

---

## ECOLOGICAL SYSTEM: ATLANTIC COASTAL PLAIN NORTHERN PONDSHORE

---

**Summary:** This system includes vegetation of groundwater-flooded depressions characterized by a flora generally restricted to the Coastal Plain from the southern portion of the Delmarva Peninsula to Cape Cod, Massachusetts. Ponds may contain permanent water, such as the deep glacial kettleholes of Cape Cod and Long Island, New York, or may be shallow basins where groundwater drops below the surface late in the growing season. This system occurs on sandy deposits such as outwash plains of the glaciated region (Long Island and Cape Cod), on the deep sands of the New Jersey Pine Barrens, or on finer sediments of the Coastal Plain of Cape May, New Jersey, the Delmarva Peninsula, and the Chesapeake Bay region. The vegetation of steeper-sided basins (generally those containing permanent water) are characterized by strong zonation, with a border of tall shrubs, such as *Vaccinium corymbosum* (highbush blueberry), and several essentially concentric bands or zones dominated by different associations, depending on geography. Characteristic species in Massachusetts and Long Island include *Rhexia virginica* (Virginia meadowbeauty), *Cyperus dentatus* (bulblet flatsedge), *Gratiola aurea* (golden hedge-hyssop), *Panicum verrucosum* (warty panicgrass), *Euthamia caroliniana* (slender goldentop), *Carex striata* (peatland sedge), *Juncus pelocarpus* (brown-fruit rush), *Rhynchospora capillacea* (limestone beaksedge), *Rhynchospora macrostachya* (tall horned beaksedge), *Xyris difformis* (bog yellow-eyed-grass), *Fimbristylis autumnalis* (slender fimbry), *Scleria reticularis* (netted nutrush), *Sabatia kennedyana* (Plymouth gentian), *Drosera filiformis* (threadleaf sundew), *Juncus militaris* (bayonet rush), and many others.

Ponds of the New Jersey Pine Barrens share many of these species, with others including *Juncus repens* (creeping rush), *Muhlenbergia torreyi* (ring muhly), *Rhynchospora oligantha* (feather-bristle beaksedge), *Rhynchospora cephalantha* (bunched beaksedge), *Rhynchospora chalarocephala* (loose-head beaksedge), and many others. In shallow basins, such strong zonation is generally lacking but still remains evident in some cases. On Cape Cod, Long Island, and New Jersey, this system most often occurs within the pitch pine barrens.

From Cape May and south, the system occurs within an upland matrix of mixed hardwood forests and generally supports a seasonally flooded swamp forest characterized by *Liquidambar styraciflua* (sweetgum), *Acer rubrum* (red maple), wetland oaks such as *Quercus phellos* (willow oak), and in Virginia and scattered locations on the Inner Coastal Plain of Maryland *Nyssa biflora* (swamp blackgum). The vegetation is characterized by many of the species from New England, New York and New Jersey and also includes *Juncus repens* (creeping rush), *Boltonia asteroides* (white doll's-daisy), *Fimbristylis perpusilla* (Harper's fimbry), *Coelorachis rugosa* (wrinkled jointgrass), *Dichantherium spretum* (Eaton's witchgrass), *Saccharum giganteum* (giant plumegrass), *Eleocharis quadrangulata* (squarestem spikerush), and others. *Cephalanthus occidentalis* (common buttonbush) often occurs as scattered individuals or as a shrub swamp with less diversity and cover of Coastal Plain flora.

**High-ranked Species:** *Clonophis kirtlandii* (G2, kirtland's snake), *Coreopsis rosea* (G3, pink tickseed), *Dichantherium hirstii* (G1, hirsts' rosette grass), *Eulimnadia agassizii* (G1G2, agassiz clam shrimp), *Eupatorium leucolepis* var. *novae-angliae* (G5T1, white-bract boneset), *Eupatorium resinosum* (G3, pine barren thoroughwort), *Euthamia galetorum* (G3, narrowleaf fragrant goldenrod), *Fimbristylis perpusilla* (G2, harper's fimbry), *Helenium virginicum* (G3, Virginia sneezeweed), *Hypericum adpressum* (G3, creeping St. John's-wort), *Lobelia boykinii* (G2G3, boykin's lobelia), *Lycopodiella margueritiae* (G2, northern prostrate clubmoss), *Lycopodiella subappressa* (G2, northern appressed clubmoss), *Oxypolis canbyi* (G2, canby's cowbane), *Papaipema sulphurata* (G2, decodon stem borer moth), *Rhexia aristosa* (G3, awned meadowbeauty), *Rhynchospora inundata* (G3G4, narrow-fruit horned beaksedge), *Sabatia kennedyana* (G3, plymouth gentian), *Sagittaria teres* (G3, slender arrowhead), *Schoenoplectus etuberculatus* (G3G4, swamp bulrush), *Scirpus ancistrochaetus* (G3, barbed-bristle bulrush)

**Range:** This system ranges from the southern portion of the Delmarva Peninsula to Cape Cod, Massachusetts, and also in limited, highly disjunct occurrences on sand lakeplain near southern Lake Michigan and in southeastern Vermont. United States: DE, MA, MD, MI, NJ, NY, VA, VT

**Delaware Estuary Associations:**

- Blueberry Wetland Thicket
- Buttonbush Coastal Plain Pond
- Cape May - Delmarva Depression Meadow
- Coastal Plain Muck Pondshore
- Coastal Plain Pond
- Coastal Plain Pondshore
- Creeping Lovegrass Coastal Plain Pond
- Deep Muck Coastal Plain Pond
- Northern Peatland Sedge Coastal Plain Pond
- Panicgrass Pondshore
- Pine Barrens Floodplain Forest
- Red Maple - Sweetgum Swamp
- Swamp-loosestrife Coastal Plain Pond
- Upper South Switchgrass Wet Prairie
- Water-willow Shrub Swamp

