

Botanical Survey of
Walcott Woods
Maynard, Massachusetts



New England Wild Flower Society

180 Hemenway Road
Framingham, MA 01701
508-877-7630
www.newfs.org

Report by

Amanda K. Weise, Ecological Programs Coordinator
with the help of Conservation Fellows Chris Schorn & Luke Davis

Conducted in 2013

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INTRODUCTION

Amanda Weise, Ecological Programs Coordinator for the New England Wild Flower Society (NEWFS), along with Conservation Fellows; Luke Davis, Tom Grove, and Chris Schorn, conducted a botanical survey of Walcott Woods (Walcott Street Extension: parcels A and B) for the Maynard Conservation Commission on July 15th, 2013. This unique property is a small suburban/urban parcel, located a quarter-mile from the heart of downtown Maynard. The parcel contains approximately 0.75 acres of mesic forest and open meadow habitat (figure 1).

The site is currently unmanaged, but is being considered for a potential restoration project to maintain habitat space for native plant species while providing recreational space for Maynard residents.

The purpose of the botanical survey was to 1) document the invasive plant species occurring throughout the property, and 2) make management suggestions based upon these findings. The survey additionally identified native plant species and documented natural habitats.

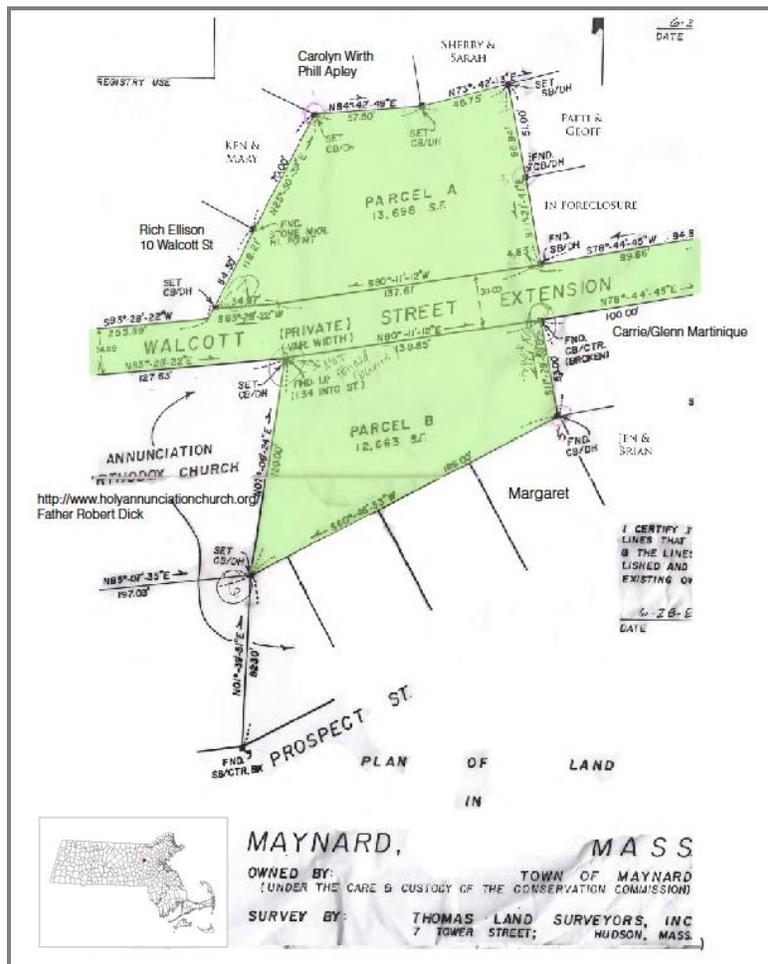


Figure 1. Adapted tax map of Walcott Woods located on Walcott Street Extension (Maynard, Massachusetts).

METHODS

The property was visited one time on July 15th, 2013. The property was surveyed on foot from 8:30 am to 1:00 pm using a random meander sampling technique. This sampling technique is an effective method for detecting non-native invasive plant species and well suited for a parcel of this size (Huebner 2007). Common plants were identified as they were encountered using wildflower and grass guides. More difficult specimens were keyed out in the field using *Flora Novae Angliae* (Haines 2011). For many graminoids, specimens were collected for identification under microscope.

Plants were considered invasive if listed as “invasive,” “likely invasive,” or “potentially invasive” in *An Evaluation of Non-Native Plant Species for Invasiveness in Massachusetts, with annotated list* (Massachusetts Invasive Plant Advisory Group, 2005). A complete list of references is given at the end of this document.

