

WILDERNESS CONSERVATION AREA MANAGEMENT PLAN



Prepared for:

*Manchester Essex
Conservation Trust*

July 2013

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FOREWARD

This plan was initiated during the spring of 2012 through a grant provided by Entrust to the Manchester Essex Conservation Trust (MECT). MECT is a privately funded land conservation organization created in 1963 as the Manchester Conservation Trust (MCT) in order to preserve ecologically important land and wildlife habitat within the Town of Manchester. In 1999, its mission was broadened to include protection of wildlife habitat within the Town of Essex. MECT recognizes the significance of its core landholdings in the Manchester-Essex woods as an open space linkage to other critical habitats, including land on the east side of Southern Avenue and extending toward the Gloucester water supply ponds.

MECT is now the sole trustee of MCT and presently owns and protects nearly 1,100 acres, including approximately 400 acres in Manchester and 700 acres in Essex. The bulk of this land has been designated the Wilderness Conservation Area. MECT continues to expand and consolidate ownership of numerous woodlots in this undeveloped portion of the Manchester-Essex woods for use and enjoyment of passive recreational activities.

In 1985 MECT commissioned the preparation of a Management Plan for the Wilderness Conservation Area, also known as the Manchester-Essex Woods. This earlier plan was prepared by William B. Cross, Professional Forester, under the direction of then Executive Director Helen Bethell. In the spring of 2012, MECT commissioned Rimmer Environmental Consulting, LLC to prepare an update to this plan so that it could assess the extent to which site conditions may have changed in the intervening 27 years, to evaluate whether prior recommendations had been implemented, and to determine if other management goals should be pursued in order to continue to provide maximum protection for this invaluable resource.

Technological improvements since the original plan was developed provide an opportunity to significantly improve the mapping component of the plan and to make the update available electronically so that it is more readily available to a wider audience. Contributions to this plan have been made by numerous individuals, including especially, MECT Executive Director Kathy Leahy, Board members Helen Bethell and William Vachon and important natural resources inventories from James MacDougall and Erika Sonder.

1.0 INTRODUCTION

The following material was developed in order to provide the Manchester Essex Conservation Trust with an update to the Management Plan for the Wilderness Conservation Area, originally prepared for the Manchester Conservation Trust in 1985 by William B. Cross. In the 27 years since this plan was developed, much of the core of this important conservation area remains intact, but several important additions and acquisitions have been made. This update focuses on the Manchester portion of these woods, though much of the information is relevant to the Essex woods as well.

An updated plan was determined to be important in order to identify any new and significant natural resources, to improve mapping in order to better understand the location and extent of these resources,

to evaluate the trail system, to update ownership status, and most importantly to review and assess current uses of the property so that management strategies could be developed or amended to provide the highest protection of natural resources.

The original plan included a comprehensive description of the environmental conditions of the site at the time, including geology, soils, vegetation, wildlife as well as cultural and historical significance. Most of these resources remain largely unchanged, though portions of the site closest to developed areas are experiencing some human-induced affects such as introduction of non-native species. The original plan identified general ownership and current uses of the roughly 380 acres of land that then comprised the study area, 250 acres of which were identified as being in Manchester. It identified significant conservation partners that to this day continue to provide conservation protection in the area, including the Town of Manchester, Essex County Greenbelt Association and The Trustees of Reservations. It provided a general description of unprotected parcels and threats from nearby land uses. Most importantly, the previous plan identified areas of concern and recommended short and long-term management tasks ranging from trail maintenance to potential development impacts. A trail inventory was also included.

It is the intention of this plan to follow in approximately the same format as the original plan so that direct comparisons can be made and an assessment of accomplishments and remaining tasks can be provided.

2.0 NATURAL CHARACTERISTICS

2.1 Location

Figure 1 depicts a US Geological Services topographic quadrangle map that identifies the approximate extent of the study area, which is bounded by the Manchester/Essex Town boundary to the north, Cedar swamp on the east, Route 128 on the south and Maple Swamp on the west. The Manchester portion of these woods is estimated to be approximately 400 acres. Another 700 or so contiguous acres are located in Essex.

2.2 Geology and Topography

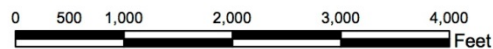
Since there has been little in the way of direct disturbance to the land since the original Management Plan was prepared in 1985, the geology and topography of the site remain essentially unchanged. Like all of Essex County, the current topography is the result of glacial retreat which eroded much of the sand and gravel from the numerous granite bedrock peaks that intersperse the site, creating areas of exposed rock. The highest peak, known as Millstone Hill, rises to approximately 171 feet above sea level. Interspersed between these knobs of granite are the valleys which accumulated sediment and organic matter, forming the swamps and streams that are scattered throughout the study area. In some areas, clay from former salt water deposits lay under the muck of the swamps.



Figure 1- USGS-Project Locus



Legend	
Special Features	Comment
	Parking



The site is generally divided into two large drainage areas. Bayberry Swamp (also known as Spruce Swamp) drains east toward Cedar Swamp which stretches along the west side of Old School Street in the eastern portion of the site. The Cedar Swamp watershed has a drainage area of approximately 2.1 square miles and outlets east and south toward Saw Mill Brook, forming one of the main tributaries to Manchester's Lincoln Street well (See Figure 2).

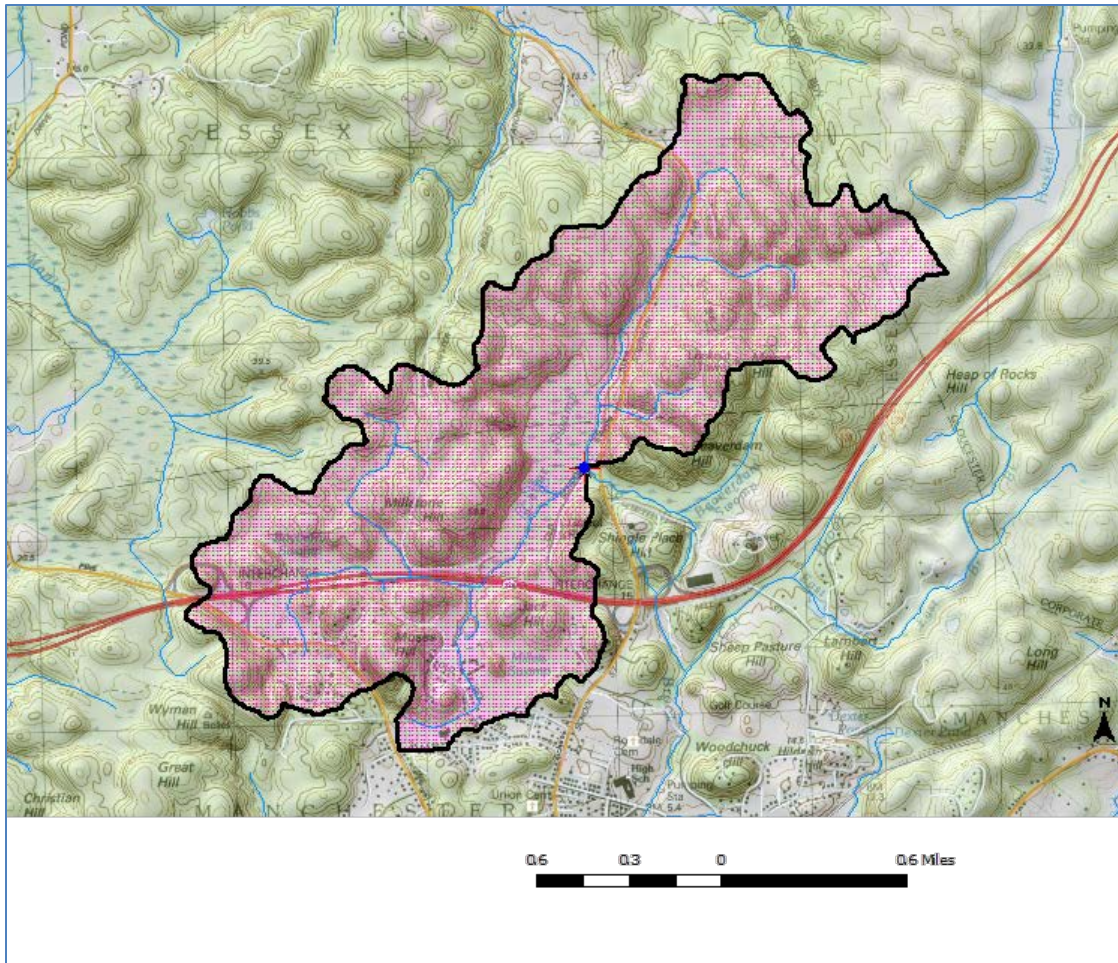


Fig. 2: Cedar Swamp Drainage Area

Maple swamp is located at the western end of the study area and has a drainage area of approximately 1.7 square miles. It drains northward toward Chebacco Lake which is part of the recharge area for the Town of Essex water supply (see Figure 3).

