

**Ecological and Land Management Survey
and Botanical Inventory
for the Nipmuc River Conservation Area
in Burrillville, Rhode Island**



**Submitted by
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October 2004



Providing Ecosystem Science and Information

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Site location

The Nipmuc River Conservation Area is located in Burrillville, Providence County, Rhode Island. It is located within the United States Geological Survey Chepachet, Rhode Island topographic quadrangle (see Figure 1). The property is situated in the northwest corner of Rhode Island, less than 1500 meters south of the Massachusetts border. It is bounded by Round Top Road (Route 96) to the west, Sherman Farm Road (Route 98) to the east, and Brook Road to the north.

Directions

The main access point is located approximately one mile north of Harrisville on Round Top Road (Route 96). There is a small parking sign on the west side of the road and a large entrance sign at the trailhead on the east side of the road.

Access/parking

The Nipmuc River Conservation Area is accessed most easily from a public trail with an entrance on Round Top Road (see above). Parking is available along the west side of the road.

Survey dates and observers

Five visits were made to the property on the following days: 4 June, 9 July, 27 July, 24 August, and 22 September. The first trip was an orientation visit with Marc Tremblay. Jackie Sones (Conservation Biologist), Ginger Brown (Ecological Inventory, Monitoring, & Stewardship Program Coordinator), Lisa Gould (Senior Scientist) and Kristen Puryear (RINHS volunteer) performed the site visits. An aerial photograph of the property, survey routes, and features noted during the surveys are illustrated in Figures 2, 3, and 4, respectively.

Property description

The Nipmuc River Conservation Area is approximately 214 acres (86 hectares) in size and is roughly rectangular in shape — approximately 2200 meters long and 200–600 meters wide. The property boundary generally follows the drainage of the Nipmuc River. Slopes are relatively gentle, with elevations ranging from 300–400 feet. There are some small hills in the center of the property, and one steep slope along the river in the northeast corner (see Figure 1). Major features include the river itself, along with relatively flat upland forests.

The two major forest types include Oak–Pine Forest and Hemlock–Hardwood Forest. The Oak–Pine Forest is dominated by Red Oak (*Quercus rubra*) and White Pine (*Pinus strobus*), with an understory of Witch Hazel (*Hamamelis virginiana*), Black Huckleberry (*Gaylussacia baccata*), and Lowbush Blueberry (*Vaccinium angustifolium*).

The Hemlock–Hardwood Forest is dominated by Eastern Hemlock (*Tsuga canadensis*), with occasional Red Oak (*Quercus rubra*) and Sugar Maple (*Acer saccharum*). Understory associates include Bracken Fern (*Pteridium aquilinum*), Wild Sarsparilla (*Aralia nudicaulis*), Partridgeberry

(*Mitchella repens*), Wintergreen (*Gaultheria procumbens*), and Canada Mayflower (*Maianthemum canadense*).

The Red Maple–Deciduous Shrub Swamp is dominated by Red Maple (*Acer rubrum*) and shrubs such as Highbush Blueberry (*Vaccinium corymbosum*), Spicebush (*Lindera benzoin*), Winterberry (*Ilex verticillata*), and Sweet Pepperbush (*Clethra alnifolia*). Skunk Cabbage (*Symplocarpus foetidus*) and Cinnamon Fern (*Osmunda cinnamomea*) are also common.

One of the interesting communities on the property, the Riverside Sand/Gravel Bars, support smartweeds (*Polygonum* spp.), Cardinal-flower (*Lobelia cardinalis*), Virginia Meadow-beauty (*Rhexia virginica*), Common Yellow-eyed Grass (*Xyris difformis*), and White Turtlehead (*Chelone glabra*).

The beaver pond has some open water with Yellow Pond-lilies (*Nuphar variegata*) as well as a Scrub/Shrub Wetland type dominated by Winterberry (*Ilex verticillata*) and Tussock Sedge (*Carex stricta*).

The surrounding properties are primarily residential, with some agricultural land, as well as an abandoned gravel pit in the northeast corner.

Natural communities

The property is diverse and contains the following natural communities (based on Enser 2002c):

- Oak–Pine Forest
- Hemlock–Hardwood Forest
- Upper Perennial Stream/River
- Intermittent Stream
- Eutrophic Pond
- Riverside Sand/Gravel Bar
- Scrub/Shrub Wetland
- Red Maple–Deciduous Shrub Swamp
- Vernal Pool

The natural communities present are generally of good quality. The property is relatively unfragmented except for off-road vehicle tracks at the northern end and a few walking paths.

The general distribution of the forested and wetland community types can be seen in Figure 5.

For full descriptions of the community types, refer to *A Natural Community Classification of Rhode Island* (Enser 2002c). This document is available online at:

<http://www.state.ri.us/dem/programs/bpoladm/plandev/heritage/index.htm>.

Aquatic resources

At the northern end of the property, the Nipmuc River flows south from the confluence of Round Top Brook and Chockalog Brook. The Nipmuc River runs north–south through the center of the

property. A small, unnamed stream also runs north–south in the southwestern portion of the property and eventually joins the Nipmuc River at the southern end of the property. Intermittent streams feed into the river in a few locations. The dominant Red Maple–Deciduous Shrub Swamp is located in the southern portion of the property. A small freshwater pond and a beaver pond are located in the northeastern corner (see Figure 4). Based on wildlife sightings, vernal pools are probably present on the property, but their locations are currently unknown.

After the Nipmuc River leaves the Nipmuc River Conservation Area, it eventually runs into the Harrisville Reservoir. Water quality impacts within the property boundaries could impact important water resources downstream.

Flora

A complete list of plant species observed in 2004 can be found in Table 1. A second plant list in taxonomic order including status and abundance in Rhode Island can be found in Appendix F.

184 plant species were observed in 2004, including the following: 177 native species (2 of which are state-listed), 3 non-native species (2 of which are invasive), and 4 species of unknown origin. Life forms included 25 trees, 40 shrubs, 9 vines, 17 ferns and fern-like plants, 11 grasses and grass-like plants, and 82 wildflowers (see Table 1).

Two state-listed plant species were documented: Woodland-horsetail (*Equisetum sylvaticum*) and Large-leaved Aster (*Aster macrophyllus*). Both of these are species of Concern in Rhode Island. Their locations on the property can be seen in Figure 6. Photographs of them can be found in Appendix B. There are only 11 other records in the state (2 in the past 20 years) for Woodland-horsetail, and 9 other records in the state (none in the last 20 years) for Large-leaved Aster.

Two of the non-native species, Japanese Barberry (*Berberis thunbergii*) and True Watercress (*Rorippa nasturtium-aquaticum*), are considered invasive by the Rhode Island Invasive Species Council (Gould 2001). A Japanese Barberry fact sheet can be found in Appendix D.

Further botanical work could reveal other plant species of interest, especially in the wetlands.

Fauna

Birds: No formal bird inventory work has been done on the site. However, Todd McLeish has maintained an informal list and his observations are reported in Table 2. Todd has recorded 65 species of birds in the Nipmuc River Conservation Area. During visits in 2004, we confirmed many of these species, and added one species. This brings the total bird species list to 66. Three of these species are ecoregional conservation targets for The Nature Conservancy and ten are priority species listed in the Partners in Flight Landbird Conservation Plan for Southern New England (Dettmers and Rosenberg 2000).

Mammals: Apparently no mammal inventory work has been done at the site (Brown, C. pers. comm.; Tefft, pers. comm.). However, a few observations were made during our visits, and other species are expected based on natural community types present and status/distribution in Rhode

Island. Table 3 includes a list of 25 mammal species with the potential to occur at the Nipmuc River Conservation Area.

Amphibians and reptiles: Apparently no amphibian and reptile work has been done at the site (Raithel, pers. comm.; Tefft, pers. comm.). However, the following three amphibians and one reptile were observed in 2004:

American Toad (*Bufo americanus americanus*)
Green Frog (*Rana clamitans melanota*)
Wood Frog (*Rana sylvatica*)
Eastern Garter Snake (*Thamnophis sirtalis sirtalis*)

The Wood Frogs indicate the presence of vernal pools.

There is also a Rhode Island Natural Heritage Program record for Wood Turtle (*Clemmys insculpta*) in the Nipmuc River (just south of the Nipmuc River Conservation Area). Wood Turtle is a species of Concern in Rhode Island and a conservation target in The Nature Conservancy's Lower New England/Northern Piedmont Region (Barbour 2001). There are only 11 records for Wood Turtle in the state (3 in the last 20 years). Photographs of Wood Turtles can be found in Appendix B and a fact sheet about Wood Turtles can be found in Appendix E.

Fish: Table 4 lists ten species of fish that have been documented in the Nipmuc River by the Rhode Island Department of Environmental Management (Libby 2004). Seven of these are native and three are non-native.

Dragonflies and damselflies: Table 5 lists 22 species of dragonflies and damselflies that have been documented at the Nipmuc River Conservation Area. Twenty-one were recorded by the Rhode Island Odonata Atlas (Brown 2004) and one additional species was observed in 2004, bringing the total list of dragonflies and damselflies on the property to twenty-two. These species are typical of southern New England odonate assemblages associated with small rivers and are indicative of good habitat quality.

Robber flies: Seven species of robber flies were recorded at the Nipmuc River Conservation Area in 2004: *Efferia aestuans*, *Holopogon phaenotus*, *Laphria canis*, *Laphria canis* complex, *Laphria grossa* (sight record), *Machimus sadyates*, and *Machimus snowii*.

Soils

Nine soil types are present on the Nipmuc River Conservation Area (see Figure 7). The dominant types include Rumney fine sandy loam (Ru), Hinckley gravelly sandy loam, rolling (HkC), and Hinckley gravelly sandy loam, hilly (HkD). Also present are Walpole sandy loam (Wa), Adrian muck (Aa), Sudbury sandy loam (Ss), Merrimac sandy loam, 3–8% slope (MmB), Canton and Charlton extremely stony fine sandy loam, 3–15% slope (CkC), and Windsor loamy sand, 3–8% slope (WgB). Some of these soil types are sensitive to groundwater pollution and erosion.

Abiotic condition

Abiotic conditions seem good. The water quality appears excellent. There are a few areas that have been impacted by off-road vehicle activity, causing erosion along the riverbank.

Ecological processes

Water flow in the Nipmuc River has not been altered significantly. Possible water withdrawal in the southern portion of the property should be reviewed (see location in Figure 4 and photograph in Appendix C). It appears that there have been some human influences (e.g., a possible dam) at the small pond in the northeastern corner of the property. There is some beaver activity in the northern portion of the property.

Anthropogenic disturbances

Off-road vehicle activity is visible in the northern section of the property. One of the main off-road vehicle access points may be the old gravel pit in the northeast corner of the property (see Figure 4). Informal walking paths are present throughout the property. There are a few hunting stands/ladders scattered along the western side of the property. Land has been cleared very close to the western property boundary, and bulldozer tracks lead directly to and may have crossed over onto the property (see Figure 4 and Appendix C). A water withdrawal system may be in place in the southeastern portion of the property. There are several small wooden bridges crossing the stream in the southwestern corner of the property. Flagging is present along southern sections of the river; it is not known who maintains these flags, but it is possible that they belong to a USGS Water Gauging site. Other miscellaneous disturbances include a few campfire sites and rope swings along the river.

Threats (including invasive species)

Changes in hydrology and water quality: Pollution, sedimentation, changes in water quantity and flow could alter the conditions within the river and downstream. A possible water withdrawal system in the southeastern portion of the river should be researched. Off-road vehicle activity should be addressed (see below).

Off-road vehicle activity: Off-road vehicle tracks are currently causing habitat destruction, habitat fragmentation, and erosion. In the northeastern corner of the property the vehicles are at least occasionally crossing the river, an activity that has potential to degrade water quality.

Trespassing: Informal paths have been maintained throughout the property, especially in the northwest corner. These trails have caused or encouraged habitat fragmentation, dumping, and increased off-road vehicle activity. There is also a large clearing on the western edge of the property, with bulldozer tracks that may extend across the boundary.

Invasive species: A few Japanese Barberry plants were found scattered throughout the property. And, although not officially within the property boundaries, several invasive plant species were found along the edge of the field that leads to the trail entrance — Japanese Barberry (*Berberis thunbergii*), Asiatic Bittersweet (*Celastrus orbiculatus*), bush honeysuckle (*Lonicera* sp.), Common

Buckthorn (*Rhamnus frangula*), and Multiflora Rose (*Rosa muliflora*). Invasive species could displace native species and reduce biodiversity at the site.

Management comments and monitoring needs

State-listed species: Three state-listed species have been found at or near the Nipmuc River Conservation Area: Woodland-horsetail (State Concern), Large-leaved Aster (State Concern), and Wood Turtle (State Concern). Annual or semi-annual visits to document the status of these species and threats to their populations are recommended. Updates should be submitted to the Rhode Island Natural Heritage Program. Both the Woodland-horsetail and Large-leaved Aster populations are located along the main walking trail and therefore could be vulnerable to human impacts. It would be helpful to monitor any changes to the trail or visitor use that could threaten these species.

Invasive species: If possible, establish a proactive management strategy to prevent the further spread of invasive species. Japanese Barberry plants should be removed whenever possible (see fact sheet in the Appendix). Trails should be monitored annually for invasive species, especially near the entrance where there is a known source.

Off-road vehicle impacts: Property boundaries should be posted, with information about ownership and regulations (e.g., activities that are permitted and not permitted). Establish regular monitoring visits to establish a presence on the property.

Trails: Maintain the walking trail. Consider other trails, but only if they would not encourage further off-road vehicle impacts. Design trails that are ecologically sensitive, especially when in proximity to the river, streams, and wetlands. Avoid high-impact recreational activities, e.g., those that increase erosion.

Forest Management: Design a forest management plan that minimizes fragmentation, edge effects, loss of forest cover, and erosion. The plan should also take into account rare species locations and wetland buffers.

Interpretation: Consider adding interpretive information to the kiosk at the trail entrance and possibly offering an annual walk to encourage local appreciation and support for the natural resources on the property.

Adjacent conservation land

Other nearby conservation areas include two Rhode Island Department of Environmental Management properties (Round Top Wildlife Management Area and Black Hut Wildlife Management Area) as well as one Audubon Society of Rhode Island property: Fayette E. Bartlett. See Figure 8.

Inventory needs

Rare plants: It would be helpful to thoroughly document the Woodland-horsetail and Large-leaved Aster populations at the site by conducting more searches specifically for these species and to

document their reproductive status. Also, more time should be dedicated to evaluating the orchids, sedges, and rushes on the property and whether any other rare plant species are present.

Reptiles: Because there is a nearby record for Wood Turtle [(*Clemmys insculpta*)—State Concern] on the Nipmuc River, it would be worthwhile determining if Wood Turtles are using the stretch of river within the Nipmuc River Conservation Area. This property also has the potential to support Ribbon Snake (*Thamnophis sauritus*), a species of Concern in Rhode Island.

Mammals: Two state-listed small mammals would be worth searching for at the Nipmuc River Conservation Area: Common Water Shrew (*Sorex palustris*) and Smoky Shrew. Both of these are species of Concern in Rhode Island.

Dragonflies: The river and smaller streams have potential to support two rare dragonflies: Arrowhead Spiketail [(*Cordulegaster obliqua*) — State Concern] and Southern Pygmy Clubtail [(*Lanthus vernalis*) — known from only six other locations in Rhode Island]. Searches should be conducted during their flight seasons (e.g., June). Other rare dragonflies of interest include Zebra Clubtail [(*Sylurus scudderi*)—State Threatened], Brook Snaketail [(*Ophiogomphus aspersus*)—State Threatened], and Maine Snaketail (*Ophiogomphus mainensis*).

Freshwater mussels: Freshwater mussels have exhibited strong declines throughout the Northeast. Five species are state-listed in Rhode Island (Enser 2002a). The water quality in the Nipmuc River may support freshwater mussel populations. Surveys should be conducted to detect the presence of any rare species.

Invasive species: More work should be done to document the level of Japanese Barberry infestation. Property boundaries should be checked for the presence of other invasive plant species and for invasive plant species sources (e.g., invasive species growing in neighbors' yards).

Vernal pools: Although Wood Frogs indicate the presence of vernal pools, more effort should be made to document vernal pool locations in order to avoid any negative impacts in the future. Amphibian calling surveys (listening for Wood Frogs) in the spring would be a good way to determine vernal pool locations.

Acknowledgements

Marc Tremblay provided orientation, maps, and contact information. Virginia Brown, Lisa Gould, and Kristen Puryear assisted with fieldwork. Todd McLeish offered his bird list. Alan Libby supplied results of fish surveys. Virginia Brown and Erik Endrulat contributed the list of dragonflies and damselflies. Charlie Brown, Rick Enser, Chris Raithel, Larry Taft, and Brian Tefft answered inquiries regarding wildlife inventories on and near the property. Erik Endrulat and Tom Kravitz (Burrillville Town Planner) provided GIS support. This project was funded by the Burrillville Conservation Commission and by a Rhode Island Natural History Survey Stewardship Grant (supported by the Boston Foundation).

