

PLEASANT HILL PRESERVE

SCARBOROUGH, MAINE



Prepared by:
FB Environmental Associates
97A Exchange Street, Suite 305
Portland, ME 04101
www.fbenvironmental.com



Prepared for:
Scarborough Land Trust
P.O. Box 1237
Scarborough, ME 04070
www.scarboroughlandtrust.org

NATURAL RESOURCES INVENTORY

PLEASANT HILL PRESERVE

SCARBOROUGH, MAINE

DECEMBER 2015



FB ENVIRONMENTAL ASSOCIATES

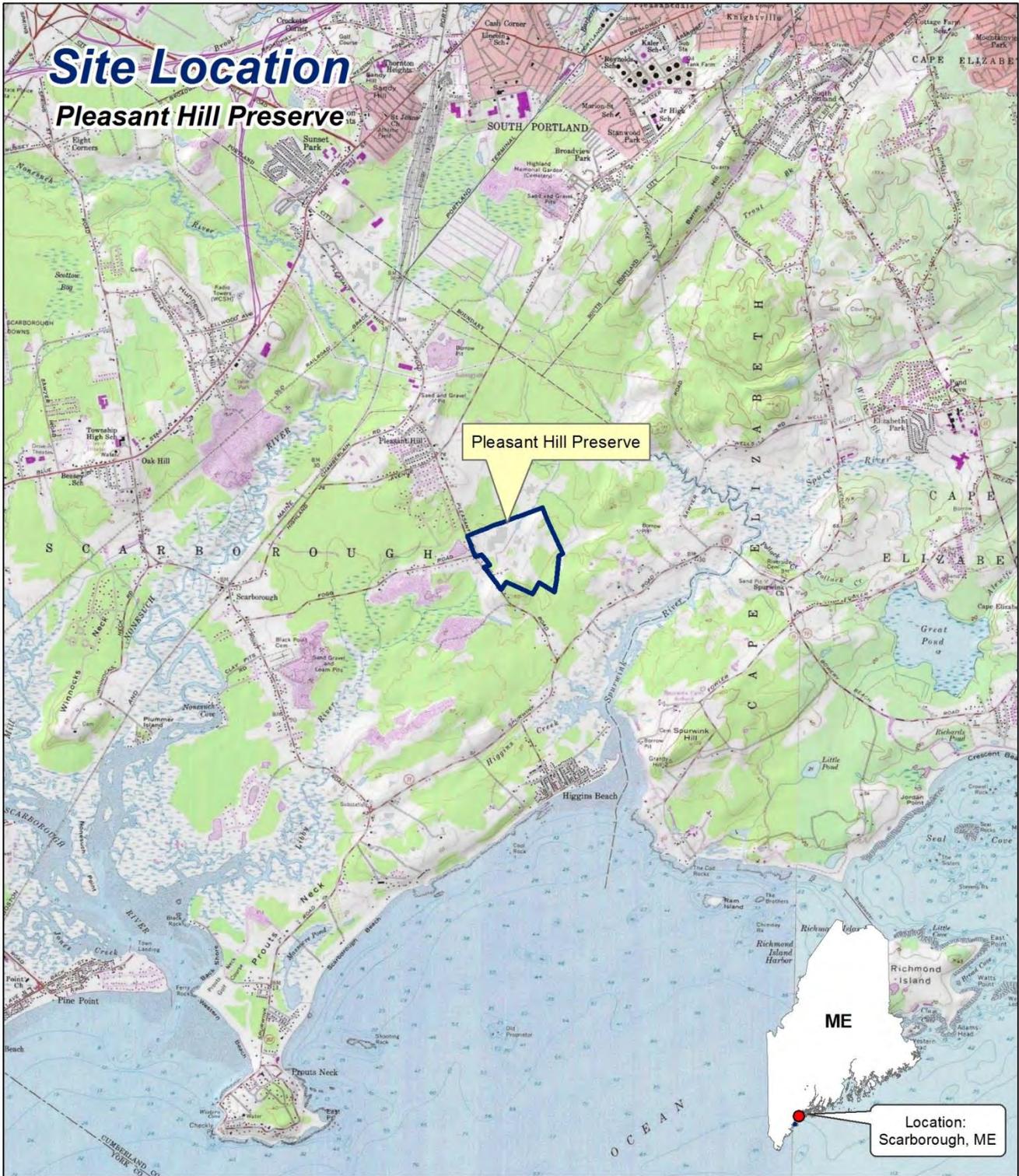
97A Exchange Street, Suite 305
Portland, ME 04101
www.fbenvironmental.com

PRINCIPAL AUTHORS

Lauren Bizzari
Krystal Costa
Kevin J. Ryan, Ph.D.

- Editing and formatting design by Laura Diemer -

Front cover photos taken by FBE.



 Property Boundary

0 1.5 3 Miles



Data Sources: MEGIS, ESRI
Coordinate System: NAD 1983 UTM
Zone 19
Created by FB Environmental,
August 2015

TABLE OF CONTENTS

INTRODUCTION 1

 Study Objectives 1

 Geographic Setting..... 1

 Property History 2

METHODS 5

 Landscape Analysis 5

 Wetland Delineation 5

 Field Inventories..... 7

RESULTS 8

 Geology and Soils 8

 Drainage Class 8

 Parent Material 9

 Terrestrial and Wetland Communities 9

 Terrestrial Communities 9

 Wetland Communities 12

 Flora 19

 Tree Inventory 19

 Signature Tree..... 19

 Other Vascular Plants 19

 Invasive Species..... 20

 Wildlife Observations 22

REFERENCES 24



A stand of red oaks at the southern end of the property. Photo Credit: FBE.

INTRODUCTION

STUDY OBJECTIVES

The Scarborough Land Trust (SLT) acquired Benjamin Farm in December of 2014 – an acquisition that was 15 years in the making. The farm was purchased from the children of Jerrerd Benjamin with funds from the Town of Scarborough’s Land Bond and private donors who sought to permanently conserve the farm for open space, scenic views, wildlife habitat, and passive recreation. SLT renamed the property Pleasant Hill Preserve in September 2015. To assess and catalog the natural communities currently present on the property, SLT hired FB Environmental Associates (FBE) to conduct a Natural Resources Inventory (NRI) of the property. The specific objectives of the NRI were to:

- ✦ Delineate natural communities
- ✦ Conduct a formal wetland delineation
- ✦ Identify sensitive or noteworthy natural features
- ✦ Develop a comprehensive list of tree species present
- ✦ Develop a list of vascular plants observed during fieldwork
- ✦ Inventory and map the distribution of non-native, invasive plants
- ✦ Document observed wildlife

This report presents these objectives and other interesting findings during field investigations. The NRI will help guide the development of a management plan for the property. Such plans are essential for maintaining the scenic, cultural, and natural characteristics of a given property, while also allowing for public access and recreational activities.

GEOGRAPHIC SETTING

Pleasant Hill Preserve is located east of the intersection of Pleasant Hill Road and Fogg Road in Scarborough, Maine. The 135-acre property is bordered by residential development to the north and west, privately-owned, forested parcels to the south, and the Rachel Carson National Wildlife Refuge to the east.

Elevation on the property ranges from 10 to 72 feet above mean sea level; the majority of the property is relatively flat (Appendix A, Map 1). These flat areas were cleared in the past for pasture and agricultural production. Hilly areas on the farm remain forested.

The property is part of a corridor of conserved land from the Spurwink River in Cape Elizabeth to the Libby River in Scarborough. At present, the property is dominated by wetland areas, open fields (formerly used for pasture and agriculture), and patches of mature forest. Wetlands at Pleasant Hill Preserve are extensive; a large wetland complex encompasses just over one-third of the property. The wetlands are largely groundwater-fed and are within the Spurwink River watershed. Water flows to the Spurwink and enters the Atlantic Ocean at Higgins Beach. The forested areas consist mainly of mature red oaks (*Quercus rubra*) with some eastern white pines (*Pinus strobus*), although several pine-dominated stands are also present.

PROPERTY HISTORY

The section below draws heavily from information provided by Rita Breton via an e-mail correspondence on June 4, 2015. Rita obtained some of the information below through interviews with Henrietta Robinson Larou, Belle Robinson Graney, Dick Fowler, Neils Johnson, Jr., and Ron Johnson. She also gleaned information from the Cumberland County Registry of Deeds.

Pleasant Hill Preserve was once two long-standing, independent farms: Beech Hill and Robinson Farms. Beech Hill Farm (known historically as Beach Hill) was located on the east side of the property. Owned by the family of a Danish immigrant (Hans Lund) beginning in the early 1900s, the property was initially a small dairy farm that sold milk to Nutter Farm, which was located on the corner of Pleasant Hill and Highland Avenue. After the dairy farm closed, the family turned to vegetable growing, particularly cabbage and lettuce, which were sold to wholesalers in Portland and Boston. The family also maintained six cows and three horses on the property and 20-25 acres of hayfields. Remnants of an underground cabbage house for year-round storage are still visible today. Hans Lund also fished for eels near the back of the property at the headwaters of the Spurwink River; he sold the eels to the Danish community in Portland.

The family used a well between the house and barn and another spring near the front of the property for drinking water. In the 1930s or 40s, Pleasant Hill Road was diverted and straightened to its current position, away from the front of Beech Hill Farm. In 1955, the family sold the property, and in February of 1965, the farmhouse and one barn burned to the ground. Jerrerd Benjamin acquired the property shortly after in September of 1965, whereby he removed the remaining barn.



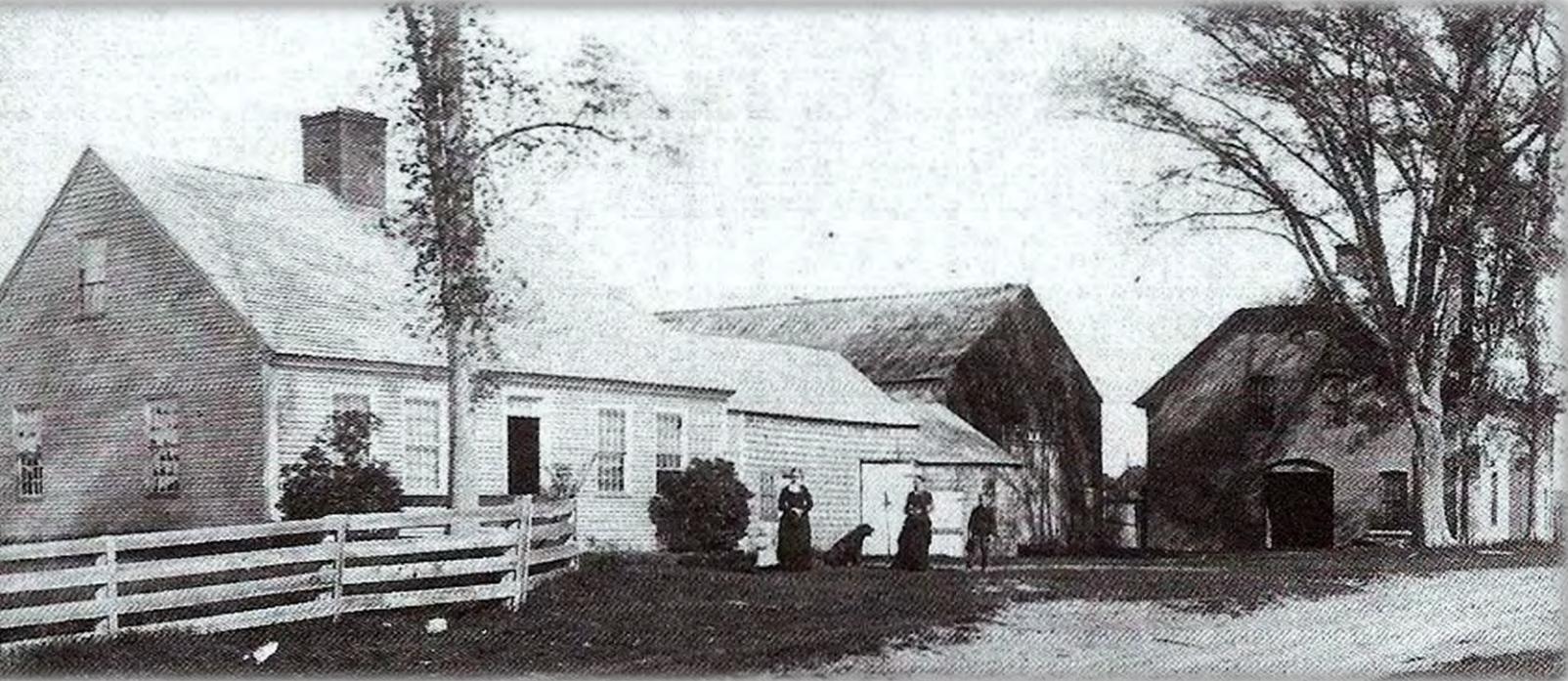
Beech Hill Farm in the 1930s. Photo Credit: Neils Johnson.

Robinson Farm was located on the west side of the property. After purchasing the property in 1826, three generations of Robinsons used the property for hay for their horses. In the late 1870s, Charles Robinson also owned the Scarborough Brick Yard; remnants of a brick barn that Charles built are still visible on the property today. Without any heirs, the Robinson Farm was sold to Jack McDermott in 1954. It exchanged ownership again in 1955 to two Coulthard brothers and was actively farmed until Jerrerd Benjamin purchased two pieces of the property in 1968 and 1969. He mainly raised beef cattle, but also kept pigs, sheep, geese, and chickens on the farm until 2005.

Benjamin owned the combined properties for 36 years, but did not live on-site. He died in 2006 and the property was transferred to his five children. The Benjamin Family took down the brick barn shown below. In 2015, SLT removed the remains of the homestead, which was beyond repair. Mr. Benjamin was the last person to farm the property and after his passing the property remained inactive.



Jerrerd Benjamin (top left), brick barn (bottom left), and beef cattle (top right) on Benjamin Farm. Photo Credit: Beth Bellemere.



Robinson Farm, circa 1870-80s. The large iconic brick barn was built by Charles Robinson, who owned the Scarborough Brick Yard. Photo Credit: Janice M. Littlejohn.

**A THING IS RIGHT WHEN IT TENDS TO
PRESERVE THE INTEGRITY, STABILITY, AND
BEAUTY OF THE BIOTIC COMMUNITY. IT IS
WRONG WHEN IT TENDS OTHERWISE.**

– ALDO LEOPOLD

METHODS

LANDSCAPE ANALYSIS

Prior to undertaking field inventories, FBE staff obtained spatial (GIS) and other data from a variety of sources as an initial screening of natural resources at Pleasant Hill Preserve. The following information was examined for the property:

- ✦ Tax map obtained from the Maine Office of GIS
- ✦ Topographic map obtained from the Maine Office of GIS (MEGIS)
- ✦ Recent aerial imagery obtained from the Environmental Science Research Institute (ESRI)
- ✦ Geology and soils maps (obtained from the Maine Geological Survey and USDA Natural Resource Conservation Service, respectively)
- ✦ National Wetlands Inventory (NWI) map obtained from MEGIS
- ✦ Benjamin Farm Site Visit Summary drafted by the Maine Natural Areas Program in 2013
- ✦ Correspondence from the Maine Department of Inland Fisheries and Wildlife (MDIFW) regarding the presence of Endangered, Threatened, and Special Concern species, as well as any designated Essential and Significant Wildlife Habitats and Fisheries Habitat (Appendix B, C)

WETLAND DELINEATION

Based on current State and U.S. Army Corps of Engineers (USACE) policy for identifying jurisdictional wetlands, wetland delineations were performed following the protocols described in the *1987 USACE Wetlands Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0* (USACE, 2012). The Routine Onsite Determination Method was used for this project. This methodology involves identifying wetlands based on three criteria: the presence of hydrophytic vegetation, hydric soils, and hydrology. For a given area to be considered a wetland, all three of these parameters must be met, with some exceptions for disturbed areas. Wetland delineation took place over the course of ten days: May 13, June 11 and 12, July 6, 16, 21, 22, and 30, August 4, and December 7, 2015.





Hydrophytic vegetation (top); hydric soil (center); and wetland hydrology (bottom). Photo Credit: FBE.

