

Botanical Inventory
Mason Brook Headwaters
Mason, New Hampshire



Prepared by

NEW ENGLAND
WILD
FLOWER
SOCIETY



HEADQUARTERS & GARDEN IN THE WOODS

180 Hemenway Road • Framingham, Massachusetts 01701-2699
T 508.877.7630 • F 508.877.3658 • W newenglandWILD.org

Amanda Weise, Ecological Program Coordinator
John Burns, Plant Conservation Volunteer Coordinator

February, 2015

This page has been intentionally left blank

Table of Contents

Acknowledgements	4
Introduction	5
Methods	5
Results	6
Plant Diversity.....	6
Unconfirmed Records	8
Discussion and Recommendations	8
North Inventory Area	8
Middle Inventory Area	9
South Inventory Area	11
Recommendations	12
APPENDICES	16
APPENDIX A. STUDY AREA	
APPENDIX B. STUDY AREA ZONES	
APPENDIX C. SPECIES LIST	
APPENDIX D. NATURAL COMMUNITIES	
APPENDIX E. INVASIVE SPECIES INFESTATIONS	
APPENDIX F. EXPLANATION OF STATE RANK CODES	
APPENDIX G. GLOSSARY OF TERMS	
Table 1. New Hillsborough County Records	7
Table 2. Invasive Species.....	7
Table 3. Unidentified and Unconfirmed Species	8
Figure 1. Floristic Composition Based on Plant Type	7
Figure 2. Number of Native vs. Non-native and Invasive Species	7
Figure 3. Interior eastern hemlock forest of the Northern Inventory Area. Amanda Weise © 2014.....	9
Figure 4. Nose Meadow, Middle Inventory Area. John Burns © 2014	11
Figure 5. Beaver pond drainage system and wet meadow, South Inventory Area. Amanda Weise © 2014	12
Figure 6. <i>Carex lenticularis</i> . Elizabeth Farnsworth © 2015.	12
Figure 7. <i>Carex sparganioides</i> (left) <i>Carex cephaloidea</i> (right). Both photos: Don Cameron © 2015.....	13
Figure 8. <i>Salix cinerea</i> bark. Amanda Weise © 2013.....	14

Acknowledgements

This report was produced for the Town of Mason, Conservation Commission and funded by a generous donation from Catherine Schwenk.

Field work was made possible with the help of John Burns, Katherine Wenzell, Sam Gilvarg, Colin Mettey, Barbara and Charlie Grunden, Jim Wickis, Joan Gorga and Linda Kunhardt.

Writing assistance was provided by John Burns and Colin Mettey. Maps were produced by John Burns. Editing was completed by Brent Powers.





Introduction

The Mason Brook Headwaters Inventory Area is comprised of just over 200 acres of conserved land in the heart of Mason, New Hampshire (Appendix A). This historic track of private and town land marks the geographical center of the original township and protects the headwaters of Mason Brook, a tributary to the Squannacook River.

The area's forests are a mosaic of northern transitional *Hemlock - beech - oak - pine forest* community and southern Appalachian oak - pine forest types as defined by the New Hampshire Classification of Natural Communities (Sperduto, 2005). The merging of these forests creates a variable canopy comprised of oak (*Quercus* spp.), hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*), pitch pine (*Pinus rigida*), birch (*Betula* spp.), maple (*Acer* spp.) and ash (*Fraxinus* spp.). The dense forest overstory retards significant shrub and herbaceous growth, while forest gaps created by blow-downs, logging roads, and flooding support a diversity of plant species, including a number of wildflowers such as the small purple flowered perennial gaywings (*Polygala paucifolia*) and pink lady's slipper (*Cypripedium acaule*) admired by many locals.

To better understand the floristic composition of the area, the New England Wild Flower Society was contracted in 2014 to perform the area's first vascular plant inventory. Results of the inventory will assist the Town in documenting, managing, and protecting its local natural resources. Primary objectives were to inventory the area's vascular plants, document rare and invasive plant species and document rare or unique natural communities. This report includes the inventory results and a discussion of the findings as well as visual aids such as maps and photographs.

Methods

The inventory was conducted over four days throughout the growing season (May 22nd, July 1st, August 8th, and September 11th) in order to capture the flowering period for the majority of plants. Surveyors included New England Wild Flower staff John Burns, and Amanda Weise; Conservation Fellows Katherine Wenzell, Sam Gilvarg, and Colin Mettey; and Plant Conservation Volunteers Barbara and Charlie Grunden, Jim Wickis, Joan Gorga, and Linda Kunhardt.

Given the size of the area, the property was subdivided into three smaller inventory areas (North, Middle, and South) using natural landscape features, roads, and property boundaries (Appendix B). Surveyors worked in three teams covering their assigned areas using a standard 'meander' inventory technique to cover the largest area while documenting the greatest amount of plant diversity. Using this technique, surveyors attempted to cover as much of the area as possible while using their botanical knowledge and understanding of natural communities to guide them in the field. Garmin 60 CSx GPS units, loaded with parcel information, were used by each team to track coverage of the areas and record specific point locations of rare or invasive plants and unique landscape features.



Teams listed all trees, shrubs, subshrubs, woody vines, graminoids (grasses, sedges, and rushes), herbaceous plants (wildflowers), and non-flowering herbaceous plants (ferns and fern allies (clubmosses, spikemosses, and horsetails)) observed in the field. To the greatest extent possible, plants were identified in the field using technical references and field guides [Newcomb (1977), Cobb *et al.* (2005), and Haines (2011)] and in cases where in-the-field identification was not possible, plants were photographed and/or collected for later identification in the office. Rare species identified in the field were documented with New Hampshire Natural Heritage Inventory Rare Plant Forms, photographed, and mapped with a GPS unit. Invasive plant species infestations or single occurrences were also mapped with a GPS.

Spatial data and species lists were analyzed using Arc GIS 9.3 (ESRI 2009). Species lists were compared to NH County and Plant Tracking lists (New Hampshire Natural Heritage Bureau 2014), New England Wild Flower Society's [GoBotany](#) database, and *Flora Novae Angliae* (Haines 2011). Plants were considered threatened, endangered, "watch listed" or historic based on the Plant Tracking List- Rare and Imperiled Species; plants were considered invasive if listed as "invasive," "prohibited," or "watch listed" in New Hampshire Prohibited Invasive Species List and Invasive Species Watch List (Cygan 2013). Nomenclature for the report follows that of *Flora Novae Angliae* (Haines 2011).

Results

Plant Diversity

A total of 330 species, representing 79 families, were observed in the inventory area (Appendix C). Floristic composition by plant type includes 164 forbs, 80 woody (trees, shrubs, subshrubs, and woody vines), 65 graminoids, and 21 non-flowering plants (ferns and club mosses) (Figure 1). Comparison with the state county checklist revealed ten species that were previously undocumented in Hillsborough County (Table 1).

Of these, 273 are native species (82%), 52 are non-native species (16%), and five are of unknown or undetermined origin (Figure 2); of these non-native species, nine are state-listed invasive and prohibited from sale (2%) (Table 2).

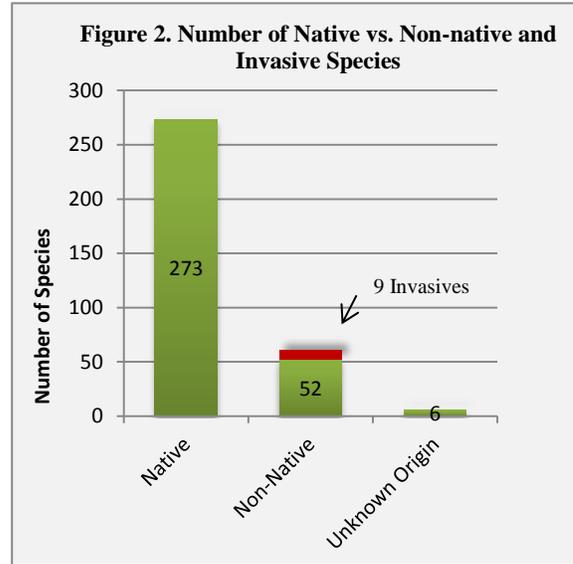
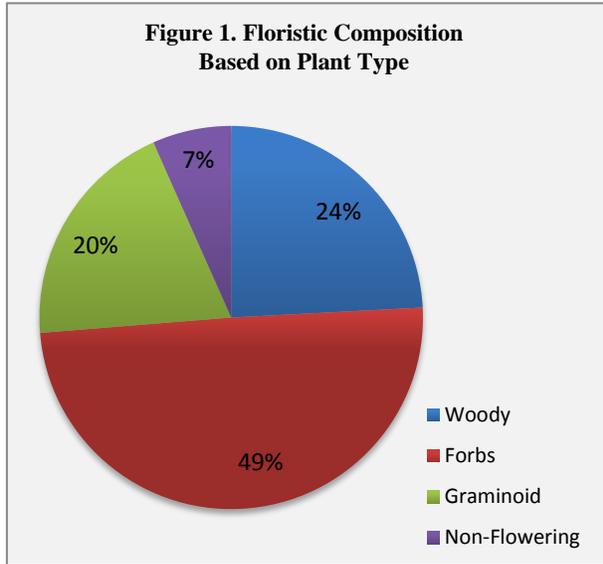