RESULTS

Plant Species

A total of 77 plant species were observed at Walcott Woods. Appendix 1 provides a list of these species by growth habit (herbs; ferns & allies; graminoids; shrubs & trees). Nomenclature follows *Flora Novae Angliae* (Haines, 2011). The list includes 39 herbaceous forb species (51% of all species); 5 ferns or fern allies (6%); 26 shrubs or trees (33%); 8 graminoids (10%). Of these, 52 are native species (68%) and 25 are non-native species (32%). Ten of these non-native species are state-listed as invasive (13%).

Four forbs, one fern, and two trees were not keyed to the species level due to lack of flowering structures essential for identification. Percent values were rounded up to the nearest tenth.

DISCUSSION

Walcott Woods is a unique parcel with semi-natural mesic-forest, a forested perennial stream, and open meadow habitats (figure 2). The property is located in a “ravine” between several developed lots and is divided by a west-east flowing perennial stream. The majority of the property is shaded under a dense, mature tree canopy dominated by Norway maple (*Acer platanoides*). Silver maple (*Acer saccharinum*) and boxelder (*Acer negundo*) are also abundant in the canopy and are indicators of wet soils. Sugar maple (*Acer saccharum*), butternut (*Juglans cinerea*), and basswood (*Tilia americana*) were also identified in the forest, which thrive in nutrient rich soils (figures 3 & 5). A flat open meadow habitat is situated on the northeast corner of the parcel and is dominated by graminoids and weedy herbaceous plants commonly found in waste places or human influenced landscapes (figure 5).

The site is heavily influenced by abutting residential properties and years of on-site disturbance; factors which have likely lead to introductions of non-native and invasive plant species. With prioritized management of invasive and major non-native plant species, the site can provide a valuable community recreation space while maintaining important suburban/urban forest and meadow habitats.



Figure 2. Walcott Woods habitat locations.



Figure 3. Walcott Woods mesic forest: jewelweed dominated stream corridor.

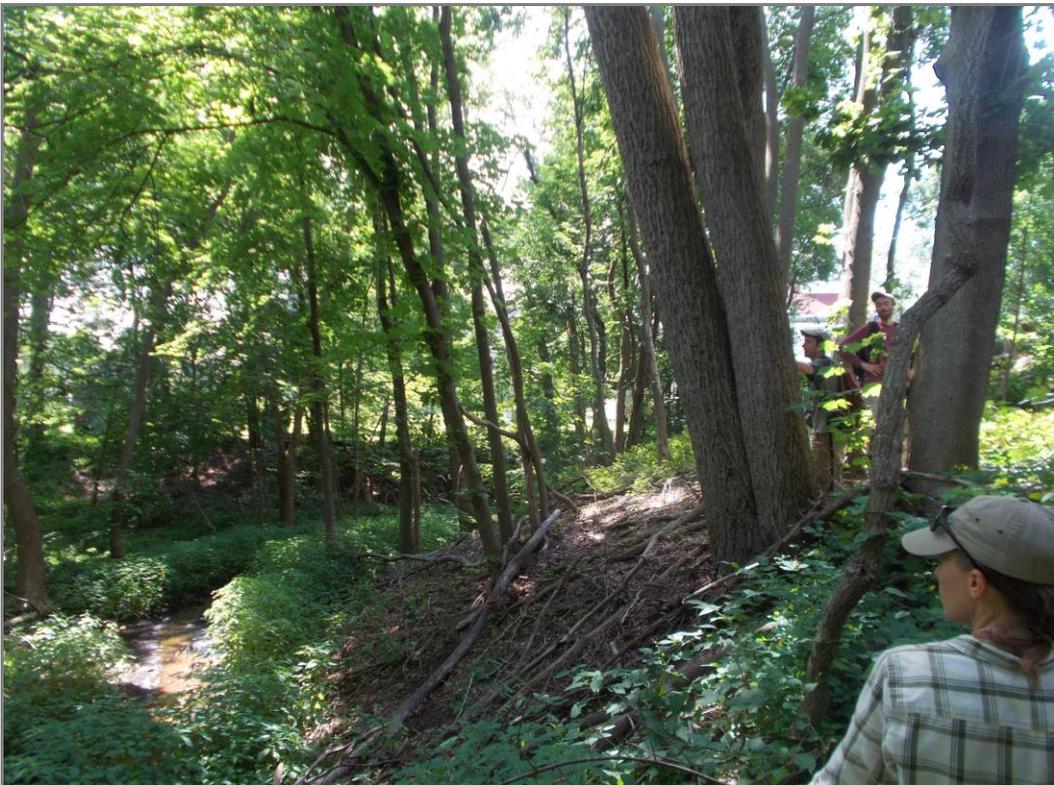


Figure 4. Walcott Woods mesic forest: streamside sloped bank. Large, multi-stem butternut tree, right.