**CLASSIFIERS FOR ATLANTIC COASTAL PLAIN NORTHERN PONDShORE**

**Primary Division:** 203

**Land Cover Class:** Herbaceous Wetland

**Spatial Scale & Pattern:** Small patch

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

**Non-diagnostic Classifiers:** Herbaceous; Depressional; Isolated Wetland [Partially Isolated]

---

**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 in 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](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)

## BUTTONBUSH COASTAL PLAIN POND

*Cephalanthus occidentalis* / *Polygonum hydropiperoides* - *Panicum verrucosum* Shrubland

**Range:** The known range of this community includes the central Atlantic Coastal Plain of Delaware, Maryland and Virginia, with an uncertain northward extension to Rhode Island and Massachusetts.

**Environmental Description:** Habitats are relatively small basin wetlands that draw down entirely during dry years, exposing some bare substrate by the end of the growing season. Soils typically have a shallow organic layer overlying silt loam or clay loam.

**Vegetation Description:** Physiognomy of stands varies from sparse to rather dense shrublands dominated by *Cephalanthus occidentalis* (common buttonbush). In the Coastal Plain, *Decodon verticillatus* (swamp-loosestrife) may be present or even codominant. Characteristic herbs in the main, Coastal Plain part of the range include *Dulichium arundinaceum* (threeway sedge), *Polygonum hydropiperoides* (swamp smartweed), *Torreyochloa pallida* (pale false mannagrass), *Rhexia virginica* (Virginia meadowbeauty), and *Panicum hemitomon* (maidencane). More irregular herbaceous associates of the compositionally variable stands include *Bidens frondosa* (devil's pitchfork), *Scirpus cyperinus* (woolgrass bulrush), *Proserpinaca palustris* (marsh mermaidweed), *Triadenum virginicum* (Virginia marsh St. John's-wort), *Dichantherium spretum* (Eaton's witchgrass), *Scleria reticularis* (netted nutrush), and *Fimbristylis autumnalis* (slender fimbry).

**Noteworthy Associated Plant and/or Animal Species:** *Eleocharis melanocarpa* (black-fruit spikerush), *Helenium virginicum* (Virginia sneezeweed), *Scirpus ancistrochaetus* (barbed-bristle bulrush)

**Characteristic Species:** *Cephalanthus occidentalis* (common buttonbush), *Dulichium arundinaceum* (threeway sedge), *Panicum hemitomon* (maidencane), *Polygonum hydropiperoides* (swamp smartweed), *Rhexia virginica* (Virginia meadowbeauty), *Torreyochloa pallida* (pale false mannagrass)

**Dynamics/Successional Trajectory:** Most of the Coastal Plain ponds are believed to be sinkhole features that formed through dissolution of underlying carbonate-rich shell marl deposits. The marl deposits are too deep to influence soil or water chemistry of the ponds, which are strongly acidic in most examples. Ponds supporting this community type have mineral soil substrates and a regime of relatively deep and/or long seasonal flooding.

**Management Concerns:** The community is threatened by groundwater alteration and by agricultural runoff.

**Reference Sites:** Upper tributary of Blackbird Creek, near Townsend, DE

**Global and State Conservation Ranks and Reasons:** G3? (14-Dec-1998). DE: SNR. Although there may be 100-200 occurrences of this community, the acreage is very small, probably fewer than 2000 acres rangewide.

**VegBank Link for Plot Data:** [http://vegbank.org/natureserve/element\\_global.2.684722](http://vegbank.org/natureserve/element_global.2.684722)

**References:** Bartgis 1986, Berdine and Gould 1999, Bowman 2000, Buhlmann et al. 1999, Eastern Ecology Working Group n.d., Fleming and Coulling 2001, Fleming and Van Alstine 1999, Fleming et al. 2001, Harrison 2004, McAvoy and Clancy 1994, Rawinski 1997, Sneddon 1994, Tyndall et al. 1990

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Shrub/sapling (tall & short)	Broad-leaved deciduous shrub	<i>Cephalanthus occidentalis</i> (common buttonbush)
Shrub/sapling (tall & short)	Broad-leaved deciduous shrub	<i>Decodon verticillatus</i> (swamp-loosestrife)

## CAPE MAY - DELMARVA DEPRESSION MEADOW

*Cladium mariscoides* - *Coelorachis rugosa* Herbaceous Vegetation

**Range:** This wetland occurs in southern New Jersey and Delaware.

**Environmental Description:** This seasonally flooded, depressional wetland occurs in the Coastal Plain of southern New Jersey and Delaware. The substrate is sandy loam over sandy clay loam.

**Vegetation Description:** The vegetation is diverse, with *Cladium mariscoides* (twig-rush) arguably the most characteristic species. Herbaceous associates may include *Dichanthelium spretum* (Eaton's witchgrass), *Coelorachis rugosa* (wrinkled jointgrass), *Boltonia asteroides* (white doll's-daisy), *Eryngium aquaticum* (rattlesnake-master), *Rhexia virginica* (Virginia meadowbeauty), *Fimbristylis autumnalis* (slender fimbry), *Scleria reticularis* (netted nutrush), *Sclerolepis uniflora* (pink bogbutton), and others. Additional species at a site in Delaware include *Panicum hemitomon* (maidencane), *Rhynchospora chalarocephala* (loose-head beaksedge), *Scleria reticularis* (netted nutrush), *Proserpinaca pectinata* (combleaf mermaidweed), *Fimbristylis autumnalis* (slender fimbry), *Dichanthelium hirstii* (hirsts' rosette grass), *Rhexia aristosa* (awned meadowbeauty), *Sabatia difformis* (lanceleaf rose-gentian), and *Xyris smalliana* (Small's yellow-eyed-grass).



