INTERNATIONAL CLASSIFICATION OF ECOLOGICAL COMMUNITIES:

TERRESTRIAL VEGETATION OF THE UNITED STATES

Chesapeake Bay Lowlands Ecoregion

Report from
Biological Conservation Datasystem
July 2003

by

NatureServe

1101 Wilson Blvd., 15th floor
Arlington, VA 22209

This subset of the International Classification of Ecological Communities (ICEC) covers vegetation alliances and associations attributed to the Chesapeake Bay Lowlands Ecoregion**.** This community classification has been developed in consultation with many individuals and agencies and incorporates information from a variety of publications and other classifications. A fully searchable and periodically updated on-line source for the ICEC is at http://www.natureserveexplorer.org. Comments and suggestions regarding the contents of this subset should be directed to Stephanie Neid <sneid@dred.state.nh.us> and Lesley Sneddon <lesley_sneddon@natureserve.org>.

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The following citation should be used in any published materials, which reference these data:
NatureServe. 2002. International Classification of Ecological Communities: Terrestrial Vegetation. Natural Heritage Central Databases. NatureServe, Arlington, VA.

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These data are extracted from:

NatureServe. 2002. International Classification of Ecological Communities: Terrestrial Vegetation. Natural Heritage Central Databases. NatureServe, Arlington, VA.

This document may be generally cited as follows:

NatureServe[1]. 2002. International classification of ecological communities: Terrestrial vegetation of the United States. Chesapeake Bay Lowlands Ecoregion. NatureServe, Arlington, VA and Boston, MA.

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Acknowledgments

We would like to express our appreciation to Jennifer Casey of the US Fish and Wildlife Service Region 5 and to Elizabeth Johnson of the National Park Service for raising funds and providing financial support for the review of this classification. We would also like to acknowledge the contributions of the ecologists of the eastern Natural Heritage Programs in their review of this document:

- Peter Bowman, Delaware Natural Heritage Program
- Jason Harrison, Maryland Natural Heritage Program
- Philip Coulling, Virginia Division of Natural Heritage

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Loblolly Pine Forest Alliance

PINUS TAEDA / LIQUIDAMBAR STYRACIFLUA - ACER RUBRUM VAR. RUBRUM / VACCINIUM STAMINEUM FOREST
Loblolly Pine / Sweetgum - Red Maple / Deerberry Forest
Successional Loblolly Pine Forest **GM (00-07-06)**
Ecological Group (SCS;MCS): Semi-natural Wooded Uplands (900-40; 8.0.0.1)

Concept: This successional forest of the Piedmont and Upper East Gulf Coastal Plain is dominated by *Pinus taeda* over a subcanopy of hardwoods with *Acer rubrum var. rubrum* and *Liquidambar styraciflua* dominant in this stratum. The forest develops following site preparation, with or without site conversion, and also following agriculture. It ranges from the Piedmont of Virginia, through North Carolina, South Carolina, Georgia and Alabama, extending into the adjacent eastern end of the Upper East Gulf Coastal Plain (e.g., Talladega National Forest). Variability exists in species composition and density of subcanopy hardwoods across the geographic range. Stands typically have more-or-less closed canopies, understories dominated by fire-intolerant hardwoods, and shrub-dominated lower strata.
Comments:
Range: This forest ranges from the Piedmont of Virginia, through North Carolina, South Carolina, Georgia and Alabama, extending into the adjacent eastern end of the Upper East Gulf Coastal Plain (e.g., Talladega National Forest).
States/Provinces: AL:S?, GA:S?, MD:S?, NC:S?, SC:S?, VA:S?
TNC Ecoregions: 43:C, 52:C, 58:?
USFS Ecoregions: 221D:CC, 231Aa:CCC, 231B:CC, 232:C, M221D:??
Federal Lands: NPS (Cowpens); USFS (Oconee, Sumter, Talladega, Uwharrie?)
Synonymy: IF3b. Plantation (Hardwood or Conifer) (Allard 1990) B. in part, Loblolly Pine: 81 (Eyre 1980) B, Loblolly Pine - Hardwood: 82 (Eyre 1980) B, Loblolly Pine (21) (USFS 1988)
References: Allard 1990, Eyre 1980, Felix et al. 1983, NatureServe Ecology - Southeastern U.S. unpubl. data, USFS 1988
Authors: S. Landaal, SCS **Confidence:** 3 **Identifier:** CEGL006011

PINUS TAEDA / MORELLA CERIFERA / VITIS ROTUNDIFOLIA FOREST
Loblolly Pine / Wax-myrtle / Muscadine Forest
Mid-Atlantic Coastal Loblolly Pine Forest **G3 (99-11-30)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Maritime Stable Dune Forests and Woodlands (240-50; n/a)

Concept: This mid-Atlantic coastal upland loblolly pine forest occurs on the Outer Coastal Plain and on barrier islands in sheltered backdunes protected from salt spray and overwash. The substrate is rapidly drained, nutrient-poor sands or sandy loams. This community is dominated by *Pinus taeda*, which can be the sole canopy component or can be associated with *Quercus falcata, Acer rubrum, Prunus serotina var. serotina*, and *Sassafras albidum*. The tall-shrub layer is comprised of *Morella cerifera (= Myrica cerifera)* and *Vaccinium corymbosum*. Vines and lianas are always present in abundance; *Vitis rotundifolia* is most common, but *Toxicodendron radicans, Smilax rotundifolia, Smilax glauca*, and *Parthenocissus quinquefolia* are usually present in abundance as well. The herbaceous layer may be sparse, particularly if shrubs and vines are dense, but *Chasmanthium laxum* may be fairly abundant in this community. Other herbs include *Panicum amarum var. amarulum, Eupatorium hyssopifolium*, and *Elephantopus nudatus*. In southern Virginia and North Carolina, *Quercus virginiana* and *Gelsemium sempervirens* may also be present, but *Quercus virginiana* is never abundant and when present is usually restricted to the understory.
Comments: This community has floristic affinity with communities of the *Quercus virginiana - (Sabal palmetto)* Forest Alliance (A.55) but is differentiated by a strong dominance by *Pinus taeda* and lack of species of southern maritime forests such as *Sabal minor* and *Osmanthus americanus*. This community also shares a number of species in common with *Prunus serotina / Morella cerifera / Smilax rotundifolia* Shrubland (CEGL006319) but is differentiated by a strong dominance by

Pinus taeda, a structure characterized by generally taller and straighter trees, a better developed herbaceous layer, and in general, a more protected position in backdunes.
Range: This association occurs along the mid-Atlantic coast from Delaware to North Carolina.
States/Provinces: DE:S2, MD:S?, NC:S1, VA:S?
TNC Ecoregions: 57:C, 58:C, 62:C
USFS Ecoregions: 232Ac:CCC, 232Bx:CC?, 232Bz:CCC
Federal Lands: NPS (Assateague Island, Cape Hatteras); USFWS (Chincoteague)
Synonymy: *Pinus taeda / Myrica cerifera / Vitis rotundifolia* Forest: *Pinus taeda / Myrica* coastal forest association (Clancy 1993a) =, Mature loblolly pine forest of dry sites (Bratton and Davison 1987) =. at Cape Hatteras., *Pinus taeda* community (Harvill 1967) =, Pine woodland (Stalter 1990) F. Virginia portion Assateague Island., Pine-deciduous hardwood woodland (Stalter 1990) F. Virginia portion Assateague Island., Upland forest (Klotz 1986) B. Virginia., Mature loblolly pine stand (Fleming 1978) =. at Angola Neck, Delaware., Woodland community (Hill 1986) B. Assateague Island., Mesic forest (Clampitt 1991) B. at Virginia Beach., Maritime forest (Clampitt 1991) B. at Virginia Beach., *Pinus taeda / Myrica* spp. coastal forest association (Clancy 1993b)
References: Bratton and Davison 1987, Clampitt 1991, Clancy 1993a, Clancy 1993b, Fleming 1978, Fleming 1998, Fleming et al. 2001, Harvill 1967, Higgins et al. 1971, Hill 1986, Klotz 1986, Schafale and Weakley 1990, Stalter 1990, Stalter and Lamont 1990
Authors: L.A. Sneddon, ECS **Confidence:** 2 **Identifier:** CEGL006040

I.A.8.N.b.17. PINUS VIRGINIANA FOREST ALLIANCE

Virginia Pine Forest Alliance

PINUS VIRGINIANA SUCCESSIONAL FOREST

Virginia Pine Successional Forest
Virginia Pine Successional Forest **GD (00-06-13)**
Ecological Group (SCS;MCS): Semi-natural Wooded Uplands (900-40; 8.0.0.1)

Concept: This community occurs in areas where canopy removal has created dry, open conditions and bare mineral soil, allowing for the establishment of *Pinus virginiana*. These habitats include old fields, old pastures, clearcuts, and burned or eroded areas. This forest typically has a very dense canopy of *Pinus virginiana* and little understory vegetation. The dense canopy may also include admixtures of other *Pinus* species (e.g., *Pinus taeda, Pinus echinata*) or other early successional deciduous trees (e.g., *Acer rubrum, Liquidambar styraciflua, Liriodendron tulipifera*). Associated woody and herbaceous species vary with geography but are typically ruderal or exotic species. Shrub and herb layers are frequently very sparse. Stands are short-lived, generally less than 75 years.
Comments: Early successional *Pinus virginiana* vegetation occurring over calcareous substrates is classed in *Pinus virginiana - Juniperus virginiana var. virginiana - Ulmus alata* Forest (CEGL007121) and has species indicative of calcareous substrates.
Range: This successional community is possible in the Piedmont from Pennsylvania south to Alabama, and ranges west into the Appalachians, Ridge and Valley, the Cumberland Plateau, and in scattered locales of the Interior Low Plateau.
States/Provinces: AL:S?, GA:S?, IN:S?, KY:S?, MD:S?, NC:S?, NJ:S?, PA:S?, SC:S?, TN:S?, VA:S?, WV:S?
TNC Ecoregions: 50:C, 51:C, 52:C, 58:P, 59:C, 61:C
USFS Ecoregions: 221D:CC, 221Ha:CCC, 221Hb:CCC, 221Hc:CCC, 221He:CCC, 221J:CC, 222Ej:CCC, 222En:CCC, 222Eo:CCC, 231Cd:CCC, M221Aa:CCC, M221Ab:CCC, M221Ac:CCC, M221Ca:CCP, M221Cb:CCP, M221Cc:CCP, M221Cd:CCC, M221Ce:CCP, M221Da:CCC, M221Db:CCC, M221Dc:CCC, M221Dd:CCC
Federal Lands: NPS (Great Smoky Mountains, Shiloh); TVA (Tellico); USFS (Bankhead, Chattahoochee, Cherokee, Daniel Boone, George Washington, Jefferson, Sumter, Uwharrie?)
Synonymy: Xeric Pine Forest (Ambrose 1990a) B, Virginia Pine, RV (Pyne 1994) B, IA7c. Xeric Virginia Pine Ridge Forest (Allard 1990) B. in part, Virginia Pine: 79 (Eyre 1980) B, Virginia Pine - Oak: 78 (Eyre 1980) B, Unclassified Old-Field Successional Forest (Fleming and Moorhead 2000)
References: Allard 1990, Ambrose 1990a, Andreu and Tukman 1995, Eyre 1980, Fike 1999, Fleming and Coulling 2001, Fleming and Moorhead 2000, Nelson 1986, Patterson et al. 1999, Pyne 1994
Authors: M. Andreu and M. Tukman, mod. K.D. Patterson, SCS **Confidence:** 1 **Identifier:** CEGL002591