Table 1. New Hillsborough County Records

Species Name	Common Name	Family	Inventory Area
<i>Vinca minor</i>	lesser periwinkle	Apocynaceae	North
<i>Triadenum fraseri</i>	Fraser's marsh-St. John's-wort	Hypericaceae	Middle
<i>Solidago flexicaulis</i>	ziz-zag goldenrod	Asteraceae	North
<i>Solidago altissima</i>	tall goldenrod	Asteraceae	South
<i>Sedum acre</i>	moss stonecrop	Crassulaceae	South
<i>Oxalis florida</i>	flowering yellow wood sorrel	Oxalidaceae	Middle
<i>Euonymus europaeus</i>	European spindle-tree	Celastraceae	Middle
<i>Carex platyphylla</i>	broad-leaved sedge	Cyperaceae	North
<i>Bellis perennis</i>	lawn-daisy	Asteraceae	South
<i>Alopecurus pratensis</i>	field meadow-foxtail	Poaceae	South

Table 2. Invasive Species

Species Name	Common Name	Family	Inventory Area
<i>Lythrum salicaria</i>	purple loosestrife	Lythraceae	Middle
<i>Phalaris arundinacea</i>	reed canary grass	Poaceae	Middle
<i>Cynanchum louiseae</i>	black swallowwort	Apocynaceae	Middle, South
<i>Elaeagnus umbellata</i>	autumn-olive	Elaeagnaceae	North, Middle, South
<i>Euonymus alatus</i>	burning-bush	Celastraceae	North, Middle
<i>Rosa multiflora</i>	rambler rose	Rosaceae	North, Middle
<i>Berberis thunbergii</i>	Japanese barberry	Berberidaceae	North, Middle
<i>Celastrus orbiculatus</i>	Asian bittersweet	Celastraceae	North, Middle
<i>Lonicera morrowii</i> (& <i>Lonicera</i> sp.)	Morrow's honeysuckle	Caprifoliaceae	North, Middle



Unconfirmed Records

Six plants were identified to genus, but could not be identified beyond that level due to lack of characteristics essential for such identification. These species are listed with “*sp.*” following the genus name in Table 3 and Appendix C. An additional six plants required further examination to verify their identifications. For these, we have been able to designate a species name, but without 100% certainty – usually because of similarities between it and another member of the same genus. These species, found with “*cf.*” between their genus and specific epithet, include two state-listed rare species, two state historic species and two relatively common species (Table 3 and Appendix C).

Table 3. Unidentified and Unconfirmed Species

Species Name	Common Name	Family	Inventory Area	State Rank
<i>Amelanchier</i> sp.	shadbush	Rosaceae	North	-
<i>Botrychium</i> sp.	moonwort	Ophioglossaceae	Middle	-
<i>Lonicera</i> sp.	honeysuckle	Caprifoliaceae	Middle	-
<i>Malus</i> sp.	apple	Rosaceae	North	-
<i>Sphagnum</i> sp.	peat moss	Sphagnaceae	North, Middle, South	
<i>Sorbus</i> sp.	mountain-ash	Rosaceae	North	-
<i>Carex</i> cf. <i>lenticularis</i>	lake shore sedge	Cyperaceae	Middle	-
<i>Carex</i> cf. <i>sparganioides</i>	bur-reed sedge	Cyperaceae	Middle	S1
<i>Desmodium</i> cf. <i>cuspidatum</i>	large-bracted tick-trefoil	Fabaceae	South	SH
<i>Digitaria</i> cf. <i>filiformis</i> var. <i>filiformis</i>	slender crabgrass	Poaceae	North	SH
<i>Erigeron</i> cf. <i>pulchellus</i>	Robin's plantain fleabane	Asteraceae	North	-
<i>Symphotrichum</i> cf. <i>patens</i>	late purple American-aster	Asteraceae	Middle	S2

Discussion and Recommendations

North Inventory Area

The area is topographically defined by several north-south ridges and exposed rock outcrops which form the drainage system for a tributary of Mason Book. The majority of the area is dry upland forest, dominated by white pine, oak and eastern hemlock with little understory vegetation with the exception of mountain laurel (*Kalmia latifolia*) which forms scattered dense stands throughout which surveyors could not easily penetrate. The main drainage at the center of the property develops into a small stream and buffering wetland which feed into Nose Meadow at Darling Hill Road while a secondary drainage closely parallels Meeting House Road and forms a shrub marsh just beyond the property boundary. Areas of standing water which might qualify as vernal pools and isolated wetland basins were common including a *Buttonbush shrubland wetland* community on the east side of the property (Appendix D).



The shrub marsh at Darling Hill Road was characterized by diverse shrub layer including chokeberry (*Aronia melanocarpa*), maleberry (*Lyonia ligustrina*), arrowwood (*Viburnum dentatum*), winterberry holly (*Ilex verticillata*), alder (*Alnus incana*) and silky dogwood (*Swida amomum*) under a sparse canopy of red maple (*Acer rubrum*). The understory vegetation was mostly tussock sedge (*Carex stricta*), cinnamon fern (*Osmundastrum cinnamomeum*) and interrupted fern (*Osmunda claytoniana*). Just beyond the edges of the marsh, on slightly richer mesic soils, dwarf ginseng (*Panax trifolius*) and painted trillium (*Trillium undulatum*) were observed, but in very low numbers.

Rocky outcrops encrusted in black rock tripe lichen at the center of the property hosted rock polypody fern (*Polypodium virginianum*) and fringed bindweed (*Fallopia cilinodis*) under a canopy of mountain laurel, witchhazel (*Hammamelis virginiana*), eastern hemlock and maple, birch, oak, and an occasional pitch pine (*Pinus rigida*). In open dry roadside areas rosette-panicgrasses (*Dichantheium* spp.), fern-leaved false foxglove (*Aureolaria pedicularia* var. *pedicularia*) and what we believe to be slender crabgrass (*Digitaria filiformis* var. *filiformis*), a state historic species, were observed.

Invasives were generally restricted to roadside and wetland areas, usually within a few hundred feet of a road or development. Japanese barberry (*Berberis thunbergii*), non-native shrub honeysuckle (*Lonicera* spp.) and Multiflora Rosa (*Rosa multiflora*) were observed in the drainage wetland marsh and shrub marsh just beyond the property boundary. Burning bush (*Euonymus alatus*) was restricted to roadside upland areas on Darling Hill Road (Appendix E).



Figure 3. Interior eastern hemlock forest of the Northern Inventory Area. Amanda Weise © 2014

Middle Inventory Area

The relatively flat area north of Merriam Hill Road features the town's well known Nose Meadow, a wide *Sedge meadow marsh* where several tributaries join to form Mason Brook. This area was historically open grassland and used as overwintering grounds for young cattle. Damming during recent decades along Merriam Hill Road impounded the area, creating



favorable habitat for many wetland species. South of the dam, the topography becomes variable with dry upland forest on west side of the Bronson Potter Lots, and mesic forest and impoundments along the Mason Brook drainage to the east (Appendix D).

Nose Meadow consists of a somewhat loose matrix of Sphagnum moss with a wide variety of graminoids extending out towards a band of open water in the central channel. Based on aerial photographs, the open water comprises about 25 percent of the total area of the wetland. This fluctuates depending on rain and snow melt. The height of the sedge mat varies based on the species composition and could be likened to a patch-work quilt. The majority of the wetland was outside the property boundary and therefore was not included in this survey, but based on the species found in this inventory, it is worth returning to for a more thorough investigation.

On the eastern edge of the Meadow, the extent of inventory area, large patches of swollen-beaked sedge (*Carex utriculata*) make up the bulk of vegetation along with patches of common woolsedge (*Scirpus cyperinus*) and awl-fruited sedge (*Carex stipata*). With careful approach, the mat could support people's weight but only in well-established areas. More sensitive areas of open sphagnum, spatulate-leaved sundew (*Drosera intermedia*), large cranberry (*Vaccinium macrocarpon*), spikesedge (*Eleocharis spp.*) and several species of St. Johnswort (*Hypericum spp.*) were avoided due to potential negative impacts of foot traffic. Open water species of broad-leaved cattail (*Typha latifolia*), pickerelweed (*Pontederia cordata*) and pond lilies (*Nymphaea odorata*, *Nuphar variegata*) are more prominent in the southern portion of the wetland towards the road as would be expected for areas with deeper water habitats.

The edge of the wetland is lined with a well-developed shrub line consisting primarily of speckled alder (*Alnus incana*), southern arrow-wood (*Viburnum dentatum*) and silky dogwood (*Swida amomum*). However, a few pioneering red maple and white pine grow out of the shrub line near the edge of the wetland forming a broken overstory canopy.