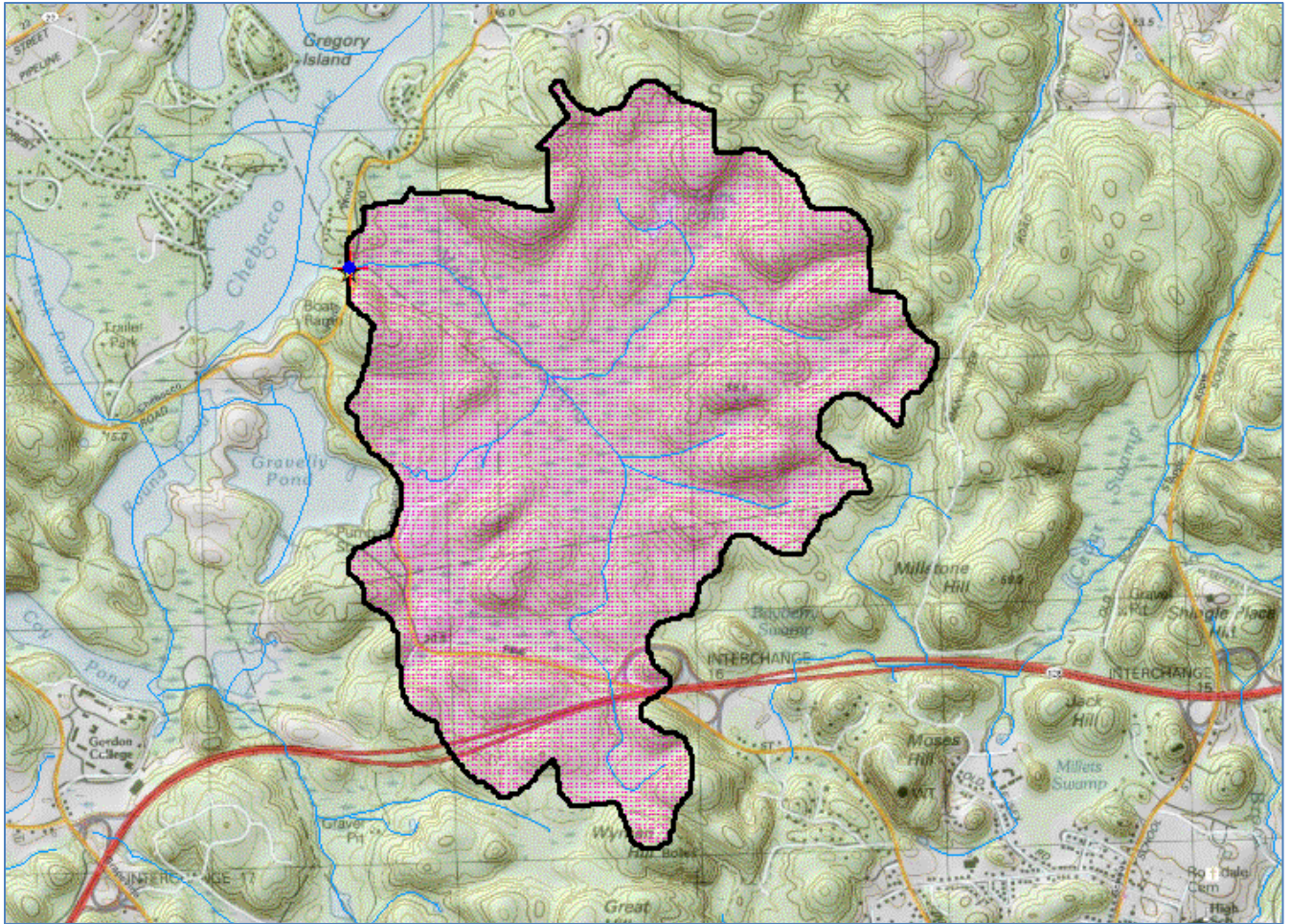


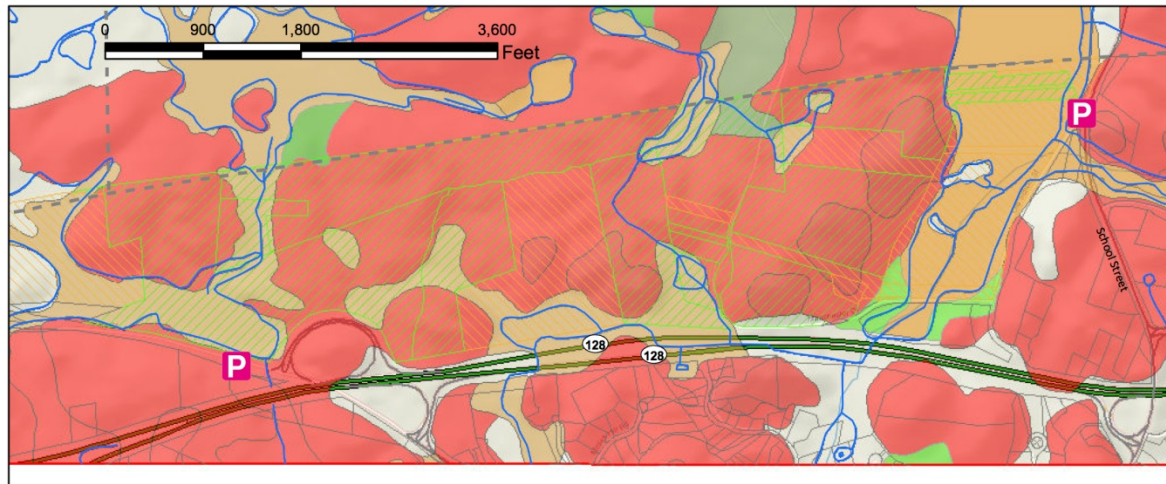
Fig. 3: Maple Swamp Drainage Area

These wetland systems contained within the Cedar Swamp and Maple Swamp drainage areas are significant for the flood control and stormwater renovation functions that they provide. As stated in the 1985 report, Cedar Swamp receives flow from as far away as Pleasant Street and the upper Pine Street area south of Route 128. It also collects all of the stormwater runoff from the highway from School Street to Pine Street. The wetlands provide an opportunity to absorb floodwater, protecting downstream areas such as those along Sawmill Brook from storm damage, as well as to attenuate pollutants from urban runoff prior to recharging to the aquifer or discharging into other surface water bodies.

2.3 Soils and Soil Suitability

According to the soil map provided by the Natural Resources Conservation Service (formerly Soil Conservation Service) included as Figure 4, almost 2/3 of the study area consists of Chatfield-Hollis Rock Outcrop Complex with slopes ranging from 3-15% and Hollis Rock Outcrop with slopes ranging from 3-25%. This soil complex occurs on undulating hills and consists of well drained, moderately deep Chatfield soils, somewhat excessively drained, shallow Hollis soils and

exposed bedrock. The surface typically has stones and boulders 1-4 feet in diameter. Freetown muck accounts for about 10% of the study area and occurs in the lower elevations within the



Legend

muname

- Canton fine sandy loam
- Scituate fine sandy loam
- Wareham loamy sand
- Freetown muck
- Swansea muck
- Chatfield-Hollis-Rock outcrop complex
- Rock outcrop-Hollis complex



Figure 4

Soils

Manchester Woods

Manchester Essex Conservation Trust

major swamp systems, especially Bayberry and Maple swamps. This soil is deep, nearly level and very poorly drained, occurring along rivers and streams systems. Swansea muck is more common in Cedar swamp and is also deep and very poorly drained. None of these soil types are well suited for farming or development. The Chatfield Hollis soils are shallow to bedrock, with numerous bedrock outcrops, limited absorption for septic system and may contain significant slope limitations. The muck soils occur in wetlands that are protected under local, state and federal wetland protection regulations. The site contains approximately 6% Udorthents, which are areas where soil has been excavated or deposited. They are typically associated with urban land but occur within the study area near and within Old School Street.

Soil suitability is a factor in planning for recreational uses on the site, since shallow, steep soils may be susceptible to erosion. The Chatfield soils are suited to forest growth, but the Hollis soils are generally not due to the shallow depth to bedrock.

2.4 Vegetative Communities

This study finds, like the 1985 plan, the site continues to support several distinct vegetative communities which remain intact and largely unchanged from their previous descriptions. These plant communities are generally stratified vertically, according to elevation on the landscape. They include open water habitats found in Heron and Cedar Swamp Ponds, forested wetlands such as those found in Cedar, Bayberry, Fox and Maple Swamps, the upland forested community that occurs on more gently sloping hillsides, and a dry, rocky summit community such as that which occurs on the steep slopes and tops of Millstone Hill and Prospect Ledge. Each of these areas supports a distinct suite of vegetation that supports a variety of wildlife habitats. These general habitat types have been further divided into ten (10) categories according to the dominant plant associations that comprise them.

The locations of these vegetative communities have been mapped through aerial photo interpretation and are presented in Figure 5 below. This figure indicates that 29% of the site consists of open water or wetland resources, 69% contains undisturbed upland forested areas, 1% consists of cliff or rocky summit and 1% is disturbed from human activities.

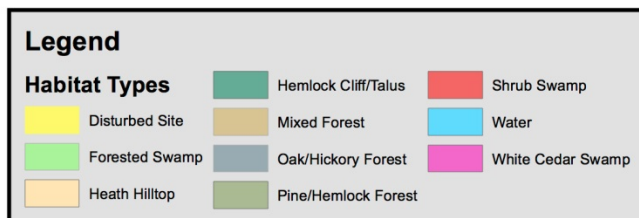
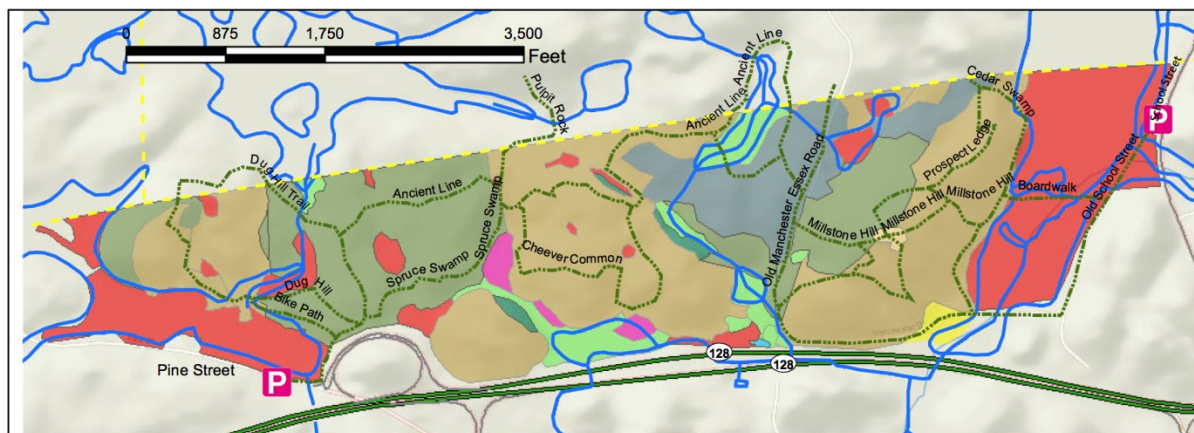


Figure 5

Vegetation Communities

Manchester Woods

Manchester Essex Conservation Trust

A plant inventory of the Manchester Essex Woods was conducted by Manchester resident and former Conservation Commission member Ericka Sonder in 2002. The data included in this report has been updated with current taxonomy, and is provided as an attachment. Although not a complete list of all species within the study area, this document provides important baseline data to compare with future observations.

The site also supports several rare and endangered plant species. Due to the sensitivity of these plants to disturbance, their location is not provided in this report. The Massachusetts Division of Fisheries and Wildlife – Natural Heritage and Endangered Species Program (NHESP) maps and maintains records on the location and status of these species within the project area and regularly inspects to monitor the populations. The precise location of these species is important to note should any significant trail relocations be considered in the future. The Priority Habitat map provided by NHESP (see Figure 7) identifies the general area of rare species habitat within the project environs. Any significant changes to trails should be done in consultation with NHESP in these areas.

Open Water

The open water areas occur primarily in Heron Pond and Cedar Swamp Pond. Both of these ponds are relatively shallow and contain broad-leaf cattail (*Typha latifolia*), as well as numerous other aquatic emergent such as pickerel weed (*Pontederia cordata*) arrow arum (*Peltandra virginica*), arrowhead (*Sagittaria latifolia*) and floating-leaved aquatics such as pondweeds (*Potamogeton* sp.), yellow water lily (*Nuphar lutea*), and duck weed (*Lemna* sp.) Portions of Heron Pond, especially on the south side of the boardwalk trail, contain stands of t common reed (*Phragmites australis*) that have begun to encroach on the shallow areas. Wetlands along Pine Street also contain *Phragmites*, especially the northern section near the old landfill. This non-native and invasive species was not noted in the 1985 report and appears to be expanding according to observations by regular trail users. Continued expansion threatens the diverse native plant populations and the wildlife that is dependent upon those native plants. Measures to control the growth and spread of this species are discussed in section 5. Purple loosestrife (*Lythrum salicaria*), also a non-native and invasive species that occurs along the pond shores was noted in 1985 and continues to be present but does not appear to be presenting the same threat to habitat diversity as *Phragmites*.



Photo 1: Heron Pond viewed from boardwalk

There are several other small, seasonal pools interspersed throughout the site. Several of these seasonal ponds qualify as vernal pools because they contain open water only in late winter through early summer and provide habitat for amphibian species which rely solely upon these pools for breeding as discussed in section 2.5, Wildlife Habitat.



Photo 2: Cedar Swamp Pond from boardwalk with *Phragmites* in background

Forested and Shrub Wetlands

Forested wetlands and shrub swamps account for nearly 30% of the project site. The large forested wetland systems at the site include the named swamps such as Cedar Swamp, Bayberry Swamp, Fox Swamp and Maple Swamp but also include other smaller, unnamed forested wetlands interspersed throughout the site. Typically the larger forested wetlands contain an interior that is dominated by scrub-shrub species, with trees on the hummocks and mounds and along the margins of these wetlands. The over story is primarily red maple (*Acer rubrum*), though hemlock (*Tsuga canadensis*) is also common especially along the periphery and on rocky seepage slopes. As discussed in the previous report, small areas of white cedar and red spruce estimated to be approximately 4 acres in total can still be found, representing one of the few remaining locations where this community can be found in the area.

In the forested wetlands, the understory is typically dense and diverse and includes numerous berry producing shrubs such as highbush blueberry (*Vaccinium corymbosum*), winterberry (*Ilex verticillata*), silky dogwood (*Cornus amomum*), northern arrow-wood (*Viburnum recognitum*) and spicebush (*Lindera benzoin*). Sweet pepperbush (*Clethra alnifolia*) is also very common. The groundcover includes skunk cabbage (*Symplocarpus foetidus*), Sphagnum moss (*Sphagnum*), poison ivy (*Toxicodendron radicans*), cinnamon fern (*Cinnamon fern*), sensitive fern (*Onoclea sensibilis*) and royal fern (*Osmunda regalis*).



Photo 3: Cedar Swamp

Since 1985, significant regulatory protection has been enacted to provide protection to wetland resources from development pressure and alterations from cutting, clearing, changing of grades or changes in hydrology from any use or activity. These wetland systems are now legally

recognized and protected under the Town of Manchester Wetland Protection Bylaw, enacted in 1988 as well as state and federal wetland protection regulations. Wetlands are now recognized for the multitude of important public functions they provide, including flood control, storm damage protection, groundwater protection and recharge, water quality protection and wildlife habitat. Most New England wildlife species rely on wetlands at some stage in their development as food source, nesting, overwintering or breeding habitat.