Figure 5. Walcott Woods open meadow habitat.

Recommendations for Management

Open Meadow

The meadow community is most impacted by non-native invasive plant species at the forest edge, therefore management efforts should focus on systematically removing plants of highest concern in this area. These include Norway maple (*Acer platanoides*), Japanese barberry (*Berberis thunbergii*), non-native honeysuckle species (*Lonicera spp.*), multiflora rose (*Rosa multiflora*), Oriental bittersweet (*Celastrus orbiculatus*), European buckthorn (*Rhamnus cathartica*), as well as seedlings of glossy buckthorn (*Frangula alnus*) (figure 6).

Non-native white mulberry (*Morus alba*) is also found throughout this area. Although this species is not invasive, the Maynard Conservation Commission should consider its removal as it exhibits invasive characteristics and can become weedy in developed/urban sites.



Figure 6. Walcott Woods non-native and invasive plant locations. Locations of “high” concern species included. Species found site-wide (e.g. Norway maple) were not mapped, but are nonetheless considered high concern species.

Treatment for the aforementioned woody tree, shrub, and vine species should (ideally) be implemented before seed dispersal, which occurs in the late summer to early fall. Control techniques for such woody invasives include 1) hand digging or weed wrenching, 2) girdling, 3) mowing or bushing, 4) and chemical control. Given the seed bank may be dominated by seed of non-native plants, a technique which minimizes soil disturbance is preferable. Girdling may be inappropriate in this area or even site-wide, given the potential for on-site recreation (standing hazard trees).

The uses of several techniques, focusing on different sized plants, will be most appropriate here. An example of such an approach might include: 1) volunteers weed wrenching plants along the forest edge ½ inch to 1.5 inches in diameter, 2) Conservation Commission Members felling large trees, 3) licensed applicators using chemical control (see below) to supplement previously completed work, and lastly 4) late season mowing and brushing to suppress invasive seedlings and maintain the opening.

Part of the on-site management plan will likely include herbicide (chemical) application which is a highly effective and efficient means to control woody invasive plant species. For most invasive plants, this is best done through a foliar application or “cut-and-paint” application of glyphosate. Foliar applications are best completed late summer through early fall, before leaf drop. Cut and paint application can be completed throughout the winter season on days above 32 degrees Fahrenheit. Such herbicide applications generally kill targeted plants with a single application.

In addition to invasive shrubs at the forest edge, the meadow habitat is also influenced by non-native and invasive forbs. Dame’s rocket (*Hesperis matronalis*) is intermixed with native graminoids and forbs in the open meadow, and should be hand-pulled prior to seed dispersal in the fall. Japanese hops (*Humulus japonicus*), a weedy non-native, is located near the northern edge of the parcel and along the fence near the “parking area” (figure 6). This species is aggressive and weedy in nature and therefore should similarly be hand-pulled with the roots intact to prevent further spread.

Reed canary grass (*Phalaris arundinacea*), an invasive grass species, was also identified in the meadow. During this brief survey, only a few individuals of this species were noted, and could easily be control by careful excavation or herbicide application. Control prior to seed set is ideal, but a developed inflorescence may be necessary for identification. A thorough survey should be conducted to determine the full extent of this infestation.

Mesic Forest and Stream Corridor

The forest community is most impacted by invasive trees which have integrated themselves into both the canopy and forest understory. Large Norway maples (*Acer platanoides*) dominate the canopy and should be prioritized in a long-term invasive species control plan. The presence of many seed-producing “parent” trees will result in the continual recruitment of saplings unless treated and removed from the site. At high population densities, trees’ exhibit allelopathic qualities that prevent native plant establishment, effectively homogenizing the forest’s plant community. Nonetheless, the presence of Norway maple may be deemed tolerable at this site due to its local abundance and potential for negative impacts to the underlying wetland system. At a minimum, seedlings and saplings should be manually removed to reduce impacts associated with this infestation and protect the forest’s existing plant diversity.