Hydrophytic vegetation is defined as the community of plants that occur in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to influence plant occurrence (USACE, 2012). An indicator status is assigned to each plant species; this is used to calculate the overall dominance of wetland plants in each stratum at each sample point. Based on the *2013 National Wetland Plant List* (Lichvar, 2013), the frequency of a plant species' occurrence in a wetland community determines its indicator status: Obligate Wetland, Facultative Wetland, Facultative, Facultative Upland, Upland.

A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USDA Soil Conservation Service, 1994). Hydric soil determinations were made using the Field Indicators of Hydric Soils in the United States, Version 7 (USDA-NRCS, 2010). Examples of hydric soil indicators include a histic epipedon or the presence of a dark A or Ap soil horizon underlain by a high value, low chroma (light-gray) colored soil horizon with redoximorphic features (e.g., iron and manganese concentrations or depletions).

The term "wetland hydrology" encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season. Typical indicators of wetland hydrology include inundated soils, soils saturated to the surface, drainage patterns, water marks, and morphological adaptations, such as buttressed trunks, shallow root systems, or multiple stemmed trees.

All wetlands were classified using the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979). This water resource classification system was developed by the United States Fish and Wildlife Service (USFWS) and is commonly referred to as "Cowardin Classification" (Appendix D). The Cowardin Classification is used to define wetlands and other aquatic resources by their landscape position, cover type, and hydrologic regime. Special modifiers can be added that describe water regime/chemistry, soil types, or disturbances.

Wetland boundaries were flagged using glo-pink survey flagging emblazoned with the words “WETLAND DELINEATION” and labeled with an alphanumeric code denoting the resource name and flag number. Wetland delineation data plots (a.k.a., “Corps plots”) were marked with chartreuse survey flagging. Spatial data for delineations were collected using a mapping-grade Trimble Geo 7x GPS unit (Trimble Navigation Limited, Sunnyvale, CA) which is capable of achieving sub-meter accuracy.

FIELD INVENTORIES

Field surveys were conducted by FBE staff on July 22, August 4, and October 28, 2015 to map the terrestrial natural communities, document vascular plants (including an inventory of tree species), and map invasive plants on the property. Information pertaining to the field surveys was also collected on an opportunistic basis during wetland delineation. Natural community classifications were determined in the field following Gawler and Cutko (2010). Plant species were noted as they were encountered and specimens of unknown plants in the field were collected and/or photographed to be identified later using field guides and/or botanical keys. Invasive species were mapped as either points (for isolated individuals or small populations) or polygons (for mixed populations). The relative density of the infestation was also noted. GPS points for mapping the natural communities, invasive species, and other notable features were collected using Garmin GPSmap 76Cx GPS handheld GPS units (Garmin International, Inc., Olathe, KS). These units are accurate to within 10-15 meters.



A shrubby area at Pleasant Hill Preserve. Photo Credit: FBE.

RESULTS

GEOLOGY AND SOILS

The bedrock geology of Pleasant Hill Preserve consists almost entirely of Ordovician - Precambrian Cape Elizabeth Formation, which is part of the Casco Bay group. It is described by the USGS as "...an assemblage of mostly thin-bedded, light-gray, siliceous and sericitic slates; and heavier beds of graywacke slate, schist, and quartzite containing, at short intervals, thin layers or laminae of black, micaceous phyllite and light-bluish calcareous schist or slate. Thickness about 600 ft." The surficial geology of Pleasant Hill Preserve consists of thin **DRIFT** areas, **SUBMARINE FANS**, and **PRESUMPSCOT FORMATION**¹ (Appendix A, Map 2).

There are eight soil series mapped on Pleasant Hill Preserve (Appendix A, Map 3). Scantic silt loam accounts for approximately 26% of the mapped soil on the property, Buxton silt loam approximately 23%, Paxton fine sandy loam 20%, and Elmwood fine sandy loam 14%. Deerfield loamy sand, Hollis very rocky fine sandy loam, Biddeford mucky peat, and Melrose fine sandy loam each account for less than 5% of the soil on the property. Of Pleasant Hill Preserve's 135 acres, 85 acres (63%) are mapped as Prime Farmland or Farmland of Statewide Importance. Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Soils of Statewide Importance almost meet the criteria for Prime Farmland and can produce high crop yields when treated and managed according to acceptable farming methods².

Drainage Class

Hollis series is somewhat excessively drained; Melrose and Paxton series are well drained; and Elmwood and Deerfield series are moderately well drained. Hydric soils have a drainage class of "very poorly" or "poorly" drained. Hydric soils undergo chemical processes that differentiate them from upland soils by creating

DEFINITIONS

DRIFT – material (e.g., gravel, sand, or clay) transported and deposited by a glacier or by glacial meltwater.

SUBMARINE FANS – formed underwater thousands of years ago as a result of large-scale sediment deposition by turbidity currents [when a dense fluid (e.g., sediment-laden water) flows through a less dense fluid (e.g., non-sediment-laden water)].

PRESUMPSCOT FORMATION – glacial-marine mud from the last ice age. The weight of the glacier forced the Earth's crust downward, allowing the ocean to flood these areas after the ice retreated.



Example of prominent redoximorphic features (rust-colored concentrations), characteristic of hydric soils.

Photo Credit: FBE.

¹ www.maine.gov/dacf/mgs/explore/surficial/sites/aug01.pdf.

² www.nrcs.usda.gov

observable soil morphologies, such as redoximorphic concentrations and depletions. The Biddeford series is very poorly drained, Scantic series is poorly drained. Buxton series is somewhat poorly drained and is not a hydric soil, but is subject to ponding during heavy rainfall.

Parent Material

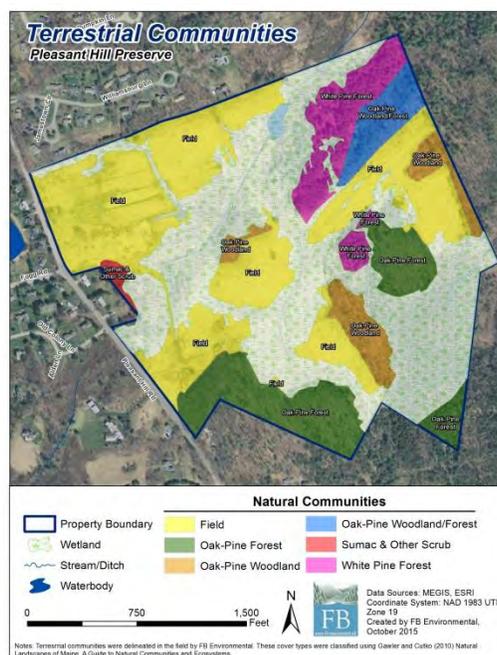
Biddeford, Buxton, and Scantic soils formed from marine and lacustrine (lake) sediment. Melrose and Elmwood were derived from glaciofluvial sediments deposited over marine/lacustrine sediments. Hollis and Paxton were derived from glacial till (unsorted sediment deposited directly by glacial ice) and Deerfield soils were derived from glacial outwash (a plain formed of glacial sediments deposited by meltwater outwash at the end of a glacier).

TERRESTRIAL AND WETLAND COMMUNITIES

As a working farmstead for over 150 years, the effects of human activity on the Pleasant Hill Preserve property are inextricably linked to the present-day plant communities. Some areas that were previously cleared for forestry or agricultural purposes have been recolonized by forest, but legacies of agricultural use remain in the form of old fences and roads. More recently abandoned areas of the farm are still dominated by plants typical of disturbed environments and old fields, such as common yarrow (*Achillea millefolium*), field bindweed (*Convolvulus arvensis*), and burdock (*Arctium minus*). Additionally, much of the property has been ditched and drained over the years, and current hydrology and wetland plant communities reflect these modifications to the landscape. Decades of disturbance have also resulted in the establishment of several non-native, invasive species (see Invasive Species section). Site photos and locations can be found in Appendix E and A, Map 4, respectively.

Terrestrial Communities

The upland (terrestrial) areas of Pleasant Hill Preserve were classified into four **NATURAL COMMUNITY** types (Appendix A, Map 5). The forested areas are dominated by Oak-Pine Forest or Oak-Pine Woodland communities. (Compared to a “forest”, the canopy of a “woodland” is more open and the trees are shorter. As a result, the herb layer is often more robust in a woodland due to more sunlight penetrating the forest floor.) White Pine Forest or a mixture of Oak-Pine Woodland/Forest are present in smaller-sized areas. These community types have a State rarity rank of S4 or S5, meaning they are apparently or demonstrably secure (i.e., not rare or imperiled) in Maine, respectively. A large proportion of the property is still historically-grazed field, though successional processes are beginning to revegetate these areas with



Map of terrestrial communities at Pleasant Hill Preserve. See Appendix A, Map 5.

shrubs and trees. A small Sumac and Other Scrub area is located on the western side of the property. Community types are described below.

A NATURAL COMMUNITY is an assemblage of interacting plants and animals and their common environment, recurring across the landscape, in which the effects of human intervention are minimal. The community includes all of the organisms in a particular setting, as well as the physical setting itself (Gawler and Cutko 2010).



Historically-grazed field. Photo Credit: FBE.

asters (*Symphyotrichum spp.*), goldenrods (*Solidago spp.*), joe-pye weed, (*Eutrochium maculatum*), common yarrow, and fleabanes (*Erigeron spp.*). Other common plants are raspberry (*Rubus spp.*), common St. John's wort (*Hypericum perforatum*), and stitchwort (*Stellaria graminea*). Non-native invasive plant species are also common in the fields (see Invasive Species section).

FIELDS

Fields border much of the wetland areas at Pleasant Hill Preserve between forested areas and wetlands. These open areas do not have an overstory, but pockets of apple trees (*Malus spp.*) are scattered throughout the property. Other shrubs and trees such as arrowwood (*Viburnum dentatum*) and black cherry (*Prunus serotina*) are also present, in addition to a thicket of staghorn sumac (*Rhus hirta*) located near the parking lot area. Weedy, herbaceous plants make up the majority of the plant diversity in the fields. This includes many members of the Aster Family, such as

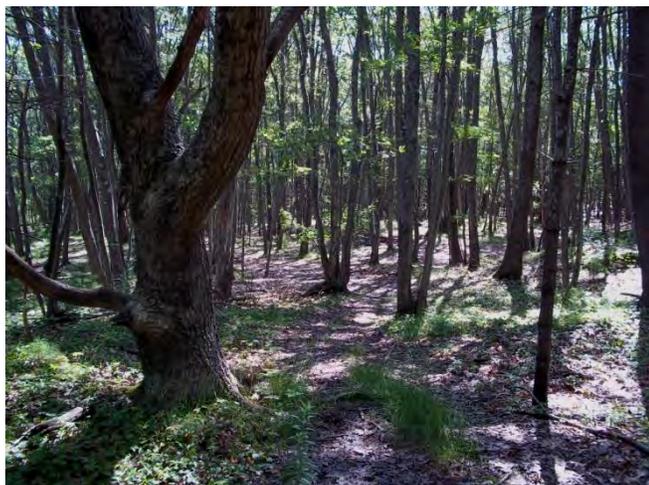


Canopy in White Pine Forest. Photo Credit: FBE.

WHITE PINE FOREST (WHITE PINE/MIXED CONIFER FOREST)

Eastern white pine is a classic “old-field” species in New England and can be found on the eastern part of the property. With its wind-dispersed seeds, white pine is among the first woody species to colonize abandoned agricultural areas by shading field grasses and forming nearly-pure stands with a few hardwood saplings underneath. The large size of the white pines dominating the canopy at Pleasant Hill Preserve indicates that farming in these areas was abandoned many years ago (> 50 years according to historical aerial photos). A few large red maple (*Acer rubrum*) and black cherry trees are scattered throughout the canopy. The understory varies in density; in some areas non-native invasive species, such as Morrow's honeysuckle (*Lonicera morrowii*), form thickets underneath

the white pines, but native species, such as red maple, red oak, shadbush (*Amelanchier* spp.), hawthorn (*Crataegus* spp.), and balsam fir (*Abies balsamea*), can also be found. The herb layer varies in density, but includes mainly Canada mayflower (*Maianthemum canadense*). When white pine stands are thinned, hardwood saplings take advantage of the light, which results in a mixed hardwood-pine forest. White Pine Forests may provide nesting habitat for bird species such as the sharp-shinned hawk (*Accipiter striatus*), pine warbler (*Dendroica pinus*), black-throated green warbler (*Setophaga virens*), and red crossbill (*Loxia curvirostra*) (Gawler and Cutko, 2010).



Old road through Oak-Pine Forest in southern section of Pleasant Hill Preserve.

Photo Credit: FBE.

OAK-PINE FOREST

Most Oak-Pine Forests in Maine (similar to Pleasant Hill Preserve) are found on once-cleared land (Gawler and Cutko, 2010). Large, mature red oak, red maple, and white pine dominate the canopy within this forest type. Red spruce (*Picea rubens*) and paper birch (*Betula papyrifera*) can also be found amid the canopy. The generally-sparse understory consists of young red maple and white pine, with the occasional ironwood (*Ostrya virginiana*) and chokecherry (*Prunus virginiana*). In areas where the understory is denser, non-native invasive species and other species common to disturbed areas, such as raspberry, are dominant. The herb layer typically includes seedlings

of the canopy species, low bush blueberry (*Vaccinium corymbosum*), Canada mayflower, and red baneberry (*Actaea rubra*). A large patch of jewelweed (*Impatiens capensis*) is located at the very top of the hill in the southern stand of this forest type, and upland sedges (*Carex* spp.) are abundant in the eastern stand. Additionally, several large rock outcrops, old roads, barbwire fences, and deer stands are present – further evidence of human activity on the property. Oak-Pine Forest provides nesting habitat for a variety of bird species, including the wood thrush (*Hylocichla mustelina*), scarlet tanager (*Piranga olivacea*), ovenbird (*Seiurus aurocapillus*), and pine warbler. Mature stands dominated by oaks offer suitable sites for cavity-nesting birds (Gawler and Cutko, 2010).



Oak-Pine Woodland near the center of Pleasant Hill Preserve. Photo Credit: FBE.

OAK-PINE WOODLAND

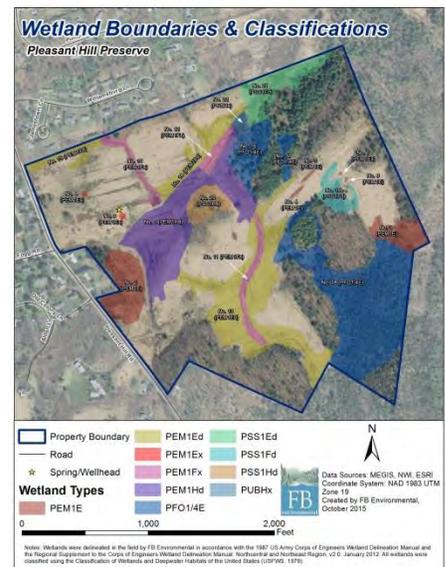
Oak-Pine Woodland is similar to Oak-Pine Forest, but with a shorter, more open canopy and a more vigorous herb layer. At Pleasant Hill Preserve, this community is generally found adjacent to or mixed with Oak-Pine Forest stands. Dominant tree species observed in this community include red oak, white pine, and a few mature black cherry trees. Black cherry, white pine, and beaked hazelnut (*Corylus cornuta*) are common in the understory. Plant species in the herb layer are similar to those found in Oak-Pine Forests, but also includes wild sarsaparilla (*Aralia nudicaulis*), white meadowsweet (*Spiraea alba*), goldenrods (*Solidago*

spp.), and an abundance of sedge. As with Oak-Pine Forest, the Oak-Pine Woodland community is relatively stable in Maine, and many sites receive recreational use. Several rare moth and butterfly species, such as the red-winged sallow (*Xystocheilus rufago*), barrens xylotype (*Xylotype capax*), and oblique zale (*Zale oblique*), use this community type to feed on oak trees (Gawler and Cutko, 2010).

Wetland Communities

As mentioned previously, the wetlands at Pleasant Hill Preserve were classified using the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979), commonly referred to as “Cowardin Classification” (Appendix D). This classification scheme is widely-used to define wetlands and other aquatic resources by their landscape position, cover type, and hydrologic regime. Special modifiers can be added that describe water regime/chemistry, soil types, or disturbances.