Photo by Delaware Natural Heritage Program

**Noteworthy Associated Plant and/or Animal Species:** *Boltonia asteroides* var. *asteroides* (white doll's-daisy), *Dichanthelium hirstii* (hirsts' rosette grass), *Eryngium aquaticum* (rattlesnake-master),

*Hypericum adpressum* (creeping St. John's-wort), *Muhlenbergia torreyana* (New Jersey muhly), *Panicum hemitomon* (maidencane), *Rhexia aristosa* (awned meadowbeauty), *Rhynchospora filifolia* (threadleaf beaksedge)

**Characteristic Species:** *Cladium mariscoides* (twig-rush)

**Dynamics/Successional Trajectory:** One of the three known occurrences is threatened by altered hydrology caused by an adjacent gravel pit.

**Reference Sites:** Bennett's Bog, NJ (1/2 mile east of Estuary boundary); Huckleberry Pond, Sussex County, DE

**Global and State Conservation Ranks and Reasons:** G1 (18-Nov-1997). DE: SNR, NJ: S1. This coastal plain pond community is restricted to a small subset of seasonally flooded basins of southern New Jersey and Delaware. Only three occurrences are known.

**VegBank Link for Plot Data:** [http://vegbank.org/natureserve/element\\_global.2.687945](http://vegbank.org/natureserve/element_global.2.687945)

**References:** Bowman 2000, Breden et al. 2001, Eastern Ecology Working Group n.d.

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Herb (field)	Graminoid	<i>Cladium mariscoides</i> (twig-rush)

## COASTAL PLAIN MUCK POND SHORE

*Rhexia virginica* - *Panicum verrucosum* Herbaceous Vegetation

**Range:** This Coastal Plain pondshore community commonly occurs in coastal Massachusetts discontinuously south to Delaware.

**Environmental Description:** This Coastal Plain pondshore community commonly occurs in coastal Massachusetts discontinuously south to Delaware. It occurs on the broad margins of shallow groundwater basins but also occurs on the protected shoreline inlets of deeper ponds in New York. The substrate is variable, ranging from loamy sand, sandy loam, or sand with an organic layer from 0 to greater than 20 cm in depth.



Photo by Kathleen Strakosch Walz

**Vegetation Description:** Characteristic species include *Rhexia virginica* (Virginia meadowbeauty), *Cyperus dentatus* (bulblet flatsedge), *Juncus canadensis* (Canadian rush), *Viola lanceolata* (bog white violet), *Juncus pelocarpus* (brown-fruit rush), *Gratiola aurea* (golden hedge-hyssop), *Rhynchospora capitellata* (northern beaksedge), *Euthamia caroliniana* (slender goldentop), *Drosera intermedia* (water sundew), *Hypericum mutilum* (dwarf St. John's-wort), *Coreopsis rosea* (pink tickseed), *Scleria reticularis* (netted nutrush), *Panicum verrucosum* (warty panicgrass), *Xyris torta* (slender yellow-eyed-grass), *Lachnanthes caroliniana* (redroot), *Rhynchospora scirpoides* (longbeak beaksedge), *Fuirena squarrosa* (hairy umbrella-sedge), and *Rhynchospora macrostachya* (tall horned beaksedge).

**Noteworthy Associated Plant and/or Animal Species:** *Coreopsis rosea* (pink tickseed), *Dichanthelium hirstii* (hirsts' rosette grass), *Nymphoides cordata* (little floatingheart), *Rhexia aristosa* (awned meadowbeauty), *Rhynchospora macrostachya* (tall horned beaksedge)

**Characteristic Species:** *Panicum verrucosum* (warty panicgrass), *Rhexia virginica* (Virginia meadowbeauty)

**Management Concerns:** Many occurrences of this community have likely been lost because they occupied shallow basins that dried out in late summer, so provided little recreation (swimming or fishing) and were likely filled in to add agricultural land or to suppress mosquito breeding. On the mid-Atlantic Coastal Plain, agriculture has caused the greatest loss, either through filling or draining, or has caused indirect degradation through fertilizer runoff.

**Reference Sites:** Wheatland Pond Complex, NJ

**Global and State Conservation Ranks and Reasons:** G2G3 (14-Dec-1998). DE: SNR, NJ: S1S3. This Coastal Plain pondshore community is restricted to shallow seasonally flooded basins of the Atlantic Coastal Plain from Massachusetts to Delaware.

**VegBank Link for Plot Data:** [http://vegbank.org/natureserve/element\\_global.2.687006](http://vegbank.org/natureserve/element_global.2.687006)

**References:** Bartgis 1986, Berdine and Gould 1999, Breden et al. 2001, Cowardin et al. 1979, Eastern Ecology Working Group n.d., Metzler and Barrett 2001, Rawinski 1984, Swain and Kearsley 2001, Thompson 1996, Thompson and Sorenson 2000, Tyndall et al. 1990

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Herb (field)	Forb	<i>Rhexia virginica</i> (Virginia meadowbeauty)
Herb (field)	Graminoid	<i>Panicum verrucosum</i> (warty panicgrass)

## COASTAL PLAIN POND

*Nymphaea odorata* - *Eleocharis robbinsii* Herbaceous Vegetation

**Range:** This association is limited to the Atlantic Coastal Plain from southern New England to Maryland.

**Environmental Description:** This hydromorphic Coastal Plain pond community ranges from southern New England to Maryland. It occurs in standing water in all but exceptionally dry years. The substrate is most often deep muck, but in oligotrophic ponds an organic layer may be absent or much reduced, and the vegetation occurs on sand or mucky sand.