Woody invasives like Japanese barberry (*Berberis thunbergii*), non-native honeysuckle species (*Lonicera spp.*), multiflora rose (*Rosa multiflora*), Oriental bittersweet (*Celastrus orbiculatus*), European buckthorn (*Rhamnus cathartica*), and glossy buckthorn (*Frangula alnus*) were also

scattered through the forest understory. Control of these woody species can be achieved through careful hand-pulling or cut and paint herbicide application (*see above section for woody plant control*).

Japanese knotweed (*Falopia japonica*) was documented in the forest understory. This invasive perennial species is notoriously difficult to manage and can establish large, monotypic stands. The source of the infestation is likely coming from the neighboring church property as well as an infested upstream wetland. Treatment of this infestation will require a cooperative management plan to remove plants from all three locations. Knotweed can be hand dug, but roots are difficult to excavate and often crumble, consequently spreading the infestation. Smothering/solarizing with plastic can weaken the plant's root system, but usually does not result in eradication unless used in conjunction with other management techniques. Chemical control is the most effective technique and is best performed by first cutting stems in early to mid-summer to stress the plant(s), then allowing the plant(s) to regrow. Stems can then be re-cut in the late summer-fall, around flowering time, and filled with a 25% solution of glyphosate. Cut stems, roots, and seeds have the potential to re-sprout and should, therefore, be handled with care.

Garlic mustard (*Allaria petiolata*) was also documented in the forest understory. This biennial invasive forb is aggressive in rich, shaded forests and forms dense colonies. Like Norway maples, this species has allelopathic qualities and disrupts the natural soil-mycorrhizal community essential for native plant germination and growth. Second year plants can be hand-pulled before they set seed in late spring to early summer.

A seasonal timeline for invasive and non-native plant management can be found in appendix 2.

Handling Plant Material

Plant material with seeds should be bagged (if feasible) and sealed in black plastic bags. Bags should then be placed in the sun and allowed to “cook” for about one month, sterilizing the seeds. Once sterilized, plant material can be “hot” composted. Alternatively, plant materials can be burned on or off-site in accordance with state regulations. Special care should be taken with all parts of Japanese knotweed as it spreads from seed, stem nodes, and root pieces

Replanting with Natives

Incorporation of native plants site-wide should be considered as part of the management and restoration of Walcott Woods. New England Wild Flower Society currently propagates a wide variety of locally sourced native plants suitable for meadow restoration. For information regarding suitable plants and plant availability, see our 2013 plant availability lists.

<http://www.newenglandwild.org/store/plant-availability-lists.html>

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Appendix 1. Species list.

<i>Family</i>	<i>Scientific Name</i>	<i>Common Name</i>	<i>Non-native = NN Invasive = I</i>
HERBS			
<i>Araceae</i>	<i>Symplocarpus foetidus</i>	Skunk cabbage	
<i>Asteraceae</i>	<i>Ambrosia artemisiifolia</i>	Common ragweed	
	<i>Arctium minus</i>	Common burdock	NN
	<i>Erechtites hieraciifolius</i>	American burnweed	
	<i>Erigeron annuus</i>	Annual fleabane	
	<i>Erigeron canadensis</i>	Canada fleabane	
	<i>Eurybia divaricata</i>	White wood-aster	
	<i>Lactuca canadensis</i>	Tall lettuce	
	<i>Rudbeckia hirta</i>	Black-eyed Susan	
	<i>Solidago gigantea</i>	Smooth goldenrod	
	<i>Solidago rugosa</i>	Common wrinkle-leaved goldenrod	
	<i>Symphotrichum cordifolium</i>	Heart-leaved aster	
<i>Balsaminaceae</i>	<i>Impatiens capensis</i>	Jewelweed	
<i>Brassicaceae</i>	<i>Alliaria petiolata</i>	Garlic mustard	NN, I
	<i>Hesperis matronalis</i>	Dame's rocket	NN, I
	<i>Lepidium virginicum</i>	Poor man's pepperweed	
<i>Cannabaceae</i>	<i>Humulus japonicus</i>	Japanese hops	NN
<i>Commelinaceae</i>	<i>Commelina communis</i>	Asiatic dayflower	NN
<i>Convolvulaceae</i>	<i>Convolvulus arvensis</i>	Field bindweed	NN
<i>Curcubitaceae</i>	<i>Echinocystis lobata</i>	Wild cucumber	NN
<i>Fabaceae</i>	<i>Trifolium hybridum</i>	Alsike clover	NN
<i>Hemerocallidaceae</i>	<i>Hemerocallis fulva</i> or <i>lilio</i> *	Day-lily	NN
<i>Hypericaceae</i>	<i>Hypericum perforatum</i>	St. John's Wort	
<i>Lamiaceae</i>	<i>Glechoma hederacea</i>	Gill-over-the-ground	NN
<i>Oxalidaceae</i>	<i>Oxalis stricta</i>	Common wood sorrel	NN
<i>Papaveraceae</i>	<i>Chelidonium majus</i>	Greater celandine	NN
<i>Phytolaccaceae</i>	<i>Phytolacca americana</i>	American pokeweed	
<i>Plantaginaceae</i>	<i>Plantago rugelii</i>	Rugel's plantain	
	<i>Plantago</i> spp. *	Plantain	
<i>Polygonaceae</i>	<i>Fallopia japonica</i>	Japanese knotweed	NN, I
	<i>Persicaria hydropiper</i>	Water-pepper smartweed	NN
	<i>Rumex obtusifolius</i>	Bitter dock	NN
<i>Rosaceae</i>	<i>Rubus occidentalis</i>	Black raspberry	
<i>Rubiaceae</i>	<i>Galium</i> spp. *	Bedstraw	
<i>Ruscaceae</i>	<i>Polygonatum pennsylvanicum</i>	Solomon's-seal	
<i>Urticaceae</i>	<i>Pilea pumila</i>	Canada clearweed	
<i>Verbenaceae</i>	<i>Verbana urticifolia</i>	White vervain	