I.A.8.N.g. Saturated temperate or subpolar needle-leaved evergreen forest

I.A.8.N.g.300. PINUS TAEDA SATURATED FOREST ALLIANCE

Loblolly Pine Saturated Forest Alliance

Concept: Saturated forests dominated by *Pinus taeda* that may occur adjacent to salt marsh on the bay side of barrier islands. *Acer rubrum, Persea palustris*, and *Liquidambar styraciflua* also may be present in the canopy. The understory may have strong dominance by vine species including *Smilax rotundifolia, Toxicodendron radicans*, and *Parthenocissus quinquefolia*.
Comments: Assateague association may be better placed in a temporarily flooded formation (G. Fleming pers. comm.).
Range: This alliance is found in North Carolina, Delaware, Maryland, and Virginia, and possibly elsewhere. Occurs on the Northwest and North Landing rivers in North Carolina.
States/Provinces: DE MD NC NJ VA
TNC Ecoregions: 57:C, 58:C, 62:C
USFS Ecoregions: 232Ab:CCP, 232Bx:CCP, 232Bz:CCC, 232C:CC
Federal Lands: NPS (Assateague Island)
Synonymy: Estuarine Fringe Loblolly Pine Forest (Schafale and Weakley 1990); pine woodland, in part (Higgins et al. 1971); Woodland community, in part (Hill 1986); mature loblolly pine stands of wet sites, in part (Bratton and Davison 1987); loblolly pine association, in part (Brush et al. 1980); coniferous swamp (Shreve et al. 1910); Loblolly Pine: 81, in part (Eyre 1980)
References: Bratton and Davison 1987, Brush et al. 1980, Eyre 1980, Fleming pers. comm., Higgins et al. 1971, Hill 1986, Schafale and Weakley 1990, Shreve et al. 1910
Authors: L. SNEDDON, MP, East **Identifier:** A.3009

PINUS TAEDA / MORELLA CERIFERA / OSMUNDA REGALIS VAR. SPECTABILIS FOREST

Loblolly Pine / Wax-myrtle / Royal Fern Forest
Coastal Loblolly Pine Wetland Forest **G2G3 (98-12-07)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Maritime Stable Dune Forests and Woodlands (240-50; n/a)

Concept: This maritime/coastal wetland forest occurs in backdune depressions with high water tables ranging from Delaware to North Carolina. Examples are characterized by a closed to partially open canopy dominated by *Pinus taeda*. Other canopy associates may be absent, or may include *Acer rubrum, Persea palustris*, or *Liquidambar styraciflua*. The understory is made up of vines, strongly dominated by *Smilax rotundifolia*, with lesser amounts of *Toxicodendron radicans* and *Parthenocissus quinquefolia*. In addition to comprising the majority of the ground layer of these forests, these vines are relatively large-stemmed lianas that contribute significant cover to the canopy by covering the lower branches of trees. *Morella cerifera (= Myrica cerifera)* is a typical shrub of this community. The herbaceous layer is usually relatively sparse, characterized most frequently by ferns such as *Woodwardia areolata, Osmunda regalis var. spectabilis*, or *Osmunda cinnamomea*, and farther south (in North Carolina) by *Chasmanthium laxum*. *Polygonum pensylvanicum* may also occur. On Assateague Island National Seashore, *Pinus taeda* dominates the canopy, with occasional *Acer rubrum*. *Smilax rotundifolia* is the strongly dominant vine of the understory, with lesser amounts of *Toxicodendron radicans* and *Parthenocissus quinquefolia*. *Morella cerifera* is also a minor component of this vegetation. Despite the shallow water table and presence of muck, there is little reflection of the influence of hydrology on the vegetation. Trees tend to occur on slightly elevated hummocks, with standing water evident in hollows. *Phragmites australis, Rubus argutus, Panicum virgatum*, and *Polygonum pensylvanicum* also occur within this community on Assateague Island National Seashore. Tree diameters range from 12-36 cm dbh. This community occurs primarily on the bay side of the island adjacent to salt marsh. Soils are characterized by moderately shallow muck (15 cm) overlying organic matter-stained sands. This vegetation occurs adjacent to salt marshes, sometimes even forming small 'islands' within high salt marsh.
Comments:
Range: This community ranges from the coast of Delaware to North Carolina.
States/Provinces: DE:S?, MD:S?, NC:S3?, NJ:S1?, VA:S?
TNC Ecoregions: 57:C, 58:C, 62:C
USFS Ecoregions: 232Ab:CCP, 232Bx:CCP, 232Bz:CCC, 232C:CC
Federal Lands: NPS (Assateague Island)
Synonymy: Estuarine Fringe Pine Forest (Loblolly Pine Subtype) (Schafale 2000), Pine woodland (Higgins et al. 1971) B. in part, Woodland community (Hill 1986) B. in part, Mature loblolly pine stands of wet sites (Bratton and Davison 1987) B. at Cape Hatteras., Loblolly pine association (Brush et al. 1980) B. in part, Coniferous swamp (Shreve et al. 1910) =. from eastern Maryland., Loblolly Pine: 81 (Eyre 1980) B. in part
References: Bratton and Davison 1987, Breden et al. 2001, Brush et al. 1980, Eyre 1980, Fleming et al. 2001, Higgins et al. 1971, Hill 1986, Schafale 2000, Schafale and Weakley 1990, Shreve et al. 1910

Authors: ECS **Confidence:** 2 **Identifier:** CEGL006137

I.B.2.N.a. Lowland or submontane cold-deciduous forest

I.B.2.N.a.15. FAGUS GRANDIFOLIA - ACER SACCHARUM - (LIRIODENDRON TULIPIFERA) FOREST ALLIANCE

American Beech - Sugar Maple - (Tuliptree) Forest Alliance

FAGUS GRANDIFOLIA - LIRIODENDRON TULIPIFERA - CARYA CORDIFORMIS / LINDERA BENZOIN / PODOPHYLLUM PELTATUM FOREST

American Beech - Tuliptree - Bitternut Hickory / Northern Spicebush / May-apple Forest

Northern Coastal Plain/Piedmont Basic Mesic Hardwood Forest **G4? (02-05-09)**

Concept: This association comprises luxuriant mesophytic forests of deep, sheltered ravines with base-rich soils in the northern portions of the Coastal Plain and adjacent Piedmont. In the Piedmont, these soils are derived from amphibolite and other mafic rocks. Coastal Plain habitats are in ravines that have downcut into Tertiary shell deposits or limesands. *Fagus grandifolia* and *Liriodendron tulipifera* are the principal canopy dominants, with *Carya cordiformis* and *Quercus rubra* as constant associates. Additional trees that may be locally important are *Juglans nigra, Ulmus rubra, Quercus alba, Quercus muehlenbergii*, and *Fraxinus americana*. Stands typically have dense understories dominated by *Asimina triloba* and *Lindera benzoin*. Herb layers are lush, but tend to be characterized by patch-dominance of clonal forbs and ferns. *Podophyllum peltatum, Arisaema triphyllum, Circaea lutetiana ssp. canadensis, Maianthemum racemosum ssp. racemosum*, and *Polystichum acrostichoides* are widespread and abundant herbs. More locally abundant herbs include *Cystopteris protrusa, Deparia acrostichoides, Diplazium pycnocarpon, Actaea racemosa (= Cimicifuga racemosa), Phegopteris hexagonoptera, Nemophila aphylla*, and *Actaea pachypoda*. Many additional low-cover herbaceous species are present in plot-sampled stands.

Comments: This association is based on the analysis of plot data from 12 stands in Caroline, Fluvanna, Gloucester, Hanover, Stafford, Surry, and York counties, VA. Homogeneity = 0.642. Mean species richness = 51. This community type occurs in small to large patches, and is likely to be somewhat locally but widely distributed in the Piedmont from Virginia northward. Coastal Plain occurrences are probably very local. The scarcity of oaks, and the abundance of *Fagus* and *Liriodendron*, in documented stands may be artifacts of past logging. An outstanding occurrence of this association, containing scattered residual trees 1.0-1.5 m dbh, has been documented at Crow's Nest, Stafford County, VA. Similar vegetation is reported from calcareous ravines in southern Maryland by Rod Simmons. Comparable stands also occur in Rock Creek Park, Washington, DC (G. Fleming pers. obs.).

Range:

States/Provinces: MD:S?, VA:S?