**Vegetation Description:** Characteristic species include *Nymphaea odorata* (white water-lily), *Nymphoides cordata* (little floatingheart), and *Eleocharis robbinsii* (Robbins' spikerush), with frequent associates including *Scleria reticularis* (netted nutrush), *Gratiola aurea* (golden hedge-hyssop), *Proserpinaca pectinata* (combleaf mermaidweed), *Utricularia juncea* (southern bladderwort), *Brasenia schreberi* (watershield), *Pontederia cordata* (pickerelweed), *Ludwigia* (seedbox) spp., *Utricularia* (bladderwort) spp., and *Eriocaulon aquaticum* (seven-angle pipewort).



Photo by Nancy Lee Adamson

**Characteristic Species:** *Eleocharis robbinsii* (Robbins' spikerush), *Nymphaea odorata* (white water-lily), *Nymphoides cordata* (little floatingheart)

**Management Concerns:** Coastal Plain ponds in general are threatened by hydrologic alteration (groundwater depletion), agricultural runoff, and recreation activities.

**Reference Sites:** Possibly at Prime Hook NWR, Sussex County, DE; Confirmed at Pierce's Pond, NJ and Deep Run Powerline, NJ

**Global and State Conservation Ranks and Reasons:** G2 (7-Dec-1998). DE: SNR, NJ: S1S2. This Coastal Plain pond association has an estimated 100-150 occurrences rangewide, but it is a small-patch community that totals fewer than 1000 acres.

**VegBank Link for Plot Data:** [http://vegbank.org/natureserve/element\\_global.2.689522](http://vegbank.org/natureserve/element_global.2.689522)

**References:** Breden 1989, Breden et al. 2001, Eastern Ecology Working Group n.d., Harrison 2004, Rawinski 1984, Sneddon 1994, Swain and Kearsley 2001

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Herb (field)	Graminoid	<i>Eleocharis robbinsii</i> (Robbins' spikerush)
Floating aquatic	Aquatic herb (floating & submergent)	<i>Nymphaea odorata</i> (white water-lily)
Floating aquatic	Aquatic herb (floating & submergent)	<i>Nymphoides cordata</i> (little floatingheart)

---

## COASTAL PLAIN POND SHORE

*Dulichium arundinaceum* - *Juncus canadensis* - *Juncus pelocarpus* Herbaceous Vegetation

---

**Range:** This Coastal Plain pondshore community occurs in Delaware, New Jersey, and Maryland.

**Environmental Description:** This community occurs along the pondshores of coastal plains.

**Vegetation Description:** The vegetation is dominated by *Dulichium arundinaceum* (threeway sedge) and *Juncus canadensis* (Canadian rush). Other associated species include *Scirpus cyperinus* (woolgrass bulrush), *Polygonum punctatum* (dotted smartweed), *Utricularia* (bladderwort) spp., *Triadenum virginicum* (Virginia marsh St. John's-wort), and *Scirpus cyperinus* (woolgrass bulrush).

**Characteristic Species:** *Dulichium arundinaceum* (threeway sedge), *Juncus canadensis* (Canadian rush)

**Reference Sites:** Seasonal Pond Townsend One in the Blackbird Creek drainage, DE

**Global and State Conservation Ranks and Reasons:** GNR (15-Nov-2000). DE: SNR, NJ: SNR.

**VegBank Link for Plot Data:** [http://vegbank.org/natureserve/element\\_global.2.684603](http://vegbank.org/natureserve/element_global.2.684603)

**References:** Bowman 2000, Eastern Ecology Working Group n.d., Rawinski 1997

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Herb (field)	Graminoid	<i>Dulichium arundinaceum</i> (threeway sedge)

---

## CREEPING LOVEGRASS COASTAL PLAIN POND

*Eragrostis hypnoides* - *Ludwigia sphaerocarpa* - *Polygonum hydropiperoides* Herbaceous Vegetation

---

**Range:** This Coastal Plain pond community occurs in New Jersey and possibly Delaware.

**Environmental Description:** This seasonally flooded, depressional wetland of the central Atlantic Coastal Plain occupies the lowest portion of the basin and is flooded for the longest period relative to adjacent vegetation zones. The substrate is an organic layer over black clay loam.

**Vegetation Description:** The vegetation is dominated by small-statured herbs, including *Eragrostis hypnoides* (creeping lovegrass), *Polygonum hydropiperoides* (swamp smartweed), *Polygonum amphibium* (water smartweed), *Ludwigia sphaerocarpa* (globe-fruit seedbox), *Oldenlandia uniflora* (clustered mille grains), *Cyperus strigosus* (straw-colored flatsedge), *Bidens frondosa* (devil's pitchfork), *Fimbristylis autumnalis* (slender fimbry), *Juncus pelocarpus* (brown-fruit rush), *Gratiola aurea* (golden hedge-hyssop), and *Lindernia dubia* (yellowseed false pimpernel). Other species of taller stature may be present, including seedlings or small saplings of *Cephalanthus occidentalis* (common buttonbush) and herbaceous species *Panicum rigidulum* (redtop panicgrass), *Carex striata* (peatland sedge), *Carex gigantea* (giant sedge), and *Torreyochloa* (false mannagrass) sp.