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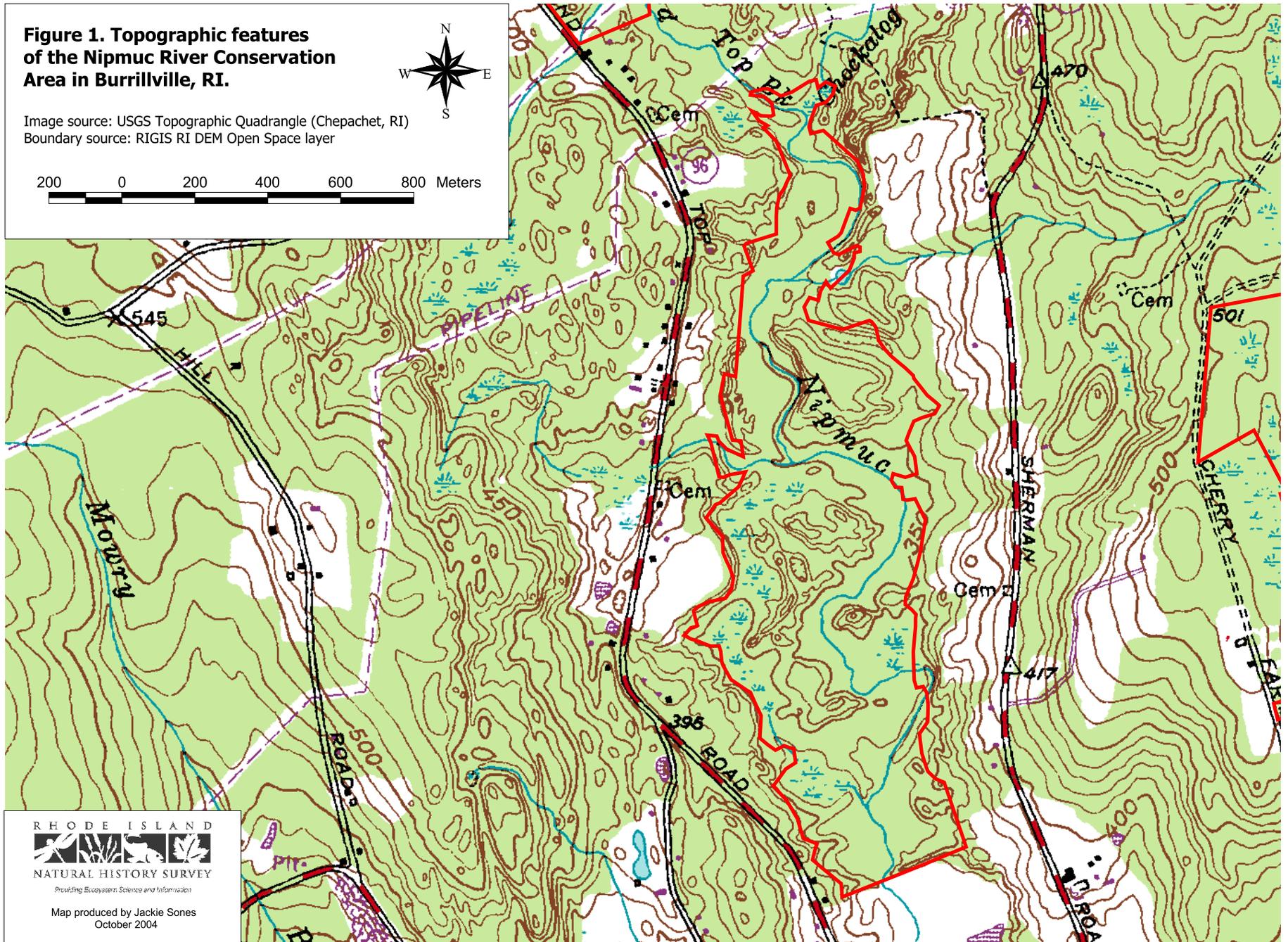
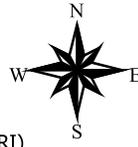
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Figure 1. Topographic features of the Nipmuc River Conservation Area in Burrillville, RI.

Image source: USGS Topographic Quadrangle (Chepachet, RI)
Boundary source: RIGIS RI DEM Open Space layer

200 0 200 400 600 800 Meters



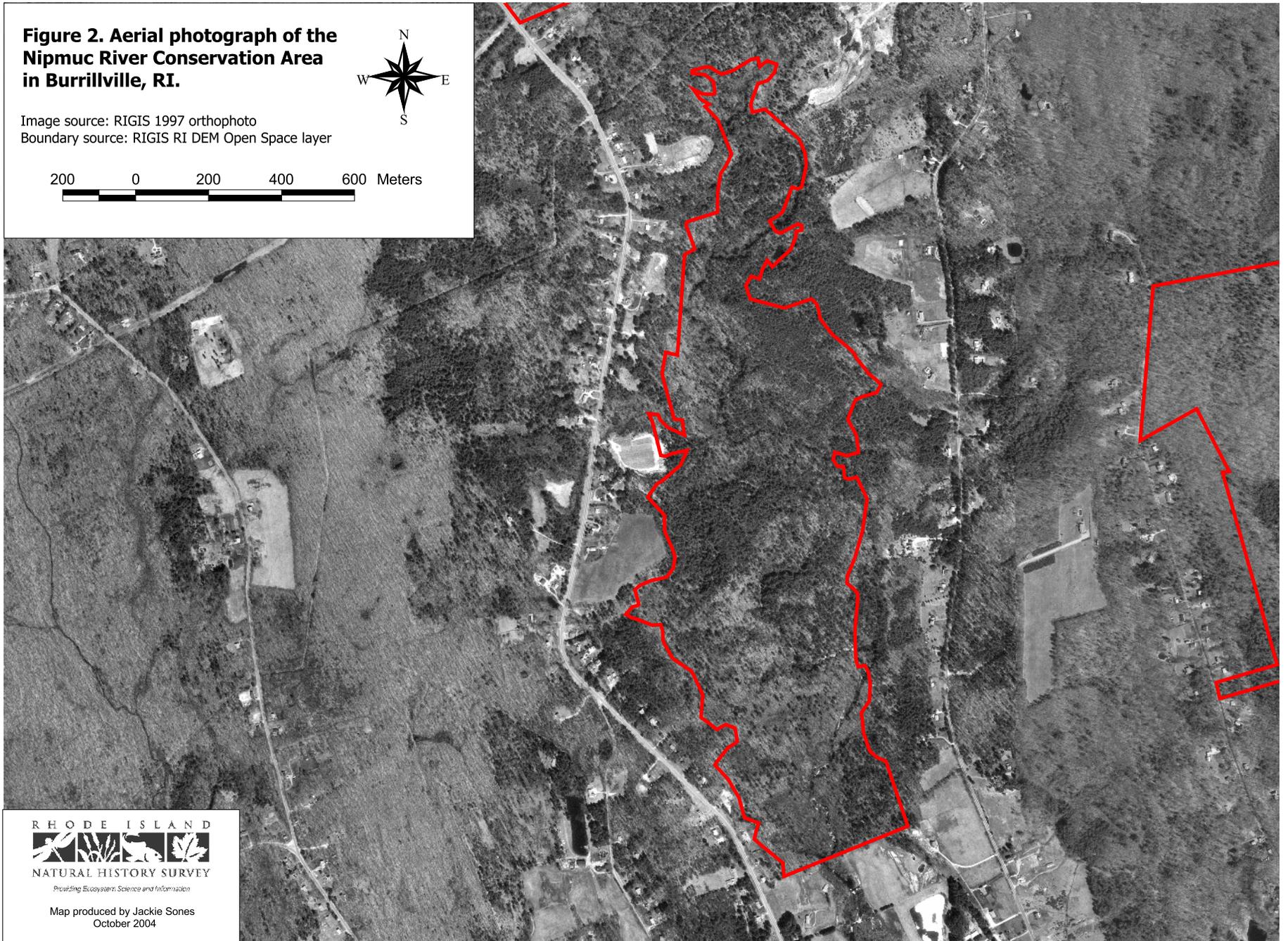
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Figure 2. Aerial photograph of the Nipmuc River Conservation Area in Burrillville, RI.



Image source: RIGIS 1997 orthophoto
Boundary source: RIGIS RI DEM Open Space layer



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**Figure 3. RINHS survey routes
at the Nipmuc River Conservation Area
during 2004.**

Image source: RIGIS 1997 orthophoto
Boundary source: RIGIS RI DEM Open Space layer
Survey routes: Garmin eTrex legend (3-15 meter accuracy)



200 0 200 400 600 800 Meters

-  River_stream
-  9 July 2004
-  27 July 2004
-  24 August 2004
-  22 September 2004

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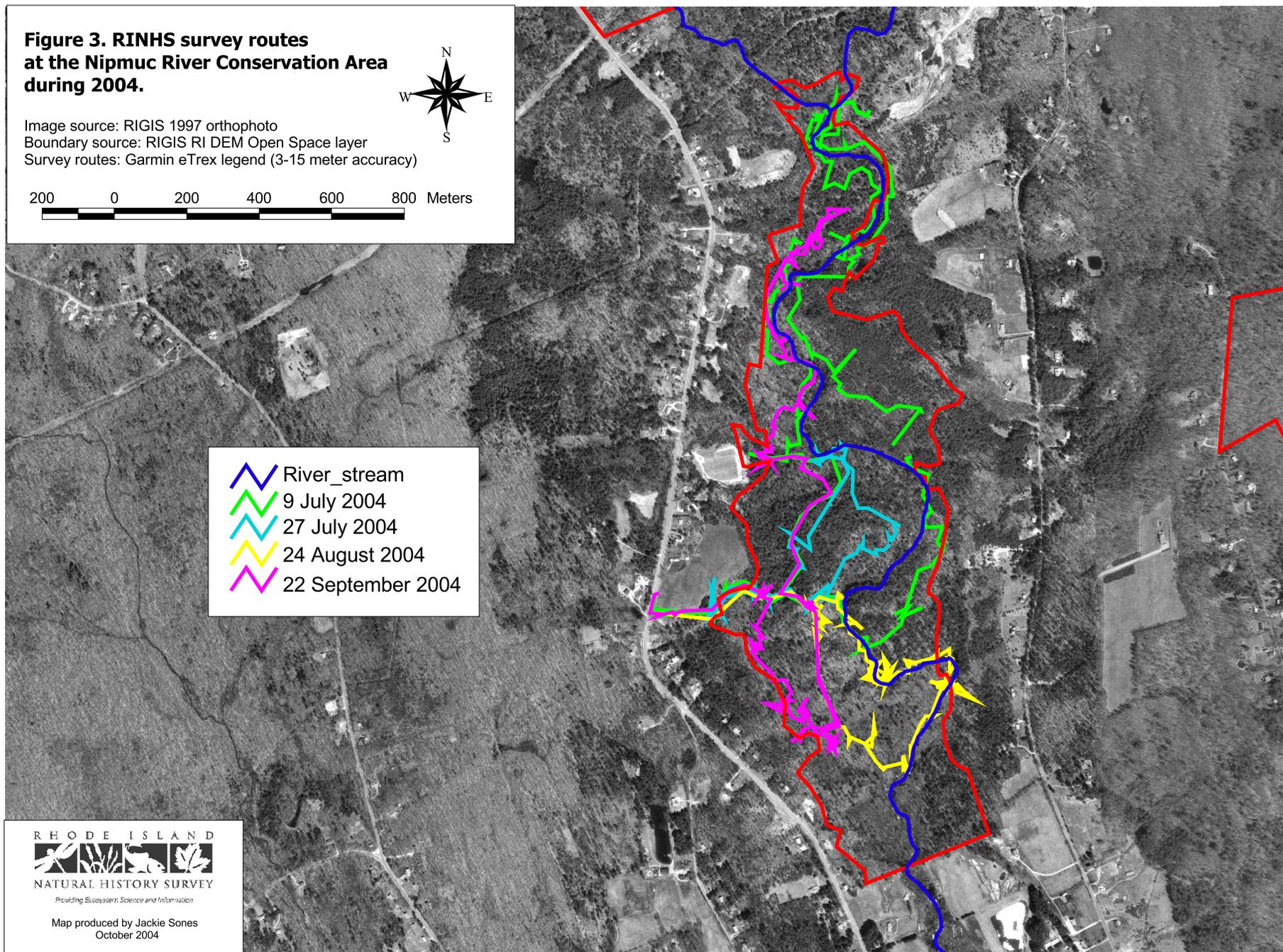


Figure 4. Features observed at the Nipmuc River Conservation Area in 2004.

Image source: RIGIS 1997 orthophoto
Boundary source: RIGIS RI DEM Open Space layer
Points: Garmin eTrex Legend (3-15 meter accuracy)



200 0 200 400 600 800 Meters

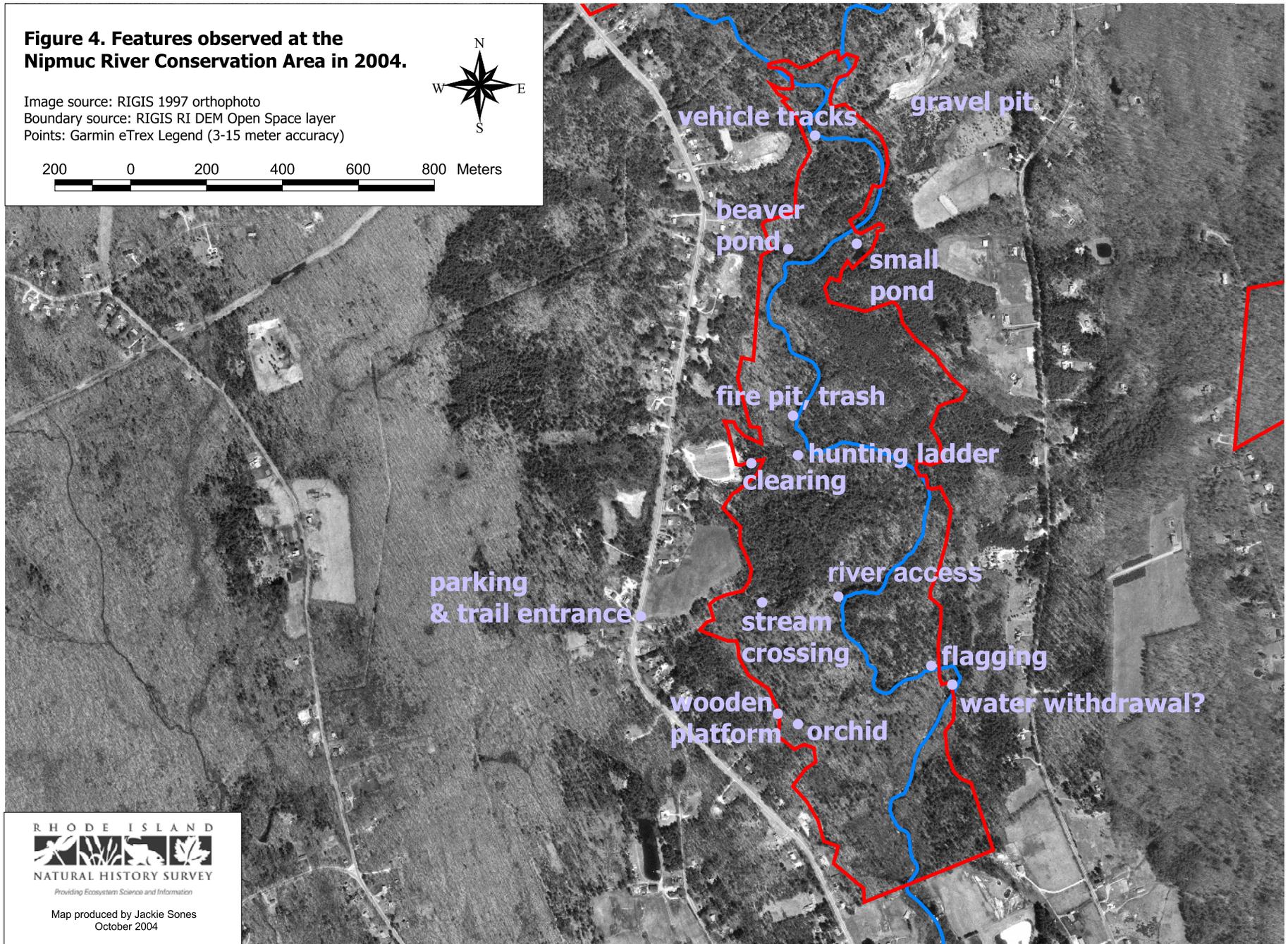


Figure 5. Land use at and near the Nipmuc River Conservation Area.