TNC Ecoregions: 52:C, 57:C, 58:C

USFS Ecoregions: 231Ae:CCC, 231Af:CCC, 232Br:CCC

Federal Lands: NPS (Colonial)

Synonymy:

References: Fleming et al. 2001, Fleming unpubl. data

Authors: ECS **Confidence:** 2 **Identifier:** CEGL006055

I.B.2.N.a.16. FAGUS GRANDIFOLIA - QUERCUS ALBA FOREST ALLIANCE

American Beech - White Oak Forest Alliance

FAGUS GRANDIFOLIA - ACER BARBATUM - QUERCUS MUEHLENBERGII / SANGUINARIA CANADENSIS FOREST

American Beech - Southern Sugar Maple - Chinquapin Oak / Bloodroot Forest

Virginia Basic Mesic Ravine Forest **G2? (01-01-08)**

Ecological Group (SCS;MCS): Southeastern Coastal Plain Circumneutral Hardwood Slope Forests (307-12; n/a)

Concept: These rich mesophytic to submesophytic forests of calcareous ravines are found in the southeastern Virginia Coastal Plain and possibly the adjacent Piedmont. Habitats are north- to east-facing slopes and adjacent low interfluves downcut into Tertiary shell deposits or lime sands, including the Pliocene marine shell deposits of the calcium-rich Yorktown

Formation. The canopies of stands of this association are typically dominated by variable combinations of *Fagus grandifolia, Acer barbatum, Quercus rubra, Quercus muehlenbergii, Tilia americana var. americana, Liriodendron tulipifera,* and *Quercus alba*. Although generally not as constant or abundant as *Fagus grandifolia* or *Acer barbatum, Quercus muehlenbergii* occurs in 75% of the plot samples and is a good diagnostic species. Characteristic or locally important understory species include *Asimina triloba, Magnolia tripetala, Ulmus rubra, Ilex opaca var. opaca, Cornus alternifolia, Cercis canadensis var. canadensis*, and *Carpinus caroliniana*. Common herbs are *Polystichum acrostichoides, Asarum canadense, Hepatica nobilis var. obtusa (= Hepatica americana), Arisaema triphyllum, Actaea racemosa (= Cimicifuga racemosa), Cardamine concatenata, Sanguinaria canadensis, Adiantum pedatum, Packera aurea (= Senecio aureus)*, and *Luzula acuminata var. carolinae*. The grass *Brachyelytrum erectum* is abundant and characteristic of more submesic habitats (e.g., convex north slopes) occupied by the type. Related vegetation occurs in the southern Piedmont of Virginia (Charlotte County). More floristic information is available in Ware and Ware (1992).
Comments: Nine plot-sampled stands from The Peninsula of Virginia (James City and York counties) and two from the City of Suffolk have been tentatively assigned to this type, along with one Piedmont outlier from Charlotte County. Similar communities lacking *Acer barbatum* have been observed, but not sampled, in calcareous ravines of Surry County. Stands in rich ravines of the southern Virginia Piedmont have similar canopies, but their understories are dominated by *Aesculus sylvatica*; based on limited data, these would appear to represent a different association. However, additional data from these areas are needed to clarify these relationships and to determine whether this association (CEGL007181) is restricted to the Coastal Plain. Mean soil chemistry values of samples collected from the 12 stands indicate calcareous, base-saturated conditions: pH = 5.6, Ca = 2616 (ppm), Mg = 86, Fe = 159, Mn = 89, Cu = 0.84, Zn = 3.1, Al = 584, P = 30, K = 78, cation exchange capacity = 17.2, total base saturation = 75.5%. This association is mostly a small-patch vegetation type. See *Quercus muehlenbergii / Erigeron pulchellus var. pulchellus - Dichanthelium boscii - (Verbesina virginica var. virginica)* Forest (CEGL007748) for related, more xerophytic forests of south-facing ravine slopes which lack *Fagus grandifolia*, and which do not contain herbs such as *Malaxis spicata, Ponthieva racemosa, Panax quinquefolius, Actaea pachypoda, Thalictrum dioicum*, and *Mitella diphylla*.
Range: Currently described only from Virginia.
States/Provinces: VA:S?
TNC Ecoregions: 52:C, 58:C
USFS Ecoregions: 231Ae:PPP, 232A:CC, 232Br:CCC, 232Ch:C??
Federal Lands: NPS (Colonial)
Synonymy: *Fagus grandifolia - Acer barbatum - Quercus muhlenbergii / Sanguinaria canadensis* Forest (Patterson pers. comm.), Basic Mesic Forest, Coastal Plain Calcareous Ravine Type (Fleming pers. comm.)
References: Fleming et al. 2001, Fleming pers. comm., Patterson pers. comm., Ware and Ware 1992
Authors: G.P. Fleming, SCS **Confidence:** 3 **Identifier:** CEGL007181

I.B.2.N.a.17. FAGUS GRANDIFOLIA - QUERCUS RUBRA - QUERCUS ALBA FOREST ALLIANCE

American Beech - Northern Red Oak - White Oak Forest Alliance

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FAGUS GRANDIFOLIA - QUERCUS ALBA - LIRIODENDRON TULIPIFERA - CARYA SPP. FOREST
American Beech - White Oak - Tuliptree - Hickory species Forest
Coastal Plain Mixed Hardwood Forest **G? (97-12-01)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Acid Hardwood Slope Forests (307-10; n/a)

Concept: This forest of mesic to dry-mesic soils, found in the northern Piedmont and adjacent ecoregions, is characterized by a mixed canopy of *Quercus alba, Quercus falcata, Quercus rubra, Quercus coccinea, Fagus grandifolia, Carya glabra, Carya alba, Liriodendron tulipifera, Sassafras albidum*, and *Liquidambar styraciflua*. *Diospyros virginiana, Nyssa sylvatica, Fraxinus americana*, and *Ilex opaca* occur in the northern edge of the range. The subcanopy is characterized by *Carpinus caroliniana* and *Cornus florida*. The shrub layer is well-developed and can include *Viburnum acerifolium, Viburnum dentatum*, and *Euonymus americana*. Heath shrubs, such as *Vaccinium corymbosum* and *Vaccinium pallidum*, may be common, but not abundant. Vines are common, including *Parthenocissus quinquefolia, Smilax glauca*, and *Toxicodendron radicans*. The herb layer is comprised of *Polystichum acrostichoides, Uvularia perfoliata, Cypripedium acaule, Mitchella repens, Tipularia discolor, Goodyera pubescens, Eurybia divaricata (= Aster divaricatus), Chimaphila maculata, Carex swanii, Medeola virginiana, Athyrium filix-femina, Carex digitalis, Carex willdenowii, Epifagus virginiana, Maianthemum canadense, Desmodium nudiflorum*, and *Polygonatum biflorum*. *Podophyllum peltatum, Arisaema triphyllum*, and *Maianthemum racemosum (= Smilacina racemosa)* can occur in more northern examples.
Comments: "This type needs a little nomenclatural revision, but is basically a very robust 'mesic mixed hardwood' association. It occurs in the Chesapeake Bay Lowlands and Piedmont ecoregions, but NOT in the Mid-Atlantic Coastal Plain, as far as I know. It grades into other mesic mixed hardwood associations in the southern part of the CBL and the Piedmont" (G. Fleming pers. comm. 2003).
Range: Currently described from Virginia northward to New Jersey and southeastern Pennsylvania.
States/Provinces: DE:S5, MD:S?, NJ:S3, PA:S1, VA:S?
TNC Ecoregions: 52:C, 58:C, 61:C, 62:C
USFS Ecoregions: 232Ac:CCC, 232Ad:CCC, 232Br:CCC, 232Bt:CCC, 232Bx:CCP, 232Bz:CCC, 232C:C?
Federal Lands: NPS (Rock Creek)
Synonymy: Maritime forest (Rawinski 1984), Southern New England oak / pine forest on sandy / gravelly soils (Rawinski 1984). in part, CNE Mesic hardwood Forest on acidic bedrock / till (Rawinski 1984). in part, Mesic Coastal Plain mixed oak forest, mixed oak - beech forest subtype (Breden 1989). in part, *Quercus* spp. - *Carya* spp. / *Cornus florida - Ilex opaca* Mesic Forest (Clancy 1993b), Coastal Plain Forest (Smith 1983) B. in part, Mixed oak forest of the south Jersey mesic uplands (Robichaud and Buell 1973), *Fagus grandifolia - Liriodendron tulipifera - Quercus (alba, rubra) / Polystichum acrostichoides - Aster divaricatus* Forest (Fleming 2001), *Fagus grandifolia - Quercus (alba, rubra) - Liriodendron tulipifera / Ilex opaca var. opaca - (Asimina triloba)* Forest (Patterson pers. comm.)
References: Berdine 1998, Bernard and Bernard 1971, Bowman 2000, Breden 1989, Breden et al. 2001, Clancy 1993b, Davis et al. 1992, Fleming 2001, Fleming et al. 2001, Fleming pers. comm., McCoy and Fleming 2000, Patterson pers. comm., Rawinski 1984, Robichaud and Buell 1973, Smith 1983
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006075

FAGUS GRANDIFOLIA - QUERCUS RUBRA / CORNUS FLORIDA / POLYSTICHUM ACROSTICHOIDES - HEXASTYLIS VIRGINICA FOREST

American Beech - Northern Red Oak / Flowering Dogwood / Christmas Fern - Virginia Heartleaf Forest
Piedmont Acidic Mesic Mixed Hardwood Forest **G3G4 (01-01-18)**
Ecological Group (SCS;MCS): Appalachian Highlands Mesic Acid Hardwood Forests (420-10; n/a)

Concept: This association represents the more typical mesic mixed hardwood forest of the Piedmont. The canopy of stands of this association is dominated by mesophytic trees such as *Fagus grandifolia, Quercus rubra, Liriodendron tulipifera, Acer rubrum*, and in the western Piedmont, *Tsuga canadensis*. Typical understory trees include *Cornus florida, Oxydendrum arboreum, Acer rubrum*, and *Ilex opaca*. Shrub species may include *Vaccinium stamineum, Viburnum rafinesquianum, Euonymus americana*, and sometimes *Kalmia latifolia*. The herb layer is often moderately dense and diverse, though it may be sparse under heavy shade. Herb species may include *Polystichum acrostichoides, Viola* spp., *Dichanthelium* spp. (= *Panicum* spp.), *Galium circaezans, Hexastylis arifolia, Hexastylis minor, Desmodium nudiflorum, Erythronium umbilicatum ssp. umbilicatum, Chamaelirium luteum, Epifagus virginiana, Tiarella cordifolia var. collina, Heuchera americana, Stellaria pubera, Podophyllum peltatum, Prenanthes serpentaria, Thalictrum thalictroides, Chrysogonum virginianum var. virginianum, Hepatica nobilis var. obtusa, Thelypteris noveboracensis*, and *Botrychium virginianum*. Exact composition varies locally with position on slope and nature of soil. Western Piedmont sites often have increasing importance of *Tsuga canadensis, Rhododendron* spp., and other species that are more typical of the Southern Blue Ridge.
Comments:
Range: This association is found in the Piedmont of the southeastern United States.
States/Provinces: GA:S?, MD:S?, NC:S4, SC:S?, VA:S?
TNC Ecoregions: 52:C, 58:C
USFS Ecoregions: 231Aa:CCC, 231Ae:CCC