Upland Forest

Upland forest is the dominant vegetative community within the study area. It includes large tracts extending along the more gently sloping hillsides and down to the edge of the forested wetlands described above. They consist of several community subsets, based upon dominate plant associations of oak/hickory, white pine/oak and white pine/hemlock. The typical forest community remains mixed oak and oak, maple, beech associates. Throughout the site, the dominant species is red oak (*Quercus rubra*), and to a lesser extent white oak (*Quercus alba*), followed by red maple as well as American beech (*Fagus grandifolia*), red maple, hemlock, black birch (*Betula lenta*), shagbark hickory (*Carya ovata*), white birch (*Betula papyrifera*), and eastern white pine (*Pinus strobus*). Hemlock is significantly reduced from its former dominance in the forest community since its decline first due to the hemlock looper in the 1970s and later by the wooly adelgid. It still occurs on damp cool slopes, and in the margins of the forested wetlands. Where hemlock stands died as a result of these infestations, the open areas appear to now be occupied by black birch. The understory is typically sparse to moderate due to the shading and the acid soils, and includes witch hazel (*Hamamelis virginiana*), maple-leaf viburnum (*Viburnum acerifolium*). Groundcover includes teabury (*Gaultheria procumbens*), Canada mayflower (*Maianthemum canadense*) and partridgeberry (*Mitchella repens*) as well as lowbush blueberry (*Vaccinium angustifolium*) along the sunny openings along the trails. Most of the trail system traverses this habitat type.

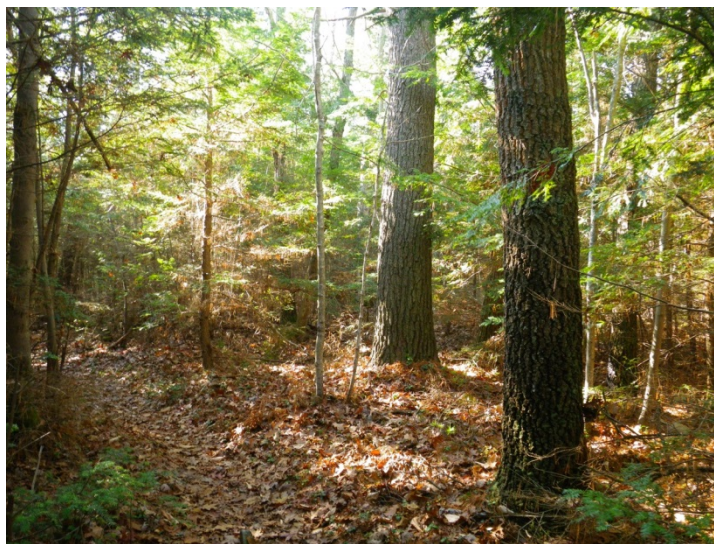


Photo 4: Upland Forest



Photo 5: Woolly Adelgid egg sacs on Hemlock

Rocky Summit

This habitat includes scattered pitch pine and scrub oak, largely stunted due to thin soils and exposure to wind. Black huckleberry (*Gaylussacia baccata*), sweet fern (*Comptonia perigrina*), lowbush blueberry and sheep laurel (*Kalmia angustifolia*) occur in the understory. Upland mosses and lichens cover much of the exposed bedrock. These areas are attractive to hikers as they afford sweeping views of the surrounding landscape and a good place to observe migrating birds as well as dragonflies and butterflies.



Photo 6: Rocky Summit

Open/Disturbed Areas

Small portions of the site, especially along Old School Street contain cleared areas currently used to store brush and other landscape materials. Along these open areas are small patches of upland meadow containing staghorn sumac (*Rhus hirta*), blackberry (*Rubus alleghiensis*), raspberry (*Rubus idaeus*) and a variety of forbs and grasses, such as Queen Anne's lace (*Daucus carota*), milkweed (*Asclepias sp.*), tansy (*Tanacetum vulgare*), asters (*Aster spp.*) and goldenrods (*Solidago spp.*) These areas should be monitored carefully as they can be an attractive place for invasive species introduction through materials deposited from outside sources or vehicles or equipment bringing in seed on tires.

2.5 Wildlife Habitat

The variety of vegetative communities within the study area supports a diverse array of wildlife habitats and wildlife species. As noted above, at least eight (8) documented vernal pools are located within the study area. Six of these pools have been certified by Mass. Division of Fisheries and Wildlife – Natural Heritage and Endangered Species Program (NHESP) as providing

breeding habitat for vernal pool dependent species. An additional two pools will be certified this year, based on observed egg masses of spotted salamander (*Ambystoma maculatum*). The locations of the previously and soon to be certified pools are indicated in Figure 6 below. Because the site is so large and the topography so undulating, it is possible that there are additional vernal pools as well and these potential pools should continue to be investigated and certified by NHESP as information becomes available.



Photo 8: Vernal Pool

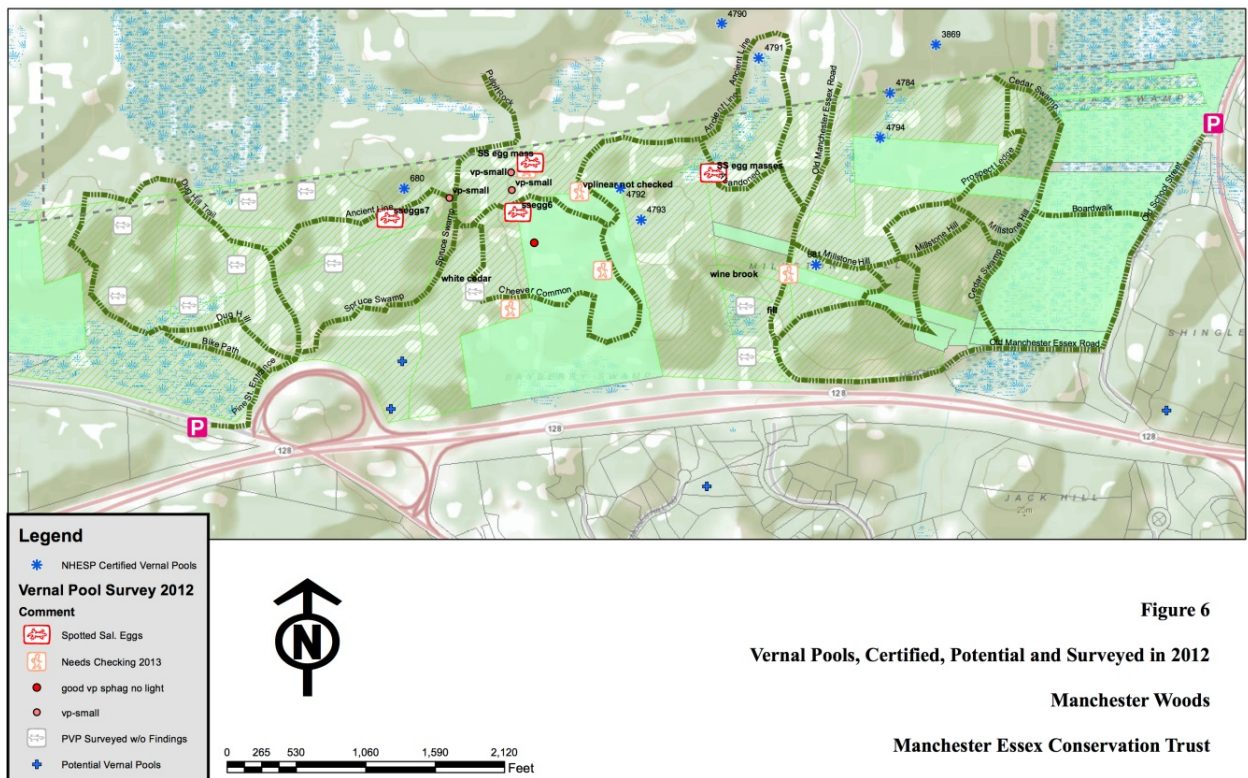


Photo 9: Spotted Salamander

Egg Mass



Photo 10: Adult Wood Frog



The project site is recognized for its significance to wildlife habitat and exemplary natural communities through its inclusion in BioMap2 prepared by NHESP. BioMap2 represents NHESP's most recent efforts to identify habitats and species of conservation concern described in the State Wildlife Action Plan. It is used to guide biodiversity conservation in Massachusetts by identifying the areas that are most critical for land preservation and conservation stewardship in order to provide protection of rare and threatened flora and fauna and for the protection of native species and their habitats. Refer to Figure 7 for the location of these sensitive habitats.

Appendix 2 provides a list of known birds, and Appendix 3 provides a list of mammals, reptiles and amphibian species which utilize the site. On a typical August day, the authors observed wood duck, great blue heron, winter wren, pine warbler, pileated woodpecker, chipping sparrow as well as American toad, spotted salamander, garter snake, evidence of recent beaver activity, evidence of red fox and white tailed deer, several species of dragonflies and butterflies. Since the 1985 plan was prepared, additional species are now present or have significantly increased in numbers, including fisher, eastern coyote, beaver, white tailed deer and turkey. Black bear is anticipated to be in this area within the next 20 years and also potentially bobcat, which has been sighted in Essex County. Some species that have experienced decline include New England cottontail and roughleg grouse. Further study is needed in order to determine if brook salamanders (Dusky and Two-lined salamanders) are present. Changing climate in the coming decades is likely to result in reductions in populations that are common in more northern areas.

Beaver continue to occupy portions of the study area and regularly dam the culvert under Old School Street, causing occasional flooding. Beaver dams located on the east side of School Street also contribute to back-up flooding of the study area. Management of beaver activities and water levels has been conducted by the Town of Manchester through use of outlet control structures through the dams and culverts, commonly known as "beaver deceivers."

NHESP also has recorded several rare wildlife species and has mapped the estimated habitat of these species. Refer to Figure 8 for a map of Estimated Habitat of Rare Wetlands Wildlife and Priority Habitat.

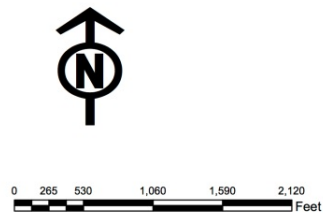
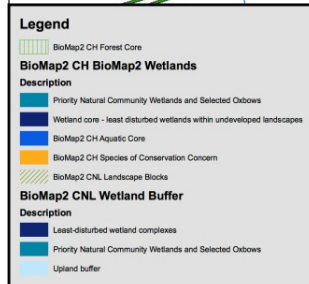
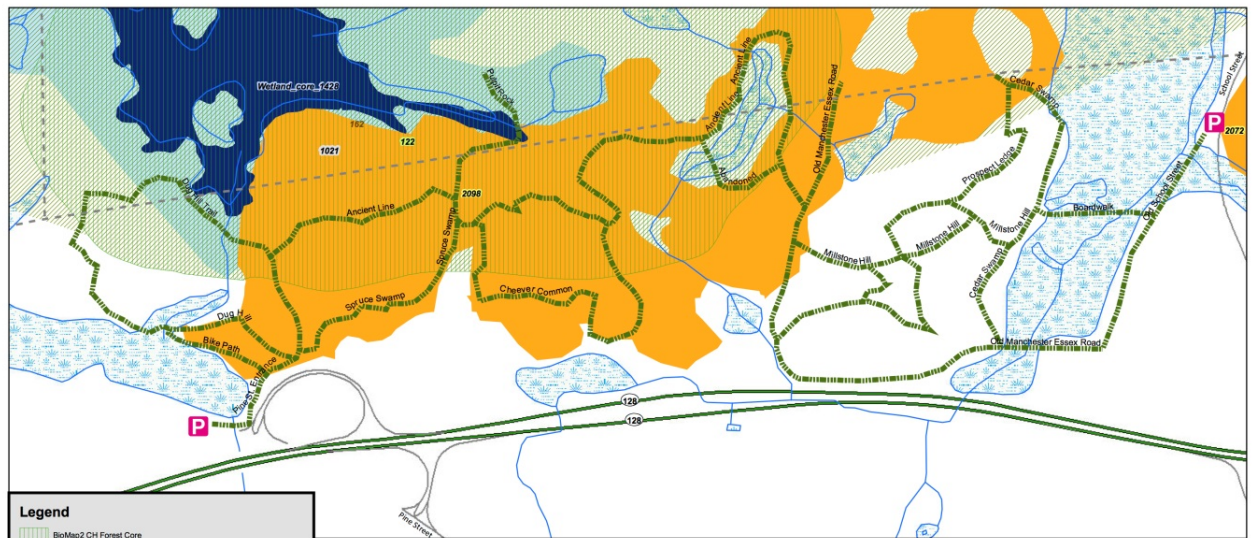