**Characteristic Species:** *Eragrostis hypnoides* (creeping lovegrass), *Ludwigia sphaerocarpa* (globe-fruit seedbox), *Polygonum hydropiperoides* (swamp smartweed)

**Dynamics/Successional Trajectory:** In years of high rainfall resulting in incomplete drawdown, many species of this association persist in the seedbank below standing water.

**Reference Sites:** Supawna Meadows NWR, Salem County, NJ

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

**VegBank Link for Plot Data:** [http://vegbank.org/natureserve/element\\_global.2.689603](http://vegbank.org/natureserve/element_global.2.689603)

**References:** Bartgis 1986, Berdine and Gould 1999, Coulling 2002, Eastern Ecology Working Group n.d., Fleming et al. 2001, Harrison 2004, Rawinski 1997

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Herb (field)	Forb	<i>Ludwigia sphaerocarpa</i> (globe-fruit seedbox)
Herb (field)	Forb	<i>Polygonum hydropiperoides</i> (swamp smartweed)
Herb (field)	Graminoid	<i>Eragrostis hypnoides</i> (creeping lovegrass)

## DEEP MUCK COASTAL PLAIN POND

*Eleocharis flavescens* - *Xyris difformis* Herbaceous Vegetation

**Range:** This Coastal Plain pond community occurs in Delaware and in New Jersey.

**Environmental Description:** This type comprises herbaceous vegetation of deep muck often associated with Coastal Plain ponds. This vegetation may only appear during the latter part of the growing season when water levels have dropped, and may not appear at all during years of particularly high rainfall.

**Vegetation Description:** This community includes low, graminoid-dominated vegetation of deep muck often associated with Coastal Plain ponds. Characteristic species include *Eleocharis flavescens* (yellow spikerush), *Eleocharis olivacea* (bright-green spikerush), *Eleocharis microcarpa* (small-fruit spikerush), *Eleocharis robbinsii* (Robbins' spikerush), *Eleocharis tricostata* (three-angle spikerush), *Eleocharis tuberculosa* (cone-cup spikerush), *Juncus pelocarpus* (brown-fruit rush), *Drosera intermedia* (water sundew), *Eriocaulon aquaticum* (seven-angle pipewort), *Fimbristylis autumnalis* (slender fimbry), *Rhynchospora scirpoides* (longbeak beaksedge), *Scleria reticularis* (netted nutrush), *Xyris difformis* var. *difformis* (bog yellow-eyed-grass), and *Xyris smalliana* (Small's yellow-eyed-grass), as well as occasional individuals of aquatic species such as *Nymphaea odorata* (white water-lily).

**Characteristic Species:** *Eleocharis flavescens* (yellow spikerush), *Xyris difformis* var. *difformis* (bog yellow-eyed-grass)

**Reference Sites:** Prime Hook NWR, DE; Wheatland Pond Complex, NJ; Steelmantown Road South Pond, Cape May, NJ; Odd Pond, NJ

**Global and State Conservation Ranks and Reasons:** GNR (1-Dec-1997). DE: SNR, NJ: S2. (Note: in NJ this is an S2 association.)

**VegBank Link for Plot Data:** [http://vegbank.org/natureserve/element\\_global.2.683317](http://vegbank.org/natureserve/element_global.2.683317)

**References:** Eastern Ecology Working Group n.d., Rawinski 1984, Swain and Kearsley 2001

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Herb (field)	Graminoid	<i>Eleocharis flavescens</i> (yellow spikerush)

### NORTHERN PEATLAND SEDGE COASTAL PLAIN POND

*Carex striata* var. *brevis* Herbaceous Vegetation

**Range:** Examples are known from the Coastal Plain in New York, Maryland and Delaware and in the New Jersey Pine Barrens. The nominal taxon ranges south to South Carolina (Kartesz 1999), and the association could also be found in the Coastal Plain of Virginia and the Carolinas.

**Environmental Description:** This vegetation occupies Coastal Plain depression meadows around the perimeter of Coastal Plain ponds. The substrate is typically composed of sand and gravel, but some community types may occur on organic muck.

**Vegetation Description:** Stands are dominated by *Carex striata* var. *brevis* (northern peatland sedge), which usually occurs in dense stands with few other associates. These may include seedlings of *Cephalanthus occidentalis* (common buttonbush) and *Acer rubrum* (red maple), as well as *Cladium mariscoides* (twig-rush), *Rhexia virginica* (Virginia meadowbeauty), *Bidens frondosa* (devil's pitchfork), *Rhynchospora macrostachya* (tall horned beaksedge), *Rhynchospora chalarocephala* (loose-head beaksedge), *Fimbristylis autumnalis* (slender fimbry), *Juncus canadensis* (Canadian rush), *Dulichium arundinaceum* (threeway sedge), *Hypericum mutilum* (dwarf St. John's-wort), and *Panicum hemitomon* (maidencane). *Sphagnum* (peatmoss) is often abundant.

**Characteristic Species:** *Carex striata* var. *brevis* (northern peatland sedge)

**Management Concerns:** These isolated wetlands are vulnerable to dredging, filling, pesticide or fertilizer runoff, and other human disturbances.

**Reference Sites:** Steelmantown Pond Road South Pond, NJ; Wheatland Pond Complex, NJ; Slab Branch Pond, NJ

**Global and State Conservation Ranks and Reasons:** G3G4 (19-Jan-2006). DE: SNR, NJ: S1S3. This small-patch wetland community is restricted to the Coastal Plain of four mid-Atlantic states and may range southward discontinuously to South Carolina.

