
ECOLOGICAL SYSTEM: ATLANTIC COASTAL PLAIN NORTHERN BASIN PEAT SWAMP

Summary: This system is comprised of acidic peat swamps formed in basins of various sizes, predominantly Atlantic white-cedar swamps, occurring on the northern portion of the Atlantic Coastal Plain from Massachusetts south to Virginia. The hydrology is saturated, as evidenced by *Sphagnum* (peatmoss)-dominated hummock-and-hollow microtopography. *Chamaecyparis thyoides* (Atlantic white-cedar) is characteristic and often dominant. *Acer rubrum* (red maple) may also be an important species, especially after logging.

High-ranked Species: *Calophrys hesseli* (G3G4, hessel's hairstreak), *Gentiana autumnalis* (G3, pine barren gentian), *Helonias bullata* (G3, swamp-pink), *Narthemcium americanum* (G2, bog asphodel), *Scirpus longii* (G2G3, Long's bulrush)

Range: This system occurs on the northern portion of the Atlantic Coastal Plain from Massachusetts south to Virginia. United States: CT, DE, MA, MD, NJ, NY, VA

Delaware Estuary Associations:

- Atlantic White-cedar / Seaside Alder Swamp
- Blueberry Wetland Thicket
- Coastal Plain Atlantic White-cedar - Red Maple Swamp
- Coastal Plain Atlantic White-cedar Swamp
- Red Maple / Seaside Alder Woodland
- Southern Red Maple - Black Gum Swamp Forest

Similar Ecological Systems in the Delaware Estuary:

- North-Central Appalachian Acidic Swamp

CLASSIFIERS FOR ATLANTIC COASTAL PLAIN NORTHERN BASIN PEAT SWAMP

Primary Division: 203

Land Cover Class: Woody Wetland

Spatial Scale & Pattern: Large patch

Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Wetland

Non-diagnostic Classifiers: Forest and Woodland (Treed); Depressional [Peaty]; Isolated Wetland [Partially Isolated]

ATLANTIC WHITE-CEDAR / SEASIDE ALDER SWAMP

Chamaecyparis thyoides / *Alnus maritima* Woodland

Range: This swamp type occurs along streams of the Delmarva Peninsula in Delaware and Maryland.

Environmental Description: This open-canopy Atlantic white-cedar swamp occurs along streams of the Delmarva Peninsula. It is also found in artificial mill ponds. The substrate is peat and muck characterized by hummock-and-hollow microtopography.

Vegetation Description: The tree canopy is characterized by low-statured *Chamaecyparis thyoides* (Atlantic white-cedar) in association with *Pinus taeda* (loblolly pine). Other woody associates include *Alnus maritima* (seaside alder), *Morella cerifera* (wax-myrtle), *Ilex glabra* (inkberry or little gallberry), and *Clethra alnifolia* (coastal sweet-pepperbush). The herbaceous layer is comprised of *Decodon verticillatus* (swamp-loosestrife), *Peltandra virginica* (green arrow-arum), *Nymphaea odorata* (white water-lily), *Carex exilis* (meager sedge), *Dichanthelium dichotomum* (witchgrass), *Oxypolis rigidior* (common water-dropwort), *Triadenum virginicum* (Virginia marsh St. John's-wort), *Dulichium arundinaceum* (threeway sedge), *Glyceria obtusa* (Atlantic mannagrass), *Rhynchospora alba* (white beaksedge), *Carex*

atlantica (prickly bog sedge), *Selaginella apoda* (meadow spike-moss), *Drosera rotundifolia* (roundleaf sundew), *Juncus militaris* (bayonet rush), *Vaccinium macrocarpon* (large cranberry), *Calopogon tuberosus* (tuberous grass-pink), and *Eriocaulon decangulare* (ten-angle pipewort). Floating mats within mill ponds have a unique species assemblage including *Xyris difformis* (bog yellow-eyed-grass), *Fuirena* (umbrella-sedge) spp., *Hypericum mutilum* (dwarf St. John's-wort), *Juncus pelocarpus* (brown-fruit rush), *Juncus canadensis* (Canadian rush), *Fimbristylis* (fimbry) sp., and *Rhynchospora macrostachya* (tall horned beaksedge).

Noteworthy Associated Plant and/or Animal Species: *Alnus maritima* (seaside alder)

Characteristic Species: *Alnus maritima* (seaside alder), *Chamaecyparis thyoides* (Atlantic white-cedar)

Management Concerns: This association may be of artificial origin, as a result of damming. More information is needed.