Figure 7

BioMap2 Natural Heritage Critical Habitats

Manchester Woods

Manchester Essex Conservation Trust

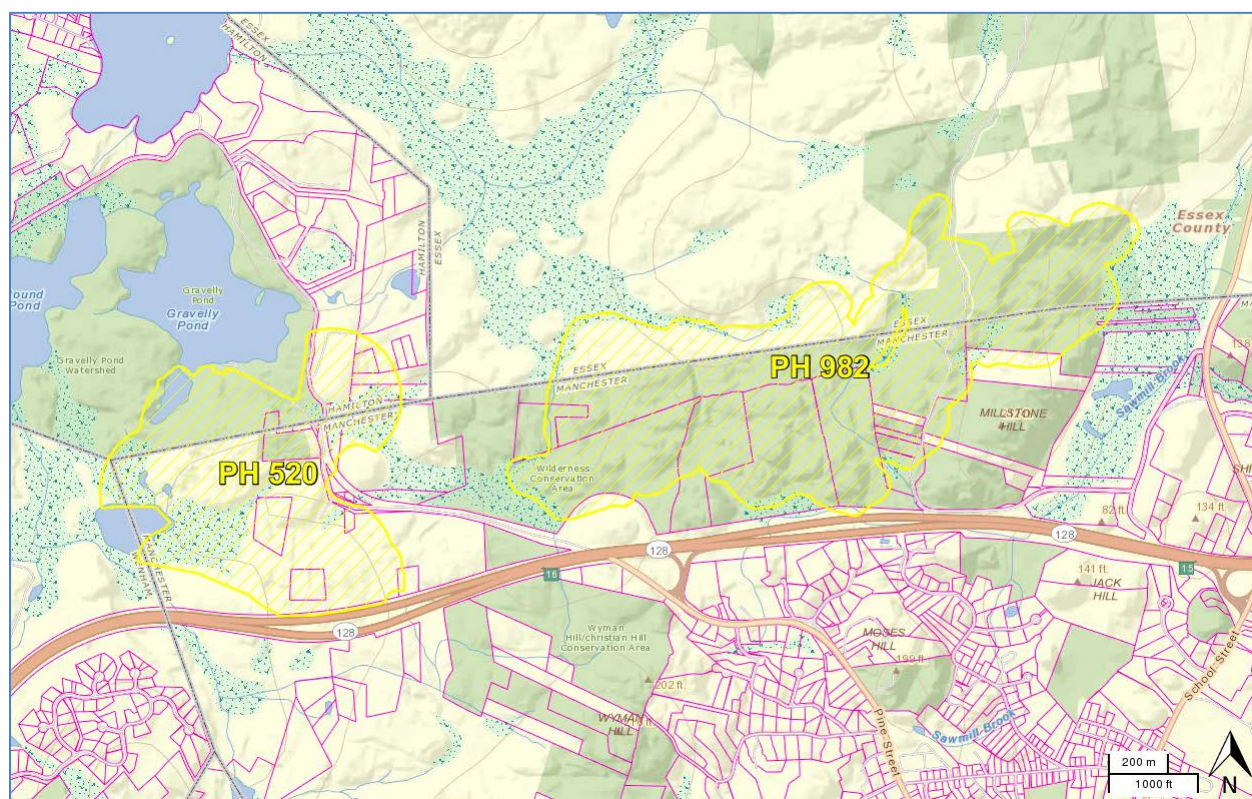


Fig. 8: Natural Heritage and Endangered Species Program
Priority Habitat Map

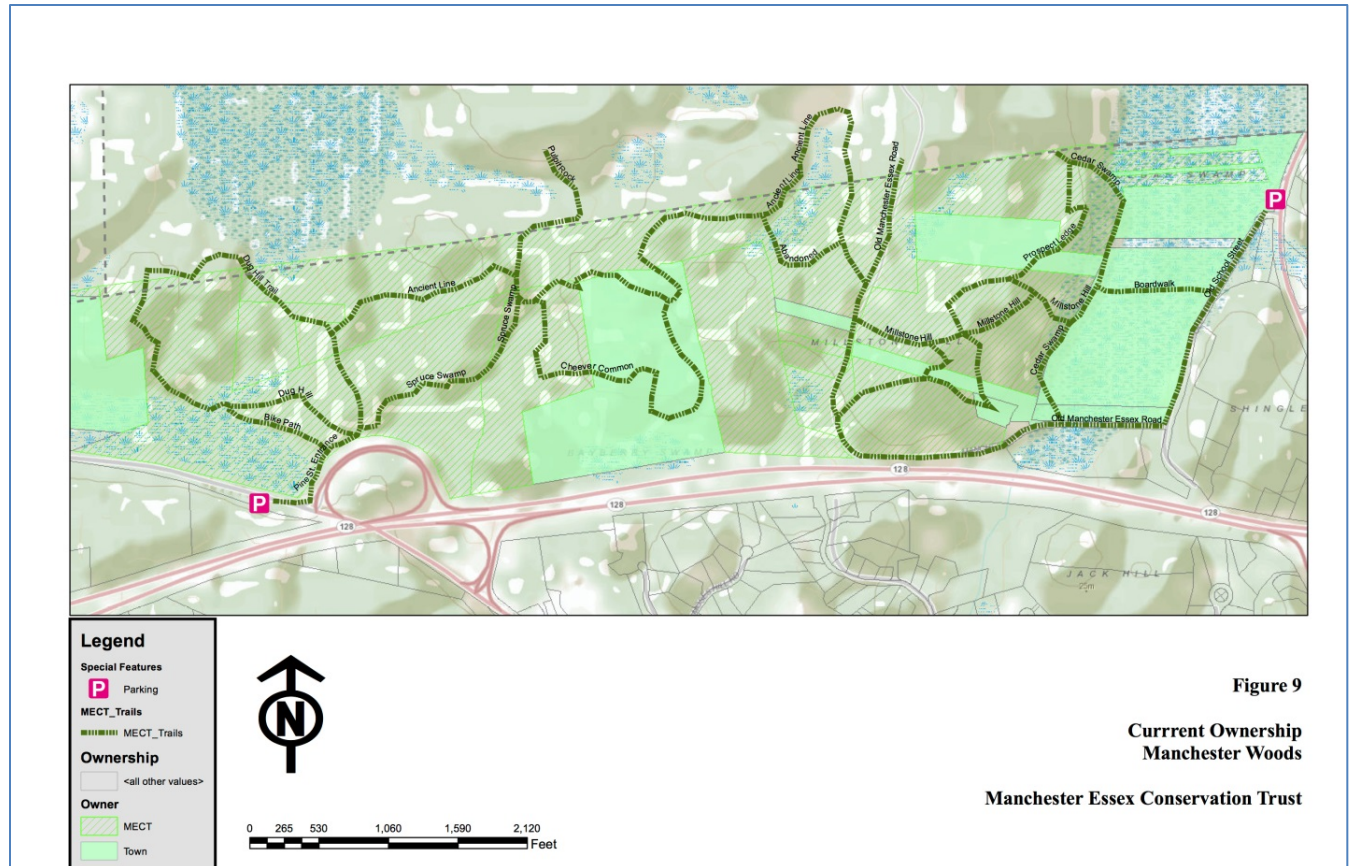
3.0 CULTURAL CHARACTERISTICS

3.1 Land Use History

The 1985 plan provided a concise history of the Manchester-Essex woods dating back to the 17th century. It includes an excellent summary of the early use and industry supported by these woods, including forestry and sawmills to support the shipyards of Essex and the furniture industry in Manchester, quarrying of granite and later Sunday afternoon carriage rides by wealthy summer residents, whose enjoyment of the scenic beauty of the landscape ultimately led to the protection of these woods. The first parcels were accepted by Manchester's Town Meeting in 1880 and continue today through the hard work and dedication of the MECT board in identifying and obtaining the remaining woodlots to provide a connected greenway. Other acquisitions by the Town of Manchester, as well as other conservation organizations such as the Trustees of Reservations and Essex County Greenbelt Association add significantly to the permanent open space protected in the area. All of these groups contain a mission to permanently preserve and protect these parcels in perpetuity for open space and conservation.

3.2 Ownership and Current Use

With a few small exceptions, virtually all of the land from Cedar Swamp off School Street to Pine Street within the Town of Manchester is now protected either by the Town of Manchester or MECT. A few small interior parcels have unknown ownership status according to the Town of Manchester Assessor's records. This may be due to incomplete or unknown property boundaries. The project site borders other forested land and very low density residential use along School Street to the east. The Pine Street side borders the former municipal landfill to the west and Route 128 to the south. The Essex portion of the woods borders the project site to the north.



3.3 Unprotected parcels

There remain a few parcels whose ownership status is undetermined, but these are small and are surrounded by other protected land. An 8.41 acre privately held parcel is located along Old School Street and contains a seasonal camp. Portions of this site remain in use to support landscaping activities, especially for the storage of brush and landscape materials. Another parcel known as Shingle Hill Place is located in the triangle formed between School Street and Old School Street is a 23.72 acre parcel of privately held land. This development of this parcel is encumbered by wetlands, lack of utilities along this section of School Street. Again, more complete survey of the area might identify other unprotected parcels.

3.4 Zoning

Despite the overwhelming conservation ownership of the study area, it remains zoned by the Town of Manchester as Limited Commercial District. The Zoning Bylaws states that within the Limited Commercial District, “no building, structure, or land shall be used and no building or structure shall be erected or altered, except for the following uses:

Business and professional offices and office buildings;
Recreational club or facilities operated for profit;

Municipal use;
any accessory use in an accessory building when completely screened from the abutting streets or lots;

In addition, by Special Permit from the Planning Board, within the area west of Pine Street, laboratories and establishments devoted to research and development are allowed.

The site is also within Zone III of the Ground and Surface Water Overlay Protection District added to the Town Bylaws in 1990 and revised in 2002. This purpose of this district is:

“to protect the public health, safety, and welfare through the preservation of the Town's water resources to ensure a future supply of safe and healthful drinking water for the residents and employees of the Town of Manchester-by-the-Sea and the general public. The designation of the Ground and Surface Water Resource Overlay Protection Districts and careful regulation of development activities within these districts can reduce the potential for ground and surface water contamination.”

“Zone III” means that land area beyond the area of Zone II from which surface water and ground water drain into Zone II, as defined in 310 CMR 22.00. The surface drainage area as determined by topography is commonly coincident with the ground water drainage area and will be used to delineate Zone III. In some locations, where surface and ground water drainage are not coincident, Zone III shall consist of both the surface drainage and the ground water drainage areas.

The Manchester Planning Board is the authority responsible for issuing a Special Permit for work subject to the Ground and Surface Water Overlay District. The prohibited uses in this zone include underground storage tanks, junkyards, landfills, stockpiling and disposal of snow or ice from highways that contains sodium chloride, storage of commercial fertilizers, animal manure without proper containment and limits on lot size for residential development not connected to municipal sewerage. Allowed uses with a Special Permit include, among other uses, storage of regulated substances, on-site sewage disposal in excess of 2,000 gallons per day, and land uses resulting in the creation of 15% or more of the area as impervious unless adequate groundwater recharge is provided. For a complete listing of prohibited and allowed uses, please refer to the Town of Manchester Zoning Bylaws.