**VegBank Link for Plot Data:** [http://vegbank.org/natureserve/element\\_global.2.687457](http://vegbank.org/natureserve/element_global.2.687457)

**References:** Bartgis 1986, Berdine and Gould 1999, Bowman 2000, Breden 1989, Breden et al. 2001, Eastern Ecology Working Group n.d., Fleming et al. 2001, Harrison 2004, Kartesz 1999, Nelson 1986, Tyndall et al. 1990

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Herb (field)	Graminoid	<i>Carex striata</i> var. <i>brevis</i> (northern peatland sedge)

## PANICGRASS PONDSHORE

*Panicum hemitomom* - *Panicum verrucosum* Herbaceous Vegetation

**Range:** This intermittent Coastal Plain pond community occurs in New Jersey within the Delaware Estuary.

**Environmental Description:** This seasonally flooded wetland occurs in small topographically isolated basins in the central Atlantic Coastal Plain. This vegetation usually occurs on the relatively higher, outer margin of the basin, occurring on loamy sands.

**Vegetation Description:** *Panicum hemitomom* (maidencane) is the dominant species, often occurring in monotypic stands. Associates that may occur at low cover include *Cladium mariscoides* (twig-rush), *Dulichium arundinaceum* (threeway sedge), *Panicum verrucosum* (warty panicgrass), *Dichanthelium spretum* (Eaton's witchgrass), *Carex striata* (peatland sedge), *Juncus repens* (creeping rush), and *Eleocharis quadrangulata* (squarestem spikerush). Occasional seedlings of *Liquidambar styraciflua* (sweetgum), *Acer rubrum* (red maple), and *Diospyros virginiana* (eastern persimmon) also may occur.



Photo by Nancy Lee Adamson

**Characteristic Species:** *Panicum hemitomom* (maidencane)

**Reference Sites:** Peasley Pond, Peaslee WMA, NJ; Belleplain SF, NJ; Odd Pond, NJ; Steelmantown Road South Pond, NJ

**Global and State Conservation Ranks and Reasons:** GNR (28-Aug-1997). DE: SNR, NJ: S1S2.

**VegBank Link for Plot Data:** [http://vegbank.org/natureserve/element\\_global.2.689661](http://vegbank.org/natureserve/element_global.2.689661)

**References:** Bartgis 1986, Berdine and Gould 1999, Bowman 2000, Breden et al. 2001, Eastern Ecology Working Group n.d., Harrison 2004

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Herb (field)	Graminoid	<i>Panicum hemitomom</i> (maidencane)

## PINE BARRENS FLOODPLAIN FOREST

*Fraxinus pennsylvanica* - *Juglans nigra* - *Ulmus americana* / *Cornus amomum* / *Onoclea sensibilis* Forest

**Range:** This floodplain forest occurs in the New Jersey Pine Barrens in the Delaware Estuary.

**Environmental Description:** This is a temporarily flooded floodplain forest associated with small streams that occurs on the Coastal Plain.

**Vegetation Description:** This is a floodplain forest community in which the canopy is codominated by *Fraxinus pennsylvanica* (green ash), *Juglans nigra* (black walnut), and *Ulmus americana* (American elm).

The shrub stratum is dominated by *Cornus amomum* (silky dogwood), in association with *Alnus serrulata* (smooth alder) and exotics, such as *Ligustrum vulgare* (European privet), *Rosa multiflora* (multiflora rose), and *Lonicera tatarica* (Tatarian honeysuckle). The herbaceous layer is dominated by *Onoclea sensibilis* (sensitive fern).

**Characteristic Species:** *Cornus amomum* (silky dogwood), *Juglans nigra* (black walnut)

**Dynamics/Successional Trajectory:** Fire frequency as well as floodplain hydrology have a profound influence on the vegetation.

**Management Concerns:** The shrub layer contains a number of exotics, including *Ligustrum vulgare* (European privet), *Rosa multiflora* (multiflora rose), and *Lonicera tatarica* (Tatarian honeysuckle). The herbaceous layer may contain exotics, such as *Allium vineale* (wild garlic) and *Microstegium vimineum* (Japanese stiltgrass).

**Reference Sites:** Brendan Byrne State Forest, NJ

**Global and State Conservation Ranks and Reasons:** GNR (7-Nov-2000). NJ: SNR.

**VegBank Link for Plot Data:** [http://vegbank.org/natureserve/element\\_global.2.685560](http://vegbank.org/natureserve/element_global.2.685560)

**References:** Eastern Ecology Working Group n.d.

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Tree canopy	Broad-leaved deciduous tree	<i>Fraxinus pennsylvanica</i> (green ash)
Tree canopy	Broad-leaved deciduous tree	<i>Juglans nigra</i> (black walnut)
Tree canopy	Broad-leaved deciduous tree	<i>Ulmus americana</i> (American elm)
Shrub/sapling (tall & short)	Broad-leaved deciduous shrub	<i>Cornus amomum</i> (silky dogwood)
Herb (field)	Fern or fern ally	<i>Onoclea sensibilis</i> (sensitive fern)

## RED MAPLE - SWEETGUM SWAMP

*Liquidambar styraciflua* - *Acer rubrum* - *Quercus phellos* / *Leucothoe racemosa* Forest

**Range:** This association is a seasonally flooded forest of shallow basins and other depressions of the Coastal Plain of the Chesapeake Bay region, New Jersey and Pennsylvania where it occurs in the Delaware Estuary.

**Environmental Description:** This type occurs in seasonally flooded shallow basins or depressions. Substrates are acidic, gleyed to mottled, sandy or clay loams. The water table may be perched.