Upon reaching Merriam Hill Road, the group encountered many more exotic species. Several species of garden plants were observed but of little conservation concern. The general area is more disturbed with some alteration of the landscape on the west side of the stream. This area appears to be a point of seed dissemination for many invasive species - Honeysuckle (*Lonicera morrowii*), Asian bittersweet (*Celastrus orbiculatus*), Japanese barberry (*Berberis thunbergii*) – which have spread downstream along the corridor (Appendix E).

The upland area west of the stream is predominantly forested by eastern hemlock in the lower portion and mixed hardwood species as elevation increases. The forest is of mixed age dominated by scattered large specimens of red oak, especially in the north, with mixed northern hardwood species – red maple, white ash, and black birch found at higher elevations.

At the base of a somewhat steep, forested slope on the westward boundary of lot E-61 there is an interesting seep worth noting. An old logging road enters the area from the north and there are some canopy gaps as a result of wind thrown trees. The added filtered light reaching the forest floor and moisture from the seep yield a unique habitat for flowering yellow wood sorrel (*Oxalis florida*) identified in this area. Large specimens of American beech (*Fagus grandifolia*) and big-

toothed aspen (*Populus grandidentata*) occupy the canopy and unusually fringed sedge (*Carex crinita*) is growing in more open pockets.



Figure 4. Nose Meadow, Middle Inventory Area. John Burns © 2014

South Inventory Area

This area is a continuation of the topography and forest system of the Middle inventory area, and constitutes the southern half of the town owned Bronson Potter Lots. A pond is positioned at the height of land in the northwest corner from which the land gradually slopes downward to a series of wetlands along Old Ashby Road to the east. The forest is of similar composition mixed age with eastern hemlock and mixed hardwoods making up majority of the overstory (Appendix D).

The pond, from aerial photographs, appears mostly open water with floating Sphagnum mats. Three quarters of the pond is shadowed by tall white pines and hardwoods, while the edges closest to Merriam Hill Road are kept open as lawn or fields. Anchored Sphagnum mats along the edges provided surveyors with a semi-stable walking surface, but not beyond about 5 ft. of shore where the risk of “breakthrough” became too high. These mats host a bog-like plant community including spatulate-leaved sundew (*Drosera intermedia*), cranberry (*Vaccinium macrocarpon*), buttonbush (*Chamaedaphne calyculata*) and cottongrass (*Eriophorum* sp.). Sedges, rushes, and grasses dominate the upper edges of the along with beggars ticks (*Bidens* spp.), asters (*Symphyotrichum* spp.) and bog laurel (*Kalmia polifolia*).

Along the eastern edge of the property, in the drainage paralleling Old Ashby Road, beaver activity and sediment deposition from seasonal flooding have created a series of small ponds supporting ribbon-leaved pondweed (*Potamogeton epihydrus*), blunt spikeweed (*Eleocharis obtusa* var. *obtusa*), and American bur-reed (*Sparganium americanum*), as well as wet meadows

abundant in arrow-leaved tearthumb (*Persicaria sagittata*), rushes (*Juncus* sp.) and sedges (*Carex* sp.).

A number of non-native agricultural species were identified in the field across from Prospect Cemetery, but generally appear to be restricted to the opening. Invasives including autumn olive (*Elaeagnus umbellata*), Oriental bittersweet (*Celastrus orbiculatus*) and multiflora rose (*Rosa multiflora*) were observed along the field edges and south of the field into the wet drainage (Appendix E). Beaver activity and flooding have retarded canopy closure in the drainage, providing ample light for the bittersweet and multiflora rose, which have become dense. Grey willow (*Salix cinerea*), an uncommon and often overlooked invasive, was identified along a pool edge, just west of the main drainage. This species is not currently listed by New Hampshire as invasive, but is listed in neighboring Massachusetts.



Figure 5. Beaver pond drainage system and wet meadow, South Inventory Area. Amanda Weise © 2014

Recommendations

Additional Botanical Survey Work

Further fieldwork is required to verify the identifications of five of the six unconfirmed species which are of botanical interest.

Lake shore sedge (*Carex lenticularis*), identified in the Middle Inventory Area from a collected specimen, is a common species of lake and stream shorelines throughout much of New England (Figure 6). Unfortunately the specimen lacked several key features required to separate this species from *Carex aquatilis* which is similar in appearance. If confirmed as *C. aquatilis*, this would be the first



Figure 6. *Carex lenticularis*.
Elizabeth Farnsworth © 2015.



record of the species in New Hampshire.

Bur-reed sedge (*Carex sparganioides*), also identified in the Middle Inventory Area, is extremely rare in New Hampshire with fewer than five occurrences state wide. A sedge of rich, moist deciduous forests, this species is commonly found in southern New England but is less common in Vermont, New Hampshire, and Maine. It can be confused with *Carex cephaloidea* which is very similar in appearance except for the congestion of its inflorescence, therefore further examination is required (Figure 7).



Figure 7. *Carex sparganioides* (left) *Carex cephaloidea* (right). Both photos: Don Cameron © 2015

Large-bracted tick-trefoil (*Desmodium cuspidatum*), identified along the road edge the field in the South Inventory Area, is “a rare plant in New England, distributed across the southern New England states as well as the southernmost portions of New Hampshire and Vermont.” This species is considered historic in New Hampshire; formerly known for three sites in Cheshire, Hillsborough and Rockingham Counties. It is most often found in dry-dry mesic forests but can also occur in dry fields and rights-of-way, as in this case. To distinguish it from other tick-trefoils, leaf and fruit characteristics must be examined.

Slender crabgrass (*Digitaria filiformis* var. *filiformis*), found roadside in the Northern Inventory area, is another state listed historic. This species is previously known from only three sites in Hillsborough County but is common in Massachusetts and Connecticut, inhabiting dry, open, sandy areas of man-made or disturbed sites, grasslands, meadows and fields or ridge ledges. To confirm this record, the plants should be compared to other crabgrasses with paniced, secund, spike-like racemes and distinguished by its upright reproductive stems.

We identified what we believe to be late purple American-aster (*Symphotrichum patens*), a threaten species in New Hampshire, along a pond edge but suspect this may be a misidentification with New York American-aster (*Symphotrichum novi-belgii*). The later



lacks glandular hairs on the involucre bract and should be easily confirmed in the field with a hand lens.

Additional botanical surveys should also include studies of 1) nose meadow, in its entirety, 2) the pond on Merriam Hill Road, and 3) the seep identified in the Middle Inventory Area (Appendix D).

Invasive Species Surveys and Management

In all three Inventory Areas, invasive plant infestations were generally restricted to within 100-200 ft. of roads and developments in disturbed habitats (roadside or beaver influenced wetland areas) or wetlands (Appendix E). The most abundant species included Oriental bittersweet, multiflora rose, and non-native honeysuckles, while purple loosestrife and grey willow were the least abundant. An effort should be made to remove invasives especially from undeveloped areas (*e.g.* forest interiors) or botanically interesting areas (*e.g.* Nose meadow) as resources allow. The majority of the species are woody shrubs which can be uprooted by hand or by using leverage devices (*i.e.* weed wrench or puller-bear (www.pullerbear.com)). Tougher to kill species, such as black swallowwort (*Cynanchum louiseae*), can be smothered using black plastic, treated with herbicides by a licensed applicator, or regularly cut back to prevent fruiting.

A single specimen of grey willow ([*Salix cinerea*](#)), an undocumented invasive woody tree/shrub in New Hampshire, was found several hundred ft. into the woods in the wetland area along Old Ashby Road. This is the first record of the species in the county as well as New Hampshire. Because of its rarity in northern New England, a more thorough search should be conducted followed by removal of all documented individuals. Mature specimens are easily identifiable by their striated bark; a characteristic not found in any other willow species (Figure 8). Uprooting, herbicide application, or smothering can be used to remove plants; girdling is not recommended due to the species tendency to produce root and stem suckers.



Figure 8. *Salix cinerea* bark. Amanda Weise © 2013



References and Resources

Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. 3 vols. Charles Scribner's Sons, New York. Vol. 1: 40.

Cygan, D. 2013. *New Hampshire Guide to Upland Invasive Species*, New Hampshire Department of Agriculture. Web published.

Cobb, B., E. Farnsworth, and C. Lowe. 2005. *Ferns of Northeastern and Central North America*. 2nd edition. Peterson Field Guide. Houghton Mifflin Company. New York, NY.

ESRI (Environmental Systems Resource Institute). 2009. ArcMap 9.3. ESRI, Redlands, California.

Gleason, H.A. and A. Cronquist. 1991. *Manual of Vascular Plants of Northeastern United States and Adjacent Canada*. 2nd edition. The New York Botanical Garden. Bronx, NY.

Haines, A. 2011. *Flora Novae Angliae*. New England Wild Flower Society. Yale University Press.

Newcomb, L. 1977. *Newcomb's Wildflower Guide*. Little and Brown Company. Boston, MA.

New Hampshire Natural Heritage Bureau. 2013. New Hampshire County Checklist. DRED-Division of Forest and Lands. Concord, NH. Web published.