Reference Sites: Prime Hook, DE

Global and State Conservation Ranks and Reasons: GNR (17-Apr-2000). DE: SNR.

VegBank Link for Plot Data: http://vegbank.org/natureserve/element_global.2.685928

References: Eastern Ecology Working Group n.d., Harrison 2004

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Tree canopy	Needle-leaved tree	<i>Chamaecyparis thyoides</i> (Atlantic white-cedar)
Tree canopy	Needle-leaved tree	<i>Pinus taeda</i> (loblolly pine)
Shrub/sapling (tall & short)	Broad-leaved deciduous shrub	<i>Alnus maritima</i> (seaside alder)
Herb (field)	Forb	<i>Decodon verticillatus</i> (swamp-loosestrife)

BLUEBERRY WETLAND THICKET

Vaccinium corymbosum - *Rhododendron viscosum* - *Clethra alnifolia* Shrubland

Range: This type occurs from New Hampshire south to New Jersey, Delaware and possibly Pennsylvania. It has been confirmed in the New Jersey and Delaware portions of the Delaware Estuary.

Environmental Description: This community typically occurs on a shallow organic layer over sand.

Vegetation Description: This type is a tall-shrub swamp where the dominant shrubs include *Vaccinium corymbosum* (highbush blueberry), *Ilex verticillata* (common winterberry), and *Rhododendron viscosum* (swamp azalea). Scattered *Acer rubrum* (red maple) are not uncommon. Associated shrub species may include *Clethra alnifolia* (coastal sweet-pepperbush), *Chamaedaphne calyculata* (leatherleaf), *Ilex glabra* (inkberry or little gallberry), *Leucothoe racemosa* (swamp doghobble), *Lyonia ligustrina* (maleberry), *Decodon verticillatus* (swamp-loosestrife), *Cephalanthus occidentalis* (common buttonbush), *Kalmia angustifolia* (sheep laurel), and *Photinia* (redtip, chokeberry) spp.. Herbaceous species commonly include *Osmunda cinnamomea* (cinnamon fern), *Osmunda regalis* (royal fern), *Lycopus uniflorus* (northern bugleweed), *Glyceria striata* (fowl mannagrass), and *Woodwardia virginica* (Virginia chainfern). *Sphagnum fimbriatum* (fringed bog moss), *Sphagnum rubellum* (red peatmoss), *Sphagnum magellanicum* (Magellan's peatmoss), *Sphagnum fallax* (flat-top bogmoss), and *Sphagnum viridum* (peatmoss) are characteristic.

Characteristic Species: *Rhododendron viscosum* (swamp azalea), *Sphagnum fallax* (flat-top bogmoss), *Sphagnum fimbriatum* (fringed bog moss), *Sphagnum magellanicum* (Magellan's peatmoss), *Sphagnum rubellum* (red peatmoss), *Sphagnum viridum* (peatmoss)

Dynamics/Successional Trajectory: This community is influenced by a strongly fluctuating water table with flooded conditions in spring and early summer followed by a drop in the water table below soil surface usually by late summer.

Reference Sites: Widespread throughout NJ and DE

Global and State Conservation Ranks and Reasons: GNR (14-Apr-1998). DE: SNR, NJ: S1S3, PA: SNR.

VegBank Link for Plot Data: http://vegbank.org/natureserve/element_global.2.685525

References: Breden et al. 2001, Conard 1935, Dowhan and Rozsa 1989, Eastern Ecology Working Group n.d., Edinger et al. 2002, Enser 1999, Fike 1999, Gawler 2002, Golet 1973, Johnson 1981b, Lynn and Karlin 1985, Metzler and Barrett 2001, Niering and Egler 1966, Reschke 1990, Schall and Murley 1984, Sperduto 2000a, Sperduto and Nichols 2004

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Tall shrub/sapling	Broad-leaved deciduous shrub	<i>Ilex verticillata</i> (common winterberry)
Tall shrub/sapling	Broad-leaved deciduous shrub	<i>Rhododendron viscosum</i> (swamp azalea)
Tall shrub/sapling	Broad-leaved deciduous shrub	<i>Vaccinium corymbosum</i> (highbush blueberry)
Herb (field)	Forb	<i>Calla palustris</i> (water arum)
Herb (field)	Forb	<i>Lycopus uniflorus</i> (northern bugleweed)
Herb (field)	Graminoid	<i>Glyceria striata</i> (fowl mannagrass)
Herb (field)	Fern or fern ally	<i>Osmunda cinnamomea</i> (cinnamon fern)
Herb (field)	Fern or fern ally	<i>Osmunda regalis</i> (royal fern)
Herb (field)	Fern or fern ally	<i>Woodwardia virginica</i> (Virginia chainfern)

COASTAL PLAIN ATLANTIC WHITE-CEDAR - RED MAPLE SWAMP

Chamaecyparis thyoides - *Acer rubrum* - *Magnolia virginiana* Forest

Range: This association is found in New Jersey, Delaware, and Maryland.