Image source: RIGIS Landuse layer (1995)
Boundary source: RIGIS RI DEM Open Space layer



200 0 200 400 600 800 Meters

-  Brushland (shrub and brush areas, reforestation)
-  Cropland (tillable)
-  Deciduous Forest (>80% hardwood)
-  Evergreen Forest (>80% softwood)
-  Idle Agriculture (abandoned fields and orchards)
-  Low Density Residential (>2 acre lots)
-  Medium Density Residential (1 to 1/4 acre lots)
-  Medium Low Density Residential (1 to 2 acre lots)
-  Mines, Quarries and Gravel Pits
-  Mixed Deciduous Forest (50 to 80% hardwood)
-  Mixed Evergreen Forest (50 to 80% softwood)
-  Pasture (agricultural not suitable for tillage)
-  Power Lines (100 ft or more width)
-  Transitional Areas (urban open)
-  Water
-  Wetland (not to be classified)

R H O D E I S L A N D



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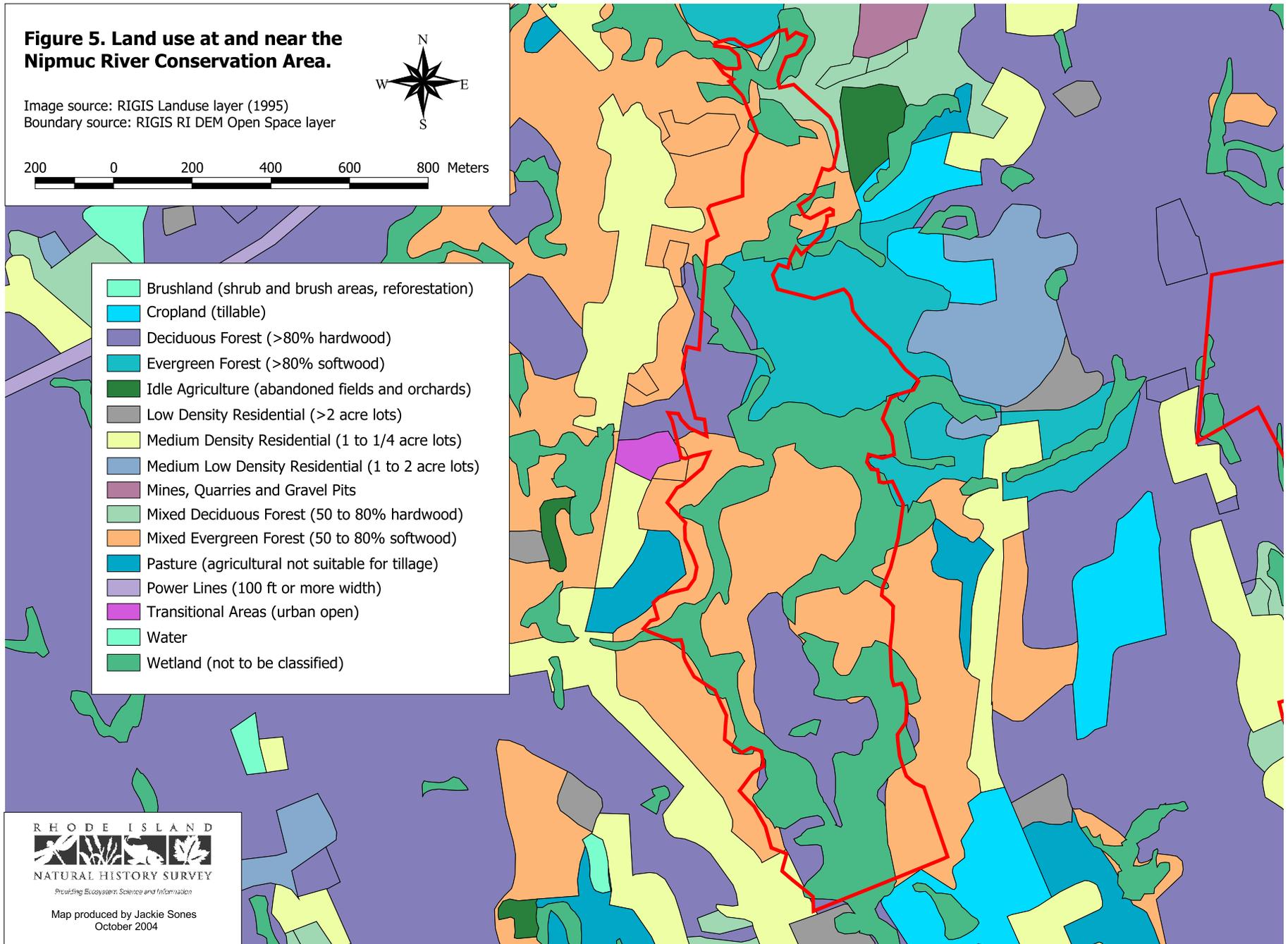
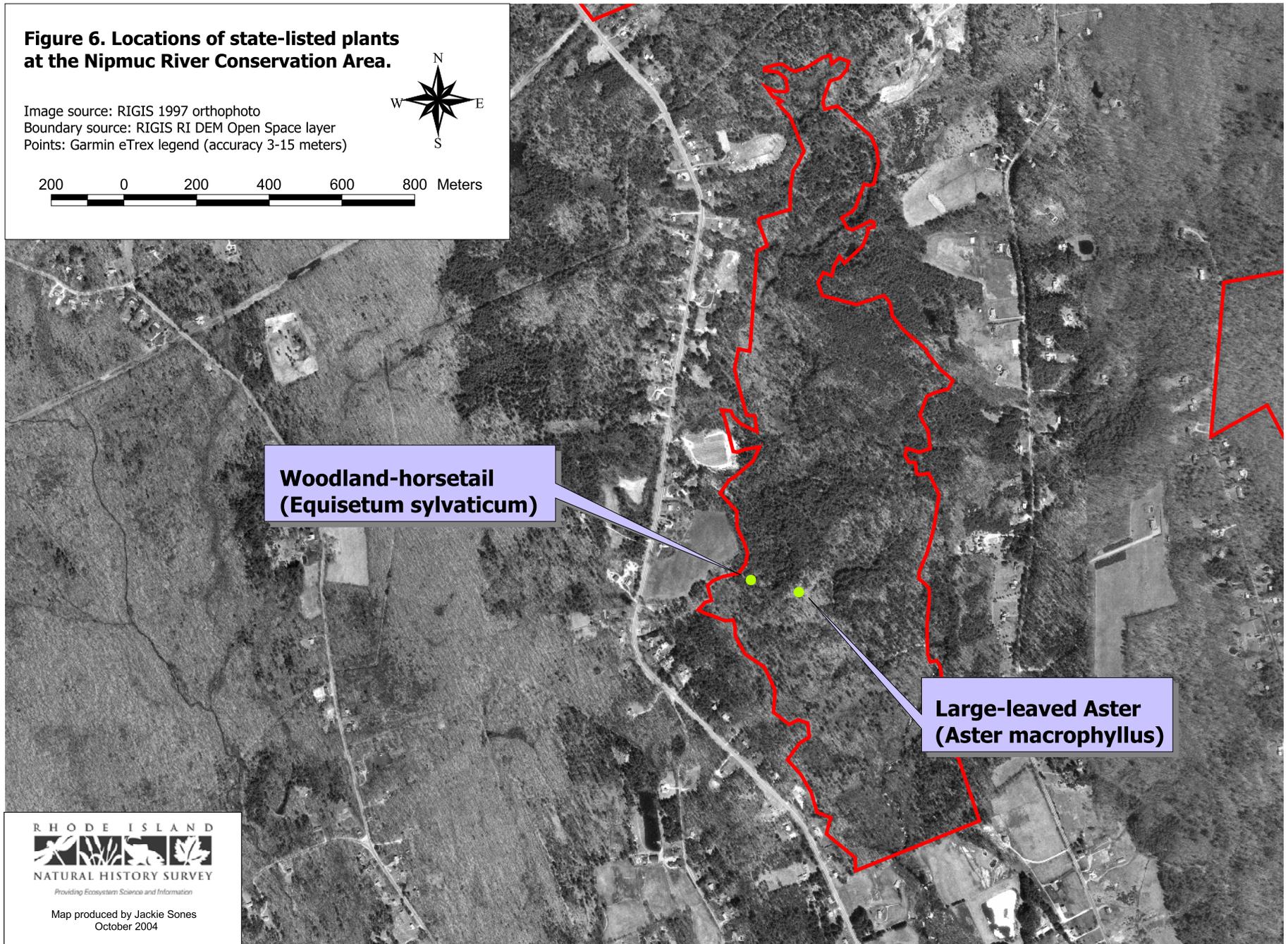


Figure 6. Locations of state-listed plants at the Nipmuc River Conservation Area.

Image source: RIGIS 1997 orthophoto
Boundary source: RIGIS RI DEM Open Space layer
Points: Garmin eTrex legend (accuracy 3-15 meters)



200 0 200 400 600 800 Meters



**Woodland-horsetail
(*Equisetum sylvaticum*)**

**Large-leaved Aster
(*Aster macrophyllus*)**



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Figure 7. Soil types present at the Nipmuc River Conservation Area.

Image source: RIGIS/USDA NRCS RI Soils layer
Boundary source: RIGIS RI DEM Open Space layer



200 0 200 400 600 800 Meters

Soil types

-  Aa
-  CkC
-  HkC
-  HkD
-  MmB
-  Ru
-  Ss
-  Wa
-  WgB

For explanation of codes,
see text on page 4.



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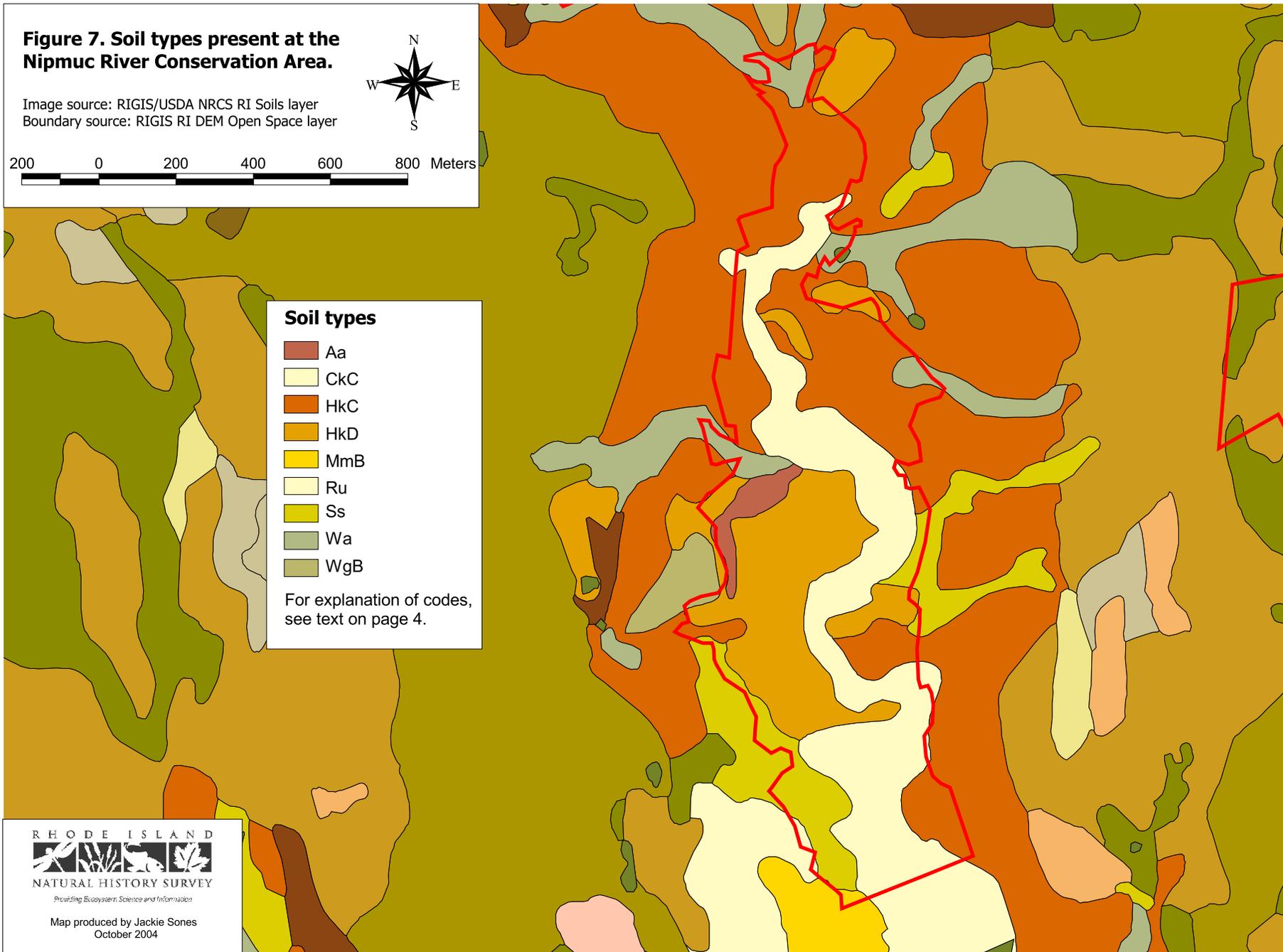
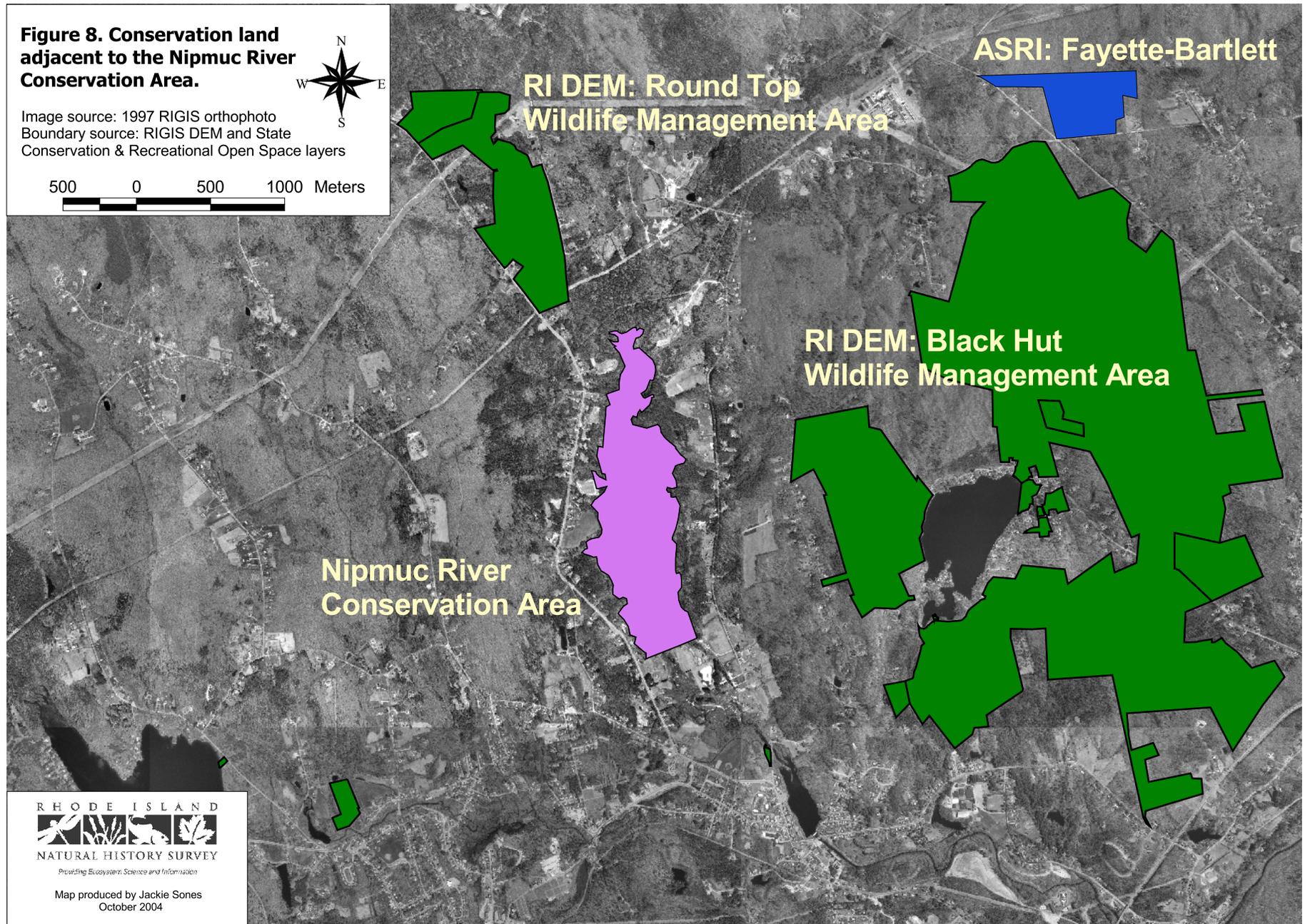


Figure 8. Conservation land adjacent to the Nipmuc River Conservation Area.

Image source: 1997 RIGIS orthophoto
Boundary source: RIGIS DEM and State Conservation & Recreational Open Space layers



500 0 500 1000 Meters



R H O D E I S L A N D



N A T U R A L H I S T O R Y S U R V E Y

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Table 1. List of plants species recorded at the Nipmuc River Conservation Area in 2004 (by life form). Nomenclature based on Gould et al. (1998).

Trees (25)

Native (24)

Red Maple	<i>Acer rubrum</i>
Sugar Maple	<i>Acer saccharum</i>
Yellow Birch	<i>Betula alleghaniensis</i>
Black Birch	<i>Betula lenta</i>
Gray Birch	<i>Betula populifolia</i>
Ironwood	<i>Carpinus caroliniana</i>
hickory	<i>Carya</i> sp.
American Chestnut	<i>Castanea dentata</i>
Frost Hawthorn	<i>Crataegus pruinosa</i>
American Beech	<i>Fagus grandifolia</i>
White Ash	<i>Fraxinus americana</i>
Eastern Red Cedar	<i>Juniperus virginiana</i>
Tulip-tree	<i>Liriodendron tulipifera</i>
Black Gum	<i>Nyssa sylvatica</i>
Hop-hornbeam	<i>Ostrya virginiana</i>
Pitch Pine	<i>Pinus rigida</i>
Eastern White Pine	<i>Pinus strobus</i>
Wild Black Cherry	<i>Prunus serotina</i>
White Oak	<i>Quercus alba</i>
Red Oak	<i>Quercus rubra</i>
Black Oak	<i>Quercus velutina</i>
Sassafras	<i>Sassafras albidum</i>
Eastern Hemlock	<i>Tsuga canadensis</i>
American Elm	<i>Ulmus americanus</i>

Unknown (1)

hawthorn	<i>Crataegus</i> sp.
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Shrubs (40)

Native (38)

Speckled Alder	<i>Alnus incana</i>
shadbush	<i>Amelanchier</i> sp.
Red Chokeberry	<i>Aronia arbutifolia</i>
Sweet Pepperbush	<i>Clethra alnifolia</i>
Sweetfern	<i>Comptonia peregrina</i>
Silky Dogwood	<i>Cornus amomum</i>
Red-osier Dogwood	<i>Cornus sericea</i>
Beaked Hazelnut	<i>Corylus cornuta</i>
Water-willow	<i>Decodon verticillatus</i>
Bush-honeysuckle	<i>Diervilla lonicera</i>
Black Huckleberry	<i>Gaylussacia baccata</i>
Dangleberry	<i>Gaylussacia frondosa</i>
Witch-hazel	<i>Hamamelis virginiana</i>
Winterberry	<i>Ilex verticillata</i>
Common Juniper	<i>Juniperus communis</i>
Sheep-laurel	<i>Kalmia angustifolia</i>
Mountain-laurel	<i>Kalmia latifolia</i>
Northern Spicebush	<i>Lindera benzoin</i>
Maleberry	<i>Lyonia ligustrina</i>
Common Mountain-holly	<i>Nemopanthus mucronatus</i>
Choke-cherry	<i>Prunus virginiana</i>
Scrub-oak	<i>Quercus ilicifolia</i>

Species that are state-listed by the Rhode Island Natural Heritage Program (Enser 2002b)

† Species that are listed as invasive by the Rhode Island Invasive Species Council (Gould 2001)

Table 1. List of plants species recorded at the Nipmuc River Conservation Area in 2004 (by life form). Nomenclature based on Gould et al. (1998).