Federal Lands: COE (Falls Lake, Jordan Lake, Kerr Reservoir); NPS (Guilford Courthouse, Ninety Six, Thomas Stone); USFS (Uwharrie)
Synonymy: *Fagus grandifolia - Quercus (alba, rubra) - Liriodendron tulipifera / Ilex opaca var. opaca - (Asimina triloba)* Forest (Fleming pers. comm.), *Fagus grandifolia - Quercus rubra - Quercus alba / Carpinus caroliniana* Forest (Lea 2002a)
References: Fleming 2001, Fleming et al. 2001, Fleming pers. comm., LeGrand and Dalton 1987, Lea 2002a, Nehmeth 1968, Oosting 1942, Peet and Christensen 1980, Peet et al. 2002, Schafale and Weakley 1990, Skeen et al. 1980
Authors: M.P. Schafale, SCS **Confidence:** **Identifier:** CEGL008465

I.B.2.N.a.27. QUERCUS ALBA - (QUERCUS RUBRA, CARYA SPP.) FOREST ALLIANCE

White Oak - (Northern Red Oak, Hickory species) Forest Alliance

QUERCUS ALBA - QUERCUS (RUBRA, COCCINEA) - CARYA (ALBA, GLABRA) / VACCINIUM PALLIDUM PIEDMONT DRY-MESIC FOREST

White Oak - (Northern Red Oak, Scarlet Oak) - (Mockernut Hickory, Pignut Hickory) / Hillside Blueberry Piedmont Dry-Mesic Forest
Piedmont Dry-Mesic Oak - Hickory Forest **G5? (01-02-06)**
Ecological Group (SCS;MCS): Appalachian Highlands Dry-mesic Oak Forests and Woodlands (401-13; 2.5.3.2)

Concept: This forest is found on submesic to dry-mesic to subxeric upland sites of mid- to upper-slope position with northerly or easterly aspects, or mid to lower slopes with more southerly aspects. In drier landscapes, this type could occupy habitats considered relatively mesic (e.g., concave slopes, lower slopes, shallow ravines). These sites are described as dry to intermediate in soil moisture. The soils are acidic and nutrient-poor, being weathered from felsic metamorphic and sedimentary rocks, or composed of unconsolidated sediments. Stands of this forest are closed to somewhat open, and are dominated by mixtures of oaks and hickories, with *Quercus alba* being most prevalent, along with *Quercus rubra, Quercus coccinea, Quercus velutina, Carya alba, Carya ovalis*, and *Carya glabra*. The *Carya* spp. are common in this type, but often most abundant in the understory. In Virginia examples, *Quercus prinus* is inconstant but sometimes important. In addition, *Pinus* spp., *Liriodendron tulipifera, Liquidambar styraciflua*, and *Acer rubrum* may be common. Understory species include *Acer rubrum, Cornus florida, Oxydendrum arboreum, Ilex opaca*, and *Nyssa sylvatica*. Shrubs include *Vaccinium stamineum, Vaccinium pallidum, Viburnum acerifolium, Viburnum rafinesquianum*, and *Euonymus americana*. In Virginia, *Vaccinium pallidum* is the principal ericad of patchy low-shrub layers, and stands may contain *Calycanthus floridus* (G. Fleming pers. comm. 2001). The woody vines *Vitis rotundifolia* and *Toxicodendron radicans* often are present. Herbs are fairly sparse, with *Hexastylis* spp., *Goodyera pubescens, Chimaphila maculata, Desmodium nudiflorum, Maianthemum racemosum, Polygonatum biflorum, Viola hastata, Tipularia discolor*, and *Hieracium venosum* as some common components (Schafale and Weakley 1990). This association is less nutrient-rich than *Quercus rubra - Quercus alba - Carya glabra / Geranium maculatum* Forest (CEGL007237).
Comments:
Range: This association is found in the Piedmont and northern Coastal Plain (Chesapeake Bay Lowlands Ecoregion) of Virginia, as well as south in the Piedmont to the Carolinas and possibly Georgia, as well as possibly in related areas of Maryland.
States/Provinces: GA?, MD?, NC:S5, SC:S?, VA:S?
TNC Ecoregions: 52:C, 58:C, 61:?
USFS Ecoregions: 221Db:CCC, 231Aa:CCC, 231Ae:CCC, 232Ad:CCC, 232Bt:CC?, 232Bx:CCC
Federal Lands: NPS (Guilford Courthouse)
Synonymy: Oak - Chestnut - Hickory Forest (Ambrose 1990a) B, White oak - northern red oak - false Solomon's seal (*Quercus alba - Quercus rubra - Smilacina racemosa*) community type (Jones 1988a), White oak - northern red oak - false Solomon's seal (*Quercus alba - Quercus rubra - Smilacina racemosa*) community type (Jones 1988b), IA6i. Interior Upland Dry-Mesic Oak - Hickory Forest (Allard 1990) B. in part, *Quercus alba - Quercus coccinea - Carya (glabra, alba) / Vaccinium pallidum* Forest (Patterson pers. comm.)
References: Allard 1990, Ambrose 1990a, Fleming et al. 2001, Fleming pers. comm., Jones 1988a, Jones 1988b, Nelson 1986, Patterson pers. comm., Schafale and Weakley 1990, Skeen et al. 1980
Authors: M.P. Schafale/G.P. Fleming, SCS **Confidence:** 1 **Identifier:** CEGL008475

I.B.2.N.a.29. QUERCUS ALBA - QUERCUS (FALCATA, STELLATA) FOREST ALLIANCE
White Oak - (Southern Red Oak, Post Oak) Forest Alliance

QUERCUS (FALCATA, ALBA, VELUTINA) / GAYLUSSACIA BACCATA - VACCINIUM PALLIDUM FOREST
(Southern Red Oak, White Oak, Black Oak) / Black Huckleberry - Hillside Blueberry Forest
Southern Red Oak – Heath Forest **G4G5 (97-12-01)**
Ecological Group (SCS;MCS): North Atlantic Coastal Plain Mixed Oak - Heath Forests (307-03; n/a)

Concept: This oak forest of the unglaciated northeastern Coastal Plain occurs on well-drained acidic soils, generally sandy loam and silt/clay. The canopy is dominated by a mixture of oaks, such as *Quercus alba, Quercus falcata*, and *Quercus velutina*. Associates include *Sassafras albidum, Quercus coccinea, Quercus prinus, Quercus stellata, Liquidambar styraciflua, Nyssa sylvatica, Carya* spp., and *Pinus taeda*, with *Ilex opaca* and *Cornus florida* forming a subcanopy. The shrub layer is well-developed and dominated by ericaceous species such as *Gaylussacia baccata, Gaylussacia frondosa, Vaccinium pallidum*, and occasionally *Lyonia mariana*.
Comments:
Range:
States/Provinces: DE:S?, MD:S?, NC?, NJ:S3S4, VA:S?
TNC Ecoregions: 58:C, 62:C
USFS Ecoregions: 232Ab:CCC, 232Ac:CCC, 232Ad:CCP, 232Br:CCC, 232Bt:CCC, 232Bx:CCP, 232Bz:CCP, 232Ch:CP?
Federal Lands:
Synonymy: Dry Oak-Pine Forest, mixed oak-pine forest subtype (Breden 1989), Pine - oak association (Shreve et al. 1910) B. in part, *Quercus alba - Quercus coccinea - Quercus velutina / Gaylussacia baccata - Vaccinium stamineum* Forest (Fleming pers. comm.)
References: Breden 1989, Breden et al. 2001, Fleming et al. 2001, Fleming pers. comm., Shreve et al. 1910, Sneddon et al. 1996
Authors: ECS **Confidence:** 2 **Identifier:** CEGL006269

I.B.2.N.a.31. QUERCUS FALCATA FOREST ALLIANCE
Southern Red Oak Forest Alliance

QUERCUS FALCATA - QUERCUS PHELLOS / ILEX OPACA FOREST
Southern Red Oak - Willow Oak / American Holly Forest
Mesic Coastal Plain Oak Forest **G? (97-12-01)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Acid Hardwood Slope Forests (307-10; n/a)

Concept: This community is a mesic oak forest of the central Atlantic Coastal Plain. In general, this vegetation borders wetlands and occurs on sand in areas with a high water table. Canopy dominants include *Quercus falcata, Quercus phellos, Quercus alba, Quercus michauxii*, with *Liquidambar styraciflua* and *Acer rubrum* common associates. Pines may be present, including *Pinus rigida* or *Pinus echinata* in New Jersey, or *Pinus taeda* in Delaware and Maryland. A subcanopy is often present with *Ilex opaca, Vaccinium corymbosum*, and *Amelanchier canadensis*. *Gaylussacia frondosa* forms a patchy shrub layer draped with *Smilax rotundifolia*, and the herb layer is sparse with species like *Chasmanthium laxum, Osmunda regalis*, and *Mitchella repens.*
Comments: This association is currently attributed to Delaware although no occurrences have been documented there.
Range: Currently described from New Jersey to Maryland.
States/Provinces: DE:S?, MD:S?, NJ:S2S3
TNC Ecoregions: 58:C, 62:C
USFS Ecoregions: 232Ab:CCC, 232Ac:CCP, 232Bt:CCC, 232Bx:CCC, 232Bz:CC?
Federal Lands:
Synonymy: Oak - southern hardwood "peri-hydric" forest (Windisch pers. comm.), Cape May lowland swamp (Breden 1989). in part
References: Berdine 1998, Bowman 2000, Breden 1989, Breden et al. 2001, Windisch pers. comm.
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006390

I.B.2.N.a.101. QUERCUS MUEHLENBERGII - (ACER SACCHARUM) FOREST ALLIANCE

Chinquapin Oak - (Sugar Maple) Forest Alliance

QUERCUS MUEHLENBERGII / ERIGERON PULCHELLUS VAR. PULCHELLUS - DICHANTHELIUM BOSCII - (VERBESINA VIRGINICA VAR. VIRGINICA) FOREST