Environmental Description: This is a mixed Atlantic white-cedar - red maple swamp of New Jersey, Delaware and Maryland.

Vegetation Description: In addition to *Chamaecyparis thyoides* (Atlantic white-cedar) and *Acer rubrum* (red maple), other canopy associates include *Magnolia virginiana* (sweetbay), *Nyssa sylvatica* (blackgum), and *Pinus rigida* (pitch pine). *Ilex opaca* (American holly) occasionally occurs in the subcanopy. The shrub layer is characterized by *Vaccinium corymbosum* (highbush blueberry), *Clethra alnifolia* (coastal sweet-pepperbush), *Ilex glabra* (inkberry or little gallberry), *Gaylussacia frondosa* (dangleberry), *Rhododendron viscosum* (swamp azalea), *Smilax rotundifolia* (roundleaf greenbrier), and *Smilax laurifolia* (blaspheme-vine). The herbaceous layer may have sparse to moderate cover and includes species such as *Osmunda cinnamomea* (cinnamon fern), *Mitchella repens* (partridgeberry), *Woodwardia virginica* (Virginia chainfern), *Sarracenia purpurea* (purple pitcherplant), *Triadenum virginicum* (Virginia marsh St. John's-wort), *Pogonia ophioglossoides* (rose pogonia), *Boehmeria cylindrica* (small-spike false nettle), *Carex collinsii* (collins' sedge), and *Carex folliculata* (northern long sedge). In canopy openings, *Orontium aquaticum* (golden club) and *Iris versicolor* (harlequin blueflag) may also occur. Sphagnum mosses form a moderately dense to dense bryophyte layer; species include *Sphagnum magellanicum* (Magellan's peatmoss), *Sphagnum cuspidatum* (toothed peatmoss), *Sphagnum pulchrum* (beautiful peatmoss), *Sphagnum flavicomans* (peatmoss), *Sphagnum recurvum* (recurved peatmoss), and *Sphagnum fallax* (flat-top bogmoss).

Characteristic Species: *Chamaecyparis thyoides* (Atlantic white-cedar), *Magnolia virginiana* (sweetbay)

Reference Sites: Brendan Byrne State Forest, NJ

Global and State Conservation Ranks and Reasons: GNR (1-Dec-1997). DE: SNR, NJ: S4.

VegBank Link for Plot Data: http://vegbank.org/natureserve/element_global.2.683516

References: Breden 1989, Breden et al. 2001, Clancy 1996, Eastern Ecology Working Group n.d., Harrison 2004, Harrison et al. 2004, Karlin 1988, Olsson 1979

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Tree canopy	Needle-leaved tree	<i>Chamaecyparis thyoides</i> (Atlantic white-cedar)
Tree canopy	Broad-leaved deciduous tree	<i>Acer rubrum</i> (red maple)
Tree canopy	Broad-leaved deciduous tree	<i>Magnolia virginiana</i> (sweetbay)
Tall shrub/sapling	Broad-leaved deciduous shrub	<i>Vaccinium corymbosum</i> (highbush blueberry)
Herb (field)	Fern or fern ally	<i>Osmunda cinnamomea</i> (cinnamon fern)

COASTAL PLAIN ATLANTIC WHITE-CEDAR SWAMP

Chamaecyparis thyoides / *Ilex glabra* - *Rhododendron viscosum* Forest

Range: This association occurs on the Atlantic Coastal Plain from Massachusetts to New Jersey and Delaware.

Environmental Description: This community generally occurs in basins overlying sand and gravel deposits or occasionally over glacial lake sediments. Water-saturated peat overlies mineral sediments. Standing water is usually present for at least half the growing season. Water and soil are nutrient-poor, especially low in nitrogen and phosphorus, and high in iron.