New Hampshire Natural Heritage Bureau. 2014. Plant Tracking List- Rare and Imperiled Species). DRED-Division of Forest and Lands. Concord, NH. Web published.

New Hampshire Natural Heritage Bureau. 2014. Rare Plant List for New Hampshire. Technical Copy. DRED-Division of Forest and Lands. Concord, NH. Web published.

New Hampshire Natural Heritage Bureau. Date unknown. Vascular Plants of New Hampshire. DRED-Division of Forest and Lands. Concord, NH. Web published..

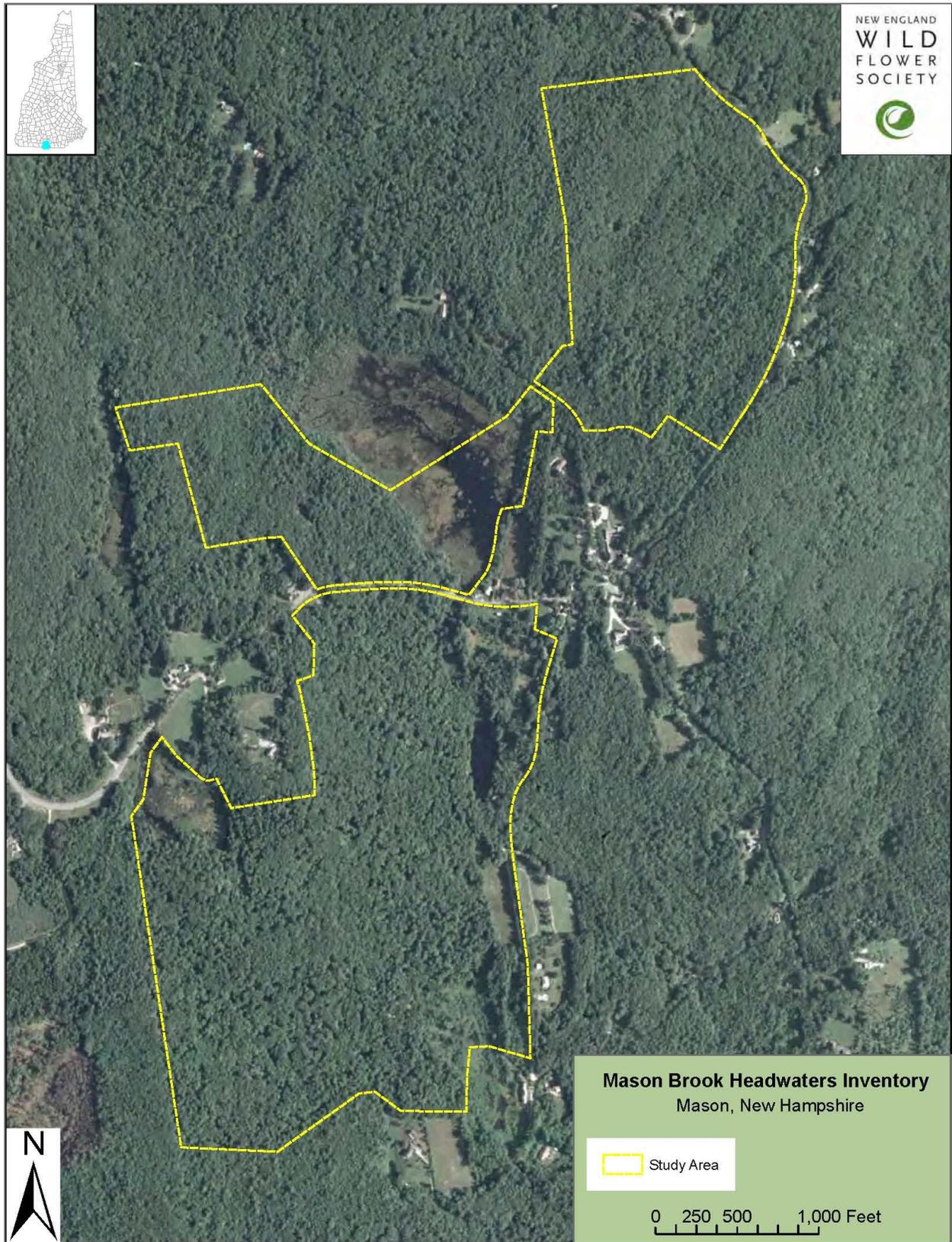
Sperduto, D.D. 2005. New Hampshire Natural Community Systems. NH Natural Heritage Bureau, Concord, NH.

Sperduto, D.D. and B. Kimball. 2011. *The Nature of New Hampshire: Natural Communities of the Granite State*. University of New Hampshire Press.

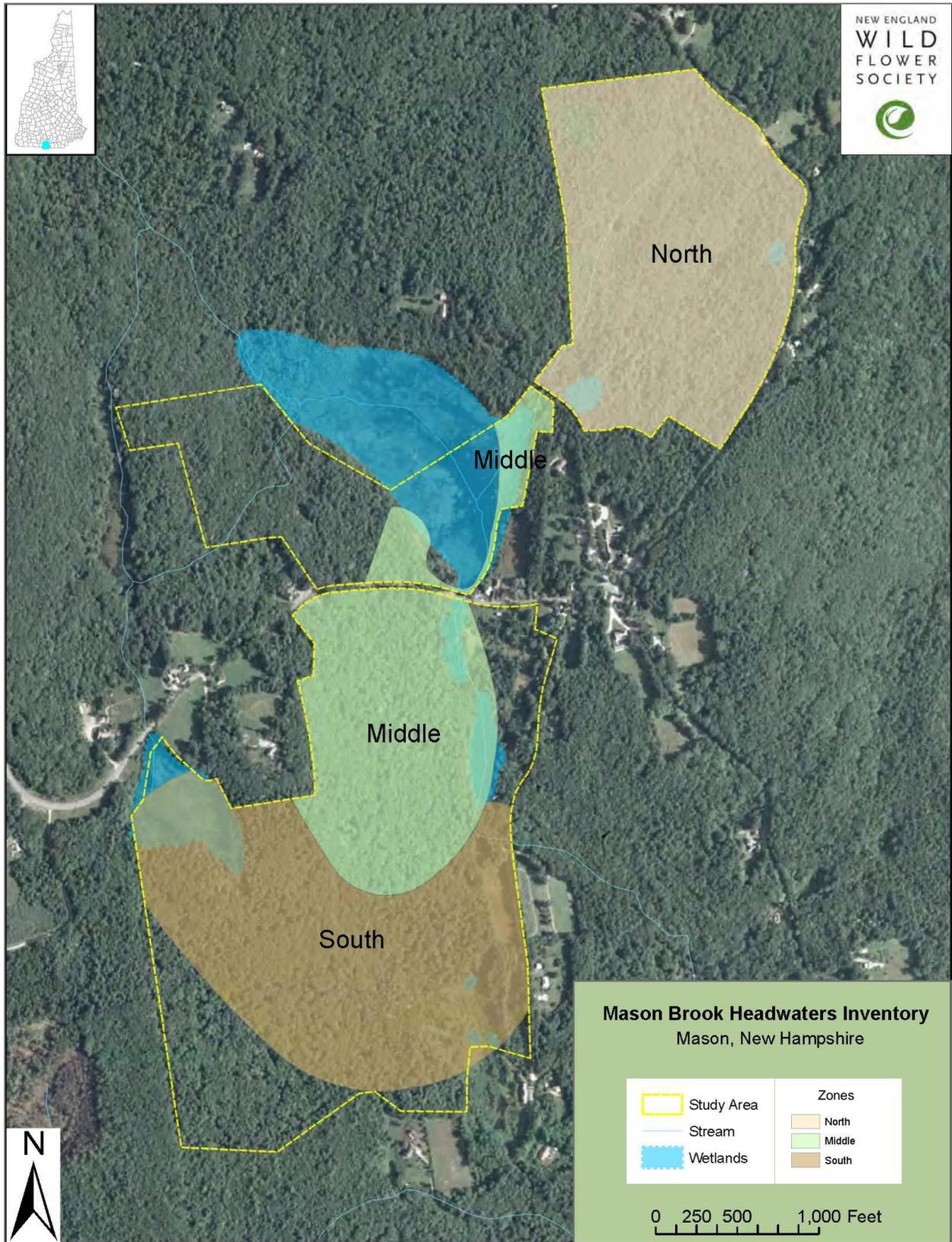
Sperduto, D.D. and W.F. Nichols. 2004. Natural Communities of New Hampshire. NH Natural Heritage Bureau, Concord, NH. Pub. UNH Cooperative Extension, Durham, NH.