The Pleasant Hill Preserve property contains a mosaic of interconnected palustrine (i.e., non-tidal and not associated with lakes or rivers) emergent, forested, and scrub-shrub wetlands (Appendix A, Maps 6 & 7). Much of the property has been ditched and drained; the current hydrology and plant communities reflect these modifications.



Wetlands map depicting classifications at Pleasant Hill Preserve. See Appendix A, Map 7.

TABLE 1. Summary of wetlands delineated at Pleasant Hill Preserve.

Wetland Number	General Wetland Type	Cowardin Classification (see Appendix D)	Area Delineated on Property (acres)	Remarks
1	Emergent (Marsh)	PEM1Hd	9.24	Large marsh at center of property
2	Emergent (Marsh)	PEM1E	3.32	Bisected from Wetland 1 via old farm road
3	Emergent (Marsh)	PEM1E	1.89	Contiguous with forested wetland to the south
4	Emergent (Wet meadow)	PEM1E	0.08	Small wetland area in field
5	Emergent (Wet meadow)	PEM1E	0.07	Small wetland area in field
6	Emergent (Wet meadow)	PEM1E	0.01	Small wetland area in field
7	Emergent (Marsh)	PEM1E	0.01	Small excavated area
8	Emergent (Marsh)	PEM1Ex	0.03	Small excavated area
9	Emergent (Marsh)	PEM1Ex	0.04	Small excavated area
10	Emergent (Marsh)	PEM1Fx	0.99	Ditch
11	Emergent (Marsh)	PEM1Fx	1.32	Ditch
12	Emergent (Marsh)	PEM1Fx	0.70	Ditch
13	Emergent (Wet Meadow)	PEM1Ed	11.46	Adjacent to ditch
14	Emergent (Wet Meadow)	PEM1Ed	2.64	Adjacent to ditch
15	Emergent (Wet Meadow)	PEM1Ed	1.17	Adjacent to ditch
16	Forested (Swamp)	PFO1/4E	2.56	Red maple swamp with evergreens also present
17	Forested (Swamp)	PFO1/4E	0.72	Red maple swamp with evergreens also present
18	Forested (Swamp)	PFO1/4E	14.27	Continues beyond property boundary
19	Scrub-Shrub	PSS1Fd	1.47	Contains cranberry
20	Scrub-Shrub	PSS1Hd	1.74	Adjacent to large marsh
21	Scrub-Shrub	PSS1Ed	3.08	Continues beyond property boundary
22	Unconsolidated Bottom (Pond)	PUBHx	0.34	Old farm pond
TOTAL			57.15	

EMERGENT WETLANDS

Palustrine emergent wetlands comprise the majority of wetlands on the property. These wetlands are dominated by persistent, perennial plants that are erect, rooted, and remain present for the entire growing season. Persistent vegetation remains standing until at least the beginning of the next growing season.



Emergent wetlands on the property with abundant blue flag iris in bloom. Photo Credit: FBE.

WETLAND 1. PEM1Hd – Palustrine, Emergent, Persistent, Permanently Flooded, Ditched

This large marsh located slightly southwest of the center of the property is the most conspicuous wetland complex at Pleasant Hill Preserve (Wetland 1). The wetland is ditched, but apparently remains permanently flooded through the duration of the growing season. The wetland is an emergent marsh dominated by cattail (*Typha latifolia*), although large patches of lake sedge (*Carex lacustris*), and blue flag iris (*Iris versicolor*) are also present. Purple loosestrife (*Lythrum salicaria*), water hemlock (*Cicuta* sp.), sensitive fern (*Onoclea sensibilis*), various species of aster, water avens (*Geum rivale*), boneset (*Eupatorium perfoliatum*), water horehound (*Lycopus americanus*), and white turtle head (*Chelone glabra*) are present to a lesser extent.

WETLANDS 2–6. PEM1E – Palustrine, Emergent, Persistent, Seasonally Flooded/Saturated

Wetlands meeting this classification exist at the western and eastern ends of the farm. The westernmost wetland (Wetland 2) borders Pleasant Hill Road to the west and an old farm road to the east. (Prior to the farm road, the wetland was connected to Wetland 1.) The wetland consists of a cattail marsh bordered to the east by a patch of lake sedge. The wetland transitions to wet meadow at its southern end and contains patches of arrowwood and speckled alder (*Alnus incana*).

Four other marshes meeting this designation are present at the eastern end of the property. The easternmost wetland (Wetland 3) is a section of wet meadow contiguous with a forested wetland complex to the south. The vegetation within this wetland is a mix of upland and wetland herbs, including rushes (*Juncus* spp.), sensitive fern, cow vetch (*Vicia cracca*), goldenrod, and cinquefoil (*Potentilla* sp.). The small,

scattered shrub layer consists of speckled alder and multiflora rose (*Rosa multiflora*). Surface water might be briefly present in this area for a short period during the growing season.

The remaining three wetlands (Wetlands 4–6) are small areas in fields just wet enough to be considered wetlands. Surface water was not present in these wetlands during any of the site visits, but the water table remained close to the soil surface. Due to the brief periods of inundation that these wetlands sustain (likely in early spring), both upland and wetland plants, including joe-pye weed, soft bulrush (*Schoenoplectus tabernaemontani*), purple loosestrife, curly dock (*Rumex crispus*), goldenrods, and cinquefoil are present within them.

WETLANDS 7–9. PEM1Ex – Palustrine, Emergent, Persistent, Seasonally Flooded/Saturated, Excavated

A small, excavated wetland (Wetland 7) is present at the eastern end of the property; it is composed of vegetation similar to wetlands 4–6. Two additional small wetland areas (Wetlands 8 and 9) resulting from excavation exist in the farm’s northwestern field. Wetland 8 is dominated by soft bulrush, although purple loosestrife is also present. Wetland 9 is a very small cattail marsh with steep banks that had some standing water during site visits.

WETLANDS 10–12. PEM1Fx – Palustrine, Emergent, Persistent, Semi-permanently Flooded, Excavated

These wetlands are man-made ditches created to drain wetlands on the property presumably to improve areas for grazing and/or agriculture. These ditches are located throughout the property and many are large enough to sustain similar hydrology and vegetation to the large cattail marsh at the center of the property. Purple loosestrife (an invasive species) is at its densest within these wetlands.

The site of an old well or spring is located near this wetland. A round concrete structure filled with old glass gallon jugs is present north of Wetland 9. A ditch (part of Wetland 10) from which spring water flows is just east of the structure.

WETLANDS 13–15. PEM1Ed – Palustrine, Emergent, Persistent, Seasonally Flooded/Saturated, Ditched

These wetlands (Wetlands 13-15) are adjacent to the ditches on the property. Though these wetlands are drained by ditches, the soil moisture nevertheless remains sufficient to support a dominance of hydrophytic plants. Vegetation within these wetlands is dominated by herbaceous plants, including blue flag iris, soft bulrush, sedges, and rattlesnake manna grass (*Glyceria canadensis*). Broad-leaved plants are also present and include purple loosestrife, water hemlock, sensitive fern, water avens, boneset, water horehound, white turtle head, and green fringed bog orchid (*Platanthera lacera*). Shrubs are somewhat sparse in these areas and consist mainly of arrowwood, and red osier dogwood (*Swida sericea*).

FORESTED WETLANDS

Three forested wetlands were delineated within the boundaries of Pleasant Hill Preserve. These freshwater wetlands are dominated by trees that are 20 feet and taller.



Forested wetland at Pleasant Hill Preserve. Photo Credit: FBE.

WETLANDS 16–18. PFO1/4E – Palustrine, Forested, Broad-leaved Deciduous/Needle-leaved Coniferous, Seasonally Flooded/Saturated

Two wetlands (Wetlands 16 and 17) located at the northern end of the property are a mix of broad-leaved deciduous and needle-leaved evergreen trees. Red maple dominates the overstories, with white pine and balsam fir also present. The shrub understories consist of speckled alder and morrow's honeysuckle. Their herbaceous layers include jewelweed, swamp buttercup, jack-in-the-pulpit, and assorted ferns.

Another forested wetland (Wetland 18) is located in the southeastern portion of the property and continues south beyond the property boundary. The overstory is a mixture of broad-leaved deciduous and needle-leaved evergreen trees. Red maple is the dominant tree, although muscledwood (*Carpinus caroliniana*), black cherry, black spruce (*Picea mariana*), and balsam fir are also present to a lesser extent. The shrub layer consists of speckled alder, beaked hazelnut, and saplings of overstory trees. The herbaceous layer includes jewelweed, swamp buttercup (*Ranunculus caricetorum*), skunk cabbage (*Symplocarpus foetidus*), poison ivy (*Toxicodendron radicans*), white pine seedlings, and several species of fern. Surface water is likely present early in the spring, and the substrate remains saturated at or near the surface for the entire growing season.

SCRUB-SHRUB WETLANDS

These wetlands are dominated by deciduous or coniferous woody vegetation that are less than 20 feet tall, including shrubs, saplings, and/or stunted trees. Three scrub-shrub wetlands were delineated at Pleasant Hill Preserve.



Scrub-shrub wetland dominated by speckled alder. Photo Credit: FBE.

WETLAND 19. PSS1Fd – Palustrine, Scrub-shrub, Broad-leaved Deciduous, Semi-permanently Flooded, Ditched

This area (Wetland 19) is located within the eastern portion of the property and contains a dense thicket of speckled alder. The southern portion of the wetland contains a small area of open canopy and appears to be at least semi-permanently flooded. Large cranberry (*Vaccinium macrocarpon*) was observed in this area. It is the only location on the farm where this plant was observed.

WETLAND 20. PSS1Hd – Palustrine, Scrub-shrub, Broad-leaved Deciduous, Permanently Flooded

This small scrub-shrub area (Wetland 20) is adjacent to the Oak-Pine Woodland in the center of the property. The wetland is dominated by broad-leaved, deciduous, woody shrubs, including speckled alder, meadowsweet (*Spiraea latifolia*), red osier dogwood, and arrowwood. The herbaceous layer consists of purple loosestrife, turtlehead, soft bulrush, sedges, and several fern species. The area was flooded during the site visit in August.

WETLAND 21. PSS1Ed – Palustrine, Scrub-shrub, Broad-leaved Deciduous, Seasonally Flooded/Saturated, Ditched

This wetland (Wetland 21) is located in the northeastern corner of the property and is an impenetrable thicket of morrow's honeysuckle, speckled alder, and multiflora rose. The herb layer consists of jewelweed, swamp buttercup, sensitive fern, and soft bulrush. Though the area is ditched, it was very wet during the site visit in August, and the ditch itself contained flowing water, presumably as a result of groundwater input.

UNCONSOLIDATED BOTTOM WETLAND

Unconsolidated bottom wetlands are characterized by the lack of large stable surfaces for plant and animal attachment. The old farm pond on the property meets this classification.



Unconsolidated bottom wetland. Photo Credit: FBE.

WETLAND 22. PUBHh or PUBHx – Palustrine, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded or Excavated

This small, permanently-flooded wetland (Wetland 22) is in the northern part of the property and appears to have been excavated. The majority of the wetland is open water, but due to siltation, the wetland is transitioning to a marsh. Vegetation colonizing this wetland consists of cattail, pickerelweed (*Pontederia cordata*), arrowhead (*Sagittaria latifolia*), water hemlock, duckweed (*Lemna minor*), and watershield (*Brasenia schreberi*).

FLORA

Tree Inventory

Thirty-four species of trees, including one non-native, invasive species, were documented at Pleasant Hill Preserve (Appendix A, Map 8; Appendix F, G). There are several notable examples of native species, which could be potential “points of interest” when creating trails throughout the property.

Signature Tree

The American elm’s (*Ulmus americana*) vase-shaped habit and drooping branches make it one of the most picturesque tree species in the Northeast. It was once a very common street tree in many towns (think of the number of roads named “Elm Street”). Unfortunately, Dutch elm disease, a fungus unintentionally introduced from Europe in the 1930’s, has had deleterious effects on elm populations; large, mature individuals are increasingly rare. Existing specimens of large American elms are sometimes referred to as “survivor” trees.

During the course of field investigations, the leaves, buds, branches, and winged fruit (called samaras) of Pleasant Hill Preserve’s “Signature Tree” were examined using several field guides. All morphological characteristics are consistent with American elm. This rather magnificent tree is therefore a survivor American elm. The land trust may wish to contact a licensed arborist to examine the tree and make recommendations as to ensuring its survival.

Other Vascular Plants

In addition to the observed tree species, over 100 other vascular plant species were documented throughout the property (Appendix H). This species list includes a small population of red trillium (*Trillium erectum*) observed in the Oak-Pine Woodlands near the center of the property. Trilliums are distinctive long-lived perennial plants that bloom in early to late spring. As the trilliums were found in a very rocky, elevated area of the property, the soil has



Green fringed bog orchid (top) and large cranberry (bottom). Photo Credit: FBE.

likely never been tilled, which has enabled the trilliums to establish. Other interesting upland species observed include native bush honeysuckle (*Diervilla lonicera*), red baneberry (*Actaea rubra*), and fragrant bedstraw (*Galium triflorum*). Additionally, green fringed bog orchid (*Platanthera lacera*) and large cranberry (*Vaccinium macrocarpon*) were found in the wetlands on the property.

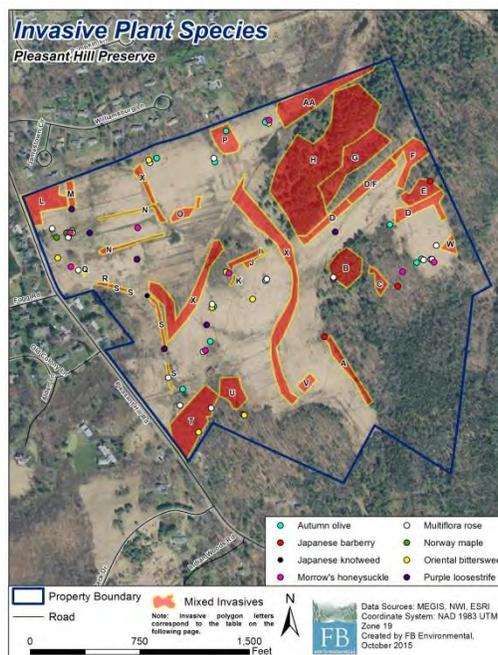
Invasive Species

Non-native, invasive plant species are abundant at Pleasant Hill Preserve. Eight separate species were documented during field surveys (Appendix A, Map 9). Throughout the property, invasive species were most commonly found in scattered to dense mixed-species clumps. These mixed-species populations are often along the forest-field boundary and along old fence lines. Dense monocultures of species such as Japanese barberry (*Berberis thunbergii*) and Japanese knotweed (*Fallopia japonica*) were also present, as well as numerous individual plants scattered throughout the fields. Descriptions of invasive species documented at Pleasant Hill Preserve are below.

ORIENTAL BITTERSWEET (*CELASTRUS ORBICULATUS*):

This is one of the most abundant invasive species on the property. It is a highly-invasive, climbing woody vine that can attain lengths of 60 feet. Oriental bittersweet is easy to distinguish from the far-less-common American bittersweet (*Celastrus scandens*) in that flowers and fruit are located in the leaf axils (the angle between the upper side of a leaf or stem and the stem or branch that supports it) on Oriental bittersweet and are only in terminal panicles (i.e., the end) of American bittersweet stems. Also, the fall fruit capsules are yellow for Oriental bittersweet and orange for American bittersweet³. Oriental bittersweet forms dense thickets and displaces native vegetation. It grows vigorously and is capable of encircling and strangling mature trees and forming dense monocultures. It prefers full sun, but can also grow in part shade, which facilitates its colonization of open forests. Its seeds are numerous, readily spread by birds, and can persist in the soil for more than 10 years.