Vegetation Description: This Atlantic white-cedar swamp is dominated by *Chamaecyparis thyoides* (Atlantic white-cedar) or codominated with *Acer rubrum* (red maple). Less frequent canopy associates include *Pinus rigida* (pitch pine), *Nyssa sylvatica* (blackgum), and *Magnolia virginiana* (sweetbay). The shrub layer is very dense and diverse with *Clethra alnifolia* (coastal sweet-pepperbush), *Ilex glabra* (inkberry or little gallberry), *Morella pensylvanica* (northern bayberry), *Gaylussacia frondosa* (dangleberry), *Leucothoe racemosa* (swamp doghobble), *Rhododendron viscosum* (swamp azalea), *Ilex verticillata* (common winterberry), *Photinia melanocarpa* (black chokeberry), and *Vaccinium corymbosum* (highbush blueberry). The herbaceous layer tends to be sparse or patchy and is limited to sunny openings with *Osmunda regalis* (royal fern), *Thelypteris palustris* (eastern marsh fern), *Woodwardia virginica* (Virginia chainfern), *Drosera* (sundew) spp., *Sarracenia purpurea* (purple pitcherplant), *Pogonia ophioglossoides* (rose pogonia), *Carex striata* var. *brevis* (northern peatland sedge), *Carex collinsii* (collins' sedge), *Carex atlantica* (prickly bog sedge), and *Smilax rotundifolia* (roundleaf greenbrier). The nonvascular layer includes several species of *Sphagnum* (peatmoss), commonly *Sphagnum fallax* (flat-top bogmoss), *Sphagnum flavicomans* (peatmoss), *Sphagnum magellanicum* (Magellan's peatmoss), *Sphagnum pulchrum* (beautiful peatmoss), *Sphagnum recurvum* (recurved peatmoss), and *Sphagnum palustre* (prairie peatmoss).

Noteworthy Associated Plant and/or Animal Species: *Narthecium americanum* (bog asphodel)

Characteristic Species: *Chamaecyparis thyoides* (Atlantic white-cedar), *Ilex glabra* (inkberry or little gallberry), *Rhododendron viscosum* (swamp azalea)

Management Concerns: Although naturally limited by the range of Atlantic white-cedar, it is likely that this community has declined from historic abundances as a result of logging and fire suppression.

Reference Sites: Brendan Byrne State Forest, NJ; Pemberton Branch in Sussex County, DE

Global and State Conservation Ranks and Reasons: G3 (10-Dec-1998). DE: SNR, NJ: S3. There are 100-200 estimated occurrences of this community covering perhaps 2500 to 7500 acres rangewide. The range is limited to the Atlantic Coastal Plain from Massachusetts to New Jersey and Delaware.

VegBank Link for Plot Data: http://vegbank.org/natureserve/element_global.2.688211

References: Barrett 1996, Bowman 2000, Breden 1989, Breden et al. 2001, Eastern Ecology Working Group n.d., Edinger et al. 2002, Enser 1999, Laderman 1989, McCormick 1979, Metzler and Barrett 1992, Metzler and Barrett 2001, Motzkin 1991, Olsson 1979, Rawinski 1984, Reschke 1990, Sperduto 2000b, Sperduto and Crowley 2002b, Swain and Kearsley 2001

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Tree canopy	Needle-leaved tree	<i>Chamaecyparis thyoides</i> (Atlantic white-cedar)
Tree canopy	Broad-leaved deciduous tree	<i>Acer rubrum</i> (red maple)
Shrub/sapling (tall & short)	Broad-leaved deciduous shrub	<i>Rhododendron viscosum</i> (swamp azalea)
Shrub/sapling (tall & short)	Broad-leaved evergreen shrub	<i>Ilex glabra</i> (inkberry or little gallberry)
Herb (field)	Fern or fern ally	<i>Osmunda regalis</i> (royal fern)

RED MAPLE / SEASIDE ALDER WOODLAND

Acer rubrum / *Alnus maritima* Woodland

Range: This community occupies 865 acres in the Prime Hook National Wildlife Refuge on the west side of Delaware Bay in Delaware.

Environmental Description: This community is a low-growing, partially open to open saturated woodland basin swamp that occurs alongside a freshwater creek in the Prime Hook National Wildlife Refuge in Delaware. It is almost completely dominated by *Acer rubrum* (red maple). The substrate is peat and muck characterized by hummock-and-hollow microtopography.



Photo by Robert Cox

Vegetation Description: The edges of the community alongside the creek and the understory are dominated by *Alnus maritima* (seaside alder).