APPENDICES

APPENDIX A. STUDY AREA



APPENDIX B. STUDY AREA ZONES



APPENDIX C. SPECIES LIST

Species	Common Name	Inventory Area		
<u>NON-FLOWERING PLANTS</u>				
Dennstaedtiaceae		N	M	S
<i>Dennstaedtia punctilobula</i>	eastern hay-scented fern		x	x
<i>Pteridium aquilinum</i>	bracken fern	x	x	x
Dryopteridaceae				
<i>Dryopteris carthusiana</i>	spinulose wood fern		x	x
<i>Dryopteris intermedia</i>	evergreen wood fern	x	x	x
<i>Dryopteris marginalis</i>	marginal wood fern	x	x	x
<i>Polystichum acrostichoides</i>	Christmas fern		x	x
Equisetaceae				
<i>Equisetum arvense</i>	field horsetail		x	x
Lycopodiaceae				
<i>Dendrolycopodium dendroideum</i>	prickly tree-clubmoss		x	x
<i>Dendrolycopodium hickeyi</i>	Hickey's tree-clubmoss	x	x	x
<i>Dendrolycopodium obscurum</i>	flat-branched tree-clubmoss	x	x	
<i>Diphasiastrum digitatum</i>	southern ground-cedar	x	x	x
Onocleaceae				
<i>Onoclea sensibilis</i>	sensitive fern	x	x	x
Ophioglossaceae				
<i>Botrychium</i> sp.			x	
Osmundaceae				
<i>Osmunda claytoniana</i>	interrupted fern	x	x	x
<i>Osmunda regalis</i>	royal fern	x	x	x
<i>Osmundastrum cinnamomeum</i>	cinnamon fern	x	x	x
Polypodiaceae				
<i>Polypodium virginianum</i>	rock polypody	x		
Sphagnum				
<i>Sphagnum</i> sp.	peat moss	x	x	x
Thelypteridaceae				
<i>Parathelypteris noveboracensis</i>	New York fern	x	x	
<i>Phegopteris connectilis</i>	long beech fern		x	
<i>Thelypteris palustris</i>	marsh fern	x	x	
Woodsiaceae				
<i>Athyrium angustum</i>	northern lady fern	x	x	x
<i>Gymnocarpium dryopteris</i>	northern oak fern	x		

Species	Common Name	Inventory Area		
		N	M	S
<u>FLOWERING PLANTS</u>				
Adoxaceae				
<i>Sambucus nigra</i> ssp. <i>canadensis</i> (N)	black elderberry	x	x	
<i>Viburnum acerifolium</i>	maple-leaved viburnum	x	x	x
<i>Viburnum dentatum</i>	smooth arrowwood	x	x	x
<i>Viburnum lantanoides</i>	hobblebush	x		
<i>Viburnum lentago</i>	nannyberry	x	x	
Alismataceae				
<i>Sagittaria latifolia</i>	common arrowhead		x	x
Amaranthaceae				
<i>Chenopodium album</i> *	lamb's quarters		x	
Anacardiaceae				
<i>Rhus hirta</i>	staghorn sumac		x	x
<i>Toxicodendron radicans</i>	poison-ivy	x	x	x
<i>Toxicodendron rydbergii</i>	western poison-ivy		x	x
<i>Toxicodendron vernix</i>	poison-sumac			x
Apiaceae				
<i>Aralia hispida</i>	bristly sarsaparilla	x		
<i>Aralia nudicaulis</i>	wild sarsaparilla	x	x	x
<i>Daucus carota</i> *	wild carrot		x	x
<i>Hydrocotyle americana</i>	American marsh-pennywort		x	x
<i>Panax trifolius</i>	dwarf ginseng	x		
<i>Zizia aurea</i>	common golden Alexanders	x		
Apocynaceae				
<i>Apocynum cannabinum</i>	hemp dogbane	x		
<i>Asclepias syriaca</i>	common milkweed	x	x	x
<i>Cynanchum louiseae</i> **	black swallowwort		x	
<i>Vinca minor</i> * (R)	lesser periwinkle	x		
Aquifoliaceae				
<i>Ilex verticillata</i>	common winterberry	x	x	
Araceae				
<i>Arisaema triphyllum</i> ssp. <i>stewardsonii</i>	Jack-in-the-pulpit	x	x	x
<i>Lemna minor</i>	common duckweed		x	
Asparagaceae				
<i>Asparagus officinalis</i> *	asparagus		x	x
Asteraceae				
<i>Achillea millefolium</i>	common yarrow	x	x	x
<i>Ambrosia artemisiifolia</i>	common ragweed	x	x	x
<i>Bellis perennis</i> * (R)	lawn-daisy			x
<i>Bidens cernua</i>	nodding beggar-ticks		x	

Species	Common Name	Inventory Area		
		N	M	S
Asteraceae cont.				
<i>Bidens connata</i>	purple-stemmed beggar-ticks		x	
<i>Bidens frondosa</i>	Devil's beggar-ticks		x	x
<i>Bidens tripartita</i>	three-lobed beggar-ticks		x	x
<i>Doellingeria umbellata</i>	tall white-aster	x		
<i>Erechtites hieraciifolius</i>	American burnweed		x	
<i>Erigeron annuus</i>	annual fleabane			x
<i>Erigeron canadensis</i>	Canada fleabane			x
<i>Erigeron cf. pulchellus</i>	Robin's plantain fleabane	x		
<i>Eupatorium perfoliatum</i>	boneset thoroughwort		x	x
<i>Eurybia divaricata</i>	white wood-aster	x	x	x
<i>Eurybia macrophylla</i>	large-leaved wood-aster	x		
<i>Euthamia graminifolia</i>	common grass-leaved-goldenrod		x	x
<i>Eutrochium dubium</i>	coastal plain Joe-Pye weed	x	x	x
<i>Hieracium paniculatum</i>	panicked hawkweed	x		x
<i>Lactuca biennis</i>	tall blue lettuce	x		
<i>Lactuca canadensis</i>	tall lettuce	x	x	x
<i>Leucanthemum vulgare</i> *	ox-eye daisy			x
<i>Nabalus trifoliolatus</i>	three-leaved rattlesnake-root	x	x	
<i>Oclemena acuminata</i>	sharp-toothed nodding-aster	x	x	x
<i>Rudbeckia hirta</i> var. <i>pulcherrima</i>	black-eyed coneflower		x	x
<i>Solidago altissima</i> (R)	tall goldenrod			x
<i>Solidago caesia</i>	axillary goldenrod		x	
<i>Solidago canadensis</i>	Canada goldenrod		x	
<i>Solidago flexicaulis</i> (R)	ziz-zag goldenrod	x		
<i>Solidago gigantea</i>	smooth goldenrod		x	x
<i>Solidago juncea</i>	early goldenrod		x	x
<i>Solidago nemoralis</i>	gray goldenrod		x	x
<i>Solidago rugosa</i>	common wrinkle-leaved goldenrod	x	x	x
<i>Symphotrichum laeve</i>	smooth American-aster		x	
<i>Symphotrichum lateriflorum</i>	calico American-aster		x	x
<i>Symphotrichum novi-belgii</i>	New York American-aster		x	
<i>Symphotrichum cf. patens</i> (E (S2))	late purple American-aster		x	
<i>Symphotrichum racemosum</i>	small white American-aster		x	
<i>Taraxacum officinale</i> *	common dandelion		x	x
<i>Tragopogon pratensis</i> *	meadow goat's beard			x
Balsaminaceae				
<i>Impatiens capensis</i>	jewelweed	x	x	
Berberidaceae				
<i>Berberis thunbergii</i> **	Japanese barberry	x	x	
Betulaceae				
<i>Alnus incana</i>	speckled alder	x	x	
<i>Betula alleghaniensis</i>	yellow birch	x	x	x
<i>Betula lenta</i>	cherry birch	x	x	x
<i>Betula papyrifera</i>	paper birch	x	x	x
<i>Betula populifolia</i>	gray birch	x	x	x
<i>Ostrya virginiana</i>	hop-hornbeam		x	x
Brassicaceae				
<i>Barbarea vulgaris</i> *	garden yellow-rocket		x	x

Species	Common Name	Inventory Area		
		N	M	S
Campanulaceae				
<i>Lobelia cardinalis</i>	cardinal-flower		x	
<i>Lobelia inflata</i>	indian-tobacco		x	x
Caprifoliaceae				
<i>Lonicera morrowii</i> *	Morrow's honeysuckle	x		
<i>Lonicera</i> sp. **			x	
Caryophyllaceae				
<i>Cerastium fontanum</i> *	mouse-ear chickweed			x
<i>Dianthus deltoides</i> *	maiden pink			x
<i>Stellaria graminea</i> *	grass-leaved stitchwort			x
Celastraceae				
<i>Celastrus orbiculatus</i> **	Asian bittersweet	x	x	x
<i>Euonymus alatus</i> **	burning-bush	x	x	x
<i>Euonymus europaeus</i> * (R)	European spindle-tree		x	x
Clethraceae				
<i>Clethra alnifolia</i>	coastal sweet-pepperbush	x		
Colchicaceae				
<i>Uvularia sessilifolia</i>	sessile-leaved bellwort	x	x	
Convolvulaceae				
<i>Calystegia sepium</i> *	hedge false bindweed		x	x
Cornaceae				
<i>Nyssa sylvatica</i>	black-gum	x		
<i>Swida alternifolia</i>	alternate-leaved dogwood	x	x	
<i>Swida amomum</i>	silky dogwood	x	x	
Crassulaceae				
<i>Hylotelephium telephium</i> *	sedum	x	x	
<i>Sedum acre</i> * (R)	moss stonecrop			x
Cupressaceae				
<i>Juniperus communis</i>	common juniper	x	x	x
Cyperaceae				
<i>Carex amnectens</i>	yellow-fruited sedge	x		
<i>Carex arctata</i>	drooping woodland sedge			x
<i>Carex communis</i>	fibrous-rooted sedge	x	x	x
<i>Carex comosa</i>	bearded sedge			x
<i>Carex crinita</i>	fringed sedge		x	x
<i>Carex debilis</i> var. <i>rudgei</i>	white-edged sedge	x	x	
<i>Carex folliculata</i>	northern long sedge		x	x
<i>Carex gracillima</i>	graceful sedge			x
<i>Carex gynandra</i>	nodding sedge	x	x	x