Chinquapin Oak / Robin's-plantain - Bosc's Witchgrass - (Common Frostweed) Forest

North Atlantic Coastal Plain Calcareous Forest **G2? (98-12-14)**

Ecological Group (SCS;MCS): Atlantic and Gulf Coast Maritime Shell Barrens and Near-coastal Calcareous Hammocks (240-70; n/a)

Concept: This dry, open, calcareous forest of the Inner Coastal Plain of Virginia is restricted to subxeric to xeric, fertile habitats over unconsolidated, calcareous deposits. These localized habitats are found on southeast- to southwest-facing, usually convex slopes of deep ravines or stream-fronting bluffs that have downcut into Tertiary shell deposits or limesands. Occurrences are small (typically <1 acre) and highly localized in dissected portions of the Inner Coastal Plain. *Quercus muehlenbergii* is a constant, codominant or dominant canopy tree, and is the most characteristic tree of this type. Some stands tend toward a woodland physiognomy, with low-statured, gnarled trees and a very open canopy. The understory includes *Juniperus virginiana var. virginiana* and *Cercis canadensis var. canadensis*. The herb layer is usually patchy, but contains a diversity of species, including several long-range mountain disjuncts. Particularly abundant or noteworthy herbaceous species include *Erigeron pulchellus var. pulchellus* and *Dichanthelium boscii*, which are the most constant and abundant herbs, each with mean cover >5% over all documented stands. Other important species are *Verbesina virginica var. virginica, Campanulastrum americanum, Smallanthus uvedalius, Silphium trifoliatum var. trifoliatum, Desmodium pauciflorum, Hexalectris spicata,* and *Piptochaetium avenaceum*.
Comments: This type is described by G. Fleming, Virginia Department of Conservation and Recreation, Division of Natural Heritage. It is based on analysis of plot data from 11 stands in James City, Stafford, Surry, and York counties (VA). Homoteneity = 0.653. Mean species richness = 70. According to Rod Simmons, vegetation similar to the stands of this type at Crow's Nest, Stafford County, VA, occurs across the Potomac River at Chapman's Landing, Maryland. It is likely that this community type is endemic to a narrow region of the Coastal Plain stretching from Charles County, MD, south to Surry County, VA. Further inventory is required to determine whether it is present in Isle of Wight County and City of Suffolk, VA. This is a small-patch community type, usually occurring in patches <1 acre. The total acreage of all known occurrences is <25 acres.
Range: This dry, open, calcareous forest occurs in the Inner Coastal Plain of Virginia.
States/Provinces: MD:S?, VA:S?
TNC Ecoregions: 57:C, 58:C
USFS Ecoregions: 232Br:CCC
Federal Lands: NPS (Colonial)
Synonymy: *Quercus muhlenbergii / Erigeron pulchellus var. pulchellus - Dichanthelium boscii - (Verbesina virginica)* Forest (Patterson pers. comm.)
References: Fleming 2001, Fleming et al. 2001, Fleming unpubl. data, Patterson pers. comm., Ware and Ware 1992
Authors: G.P. Fleming, ECS **Confidence:** 2 **Identifier:** CEGL007748

I.B.2.N.a.100. QUERCUS VELUTINA - QUERCUS ALBA - (QUERCUS COCCINEA) FOREST ALLIANCE

Black Oak - White Oak - (Scarlet Oak) Forest Alliance

QUERCUS VELUTINA - QUERCUS COCCINEA - QUERCUS PRINUS / KALMIA LATIFOLIA FOREST

Black Oak - Scarlet Oak - Rock Chestnut Oak / Mountain Laurel Forest

Coastal Oak / Laurel Forest **G? (97-12-01)**

Ecological Group (SCS;MCS): North Atlantic Coastal Plain Mixed Oak - Heath Forests (307-03; n/a)

Concept: This association comprises coastal oak-laurel forests occurring on sandy and gravelly soils on convex slopes. Characteristic dominants are *Quercus coccinea, Quercus velutina, Quercus prinus,* and *Quercus alba*. Pines (*Pinus rigida, Pinus echinata,* or *Pinus virginiana*) may be present at low cover in some examples. *Kalmia latifolia* is the dominant shrub forming extensive, dense patches, with other ericaceous shrubs such as *Vaccinium pallidum, Vaccinium stamineum,* and *Gaylussacia baccata* contributing low cover. The herbaceous layer is sparse due to the dense *Kalmia latifolia* and may include *Pteridium aquilinum, Gaultheria procumbens, Carex pensylvanica,* and *Carex albicans.*
Comments: Examples of this forest in New York and New Jersey are 90+ acres in size; a 20-acre minimum size criteria is suggested for this type. The geographic range of this type needs review.
Range: The distribution of this type is centered in New Jersey and Long Island, New York. It may also occur in surrounding states.
States/Provinces: CT?, DE?, MD?, NJ:S3, NY:S3, RI?, VA?
TNC Ecoregions: 58:C, 62:C
USFS Ecoregions: 221Ae:CCC, 221Dc:CPP, 232Aa:CCC, 232Ab:CCC, 232Ac:CCC, 232Ad:CCP, 232Br:CCC, 232Bt:CCP, 232Ch:CCC
Federal Lands:
Synonymy: Mixed oak - mt. laurel - azalea - heath mesic forest (Windisch 1995b). found at Fort Dix., Dry oak-pine forest (Breden 1989), Oak - Mountain Laurel Forest (Greller 1977)
References: Breden 1989, Breden et al. 2001, Edinger et al. 2002, Greller 1977, Hunt 1997, Windisch 1995b
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006374

I.B.2.N.d. Temporarily flooded cold-deciduous forest

I.B.2.N.d.12. LIQUIDAMBAR STYRACIFLUA - (LIRIODENDRON TULIPIFERA, ACER RUBRUM) TEMPORARILY FLOODED FOREST ALLIANCE

Sweetgum - (Tuliptree, Red Maple) Temporarily Flooded Forest Alliance

LIQUIDAMBAR STYRACIFLUA - QUERCUS PALUSTRIS / CARPINUS CAROLINIANA / CAREX INTUMESCENS FOREST

Sweetgum - Pin Oak / Ironwood / Bladder Sedge Forest

Coastal Plain Floodplain Forest **G? (00-03-21)**

Ecological Group (SCS;MCS): Southeastern Coastal Plain Large River Bottomland Hardwood Forests (385-20; 1.6.4.2)

Concept: This bottomland forest of the Coastal Plain of the Chesapeake Bay region occurs along braided stream channels. Soils are moderately well-drained to very poorly drained sandy, silty or clay loams. The canopy is diverse, characterized by *Liquidambar styraciflua, Acer rubrum, Quercus palustris, Fraxinus pennsylvanica, Quercus pagoda, Quercus michauxii,* and *Quercus phellos*. The well-developed understory is usually dominated by *Carpinus caroliniana,* with other associates including *Ilex opaca var. opaca, Lindera benzoin,* and *Asimina triloba*. Occasional shrubs may include *Ilex verticillata, Viburnum dentatum,* and *Ilex decidua*. The herbaceous layer is dense and is characterized by *Cinna arundinacea, Carex intumescens, Carex debilis, Onoclea sensibilis, Arisaema triphyllum,* and *Solidago rugosa*.
Comments:
Range: This bottomland forest is found in the Coastal Plain of the Chesapeake Bay region.
States/Provinces: MD:S?, VA?
TNC Ecoregions: 58:C
USFS Ecoregions: 232Ad:CCC
Federal Lands:
Synonymy:
References: Fleming et al. 2001, Meininger 1998
Authors: ECS **Confidence:** 2 **Identifier:** CEGL006602

LIRIODENDRON TULIPIFERA - ACER RUBRUM - LIQUIDAMBAR STYRACIFLUA / MEDEOLA VIRGINIANA FOREST
Tuliptree - Red Maple - Sweetgum / Indian Cucumber-root Forest
Coastal Plain Bottomland / Tributary Forest **G? (00-04-12)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Small Stream Forests (365-10; 1.6.3.9)

Concept: This bottomland forest community occurs on the Inner Coastal Plain of the Chesapeake Bay region. It occurs along small streams and on adjacent low slopes on somewhat poorly drained sandy loams or sandy clay loams. The tree canopy is dominated by *Liriodendron tulipifera* and *Acer rubrum*, with *Liquidambar styraciflua* at lower abundance. Other canopy associates may include *Nyssa sylvatica, Fagus grandifolia* and *Quercus rubra*. The understory is made up of the same species as the canopy dominants, with *Ilex opaca*. The shrub layer is dominated by *Asimina triloba, Lindera benzoin*, and *Ilex opaca*, with less frequent associates including *Clethra alnifolia, Vaccinium corymbosum, Magnolia virginiana*, and *Viburnum* spp. The herbaceous layer is characterized by *Thelypteris noveboracensis, Mitchella repens, Euonymus americana*, and *Medeola virginiana*.
Comments:
Range: This bottomland forest community occurs on the Inner Coastal Plain of the Chesapeake Bay region.
States/Provinces: MD:S?, VA:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232A:CC, 232B:CC
Federal Lands:
Synonymy:
References: Fleming et al. 2001
Authors: ECS **Confidence:** 2 **Identifier:** CEGL006601

I.B.2.N.d.14. PLATANUS OCCIDENTALIS - (LIQUIDAMBAR STYRACIFLUA, LIRIODENDRON TULIPIFERA) TEMPORARILY FLOODED FOREST ALLIANCE
Sycamore - (Sweetgum, Tuliptree) Temporarily Flooded Forest Alliance

PLATANUS OCCIDENTALIS - (LIQUIDAMBAR STYRACIFLUA, LIRIODENDRON TULIPIFERA) / ASIMINA TRILOBA FOREST
Sycamore - (Sweetgum, Tuliptree) / Common Pawpaw Forest
Coastal Plain Streamside Forest **G3G4 (00-03-21)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Riverfront and Levee Forests and Shrublands (385-30; 1.6.4.4)