Decodon verticillatus (swamp-loosestrife), *Clethra alnifolia* (coastal sweet-pepperbush), *Morella pensylvanica* (northern bayberry), and occasionally *Cephalanthus occidentalis* (common buttonbush) and *Leucothoe racemosa* (swamp doghobble) occur as associates in the shrub layer. *Toxicodendron radicans* (eastern poison-ivy) and *Smilax rotundifolia* (roundleaf greenbrier) are typical in the vine layer. The herbaceous layer grows densely on hummocks. Herbaceous species include *Osmunda regalis* (royal fern), *Triadenum virginicum* (Virginia marsh St. John's-wort), *Lobelia cardinalis* (cardinal-flower), *Carex seorsa* (weak stellate sedge), *Dulichium arundinaceum* (threeway sedge), and *Polygonum hydropiperoides* (swamp smartweed).

Noteworthy Associated Plant and/or Animal Species: *Alnus maritima* (seaside alder)

Characteristic Species: *Acer rubrum* (red maple), *Alnus maritima* (seaside alder)

Dynamics/Successional Trajectory: This woodland swamp occurs along a freshwater stream (Prime Hook Creek) that was historically tidally influenced but is no longer influenced by tidal forces due to the installation of a water control structure in the stream. Coastal storm surges may occasionally influence this community, as it is located approximately one mile from Delaware Bay.

Management Concerns: This association may be of artificial origin, as a result of damming.

Reference Sites: Prime Hook NWR, DE

Global and State Conservation Ranks and Reasons: GNR (5-Jan-2006). DE: SNR. This association may be of artificial origin, as a result of damming. More information is needed.

VegBank Link for Plot Data: http://vegbank.org/natureserve/element_global.2.790558

References: Coxe 2005, Eastern Ecology Working Group n.d.

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Tree canopy	Broad-leaved deciduous tree	<i>Acer rubrum</i> (red maple)
Shrub/sapling (tall & short)	Broad-leaved deciduous shrub	<i>Alnus maritima</i> (seaside alder)
Shrub/sapling (tall & short)	Vine/Liana	<i>Toxicodendron radicans</i> (eastern poison-ivy)
Herb (field)	Fern or fern ally	<i>Osmunda regalis</i> (royal fern)

SOUTHERN RED MAPLE - BLACK GUM SWAMP FOREST

Acer rubrum - *Nyssa sylvatica* - *Magnolia virginiana* / *Viburnum nudum* var. *nudum* / *Osmunda cinnamomea* - *Woodwardia areolata* Forest

Range: This community ranges from southeastern New York and New Jersey to southeastern Virginia on the Coastal Plain. In Virginia, it extends into the extreme eastern portion of the Piedmont.

Environmental Description: This association is generally restricted to groundwater-saturated stream bottoms, seeping toeslopes, and poorly drained depressions with seasonally perched water tables. Sites typically have hummock-and-hollow microtopography with braided channels, *Sphagnum* (peatmoss)-covered hummocks, mucky depressions, and areas of exposed sand and gravel. Soils are extremely acidic and very low in base status.

Vegetation Description: Canopy closure ranges from closed to quite open. Plot data from 20 Virginia and Maryland stands indicate that *Acer rubrum* (red maple) and *Nyssa sylvatica* (blackgum) are consistently dominant overstory species. *Magnolia virginiana* (sweetbay) is a frequent overstory associate and usually dominant in the subcanopy layer, or codominant with *Ilex opaca* (American holly). *Liriodendron tulipifera* (tuliptree) is a frequent but minor overstory associate. Shrub layers tend to be dense and diverse, characteristically containing *Viburnum nudum* var. *nudum* (southern wild raisin), *Vaccinium corymbosum* (highbush blueberry), *Smilax rotundifolia* (roundleaf greenbrier), *Ilex verticillata* (common winterberry), and *Lindera benzoin* (northern spicebush). In parts of the range, *Clethra alnifolia* (coastal sweet-pepperbush) is a dominant shrub, while in New Jersey, *Chamaedaphne calyculata* (leatherleaf) and *Gaylussacia frondosa* (dangleberry) are present. Additional, less constant shrub associates are *Rhododendron viscosum* (swamp azalea), *Leucothoe racemosa* (swamp doghobble), *Chionanthus virginicus* (fringetree), *Viburnum dentatum* (southern arrow-wood), *Toxicodendron vernix* (poison-sumac), and *Carpinus caroliniana* (American hornbeam). The herb layer varies from dense to sparse. *Osmunda cinnamomea* (cinnamon fern) and *Woodwardia areolata* (netted chainfern) are generally the most constant and abundant herbs, but *Symplocarpus foetidus* (skunk-cabbage) is a patch-dominant in approximately two-thirds of the Virginia and Maryland stands. Additional characteristic herbs occurring at low cover include *Arisaema triphyllum* ssp. *pusillum* (Jack-in-the-pulpit), *Carex folliculata* (northern long sedge), *Carex seorsa* (weak stellate sedge), *Chelone glabra* (white turtlehead),