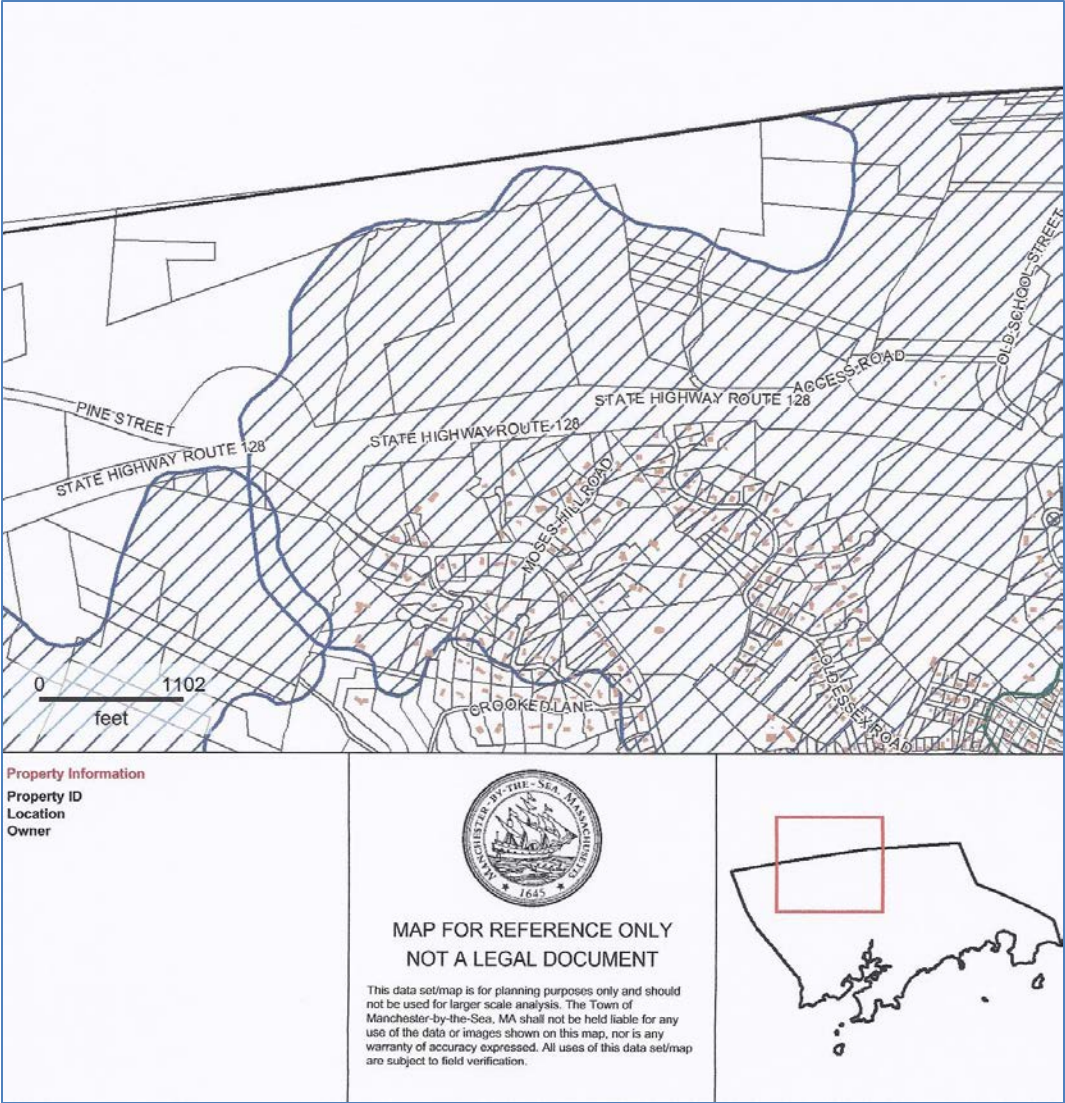


Fig. 10 Water Resources Protection District

4.0 COMMUNITY AND REGIONAL NEEDS

The 1985 study contained an evaluation of the regional context of the study area, in terms of demand for industry, housing, water supplies and open space. At the time of this earlier study a much smaller percentage of the project area was afforded permanent open space protection, making threats from development more significant to the future of the area. In addition, the absence of strong environmental protection regulations meant that potential development was more likely to proceed unimpeded by a thorough evaluation of a project's environmental impacts. The protections now afforded by wetland protection regulations, floodplain regulations, water supply protections and zoning protection in combination with the protections provided by the conservation mandate of the organizations that now control most of these woods make development much less likely than in 1985. In addition, the irregular topography, shallow soils, steep slopes and poor infiltration in much of the site

add to the development challenges. However, development of surrounding properties and any remaining inholdings could affect the integrity and value of the study area if careful attention and thoughtful planning are not in place.

Access to the study area is primarily from Pine Street and Old School Street. There remains privately held land approximately .5 mile west of Old School Street, and between School Street and Old School Street. However, the Town of Manchester owns land on both sides of this unimproved gravel road making widening for any private development more difficult. Access from Pine Street is not feasible since this is land held primarily by MECT and is also contains significant wetlands.

Commercial development has continued on the east side of School Street and though the Trustees of Reservations holds over 100 acres of conservation land known as the Agassiz Rock Reservation, significant privately held parcels remain to the north and east.

Approximately 40% of Manchester's water supply is provided by the Lincoln Street well, located downstream of Cedar Swamp and the streams that outlet from it. The remaining 60% comes from Gravelly Pond, located just west of the study area in Hamilton within the Maple Swamp drainage area. The wetlands and woodlands within the study area are critical to the protection of the surface water quality of the ponds and also the recharging of the aquifer that provides that contributes to the wells. While there are no immediate needs for further supply, Cedar Swamp has in the past served as an emergency supply for the City of Gloucester, though these wells are now abandoned. With uncertainty in water supply needs and changes in climate that may affect the availability of public water supplies into the future, the protection of wetlands within the study area becomes even more vital.

The Town of Manchester's most recent Open Space and Recreation Plan identifies the protection of safeguards to its water supplies and the protection of water quality as primary goals, in addition to the protection of wildlife habitat and outdoor passive recreation opportunities. The Town holds many conservation parcels, including parcels within the study area. MECT and the Town have traditionally worked together in identifying and preserving significant parcels as they become available. Other conservation partners include Essex County Greenbelt Association, The Trustees of Reservations and the Commonwealth of Massachusetts. Continued cooperation among these groups is essential in acquiring, managing and providing permanent protection to these parcels. It is becoming more common for parcels to contain more than one source of conservation protection, with one entity holding the parcel in perpetuity for conservation purposes and the other holding a conservation restriction, essentially providing another layer of protection should the resources or of one entity not be able to fulfill its mission or provide adequate stewardship.

5.0 MANAGEMENT CONCERNS

5.1 Protection of Biodiversity

Essential to the protection of the wildlife habitat of the Manchester-Essex Woods is the protection of native plant communities. At present, the parcel is remarkably free of the typical intrusions of non-native and invasive plants that occupy so many suburban landscapes. The exception within the project site is the perimeter along Pine Street and School Street, along Old School Street near where landscape materials are stored, and within Heron Pond where *Phragmites* and purple loosestrife have gotten a foothold. In order to prevent further colonization by these plants and to maintain the native plant community, eradication efforts should be considered and a plan implemented to monitor the site for future encroachments.

Coordination with the Town of Manchester Department of Public Works and Mass Department of Transportation may be necessary in order to communicate this threat and help to develop roadway maintenance practices that take into account the potential for altering plant communities that make areas near roads more attractive for non-native species. For example, road salting practices have the potential to adversely affect water quality through higher sodium and calcium loading, and excess road salts burn or kill vegetation, making colonization by non-natives that tolerate low nutrient soils near roadsides more likely. Excess sediment loading from sanding activities and unvegetated road shoulders can also provide avenues for the introduction of non-native plants. Seeds can easily enter a site through vehicle tires, equipment or materials stockpiled on site. The potential for transport of non-native seed should be considered prior to any plans to conduct maintenance activities, build boardwalks or repair trails. Equipment should be cleaned prior to entry to the property and any areas of disturbed soil should be immediately re-seeded with native grass seed mixes to minimize the potential for intrusion of unwanted species.

In addition to keeping out unwanted species, management strategies should be developed to encourage and protect rare species by ensuring that trails avoid these areas.



Photo 10: Close-up of Phragmites



Photo 11: Stockpile of brush and material off Old School Street

5.2 Protection of Water Quality

The Town of Manchester Open Space Plan discusses the need to reduce road salting of Route 128 in order to provide protection to the Town's Water Supplies. Since runoff from this state highway discharges into both the Cedar Swamp and Maple Swamp drainage areas, this measure would also serve to protect the water quality of Wilderness Conservation Area. Efforts should be taken to coordinate with the Town in urging MassDOT to consider limited road salting in this area. This would likely require some type of water quality monitoring in order to demonstrate that excess sodium and calcium are

entering into wetland or threatening public water supplies. Local measures should also be considered to address treatment of School Street and Pine Street.

5.3 Unauthorized Recreational Uses

The use of the site by mountain bikes is a new development since the 1985 plan and should be considered in future management. Presently, there is evidence of relatively light use by mountain bikers, whether because it is relatively undiscovered or other areas in the vicinity provide better opportunities is not known. While light to moderate use often has little impact on the trails, bikers often go off the trail in order to avoid or sometimes to take advantage of obstacles. One of these trails was noted off of the Dug Hill Trail near the Pine Street entrance. While impacts at this time were determined to be relatively minor, measures should be taken to block these new trails and if necessary add signage in those locations to discourage off trail riding.



Photo 12: Mountain Bike Tracks

Another new recreational use since the 1985 plan is rock climbing. A group of climbers has recently begun using the rock face on the north side of Bayberry Swamp in the Cheever Common loop trail. Although this section of the woods is within land held by the Town of Manchester, other sites within the MECT parcels are attractive and might be used in the future. Since this activity typically results in the ad hoc creation of new trails, trampling of vegetation, removal of lichen from rocks and sometimes cutting of overhanging branches, its use should be carefully managed and potentially prohibited.



Photo 13: Climbing rock



Photo 14: Climbing screw in ledge

5.4 Wildlife Management

Beaver are a prominent component of the Cedar Swamp landscape and are new to the site since the 1985 plan. Beavers are often a welcome harbinger of a diverse ecosystem and many species of wildlife rely upon the habitat created through their activities. However, beaver have regularly clogged the culverts under Old School Street and School Street, causing flooding of roads and private properties. Clearly this activity should be managed in order to minimize flooding that creates health and safety concerns. However, this management should be balanced against the benefit beaver provide in a natural ecosystem. Since the beaver reintroduction to Massachusetts is very recent, populations have been steadily increasing into unoccupied habitat. However, it is expected that as food sources become depleted and with the colonization of beaver parasites that often provide a natural control on the population, incidences of beaver related problems may begin to level out. Flow control devices within culverts ("beaver deceivers") are often effective at maintaining water levels at a height agreeable to both humans and beaver. State regulations now prohibit leg hold traps, and while live trapping is still permitted, relocation of animals once trapped is not. The only other management solution available is to hire a hunter. This is often ineffective as well, since beaver are most active at night, at a time when discharge of firearms is not permitted. These challenges should be considered when maintaining or altering trails that could potentially be flooded by beaver.

White-tailed deer are significantly more abundant than in 1985. The absence of local predators combined with the decline in the number of hunters and the acclimation of deer populations to human activities have contributed to this increase. No evidence was observed of over-browsing or lack of vegetation within the study area, though deer populations in the north east are believed to be at or near carrying capacity. At some time in the future it may be necessary to consider the best means of managing populations in order to preserve a diverse vegetative community. However, the more pressing current concern with deer is the increase in the incidence of tick borne diseases which use deer as host, including Lyme disease.

The changing climate is also resulting in increases in mosquito-borne diseases such as West Nile virus and Eastern Equine Encephalitis. It is expected that the rates of infection for these diseases will increase in the future, with increasing pressure to manage mosquito breeding habitat in wetlands or conduct aerial spraying of pesticides within sensitive wildlife habitat areas. In the short term, it may be appropriate to add signage to alert hikers to the potential threats from insect and tick borne diseases and the precautions that should be taken to minimize the potential for infection. In the long term, MECT may need to develop a management strategy that addresses public health concerns without adversely affecting wildlife habitat protection.

5.5 Trail Maintenance

The project site contains a number of well-marked and well-maintained trails. MECT has published a trail map of the property. Figure 10 below shows the location of these trails. Trails are also numbered to assist in navigation of the area. Copies of trail maps have been provided to the Manchester police and fire departments to assist with any emergency responses that might be required. Maps are planned

to be provided to the Essex police and fire departments as well. Trail maintenance is coordinated and conducted by the MECT Land Stewardship Committee. At the time of this writing, maintenance is being coordinated by MECT member Bill Vachon. Some projects are conducted in coordination with Eagle Scout projects. Approximately 20 new trail signs are being made that will be installed at various trail intersections to replace older signs which have been stolen, damaged or rotted. The new ones will be made from age-resistant, pressure-treated wood. Occasionally, new trails may be added. It is recommended that this report be consulted to ensure that any new trails avoid sensitive areas to the maximum extent feasible, especially avoiding wetlands.

Some of the trail segments MECT maintains are located within conservation land owned by the Towns of Manchester and Essex. MECT is working to develop agreements with each community to limit any liability from conducting this work.

Parking for trail use is primarily at the School Street/Old School Street entrance. There is a kiosk at this location with trail maps and other information and notices available to users. MECT has recently filed a Notice of Intent with the Manchester Conservation Commission under the Mass. Wetlands Protection Act for permission to improve this parking area, including re-grading and improvements to stormwater runoff. Parking at the Pine Street entrance is very limited, and available only along the road shoulder and an informal pull-off area. Further coordination with the Town of Manchester Conservation Commission and Department of Public Works is recommended to improve the parking areas, especially improving stormwater runoff and the erosion and potential sedimentation of wetlands that occurs from vehicles driving on the road shoulder. A second kiosk is located along the Spruce Swamp Trail off of Pine Street, near the intersection with the Dug Hill Trail.