Concept: This Inner Coastal Plain streamside forest of the Chesapeake Bay 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. The tree canopy is dominated by *Platanus occidentalis, Liquidambar styraciflua, Betula nigra, Liriodendron tulipifera*, and *Acer rubrum*. Less frequent associates may include *Quercus michauxii, Ulmus americana*, and *Quercus phellos*. The subcanopy is of variable cover and is characterized by *Asimina triloba, Carpinus caroliniana, Lindera benzoin*, and *Ilex opaca*, with *Cornus florida* found less frequently. Typical vines include *Toxicodendron radicans, Parthenocissus quinquefolia*, and *Smilax rotundifolia*. The most abundant herbs are *Boehmeria cylindrica* and *Arisaema triphyllum*. Other herbaceous associates include *Geum virginianum, Carex debilis, Lycopus virginicus, Impatiens capensis, Pilea pumila, Claytonia virginica, Ranunculus abortivus*, and *Cardamine concatenata*. The vine *Campsis radicans* may also be present.
Comments:
Range: This forest is found in the Inner Coastal Plain of the Chesapeake Bay region.
States/Provinces: DE:S?, MD:S?, VA:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232Ad:CCC, 232Br:CCC
Federal Lands:
Synonymy:
References: Fleming et al. 2001, Thompson et al. 1999
Authors: ECS **Confidence:** 2 **Identifier:** CEGL006603

I.B.2.N.d.16. QUERCUS (MICHAUXII, PAGODA, SHUMARDII) - LIQUIDAMBAR STYRACIFLUA TEMPORARILY FLOODED FOREST ALLIANCE

(Swamp Chestnut Oak, Cherrybark Oak, Shumard Oak) - Sweetgum Temporarily Flooded Forest Alliance

QUERCUS PAGODA - QUERCUS PHELLOS - QUERCUS LYRATA - QUERCUS MICHAUXII / CHASMANTHIUM LATIFOLIUM FOREST

Cherrybark Oak - Willow Oak - Overcup Oak - Swamp Chestnut Oak / River-oats Forest

Piedmont Triassic Basin Oak Bottomland Forest **G2? (97-08-22)**

Ecological Group (SCS;MCS): Appalachian Highlands Large River Floodplain Forests (422-20; n/a)

Concept: This association covers Piedmont bottomland forests which occur in broad, flat floodplains of Triassic basins. The diverse canopy is characteristic, composed of species which often are normally sorted out along a hydrologic gradient in the larger floodplains of the Coastal Plain. The canopy is dominated by *Quercus pagoda, Quercus phellos, Quercus michauxii, Liquidambar styraciflua, Liriodendron tulipifera, Celtis laevigata*, and *Ulmus americana*, with lesser amounts of *Quercus shumardii, Quercus palustris, Acer barbatum, Carya ovalis, Carya cordiformis*, and *Pinus taeda*. In addition, *Quercus lyrata* is present in abandoned sloughs and oxbows, which are inclusions in this association. Subcanopy trees are *Ilex decidua, Carpinus caroliniana, Aesculus sylvatica, Asimina triloba*, and *Acer barbatum*. Shrubs and woody vines are *Lindera benzoin, Bignonia capreolata, Toxicodendron radicans, Smilax rotundifolia*, and others. The herb stratum includes *Chasmanthium latifolium, Carex* spp., *Arisaema triphyllum, Cardamine concatenata, Claytonia virginica, Geranium maculatum, Erythronium americanum, Lysimachia ciliata*, and others.

Comments: As defined, this Piedmont type would be largely restricted to the Triassic Basin (Southern Triassic Basins Subsection 231Ao), as *Quercus pagoda* is rarely found outside of the Coastal Plain. In contrast to the floodplains of the adjacent Slate Belts (231Ae, 231Af), those in the Triassic basins are broader and flatter, showing some Coastal Plain influence as demonstrated by the presence of *Quercus pagoda*. The name of this association may need revision; the distinctions (floristic and nomenclatural) between this type and more common Coastal Plain bottomland associations need further verification. It occurs in the Piedmont instead of the Coastal Plain.

Range:

States/Provinces: NC:S3?, SC?, VA:S?

TNC Ecoregions: 52:C, 58:C

USFS Ecoregions: 231Af:CCP, 231Ao:CCC

Federal Lands: COE (Jordan Lake)

Synonymy:

References: Fleming et al. 2001, LeGrand 1999, Schafale and Weakley 1990

Authors: SCS **Confidence:** 2 **Identifier:** CEGL007356

I.B.2.N.d.26. QUERCUS PALUSTRIS - ACER RUBRUM TEMPORARILY FLOODED FOREST ALLIANCE

Pin Oak - Red Maple Temporarily Flooded Forest Alliance

QUERCUS (PALUSTRIS, PHELLOS) - ACER RUBRUM / CINNA ARUNDINACEA FOREST

(Pin Oak, Willow Oak) - Red Maple / Stout Woodreed Forest

Coastal Plain Oak Floodplain Swamp **G? (00-03-27)**

Ecological Group (SCS;MCS): Southeastern Coastal Plain Large River Bottomland Hardwood Forests (385-20; 1.6.4.2)

Concept: This floodplain swamp community of the Chesapeake Bay region and environs occurs in topographic depressions within alluvial floodplains. The tree canopy is dominated by *Quercus palustris, Quercus phellos, Acer rubrum*, and *Liquidambar styraciflua*. The shrub layer is of relatively low cover and comprised of *Viburnum dentatum, Viburnum prunifolium*, and *Ilex verticillata*. *Vaccinium corymbosum* is a less frequent shrub layer associate. Typical vines include *Toxicodendron radicans, Parthenocissus quinquefolia*, and *Smilax rotundifolia*. The herb layer is characterized by *Cinna arundinacea, Boehmeria cylindrica, Symphyotrichum lateriflorum var. lateriflorum (= Aster vimineus)*, and *Carex* spp., with less frequent associates including *Arisaema triphyllum, Eurybia divaricata (= Aster divaricatus), Lycopus virginicus, Ranunculus abortivus, Euonymus americana, Chasmanthium laxum*, and *Glyceria striata*.

Comments:

Range: This community is found in the Chesapeake Bay region.

States/Provinces: MD:S?, VA:S?
TNC Ecoregions: 52:C, 58:C
USFS Ecoregions: 231Ap:CCC, 232Ad:CCC
Federal Lands:
Synonymy: *Acer rubrum - Liquidambar styraciflua - Quercus (palustris, phellos)* Seasonally Flooded Forest (Patterson pers. comm.)
References: Fleming et al. 2001, Patterson pers. comm., Thompson et al. 1999
Authors: ECS **Confidence:** 2 **Identifier:** CEGL006605

I.B.2.N.e. Seasonally flooded cold-deciduous forest

I.B.2.N.e.1. ACER RUBRUM - FRAXINUS PENNSYLVANICA SEASONALLY FLOODED FOREST ALLIANCE

Red Maple - Green Ash Seasonally Flooded Forest Alliance

ACER RUBRUM - FRAXINUS PENNSYLVANICA / SAURURUS CERNUUS FOREST

Red Maple - Green Ash / Lizard's-tail Forest
Chesapeake Red Maple Swamp **G? (00-03-21)**
Ecological Group (SCS;MCS): Northern Coastal Plain Swamp Forests (490-12; n/a)

Concept: This red maple swamp community of the Coastal Plain of the Chesapeake Bay region occurs on poorly drained to very poorly drained, base-rich, alluvial soils that are seasonally to semipermanently flooded. A thin organic horizon overlies sandy or silt clay loam soils. This swamp has pronounced hummock-and-hollow microtopography. The tree canopy is closed to partially open and dominated by *Acer rubrum, Fraxinus pennsylvanica*, and *Quercus lyrata*. Associated canopy species may include *Nyssa sylvatica, Quercus phellos*, and *Populus heterophylla*. The shrub layer includes *Lindera benzoin, Leucothoe racemosa, Ilex verticillata, Viburnum* spp., and *Fraxinus pennsylvanica* saplings. The herbaceous layer is characterized by *Saururus cernuus, Peltandra virginica, Boehmeria cylindrica, Triadenum walteri, Cinna arundinacea, Pilea pumila, Impatiens capensis, Osmunda cinnamomea, Osmunda regalis, Leersia oryzoides, Leersia virginica, Glyceria striata, Commelina virginica, Rumex verticillatus, Carex* spp., and *Polygonum arifolium*.
Comments:
Range: This red maple swamp community occurs in the Coastal Plain of the Chesapeake Bay region.
States/Provinces: DE:S?, MD:S?, NJ:S?, VA:S?
TNC Ecoregions: 52:C, 58:C, 62:C
USFS Ecoregions: 232Ad:CCC, 232Br:CCC, 232Bt:CCC, 232Bx:CCC
Federal Lands:
Synonymy:
References: Bowman 2000, Breden et al. 2001, Fleming 2001, Meininger 1998, Thompson et al. 1999
Authors: ECS **Confidence:** 1 **Identifier:** CEGL006606

I.B.2.N.e.6. LIQUIDAMBAR STYRACIFLUA - (ACER RUBRUM) SEASONALLY FLOODED FOREST ALLIANCE

Sweetgum - (Red Maple) Seasonally Flooded Forest Alliance

LIQUIDAMBAR STYRACIFLUA - ACER RUBRUM - NYSSA BIFLORA / CAREX JOORII FOREST

Sweetgum - Red Maple - Swamp Blackgum / Cypress Swamp Sedge Forest
Central Coastal Plain Basin Swamp **G1G2 (97-11-20)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Upland Depression Forested Ponds (340-10; n/a)

Concept: This seasonally flooded hardwood forest community occurs in groundwater basins on the Coastal Plain of Maryland and Virginia. The canopy is of variable closure and is dominated by *Liquidambar styraciflua, Acer rubrum*, and *Nyssa biflora*. Associated canopy species include *Quercus lyrata, Quercus laurifolia* and *Diospyros virginiana*. The shrub layer is comprised of *Leucothoe racemosa* and scattered *Cephalanthus occidentalis*. The herbaceous layer is characterized by *Carex joorii, Carex striata, Panicum verrucosum, Fimbristylis autumnalis*, and others.
Comments:
Range: This community is limited to small seasonally flooded depressions of the Coastal Plain of Maryland and Virginia.

