
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

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

MOST ABUNDANT SPECIES

STRATUM	LIFEFORM	SPECIES
Shrub/sapling (tall & short)	Broad-leaved deciduous shrub	<i>Alnus serrulata</i> (smooth alder)
Shrub/sapling (tall & short)	Broad-leaved deciduous shrub	<i>Cornus amomum</i> (silky dogwood)
Herb (field)	Fern or fern ally	<i>Osmunda regalis</i> (royal fern)

COASTAL PLAIN OAK FLOODPLAIN SWAMP

Quercus (palustris, phellos) - Acer rubrum / Cinna arundinacea Forest

Range: This community is found in the Chesapeake Bay region north to the southern Coastal Plain of New Jersey and Pennsylvania.

Environmental Description: This floodplain swamp community of the Chesapeake Bay region and environs occurs in topographic depressions within alluvial floodplains. It occurs in pockets of saturated soils in, or at the edges of, depressions within a larger floodplain forest with annual flooding. Soils are poorly drained loams or clay loams.

Vegetation Description: The tree canopy is dominated by *Quercus palustris* (pin oak), *Quercus phellos* (willow oak), *Acer rubrum* (red maple), and *Liquidambar styraciflua* (sweetgum). The shrub layer is of relatively low cover and comprised of *Viburnum dentatum* (southern arrow-wood), *Viburnum prunifolium* (smooth blackhaw), and *Ilex verticillata* (common winterberry). *Vaccinium corymbosum* (highbush blueberry) is a less frequent shrub layer associate. Typical vines include *Toxicodendron radicans* (eastern poison-ivy), *Parthenocissus quinquefolia* (Virginia creeper), and *Smilax rotundifolia* (roundleaf greenbrier). The herb layer is characterized by *Cinna arundinacea* (sweet woodreed), *Boehmeria cylindrica* (small-spike false nettle), *Symphotrichum lateriflorum* var. *lateriflorum* (calico aster), and *Carex* (sedge) spp., with less frequent associates including *Arisaema triphyllum* (Jack-in-the-pulpit), *Eurybia divaricata* (white wood-aster), *Lycopus virginicus* (Virginia water-horehound), *Ranunculus abortivus* (kidneyleaf buttercup), *Euonymus americanus* (American strawberry-bush), *Chasmanthium laxum* (slender spikegrass), and *Glyceria striata* (fowl mannagrass).

Characteristic Species: *Boehmeria cylindrica* (small-spike false nettle), *Cinna arundinacea* (sweet woodreed), *Quercus palustris* (pin oak)

Dynamics/Successional Trajectory: This floodplain forest is subject to annual flooding.

Reference Sites: Cape May, NJ, and potentially Cedar Swamp WMA, New Castle County, DE

Global and State Conservation Ranks and Reasons: GNR (27-Mar-2000). DE?:SNA, NJ?:SNA, PA: SNR.

VegBank Link for Plot Data: http://vegbank.org/natureserve/element_global.2.689632

References: Eastern Ecology Working Group n.d., Fleming et al. 2001, Harrison 2004, Harrison and Stango 2003, Patterson pers. comm., Thomson et al. 1999

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>Quercus palustris</i> (pin oak)
Tree canopy	Broad-leaved deciduous tree	<i>Quercus phellos</i> (willow oak)
Herb (field)	Graminoid	<i>Cinna arundinacea</i> (sweet woodreed)

COASTAL PLAIN STREAMSIDE FOREST

Platanus occidentalis - (*Liquidambar styraciflua*, *Liriodendron tulipifera*) / *Asimina triloba* Forest

Range: This forest is found in the Inner Coastal Plain of the Chesapeake Bay region, in the Upper Coastal Plain and Piedmont of Delaware, and in New Jersey. In the Delaware Estuary, this community occurs in New Jersey and possibly Pennsylvania and Delaware.

Environmental Description: This Inner Coastal Plain streamside forest of the Mid-Atlantic region occurs along braided and intermittent streams on active and former stream channels. Flooding frequency is annual, and soils are alluvial clay loams or sandy clay loams.