The following is a general summary of conditions of the major trails:

Old Manchester-Essex Road - This trail runs north/south from Route 128 to Andrews Street in Essex provides. It is wider than the other trails, making it more attractive for use by an excellent trail for a variety of recreational uses. This is the only trail that horses are allowed to use. It continues to provide an important access for fire control. However, its width could make it attractive for use by unauthorized motorized vehicles, though this has not been reported to be a problem at this time. Intersections with other trails are well marked.

Ancient Line Trail – Trail is open and in good condition. It contains a boardwalk along one small section. During the next year, an additional bridge across a wet section at its eastern end may be installed as part of an Eagle Scout project. This section is now bypassed with a small loop trail.

Baby Rock Access – This trail is in Essex, and can be accessed from the west from the Manchester Essex Road or from the east from the Prospect Ledge Trail. It was not specifically evaluated for this report, however, Bill Vachon reports that the trail is in good condition.

Bear's Den Trail – This trail is also in Essex. Bill Vachon reports it is in good condition.

Candlewood Hill Spur - This trail is in Essex. MECT does not control all of the access points to this trail. No action is currently planned on this trail.

Cedar Swamp Trail – This trail is in good condition and one of the more popular trails in the project area. It contains a boardwalk which is in very good condition. Boards are replaced regularly and vegetation is trimmed away from it. Signs and blazes on the trees are maintained.

Cheever Commons Loop – Much of this trail is owned by the Town of Manchester. It is well maintained and has appropriate signage. MECT has worked closely with the Manchester Conservation Commission to address recent use of a cliff on the south side of this trail that is used by rock climbers. Consideration is now being given to how to address this relatively new activity and any potential impacts it may have to vegetation on and around the cliff.

Dug Hill Trail – This trail is accessed off of Pine Street. An information kiosk is located at its intersection with the Spruce Swamp Trail. The bridge over Mill Brook has been re-built twice over the past 12 years, most recently in 2009. More visible signage is needed to identify all trail intersections on this trail. There are some side trails off of this trail created by mountain bike users, but as of this date the impact from this activity appears to be minimal.

Millstone Hill Trail - This trail is accessed by the Manchester/Essex Road or the Cedar Swamp Trail. It is in good conditions.

Prospect Ledge Trail – This trail is accessed from the Cedar Swamp Trail or Millstone Hill Trail. It is well marked and in good condition.

Pulpit Rock Trail – Most of this trail is in Essex and was not specifically inventoried. This is one of the most remote walking trails in the system. It is kept open and in good condition. A recent Eagle Scout project installed bridges over several wet areas in the trail.

Spruce Swamp Trail – This trail is accessed from Pine Street and is open and in good condition from Manchester to Essex.

Varney's Woods Road – This trail is in Essex and was not specifically inventoried. MECT does not typically maintain this trail

Homestead Trail – This trail was opened approximately 5 years ago. It extends from Andrews Street in Essex to Bears Den. The land was protected as part of a major fund raising effort called "Save Our Woods." Bill Vachon reports that the trail is in good condition and contains an attractive bridge cross a stream at the Essex end.

Sam Hoar Memorial - In 2009 after acquiring a 10-acre tract of land in Essex located east of the Old Manchester –Essex Road, a memorial was installed in honor of Sam Hoar who was active in the acquisition and protection of conservation land. The memorial is close to the end of Andrews Street in Essex. The half-mile trail features numbered posts linked to inspirational quotes. The trail leads to the

top of a small hill with wonderful views. Several flat boulders provide opportunities for rest and contemplation.

Linkage Trails – There are various shorter trails that create linkages to the main trails. Most of these contain signage and trail blazes have been installed.



Photo14: New Boardwalk

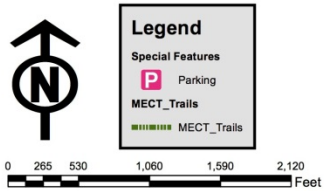


Figure 11

TRAIL MAP
Manchester Woods

Manchester Essex Conservation Trust

6.0 RECOMMENDATIONS FOR FUTURE ACTION

1. Address encroachment by non-native and invasive plants, especially *Phragmites* encroaching into Heron Pond. Once established, these stands are difficult to control, so early action is often the key to success. Consider hiring a professional to develop a management and control strategy. This effort will likely require use of herbicide, among other measures to kill existing *Phragmites* stands. Since the work will occur in wetlands, it will require prior authorization by the Manchester Conservation Commission under the Mass. Wetlands Protection Act and the Town of Manchester General Wetlands Bylaw. The following are links to fact sheets regarding *Phragmites* control: <http://www.uri.edu/cels/ceoc/documents/commonReed.pdf> and http://www.wetland.org/07_images/restoration/habitat_enhancement/Phragmites%20brochure.pdf
2. Continue to identify, map and certify with the Mass. Division of Fisheries and Wildlife – Natural Heritage and Endangered Species Program the many vernal pools on the project site. The sensitive nature of these pools should be mapped and trail construction and maintenance activities closely managed to avoid unnecessary impacts to this important resource. Since amphibian migration typically occurs during rainy nights in spring, users of the property do not typically affect migration activities. However, unleashed dogs that are allowed to enter into vernal pools after eggs are laid can do significant damage and affect future populations. Posting information regarding vernal pools at entrance areas during the spring months should be considered.
3. Continue to monitor and evaluate the site for other rare and endangered plants and animals. The site is known to provide important habitat for several rare plants and animals. It is likely that there are additional rare species which have not yet been identified and mapped at the site, such as Hessel's Hairstreak, Red-bellied Tiger Beetle, Banded Bog Haunter, Intricate Fairy Shrimp and Blue-Spotted Salamander. Future trail construction and maintenance activities should be directed away from any rare species habitat. The actual location of these resources should be closely guarded to prevent impacts from collectors.
4. Continue trail maintenance activities, including installation of new and replacement signs, remove blow-downs as they occur, trim brush to maintain trails open, repair bridges and boardwalks as needed.
5. Continue to coordinate with the Town of Manchester Conservation Commission and Department of Public Works to improve parking and access from Pine Street in order to minimize erosion and potential sedimentation of wetlands along the road shoulder. This work is already underway for the School Street entrance. Stormwater runoff from these areas not only contributes pollutants that affect water quality and the potential habitat quality of the vernal

pool along Pine Street, but the disturbed soil in these areas creates conditions that encourage colonization by *Phragmites* and other invasive plant species.

6. As recommended in the previous plan, MECT should consider a comprehensive property survey of site and establishments of property bounds so that the property limits can be monitored on an annual basis. This process would help to establish a more precise location of any private inholdings that might still remain.
7. Continue to monitor and consider the management implications of expanding uses such as mountain bike usage and rock climbing which have recently become more popular. Consider expanding the list of regulations in order to limit potential adverse impacts from these uses.
8. Consider additional educational material and outreach regarding potential impacts to the property as a result of global climate change. One of the first impacts that are now being seen is an increase in mosquitoes and mosquito related disease. Increases in tick populations are also noted. Users should be encouraged to take appropriate precautions to protect themselves from contact with mosquitoes and ticks.
9. Continue to cooperate with other conservation groups, especially Essex County Greenbelt Association and The Trustees of Reservations, both of whom manage properties nearby, including Agassiz Rock Reservation. MECT may also wish to consider having one of these groups hold additional easements or restrictions on the parcels to provide even greater long-term protection and management capabilities.

APPENDICES:

1. Plant List – Compiled by Erika Sonder with updated taxonomy compiled by James MacDougall
2. Bird Inventory – Compiled by James MacDougall from eBird and Essex County Ornithological Club records
3. Wildlife Inventory – Mammals, Reptiles and Amphibians

Manchester Essex Woods Plant List
Compiled by Erika Sonder 2002, Taxonomy



Binomial

Update 2013

Common Name

Aceraceae

Acer pensylvanicum L.

striped maple

Acer rubrum L.

red maple

Alismataceae

Alisma subcordatum Raf.

American water plantain

Anacardiaceae

Rhus copallinum L.

winged sumac

Rhus hirta (L.) Sudw.

staghorn sumac

Toxicodendron radicans (L.) Kuntze

eastern poison ivy

Apiaceae

Aegopodium podagraria L.

bishop's goutweed

Aralia hispida Vent.

bristly sarsaparilla

Aralia nudicaulis L.

wild sarsaparilla

Cicuta maculata L.

spotted water hemlock

Daucus carota L.

Queen Anne's lace

Panax trifolius L.

dwarf ginseng

Sanicula marilandica L.

Maryland sanicle

Sium suave Walter

hemlock waterparsnip

Aquifoliaceae

Ilex opaca Aiton

American holly

Ilex verticillata (L.) A. Gray

common winterberry

Araceae

Arisaema triphyllum (L.) Schott

Jack in the pulpit

Calla palustris L.

water arum

Symplocarpus foetidus (L.) Salisb. ex W.P.C. Barton

skunk cabbage

Asclepiadaceae

Asclepias incarnata L.

swamp milkweed

Manchester Essex Woods Plant List

Compiled by Erika Sonder 2002, Taxonomy



Binomial	Update 2013	Common Name
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Asteraceae

<i>Achillea millefolium</i> L.	common yarrow
<i>Ambrosia artemisiifolia</i> L.	annual ragweed
<i>Anthemis cotula</i> L.	stinking chamomile
<i>Bidens coronata</i> (L.) Britton	crowned beggarticks
<i>Bidens frondosa</i> L.	devil's beggartick
<i>Cirsium pumilum</i> Spreng.	pasture thistle
<i>Erechtites hieraciifolia</i> (L.) Raf. ex DC.	American burnweed
<i>Erigeron annuus</i> (L.) Pers.	eastern daisy fleabane
<i>Erigeron strigosus</i> Muhl. ex Willd.	prairie fleabane
<i>Eupatorium perfoliatum</i> L.	common boneset
<i>Euthamia graminifolia</i> (L.) Nutt.	flat-top goldentop
<i>Eutrochium dubium</i> (Willd. ex Poir.) E.E. Lamont	coastal plain joe pye weed
<i>Gnaphalium uliginosum</i> L.	marsh cudweed
<i>Hieracium</i> × <i>floribundum</i> Wimm. & Grab. (pro sp.)	
<i>Hieracium</i> L.	hawkweed
<i>Hieracium paniculatum</i> L.	Allegheny hawkweed
<i>Lactuca biennis</i> (Moench) Fernald	tall blue lettuce
<i>Lapsana communis</i> L.	common nipplewort
<i>Nabalus trifoliolatus</i> Cass.	
<i>Prenanthes trifoliolata</i> (Cass.) Fernald	gall of the earth
<i>Sericocarpus asteroides</i> (L.) Britton, Sterns & Poggenb.	toothed whitetop aster
<i>Solidago bicolor</i> L.	white goldenrod
<i>Solidago caesia</i> L.	wreath goldenrod
<i>Solidago canadensis</i> L.	Canada goldenrod
<i>Solidago juncea</i> Aiton	early goldenrod
<i>Solidago puberula</i> Nutt.	downy goldenrod
<i>Symphyotrichum cordifolium</i> (L.) G.L. Nesom	common blue wood aster
<i>Symphyotrichum ericoides</i> (L.) G.L. Nesom	white heath aster
<i>Symphyotrichum lateriflorum</i> (L.) Á. Löve & D. Löve	calico aster
<i>Symphyotrichum novae-angliae</i> (L.) G.L. Nesom	New England aster
<i>Symphyotrichum puniceum</i> (L.) Á. Löve & D. Löve	purplestem aster

Manchester Essex Woods Plant List
Compiled by Erika Sonder 2002, Taxonomy



Binomial	Update 2013	Common Name
<i>Tanacetum vulgare</i> L.		common tansy
<i>Taraxacum officinale</i> F.H. Wigg.		common dandelion
Balsaminaceae		
<i>Impatiens capensis</i> Meerb.		jewelweed
Berberidaceae		
<i>Berberis vulgaris</i> L.		common barberry
Betulaceae		
<i>Alnus incana</i> (L.) Moench ssp. <i>rugosa</i> (Du Roi) R.T.		speckled alder
<i>Betula lenta</i> L.		sweet birch
<i>Betula pendula</i> Roth		European white birch
<i>Betula populifolia</i> Marshall		gray birch
<i>Corylus americana</i> Walter		American hazelnut
<i>Corylus cornuta</i> Marshall		beaked hazelnut
Brassicaceae		
<i>Alliaria petiolata</i> (M. Bieb.) Cavara & Grande		garlic mustard
<i>Barbarea vulgaris</i> W.T. Aiton		garden yellowrocket
<i>Capsella bursa-pastoris</i> (L.) Medik.		shepherd's purse
<i>Lunaria annua</i> L.		annual honesty
<i>Sinapis alba</i> L.		white mustard
Cabombaceae		
<i>Brasenia schreberi</i> J.F. Gmel.		watershield
Campanulaceae		
<i>Lobelia cardinalis</i> L.		cardinalflower
<i>Lobelia inflata</i> L.		Indian-tobacco
Caprifoliaceae		
<i>Diervilla lonicera</i> Mill.		northern bush honeysuckle
<i>Lonicera canadensis</i> W. Bartram ex Marshall		American fly honeysuckle