MORROW'S HONEYSUCKLE (*LONICERA MORROWII*): Another common invasive at Pleasant Hill Preserve is Morrow's honeysuckle, a multi-stemmed, upright, deciduous shrub with telltale shaggy bark and opposite leaves. The plant was imported from Asia in the 1800s for use as an ornamental, wildlife food and cover, and soil erosion control. Widely planted through the 20th century, it is now recognized as a highly invasive species found in a variety of landscape settings⁴. As with Oriental bittersweet, Morrow's honeysuckle forms dense thickets and displaces native vegetation. It invades open woodlands, old fields, and other disturbed sites, and spreads rapidly via wildlife-facilitated seed dispersal. While the fruits of



Map of invasive species at Pleasant Hill Preserve. See Appendix A, Map 9.

³ The Nature Conservancy Maine Invasive Plant Fact Sheet: Oriental bittersweet.

⁴ Maine Cooperative Extension Publications Bulletin #2507, Shrubby Honeysuckles.

Morrow's and other exotic honeysuckles provide some nutrition for birds and mice in winter, their carbohydrate-rich quality makes them inferior to the lipid-rich fruits of many native species that sustain migrating birds⁵.

MULTIFLORA ROSE (*ROSA MULTIFLORA*): This shrub is an aggressive colonizer of roadsides, fence lines, forest edges, old fields, and powerline corridors, and is very efficient at crowding out other vegetation where it is present. Multiflora rose is distinguishable from native roses by its large clusters of white or pale pink blossoms and abundant small red fruits ("hips"), which are eaten and then spread by birds. Seeds that have passed through birds' digestive tracts sprout readily in nearly all soil conditions.

JAPANESE BARBERRY (*BERBERIS THUNBERGII*): Japanese barberry has escaped from cultivation and is adept at invading natural areas. Barberry is a deciduous, woody shrub with bright red berries, spoon-shaped foliage, and sharp spines. It usually grows about three feet high, but occasionally reaches up to six feet. It can grow under a closed canopy and sometimes forms complete monocultures in more southerly forests. A direct threat to humans posed by Japanese barberry is that it harbors high densities of ticks, due to the favorable microclimate it creates for them.

PURPLE LOOSESTRIFE (*LYTHRUM SALICARIA*): Purple loosestrife is a common invader of wetlands and its removal is sometimes contested by those who enjoy the plants showy magenta flowers. The plant can form dense, impenetrable stands that are unsuitable as cover, food, or nesting sites for a wide range of native wetland animals, including ducks, geese, rails, bitterns, muskrats, frogs, toads, and turtles.

AUTUMN OLIVE (*ELAEAGNUS UMBELLATA*): Autumn olive is a deciduous shrub that can grow as tall as 20 feet. It was once widely promoted as a great way to provide wildlife habitat and erosion control in environmentally-disturbed areas. The shrub does create habitat and food for wildlife; however, it out-competes and displaces native plants by creating dense shade that hinders the growth of sun-loving plants. The plant produces an abundance of seeds each year that can easily grow in even the most unfavorable soils due to its nitrogen-fixing root nodules.

NORWAY MAPLE (*ACER PLATANOIDES*): This tree is native to Europe and was originally planted as an ornamental and street tree, but has since escaped into disturbed habitats, such as urban woodlots and forest edges. Norway maple can be distinguished from our native sugar maple (*Acer saccharum*) by the white milky sap that exudes from the leaf petioles (leaf stalks). The plant is a threat to native species diversity, as it can shade out spring ephemerals and other understory vegetation, as well as out-compete native canopy species. The seeds are similar to the seeds of our native maples and are dispersed by wind.

JAPANESE KNOTWEED (*FALLOPIA JAPONICA*): Japanese knotweed forms dense thickets, often in wetlands, riparian areas, and disturbed areas. While it is susceptible to frost, it has a high tolerance for dry soil and salt, allowing it to survive along roadsides and ditches. Japanese knotweed spreads by rhizomes, and even small fragments can sprout into new plants. Infestation can spread rapidly along waterways, where rhizome fragments can float downstream and establish new colonies. The thickets that

⁵ New York Invasive Species Information website, Honeysuckle (*Lonicera spp.*)

subsequently form exclude native vegetation. Their exceptional vegetative reproduction can make it especially difficult to eradicate once established⁶.

WILDLIFE OBSERVATIONS

Formal wildlife surveys were not conducted at Pleasant Hill Preserve; however, numerous species were encountered and documented throughout the course of field activities. Prior to the field investigation, FBE contacted MDIFW to request information on known locations of Endangered, Threatened, and Special Concern Species, as well as designated Essential and Significant Wildlife Habitats and fisheries habitat concerns within the vicinity of Pleasant Hill Preserve (Appendix B, C). While there have been sightings of various wildlife, such as waterfowl, MDIFW is unaware of the presence of any *Significant Wildlife Habitats* within the area, which include Waterfowl and Wading Bird Habitats, Deer Wintering Areas, Seabird Nesting Islands, Shorebird Areas, and Significant Vernal Pools. However, a comprehensive statewide inventory for Significant Vernal Pools has not been completed.

Formal vernal pools surveys were not conducted at Pleasant Hill Preserve as part of this project; however, a vernal pool-breeding species, the wood frog (*Lithobates sylvaticus*), was observed on several occasions. These frogs breed primarily in vernal pools and spend the vast majority of their lives in terrestrial areas adjacent to breeding areas, sometimes traveling about 1,500 feet from breeding pools. It is unknown whether the individuals observed breed in pools on Pleasant Hill Preserve or on adjacent parcels. Nevertheless, the property contains suitable habitat for wood frogs and likely spotted salamanders (*Ambystoma maculatum*) as well.



Wood frog. Photo Credit: FBE.

MDIFW also indicated that the New England Cottontail (*Sylvilagus transitionalis*) has been observed within the vicinity of Pleasant Hill Preserve. These rabbits require early successional forest with very thick vegetation. Cory Stearns of MDIFW stated that these rabbits in Maine are sometimes associated with dense stands of aspen (*Populus* spp.). Quaking aspen does exist at Pleasant Hill Preserve, but not in dense stands. While certainly not impossible, it is unlikely that the New England Cottontail exists at the property due to the lack of early successional forest.

⁶ https://www.eddmaps.org/ipane/ipanespecies/herbs/Polygonum_cuspidatum.htm

If these rabbits do exist on the property, they might be encountered in the areas of thick brush within the patch of forest at the northern end of the property, adjacent to the Rachel Carson National Wildlife Refuge.



Milk snake (top) and Monarch butterfly on goldenrod (bottom). Photo Credit: FBE (top) and Eric Chapman (bottom).

An abandoned barn is present near the southern end of the farm. Listed as Special Concern in Maine and being true to their name, barn swallows (*Hirundo rustica*) were observed nesting in the structure. Barn swallows are insectivores and snatch insects out of the air while in flight, which results in rather impressive aerial maneuvers. The swallows were observed feeding in the open fields surrounding the barn. Removal of the barn will eliminate nesting habitat for this species.

Pieces of tin roof and several debris piles surrounding the old barn serve as good snake habitat. Numerous common garter snakes (*Thamnophis sirtalis*) and milk snakes (*Lampropeltis triangulum*) were observed underneath debris. Garter snakes feed primarily on amphibians, such as American toads (*Anaxyrus americanus*), while milk snakes feed primarily on small mammals. It is not uncommon to find milk snakes in the vicinity of barns. It was believed that these snakes would steal milk from dairy cattle, hence their name. The land trust should consider leaving some debris near the barn to provide habitat for these snakes.

Common game animals were observed as well. White-tailed deer (*Odocoileus virginianus*) individuals and signs (i.e., trails, droppings) were observed in the fields and woods, as were several wild turkeys (*Meleagris gallopavo*). One of the turkeys was a female with poults and likely nests within the boundaries of Pleasant Hill Preserve. Other mammals observed include an adult woodchuck (*Marmota monax*) on the trail between

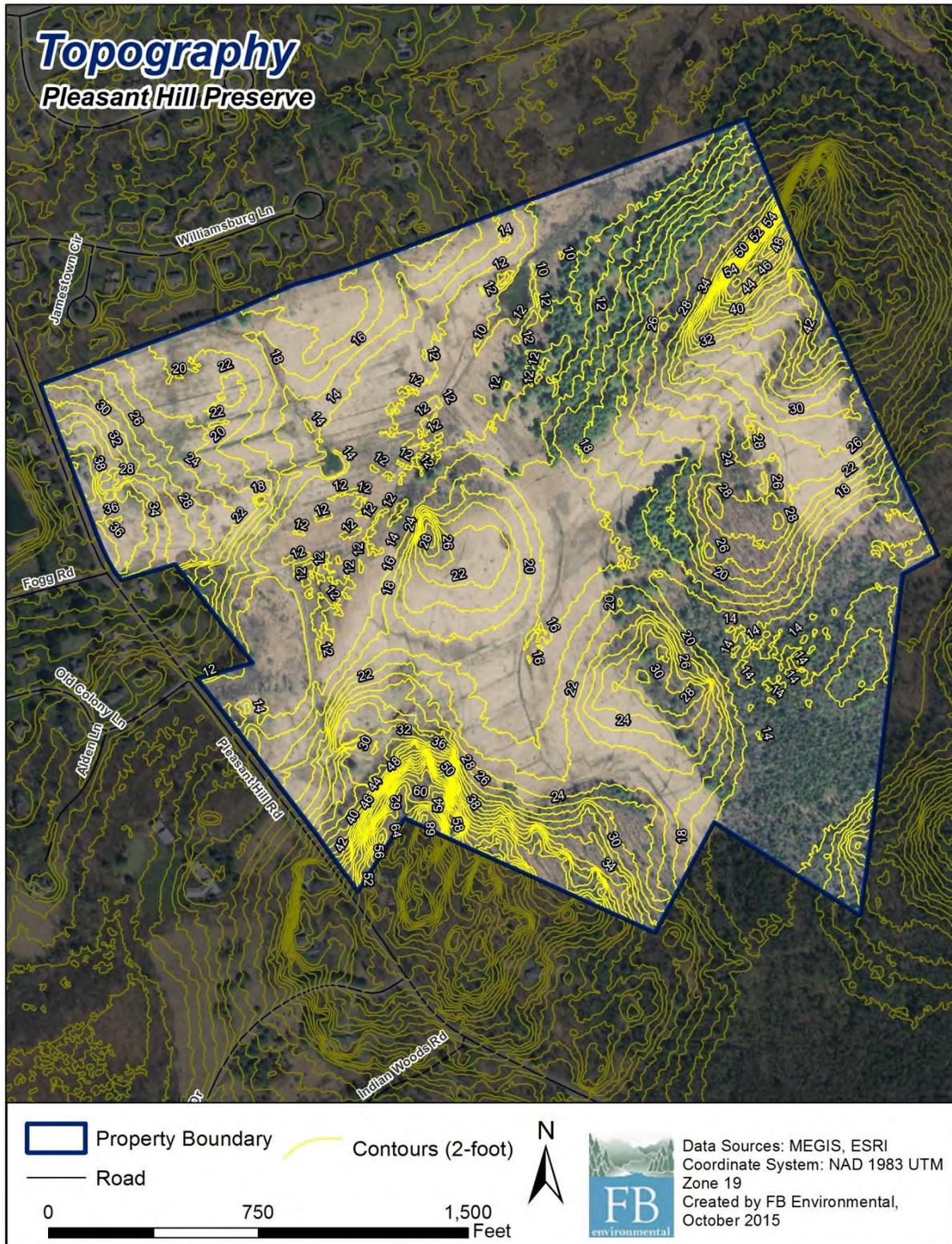
Wetlands 1-2 and a muskrat (*Ondatra zibethicus*) in the open water portion of Wetland 10. A raccoon skull (*Procyon lotor*) was found in the Oak-Pine Woodland at the center of the property. Meadow voles (*Microtus pennsylvanicus*) are also undoubtedly abundant in the farm fields.

Caterpillars and adults of lepidopterans (butterflies and moths) were observed, including Harris' checkerspot (*Chylosyne harrissii*), Striped Garden Caterpillar (*Trichordstra legitima*), and Monarch butterfly (*Danaus plexippus*), whose host plant, common milkweed (*Asclepias syriaca*), is present on the property.

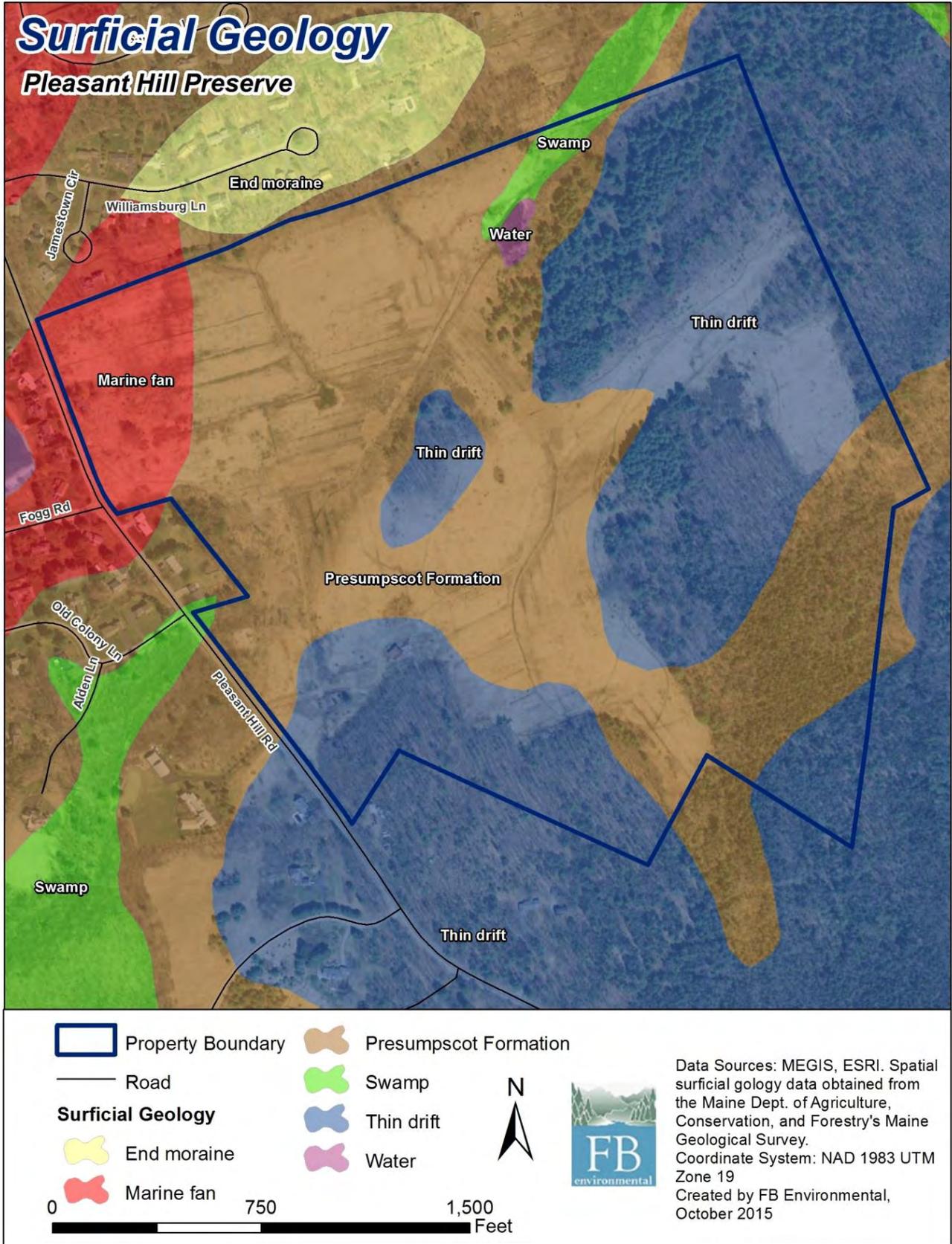
REFERENCES

- Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979. *Classification of wetlands and deepwater habitats of the United States*. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 131pp.
- Gawler, S, and A. Cutko. 2010. *Natural Landscapes of Maine: A Guide to Natural Communities and Ecosystems*. Maine Natural Areas Program, Maine Department of Conservation, Augusta, Maine.
- Lichvar, R.W. 2013. *The National Wetland Plant List: 2013 wetland ratings*. Phytoneuron 2013-49: 1–241. Published 17 July 2013. ISSN 2153 733X
- U.S. Army Corps of Engineers. (2012). *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.
- USDA-NRCS (2010). *Field Indicators of Hydric Soils in the United States*. Version 7.0. L.M. Vasilas, G.W. Hurt, and C.V. Noble (eds.). USDA-NRCS, in cooperation with the National Technical Committee for Hydric Soils.