Species	Common Name	Inventory Area		
		N	M	S
Cyperaceae cont.				
<i>Carex intumescens</i>	greater bladder sedge	x		
<i>Carex lasiocarpa</i>	woolly-fruited sedge		x	x
<i>Carex</i> cf. <i>lenticularis</i>	lake shore sedge		x	
<i>Carex lurida</i>	sallow sedge	x	x	x
<i>Carex normalis</i>	greater straw sedge		x	
<i>Carex pallescens</i>	pale sedge			x
<i>Carex pennsylvanica</i>	Pennsylvania sedge	x	x	x
<i>Carex platyphylla</i> (R)	broad-leaved sedge	x		
<i>Carex projecta</i>	necklace sedge		x	
<i>Carex pseudocyperus</i>	cypress-like sedge		x	
<i>Carex radiata</i>	eastern star sedge		x	x
<i>Carex rosea</i>	rosy sedge		x	
<i>Carex scabrata</i>	eastern rough sedge		x	x
<i>Carex scoparia</i>	pointed broom sedge		x	x
<i>Carex</i> cf. <i>sparganioides</i> (E (S1))	bur-reed sedge		x	
<i>Carex stipata</i>	awl-fruited sedge	x	x	x
<i>Carex stricta</i>	tussock sedge	x	x	x
<i>Carex swanii</i>	Swan's sedge	x	x	x
<i>Carex utriculata</i>	swollen-beaked sedge		x	
<i>Cyperus strigosus</i>	straw-colored flatsedge			x
<i>Dulichium arundinaceum</i>	three-way sedge		x	x
<i>Eleocharis flavescens</i> var. <i>olivacea</i>	yellow spikesedge		x	
<i>Eleocharis obtusa</i> var. <i>obtusa</i>	blunt spikesedge		x	
<i>Eriophorum tenellum</i>	few-nerved cottongrass		x	
<i>Scirpus atrocinctus</i>	black-girdled woolsedge	x	x	
<i>Scirpus cyperinus</i>	woolgrass		x	x
<i>Scirpus hattorianus</i>	mosquito bulrush		x	x
Droseraceae				
<i>Drosera intermedia</i>	spatulate-leaved sundew		x	x
Elaeagnaceae				
<i>Elaeagnus umbellata</i> **	autumn-olive		x	x
Ericaceae				
<i>Chamaedaphne calyculata</i>	leatherleaf		x	x
<i>Chimaphila maculata</i>	spotted wintergreen		x	x
<i>Epigaea repens</i>	trailing-arbutus	x		
<i>Gaultheria procumbens</i>	eastern spicy-wintergreen	x	x	x
<i>Hypopitys monotropa</i>	yellow pine-sap		x	
<i>Kalmia latifolia</i>	mountain laurel	x	x	x
<i>Kalmia polifolia</i>	bog laurel		x	
<i>Lyonia ligustrina</i>	maleberry	x	x	x
<i>Monotropa uniflora</i>	one-flowered Indian-pipe	x	x	x
<i>Pyrola elliptica</i>	elliptic-leaved shinleaf		x	x
<i>Vaccinium angustifolium</i>	common lowbush blueberry	x	x	x
<i>Vaccinium corymbosum</i>	highbush blueberry	x	x	x
<i>Vaccinium macrocarpon</i>	large cranberry		x	x
<i>Vaccinium pallidum</i>	hillside blueberry	x		
Fabaceae				
<i>Amphicarpaea bracteata</i>	American hog-peanut		x	x
<i>Apios americana</i>	common ground-nut		x	x
<i>Desmodium</i> cf. <i>cuspidatum</i> (SH)	large-bracted tick-trefoil			x

Species	Common Name	Inventory Area		
		N	M	S
Fabaceae cont.				
<i>Lespedeza hirta</i>	hairy bush-clover			x
<i>Lotus corniculatus</i> *	garden bird's-foot-trefoil		x	x
<i>Trifolium aureum</i> *	palmete hop clover	x		x
<i>Trifolium pratense</i> *	red clover		x	x
<i>Trifolium repens</i> *	white clover		x	x
<i>Vicia cracca</i> *	cow vetch			x
<i>Castanea dentata</i>	American chestnut	x	x	x
<i>Fagus grandifolia</i>	American beech	x	x	x
<i>Quercus alba</i>	eastern white oak	x	x	
<i>Quercus rubra</i>	northern red oak	x	x	x
<i>Quercus velutina</i>	black oak	x	x	x
Hamamelidaceae				
<i>Hamamelis virginiana</i>	American witch-hazel	x	x	x
Hemerocallidaceae				
<i>Hemerocallis fulva</i> *	orange day-lily	x	x	x
Hypericaceae				
<i>Hypericum canadense</i>	lesser St. John's-wort		x	
<i>Hypericum mutilum</i>	dwarf St. John's-wort		x	x
<i>Hypericum perforatum</i> *	common St. John's-wort			x
<i>Triadenum fraseri</i> (R)	Fraser's marsh-St. John's-wort		x	x
<i>Triadenum virginicum</i>	Virginia marsh-St. John's-wort		x	
Iridaceae				
<i>Iris versicolor</i>	blue iris	x	x	
Juglandaceae				
<i>Carya ovata</i>	shagbark hickory	x	x	x
Juncaceae				
<i>Juncus canadensis</i>	Canada rush		x	x
<i>Juncus effusus</i>	common soft rush		x	x
<i>Juncus marginatus</i>	grass-leaved rush	x		
<i>Juncus pylaei</i>	Pylae's soft rush		x	
<i>Juncus tenuis</i>	path rush		x	x
<i>Luzula multiflora</i> ssp. <i>multiflora</i>	common wood rush	x	x	x
Lamiaceae				
<i>Lycopus uniflorus</i>	northern water-horehound	x	x	x
<i>Mentha arvensis</i>	ginger mint		x	x
<i>Scutellaria lateriflora</i>	mad dog skullcap		x	x
Lauraceae				
<i>Lindera benzoin</i>	northern spicebush		x	x
<i>Sassafras albidum</i>	sassafras	x	x	x