Shrubs (continued)

Swamp-azalea	<i>Rhododendron viscosum</i>
Pasture-rose	<i>Rosa carolina</i>
Swamp-rose	<i>Rosa palustris</i>
Common Blackberry	<i>Rubus allegheniensis</i>
Northern Dewberry	<i>Rubus flagellaris</i>
Bristly Dewberry	<i>Rubus hispidus</i>
Common Elderberry	<i>Sambucus canadensis</i>
Meadowsweet	<i>Spiraea alba</i>
Steeple-bush	<i>Spiraea tomentosa</i>
Poison Sumac	<i>Toxicodendron vernix</i>
Lowbush Blueberry	<i>Vaccinium angustifolium</i>
Highbush Blueberry	<i>Vaccinium corymbosum</i>
Hillside Blueberry	<i>Vaccinium pallidum</i>
Maple-leaved Viburnum	<i>Viburnum acerifolium</i>
Northern Arrowwood	<i>Viburnum dentatum</i> var. <i>lucidum</i>
Northern Wild Raisin	<i>Viburnum nudum</i> var. <i>cassinoides</i>
Non-native (1)	
Japanese Barberry [†]	<i>Berberis thunbergii</i>
Unknown (1)	
Willow	<i>Salix</i> sp.

Vines (9)

Native (9)

Hog-peanut	<i>Amphicarpaea bracteata</i>
Wild Clematis	<i>Clematis virginiana</i>
dodder	<i>Cuscuta</i> sp.
Sawbrier	<i>Smilax glauca</i>
Carrion-flower	<i>Smilax herbacea</i>
Bullbrier	<i>Smilax rotundifolia</i>
Common Poison Ivy	<i>Toxicodendron radicans</i>
Fox-grape	<i>Vitis labrusca</i>
grape	<i>Vitis</i> sp.

Ferns, Clubmosses, and Horsetails (17)

Native (17)

lady fern	<i>Athyrium filix-femina</i>
Cut-leaved Grapefern	<i>Botrychium</i> sp. (probably <i>dissectum</i>)
Hay-scented Fern	<i>Dennstaedtia punctilobula</i>
Spinulose Wood-fern	<i>Dryopteris carthusiana</i>
Crested Wood-fern	<i>Dryopteris cristata</i>
Sensitive Fern	<i>Onoclea sensibilis</i>
Cinnamon Fern	<i>Osmunda cinnamomea</i>
Interrupted Fern	<i>Osmunda claytoniana</i>
Royal Fern	<i>Osmunda regalis</i>
Christmas Fern	<i>Polystichum acrostichoides</i>
Bracken Fern	<i>Pteridium aquilinum</i>
New York Fern	<i>Thelypteris noveboracensis</i>
Marsh-fern	<i>Thelypteris palustris</i>
Creeping Jenny	<i>Diphasiastrum digitatum</i>
Shining Clubmoss	<i>Huperzia lucidula</i>
Prince's Pine	<i>Lycopodium obscurum</i>
Woodland-horsetail [#]	<i>Equisetum sylvaticum</i>

[#] Species that are state-listed by the Rhode Island Natural Heritage Program (Enser 2002b)

[†] Species that are listed as invasive by the Rhode Island Invasive Species Council (Gould 2001)

Table 1. List of plants species recorded at the Nipmuc River Conservation Area in 2004 (by life form). Nomenclature based on Gould et al. (1998).

Grasses, Rushes, and Sedges (11)

Native (9)

Long-awned Wood-grass
sedge

Early Sedge
Tussock Sedge

Swan's Sedge
spike-rushes

Path-rush
Deertongue

Woolly Bulrush (probably)

Unknown (2)

sedges
panic-grasses

Brachyelytrum erectum

Carex crinita

Carex pennsylvanica

Carex stricta

Carex swanii

Eleocharis spp.

Juncus tenuis

Panicum clandestinum

Scirpus sp. (probably *cyperinus*)

Carex spp.

Panicum spp.

Wildflowers (82)

Native (80)

Wood-anemone

Spreading Dogbane

Wild Sarsparilla

Jack-in-the-pulpit

Swamp-milkweed

White Wood-aster

Calico Aster

Large-leaved Aster[#]

Small White Aster

asters

Tall Flat-topped White Aster

Devil's Beggar-ticks

beggar-ticks

Bog-hemp

Marsh-marigold

White Turtlehead

Spotted Wintergreen

Pipsissewa

Golden Saxifrage

Common Enchanter's Nightshade

Clinton's Lily

Bastard Toadflax

Goldthread

Bunchberry

Pink Lady's-slipper

tick-trefoil

Trailing Arbutus

Three-nerved Joe-Pye-weed

White Boneset

Marsh-bedstraw

Wintergreen

Wild Geranium

Downy Rattlesnake-plantain

Panicled Hawkweed

Anemone quinquefolia

Apocynum androsaemifolium

Aralia nudicaulis

Arisaema triphyllum

Asclepias incarnata

Aster divaricatus

Aster lateriflorus

Aster macrophyllus

Aster racemosus

Aster spp.

Aster umbellatus

Bidens frondosa

Bidens sp.

Boehmeria cylindrica

Caltha palustris

Chelone glabra

Chimaphila maculata

Chimaphila umbellata

Chrysosplenium americanum

Circaea lutetiana

Clintonia borealis

Comandra umbellata

Coptis trifolia

Cornus canadensis

Cypripedium acaule

Desmodium sp.

Epigaea repens

Eupatorium dubium

Eupatorium perfoliatum

Galium palustre

Gaultheria procumbens

Geranium maculatum

Goodyera pubescens

Hieracium paniculatum

[#] Species that are state-listed by the Rhode Island Natural Heritage Program (Enser 2002b)

[†] Species that are listed as invasive by the Rhode Island Invasive Species Council (Gould 2001)

Table 1. List of plants species recorded at the Nipmuc River Conservation Area in 2004 (by life form). Nomenclature based on Gould et al. (1998).

Wildflowers (continued)

Rough Hawkweed	<i>Hieracium scabrum</i>
Marsh-pennywort	<i>Hydrocotyle americana</i>
Canada St. John's-wort	<i>Hypericum canadense</i>
Spotted St. John's-wort	<i>Hypericum punctatum</i>
Spotted Jewelweed	<i>Impatiens capensis</i>
Northern Blue Flag	<i>Iris versicolor</i>
Cardinal-flower	<i>Lobelia cardinalis</i>
water-horehound	<i>Lycopus</i> sp.
Whorled Loosestrife	<i>Lysimachia quadrifolia</i>
Wild Lily-of-the-valley	<i>Maianthemum canadense</i>
Indian Cucumber-root	<i>Medeola virginiana</i>
Cow-wheat	<i>Melampyrum lineare</i>
Partridge-berry	<i>Mitchella repens</i>
Indian Pipe	<i>Monotropa uniflora</i>
Yellow Pond-lily	<i>Nuphar variegata</i>
Common Yellow Wood-sorrel	<i>Oxalis stricta</i>
Arrow-arum	<i>Peltandra virginica</i>
Orchid	<i>Platanthera</i> sp.
Fringed Polygala	<i>Polygala paucifolia</i>
Small Solomon's Seal	<i>Polygonatum pubescens</i>
Halberd-leaved Tearthumb	<i>Polygonum arifolium</i>
Mild Water-pepper	<i>Polygonum hydropiperoides</i>
Pickerelweed	<i>Pontederia cordata</i>
Dwarf Cinquefoil	<i>Potentilla canadensis</i>
Common Cinquefoil	<i>Potentilla simplex</i>
White Lettuce	<i>Prenanthes alba</i>
Gall-of-the-earth	<i>Prenanthes trifoliolata</i>
Virginia Meadow-beauty	<i>Rhexia virginica</i>
Broad-leaved Arrowhead	<i>Sagittaria latifolia</i>
Mad-dog Skullcap	<i>Scutellaria lateriflora</i>
Water-parsnip	<i>Sium suave</i>
False Solomon's Seal	<i>Smilacina racemosa</i>
Silverrod	<i>Solidago bicolor</i>
Late Goldenrod	<i>Solidago gigantea</i>
Sweet Goldenrod	<i>Solidago odora</i>
Downy Goldenrod	<i>Solidago puberula</i>
Goldenrods	<i>Solidago</i> spp.
Swamp-goldenrod	<i>Solidago uliginosa</i>
Skunk-cabbage	<i>Symplocarpus foetidus</i>
Tall Meadow-rue	<i>Thalictrum pubescens</i>
Marsh St. John's-wort	<i>Triadenum virginicum</i>
Starflower	<i>Trientalis borealis</i>
Sessile Bellwort	<i>Uvularia sessilifolia</i>
Northern Downy Violet	<i>Viola sagittata</i>
violets	<i>Viola</i> spp.
Common Yellow-eyed Grass	<i>Xyris difformis</i>
Non-native (2)	
True Watercress [†]	<i>Rorippa nasturtium-aquaticum</i>
Common Dandelion	<i>Taraxacum officinale</i>

Species that are state-listed by the Rhode Island Natural Heritage Program (Enser 2002b)

† Species that are listed as invasive by the Rhode Island Invasive Species Council (Gould 2001)

Table 2. Birds recorded along the Nipmuc River Trail (courtesy of Todd McLeish). Nomenclature based on August et al. (2001).

Great Blue Heron (<i>Ardea herodias</i>) [#]	Northern Cardinal (<i>Cardinalis cardinalis</i>)
Mallard (<i>Anas platyrhynchos</i>)	Rose-breasted Grosbeak (<i>Pheucticus ludovicianus</i>) ^{PIF}
Turkey Vulture (<i>Cathartes aura</i>)	Eastern Towhee (<i>Pipilo erythrophthalmus</i>)
Sharp-shinned Hawk (<i>Accipiter striatus</i>) ^{#, PIF}	Chipping Sparrow (<i>Spizella passerina</i>)
Red-shouldered Hawk (<i>Buteo lineatus</i>) ^{PIF}	Song Sparrow (<i>Melospiza melodia</i>)
Broad-winged Hawk (<i>Buteo platypterus</i>)	White-throated Sparrow (<i>Zonotrichia albicollis</i>)
Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Dark-eyed Junco (<i>Junco hyemalis</i>)
Ruffed Grouse (<i>Bonasa umbellus</i>)	Red-winged Blackbird (<i>Agelaius phoeniceus</i>)
Wild Turkey (<i>Meleagris gallopavo</i>)	Common Grackle (<i>Quiscalus quiscula</i>)
Great Black-backed Gull (<i>Larus marinus</i>)	Brown-headed Cowbird (<i>Molothrus ater</i>)
Mourning Dove (<i>Zenaidura macroura</i>)	House Finch (<i>Carpodacus mexicanus</i>)
Belted Kingfisher (<i>Ceryle alcyon</i>)	American Goldfinch (<i>Carduelis tristis</i>)
Downy Woodpecker (<i>Picoides pubescens</i>)	House Sparrow (<i>Passer domesticus</i>)
Hairy Woodpecker (<i>Picoides villosus</i>) ^{PIF}	
Northern Flicker (<i>Colaptes auratus</i>)	
Acadian Flycatcher (<i>Empidonax vireescens</i>) [#]	
Eastern Phoebe (<i>Sayornis phoebe</i>)	
Eastern Kingbird (<i>Tyrannus tyrannus</i>) [*]	
Tree Swallow (<i>Tachycineta bicolor</i>)	
Barn Swallow (<i>Hirundo rustica</i>)	
Blue Jay (<i>Cyanocitta cristata</i>)	
American Crow (<i>Corvus brachyrhynchos</i>)	
Black-capped Chickadee (<i>Poecile atricapilla</i>)	
Tufted Titmouse (<i>Baeolophus bicolor</i>)	
Red-breasted Nuthatch (<i>Sitta canadensis</i>)	
White-breasted Nuthatch (<i>Sitta carolinensis</i>)	
Brown Creeper (<i>Certhia americana</i>)	
House Wren (<i>Troglodytes aedon</i>)	
Golden-crowned Kinglet (<i>Regulus satrapa</i>) [#]	
Ruby-crowned Kinglet (<i>Regulus calendula</i>)	
Blue-gray Gnatcatcher (<i>Poliophtila caerulea</i>)	
Veery (<i>Catharus fuscescens</i>)	
Hermit Thrush (<i>Catharus guttatus</i>)	
Wood Thrush (<i>Hylocichla mustelina</i>) ^{PIF, TNC}	
American Robin (<i>Turdus migratorius</i>)	
Gray Catbird (<i>Dumetella carolinensis</i>)	
Cedar Waxwing (<i>Bombycilla cedrorum</i>)	
European Starling (<i>Sturnus vulgaris</i>)	
Blue-headed Vireo (<i>Vireo solitarius</i>)	
Red-eyed Vireo (<i>Vireo olivaceus</i>)	
Magnolia Warbler (<i>Dendroica magnolia</i>)	
Black-throated Blue Warbler (<i>Dendroica caerulescens</i>) ^{#, PIF, TNC}	
Yellow-rumped Warbler (<i>Dendroica coronata</i>)	
Black-throated Green Warbler (<i>Dendroica virens</i>)	
Blackburnian Warbler (<i>Dendroica fusca</i>) ^{#, PIF}	
Pine Warbler (<i>Dendroica pinus</i>)	
Black-and-white Warbler (<i>Mniotilta varia</i>) ^{PIF}	
American Redstart (<i>Setophaga ruticilla</i>)	
Ovenbird (<i>Seiurus aurocapillus</i>)	
Northern Waterthrush (<i>Seiurus noveboracensis</i>)	
Louisiana Waterthrush (<i>Seiurus motacilla</i>) ^{PIF, TNC}	
Common Yellowthroat (<i>Geothlypis trichas</i>)	
Scarlet Tanager (<i>Piranga olivacea</i>) ^{PIF}	

* Species not observed by Todd McLeish, but observed by RINHS in 2004

Species that are state-listed by the Rhode Island Natural Heritage Program (Enser 2002a)

^{PIF} Species listed as priority species in Southern New England by Partners in Flight (Dettmers and Rosenberg 2000)

^{TNC} Species listed as ecoregional conservation targets by The Nature Conservancy (Barbour 2001)

Table 3. Mammals with the potential to occur at the Nipmuc River Conservation Area. Nomenclature based on August et al. (2001).

Virginia Opossum (*Didelphis virginiana*)
Northern Short-tailed Shrew (*Blarina brevicauda*)
Masked Shrew (*Sorex cinereus*)
Star-nosed Mole (*Condylura cristata*)
Common Water Shrew (*Sorex palustris*)#
Little Brown Myotis (*Myotis lucifagus*)
Southern Flying Squirrel (*Glaucomys volans*)
Eastern Gray Squirrel (*Sciurus carolinensis*)*
Eastern Chipmunk (*Tamias striatus*)*
Red Squirrel (*Tamiasciurus hudsonicus*)
American Beaver (*Castor canadensis*)*
Woodland Jumping Mouse (*Napaeozapus insignis*)
Southern Red-backed Vole (*Clethrionomys gapperi*)
Common Muskrat (*Ondatra zibethicus*)
White-footed Mouse (*Peromyscus leucopus*)
Coyote (*Canis latrans*)
Common Gray Fox (*Urocyon cinereoargenteus*)
Red Fox (*Vulpes vulpes*)
Common Raccoon (*Procyon lotor*)
Northern River Otter (*Lontra canadensis*)
American Mink (*Mustela vison*)
Striped Skunk (*Mephitis mephitis*)
Fisher (*Martes pennanti*)#
Long-tailed Weasel (*Mustela frenata*)†
White-tailed Deer (*Odocoileus virginianus*)*

† Species observed by Todd McLeish

* Species observed by RINHS in 2004

Species that are state-listed by the Rhode Island Natural Heritage Program (Enser 2002a)

Table 4. Fish observed in the Nipmuc River, at the USGS Gauging Station off Sherman Farm Road (courtesy of Alan Libby, RI DEM). Listed in decreasing order of abundance. Nomenclature based on August et al. (2001).