States/Provinces: MD:S?, VA:S?
TNC Ecoregions: 57:?, 58:C
USFS Ecoregions: 232A:CC, 232B:CC, 232C:C?
Federal Lands:
Synonymy:
References: Fleming et al. 2001, Rawinski 1997, Sneddon et al. 1996
Authors: ECS **Confidence:** 2 **Identifier:** CEGL006223

LIQUIDAMBAR STYRACIFLUA - ACER RUBRUM - QUERCUS PHELLOS / LEUCOTHOE RACEMOSA FOREST
Sweetgum - Red Maple - Willow Oak / Swamp Doghobble Forest
Red Maple - Sweetgum Swamp **G? (97-12-01)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Upland Depression Forested Ponds (340-10; n/a)

Concept: This association is a seasonally flooded forest of shallow basins and other depressions of the Coastal Plain of the Chesapeake Bay region. The substrate is characterized by mineral soils, generally acidic, gleyed to mottled, sandy or clay loams. Characteristic tree species include *Acer rubrum, Liquidambar styraciflua*, and *Nyssa sylvatica*, which are nearly constant in the canopy. Associates include *Ilex opaca, Magnolia virginiana, Nyssa biflora, Sassafras albidum, Quercus palustris, Pinus taeda*, and *Quercus phellos*, and occasionally *Quercus lyrata* or *Betula nigra*. The shrub layer is characterized by *Leucothoe racemosa, Vaccinium corymbosum, Clethra alnifolia, Lindera benzoin, Ilex verticillata*, and *Rhododendron viscosum*. *Smilax rotundifolia* is a particularly characteristic vine. The herbaceous layer is generally sparse but may include *Mitchella repens, Osmunda cinnamomea, Woodwardia areolata, Onoclea sensibilis, Carex albolutescens, Scirpus cyperinus*, and *Polygonum* spp.
Comments: Delaware examples contain *Quercus* spp. and *Magnolia virginiana*. In Maryland, *Clethra* is more prominent than *Leucothoe, Quercus phellos* less characteristic than *Nyssa sylvatica*.
Range: This association is a seasonally flooded forest of shallow basins and other depressions of the Coastal Plain of the Chesapeake Bay region.
States/Provinces: DE:S?, MD:S?, NJ:S3, NY:S1S2, PA?, VA:S?
TNC Ecoregions: 58:C, 61:C, 62:C
USFS Ecoregions: 221Ae:CCC, 221Dc:CCC, 231A:??, 232Aa:CCC, 232Ab:CCC, 232Ac:CCC, 232Ad:CCC, 232Bt:CCC
Federal Lands:
Synonymy: *Leucothoe racemosa* communities (Tyndall et al. 1990). are likely synonymous with this community, *Liquidambar-Acer* hardwood swamp (Breden 1989)
References: Bowman 2000, Breden 1989, Breden et al. 2001, Brush et al. 1980, Clancy 1996, Edinger et al. 2002, Fleming et al. 2001, Hunt 1998, Sneddon and Anderson 1994, Sneddon et al. 1996, Thompson et al. 1999, Tyndall et al. 1990
Authors: ECS **Confidence:** 1 **Identifier:** CEGL006110

I.B.2.N.e.15. QUERCUS PHELLOS SEASONALLY FLOODED FOREST ALLIANCE
Willow Oak Seasonally Flooded Forest Alliance

QUERCUS PHELLOS / CAREX STRIATA VAR. BREVIS FOREST
Willow Oak / Northern Peatland Sedge Forest
Delmarva Upland Oak Pool **G2? (97-08-15)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Upland Depression Forested Ponds (340-10; n/a)

Concept: This association is found in isolated, extensive upland depressions, in Delmarva bays in Accomack County, Virginia. The vegetation is characterized by mixed canopies of *Quercus phellos, Quercus michauxii, Quercus pagoda, Quercus palustris*, and/or *Quercus alba*. In addition, *Acer rubrum*, *Nyssa sylvatica, Liquidambar styraciflua*, and *Pinus taeda* are minor or understory trees. Shrubs (sparse to open) include *Morella cerifera (= Myrica cerifera), Cephalanthus occidentalis, Itea virginica, Clethra alnifolia, Rhododendron viscosum, Lyonia ligustrina var. foliosiflora, Leucothoe racemosa, Smilax rotundifolia, Vaccinium corymbosum*, and *Vaccinium formosum*. In the herbaceous layer, *Carex striata var. brevis* is the overwhelming herbaceous dominant (25-75% cover), with *Carex bullata* also abundant (25-50% cover) in some examples. Minor herbaceous associates include *Woodwardia virginica, Woodwardia areolata, Euthamia graminifolia, Pluchea foetida, Scirpus cyperinus*, and *Rhexia mariana*. The stands apparently cover many hectares and are associated with slight depressions with drainage impeded by an impermeable clay layer about half a meter below the soil surface. The habitat apparently has a seasonally high water table but ponds water only intermittently or for short periods.
Comments: This vegetation has been documented by Bill Moorhead (VANHP), who investigated several of the large, elliptical depressions that dot the flat landscape in Accomack County. There are three plots that document this vegetation, at two sites: "Dahl Swamp" and "The Lake" (G. Fleming pers. comm.). The stands apparently cover many hectares and are associated with slight depressions with drainage impeded by an impermeable clay layer about half a meter below the soil surface. The habitat apparently has a seasonally high water table but ponds water only intermittently or for short periods. Most of the areas seen by Bill Moorhead had been logged some decades ago and had a very open (woodland-like) physiognomy due to poor restocking of canopy trees. However, he also obtained information from local people that one of the areas was known historically as "savanna land," suggesting that fire and hydrology maintained a woodland physiognomy in the depressions (G. Fleming pers. comm.).
Range: This association is restricted to isolated upland pools in Delmarva bays in Accomack County, Virginia.
States/Provinces: MD?, VA:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232Bz:CCC
Federal Lands:
Synonymy:
References: Fleming et al. 2001, Fleming pers. comm.
Authors: SCS **Confidence:** 2 **Identifier:** CEGL004644

I.B.2.N.e.22. TAXODIUM DISTICHUM - NYSSA (AQUATICA, BIFLORA, OGECHE) SEASONALLY FLOODED FOREST ALLIANCE

Bald-cypress - (Water Tupelo, Swamp Blackgum, Ogeechee Tupelo) Seasonally Flooded Forest Alliance

TAXODIUM DISTICHUM - NYSSA BIFLORA CHESAPEAKE BAY FOREST

Bald-cypress - Swamp Blackgum Chesapeake Bay Forest
Chesapeake Bay Cypress – Gum Swamp **G? (97-12-01)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Backswamp/Slough Floodplain Forests (385-10; 1.6.4.3)

Concept: These forests comprise cypress - swamp blackgum in channels of blackwater rivers in the Chesapeake Bay region, characterized by a canopy dominated by *Taxodium distichum* and *Nyssa biflora*, in association with *Fraxinus pennsylvanica* or *Fraxinus profunda*. Shrubs tend to be sparse, but common species include *Clethra alnifolia, Viburnum dentatum, Cornus amomum, Itea virginica, Cephalanthus occidentalis*, and *Rhododendron viscosum*. The herb layer of these forests is variable, supporting such species as *Saururus cernuus, Osmunda cinnamomea, Woodwardia areolata, Boehmeria cylindrica, Dulichium arundinaceum, Lobelia cardinalis, Impatiens capensis, Polygonum hydropiperoides, Carex folliculata, Carex atlantica, Carex crinita, Carex intumescens, Carex lonchocarpa, Carex seorsa*, and other *Carex* spp., *Orontium aquaticum*, and *Peltandra virginica*. Soils of this community are generally organic, and waters usually acidic. This vegetation may be tidally influenced and is occasionally affected by storm tides in Delaware and Maryland. In Virginia, this vegetation is almost exclusively tidal.
Comments:
Range:
States/Provinces: DE:S?, MD:S?, VA:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232Ac:CCC, 232Ad:CCC, 232Br:CCC, 232Bt:CCC, 232Bx:CCC, 232Bz:CC?, 232C:CC
Federal Lands:

Synonymy:
References: Beaven and Oosting 1939, Dennis 1986, Fleming 1978, Fleming et al. 2001, McAvoy and Clancy 1993, Stalter 1981
Authors: ECS **Confidence:** 2 **Identifier:** CEGL006214

I.B.2.N.g. Saturated cold-deciduous forest

I.B.2.N.g.2. ACER RUBRUM - NYSSA SYLVATICA SATURATED FOREST ALLIANCE

Red Maple - Blackgum Saturated Forest Alliance

ACER RUBRUM - NYSSA SYLVATICA - MAGNOLIA VIRGINIANA FOREST

Red Maple - Blackgum - Sweetbay Forest
Southern Red Maple - Black Gum Swamp Forest **G3? (97-12-01)**
Ecological Group (SCS;MCS): Northern Coastal Plain Acid Seepage Swamp Forests (360-15; n/a)

Concept: This acidic red maple swamp forest community of the eastern middle-latitude states is a nutrient-poor wetland forest occurring in poorly drained depressions. Soils are typically moderately deep to deep muck over mineral soil, with pools of standing water at the surface. Acidic waters originate from groundwater-fed seepage, with little to no overland seasonal flooding. This community is characterized by *Acer rubrum* and *Nyssa sylvatica* in the canopy, which may be quite open in some examples. Canopy associates include *Magnolia virginiana, Liquidambar styraciflua,* and *Persea palustris* plus occasional incidental *Liriodendron tulipifera* or *Pinus taeda*. Upland trees may occur on drier hummocks. The shrub layer is characterized by *Vaccinium corymbosum*, as well as *Clethra alnifolia, Ilex verticillata, Ilex opaca, Viburnum nudum, Lindera benzoin*, and *Rhododendron viscosum*. The herbaceous layer is generally poorly developed but diverse and may include *Symplocarpus foetidus, Triadenum virginicum, Lythrum lineare, Osmunda regalis var. spectabilis, Woodwardia areolata, Carex folliculata, Carex lonchocarpa, Carex collinsii, Carex atlantica, Bartonia paniculata, Parnassia asarifolia, Helonias bullata, Chelone glabra, Oxypolis rigidior*, and *Osmunda cinnamomea*. *Sphagnum* spp. and other mosses are common.
Comments:
Range:
States/Provinces: DE:S?, MD:S?, NJ:S4S5, NY:S4S5, PA:S?, VA:S?
TNC Ecoregions: 58:C, 61:C, 62:C
USFS Ecoregions: 221Da:CCC, 221Db:CCC, 232Aa:CCP, 232Ab:CCC, 232Ac:CC?, 232Br:CCC, 232Bt:CCC, 232Bz:CCC, 232Ch:CP?
Federal Lands: NPS (Assateague Island)
Synonymy: Cape May lowland swamp (Breden 1989) B. in part, Inland red maple swamp (Breden 1989), Pine barrens hardwood swamp (Breden 1989) B. in part, *Acer rubrum - Quercus nigra - Nyssa sylvatica* swamp (Harvill 1967). Virginia portion of Assateague Island., Broadleaf swamp forest (Heckscher 1994). described from Cumberland County, New Jersey., Woodland fresh marsh community (Hill 1986), *Acer rubrum - Nyssa sylvatica / Magnolia virginiana / Woodwardia areolata - Symplocarpus foetidus* Saturated Forest (Patterson pers. comm.)
References: Breden 1989, Breden et al. 2001, Edinger et al. 2002, Ehrenfeld and Gulick 1981, Fike 1999, Fleming et al. 2001, Harvill 1967, Heckscher 1994, Hill 1986, McCormick 1979, Patterson pers. comm., Robichaud and Buell 1973, Sipple and Klockner 1984, Windisch 1995b
Authors: ECS **Confidence:** 2 **Identifier:** CEGL006238