Manchester Essex Woods Plant List

Compiled by Erika Sonder 2002, Taxonomy



Binomial	Update 2013	Common Name
<i>Sambucus nigra</i> L. ssp. <i>canadensis</i> (L.) R. Bolli		American black elderberry
<i>Viburnum acerifolium</i> L.		mapleleaf viburnum
<i>Viburnum dentatum</i> L.		southern arrowwood
<i>Viburnum lantanoides</i> Michx.		hobblebush
<i>Viburnum nudum</i> L. var. <i>cassinoides</i> (L.) Torr. & A.		withe-rod

Caryophyllaceae

<i>Cerastium arvense</i> L.	field chickweed
<i>Silene vulgaris</i> (Moench) Garcke	maidenstears
<i>Stellaria graminea</i> L.	grass-like starwort
<i>Stellaria media</i> (L.) Vill.	common chickweed

Clethraceae

<i>Clethra alnifolia</i> L.	coastal sweetpepperbush
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Clusiaceae

<i>Hypericum boreale</i> (Britton) E.P. Bicknell	northern St. Johnswort
<i>Hypericum canadense</i> L.	lesser Canadian St. Johnswort
<i>Hypericum perforatum</i> L.	common St. Johnswort
<i>Hypericum punctatum</i> Lam.	spotted St. Johnswort
<i>Triadenum virginicum</i> (L.) Raf.	Virginia marsh St. Johnswort

Convolvulaceae

<i>Calystegia sepium</i> (L.) R. Br.	hedge false bindweed
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Cornaceae

<i>Cornus canadensis</i> L.	bunchberry dogwood
<i>Nyssa sylvatica</i> Marshall	blackgum
<i>Swida amomum</i> (Mill.) Small	

Cupressaceae

<i>Chamaecyparis thyoides</i> (L.) Britton, Sterns & Poggenb.	Atlantic white cedar
<i>Juniperus communis</i> L.	common juniper
<i>Juniperus virginiana</i> L.	eastern redcedar

Manchester Essex Woods Plant List
Compiled by Erika Sonder 2002, Taxonomy



Binomial

Update 2013

Common Name

Cuscutaceae

Cuscuta gronovii Willd. ex Schult.

scaldweed

Cyperaceae

Carex canescens L.

silvery sedge

Carex cephalophora Muhl. ex Willd.

oval-leaf sedge

Carex folliculata L.

northern long sedge

Carex gynandra Schwein.

nodding sedge

Carex intumescens Rudge

greater bladder sedge

Carex lurida Wahlenb.

shallow sedge

Carex nigra (L.) Reichard

smooth black sedge

Carex pensylvanica Lam.

Pennsylvania sedge

Carex scoparia Schkuhr ex Willd.

broom sedge

Carex stipata Muhl. ex Willd.

awlfruit sedge

Carex stricta Lam.

upright sedge

Cyperus strigosus L.

strawcolored flatsedge

Dulichium arundinaceum (L.) Britton

threeway sedge

Eleocharis acicularis (L.) Roem. & Schult.

needle spikerush

Eleocharis robbinsii Oakes

Robbins' spikerush

Eleocharis tenuis (Willd.) Schult.

slender spikerush

Schoenoplectus americanus (Pers.) Volkart ex Schinz &

chairmaker's bulrush

Scirpus cyperinus (L.) Kunth

woolgrass

Scirpus microcarpus J. Presl & C. Presl

panicled bulrush

Droseraceae

Drosera rotundifolia L.

roundleaf sundew

Equisetaceae

Equisetum arvense L.

field horsetail

Equisetum sylvaticum L.

woodland horsetail

Ericaceae

Arctostaphylos uva-ursi (L.) Spreng.

kinnikinnick

Manchester Essex Woods Plant List
Compiled by Erika Sonder 2002, Taxonomy



Binomial	Update 2013	Common Name
<i>Chamaedaphne calyculata</i> (L.) Moench		leatherleaf
<i>Gaultheria procumbens</i> L.		eastern teaberry
<i>Gaylussacia baccata</i> (Wangenh.) K. Koch		black huckleberry
<i>Gaylussacia frondosa</i> (L.) Torr. & A. Gray ex Torr.		blue huckleberry
<i>Kalmia angustifolia</i> L.		sheep laurel
<i>Kalmia latifolia</i> L.		mountain laurel
<i>Lyonia ligustrina</i> (L.) DC.		maleberry
<i>Rhododendron maximum</i> L.		great laurel
<i>Rhododendron viscosum</i> (L.) Torr.		swamp azalea
<i>Vaccinium angustifolium</i> Aiton		lowbush blueberry
<i>Vaccinium corymbosum</i> L.		highbush blueberry

Fabaceae

<i>Apios americana</i> Medik.	groundnut
<i>Lotus corniculatus</i> L.	bird's-foot trefoil
<i>Trifolium arvense</i> L.	rabbitfoot clover
<i>Trifolium repens</i> L.	white clover

Fagaceae

<i>Fagus grandifolia</i> Ehrh.	American beech
<i>Quercus alba</i> L.	white oak
<i>Quercus ilicifolia</i> Wangenh.	bear oak
<i>Quercus rubra</i> L.	northern red oak
<i>Quercus velutina</i> Lam.	black oak

Fumariaceae

<i>Corydalis sempervirens</i> (L.) Pers.	rock harlequin
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Gentianaceae

<i>Bartonia paniculata</i> (Michx.) Muhl.	twining screwstem
<i>Bartonia virginica</i> (L.) Britton, Sterns & Poggenb.	yellow screwstem

Geraniaceae

<i>Geranium robertianum</i> L.	Robert geranium
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Manchester Essex Woods Plant List
Compiled by Erika Sonder 2002, Taxonomy



Binomial Update 2013 Common Name

Lythraceae

Decodon verticillatus (L.) Elliott

swamp loosestrife

Lythrum salicaria L.

purple loosestrife

Melastomataceae

Rhexia virginica L.

handsome Harry

Monotropaceae

Monotropa hypopithys L.

pinemap

Monotropa uniflora L.

Indianpipe

Nymphaeaceae

Nuphar lutea (L.) Sm.

yellow pond-lily

Nymphaea odorata Aiton

American white waterlily

Onagraceae

Circaea canadensis sensu Fernald

broad-leaved enchanter's nightshade

Epilobium coloratum Biehler

purpleleaf willowherb

Ludwigia palustris (L.) Elliott

marsh seedbox

Oenothera perennis L.

little evening primrose

Orobanchaceae

Epifagus virginiana (L.) W.P.C. Barton

beechdrops

Oxalidaceae

Oxalis corniculata L.

creeping woodsorrel

Oxalis stricta L.

common yellow oxalis

Papaveraceae

Chelidonium majus L.

celandine

Phytolaccaceae

Phytolacca americana L.

American pokeweed

Manchester Essex Woods Plant List
Compiled by Erika Sonder 2002, Taxonomy



Binomial	Update 2013	Common Name
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Plantaginaceae

<i>Plantago lanceolata</i> L.	narrowleaf plantain
<i>Plantago major</i> L.	common plantain

Poaceae

<i>Agrostis capillaris</i> L.	colonial bentgrass
<i>Alopecurus pratensis</i> L.	meadow foxtail
<i>Bromus tectorum</i> L.	cheatgrass
<i>Dactylis glomerata</i> L.	orchardgrass
<i>Dichanthelium boreale</i> (Nash) Freckmann	northern panicgrass
<i>Dichanthelium dichotomum</i> (L.) Gould var. <i>dichotomum</i>	cypress panicgrass
<i>Digitaria sanguinalis</i> (L.) Scop.	hairy crabgrass
<i>Echinochloa crus-galli</i> (L.) P. Beauv.	barnyardgrass
<i>Festuca ovina</i> L.	sheep fescue
<i>Glyceria borealis</i> (Nash) Batchelder	small floating mannagrass
<i>Glyceria canadensis</i> (Michx.) Trin.	rattlesnake mannagrass
<i>Leersia oryzoides</i> (L.) Sw.	rice cutgrass
<i>Muhlenbergia frondosa</i> (Poir.) Fernald	wirestem muhly
<i>Phragmites australis</i> (Cav.) Trin. ex Steud.	common reed
<i>Poa annua</i> L.	annual bluegrass
<i>Poa nemoralis</i> L.	wood bluegrass
<i>Poa pratensis</i> L.	Kentucky bluegrass
<i>Setaria glauca</i> (L.) P. Beauv.	

Polygalaceae

<i>Polygala polygama</i> Walter	racemed milkwort
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Polygonaceae

<i>Polygonum arifolium</i> L.	halberdleaf tearthumb
<i>Polygonum cilinode</i> Michx.	fringed black bindweed
<i>Polygonum cuspidatum</i> Siebold & Zucc.	Japanese knotweed
<i>Polygonum hydropiperoides</i> Michx.	swamp smartweed

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Binomial	Update 2013	Common Name
<i>Polygonum pensylvanicum</i> L.		Pennsylvania smartweed
<i>Polygonum sagittatum</i> L.		arrowleaf tearthumb
<i>Rumex acetosella</i> L.		common sheep sorrel
<i>Rumex obtusifolius</i> L.		bitter dock

Primulaceae

<i>Hottonia inflata</i> Elliott	American featherfoil
<i>Lysimachia quadrifolia</i> L.	whorled yellow loosestrife
<i>Lysimachia terrestris</i> (L.) Britton, Sterns & Poggenb.	earth loosestrife
<i>Trientalis borealis</i> Raf.	starflower

Pyrolaceae

<i>Chimaphila maculata</i> (L.) Pursh	striped prince's pine
<i>Chimaphila umbellata</i> (L.) W.P.C. Barton	pipsissewa
<i>Pyrola americana</i> Sweet	American wintergreen
<i>Pyrola elliptica</i> Nutt.	waxflower shinleaf

Ranunculaceae

<i>Anemone quinquefolia</i> L.	wood anemone
<i>Caltha palustris</i> L.	yellow marsh marigold
<i>Ranunculus repens</i> L.	creeping buttercup
<i>Thalictrum pubescens</i> Pursh	king of the meadow

Rhamnaceae

<i>Frangula alnus</i> Mill.	glossy buckthorn
<i>Rhamnus cathartica</i> L.	common buckthorn

Rosaceae

<i>Amelanchier canadensis</i> (L.) Medik.	Canadian serviceberry
<i>Amelanchier stolonifera</i> Wiegand	running serviceberry
<i>Aronia floribunda</i> (Lindl.) Spach	purple chokeberry
<i>Aronia melanocarpa</i> (Michx.) Elliott	black chokeberry
<i>Crataegus</i> L.	hawthorn
<i>Geum canadense</i> Jacq.	white avens

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Binomial	Update 2013	Common Name
<i>Malus floribunda</i> Siebold ex Van Houtte		Japanese flowering crab apple
<i>Potentilla canadensis</i> L.		dwarf cinquefoil
<i>Potentilla recta</i> L.		sulphur cinquefoil
<i>Potentilla simplex</i> Michx.		common cinquefoil
<i>Prunus pensylvanica</i> L. f.		pin cherry
<i>Prunus serotina</i> Ehrh.		black cherry
<i>Prunus virginiana</i> L.		chokecherry
<i>Rosa carolina</i> L.		Carolina rose
<i>Rosa multiflora</i> Thunb.		multiflora rose
<i>Rosa palustris</i> Marshall		swamp rose
<i>Rubus allegheniensis</i> Porter		Allegheny blackberry
<i>Rubus hispidus</i> L.		bristly dewberry
<i>Rubus idaeus</i> L.		American red raspberry
<i>Spiraea alba</i> Du Roi var. <i>latifolia</i> (Aiton) Dippel		white meadowsweet
<i>Spiraea tomentosa</i> L.		steeplebush

Rubiaceae

<i>Cephalanthus occidentalis</i> L.	common buttonbush
<i>Galium labradoricum</i> (Wiegand) Wiegand	northern bog bedstraw
<i>Galium palustre</i> L.	common marsh bedstraw
<i>Houstonia caerulea</i> L.	azure bluet
<i>Mitchella repens</i> L.	partridgeberry