Fallfish (<i>Semotilus corporalis</i>)	Native
Tesselated Darter (<i>Etheostoma olmstedii</i>)	Native
White Sucker (<i>Catostomus commersoni</i>)	Native
Redfin Pickerel (<i>Esox americanus</i>)	Native
Bluegill (<i>Lepomis macrochirus</i>)	Introduced
Brook Trout (<i>Salvelinus fontinalis</i>)	Introduced
Chain Pickerel (<i>Esox niger</i>)	Native
Pumpkinseed (<i>Lepomis gibbosus</i>)	Native
Swamp Darter (<i>Etheostoma fusiforme</i>)	Native
Yellow Bullhead (<i>Ameiurus natalis</i>)	Introduced

Table 5. Dragonflies and damselflies recorded at the Nipmuc River Conservation Area (courtesy of the Rhode Island Odonata Atlas). Nomenclature based on Paulson and Dunkle (1996).

Shadow Darner (*Aeshna umbrosa*)
Violet Dancer (*Argia fumipennis violacea*)
Powdered Dancer (*Argia moesta*)
Fawn Darner (*Boyeria vinosa*)
Sparkling Jewelwing (*Calopteryx dimidiata*)
Ebony Jewelwing (*Calopteryx maculata*)
Aurora Damsel (*Chromagrion conditum*)
Twin-spotted Spiketail (*Cordulegaster maculata*)
Stream Cruiser (*Didymops transversa*)
Skimming Bluet (*Enallagma geminatum*)
Ashy Clubtail (*Gomphus lividus*)
Dragonhunter (*Hagenius brevistylus*)
Uhler's Sundragon (*Helocordulia uhleri*)
Sweetflag Spreadwing (*Lestes forcipatus*)
Slender Spreadwing (*Lestes rectangularis*)*
Slaty Skimmer (*Libellula incesta*)
Cyrano Darner (*Nasiaeschna pentacantha*)
Blue Dasher (*Pachydiplax longipennis*)
Eastern Least Clubtail (*Stylogomphus albistylus*)
Cherry-faced Meadowhawk (*Sympetrum internum*)
Band-winged Meadowhawk (*Sympetrum semicinctum*)
Autumn Meadowhawk (*Sympetrum vicinum*)

*Species not recorded by the Rhode Island Odonata Atlas, but observed by RINHS in 2004

Appendix A. Miscellaneous photographs from the Nipmuc River Conservation Area in 2004.



Nipmuc River



Unnamed stream



Nipmuc River (beaver activity)



Ebony Jewelwing (*Calopteryx maculata*)



Beaver pond



Virginia Meadow-beauty (*Rhexia virginica*)

Appendix B. Photographs of state-listed species at the Nipmuc River Conservation Area in 2004.



Large-leaved Aster (*Aster macrophyllus*)



Large-leaved Aster (*Aster macrophyllus*)



Woodland-horsetail (*Equisetum sylvaticum*)



Woodland-horsetail (*Equisetum sylvaticum*)



Wood Turtle (*Clemmys insculpta*)
(Reference photo, not taken at Nipmuc)



Wood Turtle (*Clemmys insculpta*)
(Reference photo, not taken at Nipmuc)

Appendix C. Photographs of anthropogenic disturbances at the Nipmuc River Conservation Area in 2004.



Water withdrawal system?



Pipes near possible withdrawal system



Collapsed platform



Metal stand near collapsed platform

Appendix C (continued). Photographs of anthropogenic disturbances at the Nipmuc River Conservation Area in 2004.



Footbridge over stream



Bulldozer trail (clearing in background)



Hunting ladder



MAINE INVASIVE PLANTS

Japanese Barberry

Berberis thunbergii
(Barberry Family)

Threats to Native Habitats

Japanese barberry has escaped from cultivation and is progressively invading natural areas. It is a particular threat to open and second-growth forests. An established colony can eventually grow thick enough to crowd out native understory plants. Traversing through dense patches of barberry can be difficult and even painful. Birds eat the red berries, thereby spreading the shrub into new areas.

Description

Japanese barberry is a dense woody shrub with numerous arching spine-bearing branches. It usually grows about three feet high, but occasionally reaches up to six feet. A single spine grows off the stem beneath each cluster of small wedge-shaped leaves. Its small yellow flowers are four-parted and can occur alone or in small clusters. Flowers appear in May, and the fruits—red oblong berries—persist on the plant into the following winter. In the fall, the leaves of Japanese barberry turn attractive shades of red and orange. Fall foliage color is one of the reasons this plant has been widely planted as an ornamental.

Habitat

Japanese barberry is found in old fields, in open woods, on floodplains, on ledges, along power lines, and on roadsides. In Maine it occurs in thickets, on roadsides, and in open areas. Plants are both sun- and shade-tolerant, and invasions of relatively undisturbed woodlands are becoming more common. It grows successfully in a variety of soil types.

Distribution

Japanese barberry is native to Asia. It was brought to North America in the late nineteenth century and has been widely planted as an ornamental. It has



Japanese Barberry (photo by Leslie Mehrhoff, courtesy of the New England Wild Flower Society)

escaped and naturalized (is established and reproducing in the wild) as far north as Nova Scotia, south to North Carolina, and west to Montana. In Maine, Japanese barberry has been documented in five counties. It probably occurs in more, particularly the southern counties, but has been under-collected due to a general lack of interest in weedy species.

Control

Mechanical removal is recommended because it is effective and may cause the least disturbance. Japanese barberry is one of the first plants to leaf out in spring and is therefore easy to distinguish from other shrubs. Whole shrubs may be removed with a hoe or weed wrench. Use of thick or sturdy

gloves is recommended to provide protection from the spines. Plants can resprout from roots, so remove as much of the roots as possible. Regular mowing can prevent barberry from returning once it has been removed. In areas where mechanical removal is not practical, such as rock piles or outcrops, a glyphosate herbicide can be used. Consult a licensed herbicide applicator before applying herbicides over large areas.

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For more information or for a more extensive list of references on invasive species contact:

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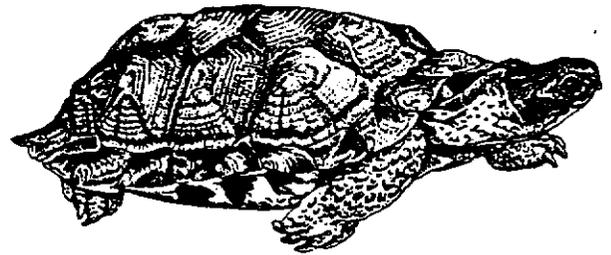
Natural Heritage & Endangered Species Program

Commonwealth of Massachusetts
Division of Fisheries & Wildlife
Route 135
Westborough, MA 01581
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MASSACHUSETTS SPECIES OF SPECIAL CONCERN

Wood Turtle (*Clemmys insculpta*)

DESCRIPTION: The Wood Turtle is one of the most terrestrial of North American turtles. It is a medium sized turtle and the largest member of its genus, ranging from 12-23 cm (5-9 in) in length. The Wood Turtle is so named because the roundish segments of its upper shell (carapace) resemble a wood-grained cross-section of a branch complete with growth rings. The carapace is characteristically rough and is sculptured with grooves and ridges that rise upward to form individual pyramids. The raised pyramid-like shields, prominent central keel, and slight upward flare of the pointed posterior marginals give this turtle its unique shape. It is this sculptured appearance that has earned the Wood Turtle its species name insculpta.



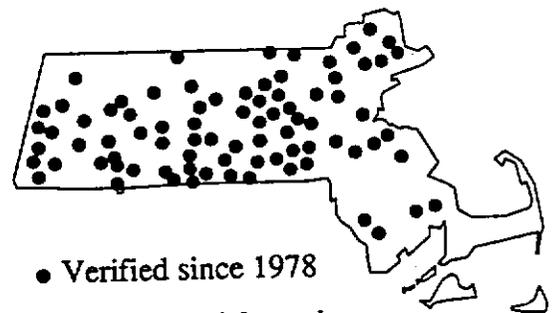
DeGraaf, Richard M. and Rudis, Deborah D.
Amphibians and Reptiles of New England,
Amherst, Massachusetts: The University of
Massachusetts, 1983.

The carapace is brown, often with yellow streaks radiating from protruding black flecked centers. The undershell (plastron) is bone yellow with an irregular black blotch on the outside posterior corner of each scute (plate-like scale). The head, top of the neck and tail, and the outer scales of the legs and the claws are black. The undersides of the neck and legs are orange or red thus giving rise to the vernacular name "redlegs"; used during the early part of the 20th century when these turtles were sold as food. The legs are clad with thick protective scutes, particularly on the male. The sides of the head are arched downward, and this trapezoid shape, along with moist dark eyes, gives the Wood Turtle a sad look.

Males can be distinguished from females by their longer, thicker tail, a concave plastron with a deeply notched rear margin, and prominent scales on the front of the forelegs. Males are generally larger than females. Young are a gray brown with no red or orange color, the shell is keelless, and the tail as long as the carapace.



Range of the Wood Turtle



● Verified since 1978
Distribution in Massachusetts

SIMILAR SPECIES IN MASSACHUSETTS: The habitat of the Eastern Box Turtle (*Terrapene carolina*) and the Blanding's Turtle (*Emydoidea blandingi*) may overlap that of the Wood Turtle, but neither has the Wood Turtle's pyramidal shell segments. Unlike the Wood Turtle, the Box and Blanding's Turtle have hinged plastrons into which they can withdraw or partially withdraw if threatened. The Northern Diamondback Terrapin (*Malaclemmys terrapin*) has a shell similar to that of the Wood Turtle, but its skin is grey and it lives only near saltwater (which the Wood Turtle avoids).

RANGE: The Wood Turtle can be found throughout New England, north to Nova Scotia, west to eastern Minnesota, and south to northern Virginia.

HABITAT IN MASSACHUSETTS: The preferred habitat of the Wood Turtle is riparian areas. Slower moving streams are favored, with sandy bottoms and heavily vegetated stream banks. The bottoms and muddy banks provide hibernating sites for overwintering, and sandy or gravelly banks are used for nesting. The Wood Turtle spends most of the spring and summer in meadows and upland forests and returns to the streams in late summer or early fall to mate and overwinter. During the day, it is often seen in woodlands, hayfields, and along roadsides adjacent to streams.

LIFECYCLE/BEHAVIOR: The Wood Turtle has a way of life that makes it at home either in or out of the water. Next to the box turtle, it is our most terrestrial species; possessing exceptional intelligence and a unique climbing ability. In southern or coastal areas of its range, the Wood Turtle becomes active in late March, but elsewhere it is usually mid-to late April or even May before it is sighted. Upon coming out of hibernation, the Wood Turtle begins its terrestrial activity by moving up on the river bank to bask in the sun. This species is diurnal (active by day), foraging in midday and sunning on logs in streams or along muddy river banks in the early morning and late afternoon. It is this habit of basking on the muddy river banks which has given the Wood Turtle the popular name "mud turtle." The Wood Turtle leads a rather solitary life and rarely will one find more than a single wood turtle at a time.

Wood Turtles remain relatively close to their streams and rivers, rarely getting more than a few hundred meters away from the banks. They have relatively linear home ranges that tend to run up to 1.6 km (a mile) in length. Males have been observed exhibiting aggressive behavior such as chasing, biting, and butting both during the mating season and at other times. This behavior appears to be more about social status than territorial ownership. Typically, one or both males make an "open mouth" gesture, snapping open and closing the mouth near the other's head, rarely resulting in actual biting. Prolonged interactions are often accompanied by audible hissing from one or both animals. Females tend to be more peaceable; interactions seldom involve more than a simple nose touching and departure.

The Wood Turtle becomes sexually active in the spring when the water temperature reaches 15 C (59 F). This species has a courtship ritual involving a "dance" that takes place for several hours prior to mating. The dance involves the male and female approaching each other slowly with necks extended and their heads up. Before they actually touch noses, they lower their heads and swing them from side to side. Courting adults may produce a very subdued whistle that is rarely heard by observers. These courtship behaviors occur on land, yet actual mating appears to take place only in the water.

The female Wood Turtle wanders in search of a nest site in late May or mid-June. She often digs her nest during or just after a slight rainstorm. Nest-digging can begin relatively early in the morning or late in the afternoon. The female Wood Turtle generally digs several six-inch holes before deciding on a definite nest site. The function of this may be to confuse nest predators that are searching for buried eggs. The female digs her nest using her hind feet only. The nest is a six-inch hole dug in sandy or soft loam sand areas, including gravel banks, roadsides, fields and meadows. It is generally high enough out of the river's floodplain to avoid inundation by fluctuating water levels. A clutch of 4 to 12 (generally 7 to 9) eggs are deposited inside the nest, covered with sand, and left to incubate for ten to sixteen weeks in the warmth of the sun. The eggs are white, smooth, and elliptical measuring 3.4 cm (1.4 in) in length and 2.4 cm (0.95 in) in width. From beginning to end, the nesting process may take three or four hours. Wood turtles lay only one clutch per year.

Hatchlings may leave the nest immediately or may remain in the nest over the winter and emerge in early spring. The young turtles are miniatures of the adults but have long tails. Once out of the nest, the young seek out the deep portions of streams where they virtually disappear until they become sexually mature at the age of twelve to fifteen years. The life span of the adult Wood Turtle is easily 50 years and may frequently reach 80 years of age.

The Wood Turtle is omnivorous and an unusual member of its family in that it exploits both aquatic and terrestrial food sources. Its diet consists of plant material from algae and grasses to berries and animal matter including insects, fish, earthworms, tadpoles, and carrion from many kinds of animals. The Wood Turtle often exhibits an unusual feeding behavior referred to as "stomping." In its search for food, this species will stomp on the ground alternating its front feet, creating vibrations in the ground resembling rainfall. Earthworms, responding as though to rainfall, rise to the ground's surface to keep from drowning. Instead of rain, the earthworm is met by the Wood Turtle, and is promptly devoured.

In October, the Wood Turtle returns to the deep channels of streams for the winter. With head and limbs tucked in under the carapace and tail extended, it lies next to submerged anchored stumps and logs on the sides of the stream away from the main current. It also may hibernate in large groups in community burrows which may include muddy banks, stream bottoms, deep pools, decaying forest vegetation, and abandoned muskrat burrows.

POPULATION STATUS IN MASSACHUSETTS: The Wood Turtle is listed as a "Species of Special Concern" in Massachusetts. Since 1978, there have only been 153 sightings reported to the Massachusetts Natural Heritage and Endangered Species Program in 97 different locations across the state. It should be noted that these sightings are not indicative of populations but may be road crossing sightings or single individuals. Population decline of this species has been caused by pollution of streams, development of wooded streambanks, the unnatural increase in predation due to human presence, highway casualties, and extensive commercial and incidental collection of specimens for pets. Wood turtles are also killed during hay-mowing operations.

MANAGEMENT RECOMMENDATIONS: In order to ensure the longevity of the Wood Turtle as a species, the following recommendations regarding specific habitat preservation are suggested. In reference to timber harvesting, the primary concerns are the preservation of the local environments near streams and the prevention of siltation. Establishment of a minimum 50-foot no-cut buffer zone along the streams and rivers; the implementation of erosion controls that may be appropriate for the specific site (particularly recommended in steep slope situations); and utilization of portable or temporary bridges rather than fording to cross streams are strongly suggested. Selective rather than regeneration cutting within 50-300 feet of streams known to be inhabited by Wood Turtles may also help to maintain suitable habitat for this species. Wood Turtles often use clearings and meadows and would probably benefit from slash piles. Avoid use of heavy equipment within 50 feet of streams and minimize use 50-100 feet from streams.

Enforcement of the Massachusetts Endangered Species Act is also needed to protect this species from the pet trades and biological supply. In a five-year study in Pennsylvania by John H. Kaufmann, research showed that though this species is long lived, population data may be misleading as the individuals sighted were older turtles, and not reproducing at a sustainable population rate. It is estimated that there may be as much as a 99% mortality rate from hatching to adulthood (Robakiewicz). In small populations such as those in Massachusetts, such a high mortality rate could prove disastrous.

In summary, the Wood Turtle populations and their habitats need protection. This species is attracted to tangles of vegetation, though the specific type of plant matter appears to be unimportant. Not mowing within 100 meters (100 yds) of stream banks encourages woody vegetation such as gray dogwood to flourish. In upland sites, fallen trees should be left. Meadows dense with many layers of vegetation are preferred by Wood Turtles over well-mown lawns. Encourage brushy tangles and get local gardeners to allow a few tomatoes and strawberries to run rampant so that turtles can harvest some of the fruit. Protecting riverine corridors is important to prevent fragmentation of habitats and populations. In addition, protecting wetlands and water quality is critical as these turtles show a tendency to return to the same stream each year, and they are sensitive to pollution (Robakiewicz).

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Appendix F. Botanical Inventory at the Nipmuc River Conservation Area, Burrillville, RI — 2004. For explanation of codes, see Appendix G.

