td>Yes</td>
<td>OBL</td>
</tr>
<tr>
<td>Sphagnum sp.*</td>
<td>50</td>
<td>100</td>
<td>Yes</td>
<td>OBL</td>
</tr>
</tbody>
</table>

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Vegetation conclusion:
Number of dominant wetland indicator plants: 5
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.
NRCS Soil Map and Soil Report
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 1:25,000.

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: Worcester County, Massachusetts, Northwestern Part
Survey Area Data: Version 11, Oct 6, 2017

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

Date(s) aerial images were photographed: Mar 30, 2011—May 1, 2011

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

<table>
<thead>
<tr>
<th>Map Unit Symbol</th>
<th>Map Unit Name</th>
<th>Acres in AOI</th>
<th>Percent of AOI</th>
</tr>
</thead>
<tbody>
<tr>
<td>59A</td>
<td>Bucksport and Wonsqueak mucks, 0 to 2 percent slopes</td>
<td>20.2</td>
<td>28.6%</td>
</tr>
<tr>
<td>351C</td>
<td>Becket fine sandy loam, 8 to 15 percent slopes</td>
<td>1.4</td>
<td>1.9%</td>
</tr>
<tr>
<td>355B</td>
<td>Marlow fine sandy loam, 3 to 8 percent slopes</td>
<td>0.7</td>
<td>1.0%</td>
</tr>
<tr>
<td>908C</td>
<td>Becket-Skerry association, 0 to 15 percent slopes, extremely stony</td>
<td>36.0</td>
<td>51.0%</td>
</tr>
<tr>
<td>917B</td>
<td>Pillsbury-Peacham association, 0 to 8 percent slopes, extremely stony</td>
<td>6.1</td>
<td>8.6%</td>
</tr>
<tr>
<td>924C</td>
<td>Tunbridge-Lyman-Berkshire association, 3 to 15 percent slopes, extremely stony</td>
<td>6.2</td>
<td>8.8%</td>
</tr>
<tr>
<td><strong>Totals for Area of Interest</strong></td>
<td></td>
<td><strong>70.5</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>
Wetland Sketch Map