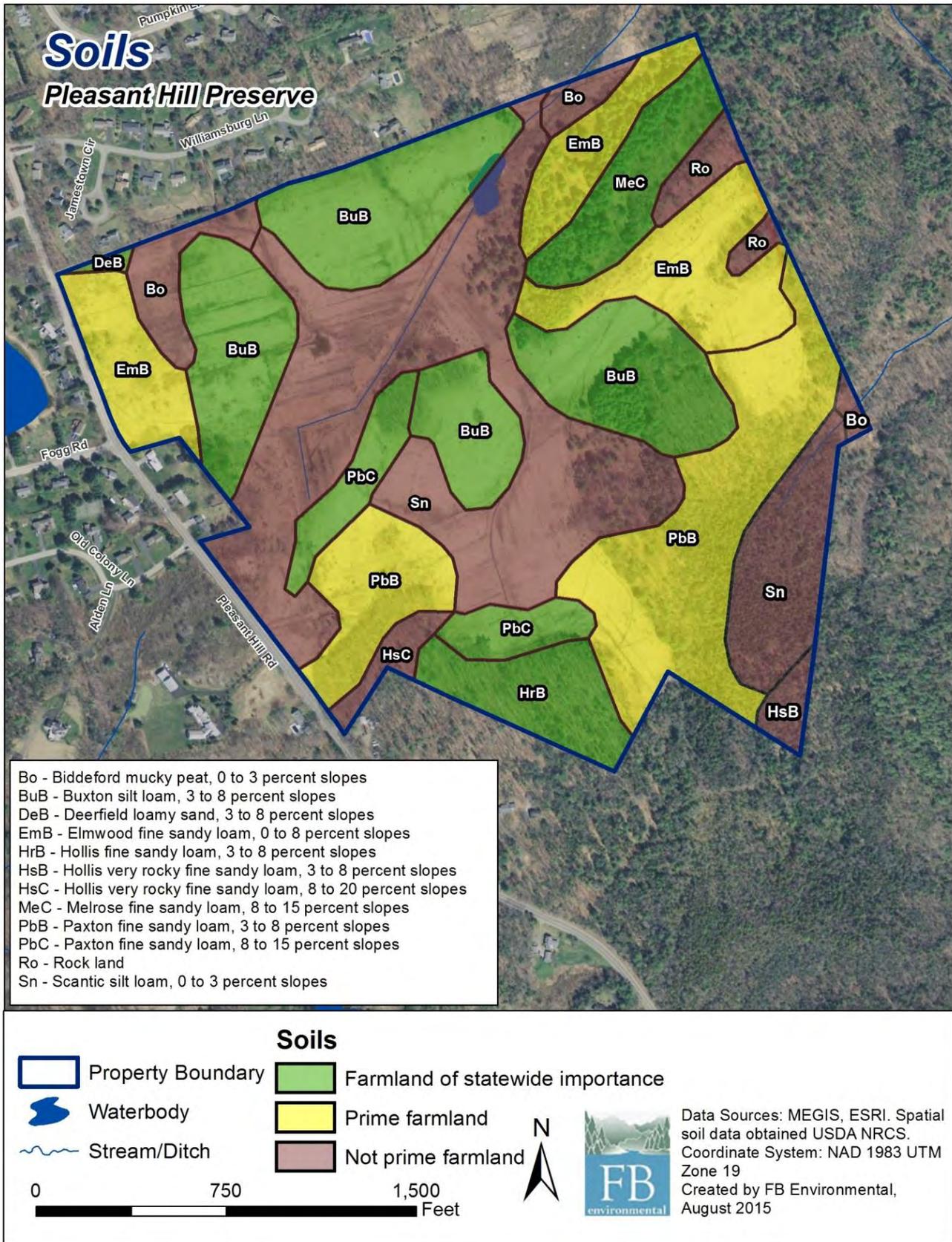
APPENDIX A. MAPS



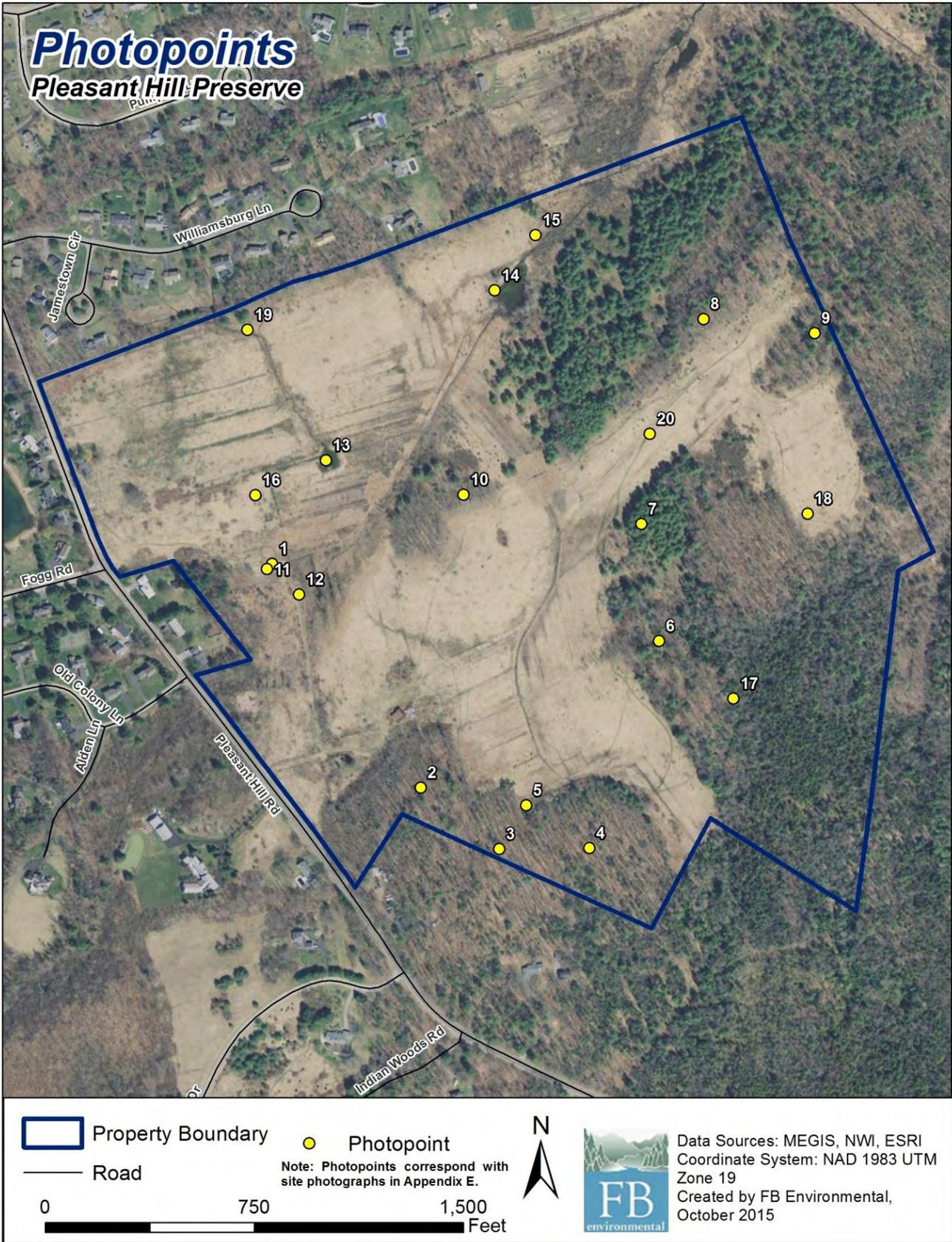
MAP 1



MAP 2



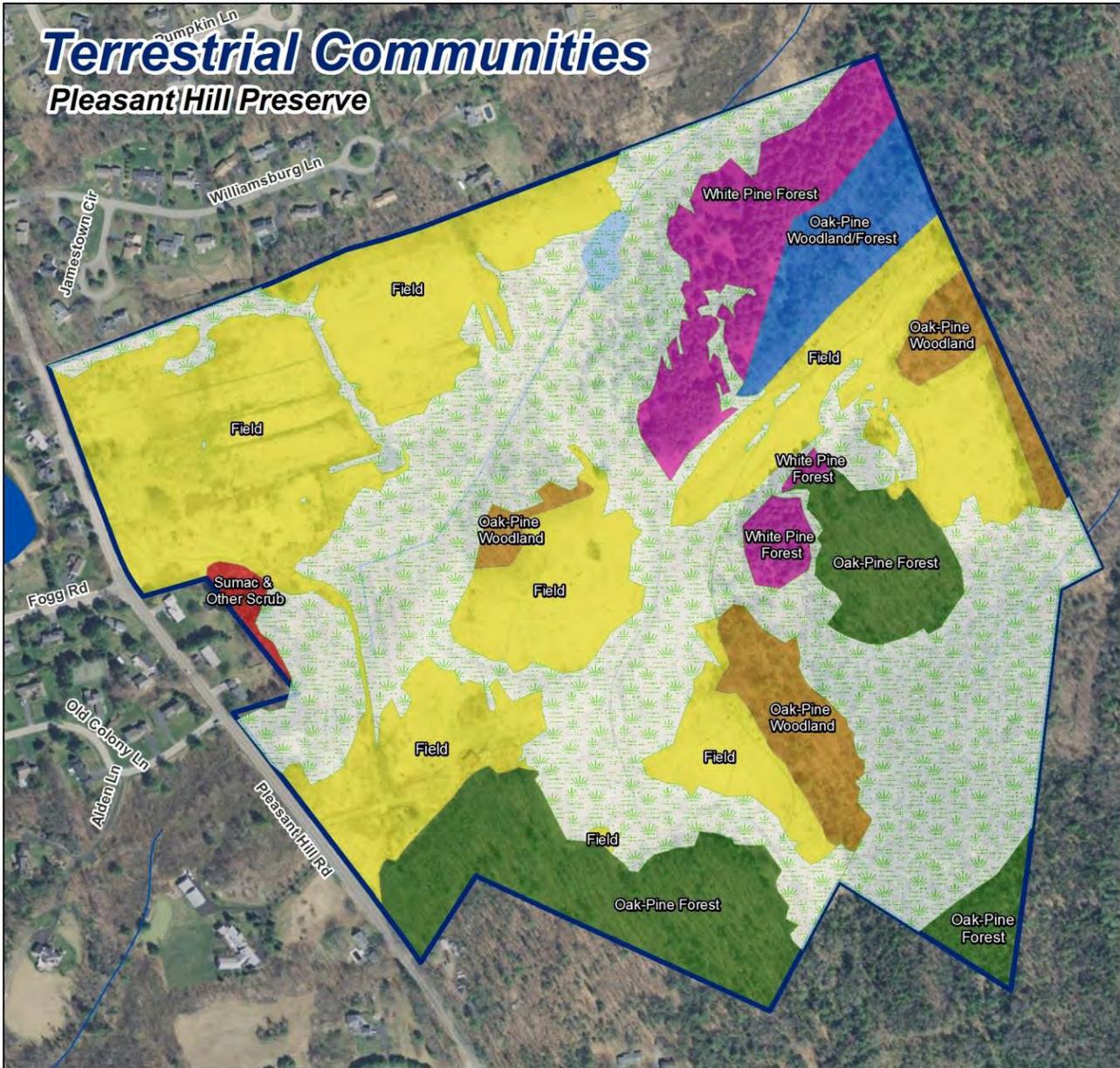
MAP 3



MAP 4

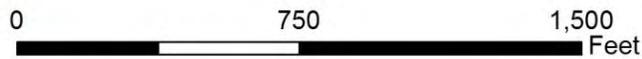
Terrestrial Communities

Pleasant Hill Preserve



Natural Communities

- | | | |
|-------------------|-------------------|--------------------------|
| Property Boundary | Field | Oak-Pine Woodland/Forest |
| Wetland | Oak-Pine Forest | Sumac & Other Scrub |
| Stream/Ditch | Oak-Pine Woodland | White Pine Forest |
| Waterbody | | |

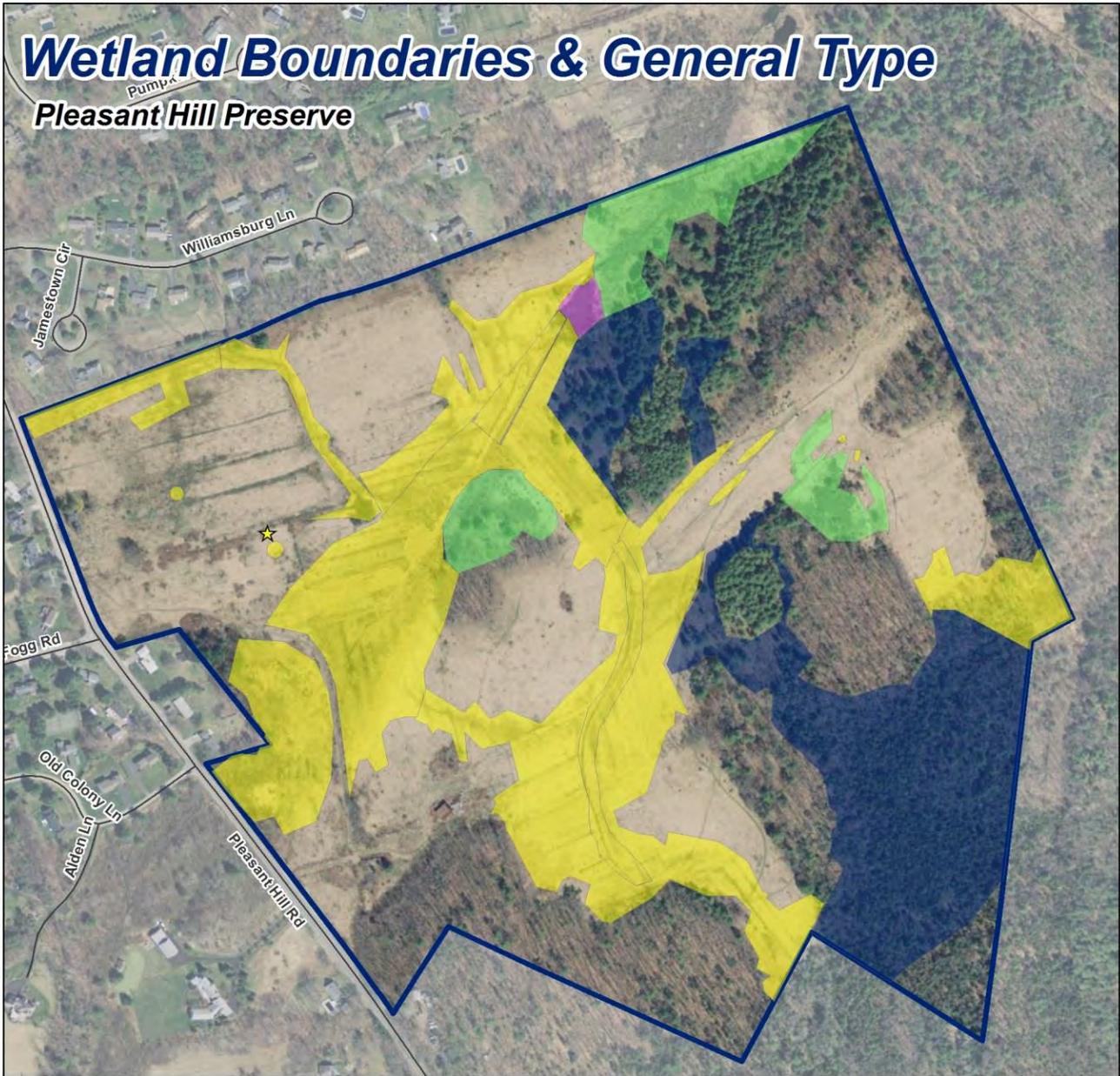


Data Sources: MEGIS, ESRI
 Coordinate System: NAD 1983 UTM
 Zone 19
 Created by FB Environmental,
 October 2015

Notes: Terrestrial communities were delineated in the field by FB Environmental. These cover types were classified using Gawler and Cutko (2010) Natural Landscapes of Maine. A Guide to Natural Communities and Ecosystems.