**Vegetation Description:** Characteristic tree species include *Acer rubrum* (red maple), *Liquidambar styraciflua* (sweetgum), and *Nyssa sylvatica* (blackgum), which are nearly constant in the canopy. Associates include *Ilex opaca* (American holly), *Magnolia virginiana* (sweetbay), *Nyssa biflora* (swamp blackgum), *Sassafras albidum* (sassafras), *Quercus palustris* (pin oak), *Pinus taeda* (loblolly pine), and *Quercus phellos* (willow oak), and occasionally *Quercus falcata* (southern red oak), *Quercus lyrata* (overcup oak), or *Betula nigra* (river birch). The shrub layer is characterized by *Leucothoe racemosa* (swamp doghobble), *Vaccinium corymbosum* (highbush blueberry), *Clethra alnifolia* (coastal sweet-pepperbush), *Lindera benzoin* (northern spicebush), *Ilex verticillata* (common winterberry), and *Rhododendron viscosum* (swamp azalea). *Smilax rotundifolia* (roundleaf greenbrier) is a particularly characteristic vine. The herbaceous layer is generally sparse but may include *Mitchella repens* (partridgeberry), *Osmunda cinnamomea* (cinnamon fern), *Woodwardia areolata* (netted chainfern), *Onoclea sensibilis* (sensitive fern), *Osmunda regalis* (royal fern), *Carex albolutescens* (greenish-white sedge), *Scirpus cyperinus* (woolgrass bulrush), *Juncus effusus* (soft rush), and *Polygonum* (smartweed, knotweed) spp.

**Characteristic Species:** *Leucothoe racemosa* (swamp doghobble), *Quercus phellos* (willow oak), *Smilax rotundifolia* (roundleaf greenbrier)

**Reference Sites:** Brendan Byrne State Forest, NJ; Fort Dix, Inner Coastal Plain, NJ; Delhaas Woods, and Black Ditch County Park, Bucks County, PA

**Global and State Conservation Ranks and Reasons:** GNR (1-Dec-1997). DE: SNR, NJ: S3, PA: SNR.

**VegBank Link for Plot Data:** [http://vegbank.org/natureserve/element\\_global.2.687145](http://vegbank.org/natureserve/element_global.2.687145)

**References:** Bowman 2000, Breden 1989, Breden et al. 2001, Brush et al. 1980, Clancy 1996, Eastern Ecology Working Group n.d., Edinger et al. 2002, Fleming et al. 2001, Harrison 2004, Harrison and Stango 2003, Hunt 1998, Sneddon and Anderson 1994, Sneddon et al. 1996, Thomson et al. 1999, Tyndall et al. 1990, VDNH 2003

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>Leucothoe racemosa</i> (swamp doghobble)

## SWAMP-LOOSESTRIFE COASTAL PLAIN POND

*Decodon verticillatus* / *Triadenum virginicum* Shrubland

**Range:** This association occurs in southern New England, New Jersey and Delaware.

**Environmental Description:** This wetland vegetation of mucky substrates occurs in coastal plains of the the northeastern U.S. It often completely covers small seasonally flooded basins or occurs in a patchy zone on the periphery of larger permanent water bodies.

**Vegetation Description:** The vegetation is dominated by *Decodon verticillatus* (swamp-loosestrife). Although the flooding regime is typified by a longer hydroperiod than many other Coastal Plain pondshore vegetation types as evidenced by moderately deep to deep muck, water levels in dry years drop below the surface, exposing substrate that supports Coastal Plain species such as *Drosera intermedia* (water sundew), *Hypericum mutilum* (dwarf St. John's-wort), and *Viola lanceolata* (bog white violet). Typical associates include *Triadenum virginicum* (Virginia marsh St. John's-wort), *Leersia oryzoides* (rice cutgrass), *Lycopus uniflorus* (northern bugleweed), *Lycopus virginicus* (Virginia water-horehound), *Bidens connata* (purple-stem beggarticks), *Lysimachia terrestris* (swamp-candles), *Juncus canadensis* (Canadian rush), *Galium palustre* (common marsh bedstraw), and *Woodwardia virginica* (Virginia chainfern).



Photo by Nancv Lee Adamson

**Characteristic Species:** *Decodon verticillatus* (swamp-loosestrife), *Triadenum virginicum* (Virginia marsh St. John's-wort)

**Dynamics/Successional Trajectory:** Although the flooding regime is typified by a longer hydroperiod than many other Coastal Plain pondshore vegetation types as evidenced by moderately deep to deep

muck, water levels in dry years drop below the surface, exposing substrate that supports Coastal Plain species.

**Reference Sites:** Several millponds in Sussex County, DE

**Global and State Conservation Ranks and Reasons:** GNR (21-Apr-2004). DE: SNR, NJ: SNR.

**VegBank Link for Plot Data:** [http://vegbank.org/natureserve/element\\_global.2.721909](http://vegbank.org/natureserve/element_global.2.721909)

**References:** Eastern Ecology Working Group n.d., Sneddon et al. 1999

---

### UPPER SOUTH SWITCHGRASS WET PRAIRIE

*Panicum virgatum* Seasonally Flooded Herbaceous Vegetation

---

**Range:** This vegetation is found in Kentucky and possibly Tennessee. It has also been found in the New Jersey Pine Barrens. It, or a closely related type, has also been found in the New Jersey Pine Barrens.

**Environmental Description:** In New Jersey, this community occurs on sandy soils and in areas associated with Coastal Plain pondshores. This broadly defined type represents prairie-related, seasonally flooded herbaceous vegetation dominated by *Panicum virgatum* (switchgrass).

**Vegetation Description:** This seasonally flooded herbaceous vegetation community is dominated by *Panicum virgatum* (switchgrass).