Photo by Linda Kelly

Vegetation Description: The tree canopy is dominated by *Platanus occidentalis* (sycamore), *Liquidambar styraciflua* (sweetgum), *Betula nigra* (river birch), *Liriodendron tulipifera* (tuliptree), and *Acer rubrum* (red maple). Less frequent associates may include *Quercus michauxii* (swamp chestnut oak), *Ulmus americana* (American elm), and *Quercus phellos* (willow oak). The subcanopy is of variable cover and is characterized by *Asimina triloba* (common pawpaw), *Carpinus caroliniana* (American hornbeam), *Lindera benzoin* (northern spicebush), and *Ilex opaca* (American holly), with *Cornus florida* (flowering dogwood) found less frequently. Typical vines include *Toxicodendron radicans* (eastern poison-ivy), *Parthenocissus quinquefolia* (Virginia creeper), and *Smilax rotundifolia* (roundleaf greenbrier). The most abundant herbs are *Boehmeria cylindrica* (small-spike false nettle) and *Arisaema triphyllum* (Jack-in-the-pulpit). Other herbaceous associates include *Geum virginianum* (cream avens), *Carex debilis* (white-edge sedge), *Lycopus virginicus* (Virginia water-horehound), *Impatiens capensis* (orange jewelweed), *Pilea pumila* (Canadian clearweed), *Claytonia virginica* (Virginia springbeauty), *Ranunculus abortivus* (kidneyleaf buttercup), and *Cardamine concatenata* (cutleaf toothwort). The vine *Campsis radicans* (trumpetvine) may also be present. *Asimina triloba* (common pawpaw) does not occur in New Jersey examples of this site; however, all of the other species listed are typical.

Characteristic Species: *Arisaema triphyllum* (Jack-in-the-pulpit), *Asimina triloba* (common pawpaw), *Boehmeria cylindrica* (small-spike false nettle), *Platanus occidentalis* (sycamore)

Reference Sites: Brandywine Creek, DE?; Rancocas State Park, NJ

Global and State Conservation Ranks and Reasons: G3G4 (21-Mar-2000). DE: SNR, NJ: SNR, PA?: SNA. This community is newly proposed and requires further evaluation. Global based on state rank.

VegBank Link for Plot Data: http://vegbank.org/natureserve/element_global.2.686841

References: Bartgis 1986, Eastern Ecology Working Group n.d., Fleming et al. 2001, Harrison 2004, Thomson et al. 1999

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Tree canopy	Broad-leaved deciduous tree	<i>Betula nigra</i> (river birch)
Tree canopy	Broad-leaved deciduous tree	<i>Liquidambar styraciflua</i> (sweetgum)
Tree canopy	Broad-leaved deciduous tree	<i>Liriodendron tulipifera</i> (tuliptree)
Tree canopy	Broad-leaved deciduous tree	<i>Platanus occidentalis</i> (sycamore)
Shrub/sapling (tall & short)	Broad-leaved deciduous shrub	<i>Carpinus caroliniana</i> (American hornbeam)
Shrub/sapling (tall & short)	Vine/Liana	<i>Toxicodendron radicans</i> (eastern poison-ivy)
Herb (field)	Forb	<i>Arisaema triphyllum</i> (Jack-in-the-pulpit)
Herb (field)	Forb	<i>Boehmeria cylindrica</i> (small-spike false nettle)

SOUTHERN COASTAL PLAIN COTTONWOOD - WILLOW RIVERFRONT FOREST

Populus deltoides - *Salix nigra* / *Mikania scandens* Forest

Range: This forest occurs in the southeastern Coastal Plain of the United States. The status in the lower Piedmont is undetermined. It, or a closely related community, also occurs in New Jersey's portion of the Delaware Estuary.