<i>Family</i>	<i>Scientific Name</i>	<i>Common Name</i>	<i>Non-native = NN Invasive = I</i>
<i>Violaceae</i>	<i>Viola</i> sp.*	Violet	
FERNS & ALLIES			
<i>Dryopteridaceae</i>	<i>Dryopteris</i> sp. *	Wood fern	
<i>Equisetaceae</i>	<i>Equisetum arvense</i>	Field horsetail	
<i>Onocleaceae</i>	<i>Onoclea sensibilis</i>	Sensitive fern	
<i>Thelypteridaceae</i>	<i>Parathelypteris novboransis</i>	New York fern	
<i>Woodsiaceae</i>	<i>Athyrium angustum</i>	Northern lady fern	
GRAMINOIDS			
<i>Cyperaceae</i>	<i>Carex crawfordii</i>	Crawford's sedge	
	<i>Carex vulpinoidea</i>	Common fox sedge	
	<i>Scirpus hattorianus</i>	Mosquito bulrush	
<i>Juncaceae</i>	<i>Juncus effusus</i>	Common soft rush	
	<i>Juncus tenuis</i>	Path rush	
<i>Poaceae</i>	<i>Dicanthelium clandestinum</i>	Deer-tongue rosette panic grass	
	<i>Phalarus arundinacea</i>	Reed canary grass	
SHRUBS & TREES			
<i>Adoxaceae</i>	<i>Sambucus racemosa</i>	Red elderberry	
<i>Anacardiaceae</i>	<i>Toxicodendron radicans</i>	Poison ivy	
<i>Berberidaceae</i>	<i>Berberis thunbergii</i>	Japanese barberry	NN, I
<i>Bignoniaceae</i>	<i>Catalpa speciosa</i>	Northern catalpa	NN
<i>Caprifoliacea</i>	<i>Lonicera</i> spp.	Non-native honeysuckle	NN, I
<i>Celastraceae</i>	<i>Celastrus orbiculatus</i>	Oriental bittersweet	NN, I
<i>Cornacea</i>	<i>Swida amomum</i>	Silky dogwood	
<i>Fagaceae</i>	<i>Fagus grandifolia</i>	American beech	
	<i>Quercus rubra</i>	Northern red oak	
<i>Juglandaceae</i>	<i>Juglans cinerea</i>	Butternut	
<i>Malvaceae</i>	<i>Tilia americana</i>	Basswood	
<i>Moraceae</i>	<i>Morus alba</i>	White mulberry	NN
<i>Oleaceae</i>	<i>Forsythia virida</i> or <i>suspensa</i> *	Forsythia	
	<i>Fraxinus pennsylvanica</i>	Green ash	
<i>Rhamnaceae</i>	<i>Frangula alnus</i>	Glossy buckthorn	NN, I
	<i>Rhamnus cathartica</i>	European buckthorn	NN, I
<i>Rosaceae</i>	<i>Prunus</i> sp. *	Ornamental flowering cherry	
	<i>Prunus serotina</i>	Black cherry	
	<i>Rosa multiflora</i>	Multiflora rose	NN, I
<i>Sapindaceae</i>	<i>Acer negundo</i>	Boxelder	
	<i>Acer platanoides</i>	Norway maple	NN, I
	<i>Acer rubrum</i>	Red maple	
	<i>Acer saccharinum</i>	Silver maple	