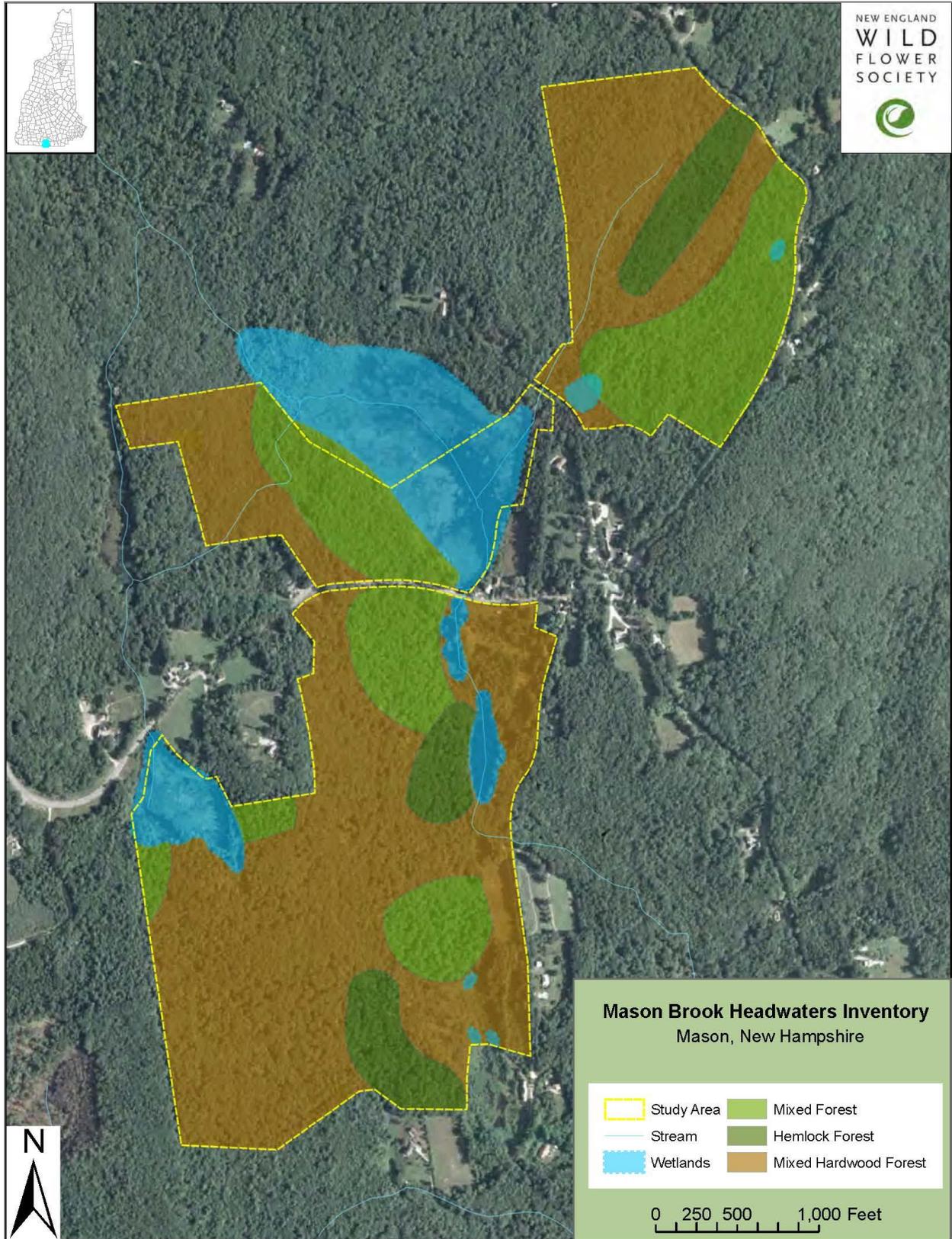
Species	Common Name	Inventory Area		
		N	M	S
Liliaceae		N	M	S
<i>Clintonia borealis</i>	yellow blue-bead lily	x		
<i>Medeola virginiana</i>	Indian cucumber root	x	x	x
Lythraceae				
<i>Lythrum salicaria</i> **	purple loosestrife		x	
Malvaceae				
<i>Tilia americana</i> var. <i>americana</i>	American linden	x	x	
Melanthiaceae				
<i>Trillium undulatum</i>	painted trillium	x	x	
Myricaceae				
<i>Comptonia peregrina</i>	sweet-fern	x	x	x
Myrsinaceae				
<i>Lysimachia borealis</i>	starflower	x		x
<i>Lysimachia quadrifolia</i>	whorled yellow-loosestrife	x	x	x
<i>Lysimachia terrestris</i>	swamp yellow-loosestrife	x	x	x
Nymphaeaceae				
<i>Brasenia schreberi</i>	water-shield		x	x
<i>Nuphar variegata</i>	yellow pond-lily		x	
<i>Nymphaea odorata</i>	white water-lily		x	x
Oleaceae				
<i>Fraxinus americana</i>	white ash		x	
<i>Fraxinus pennsylvanica</i>	green ash	x	x	x
Onagraceae				
<i>Chamerion angustifolium</i>	narrow-leaved fireweed	x		
<i>Circaea alpina</i>	small enchanter's-nightshade	x		
<i>Epilobium coloratum</i>	eastern willow-herb		x	
<i>Ludwigia palustris</i>	common water-primrose	x	x	
Orchidaceae				
<i>Cypripedium acaule</i>	pink lady's-slipper	x	x	x
Orobanchaceae				
<i>Agalinis paupercula</i>	small-flowered false-foxglove		x	
<i>Aureolaria pedicularia</i> var. <i>pedicularia</i>	fern-leaved false foxglove	x		
<i>Epifagus virginiana</i>	beechnut		x	x
<i>Melampyrum lineare</i>	cow-wheat	x	x	x
Oxalidaceae				
<i>Oxalis florida</i> (R)	flowering yellow wood sorrel		x	x
<i>Oxalis stricta</i>	common yellow wood sorrel		x	x

Species	Common Name	Inventory Area		
		N	M	S
Papaveraceae				
<i>Chelidonium majus</i> *	greater celandine	x		
Phrymaceae				
<i>Mimulus ringens</i>	Allegheny monkey-flower		x	x
Pinaceae				
<i>Pinus resinosa</i>	red pine		x	x
<i>Pinus rigida</i>	pitch pine	x		
<i>Pinus strobus</i>	eastern white pine	x	x	x
<i>Tsuga canadensis</i>	eastern hemlock	x	x	x
Plantaginaceae				
<i>Chelone glabra</i>	white turtlehead		x	
<i>Plantago lanceolata</i> *	English plantain		x	x
<i>Plantago major</i> *	common plantain		x	x
<i>Plantago rugelii</i>	Rugel's plantain		x	x
<i>Veronica officinalis</i> *	common speedwell		x	x
<i>Veronica serpyllifolia</i> *	thyme-leaved speedwell		x	x
Poaceae				
<i>Agrostis perennans</i>	autumn bentgrass		x	
<i>Alopecurus pratensis</i> * (R)	field meadow-foxtail			x
<i>Anthoxanthum odoratum</i> *	large sweet grass		x	x
<i>Brachyelytrum aristosum</i>	northern long-awned wood grass	x		x
<i>Brachyelytrum erectum</i> (IND)	southern long-awned wood grass		x	
<i>Bromus inermis</i>	smooth brome		x	
<i>Calamagrostis canadensis</i> var. <i>canadensis</i>	bluejoint		x	x
<i>Dactylis glomerata</i> *	orchard grass		x	x
<i>Danthonia spicata</i>	poverty grass	x	x	
<i>Deschampsia flexuosa</i>	wavy hair grass	x		
<i>Dichanthelium acuminatum</i>	hairy rosette-panicgrass	x	x	x
<i>Dichanthelium clandestinum</i>	deer-tongue rosette-panicgrass	x	x	
<i>Digitaria filiformis</i> var. <i>filiformis</i> (SH)	slender crabgrass	x		
<i>Elymus repens</i> *	creeping wild-rye			x
<i>Glyceria borealis</i>	northern manna grass		x	
<i>Glyceria canadensis</i>	rattlesnake manna grass		x	x
<i>Glyceria grandis</i>	American manna grass		x	
<i>Leersia oryzoides</i>	rice cut grass		x	x
<i>Leersia virginica</i>	white cut grass	x	x	x
<i>Oryzopsis asperifolia</i>	roughleaf ricegrass			x
<i>Phalaris arundinacea</i>	reed canary grass		x	
<i>Phleum pratense</i> *	common Timothy			x
Polygalaceae				
<i>Polygala paucifolia</i>	gaywings	x	x	
<i>Fallopia cilinodis</i>	fringed bindweed	x		
<i>Persicaria careyi</i>	Carey's smartweed		x	
<i>Persicaria maculosa</i> *	lady's-thumb smartweed	x	x	x
<i>Persicaria sagittata</i>	arrow-leaved tearthumb		x	x
<i>Rumex acetosella</i> *	common sheep sorrel			x
<i>Rumex crispus</i> *	curly dock	x	x	x
<i>Rumex obtusifolius</i> *	bitter dock		x	