Page	Species	Common Name	Habit (Wetland Status)	RI Status	Abundance
Division LYCOPODIOPHYTA Class LYCOPODIOPSIDA Order LYCOPODIALES					
Family LYCOPODIACEAE Clubmoss Family					
002	<i>Huperzia lucidula</i> (Michaux) Trevisan	Shining Clubmoss	NPF (FACW-)	1	III
	Synonyms: <i>Lycopodium lucidulum</i> Michx. [F50; GC91; S93; USDA82]				
003	<i>Lycopodium obscurum</i> Linnaeus	Prince's- or Princess-pine; Ground-pine, Flat-branched Tree-clubmoss	NPF (FACU)	1	III
004	<i>Diphasiastrum digitatum</i> (Dillenius ex A. Braun) Holub	Creeping Jenny, Ground-cedar; Running Cedar; Dead-man's-fingers (RI Colloquialism)	NPF (FACU-)	1	III
	Synonyms: <i>Lycopodium complanatum</i> L. var. <i>flabelliforme</i> Fern. [F50; S93] <i>Lycopodium digitatum</i> Dillen. [GC91] <i>Lycopodium digitatum</i> Dillenius ex A. Braun [K94; USDA82]				
Division EQUISETOPHYTA Class EQUISETOPSIDA Order EQUISETALES					
Family EQUISETACEAE Horsetail Family					
008	<i>Equisetum sylvaticum</i> Linnaeus	Wood- or Woodland-horsetail	NPF (FACW)	1	II
	Synonyms: <i>Equisetum sylvaticum</i> L. var. <i>pauciramosum</i> Milde [F50; S93]				
Division POLYPODIOPHYTA Class POLYPODIOPSIDA Order OPHIOGLOSSALES					
Family OPHIOGLOSSACEAE Adder's-tongue Family					
011	<i>Botrychium dissectum</i> Sprengel	Cut-leaved or Lace-frond Grapefern	NPF (FAC)	1	III
	Synonyms: <i>Botrychium dissectum</i> Sprengel var. <i>obliquum</i> (Muhl. ex Willd.) Clute [GC91]				
Class POLYPODIOPSIDA Order POLYPODIALES					
Family OSMUNDACEAE Royal Fern Family					
012	<i>Osmunda regalis</i> Linnaeus var. <i>spectabilis</i> (Willdenow) A. Gray	Royal Fern	NPEF (OBL)	1	IV
012	<i>Osmunda cinnamomea</i> Linnaeus	Cinnamon Fern	NPEF (FACW)	1	IV
	Synonyms: <i>Osmunda cinnamomea</i> L. var. <i>cinnamomea</i> [GC91; K94; S93] <i>Osmunda cinnamomea</i> L. var. <i>glandulosa</i> Waters [F50; K94; S93]				
012	<i>Osmunda claytoniana</i> Linnaeus	Interrupted Fern	NPF (FAC)	1	IV
	Synonyms: <i>Osmunda claytoniana</i> L. var. <i>claytoniana</i> [GC91]				

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Class POLYPODIOPSIDA Order POLYPODIALES					
Family DENNSTAEDTIACEAE Bracken Family					
015	<i>Dennstaedtia punctilobula</i> (Michaux) T. Moore	Hay-scented Fern, Boulder-fern	NPF	1	IV
015	<i>Pteridium aquilinum</i> (Linnaeus) Kuhn var. <i>latiusculum</i> (Desvaux) L. Underwood ex A. Heller	Bracken Fern, Brakes (RI colloquialism)	NPF (FACU)	1	IV
	Synonyms: <i>Pteridium aquilinum</i> (L.) Kuhn var. <i>latiusculum</i> (Desvaux) Underw. [F50; GC91; S93]				
Class POLYPODIOPSIDA Order POLYPODIALES					
Family DRYOPTERIDACEAE (Section 1) Wood-fern Family					
021	<i>Athyrium filix-femina</i> (Linnaeus) Mertens	lady fern	NPF (FAC)	1	III
Class POLYPODIOPSIDA Order POLYPODIALES					
Family THELYPTERIDACEAE Marsh-fern Family					
025	<i>Thelypteris noveboracensis</i> (Linnaeus) Nieuwland	New York Fern	NPF (FAC)	1	IV
	Synonyms: <i>Dryopteris noveboracensis</i> (L.) Gray [F50]				
025	<i>Thelypteris palustris</i> Schott var. <i>pubescens</i> (Lawson) Fernald	Marsh- or Meadow-fern	NPEF (FACW+)	1	IV
	Synonyms: <i>Dryopteris thelypteris</i> (L.) Gray var. <i>pubescens</i> (Lawson) Nakai [F50] <i>Thelypteris thelypteroides</i> (Michx.) J. Holub [USDA82]				
Class POLYPODIOPSIDA Order POLYPODIALES					
Family DRYOPTERIDACEAE (Section 2) Wood-fern Family					
026	<i>Dryopteris cristata</i> (Linnaeus) A. Gray	Crested Wood-fern	NPEF (FACW+)	1	III
027	<i>Dryopteris carthusiana</i> (Villars) H. P. Fuchs	Spinulose or Toothed Wood-fern; Fancy Fern, Florist's Fern	NPF (FAC+)	1	III
	Synonyms: <i>Dryopteris spinulosa</i> (O. F. Muell.) Watt [F50; USDA82] <i>Dryopteris spinulosa</i> (O. F. Muell.) Watt var. <i>spinulosa</i> [S93]				
028	<i>Polystichum acrostichoides</i> (Michaux) Schott	Christmas Fern, Dagger-fern, Canker-brake	NPF (FACU-)	1	III
029	<i>Onoclea sensibilis</i> Linnaeus	Sensitive Fern	NPEF (FACW)	1	IV

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Class PINOPSIDA		Order CONIFERALES			
Family PINACEAE		Pine Family			
034	<i>Tsuga canadensis</i> (Linnaeus) Carrière	Eastern Hemlock	NT (FACU)	1	III
035	<i>Pinus strobus</i> Linnaeus	Eastern or Northern White Pine	NT (FACU)	1	IV
035	<i>Pinus rigida</i> Miller	Pitch Pine	NT (FACU)	1	III
Class PINOPSIDA		Order PINALES			
Family CUPRESSACEAE		Cypress Family			
037	<i>Juniperus communis</i> Linnaeus var. <i>depressa</i> Pursh	Common Juniper, Savin; Barren Ground-juniper (RI colloquialism)	NS	1	III
	Synonyms: <i>Juniperus communis</i> L. var. <i>communis</i>	[FNA93 considers this variety to be large specimens of var. <i>depressa</i>]			
037	<i>Juniperus virginiana</i> Linnaeus var. <i>virginiana</i>	Northern or Eastern Red Cedar	NT (FACU)	1	IV
	Synonyms: <i>Juniperus virginiana</i> L. var. <i>creba</i> Fernald & Griscom	[F50; GC91; S93]			
Division MAGNOLIOPHYTA		Class MAGNOLIOPSIDA (Dicotyledons)		Order MAGNOLIALES	
Family MAGNOLIACEAE		Magnolia Family			
039	<i>Liriodendron tulipifera</i> L.	Tulip-tree, Yellow Poplar, Tulip-poplar	NT (FACU)	1	III
Class MAGNOLIOPSIDA		Order LAURALES			
Family LAURACEAE		Laurel Family			
041	<i>Sassafras albidum</i> (Nutt.) Nees	Sassafras, White Sassafras, "Red" Sassafras	NT (FACU-)	1	IV
	Synonyms: <i>Sassafras albidum</i> var. <i>albidum</i> [S93] <i>Sassafras albidum</i> var. <i>molle</i> (Raf.) Fern. [S93]				
041	<i>Lindera benzoin</i> (L.) Blume var. <i>benzoin</i>	Northern Spicebush, Wild Allspice, Benjamin-bush	NS (FACW-)	1	IV

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Class MAGNOLIOPSIDA Order NYMPHAEALES					
Family NYMPHAEACEAE Water-lily Family					
045	<i>Nuphar variegata</i> Durand	Yellow Pond-lily, Spatterdock, Bull-lily, Bullhead-lily	NPE/F (OBL)	1	III
	Synonyms:	<i>Nuphar lutea</i> (L.) Sm. ssp. <i>variegata</i> (Dur.) E. O. Beal [K94] <i>Nuphar luteum</i> (L.) Sibth. & J. E. Smith ssp. <i>variegatum</i> (Engelm. ex G. W. Clinton) E. O. Beal [USDA82] <i>Nuphar variegatum</i> Engelm. [F50; S93]			
Class MAGNOLIOPSIDA Order RANUNCULALES					
Family RANUNCULACEAE Buttercup Family					
048	<i>Caltha palustris</i> L.	Marsh-marigold, Cowslip	NPF (OBL)	1	III
052	<i>Anemone quinquefolia</i> L. var. <i>quinquefolia</i>	Wood-anemone, Windflower; Mayflower (RI colloquialism)	NPF (FACU)	1	IV
054	<i>Clematis virginiana</i> L.	Virgin's Bower, Old-man's-beard, Wild Clematis, Devil's-darning-needle	NPV (FAC)	1	III
062	<i>Thalictrum pubescens</i> Pursh	Tall Meadow-rue, Muskrat-weed, King-of-the-meadow	NPF (FACW+)	1	III
	Synonyms:	<i>Thalictrum polygamum</i> Muhl. var. <i>intermedium</i> Boivin [F50; S93] <i>Thalictrum polygamum</i> Muhl. var. <i>polygamum</i> [S93]			
062	<i>Coptis trifolia</i> (L.) Salisb. var. <i>groenlandica</i> (Oeder) Fassett	Goldthread, Canker-root	NPF (FACW)	1	III
	Synonyms:	<i>Coptis groenlandica</i> (Oeder) Fern. [F50; S93] <i>Coptis trifolia</i> (L.) Salisb. [FNA97; MT97] <i>Coptis trifolia</i> (L.) Salisb. ssp. <i>groenlandica</i> (Oeder) Hultén [K94; USDA82]			
Class MAGNOLIOPSIDA Order RANUNCULALES					
Family BERBERIDACEAE Barberry Family					
064	<i>Berberis thunbergii</i> DC.	Japanese Barberry	IS (FACU)	4*	IV
Class MAGNOLIOPSIDA Order HAMAMELIDALES					
Family HAMAMELIDACEAE Witch-hazel Family					
071	<i>Hamamelis virginiana</i> L.	Witch-hazel	NST (FACU+)	1	III

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Class MAGNOLIOPSIDA Order URTICALES					
Family ULMACEAE Elm Family					
072	<i>Ulmus americana</i> L.	American or White Elm	NT (FACW-)	1	III
Class MAGNOLIOPSIDA Order URTICALES					
Family URTICACEAE Nettle Family					
076	<i>Boehmeria cylindrica</i> (L.) Swartz Synonyms: <i>Boehmeria cylindrica</i> (L.) Swartz var. <i>cylindrica</i> [S93] <i>Boehmeria cylindrica</i> (L.) Swartz var. <i>drummondiana</i> Wedd. [F50; S93] <i>Boehmeria cylindrica</i> (L.) Swartz var. <i>drummondiana</i> (Wedd.) Wedd. [USDA82]	Bog-hemp, False Nettle	NPF (FACW+)	1	III
Class MAGNOLIOPSIDA Order JUGLANDALES					
Family JUGLANDACEAE Walnut Family					
078	<i>Carya</i> sp.	hickory	NT	1	III
Class MAGNOLIOPSIDA Order MYRICALES					
Family MYRICACEAE Bayberry Family					
080	<i>Comptonia peregrina</i> (L.) J. M. Coulter Synonyms: <i>Myrica asplenifolia</i> L. [USDA82]	Sweet Fern	NS	1	IV
Class MAGNOLIOPSIDA Order FAGALES					
Family FAGACEAE Beech Family					
081	<i>Fagus grandifolia</i> Ehrh. var. <i>grandifolia</i> Synonyms: <i>Fagus grandifolia</i> Ehrh. [FNA97; K94; USDA82]	American Beech, Red Beech	NT (FACU)	1	IV
082	<i>Castanea dentata</i> (Marshall) Borkh.	American Chestnut	NT	1	III
084	<i>Quercus alba</i> L.	White Oak	NT (FACU)	1	IV
086	<i>Quercus ilicifolia</i> Wangenh.	Scrub-oak, Bear-oak	NT	1	III
087	<i>Quercus velutina</i> Lam.	Black Oak	NT	1	IV

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087	<i>Quercus rubra</i> L.	Northern Red Oak	NT (FACU-)	1	IV
Class MAGNOLIOPSIDA		Order FAGALES			
Family BETULACEAE		Birch Family			
088	<i>Corylus cornuta</i> Marshall	Beaked Hazelnut	NS (FACU-)	1	III
088	<i>Ostrya virginiana</i> (Miller) K. Koch	Hop-hornbeam, Ironwood, Leverwood	NT (FACU-)	1	III
089	<i>Carpinus caroliniana</i> Walter var. <i>virginiana</i> (Marshall) Fern.	Ironwood, Musclewood, Blue Beech, American Hornbeam	NT (FAC)	1	III
	Synonyms:	<i>Carpinus caroliniana</i> Walter ssp. <i>virginiana</i> (Marshall) Furlow [FNA97; K94; MT97]			
089	<i>Betula alleghaniensis</i> Britton	Yellow Birch	NT (FAC)	1	III
	Synonyms:	<i>Betula alleghaniensis</i> Britton var. <i>alleghaniensis</i> [K94; S93] <i>Betula alleghaniensis</i> Britton var. <i>macrolepis</i> (Fern.) Braysshaw [K94; S93] <i>Betula lutea</i> Michx. f. [F50] <i>Betula lutea</i> Michx. f. var. <i>macrolepis</i> Fern. [F50]			
090	<i>Betula lenta</i> L.	Sweet, Black, or Cherry Birch	NT (FACU)	1	III
090	<i>Betula populifolia</i> Marshall	Gray or White Birch; Oldfield-birch	NT (FAC)	1	IV
091	<i>Alnus incana</i> (L.) Moench. var. <i>americana</i> Regel	Speckled Alder	NST (FACW)	1	III
	Synonyms:	<i>Alnus incana</i> (L.) Moench. ssp. <i>rugosa</i> (Du Roi) Clausen [FNA97; K94] <i>Alnus rugosa</i> (Du Roi) Sprengel [F50; USDA82] <i>Alnus rugosa</i> (Du Roi) Sprengel var. <i>americana</i> (Regel) Fern. [S93]			
Class MAGNOLIOPSIDA		Order POLYGONALES			
Family POLYGONACEAE		Smartweed Family			
137	<i>Polygonum hydropiperoides</i> Michx.	False Water-pepper, Smartweed	NPF (OBL)	1	III
	Synonyms:	<i>Polygonum hydropiperoides</i> Michx. [K94] <i>Polygonum opelousanum</i> Riddell ex Small [USDA82] <i>Polygonum opelousanum</i> Riddell var. <i>adenocalyx</i> Stanford [F50; S93] <i>Polygonum opelousanum</i> Riddell var. <i>opelousanum</i> [S93]			

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138	<i>Polygonum arifolium</i> L. Synonyms: <i>Polygonum arifolium</i> L. var. <i>pubescens</i> (Keller) Fern. [F50; S93; USDA82]	Halberd-leaved Tearthumb	NAEF (OBL)	1	III
Class MAGNOLIOPSIDA		Order THEALES			
Family CLUSIACEAE		Mangosteen Family			
144	<i>Hypericum punctatum</i> Lam.	Spotted St. John's-wort	NPF (FAC-)	1	III
145	<i>Hypericum canadense</i> L.	Narrow-leaved or Canada St. John's-wort	NAPF (FACW)	1	III
145	<i>Triadenum virginicum</i> (L.) Raf. Synonyms: <i>Hypericum virginicum</i> L. [F50; S93]	Marsh St. John's-wort	NPEF (OBL)	1	III
Class MAGNOLIOPSIDA		Order VIOLALES			
Family VIOLACEAE		Violet Family			
158	<i>Viola</i> spp.	violets	PF		
159	<i>Viola sagittata</i> Aiton Synonyms: <i>Viola emarginata</i> (Nutt.) LeConte [F50 lists as a separate species] <i>Viola fimbriatula</i> Sm. [F50, S93, & USDA82 list as a separate species] <i>Viola</i> X <i>emarginata</i> (Nutt.) LeConte [USDA82]	Northern Downy or Arrow-leaved Violet	NPF (FACW)	1	III
Class MAGNOLIOPSIDA		Order SALICALES			
Family SALICACEAE		Willow Family			
168	<i>Salix</i> sp.	willow	NS	1	III
Class MAGNOLIOPSIDA		Order CAPPARALES			
Family BRASSICACEAE		Mustard Family			
193	<i>Rorippa nasturtium-aquaticum</i> (L.) Hayek Synonyms: <i>Nasturtium officinale</i> R. Br. [F50; USDA82]	True Watercress	IPZEF (OBL)	4	III

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Page	Species	Common Name	Habit (Wetland Status)	RI Status	Abundance
Class MAGNOLIOPSIDA		Order ERICALES			
Family CLETHRACEAE		Clethra Family			
200	<i>Clethra alnifolia</i> L.	Sweet Pepperbush, Soapbush, Coast White Alder, Summer-sweet	NS (FAC+)	1	IV
Class MAGNOLIOPSIDA		Order ERICALES			
Family ERICACEAE		Heath Family			
204	<i>Rhododendron viscosum</i> (L.) Torr.	Clammy Azalea, Swamp-azalea; Swamp-honeysuckle	NS (FACW+)	1	IV
205	<i>Kalmia angustifolia</i> L. var. <i>angustifolia</i>	Sheep-laurel, Lambkill, Wicky	NS (FAC)	1	IV
205	<i>Kalmia latifolia</i> L.	Mountain-laurel, Calico-bush	NST (FACU)	1	IV
206	<i>Lyonia ligustrina</i> (L.) DC.	Maleberry, He-huckleberry	NS (FACW)	1	III
209	<i>Gaultheria procumbens</i> L.	Wintergreen, Teaberry, Checkerberry	NS (FACU)	1	III
209	<i>Epigaea repens</i> L.	Trailing Arbutus, Mayflower	NS	1	III
212	<i>Vaccinium angustifolium</i> Aiton	Common, Low, Lowbush, or Late Sweet Blueberry	NS (FACU-)	1	IV
	Synonyms:	<i>Vaccinium angustifolium</i> Ait. var. <i>laevifolium</i> House [F50; S93] <i>Vaccinium angustifolium</i> Ait. var. <i>nigrum</i> (Wood) Dole [F50; S93]			
212	<i>Vaccinium pallidum</i> Aiton	Low, Lowbush, or Early Sweet Blueberry; Hillside Blueberry	NS	1	IV
	Synonyms:	<i>Vaccinium vacillans</i> Torr. [F50; S93]			
212	<i>Vaccinium corymbosum</i> L.	Highbush Blueberry	NS (FACW-)	1	IV
	Synonyms:	<i>Vaccinium atrococcum</i> (A. Gray) Heller [F50 & S93 list as a separate species] <i>Vaccinium caesariense</i> MacKenzie [F50, K94, S93, & USDA82 list as a separate species] <i>Vaccinium corymbosum</i> L. var. <i>albiflorum</i> (Hook.) Fern. [F50; S93] <i>Vaccinium corymbosum</i> L. var. <i>corymbosum</i> [S93] <i>Vaccinium corymbosum</i> L. var. <i>glabrum</i> A. Gray. [F50; S93]			