<i>Family</i>	<i>Scientific Name</i>	<i>Common Name</i>	<i>Non-native = NN Invasive = I</i>
<i>Ulmaceae</i>	<i>Acer saccharum</i>	Sugar maple	
<i>Vitaceae</i>	<i>Ulmus americana</i>	American elm	
	<i>Parthenocissus quinquefolia</i>	Virginia creeper	
* Plant could not be identified to the species level as certain characteristic required for identification were absent at the time of survey.			

Appendix 2. Suggested Treatment Timeline

<i>Walcott Woods Treatment Timeline</i>	
Autumn 2013	<ul style="list-style-type: none"> ▪ Begin manual removal of woody invasive shrubs and vines site-wide, beginning at the open meadow-forest edge ▪ Develop a cooperative management plan for Japanese knotweed with abutters. If feasible, conduct treatment at Walcott Woods and the abutting church property. Prepare for treatment at the upstream location (town owned parcel) ▪ Assess reed canary grass infestation- if few individuals are found, carefully hand-dig plants and roots ▪ Assess Norway maple infestation, determining if species presence is tolerable. Regardless of assessment results, manually remove small saplings (< 3 in. diameter). If deemed <u>intolerable</u>, develop a removal strategy for large trees. ▪ Manually remove Japanese hops ▪ Mow and or brush the open meadow, repeat as needed
Winter 2013- 2014	<ul style="list-style-type: none"> ▪ Apply for necessary permits required for herbicide application and large tree removal ▪ Develop a treatment approach and timeline with a state licensed herbicide applicator ▪ Remove < 25% of the large Norway maples after ground freeze
Spring 2014	<ul style="list-style-type: none"> ▪ Hand-pull second year garlic mustard plants before seed set, several visits may be required to ensure all late blooming plants are removed
Summer 2014	<ul style="list-style-type: none"> ▪ Hand-pull dame's rocket before seed set ▪ Continue removal of woody invasive shrubs and vines site-wide, implementing chemical control if possible ▪ Continue Norway maple sapling removal ▪ Continue reed canary grass removal ▪ Monitor for and remove Japanese hops seedlings
Autumn 2014	<ul style="list-style-type: none"> ▪ Continue removal of woody invasive shrubs and vines site-wide, implementing chemical control if possible ▪ Continue treatment of Japanese knotweed ▪ Begin foliar herbicide application of Norway maple stump re-sprout ▪ Evaluate Year 1 Treatment
Winter 2014	<ul style="list-style-type: none"> ▪ Continue removal of large Norway maples after ground freeze

Appendix 3. Glossary of Terms

Ferns: flowerless and seedless vascular plants that reproduce by spore, have true roots from a rhizome, and fronds that uncurl upward.

Fern allies: All spore-bearing vascular plants that do not otherwise meet the definition of a fern. Example: horsetails.

Forbs: broad-leaved, non-grass-like herbaceous seed plants.

Graminoids: grasses or grass-like seed plants. Example: sedges.

Habitat: The environment in which a plant normally grows.

Herbs or herbaceous plants: vascular plants without significant woody tissue. This includes annuals, biennials, and perennial plants that lack significant thickening by secondary growth.

Invasive species: non-native species that invade and alter both natural and managed areas. For this document, plants are considered invasive if listed as “invasive,” “likely invasive,” or “potentially invasive” in *An Evaluation of Non-Native Plant Species for Invasiveness in Massachusetts, with annotated list* (Massachusetts Invasives Plant Advisory Group, 2005).

Native species: those species that occurred in the United States before Europeans arrived.

Natural community: a group of species that recur together without human intervention. These species interact with one another, form a functional unit, and are fairly consistent from one site to another.

Non-native species: those species that began occurring in the United States after Europeans arrived.

Shrubs: perennial woody species that are generally less than 4 to 5 meters in height. Typically, shrubs are multi-stemmed.

Trees: perennial, woody species that are normally greater than 4 to 5 meters in height. Typically, trees are single-stemmed.

Vascular plants: plants with water and fluid conductive tissue (xylem and phloem). This includes seed plants, ferns, and fern allies.