Environmental Description: This forest occurs in the southeastern Coastal Plain along the fronts and banks of large rivers and on islands where sediment accretes. This community is found on the fronts or banks of major rivers which are better-drained than areas farther from the watercourse. It can also be found on relatively newly accreted soil at the ends of islands and stream bars. Soils are coarser-textured than those of most other bottomland communities because the heavier soil particles drop out of flood waters first; silts and clays stay suspended longer and are deposited farther from the watercourse. This community may establish itself in either Zone III or Zone IV. If it occurs in Zone III, soil accretion will move the community into Zone IV. Zone III communities experience semipermanently inundated or saturated soil from surface or groundwater during >25% of the growing season; flooding is typical during winter and spring with a 51-100% frequency, but the soil is not saturated approximately 60% of the year. Zone IV communities experience seasonal inundation or groundwater saturation for approximately 12.5-25% of the year, usually during spring and early summer with a frequency of 51-100%.

Vegetation Description: Stands of this forest are dominated by *Populus deltoides* (eastern cottonwood) and *Salix nigra* (black willow). These two species combined contribute at least 75% of the canopy cover with each contributing 25-75% of the total and a variety of other bottomland species contributing the rest. In addition to the above-listed species, *Acer rubrum* (red maple), *Acer negundo* (box-elder), *Fraxinus pennsylvanica* (green ash), *Betula nigra* (river birch), *Celtis occidentalis* (common hackberry), *Ulmus americana* (American elm), *Liquidambar styraciflua* (sweetgum), *Juglans nigra* (black walnut), and *Acer saccharinum* (silver maple) all may be present within their ranges. *Ilex opaca* var. *opaca* (American holly), *Carpinus caroliniana* (American hornbeam), and *Lindera benzoin* (northern spicebush) may be present in the subcanopy. Depending on the maturity of the occurrence, physiognomy varies. The herb layer is sparse to dense.

Characteristic Species: *Populus deltoides* (eastern cottonwood), *Salix nigra* (black willow)

Dynamics/Successional Trajectory: This community experiences frequent flooding of short duration. Very heavy siltation can kill enough individuals of *Populus deltoides* (eastern cottonwood) to convert the community to one dominated almost exclusively by *Salix nigra* (black willow). This forest often succeeds to a forest dominated by some combination of *Celtis laevigata* (sugarberry), *Ulmus americana* (American elm), *Platanus occidentalis* (sycamore), *Fraxinus pennsylvanica* (green ash), and *Liquidambar styraciflua* (sweetgum). Regardless, succession in this community occurs relatively swiftly.

Management Concerns: Management may require removal of exotics to maintain the quality of occurrences. It is important to maintain the natural hydrology of the associated river. More inventory is needed to determine the relationship between the New Jersey community and the more southern variants of this community.

Reference Sites: Palmyra Cove, NJ

Global and State Conservation Ranks and Reasons: G4G5 (2-Sep-1999). NJ: SNR.

VegBank Link for Plot Data: http://vegbank.org/natureserve/element_global.2.683975

References: Allard 1990, Ambrose 1990a, Burns and Honkala 1990b, Clark and Benforado 1981, Dickson and Segelquist 1978, Eyre 1980, Faulkner and Patrick n.d., Foti et al. 1994, Klimas 1988b, Klimas et al. 1981, McWilliams and Rosson 1990, Oberholster 1993, Putnam 1951, Putnam et al. 1960, Schotz pers. comm., Smith 1996a, Smith and Linnartz 1980, Southeastern Ecology Working Group n.d., TDNH unpubl. data, Van Auken and Bush 1988, Wharton 1978, Wharton et al. 1982, Wieland 1994b, Wieland 2000b

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Tree canopy	Broad-leaved deciduous tree	<i>Celtis laevigata</i> (sugarberry)
Tree canopy	Broad-leaved deciduous tree	<i>Platanus occidentalis</i> (sycamore)
Tree canopy	Broad-leaved deciduous tree	<i>Populus deltoides</i> (eastern cottonwood)
Tree canopy	Broad-leaved deciduous tree	<i>Salix nigra</i> (black willow)
Shrub/sapling (tall & short)	Vine/Liana	<i>Apios americana</i> (groundnut)
Shrub/sapling (tall & short)	Vine/Liana	<i>Brunnichia ovata</i> (ladies' eardrops)
Shrub/sapling (tall & short)	Vine/Liana	<i>Campsis radicans</i> (trumpetvine)
Shrub/sapling (tall & short)	Vine/Liana	<i>Mikania scandens</i> (climbing hempvine)
Shrub/sapling (tall & short)	Vine/Liana	<i>Toxicodendron radicans</i> (eastern poison-ivy)
Herb (field)	Forb	<i>Boehmeria cylindrica</i> (small-spike false nettle)
Herb (field)	Forb	<i>Laportea canadensis</i> (Canadian wood-nettle)
Herb (field)	Forb	<i>Phytolacca americana</i> (American pokeweed)