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213	<i>Gaylussacia frondosa</i> (L.) T. & G. Synonyms: <i>Gaylussacia frondosa</i> (L.) Torr. & Gray ex Torr. [K94]	Dangleberry, Bluetangle	NS (FAC)	1	III
213	<i>Gaylussacia baccata</i> (Wangenh.) K. Koch	Black Huckleberry	NS (FACU)	1	IV
Class MAGNOLIOPSIDA Order ERICALES Family PYROLACEAE Shinleaf Family					
214	<i>Chimaphila umbellata</i> (L.) Barton var. <i>cisatlantica</i> S. F. Blake Synonyms: <i>Chimaphila umbellata</i> (L.) W. Bart. ssp. <i>cisatlantica</i> (Blake) Hultén [K94]	Pipsissewa, Wintergreen, Prince's Pine	NH	1	III
214	<i>Chimaphila maculata</i> (L.) Pursh	Pipsissewa, Spotted Wintergreen	NH	1	III
Class MAGNOLIOPSIDA Order ERICALES Family MONOTROPACEAE Indian Pipe Family					
216	<i>Monotropa uniflora</i> L.	Indian Pipe, Corpse-plant	NP—\$F (FACU-)	1	III
Class MAGNOLIOPSIDA Order PRIMULALES Family PRIMULACEAE Primrose Family					
222	<i>Lysimachia quadrifolia</i> L.	Whorled Loosestrife	NPF (FACU-)	1	IV
222	<i>Trientalis borealis</i> Raf.	Starflower	NPF (FAC)	1	III
Class MAGNOLIOPSIDA Order ROSALES Family SAXIFRAGACEAE Saxifrage Family					
237	<i>Chrysosplenium americanum</i> Schwein. Synonyms: <i>Chrysosplenium americanum</i> Schwein. ex Hook. [K94]	Golden Saxifrage, Water-carpet, Water-mat	NPF (OBL)	1	III
Class MAGNOLIOPSIDA Order ROSALES Family ROSACEAE Rose Family					
240	<i>Spiraea alba</i> Du Roi var. <i>latifolia</i> (Aiton) Dippel Synonyms: <i>Spiraea latifolia</i> (Aiton) Borkh. [F50; USDA82]	Meadowsweet	NS (FAC+)	1	IV
240	<i>Spiraea tomentosa</i> L. var. <i>tomentosa</i>	Steeple-bush, Hardhack	NS (FACW-)	1	IV

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244	<i>Potentilla simplex</i> Michx. Synonyms: <i>Potentilla simplex</i> Michx. var. <i>simplex</i> [S93] <i>Potentilla simplex</i> Michx. var. <i>calvescens</i> Fern. [F50; S93; USDA82]	Common or Old-field Cinquefoil; Five-fingers	NPF (FACU-)	1	IV
244	<i>Potentilla canadensis</i> L. Synonyms: <i>Potentilla canadensis</i> L. var. <i>canadensis</i> [S93]	Dwarf Cinquefoil, Running Five-fingers	NPF	1	IV
251	<i>Rubus hispidus</i> L. Synonyms: <i>Rubus hispidus</i> L. var. <i>obovalis</i> (Michx.) Fern. [F50; USDA82]	Swamp-, Bristly, or Evergreen Dewberry	NS (FACW)	1	IV
252	<i>Rubus flagellaris</i> Willd. Synonyms: <i>Rubus baileyanus</i> Britt. [F50, K94, & USDA82 list as a separate species] <i>Rubus jaysmithii</i> Bailey [F50 & S93 list as a separate species; K94 lists under <i>Rubus multiflorus</i>]	Northern Dewberry	NS (FACU-)	1	IV
252	<i>Rubus allegheniensis</i> T. C. Porter Synonyms: <i>Rubus alumnus</i> Bailey [F50, K94, & USDA82 list as a separate species] <i>Rubus paulus</i> Bailey [F50 lists as a separate species; K94 lists under <i>Rubus alumnus</i>]	Common or Sowteat Blackberry	NS (FACU-)	1	IV
257	<i>Rosa palustris</i> Marshall	Swamp-rose	NS (OBL)	1	III
258	<i>Rosa carolina</i> L. Synonyms: <i>Rosa carolina</i> L. var. <i>carolina</i> [S93]	Pasture-rose	NS	1	III
260	<i>Prunus serotina</i> Ehrh.	Wild Black Cherry, Rum Cherry	NT (FACU)	1	IV
260	<i>Prunus virginiana</i> L. var. <i>virginiana</i>	Choke-cherry	NST (FACU)	1	III
263	<i>Aronia arbutifolia</i> (L.) Elliott Synonyms: <i>Aronia arbutifolia</i> (L.) Elliott var. <i>arbutifolia</i> [S93] <i>Aronia arbutifolia</i> (L.) Pers. [K94] <i>Pyrus arbutifolia</i> (L.) L.f. [F50]	Red Chokeberry; Dogberry [R.I. colloquialism]	NS (FACW)	1	III
264	<i>Crataegus</i> sp.	hawthorn	T		
267	<i>Crataegus pruinosa</i> (Wendl.) K. Koch Synonyms: <i>Crataegus pruinosa</i> (Wendl. f.) K. Koch [K94]	Frosted Hawthorn	NTS	1	III

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268	<i>Amelanchier</i> sp.	shadbush	NS	1	III or IV
Class MAGNOLIOPSIDA		Order FABALES			
Family FABACEAE		Pea or Bean Family			
293	<i>Desmodium</i> sp.	tick-trefoil	NPF	1	II or III
304	<i>Amphicarpaea bracteata</i> (L.) Fern. Synonyms: <i>Amphicarpa bracteata</i> (L.) Fern. [F50] <i>Amphicarpa bracteata</i> (L.) Fern. var. <i>bracteata</i> [S93] <i>Amphicarpa bracteata</i> (L.) Fern. var. <i>comosa</i> (L.) Fern. [F50; S93; USDA82] <i>Amphicarpa bracteata</i> (L.) Rickett & Stafleu [MT97]	Hog-peanut	NPAFV (FAC)	1	IV
Class MAGNOLIOPSIDA		Order MYRTALES			
Family LYTHRACEAE		Loosestrife Family			
310	<i>Decodon verticillatus</i> (L.) Elliott	Water-willow	NEPH (OBL)	1	III
Class MAGNOLIOPSIDA		Order MYRTALES			
Family ONAGRACEAE		Evening-primrose Family			
321	<i>Circaea lutetiana</i> L. var. <i>canadensis</i> L. Synonyms: <i>Circaea lutetiana</i> L. ssp. <i>canadensis</i> (L.) Aschers. & Magnus [K94] <i>Circaea quadrisulcata</i> (Maxim) Franch. & Sav. var. <i>canadensis</i> (L.) Hara [F50; S93]	Common Enchanter's Nightshade	NPF (FACU)	1	III
Class MAGNOLIOPSIDA		Order MYRTALES			
Family MELASTOMATACEAE		Melastome Family			
323	<i>Rhexia virginica</i> L.	Virginia or Wing-stem Meadow-beauty; Deergrass, Meadow-pitchers	NPF (OBL)	1	III
Class MAGNOLIOPSIDA		Order CORNALES			
Family CORNACEAE		Dogwood Family			
324	<i>Cornus amomum</i> Miller	Silky or Knob-styled Dogwood; "Red Willow"	NS (FACW)	1	III

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324	<i>Cornus sericea</i> L. Synonyms: <i>Cornus sericea</i> L. ssp. <i>sericea</i> [K94] <i>Cornus stolonifera</i> Michx. [F50; S93; USDA82]	Red-osier Dogwood	NS (FACW+)	1	III
325	<i>Cornus canadensis</i> L.	Bunchberry, Dwarf Cornel	NPFH (FAC-)	1	III
325	<i>Nyssa sylvatica</i> Marshall var. <i>sylvatica</i>	Black Gum, Black Tupelo, Sour Gum, Pepperidge; Hornbeam, Snagwood, Mallet Tree [RI colloquialisms]	NT (FAC)	1	IV
Class MAGNOLIOPSIDA		Order SANTALES			
Family SANTALACEAE		Sandalwood Family			
326	<i>Comandra umbellata</i> (L.) Nutt. var. <i>umbellata</i> Synonyms: <i>Comandra umbellata</i> (L.) Nutt. ssp. <i>umbellata</i> [K94; USDA82]	Bastard or Star Toadflax	NP+F (FACU-)	1	III
Class MAGNOLIOPSIDA		Order CELASTRALES			
Family AQUIFOLIACEAE		Holly Family			
330	<i>Ilex verticillata</i> (L.) A. Gray	Winterberry; Black Alder (RI colloquialism)	NEST (FACW+)	1	III
331	<i>Nemopanthus mucronatus</i> (L.) Loes. Synonyms: <i>Nemopanthus mucronata</i> (L.) Trel. [F50; S93] <i>Nemopanthus mucronatus</i> (L.) Loes. ex Koehner [MT97] <i>Nemopanthus mucronatus</i> (L.) Trel. [USDA82]	Common Mountain-holly, Catberry	NS (OBL)	1	III
Class MAGNOLIOPSIDA		Order RHAMNALES			
Family VITACEAE		Grape Family			
343	<i>Vitis</i> sp.	grape	NWV	1	I or III
344	<i>Vitis labrusca</i> L.	Fox-grape	NWV (FACU)	1	IV
Class MAGNOLIOPSIDA		Order POLYGALALES			
Family POLYGALACEAE		Milkwort Family			
348	<i>Polygala paucifolia</i> Willd.	Fringed Polygala, Gay-wings, Flowering Wintergreen, Bird-on-the-wing	NPF (FACU)	1	III

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Class MAGNOLIOPSIDA		Order SAPINDALES			
Family ACERACEAE		Maple Family			
352	<i>Acer saccharum</i> Marshall	Sugar or Hard Maple; Rock-maple	NT (FACU-)	1	III
353	<i>Acer rubrum</i> L. Synonyms: <i>Acer rubrum</i> L. var. <i>rubrum</i> [K94; S93] <i>Acer rubrum</i> L. var. <i>trilobum</i> K. Koch [F50; S93] <i>Acer rubrum</i> L. var. <i>trilobum</i> T. & G. ex K. Koch [K94; USDA82]	Red or Soft Maple; Swamp-maple	NT (FAC)	1	IV
Class MAGNOLIOPSIDA		Order SAPINDALES			
Family ANACARDIACEAE		Cashew Family			
354	<i>Toxicodendron vernix</i> (L.) Kuntze Synonyms: <i>Rhus vernix</i> L. [F50; S93]	Poison Sumac, Poison Elder, Poison Dogwood	NEST (OBL)	1	III
355	<i>Toxicodendron radicans</i> (L.) Kuntze var. <i>radicans</i> Synonyms: <i>Rhus radicans</i> L. [F50] <i>Rhus radicans</i> L. var. <i>radicans</i> [S93] <i>Toxicodendron radicans</i> (L.) Kuntze [USDA82] <i>Toxicodendron radicans</i> (L.) Kuntze ssp. <i>radicans</i> [K94] <i>Note:</i> True Poison Oak, <i>Toxicodendron pubescens</i> Miller, has not been reported from Rhode Island.	Common Poison Ivy, Cow-itch, Poison Mercury; "Poison Oak" [RI colloq.]	NWVS (FAC)	1	IV
Class MAGNOLIOPSIDA		Order GERANIALES			
Family OXALIDACEAE		Wood-sorrel Family			
358	<i>Oxalis stricta</i> L. Synonyms: <i>Oxalis europaea</i> Jord. [F50 and S93 list as a separate species]	Common Yellow Wood-sorrel	NPF	1	IV
Class MAGNOLIOPSIDA		Order GERANIALES			
Family GERANIACEAE		Geranium Family			
359	<i>Geranium maculatum</i> L.	Wild or Spotted Geranium; Cranesbill	NPF (FACU)	1	III

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Class MAGNOLIOPSIDA Order GERANIALES					
Family BALSAMINACEAE Touch-me-not Family					
362	<i>Impatiens capensis</i> Meerb.	Spotted or Orange Touch-me-not; Jewelweed, Snapweed	NAF (FACW)	1	IV
Class MAGNOLIOPSIDA Order ARALIALES					
Family ARALIACEAE Ginseng Family					
363	<i>Aralia nudicaulis</i> L.	Wild Sarsaparilla	NPF (FACU)	1	IV
Class MAGNOLIOPSIDA Order ARALIALES					
Family APIACEAE Carrot Family					
369	<i>Hydrocotyle americana</i> L.	Marsh-pennywort	NPEF (OBL)	1	III
379	<i>Sium suave</i> Walter Synonyms: <i>Sium carsonii</i> E. M. Durand ex Gray	Water-parsnip [USDA82 lists as a separate species]	NPEF (OBL)	1	III
Class MAGNOLIOPSIDA Order GENTIANALES					
Family APOCYNACEAE Dogbane Family					
394	<i>Apocynum androsaemifolium</i> L.	Spreading Dogbane	NPF	1	III
Class MAGNOLIOPSIDA Order GENTIANALES					
Family ASCLEPIADACEAE Milkweed Family					
396	<i>Asclepias incarnata</i> L. var. <i>pulchra</i> (Ehrh.) Pers. Synonyms: <i>Asclepias incarnata</i> L. ssp. <i>pulchra</i> (Ehrh. ex Willd.) Woods. [K94]	Swamp-milkweed	NPEF (OBL)	1	III
Class MAGNOLIOPSIDA Order SOLANALES					
Family CUSCUTACEAE Dodder Family					
410	<i>Cuscuta</i> sp.	dodder, love-vine, strangle-weed	NAP+V	1	I or III
Class MAGNOLIOPSIDA Order LAMIALES					
Family LAMIACEAE Mint Family					
437	<i>Scutellaria lateriflora</i> L.	Mad-dog Skullcap	NPF (FACW+)	1	III

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446	<i>Lycopus</i> sp.	water-horehound	NPF (OBL)	1	III
Class MAGNOLIOPSIDA Order SCROPHULARIALES					
Family OLEACEAE Olive Family					
464	<i>Fraxinus americana</i> L.	White Ash	NT (FACU)	1	IV
Class MAGNOLIOPSIDA Order SCROPHULARIALES					
Family SCROPHULARIACEAE Figwort Family					
473	<i>Chelone glabra</i> L. Synonyms: <i>Chelone glabra</i> L. var. <i>glabra</i> [S93]	White Turtlehead, Balmony, Snakehead	NPF (OBL)	1	III
487	<i>Melampyrum lineare</i> Desr.	cow-wheat	NA+F (FACU)	1	III
Class MAGNOLIOPSIDA Order CAMPANULALES					
Family CAMPANULACEAE Bellflower Family					
500	<i>Lobelia cardinalis</i> L. var. <i>cardinalis</i> Synonyms: <i>Lobelia cardinalis</i> L. ssp. <i>cardinalis</i> [K94; USDA82]	Cardinal-flower	NPF (FAW+)	1	III
Class MAGNOLIOPSIDA Order RUBIALES					
Family RUBIACEAE Madder Family					
503	<i>Mitchella repens</i> L.	Partridge-berry, Twinberry, Two-eyed Berry, Running Box	NPF (FACU)	1	III
506	<i>Galium palustre</i> L.	Marsh-bedstraw	NPF (OBL)	1	III
Class MAGNOLIOPSIDA Order DIPSACALES					
Family CAPRIFOLIACEAE Honeysuckle Family					
508	<i>Diervilla lonicera</i> Miller	Bush-honeysuckle	NS	1	III
513	<i>Viburnum dentatum</i> L. var. <i>lucidum</i> Aiton Synonyms: <i>Viburnum recognitum</i> Fern. [F50; S93] [USDA82 lists this as a separate species]	Northern or Common Arrowwood	NS (FACW-)	1	IV
513	<i>Viburnum acerifolium</i> L.	Maple-leaved Viburnum, Dockmackie, Arrowwood, Flowering Maple	NS	1	III
513	<i>Viburnum nudum</i> L. var. <i>cassinoides</i> (L.) T. & G. Synonyms: <i>Viburnum cassinoides</i> L. [F50; S93; USDA82]	Witherod, Northern Wild Raisin	NS (FACW)	1	III