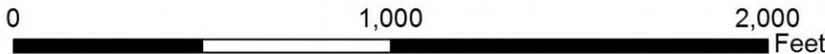
Wetland Boundaries & General Type

Pleasant Hill Preserve



General Wetland Types

-  Property Boundary
-  Unconsolidated Bottom (Pond)
-  Road
-  Emergent (Marsh or Wet Meadow)
-  Spring/Wellhead
-  Forested (Swamp)
-  Scrub-Shrub



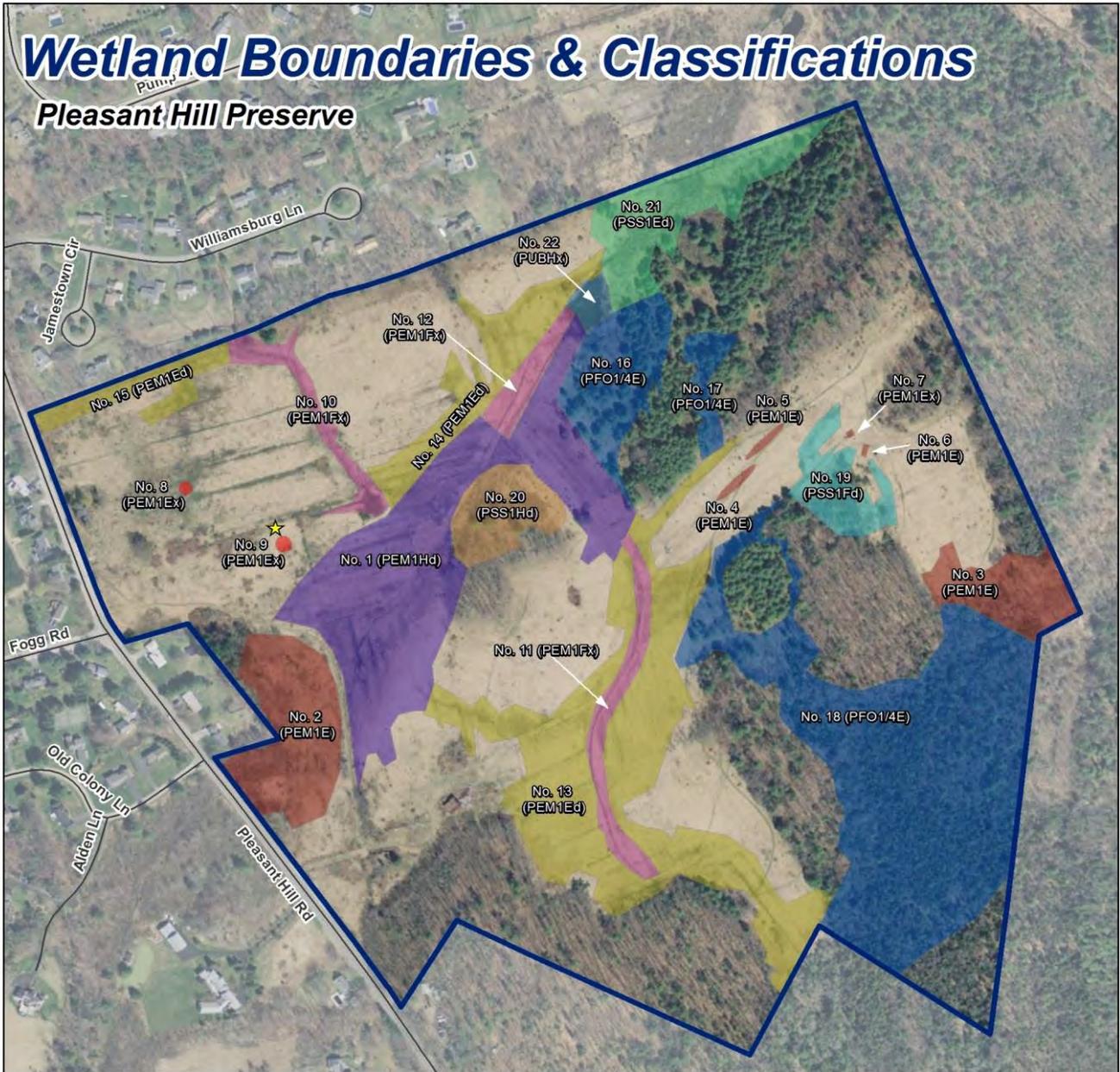
Data Sources: MEGIS, ESRI
 Coordinate System: NAD 1983
 UTM Zone 19
 Created by FB Environmental,
 October 2015

Notes: Wetlands were delineated in the field by FB Environmental in accordance with the 1987 US Army Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, v2.0. January 2012.

MAP 6

Wetland Boundaries & Classifications

Pleasant Hill Preserve



Property Boundary	PEM1Ed	PSS1Ed
Road	PEM1Ex	PSS1Fd
Spring/Wellhead	PEM1Fx	PSS1Hd
Wetland Types	PEM1Hd	PUBHx
PEM1E	PFO1/4E	



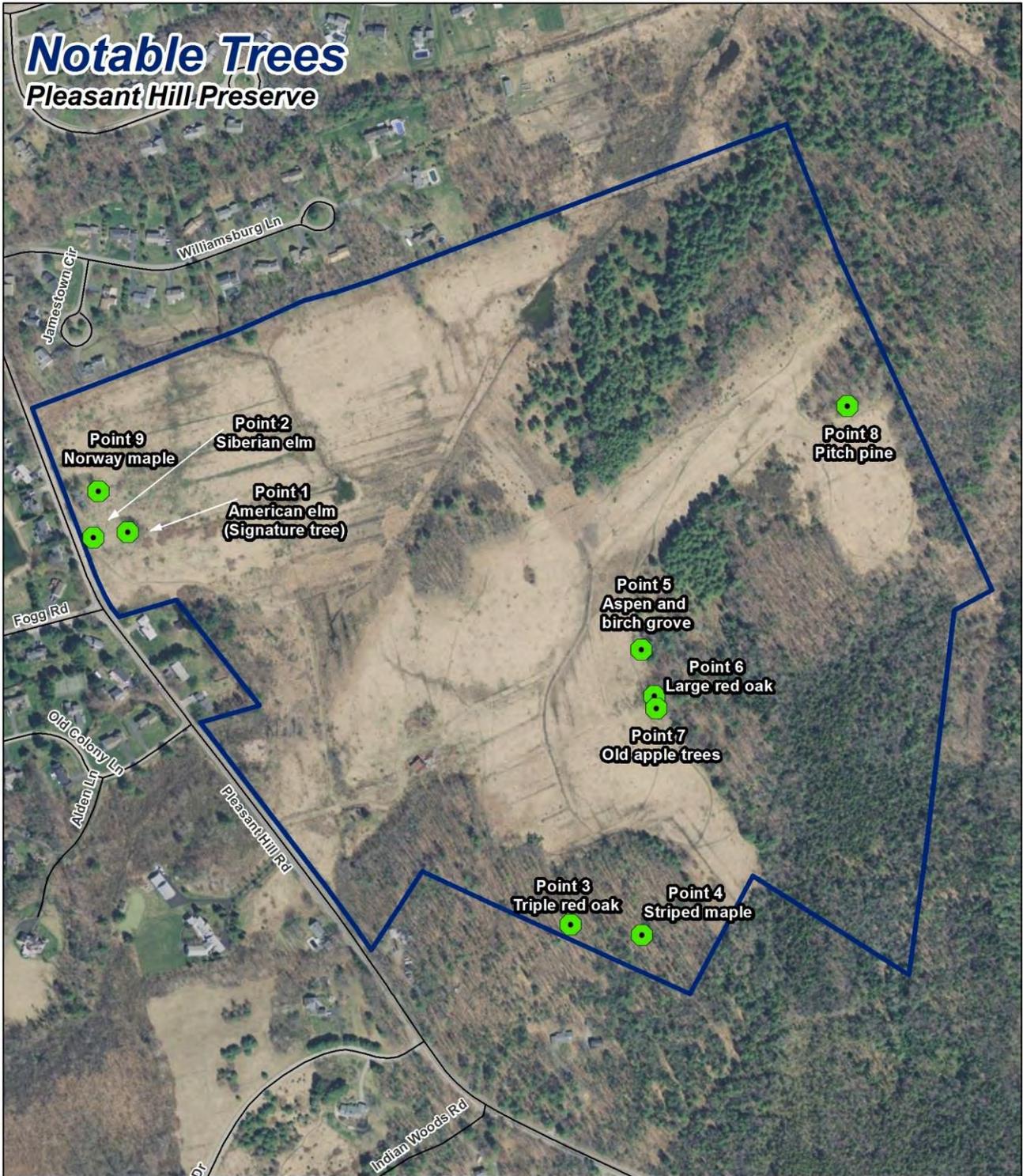
Data Sources: MEGIS, NWI, ESRI
 Coordinate System: NAD 1983 UTM
 Zone 19
 Created by FB Environmental,
 October 2015



Notes: Wetlands were delineated in the field by FB Environmental in accordance with the 1987 US Army Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, v2.0. January 2012. All wetlands were classified using the Classification of Wetlands and Deepwater Habitats of the United States (USFWS, 1979).

Notable Trees

Pleasant Hill Preserve



Property Boundary

Road

Tree Location

Note: Photopoints correspond with tree photographs in Appendix F.



0 750 1,500 Feet



Data Sources: MEGIS, ESRI.
 Coordinate System: NAD 1983 UTM
 Zone 19
 Created by FB Environmental,
 October 2015

MAP 8

COMPOSITION AND DENSITY OF INVASIVE SPECIES INFESTATION AREAS

POLYGON ID (MAP 8)	SPECIES PRESENT (IN ORDER OF ABUNDANCE)	DENSITY
A	Multiflora rose, Asiatic bittersweet, Morrow's honeysuckle	Scattered/dense clumps
AA	Morrow's honeysuckle	Monoculture
B	Asiatic bittersweet, Japanese barberry, Morrow's honeysuckle	Scattered clumps
C	Japanese barberry, Morrow's honeysuckle, Asiatic bittersweet, Multiflora rose	Scattered clumps
D	Multiflora rose	Scattered clumps
D/F	Multiflora rose/Autumn olive	Scattered clumps
E	Japanese barberry, Morrow's honeysuckle, Multiflora rose, Asiatic bittersweet	Scattered clumps
F	Autumn olive	Scattered clumps
G	Asiatic bittersweet, Morrow's honeysuckle, Japanese barberry, Multiflora rose	Scattered/dense clumps
H	Morrow's honeysuckle, Multiflora rose, Asiatic bittersweet, Japanese barberry	Scattered/dense clumps
I	Multiflora rose, Asiatic bittersweet, Morrow's honeysuckle, Japanese barberry	Scattered clumps
J	Autumn olive	Scattered clumps
K	Multiflora rose	Dense clumps
L	Autumn olive, Multiflora rose, Asiatic bittersweet	Dense clumps
M	Purple loosestrife	Scattered clumps
N	Autumn olive, Morrow's honeysuckle, Multiflora rose, Asiatic bittersweet	Scattered clumps
O	Morrow's honeysuckle	Scattered clumps
P	Multiflora rose	Scattered clumps
Q	Asiatic bittersweet	Dense clumps
R	Japanese knotweed	Single clump
S	Autumn olive, Morrow's honeysuckle, Asiatic bittersweet, Multiflora rose	Dense clumps
T	Japanese barberry	Monoculture
U	Japanese barberry, Asiatic bittersweet	Scattered clumps
V	Morrow's honeysuckle	Scattered clumps
W	Autumn olive	Scattered clumps
X	Purple loosestrife	Dense clumps

APPENDIX B. MAINE DEPARTMENT OF
INLAND FISHERIES AND WILDLIFE
CORRESPONDENCE



PAUL R. LEPAGE
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
284 STATE STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

CHANDLER E. WOODCOCK
COMMISSIONER

March 26, 2015

Kevin J. Ryan
FB Environmental Associates
97A Exchange St., Suite 305
Portland, ME 04101

RE: Information Request - Benjamin Farm, Scarborough

Dear Kevin:

Per your request received March 20, 2015, we have reviewed current Maine Department of Inland Fisheries and Wildlife (MDIFW) information for known locations of Endangered, Threatened, and Special Concern species; designated Essential and Significant Wildlife Habitats; and fisheries habitat concerns within the vicinity of the *Benjamin Farm Project* in Scarborough.

Our Department has not mapped any Essential Habitats or fisheries habitats that would be directly affected by your project.

Rare, Threatened, and Endangered Species

New England cottontail

Occurrences of New England cottontail, a State Endangered species, have been documented within the project search area. New England cottontails require large areas of shrubs and densely growing young trees. In the Northeast, much of the area supporting the species has been fragmented and no longer provides habitat patches suitable in quality or size. We recommend that you contact Region A wildlife biologist Cory Stearns (207-657-2345) for any site-specific data for your project, as well as the need to schedule a site visit to assess potential cottontail presence and habitat suitability. New England cottontails are protected under Maine's Endangered Species Act (MESA) and, as such, are afforded special protection against activities that may cause "Take" (kill or cause death), "harassment" (create injury or significantly disrupt normal behavior patterns), and other adverse actions.

Significant Wildlife Habitat

At this time, MDIFW Significant Wildlife Habitat (SWH) maps indicate no known presence of SWHs within the project area, which include Waterfowl and Wading Bird Habitats, Deer Wintering Areas, Seabird Nesting Islands, Shorebird Areas, and Significant Vernal Pools. However, a comprehensive statewide inventory for Significant Vernal Pools has not been completed. Therefore, surveys for vernal pools will need to be conducted within the project boundary prior to final project design to determine whether there are Significant Vernal Pools, or the critical terrestrial habitat from any adjacent pools,

Letter to Kevin Ryan
Comments RE: Scarborough, Benjamin Farm
March 20, 2015

present in the area. Once surveys are completed, our Department will need to verify vernal pool data sheets prior to final determination of significance.

This consultation review has been conducted specifically for known MDIFW jurisdictional features and should not be interpreted as a comprehensive review for the presence of other regulated features that may occur in this area. Prior to the start of any future site disturbance we recommend additional consultation with the municipality, and other state resource agencies including the Maine Natural Areas Program and Maine Department of Environmental Protection in order to avoid unintended protected resource disturbance.