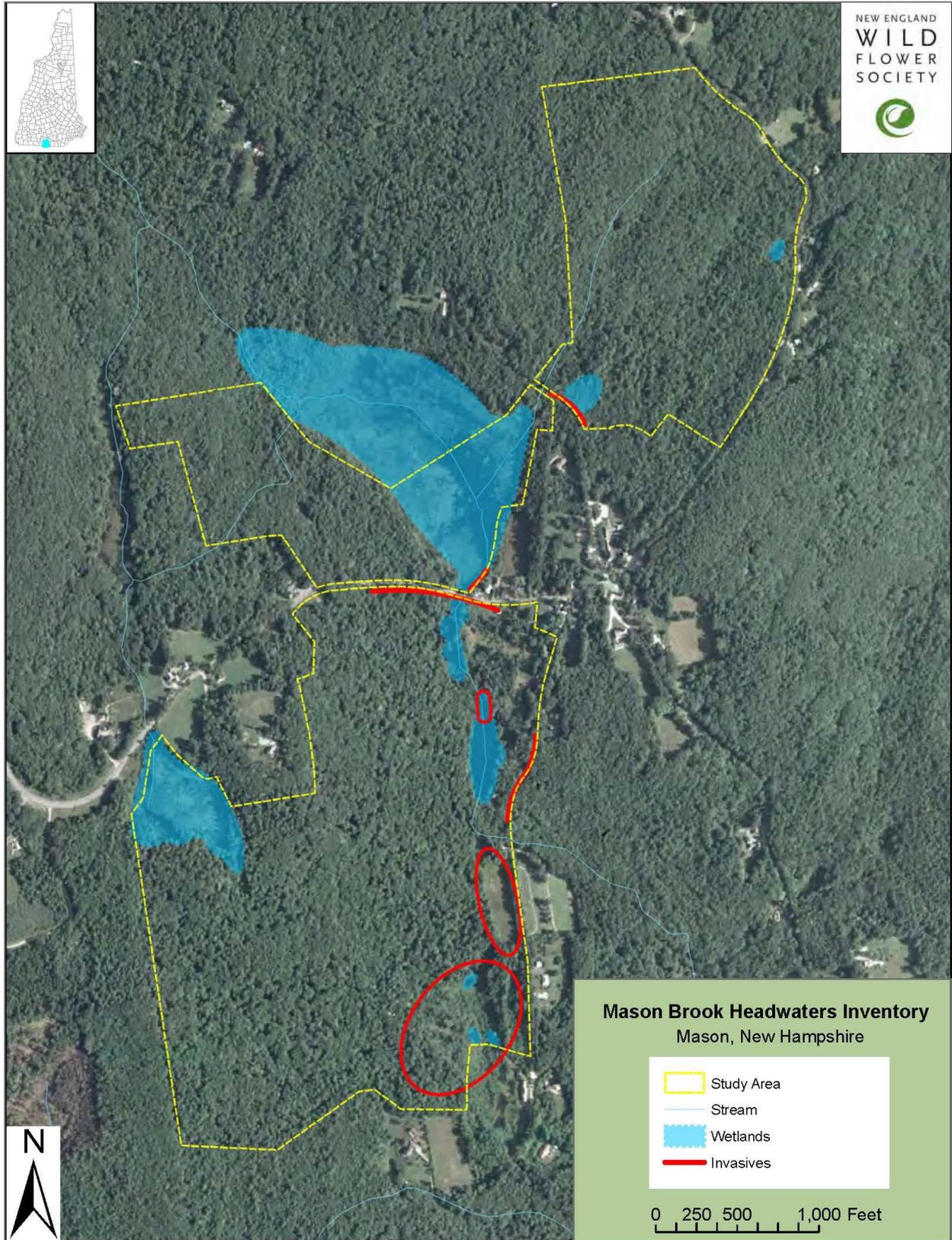
Species	Common Name	Inventory Area		
		N	M	S
Pontederiaceae				
<i>Pontederia cordata</i>	pickerelweed		x	
Potamogetonaceae				
<i>Potamogeton epihydrus</i>	ribbon-leaved pondweed		x	x
Ranunculaceae				
<i>Anemone quinquefolia</i>	wood windflower, wood anemone		x	
<i>Aquilegia vulgaris</i> *	European columbine		x	
<i>Clematis virginiana</i>	Virginia virgin's-bower	x	x	
<i>Coptis trifolia</i>	three-leaved goldthread	x	x	
<i>Ranunculus acris</i> *	tall buttercup		x	
<i>Ranunculus bulbosus</i> *	bulbous crowfoot		x	x
<i>Thalictrum pubescens</i>	tall meadow-rue	x	x	
Rosaceae				
<i>Amelanchier</i> sp.		x		
<i>Aronia melanocarpa</i>	black chokeberry	x	x	
<i>Fragaria virginiana</i>	common strawberry		x	x
<i>Malus</i> sp.		x	x	x
<i>Potentilla canadensis</i>	dwarf cinquefoil		x	x
<i>Potentilla recta</i> *	sulphur cinquefoil		x	x
<i>Potentilla simplex</i>	common cinquefoil	x	x	x
<i>Prunus serotina</i>	black cherry	x	x	x
<i>Prunus virginiana</i>	choke cherry		x	x
<i>Rosa multiflora</i> **	rambler rose	x	x	x
<i>Rubus allegheniensis</i>	common blackberry	x	x	x
<i>Rubus hispidus</i>	swamp dewberry	x	x	x
<i>Rubus idaeus</i>	red raspberry		x	x
<i>Rubus pubescens</i>	dwarf raspberry	x		
<i>Sorbus</i> sp.		x	x	x
<i>Spiraea alba</i> var. <i>latifolia</i>	white meadowsweet	x	x	x
<i>Spiraea tomentosa</i>	steeplesh		x	x
Rubiaceae				
<i>Cephalanthus occidentalis</i>	common buttonbush	x	x	x
<i>Galium circaezans</i>	forest licorice bedstraw		x	
<i>Galium mollugo</i> *	whorled bedstraw		x	
<i>Galium palustre</i>	marsh bedstraw	x		x
<i>Galium triflorum</i>	fragrant bedstraw	x	x	x
<i>Houstonia caerulea</i>	little bluet		x	x
<i>Mitchella repens</i>	partridge-berry	x	x	x
Ruscaceae				
<i>Maianthemum canadense</i>	Canada-mayflower	x	x	x
<i>Maianthemum racemosum</i>	feathery false Solomon's-seal	x	x	
<i>Polygonatum pubescens</i>	hairy Solomon's-seal	x	x	
Salicaceae				
<i>Populus grandidentata</i>	big-toothed poplar		x	x
<i>Salix cinerea</i> **	gray willow			x
<i>Salix sericea</i>	silky willow	x		

Species	Common Name	Inventory Area		
		N	M	S
Sapindaceae				
<i>Acer pensylvanicum</i>	striped maple	x	x	x
<i>Acer rubrum</i>	red maple	x	x	x
<i>Acer saccharum</i>	sugar maple	x	x	x
Saxifragaceae				
<i>Chrysosplenium americanum</i>	golden-saxifrage		x	x
Smilacaceae				
<i>Smilax rotundifolia</i>	round-leaf greenbrier	x	x	
Solanaceae				
<i>Solanum carolinense</i> *	Carolina nightshade		x	x
<i>Solanum dulcamara</i> *	climbing nightshade		x	
Taxaceae				
<i>Taxus canadensis</i>	American yew		x	
Typhaceae				
<i>Sparganium americanum</i>	American bur-reed		x	x
<i>Sparganium emersum</i>	simple-stemmed bur-reed		x	x
<i>Typha latifolia</i>	broad-leaved cat-tail		x	
Ulmaceae				
<i>Ulmus americana</i>	American elm	x	x	x
<i>Boehmeria cylindrica</i>	small-spiked false nettle		x	x
<i>Pilea pumila</i>	Canada clearweed	x		
Verbenaceae				
<i>Verbena hastata</i>	blue vervain		x	
Violaceae				
<i>Viola blanda</i>	sweet white violet		x	x
<i>Viola cucullata</i>	blue marsh violet	x	x	
<i>Viola lanceolata</i>	lance-leaved violet		x	x
<i>Viola pallens</i>	smooth white violet	x	x	x
<i>Viola sagittata</i>	arrowhead violet		x	x
<i>Viola sororia</i>	woolly blue violet	x		x
Vitaceae				
<i>Parthenocissus quinquefolia</i>	Virginia-creeper	x	x	x
<i>Vitis aestivalis</i>	summer grape		x	x
<i>Vitis labrusca</i>	fox grape	x	x	x

APPENDIX D. NATURAL COMMUNITIES



APPENDIX E. INVASIVE SPECIES INFESTATIONS



APPENDIX F. EXPLANATION OF STATE RANK CODES

Ranks describe rarity within New Hampshire (statewide or "S" rank).

Code Description

- S1 Critically imperiled because extreme rarity (generally one to five occurrences) or some factor of its biology makes it particularly vulnerable to extinction.
- S2 Imperiled because rarity (generally six to 20 occurrences) or other factors demonstrably make it very vulnerable to extinction.
- S3 Either very rare and local throughout its range (generally 21 to 100 occurrences), or found locally (even abundantly at some of its locations) in a restricted range, or vulnerable to extinction because of other factors.
- S4 Widespread and apparently secure, although the species may be quite rare in parts of its range, especially at the periphery.
- S5 Demonstrably widespread and secure, although the species may be quite rare in parts of its range, particularly at the periphery.
- SU Status uncertain, but possibly in peril. More information needed.
- SH Known only from historical records, but may be rediscovered.
- SX Believed to be extinct. May be rediscovered, but evidence indicates that this is less likely than for historical species.
- SW State Watch: native plants vulnerable to becoming threatened based on having 21-100 natural occurrences in the state observed within the last 20 years, or plants that are, in the judgment of experts, vulnerable to becoming threatened due to other important rarity and endangerment considerations (population size and trends, area of occupancy, overall viability, geographic distribution, habitat rarity and integrity, and/or degree of protection).

* In this list, ranks that are uncertain (e.g., span two categories) have been "rounded" to the most-at-risk category.

* This list is a modification of "Explanation of Global and State Rank Codes" published in *Rare Plant List for New Hampshire* (2013) and "State Watch" and "Indeterminate" Plant Species in NH, web published (2010).

APPENDIX G. 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.

Herbaceous plants or herbs: 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.

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-flowing plant: for this inventory, includes ferns and fern allies.

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 which 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.

Woody plants: plants with secondary growth, with stems that thicken each year by adding new tissue. The outermost layer of the main stem consists of a hard, nonliving tissue called bark. The living parts of woody plants, such as the inner bark and buds, remain alive.