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514	<i>Sambucus canadensis</i> L. var. <i>canadensis</i>	Common Elderberry	NS (FACW)	1	III
Class MAGNOLIOPSIDA Order ASTERALES					
Family ASTERACEAE Aster Family					
540	<i>Bidens</i> sp.	beggar-ticks	NF	1	II or III
541	<i>Bidens frondosa</i> L.	Devil's Beggar-ticks, Stick-tight	NAF (FACW)	1	IV
568	<i>Solidago</i> spp.	goldenrods	NPF	1	
568	<i>Solidago puberula</i> Nutt. var. <i>puberula</i>	Downy or Dusty Goldenrod	NPF (FACU-)	1	III
568	<i>Solidago bicolor</i> L. Synonyms: <i>Solidago bicolor</i> L. var. <i>bicolor</i> [S93]	Silverrod, White Goldenrod	NPF	1	III
569	<i>Solidago uliginosa</i> Nutt. Synonyms: <i>Solidago uliginosa</i> Nutt. var. <i>linoides</i> (T. & G.) Fern. [F50; K94; S93] <i>Solidago uliginosa</i> Nutt. var. <i>terrae-novae</i> (T. & G.) Fern. [F50; K94; S93] <i>Solidago uliginosa</i> Nutt. var. <i>uliginosa</i> [S93]	Bog-goldenrod, Swamp-goldenrod	NPF (OBL)	1	III
572	<i>Solidago odora</i> Aiton var. <i>odora</i>	Sweet Goldenrod, Licorice-goldenrod	NPF	1	III
573	<i>Solidago gigantea</i> Aiton Synonyms: <i>Solidago gigantea</i> Aiton var. <i>gigantea</i> [S93] <i>Solidago gigantea</i> Aiton var. <i>leiophylla</i> Fern. [F50] <i>Solidago gigantea</i> Aiton var. <i>serotina</i> (Ait.) Cronq. [S93]	Late or Smooth Goldenrod	NPF (FACW)	1	III
581	<i>Aster</i> spp.	asters	NPF	1	III
583	<i>Aster lateriflorus</i> (L.) Britton Synonyms: <i>Aster lateriflorus</i> (L.) Britton var. <i>hirsicaulis</i> (Lindl. ex DC.) Porter [K94] <i>Aster lateriflorus</i> (L.) Britton var. <i>horizontalis</i> (Desf.) Farw. [K94; USDA82] <i>Aster lateriflorus</i> (L.) Britton var. <i>lateriflorus</i> [K94; S93] <i>Aster lateriflorus</i> (L.) Britton var. <i>pendulus</i> (Aiton) Burgess [F50; S93; USDA82]	Calico or Starved Aster; Goblet-aster	NPF (FACW-)	1	III

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583	<i>Aster racemosus</i> Elliott Synonyms: <i>Aster fragilis</i> Willd. var. <i>subdumosus</i> (Wieg.) A. G. Jones [K94] <i>Aster vimineus</i> Lam. [S93] [F50 & USDA82 list as a separate species]	Small White or Small-headed Aster; Coastal-plain Aster	NPF (FACW)	1	IV
587	<i>Aster macrophyllus</i> L. Synonyms: <i>Aster macrophyllus</i> L. var. <i>ianthinus</i> (Burgess) Fern. [F50; K94; S93] <i>Aster macrophyllus</i> L. var. <i>macrophyllus</i> [F50; K94; S93]	Large-leaved or Big-leaved Aster	NPF	1	II
587	<i>Aster divaricatus</i> L. var. <i>divaricatus</i> Synonyms: <i>Aster divaricatus</i> (Nutt.) T. & G. [K94; USDA82]	White Wood-aster, Common White Heart-leaved Aster	NPF	1	IV
589	<i>Aster umbellatus</i> Miller	Tall Flat-topped White Aster	NPF (FACW)	1	III
600	<i>Eupatorium dubium</i> Willd. Synonyms: <i>Eupatoriadelphus dubius</i> (Willd. ex Poir.) R. M. King & H. E. Robins. [USDA82] <i>Eupatorium dubium</i> Willd. ex Poir [K94]	Three-nerved or Coastal-plain Joe-Pye-weed	NPF (FACW)	1	III
601	<i>Eupatorium perfoliatum</i> L. var. <i>perfoliatum</i>	White Boneset, Thoroughwort	NPF (FACW+)	1	III
618	<i>Prenanthes trifoliolata</i> (Cass.) Fern. Synonyms: <i>Prenanthes trifoliolata</i> (Cass.) Fern. var. <i>trifoliolata</i> [S93]	Gall-of-the-earth, Tall Rattlesnake-root	NPF	1	III
618	<i>Prenanthes alba</i> L.	White Lettuce, Rattlesnake-root	NPF (FACU)	1	III
624	<i>Hieracium paniculatum</i> L.	Panicled Hawkweed	NPF	1	III
624	<i>Hieracium scabrum</i> Michx. Synonyms: <i>Hieracium scabrum</i> Michx. var. <i>scabrum</i> [K94; S93]	Rough or Sticky Hawkweed	NPF	1	III
628	<i>Taraxacum officinale</i> Weber ex Wiggers Synonyms: <i>Taraxacum officinale</i> Weber ex Wiggers ssp. <i>officinale</i> [K94] <i>Taraxacum officinale</i> Weber var. <i>officinale</i> [S93]	Common Dandelion, Blowballs	IPF (FACU-)	4	IV

Appendix F. Botanical Inventory at the Nipmuc River Conservation Area, Burrillville, RI — 2004. For explanation of codes, see Appendix G.

Page	Species	Common Name	Habit (Wetland Status)	RI Status	Abundance
Class LILIOPSIDA (Monocotyledons) Order NAJADALES					
Family ALISMATACEAE Water-plantain Family					
634	<i>Sagittaria latifolia</i> Willd. var. <i>latifolia</i>	Broad-leaved or Common Arrowhead; Duck-potato, Wapato	NPEF (OBL)	1	III
	Synonyms: <i>Sagittaria latifolia</i> Willd. var. <i>obtusata</i> (Muhl.) Wieg. [F50; S93; USDA82]				
Class LILIOPSIDA Order ARALES					
Family ARACEAE Arum Family					
649	<i>Symplocarpus foetidus</i> (L.) Nutt.	Skunk-cabbage	NPF (OBL)	1	IV
	Synonyms: <i>Symplocarpus foetidus</i> (L.) Salisb. [USDA82] <i>Symplocarpus foetidus</i> (L.) Salisb. ex Nutt. [K94]				
649	<i>Peltandra virginica</i> (L.) Schott & Endl.	Arrow-arum, Tuckahoe	NPEF (OBL)	1	III
	Synonyms: <i>Peltandra virginica</i> (L.) Kunth [USDA82] <i>Peltandra virginica</i> (L.) Schott [K94]				
649	<i>Arisaema triphyllum</i> (L.) Schott var. <i>triphyllum</i>	Jack-in-the-pulpit, Bog-onion, Indian-turnip, Memory Root	NPF (FACW-)	1	IV
	Synonyms: <i>Arisaema atrorubens</i> (Aiton) Blume [F50] <i>Arisaema triphyllum</i> (L.) Schott [S93] <i>Arisaema triphyllum</i> (L.) Schott ssp. <i>triphyllum</i> [K94; MT97; USDA82]				
Class LILIOPSIDA Order COMMELINALES					
Family XYRIDACEAE Yellow-eyed Grass Family					
653	<i>Xyris difformis</i> Chapman	Common Yellow-eyed Grass	NPEF (OBL)	1	III
	Synonyms: <i>Xyris caroliniana</i> Walt. of some authors [F50, GC91, K94, & USDA82 list as a separate species]				
Class LILIOPSIDA Order JUNCALES					
Family JUNCACEAE Rush Family					
661	<i>Juncus tenuis</i> Willd. var. <i>tenuis</i>	Path-rush	NPG (FAC-)	1	IV
	Synonyms: <i>Juncus tenuis</i> Willd. [K94] <i>Juncus tenuis</i> Willd. var. <i>anthelatus</i> Wieg. [F50; S93] <i>Juncus tenuis</i> Willd. var. <i>williamsii</i> Fern. [F50; S93]				

Appendix F. Botanical Inventory at the Nipmuc River Conservation Area, Burrillville, RI — 2004. For explanation of codes, see Appendix G.

Page	Species	Common Name	Habit (Wetland Status)	RI Status	Abundance
Class LILIOPSIDA		Order CYPERALES			
Family CYPERACEAE Sedge Family		<i>Nomenclature according to Tucker, 1992 and Gordon Tucker, personal communication</i>			
673	<i>Scirpus cyperinus</i> (L.) Kunth	wool-grass, woolly bulrush	NPEG	1	III
674	<i>Eleocharis</i> spp.	spike-rushes	NPG	1	II or III
708	<i>Carex</i> spp.	sedges	PG		
720	<i>Carex pennsylvanica</i> Lam. var. <i>pennsylvanica</i>	Early Sedge	NPG	1	IV
728	<i>Carex swanii</i> (Fern.) Mackenzie	Swan's Sedge	NPG (FACU)	1	III
731	<i>Carex crinita</i> Lam.	sedge	NPEG (OBL)	1	III
732	<i>Carex stricta</i> Lam. Synonyms: <i>Carex stricta</i> Lam. var. <i>stricta</i> [S93] <i>Carex stricta</i> Lam. var. <i>strictior</i> (Dewey) Carey [F50; S93; USDA82]	Tussock Sedge	NPEG (OBL)	1	III
Class LILIOPSIDA		Order CYPERALES			
Family POACEAE Grass Family					
746	<i>Brachyelytrum erectum</i> (Schreber) P. Beauv. var. <i>septentrionale</i> Babel Synonyms: <i>Brachyelytrum septentrionale</i> (Babel) G. Tucker [K94]	Brachyelytrum, Long-awned Wood-grass, Short-husk Grass	NPG	1	III
796	<i>Panicum</i> sp.	panic-grass	NPG	1	III
804	<i>Panicum clandestinum</i> L. Synonyms: <i>Dichanthelium clandestinum</i> (L.) Gould [K94; USDA82]	Deertongue, (hidden) Panic-grass	NPG (FAC+)	1	IV
Class LILIOPSIDA		Order LILIALES			
Family PONTEDERIACEAE Water-hyacinth Family					
821	<i>Pontederia cordata</i> L.	Pickernelweed	NPEF (OBL)	1	IV

Appendix F. Botanical Inventory at the Nipmuc River Conservation Area, Burrillville, RI — 2004. For explanation of codes, see Appendix G.

Page	Species	Common Name	Habit (Wetland Status)	RI Status	Abundance
Class LILIOPSIDA Order LILIALES					
Family LILIACEAE Lily Family					
837	<i>Medeola virginiana</i> L.	Indian Cucumber-root	NPF	1	III
837	<i>Clintonia borealis</i> (Aiton) Raf.	Clinton's Lily, Bluebead-lily, Bead-lily, Corn-lily	NPF (FAC)	1	III
837	<i>Uvularia sessilifolia</i> L.	Wild Oats, Sessile Bellwort	NPF (FACU-)	1	III
839	<i>Smilacina racemosa</i> (L.) Desf.	False Solomon's Seal, Solomon's Plume; False or Wild Spikenard	NPF (FACU-)	1	IV
	Synonyms: <i>Maianthemum racemosum</i> (L.) Link ssp. <i>racemosum</i> [K94] <i>Smilacina racemosa</i> (L.) Desf. var. <i>cylindrata</i> Fern. [F50; S93; USDA82] <i>Smilacina racemosa</i> (L.) Desf. var. <i>racemosa</i> [S93]				
839	<i>Maianthemum canadense</i> Desf. var. <i>canadense</i>	False or Wild Lily-of-the-valley; Canada Mayflower, Two-leaved Solomon's Seal	NPF (FAC-)	1	IV
	Synonyms: <i>Maianthemum canadense</i> Desf. [K94]				
840	<i>Polygonatum pubescens</i> (Willd.) Pursh	Small, True, or Hairy Solomon's Seal	NPF	1	III
Class LILIOPSIDA Order LILIALES					
Family SMILACACEAE Catbrier Family					
843	<i>Smilax herbacea</i> L. var. <i>herbacea</i>	Carrion-flower, Carrion-vine, Jacob's Ladder	NPVF (FAC)	1	III
844	<i>Smilax glauca</i> Walter	Sawbrier, Wild Sarsaparilla	NSWV (FACU)	1	IV
	Synonyms: <i>Smilax glauca</i> Walter var. <i>leurophylla</i> Blake [F50; USDA82]				
844	<i>Smilax rotundifolia</i> L.	Bullbrier, Common Greenbrier, Catbrier, Horsebrier	NWV (FAC)	1	IV
Class LILIOPSIDA Order LILIALES					
Family IRIDACEAE Iris Family					
848	<i>Iris versicolor</i> L.	Northern Blue Flag, Wild Iris, Poison Flag	NPF (OBL)	1	III

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Page	Species	Common Name	Habit (Wetland Status)	RI Status	Abundance
Class LILIOPSIDA		Order ORCHIDALES			
Family ORCHIDACEAE		Orchid Family			
<i>Nomenclature according to Luer, 1975</i>					
851	<i>Cypripedium acaule</i> Aiton	Pink, Common, or Two-leaved Lady's-slipper (Lady-slipper); Moccasin-flower, Whip-poor-will Shoes, Nerve-root	NPF (FACU-)	1	III
855	<i>Goodyera pubescens</i> (Willd.) R. Brown Synonyms: <i>Goodyera pubescens</i> (Willd.) R. Br. ex Ait. f. [K94]	Downy Rattlesnake-plantain	NPF (FACU-)	1	III
856	<i>Platanthera</i> sp.	orchid	NPF	1	II or III

Appendix G. Explanation of columns and codes in the table in Appendix F. [For citations, see Gould et al. (1998)].

Page Refers to the page number in Gleason and Cronquist, 1991.

Species The accepted name according to: Flora of North America, 1993 (Pteridophytes & Gymnosperms); Luer, 1975 (the Orchids); Tucker, 1992 and personal communication (Cyperaceae); or Gleason and Cronquist, 1991 (all other groups).

Synonyms Given when the accepted name differs from that given in Fernald, 1950 [F50]; Flora of North America, 1997 [FNA97]; Gleason and Cronquist, 1991 [GC91]; Kartesz, 1994 [K94]; Mitchell and Tucker, 1997 [MT97]; *National List of Scientific Plant Names*, 1982 [USDA82]; Seymour, 1993 [S93]; Crow and Hellquist's *Aquatic Vascular Plants of New England* series [HC or CH + year]; or is needed to explain the inclusion of that species/variety.

Common Name The most likely common names in our area. Where available, we have listed Rhode Island colloquialisms. Common names appearing in parentheses are translations of the second half of the binomial.

Habit Similar codes as those given by the *National List of Scientific Plant Names*, 1982, but modified for our region. Wetland indicator status (according to Reed, 1988) is given in parentheses following Habit designation. The codes are:

N = <i>Native</i>	S = <i>Shrub</i>	\$ = <i>Succulent</i>
I = <i>Introduced</i>	T = <i>Tree</i>	/ = <i>Floating</i>
A = <i>Annual</i>	W = <i>Woody</i>	— = <i>Saprophytic</i>
B = <i>Biennial</i>	H = <i>Partly Woody</i>	+ = <i>Parasitic</i>
P = <i>Perennial</i>	V = <i>Vine</i>	E = <i>Emergent</i>
F = <i>Herbaceous (other than G or V)</i>		Z = <i>Submersed</i>
G = <i>Grasslike (Poaceae, Juncaceae, Cyperaceae)</i>		

In many cases codes are combined to indicate a variable growth form.

Wetland Indicator Status

OBL	= <i>Obligate Wetland species</i> These almost always (with an estimated probability of >99%) occur under natural conditions in wetlands.
FACW	= <i>Facultative Wetland species</i> These usually occur in wetlands (with an estimated probability of 67%–99%), but are occasionally found in nonwetlands.
FAC	= <i>Facultative species</i> These are equally likely to occur in wetlands or nonwetlands (with an estimated probability of 34%–67%).
FACU	= <i>Facultative Upland species</i> These usually occur in nonwetlands (with an estimated probability of 67%–99%), but occasionally are found in wetlands (with an estimated probability of 1%–33%).

Appendix G. Explanation of columns and codes in the table in Appendix F. [For citations, see Gould et al. (1998)].

- NI = No indicator
Insufficient information was available for that species to determine an indicator status.
- (+) = more frequently found in wetlands
- (-) = less frequently found in wetlands
- (*) = status tentative, based on limited information

If no designation is given, the taxon is not included on the National List (Reed, 1988).

RI Status Categorized as native to Rhode Island if believed to have been present prior to the European invasion that began in the 15th century.

- 1 Native to Rhode Island.
- 2 Native to North America, naturalized in Rhode Island.
- 3 Native to North America, with little evidence of full naturalization in Rhode Island.
 - a) Species which persist at former cultivation sites, but do not reproduce and spread.
 - b) Species which spread vegetatively, or sprout from seeds at dump sites, but not fully naturalized.
 - c) Species which may be reproducing and spreading but on a very limited basis at this point in time.
- 4 Native to other continents, naturalized in Rhode Island. * = *Invasive exotic*
- 5 Native to other continents, with little evidence of full naturalization in Rhode Island (a, b, & c same as listed under 3).
- 6 Species included in Palmatier's 1952 list of Rhode Island flora, Seymour's 1993 *The Flora of New England*, or in the Flora of North America 1993 (Volume 2, 2nd printing), but for which we have been unable to locate any other literature references (beyond generalized range descriptions), herbarium specimens, or field evidence that these plants are part of the state's flora.
- 7 Species which have been reported by field notes but for which there are no herbarium specimens or other formal documentation.

Abundance

- I Status undetermined: needs more study.
- II Rare: only species listed by the Rhode Island Natural Heritage Program, Rhode Island Department of Environmental Management.
- III Present (from common to fairly common to uncommon).
- IV Ubiquitous (widespread and abundant. Considered to be typical representatives of the Rhode Island flora, generally found in all or nearly all municipalities).
- H "Historical" (native species known to have been extirpated in Rhode Island).
- Used only with a "6" Status category; because we do not believe the plant to be in Rhode Island, we do not assign it an Abundance code.