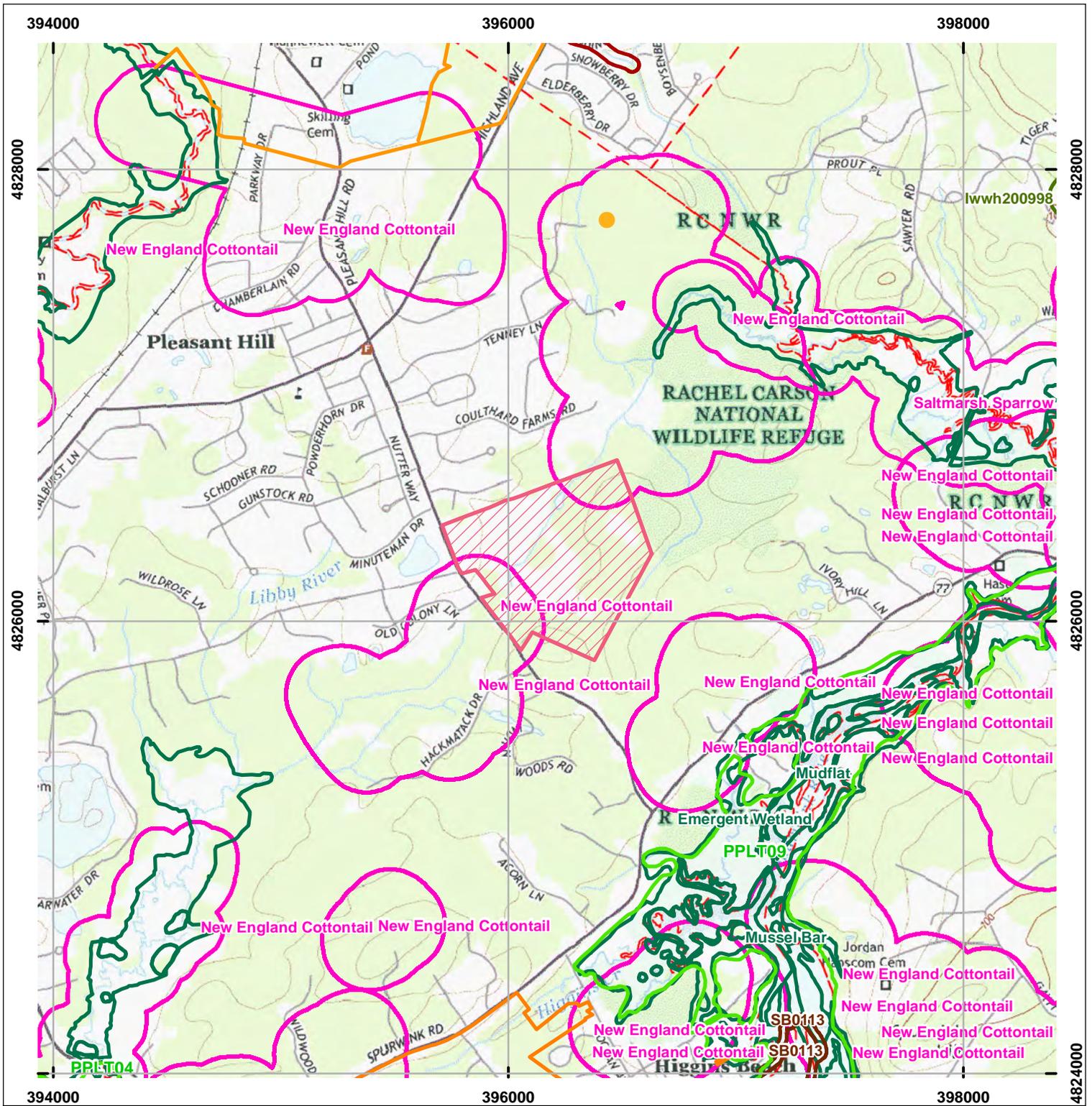
Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,

A handwritten signature in blue ink, appearing to read 'John Perry', with a stylized flourish at the end.

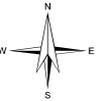
John Perry
Environmental Review Coordinator

APPENDIX C. MAINE DEPARTMENT OF
INLAND FISHERIES AND WILDLIFE
ENVIRONMENTAL REVIEW OF FISH AND
WILDLIFE OBSERVATIONS AND PRIORITY
HABITATS MAP



Environmental Review of Fish and Wildlife Observations and Priority Habitats

Project Name: Scarborough, Benjamin Farm (Version 1)



Maine Department of Inland Fisheries and Wildlife



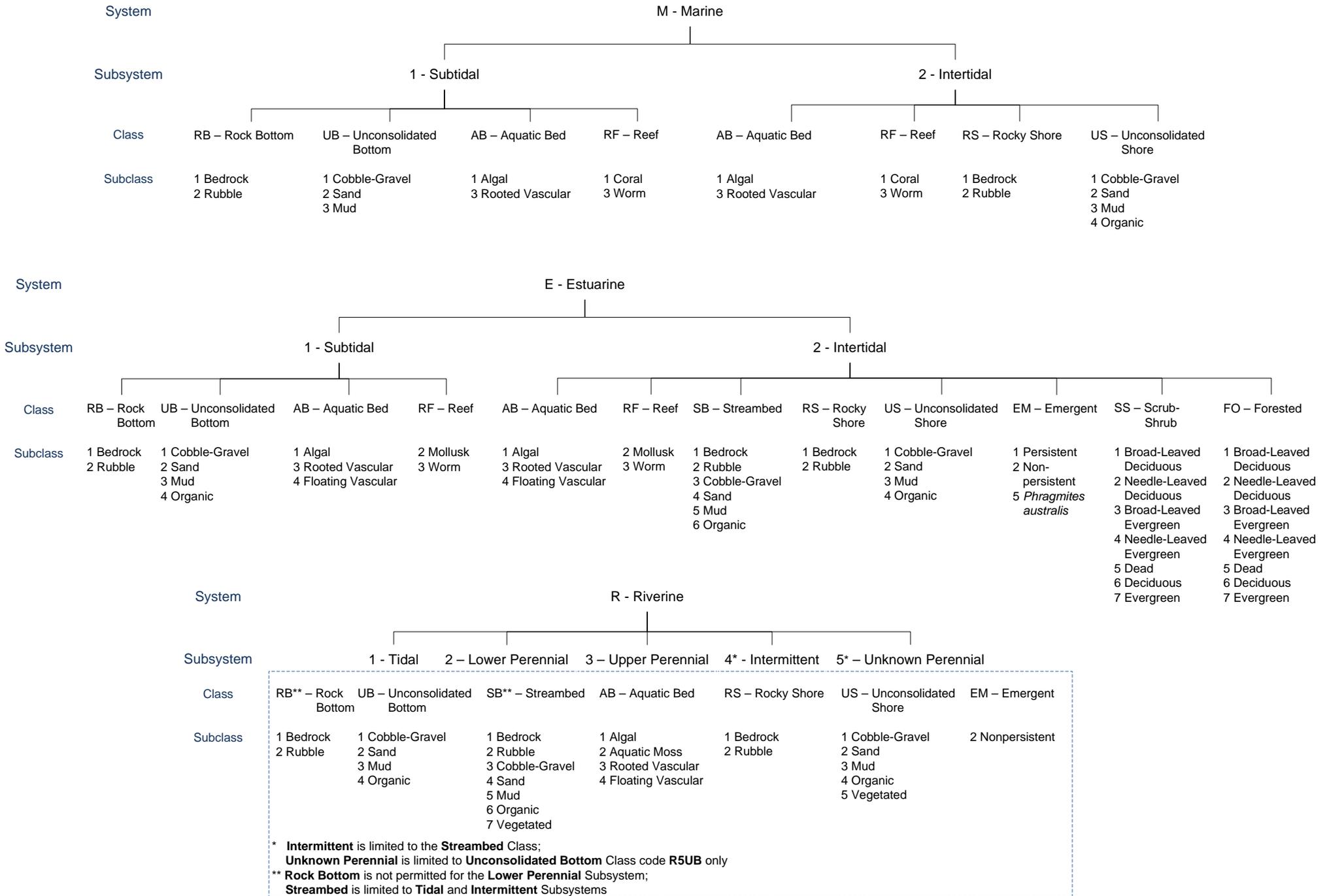
Projection: UTM, NAD83, Zone 19N

Date: 3/25/2015

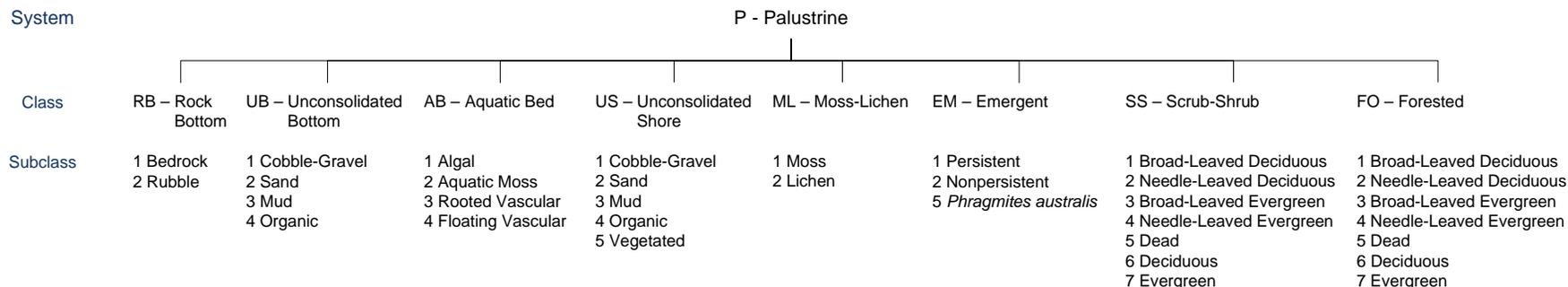
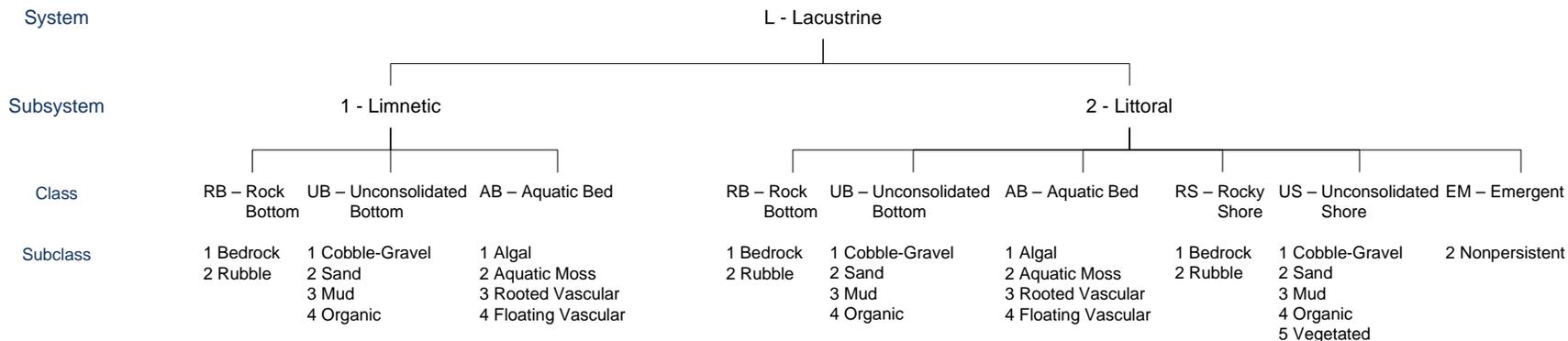


APPENDIX D. WETLANDS AND
DEEPWATER HABITATS CLASSIFICATION
(COWARDIN CLASSIFICATION)

WETLANDS AND DEEPWATER HABITATS CLASSIFICATION



WETLANDS AND DEEPWATER HABITATS CLASSIFICATION



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. The farmed modifier may also be applied to the ecological system.							
Water Regime			Special Modifiers	Water Chemistry			Soil
Nontidal	Saltwater Tidal	Freshwater Tidal		Coastal Halinity	Inland Salinity	pH Modifiers for all Fresh Water	
A Temporarily Flooded	L Subtidal	S Temporarily Flooded-Tidal	b Beaver	1 Hyperhaline	7 Hypersaline	a Acid	g Organic
B Saturated	M Irregularly Exposed	R Seasonally Flooded-Tidal	d Partly Drained/Ditched	2 Euhaline	8 Eusaline	t Circumneutral	n Mineral
C Seasonally Flooded	N Regularly Flooded	T Semipermanently Flooded-Tidal	f Farmed	3 Mixohaline (Brackish)	9 Mixosaline	i Alkaline	
E Seasonally Flooded/ Saturated	P Irregularly Flooded	V Permanently Flooded-Tidal	h Diked/Impounded	4 Polyhaline	0 Fresh		
F Semipermanently Flooded			r Artificial	5 Mesohaline			
G Intermittently Exposed			s Spoil	6 Oligohaline			
H Permanently Flooded			x Excavated	0 Fresh			
J Intermittently Flooded							
K Artificially Flooded							

APPENDIX E. SITE PHOTOGRAPHS



Photopoint 1. View east across Wetland 1, a large emergent marsh.



Photopoint 2. The large patch of jewelweed on top of the hill just south of the old barn.



Photopoint 3. An existing trail in the Oak-Pine Forest at the southern end of the property.



Photopoint 4. An area of exposed bedrock in the Oak-Pine Forest at the southern end of the property.



Photopoint 5. View north across Wetland 13 from the edge of the Oak-Pine Forest at the southern end of the property.



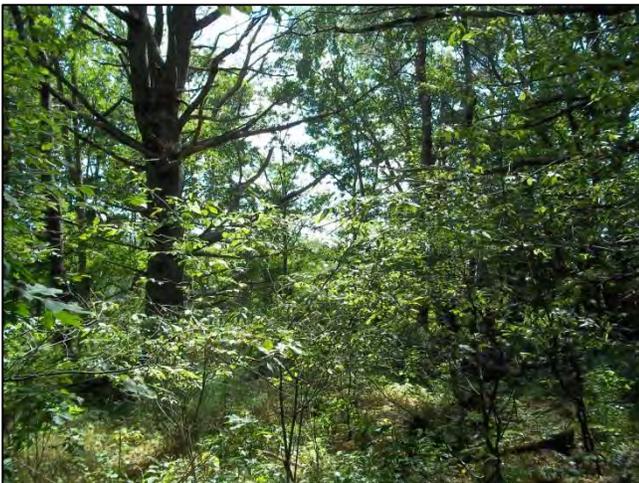
Photopoint 6. Oak-Pine Woodland at the eastern end of the property. Note the density of the understory vegetation compared to Oak-Pine Forest.



Photopoint 7. The White Pine Forest at the east-central portion of the property.



Photopoint 8. Oak-Pine Woodland/Forest at the northern end of the property. This forest is contiguous with the Rachel Carson National Wildlife Refuge.



Photopoint 9. Oak-Pine Woodland along the northeastern property boundary.



Photopoint 10. The patch of Oak-Pine Woodland at the center of the property.



Photopoint 11. View southwest into Wetland 2, an emergent marsh.



Photopoint 12. View east across Wetland 1 to the patch of Oak-Pine Woodland at the center of the property.



Photopoint 13. A small area of open water at Wetland 10.



Photopoint 14. Wetland 22 is the old farm pond which is transitioning to an emergent marsh.



Photopoint 15. View east into the scrub-shrub wetland (Wetland 21) at the northern end of the property.



Photopoint 16. Wetland 9 is a small excavated wetland.



Photopoint 17. View into Wetland 18 near the eastern property boundary.



Photopoint 18. View south into the easternmost field on the property.



Photopoint 19. Purple loosestrife is abundant in the ditches at Pleasant Hill Preserve.



Photopoint 20. View southwest towards the old barn from the east-central portion of the property.

APPENDIX F. NOTABLE TREES



Photopoint 1. The signature American elm near the entrance to the Preserve.



Photopoint 2. The Siberian elm next to an old concrete slab adjacent to Pleasant Hill Road.



Photopoint 3. A triple red oak showing the red fungus on its bark from which this species' name is derived.



Photopoint 4. A striped maple leaf. Several large specimens of this tree exist on the property.



Photopoint 5. A stand of quaking aspen and grey birch visible from the old barn.



Photopoint 6. A large, triple red oak tree.



Photopoint 7. Several old apple trees near the large oak tree in the previous photo.



Photopoint 8. One of several pitch pines on the property.



Photopoint 9. A Norway maple near the farm entrance. The tree is picturesque, but unfortunately can be invasive.