Scrophulariaceae

<i>Agalinis purpurea</i> (L.) Pennell	purple false foxglove
<i>Aureolaria</i> Raf.	false foxglove
<i>Linaria vulgaris</i> Mill.	butter and eggs
<i>Melampyrum</i> L.	cowwheat
<i>Mimulus ringens</i> L.	Allegheny monkeyflower
<i>Scrophularia lanceolata</i> Pursh	lanceleaf figwort
<i>Verbascum thapsus</i> L.	common mullein
<i>Veronica officinalis</i> L.	common gypsyweed
<i>Veronica scutellata</i> L.	skullcap speedwell

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Binomial Update 2013 Common Name

Solanaceae

Solanum dulcamara L. climbing nightshade

Sparganiaceae

Sparganium americanum Nutt. American bur-reed

Taxaceae

Taxus canadensis Marshall Canada yew

Typhaceae

Typha latifolia L. broadleaf cattail

Urticaceae

Urtica dioica L. stinging nettle

Violaceae

Viola blanda Willd. sweet white violet

Viola cucullata Aiton marsh blue violet

Viola sagittata Aiton arrowleaf violet

Viola sororia Willd. common blue violet

Vitaceae

Parthenocissus quinquefolia (L.) Planch. Virginia creeper

Vitis labrusca L. fox grape

BIRDS OF Manchester Essex Woods, Massachusetts
from eBird Records and ECOC Records



SPECIES		JAN	FEB	MAR	APRL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Canada Goose	16	■■■■■	■■■■■	■■■■■	(■■■■■	■■■■■	■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Wood Duck	8,7,10,9	—	—	■	■■■■■	(■■■■■	■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Mallard	8,9,7,6	■■■■■	■■■■■	■■■■■	■■■■■	(■■■■■	■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Bufflehead	2,8,6	■■■■■	■■■■■	■■■■■	■■■■■	—	—	—	—	—	■■■■■	■■■■■	■■■■■
Double-crested Cormorant	3,6,2,7	—	—	—	■■■■■	(■■■■■	■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Great Egret	5,9,8			—	■■■■■	(■■■■■	■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Green Heron	9,5,8	1			—	■■■■■	(■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Black-crowned Night-Heron	5,8,9	—	—	—	■■■■■	■■■■■	(■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Glossy Ibis	9,5,11			—	■■■■■	■■■■■	(■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	1
Turkey Vulture	16	11	—	■■■■■	■■■■■	(■■■■■	■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Cooper's Hawk	12,14,4	■■■■■	■■■■■	■■■■■	■■■■■	(■■■■■	■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Northern Goshawk	14,4	—	—	—	(—	—	—	)	—	—	—	—	—
Broad-winged Hawk	13,14				■■■■■	■■■■■	(■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Red-tailed Hawk	11,12,5	■■■■■	■■■■■	■■■■■	(■■■■■	■■■■■	■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Virginia Rail	9,5	—	—	—	■■■■■	■■■■■	(■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
American Woodcock	12,11,13,10	—	—	■■■■■	■■■■■	(■■■■■	■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Herring Gull	16	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■	(■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Rock Pigeon	16	(■■■■■	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Mourning Dove	16	■■■■■	■■■■■	■■■■■	(■■■■■	■■■■■	■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Yellow-billed Cuckoo	12,13,14				—	—	■■■■■	(■■■■■	■■■■■)	—	■■■■■	■■■■■	1
Black-billed Cuckoo	12,13				1	—	—	(■■■■■	■■■■■)	■■■■■	—	—	1
Chimney Swift	16				—	■■■■■	■■■■■	(■■■■■	■■■■■)	■■■■■	■■■■■	—	1
Belted Kingfisher	7,8,6	—	—	—	■■■■■	■■■■■	(■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Red-bellied Woodpecker	13,15,14	■■■■■	■■■■■	■■■■■	■■■■■	(■■■■■	■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Downy Woodpecker	16	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■	(■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Hairy Woodpecker	13,15,14	■■■■■	■■■■■	■■■■■	■■■■■	(■■■■■	■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Northern Flicker	16	■■■■■	■■■■■	■■■■■	■■■■■	(■■■■■	■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Pileated Woodpecker	14,13	■■■■■	■■■■■	■■■■■	■■■■■	(■■■■■	■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Olive-sided Flycatcher	12,10,13,14,17				—	—	—	—	—	—	—	—	—
Eastern Wood-Pewee	13,14				—	■■■■■	■■■■■	(■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■
Alder Flycatcher	9,10,17				—	—	—	(—	—)	1			
Willow Flycatcher	9,12,10,17				—	■■■■■	■■■■■	(■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■
Eastern Phoebe	16			—	■■■■■	(■■■■■	■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■	■■■■■
Great Crested Flycatcher	13,14				—	■■■■■	■■■■■	(■■■■■	■■■■■)	■■■■■	■■■■■	—	1
Eastern Kingbird	16				—	■■■■■	■■■■■	(■■■■■	■■■■■)	■■■■■	■■■■■	■■■■■	■■■■■

Codes for occurrence and abundance: ■ = Common ■ = Uncommon — = Rare () = Egg-laying/Fledging Dates i = Irruptive
Bold Face distinguishes Probable/Confirmed Breeding in these Woods in the past 20 years.



SPECIES		JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Yellow-throated Vireo	7,10,13				— (■ ———)	————	————	———	————	———	—		
Blue-headed Vireo	14				—■ ■ (—— ———)	————	————	———	———	———	———		1
Warbling Vireo	13,7,15				—■ ■ (■ ———)	————	————	———	————	———	———		
Red-eyed Vireo	13,14				—■ (■ ———)	————	————	———	————	———	———	———	
Blue Jay	16	————	————	————	—— (■ ———)	————	————	———	————	———	————	————	————
American Crow	16	————	————	————	—— (■ ———)	————	————	———	————	———	————	————	————
Fish Crow	14,15	———	———	———	—— (■ ———)	———	———	———	———	———	———	———	———
Common Raven	14, 16	1	1	———	———	———	———	———	———	———	———	———	———
Tree Swallow	16			———	——■ (———)	————	————	———	————	———	———	———	———
Bank Swallow	4,11,8				——■ ■ (■ ———)	————	————	———	———	———	———	———	———
Black-capped Chickadee	16	————	————	————	——— ■ (■ ———)	————	————	———	————	———	————	————	————
Tufted Titmouse	13,14,15	————	————	————	——— ■ (■ ———)	————	————	———	————	———	————	————	————
Red-breasted Nuthatch	14,15	————	————	————	——— — (—— ———)	———	———	———	———	———	———	———	———
White-breasted Nuthatch	13,14,15	————	————	————	—— (■ ———)	————	————	———	————	———	————	————	————
Brown Creeper	14	———	———	———	—— (———)	———	———	———	———	———	———	———	———
House Wren	15,13,12	1	1		——— ■■ (■ ———)	———	———	———	———	———	———	———	1 1
Winter Wren	14	———	———	———	——— — (■ ———)	———	———	———	———	———	———	———	———
Carolina Wren	15,13,12	———	———	———	——— — (■ ———)	———	———	———	———	———	———	———	———
Blue-gray Gnatcatcher	13,7				——■ (—— ———)	———	———	———	———	———	———	———	———
Golden-crowned Kinglet	14	————	————	————	——— — (—— ———)	———	———	———	———	———	———	———	———
Ruby-crowned Kinglet	12,14,13	———	———	———	——■ ■ ———	1	———	———	———	———	———	———	———
Eastern Bluebird	12,11,15	———	———	———	—— (■ ———)	———	———	———	———	———	———	———	———
Veery	13,10				—— ■■ (■ ———)	———	———	———	———	———	———	———	———
Hermit Thrush	14	———	———	———	——■ ■ (■ ———)	———	———	———	———	———	———	———	———
Wood Thrush	13,15				—— ■■ (■ ———)	———	———	———	———	———	———	———	1
American Robin	16	————	————	————	——— (■ ———)	———	———	———	———	———	———	———	———
Gray Catbird	16	———	———	———	——■ ■■ (■ ———)	———	———	———	———	———	———	———	———
Northern Mockingbird	15,12	————	————	————	——— ■■ (■ ———)	———	———	———	———	———	———	———	———
European Starling	16	————	————	————	(——— ———)	———	———	———	———	———	———	———	———
Cedar Waxwing	16	———	———	———	——— ■■ (———)	———	———	———	———	———	———	———	———
Ovenbird	14	1			1—— ■■ (■ ———)	———	———	———	———	———	———	1	1
Northern Waterthrush	10,14	—			—— ■■ (■ ———)	———	———	———	———	———	———	———	———
Black-and-white Warbler	14,13			1	——■ ■■ (■ ———)	———	———	———	———	———	———	———	———
Nashville Warbler	12,14,15				—— ———	———	———	———	———	———	———	1	
Common Yellowthroat	16	—	1		——■ ■■ (■ ———)	———	———	———	———	———	———	———	———

Codes for occurrence and abundance: ■ = Common ■ = Uncommon — = Rare () = Egg-laying/Fledging Dates i = Irruptive
Bold Face distinguishes Probable/Confirmed Breeding in these Woods in the past 20 years.

Codes for occurrence and abundance: ■ = Common ■ = Uncommon — = Rare () = Egg-laying/Fledging Dates i = Irruptive
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Appendix 3:

Mammals

White-tailed deer
Bobcat/*Relis rugus* (possibly)
Raccoon/*Procyon lotor*
Opossum/*Didelphis virginiana*
Red fox/*Vulpes vulpes*
Grey fox/*Urocyon cinereoargenteus*
Coyote/*Canis latrans*
Woodchuck/*Marmota monax*
Grey squirrel/*Sciurus carolinensis*
Red squirrel/*Tamiasciurus hudsonicus*
Southern flying squirrel/*Glaucomys volans*
Northern flying squirrel/*Glaucomys sabrinus*
Eastern chipmunk/*Tanuas striatus*
White-footed mouse/*Peromyscus leucopus*
Southern red-backed vole/*Clethrionomys gapperi*
Meadow vole/*Microtus pennsylvanicus*
Woodland vole/*Microtus pinetorum*
Star-nosed mole/*Condylura cristata*
Northern short-tailed shrew/*Blarina brevicauda*
Masked shrew/*Sorex cinereus*
Norway rat/*Rattus norvegicus*
Mink/*Mustela vison*
Fisher/*Martes pennant*
River otter/*Lutra canadensis*
Muskrat/*Ondatra zibethicus*
Beaver/*Castor canadensis*
Long-tailed weasel/*Mustela frenata*
Short-tailed weasel
Eastern cottontail/*Sylvilagus floridanus*
Striped skunk/*Mephitis mephitis*
Little brown bat/*Myotis lucifugus*
Eastern pipistrelle/*Pipistrellus subflavus*
Big brown bat/*Eptesicus fuscus*
Red bat/*Lasiurus borealis*

Amphibians

Spotted salamander/*Ambystoma maculatum*
Blue-spotted salamander/*Ambystoma laterale*
Two-lined salamander/*Eurycea bislineata* (probably - needs additional survey)
Four-toed salamander/*Hemidactylium scutatum* (probably - needs additional survey)
Red-backed salamander/*Plethodon cinereus*
Red-spotted newt/*Notophthalmus viridescens*
Spring peeper/*Pseudacris crucifer*
Gray tree frog/*Hyla versicolor* or *H. chrysoscelis*
American toad/*Anaxyrus americanus*
Pickerel frog/*Lithobates palustris*
Northern leopard frog/*Lithobates pipiens*
Bullfrog/*Lithobates catesbeianus*
Green frog/*Lithobates clamitans*
Wood frog/*Lithobates sylvaticus*

Reptiles

Northern Ringneck Snake/*Diadophis punctatus*
Smooth Green Snake/*Opheodrys vernalis*
Brown Water Snake/*Nerodia taxispilota*
Northern Brown Snake/*Storeria dekayi*
Redbelly Snake/*Storeria occipitomaculata*
Eastern Garter Snake/*Thamnophis sirtalis*
Eastern Ribbon Snake/*Thamnophis sauritus*
Northern Black Racer/*Coluber constrictor*
Eastern Milk Snake/*Lampropeltis triangulum*
Snapping Turtle/*Chelydra serpentina*
Spotted Turtle/*Clemmys insculpta*
Eastern Painted Turtle/*Chrysemys picta*
Stinkpot/*Sternotherus odoratus*



Brown Water Snake