Impatiens capensis (orange jewelweed), *Lycopus virginicus* (Virginia water-horehound), *Mitchella repens* (partridgeberry), *Osmunda regalis* var. *spectabilis* (royal fern), *Platanthera clavellata* (small green wood orchid), and *Viola cucullata* (marsh blue violet).

Noteworthy Associated Plant and/or Animal Species: *Helonias bullata* (swamp-pink)

Characteristic Species: *Arisaema triphyllum* ssp. *pusillum* (Jack-in-the-pulpit), *Carex folliculata* (northern long sedge), *Carex seorsa* (weak stellate sedge), *Chelone glabra* (white turtlehead), *Ilex verticillata* (common winterberry), *Impatiens capensis* (orange jewelweed), *Lindera benzoin* (northern spicebush), *Lycopus virginicus* (Virginia water-horehound), *Mitchella repens* (partridgeberry), *Osmunda regalis* var. *spectabilis* (royal fern), *Platanthera clavellata* (small green wood orchid), *Smilax rotundifolia* (roundleaf greenbrier), *Vaccinium corymbosum* (highbush blueberry), *Viburnum nudum* var. *nudum* (southern wild raisin), *Viola cucullata* (marsh blue violet), *Woodwardia areolata* (netted chainfern)

Dynamics/Successional Trajectory: Trees tend to be slow-growing and of less than optimal stature in the wet, unstable habitats. Additionally, these swamps tend to border dry, sandy uplands supporting fire-prone oak/heath forests. Occasional fires, burning into the swamps from the uplands during dry periods, may have once influenced the composition and physiognomy of this type. However, fire has now been excluded from almost all areas within the range. An exception is at Fort A.P. Hill Military Reservation, where military training results in frequent incendiary fires in a roughly 5000-ha area. Stands of this community are very susceptible to flooding from beaver activities, which usually results in the destruction or extreme alteration of a stand. In New Jersey, this community is often situated adjacent to *Chamaecyparis thyoides* (Atlantic white-cedar)-dominated swamp and may replace it after logging.

Management Concerns: This community is vulnerable to alteration or destruction by beavers and various anthropogenic activities, including hydrologic modifications.

Reference Sites: Widespread, NJ and DE, including Fort Dix, NJ

Global and State Conservation Ranks and Reasons: G3? (30-Mar-2004). DE: SNR, NJ: S4S5, PA: SNR. The type is restricted to an uncommon wetland habitat in a limited region.

VegBank Link for Plot Data: http://vegbank.org/natureserve/element_global.2.686944

References: Breden 1989, Breden et al. 2001, Eastern Ecology Working Group n.d., Edinger et al. 2002, Ehrenfeld and Gulick 1981, Fike 1999, Fleming et al. 2001, Fleming pers. comm., Harrison 2004, Harrison and Stango 2003, Harvill 1967, Heckscher 1994, Hill 1986, McCormick 1979, Patterson pers. comm., Robichaud and Buell 1973, Sipple and Klockner 1984, VDNH 2003, Windisch 1995b

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Tree canopy	Broad-leaved deciduous tree	<i>Acer rubrum</i> (red maple)
Tree canopy	Broad-leaved deciduous tree	<i>Liquidambar styraciflua</i> (sweetgum)
Tree canopy	Broad-leaved deciduous tree	<i>Nyssa sylvatica</i> (blackgum)
Shrub/sapling (tall & short)	Broad-leaved deciduous shrub	<i>Clethra alnifolia</i> (coastal sweet-pepperbush)
Shrub/sapling (tall & short)	Broad-leaved deciduous shrub	<i>Vaccinium corymbosum</i> (highbush blueberry)
Herb (field)	Fern or fern ally	<i>Osmunda cinnamomea</i> (cinnamon fern)
Herb (field)	Fern or fern ally	<i>Woodwardia areolata</i> (netted chainfern)