APPENDIX G. LIST OF TREE SPECIES¹

TOTAL: 34 species (3 identified to genus only)

FAMILY	GENUS	SPECIES	COMMON NAME	NATIVE?	INVASIVE?
Pinaceae	<i>Abies</i>	<i>balsamea</i>	balsam fir	native	n
Sapindaceae	<i>Acer</i>	<i>pensylvanicum</i>	striped maple	native	n
Sapindaceae	<i>Acer</i>	<i>platanoides</i>	Norway maple	non-native	y
Sapindaceae	<i>Acer</i>	<i>rubrum</i>	red maple	native	n
Sapindaceae	<i>Acer</i>	<i>saccharum</i>	sugar maple	native	n
Betulaceae	<i>Alnus</i>	<i>incana</i>	speckled alder	native	n
Rosaceae	<i>Amelanchier</i>	<i>spp.</i>	shadbush	native	n
Betulaceae	<i>Betula</i>	<i>papyrifera</i>	paper birch	native	n
Betulaceae	<i>Betula</i>	<i>populifolia</i>	gray birch	native	n
Betulaceae	<i>Carpinus</i>	<i>caroliniana</i>	musclewood	native	n
Betulaceae	<i>Corylus</i>	<i>cornuta</i>	beaked hazelnut	native	n
Rosaceae	<i>Crataegus</i>	<i>spp.</i>	hawthorn	native	n
Elaeagnaceae	<i>Elaeagnus</i>	<i>umbellata</i>	autumn olive	non-native	y
Oleaceae	<i>Fraxinus</i>	<i>americana</i>	white ash	native	n
Pinaceae	<i>Larix</i>	<i>laricina</i>	larch	native	n
Rosaceae	<i>Malus</i>	<i>spp.</i>	apple	non-native	n
Fagaceae	<i>Ostrya</i>	<i>virginiana</i>	ironwood	native	n
Pinaceae	<i>Picea</i>	<i>abies</i>	Norway spruce	non-native	n
Pinaceae	<i>Picea</i>	<i>mariana</i>	black spruce	native	n
Pinaceae	<i>Picea</i>	<i>rubens</i>	red spruce	native	n
Pinaceae	<i>Pinus</i>	<i>resinosa</i>	red pine	native	n
Pinaceae	<i>Pinus</i>	<i>rigida</i>	pitch pine	native	n
Pinaceae	<i>Pinus</i>	<i>strobus</i>	white pine	native	n
Pinaceae	<i>Pinus</i>	<i>sylvestris</i>	Scotch pine	non-native	n
Salicaceae	<i>Populus</i>	<i>tremuloides</i>	quaking aspen	native	n
Rosaceae	<i>Prunus</i>	<i>serotina</i>	black cherry	native	n
Rosaceae	<i>Prunus</i>	<i>virginiana</i>	choke cherry	native	n
Fagaceae	<i>Quercus</i>	<i>rubra</i>	red oak	native	n
Anacardiaceae	<i>Rhus</i>	<i>hirta</i>	staghorn sumac		n
Salicaceae	<i>Salix</i>	<i>discolor</i>	pussy willow	native	n
Adoxaceae	<i>Sambucus</i>	<i>racemosa</i>	red elderberry		n
Rosaceae	<i>Sorbus</i>	<i>aucuparia</i>	european mountain-ash	non-native	n
Cornaceae	<i>Swida</i>	<i>alterniflora</i>	alternate-leaved dogwood	native	n
Cornaceae	<i>Swida</i>	<i>sericea</i>	red-osier dogwood	native	n
Pinaceae	<i>Tsuga</i>	<i>canadensis</i>	eastern hemlock	native	n
Ulmaceae	<i>Ulmus</i>	<i>americana</i>	American elm	native	n
Ulmaceae	<i>Ulmus</i>	<i>pumila</i>	Siberian elm	non-native	n

¹ Please note, this list does not include smaller-sized shrub species

APPENDIX H. LIST OF VASCULAR PLANTS

TOTAL: 138 species, (14 identified to genus only)

GENUS	SPECIES	COMMON NAME	NATIVE STATUS	INVASIVE?
<i>Abies</i>	<i>balsamea</i>	balsam fir	native	n
<i>Acer</i>	<i>pensylvanicum</i>	striped maple	native	n
<i>Acer</i>	<i>platanoides</i>	Norway maple	non-native	y
<i>Acer</i>	<i>rubrum</i>	red maple	native	n
<i>Acer</i>	<i>saccharum</i>	sugar maple	native	n
<i>Achillea</i>	<i>millefolium</i>	common yarrow	native	n
<i>Actaea</i>	<i>rubra</i>	red baneberry	native	n
<i>Agrimonia</i>	<i>striata</i>	agrimony	native	n
<i>Alnus</i>	<i>incana</i>	speckled alder	native	n
<i>Ambrosia</i>	<i>artemesiifolia</i>	common ragweed	native	n
<i>Amelanchier</i>	<i>spp.</i>	shadbush	native	n
<i>Aralia</i>	<i>nudicaulis</i>	wild sarsparilla	native	n
<i>Arctium</i>	<i>minus</i>	common burdock	non-native	n
<i>Arisaema</i>	<i>triphillum</i>	jack-in-the-pulpit	native	n
<i>Asclepias</i>	<i>syriaca</i>	common milkweed	native	n
<i>Berberis</i>	<i>thunbergii</i>	japanese barberry	non-native	y
<i>Betula</i>	<i>papyrifera</i>	paper birch	native	n
<i>Betula</i>	<i>populifolia</i>	gray birch	native	n
<i>Brasenia</i>	<i>schreberi</i>	watershield	native	n
<i>Calla</i>	<i>palustris</i>	water arum	native	n
<i>Carex</i>	<i>spp.</i>	sedges		n
<i>Carpinus</i>	<i>caroliniana</i>	musclewood	native	n
<i>Celastrus</i>	<i>orbiculatus</i>	Asiatic bittersweet	non-native	y
<i>Centaurea</i>	<i>montana</i>	mountain knapweed	non-native	n
<i>Cerastium</i>	<i>fontanum</i>	mouse-ear chickweed	non-native	n
<i>Chamaepericlymenum</i>	<i>canadense</i>	bunchberry	native	n
<i>Chelone</i>	<i>glabra</i>	turtlehead	native	n
<i>Cicuta</i>	<i>bulbifera</i>	bulb bearing water hemlock	native	n
<i>Cicuta</i>	<i>maculata</i>	Water hemlock	native	n
<i>Circaea</i>	<i>canadensis</i>	broad-leaved enchanter's- nightshade	native	n
<i>Cirsium</i>	<i>vulgare</i>	bull thistle	non-native	n
<i>Convulvulus</i>	<i>arvensis</i>	field bindweed	non-native	n
<i>Corylus</i>	<i>cornuta</i>	beaked hazelnut	native	n
<i>Crataegus</i>	<i>spp.</i>	hawthorn	native	n
<i>Daucus</i>	<i>carota</i>	wild carrot	non-native	n
<i>Diervilla</i>	<i>lonicera</i>	bush honeysuckle	native	n

GENUS	SPECIES	COMMON NAME	NATIVE STATUS	INVASIVE?
<i>Doellingeria</i>	<i>umbellata</i>	tall white-aster	native	n
<i>Elaeagnus</i>	<i>umbellata</i>	autumn olive	non-native	y
<i>Epilobium</i>	<i>strictum</i>	downy willow-herb	native	n
<i>Equisetum</i>	<i>spp.</i>	horsetail		n
<i>Erigeron</i>	<i>spp.</i>	fleabane		n
<i>Eupatorium</i>	<i>perfoliatum</i>	boneset	native	n
<i>Eurybia</i>	<i>macrophylla</i>	large-leaved wood aster	native	n
<i>Eurybia</i>	<i>radula</i>	rough wood aster	native	n
<i>Eutrochium</i>	<i>maculatum</i>	joe-pye weed	native	n
<i>Fallopia</i>	<i>japonica</i>	Japanese knotweed	non-native	y
<i>Fallopia</i>	<i>scandens</i>	climbing bindweed	native	n
<i>Fragaria</i>	<i>virginiana</i>	common strawberry	native	n
<i>Fraxinus</i>	<i>americana</i>	white ash	native	n
<i>Galeopsis</i>	<i>bifida</i>	split-lipped hemp nettle	non-native	n
<i>Galium</i>	<i>aparine</i>	scratch bedstraw	native	n
<i>Galium</i>	<i>spp.</i>	bedstraw	non-native	n
<i>Galium</i>	<i>triflorum</i>	fragrant bedstraw	native	n
<i>Gaultheria</i>	<i>procumbens</i>	wintergreen	native	n
<i>Geranium</i>	<i>maculatum</i>	crane's bill	native	n
<i>Geum</i>	<i>rivale</i>	water avens	native	n
<i>Geum</i>	<i>spp.</i>	avens (unknown species)	native	n
<i>Glyceria</i>	<i>canadensis</i>	rattlesnake manna grass	native	n
<i>Helianthus</i>	<i>spp.</i>	sunflower (<i>H. decapetalus</i> or <i>strumosus</i>)		n
<i>Hieracium</i>	<i>spp.</i>	hawkweed (unknown species)		n
<i>Hypericum</i>	<i>perforatum</i>	common St. John's-wort	non-native	n
<i>Hypericum</i>	<i>punctatum</i>	spotted St. John's-wort (possibly incorrect)	native	n
<i>Impatiens</i>	<i>capensis</i>	jewelweed	native	n
<i>Iris</i>	<i>versicolor</i>	blue iris	native	n
<i>Juncus</i>	<i>spp.</i>	rush		n
<i>Larix</i>	<i>laricina</i>	larch	native	n
<i>Lemna</i>	<i>minor</i>	duckweed	native	n
<i>Leucanthemum</i>	<i>vulgare</i>	ox-eye daisy	non-native	n
<i>Lonicera</i>	<i>morrowii</i>	Morrow's honeysuckle	non-native	y
<i>Lychnis</i>	<i>flos-cuculi</i>	ragged robin lychnis	non-native	n
<i>Lycopus</i>	<i>americanus</i>	American water- horehound	native	n
<i>Lysimachia</i>	<i>borealis</i>	star flower	native	n
<i>Lysimachia</i>	<i>quadrifolia</i>	whorled yellow loosestrife	native	n
<i>Lysimachia</i>	<i>terrestris</i>	swamp candles	native	n

GENUS	SPECIES	COMMON NAME	NATIVE STATUS	INVASIVE?
<i>Lythrum</i>	<i>salicaria</i>	purple loosestrife	non-native	y
<i>Maianthemum</i>	<i>canadense</i>	Canada-mayflower	native	n
<i>Maianthemum</i>	<i>racemosum</i>	feathery false Solomon's seal	native	n
<i>Malus</i>	<i>spp.</i>	apple	non-native	n
<i>Melilotus</i>	<i>albus</i>	white sweet-clover	non-native	n
<i>Mitchella</i>	<i>repens</i>	partridge-berry	native	n
<i>Morella</i>	<i>caroliniensis</i>	small bayberry	native	n
<i>Oenothera</i>	<i>biennis</i>	common evening primrose	native	n
<i>Onoclea</i>	<i>sensibilis</i>	sensitive fern	native	n
<i>Ostrya</i>	<i>virginiana</i>	ironwood	native	n
<i>Oxalis</i>	<i>stricta</i>	common yellow wood sorrel	native	n
<i>Packera</i>	<i>aurea</i>	golden groundsel	native	n
<i>Parathelypteris</i>	<i>noveboracensis</i>	New York fern	native	n
<i>Persicaria</i>	<i>sagittata</i>	arrowleaved tearthumb	native	n
<i>Picea</i>	<i>abies</i>	Norway spruce	non-native	n
<i>Picea</i>	<i>mariana</i>	black spruce	native	n
<i>Picea</i>	<i>rubens</i>	red spruce	native	n
<i>Pinus</i>	<i>resinosa</i>	red pine	native	n
<i>Pinus</i>	<i>rigida</i>	pitch pine	native	n
<i>Pinus</i>	<i>strobus</i>	white pine	native	n
<i>Pinus</i>	<i>sylvestris</i>	Scotch pine	non-native	n
<i>Platanthera</i>	<i>lacera</i>	green fringed bog-orchid	native	n
<i>Populus</i>	<i>tremuloides</i>	quaking aspen	native	n
<i>Potentilla</i>	<i>recta</i>	sulphur cinquefoil	non-native	n
<i>Potentilla</i>	<i>simplex</i>	old-field cinquefoil	native	n
<i>Prunella</i>	<i>vulgaris</i>	heal-all	native	n
<i>Prunus</i>	<i>serotina</i>	black cherry	native	n
<i>Prunus</i>	<i>virginiana</i>	choke cherry	native	n
<i>Pteridium</i>	<i>aquilinum</i>	bracken fern	native	n
<i>Pyrola</i>	<i>elliptica</i>	elliptic-leaved shinleaf	native	n
<i>Quercus</i>	<i>rubra</i>	red oak	native	n
<i>Ranunculus</i>	<i>spp.</i>	buttercup (<i>R. recurvatus</i> or <i>acris</i>)		n
<i>Ranunculus</i>	<i>caricetorum</i>	swamp buttercup	native	n
<i>Rhus</i>	<i>hirta</i>	staghorn sumac		n
<i>Rosa</i>	<i>multiflora</i>	rambler rose	non-native	y
<i>Rubus</i>	<i>occidentalis</i>	black raspberry	native	n
<i>Rubus</i>	<i>odoratus</i>	flowering raspberry	native	n
<i>Rubus</i>	<i>hispidus</i>	swamp dewberry	native	n
<i>Rudbeckia</i>	<i>hirta</i>	black-eyed susan	non-native	n

GENUS	SPECIES	COMMON NAME	NATIVE STATUS	INVASIVE?
<i>Rumex</i>	<i>crispus</i>	curly doc	non-native	n
<i>Sagittaria</i>	<i>latifolia</i>	common arrowhead	native	n
<i>Salix</i>	<i>discolor</i>	pussywillow	native	n
<i>Sambucus</i>	<i>racemosa</i>	red elderberry		n
<i>Saponaria</i>	<i>officinalis</i>	soapwort	non-native	n
<i>Schoenoplectus</i>	<i>tabernaemontani</i>	soft bulrush	native	n
<i>Scirpus</i>	<i>spp.</i>	bulrush		n
<i>Smilax</i>	<i>herbacea</i>	carrion-flower	native	n
<i>Solanum</i>	<i>dulcamara</i>	climbing nightshade	non-native	n
<i>Solanum</i>	<i>ptycanthum</i>	eastern black nightshade	native	n
<i>Solidago</i>	<i>flexicaulis</i>	zig zag goldenrod	native	n
<i>Solidago</i>	<i>spp.</i>	goldenrods (<i>S. canadensis</i> and possibly others)	--	n
<i>Solidago</i>	<i>uliginosa</i>	bog goldenrod	native	n
<i>Sorbus</i>	<i>aucuparia</i>	european mountain-ash	non-native	n
<i>Spiraea</i>	<i>alba</i>	white meadowsweet	native	n
<i>Spirea</i>	<i>tomentosa</i>	steeplebush	native	n
<i>Stellaria</i>	<i>graminea</i>	stitchwort	non-native	n
<i>Swida</i>	<i>alterniflora</i>	alternate-leaved dogwood	native	n
<i>Swida</i>	<i>sericea</i>	red-osier dogwood	native	n
<i>Symphyotrichum</i>	<i>novae-angliae</i>	New england aster	native	n
<i>Taxus</i>	<i>canadensis</i>	American yew	native	n
<i>Thalictrum</i>	<i>pubescens</i>	tall meadow-rue	native	n
<i>Toxicodendron</i>	<i>radicans</i>	poison ivy	native	n
<i>Trifolium</i>	<i>pratense</i>	red clover	non-native	n
<i>Trillium</i>	<i>erectum</i>	red trillium	native	n
<i>Tsuga</i>	<i>canadensis</i>	eastern hemlock	native	n
<i>Tussilago</i>	<i>farfara</i>	coltsfoot	non-native	n
<i>Typha</i>	<i>angustifolia</i>	narrow-leaved cattail	native	n
<i>Ulmus</i>	<i>americana</i>	American elm	native	n
<i>Ulmus</i>	<i>pumila</i>	Siberian elm	non-native	n
<i>Uvularia</i>	<i>sessilifolia</i>	sessle leaved bellwort	native	n
<i>Vaccinium</i>	<i>angustifolium</i>	low bush blueberry	native	n
<i>Vaccinium</i>	<i>macrocarpon</i>	large cranberry	native	n
<i>Verbascum</i>	<i>thapsus</i>	common mullein	non-native	n
<i>Veronica</i>	<i>officinalis</i>	common speedwell	non-native	n
<i>Viburnum</i>	<i>dentatum</i>	smooth arrowwood	native	n
<i>Vicia</i>	<i>cracca</i>	cow vetch	non-native	n
<i>Vicia</i>	<i>tetrasperma</i>	four-seeded vetch	non-native	n
<i>Viola</i>	<i>sororia</i>	wolly blue violet	native	n