**Characteristic Species:** *Panicum virgatum* (switchgrass)

**Management Concerns:** This type is placed here to represent vegetation which may be virtually extinct, persisting as remnant populations of *Panicum virgatum* (switchgrass) in ditches and swales. More inventory is needed to determine the relationship of the New Jersey and southern variants of this type.

**Reference Sites:** Brendan Byrne State Forest, NJ

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

**VegBank Link for Plot Data:** [http://vegbank.org/natureserve/element\\_global.2.687290](http://vegbank.org/natureserve/element_global.2.687290)

**References:** Southeastern Ecology Working Group n.d., TDNH unpubl. data

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Herb (field)	Graminoid	<i>Panicum virgatum</i> (switchgrass)

---

### WATER-WILLOW SHRUB SWAMP

*Decodon verticillatus* Semipermanently Flooded Shrubland

---

**Range:** This community occurs in the New Jersey portion of the Delaware Estuary and may also occur in Delaware.

**Environmental Description:** This shrubland forms as a fringe along aquatic edges of lakes and streams.

**Vegetation Description:** *Decodon verticillatus* (swamp-loosestrife) forms a dense, often monotypic tangle. *Cephalanthus occidentalis* (common buttonbush) can occur but with less abundance than *Decodon verticillatus* (swamp-loosestrife). Herbaceous species vary widely but may include *Nuphar lutea* ssp. *variegata* (variegated yellow pond-lily), *Nymphaea odorata* (white water-lily), *Peltandra virginica* (green arrow-arum), *Pontederia cordata* (pickerelweed), *Utricularia* (bladderwort) spp., and *Potamogeton* (pondweed) spp.

**Characteristic Species:** *Decodon verticillatus* (swamp-loosestrife)

**Reference Sites:** (NJ and DE - no sites identified)

**Global and State Conservation Ranks and Reasons:** GNR (15-Dec-1994). DE: SNR, NJ: SNR, PA: SNR.

**VegBank Link for Plot Data:** [http://vegbank.org/natureserve/element\\_global.2.685207](http://vegbank.org/natureserve/element_global.2.685207)

**References:** Bowman 2000, Breden et al. 2001, Eastern Ecology Working Group n.d., Edinger et al. 2002, Fike 1999, Harrison 2004, Metzler and Barrett 2001, Swain and Kearsley 2001

<b>MOST ABUNDANT SPECIES</b>		
<b>STRATUM</b>	<b>LIFEFORM</b>	<b>SPECIES</b>
Short shrub/sapling	Broad-leaved deciduous shrub	<i>Decodon verticillatus</i> (swamp-loosestrife)

---

**ECOLOGICAL SYSTEM: ATLANTIC COASTAL PLAIN SMALL BROWNWATER RIVER FLOODPLAIN FOREST**

---

**Summary:** This system encompasses the floodplains of small to medium brownwater rivers of the Atlantic Coastal Plain which are intermediate between the smaller streams and the largest rivers. Brownwater rivers originate in clayey areas and carry substantial amounts of mineral sediment, creating well-developed deposition alluvial landforms and fertile soils. Vegetation is a mosaic of cypress and gum swamps, oak-dominated bottomland hardwoods, and mixed levee forests, with only local non-forested communities.

**Range:** Throughout the Atlantic Coastal Plain, from Delaware to Georgia. United States: DE, GA, MD, NC, SC, VA

**Delaware Estuary Associations:**

- Alluvial Alder Swamp Coastal Plain Oak Floodplain Swamp
- Coastal Plain Streamside Forest Southern Coastal Plain Cottonwood - Willow Riverfront Forest
- Successional Sweetgum Floodplain Forest

**CLASSIFIERS FOR ATLANTIC COASTAL PLAIN SMALL BROWNWATER RIVER FLOODPLAIN FOREST**

**Primary Division:** 203

**Land Cover Class:** Woody Wetland

**Spatial Scale & Pattern:** Linear

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

**Diagnostic Classifiers:** Riverine / Alluvial [Brownwater]

**Non-diagnostic Classifiers:** Forest and Woodland (Treed)

---

**ALLUVIAL ALDER SWAMP**

*Cornus amomum* - *Alnus serrulata* Shrubland

---

**Range:** This Coastal Plain alluvial shrubland occurs in the Chesapeake Bay Lowlands and along the Christina River in Delaware in the Delaware Estuary.

**Environmental Description:** This Coastal Plain alluvial shrubland occurs in the Chesapeake Bay Lowlands on the non-tidal portions of rivers and non-tidal bay mouths.

**Vegetation Description:** The shrub canopy is characterized by *Cornus amomum* (silky dogwood) with other associates including *Alnus serrulata* (smooth alder), *Cephalanthus occidentalis* (common buttonbush), and *Viburnum* (viburnum) spp., as well as saplings of *Acer rubrum* (red maple), *Fraxinus pennsylvanica* (green ash), and *Salix nigra* (black willow). Herbaceous associates include *Osmunda regalis* (royal fern), *Decodon verticillatus* (swamp-loosestrife), *Utricularia* (bladderwort) spp., *Limnobiium spongia* (American spongeplant), and *Cicuta bulbifera* (bulb-bearing water-hemlock).

**Characteristic Species:** *Cornus amomum* (silky dogwood)

**Reference Sites:** Lewden-Green Park in New Castle County, DE, on the Christina River

**Global and State Conservation Ranks and Reasons:** GNR (10-Oct-2000). DE: SNR.

**VegBank Link for Plot Data:** [http://vegbank.org/natureserve/element\\_global.2.683138](http://vegbank.org/natureserve/element_global.2.683138)

**References:** Eastern Ecology Working Group n.d., Harrison 2004, Tiner 1985a