SUCCESSIONAL SWEETGUM FLOODPLAIN FOREST

Liquidambar styraciflua - (*Liriodendron tulipifera*) Temporarily Flooded Forest

Range: This association is known from the Piedmont, Interior Low Plateau, Inner South Atlantic Coastal Plain, and possibly other provinces. It occurs in New Jersey's portion of the Delaware Estuary.

Environmental Description: This association occurs on disturbed sites such as wetland old fields. This is a successional community that develops following clearcutting or other disturbance along floodplains of major creeks and other temporarily flooded areas. These are productive stream terraces subject to occasional flooding (Jones et al. 1981b).

Vegetation Description: The canopy of this association is dominated by *Liquidambar styraciflua* (sweetgum) but can be dominated by *Liriodendron tulipifera* (tuliptree) in some cases. *Acer rubrum* (red maple) may be a major component of the canopy and subcanopy and may even partially dominate in some instances (TNC 1998a). In more mature examples, other canopy/subcanopy species which may occur to a lesser extent and often as scattered emergents are *Quercus alba* (white oak), *Quercus phellos* (willow oak), *Quercus nigra* (water oak), *Fraxinus americana* (white ash), *Carya* (hickory) spp., *Nyssa sylvatica* (blackgum), and *Cornus florida* (flowering dogwood). Stands in the Inner Coastal Plain of South Carolina typically contain *Persea palustris* (swampbay) and *Magnolia virginiana* (sweetbay) (Jones et al. 1981b). The shrub layer contains *Carpinus caroliniana* (American hornbeam), *Itea virginica* (Virginia-willow), *Vitis rotundifolia* (muscadine), *Parthenocissus quinquefolia* (Virginia creeper), *Smilax rotundifolia* (roundleaf greenbrier), and *Rubus* (blackberry) sp., in addition to canopy/subcanopy species. The herbaceous layer may include *Chasmanthium laxum* (slender spikegrass), *Carex* (sedge) spp., *Boehmeria cylindrica* (small-spike false nettle), and *Botrychium biternatum* (sparse-lobe grapefern), sometimes growing on hummocks in standing water. Various *Carex* (sedge) species may be present.

Characteristic Species: *Liquidambar styraciflua* (sweetgum)

Dynamics/Successional Trajectory: This is a successional community which develops following clearcutting or other disturbance along floodplains of major creeks and other temporarily flooded areas.

Management Concerns: *Lonicera japonica* (Japanese honeysuckle) is often abundant in the understory. On disturbed sites, the shrub layer is often dominated by *Ligustrum sinense* (Chinese privet), and the ground layer is typically solid *Microstegium vimineum* (Japanese stiltgrass).

Reference Sites: Supawna Meadows NWR, NJ; Mount Laurel, Pemberton, NJ

Global and State Conservation Ranks and Reasons: GNA (ruderal) (8-Aug-2000). NJ: SNA. This is a successional community which develops following clearcutting or other disturbance along floodplains of major creeks and other temporarily flooded areas.

VegBank Link for Plot Data: http://vegbank.org/natureserve/element_global.2.689938

References: Jones et al. 1981b, NatureServe Ecology - Southeastern U.S. unpubl. data, Schotz pers. comm., Southeastern Ecology Working Group n.d., TDNH unpubl. data, TNC 1998a

MOST ABUNDANT SPECIES		
STRATUM	LIFEFORM	SPECIES
Tree canopy	Broad-leaved deciduous tree	<i>Liquidambar styraciflua</i> (sweetgum)