ACER RUBRUM - NYSSA SYLVATICA - LIQUIDAMBAR STYRACIFLUA - POPULUS HETEROPHYLLA FOREST

Red Maple - Blackgum - Sweetgum - Swamp Cottonwood Forest
Cape May Lowland Swamp **G1 (97-11-18)**
Ecological Group (SCS;MCS): Northern Coastal Plain Acid Seepage Swamp Forests (360-15; n/a)

Concept: Typically this community occupies the headwaters of streams where occurrences probably receive groundwater discharge. Topography is gently rolling with a series of wet depressions alternating with drier islands. Stands generally have high diversity, one occurrence was found to contain 20-25 species of trees and 40 species of shrubs. Typical canopy species include *Acer rubrum, Liquidambar styraciflua, Fraxinus profunda,* and *Nyssa sylvatica*. *Magnolia virginiana* and *Ilex opaca* are frequent subcanopy trees. Characteristic shrubs include *Clethra alnifolia, Rhododendron viscosum, Lindera benzoin*, and *Itea virginica*. In addition to these generally 'acid-loving' species a number of typical calcicoles occur in this community

including *Cirsium muticum, Euphorbia purpurea, Platanthera flava var. flava*. Several species with a more southern distribution are also found in this community including *Quercus michauxii, Quercus phellos, Quercus nigra, Triadenum walteri*, and *Populus heterophylla*.
Comments:
Range: This community is apparently restricted to the Cape May portion of New Jersey's Outer Coastal Plain.
States/Provinces: MD?, NJ:S1
TNC Ecoregions: 58:P, 62:C
USFS Ecoregions: 232Ab:CCC
Federal Lands:
Synonymy: Cape May Lowland Swamp (Breden 1989) B
References: Bernard 1963, Breden 1989, Breden et al. 2001, Stone 1911
Authors: M. Anderson, ECS **Confidence:** 2 **Identifier:** CEGL006013

I.B.2.N.g.1. FRAXINUS NIGRA - ACER RUBRUM SATURATED FOREST ALLIANCE
Black Ash - Red Maple Saturated Forest Alliance

ACER RUBRUM - FRAXINUS PENNSYLVANICA / BIDENS LAEVIS - PILEA FONTANA FOREST
Red Maple - Green Ash / Smooth Beggarticks - Lesser Clearweed Forest
Coastal Plain Calcareous Seepage Swamp **G? (00-11-15)**
Ecological Group (SCS;MCS): Northern Coastal Plain Calcareous Seepage Swamp Forests (360-17; n/a)

Concept: This calcareous seepage swamp occurs on the Virginia Coastal Plain on groundwater-saturated stream bottoms in ravines that have cut into Tertiary shell deposits or limesands. Braided streams and hummock-and-hollow microtopography are characteristic of the environmental setting. The tree canopy is characterized by *Fraxinus pennsylvanica, Acer rubrum, Liquidambar styraciflua*, and others. The shrub layer is comprised of *Lindera benzoin, Morella cerifera (= Myrica cerifera)* and *Cornus foemina*. Vines are abundant, characterized by *Decumaria barbara*. The herbaceous layer is characterized by *Caltha palustris, Carex bromoides, Packera aurea (= Senecio aureus), Scirpus lineatus, Thelypteris palustris, Pedicularis lanceolata, Carex tetanica, Liparis loeselii*, and *Carex granularis* on drier hummocks, and *Saururus cernuus, Bidens laevis, Pilea fontana, Glyceria striata*, and *Impatiens capensis* in wetter hollows and seepage rivulets.
Comments: Although *Fraxinus pennsylvanica* rather than *Fraxinus nigra* characterizes the canopy of this type, it is placed in the *Fraxinus nigra - Acer rubrum* Saturated Forest Alliance (A.347) because of the calcareous environmental setting and presence of calciphitic species.
Range: This calcareous seepage swamp occurs on the Virginia Coastal Plain.
States/Provinces: MD?, VA:S?
TNC Ecoregions: 57:C, 58:C
USFS Ecoregions: 232Br:CCC
Federal Lands: NPS (Colonial)
Synonymy: *Acer rubrum - Fraxinus pennsylvanica / Bidens laevis - Pilea fontana - (Scirpus lineatus)* Saturated Forest [Provisional] (Fleming 2001)
References: Fleming 2001, Fleming et al. 2001
Authors: Chesapeake Bay Ecology Group, mod. L.A. Sneddon, ECS **Confidence:** 3 **Identifier:** CEGL006413

I.C.3.N.a. Mixed needle-leaved evergreen - cold-deciduous forest

I.C.3.N.a.24. PINUS TAEDA - QUERCUS (ALBA, FALCATA, STELLATA) FOREST ALLIANCE
Loblolly Pine - (White Oak, Southern Red Oak, Post Oak) Forest Alliance

(PINUS TAEDA) - QUERCUS FALCATA / GAYLUSSACIA FRONDOSA FOREST
(Loblolly Pine) - Southern Red Oak / Dangleberry Forest
Coastal Plain Loblolly Pine – Oak Forest **G5 (97-12-01)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Loblolly/Shortleaf Upland Pine and Pine-Hardwood Forests (307-09; n/a)

Concept: This mixed loblolly pine-oak forest of the northern Atlantic Coastal Plain occurs on dry to somewhat mesic, sandy or sandy loam soils on gently rolling to flat topography. The canopy is dominated by a mixture of *Pinus taeda* and oaks, of which *Quercus falcata* and *Quercus alba* are the most characteristic. Other canopy associates include *Acer rubrum, Quercus velutina, Quercus coccinea, Sassafras albidum, Nyssa sylvatica, Carya glabra,* and *Ilex opaca*. The ericaceous shrub layer is characterized by *Gaylussacia frondosa (= var. frondosa), Gaylussacia baccata, Vaccinium stamineum, Vaccinium pallidum, Vaccinium corymbosum,* and *Kalmia latifolia*. The herbaceous layer is generally sparse and characterized by *Pteridium aquilinum, Cypripedium acaule, Chimaphila maculata,* and *Gaultheria procumbens.*
Comments: The relative cover of *Pinus taeda* is likely related to disturbance history, with higher pine cover suggesting more recent disturbance.
Range:
States/Provinces: DE:S?, MD:S?, VA:S?
TNC Ecoregions: 58:C, 62:C
USFS Ecoregions: 232Ac:CCC, 232Ad:CCC, 232Br:CCC, 232Bt:CCC, 232Bx:CCC, 232Bz:CCC, 232C:CP
Federal Lands:
Synonymy: *Quercus alba - Quercus falcata - Pinus taeda / Gaylussacia frondosa* Forest (Patterson pers. comm.)
References: Bowman 2000, Clancy 1996, Fleming 2001, Fleming et al. 2001, Lea 2002b, Patterson pers. comm., Shreve et al. 1910
Authors: ECS **Confidence:** 2 **Identifier:** CEGL006169

I.C.3.N.a.26. PINUS TAEDA - QUERCUS NIGRA FOREST ALLIANCE

Loblolly Pine - Water Oak Forest Alliance

PINUS TAEDA - QUERCUS NIGRA / GELSEMIUM SEMPERVIRENS FOREST

Loblolly Pine - Water Oak / Carolina Jessamine Forest
Mid-Atlantic Barrier Island Deciduous Forest **G1 (97-12-01)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Maritime Stable Dune Forests and Woodlands (240-50; n/a)

Concept: This community occurs on barrier islands and near-coastal areas influenced by maritime processes from the eastern shore of Virginia to North Carolina. *Pinus taeda* is generally dominant or most abundant, with an average cover from 25-50%, although sites vary in the actual amount present. Other canopy associates include *Quercus nigra, Quercus falcata, Carya glabra, Oxydendrum arboreum, Fagus grandifolia,* and *Ilex opaca*. *Sassafras albidum* and *Cornus florida* are consistently present in the patchy shrub layer, which may also include *Quercus incana, Symplocos tinctoria, Castanea pumila, Vaccinium corymbosum,* and *Rhus copallinum*. A diverse vine layer dominated by *Gelsemium sempervirens* is characteristic. Other vines usually present include *Vitis rotundifolia, Vitis aestivalis, Smilax bona-nox, Smilax glauca,* and *Smilax rotundifolia*. The herbaceous layer is sparse and patchy and has no clear dominant, but typically includes *Pteridium aquilinum* and seedlings of the previously mentioned species. This forest occurs on the back portions of maritime dunes, protected from salt spray and overwash. The substrate is wind-deposited sand which is characteristically excessively well-drained and nutrient-poor. Occurrences are impacted by a number of environmental stresses including water and nutrient stress, high winds, 'sand-blasting' by salt spray, and substrate shifting during storms. The latter factors are tempered by local topography.
Comments: This community is floristically related to inland mesic forests and the maritime backdune forests which occur farther north. It is distinguished from the former by its unique topographic and dynamic environment which favors a suite of species (e.g. vines and disturbance-loving species) that rarely predominate in the inland forest. However, further research may indicate that it cannot be separated from the inland type based on species composition. It can be distinguished from its northern counterparts by the dominance of *Pinus taeda* and *Quercus nigra*. The only known occurrences are at Nags Head and Kitty Hawk in North Carolina, False Cape State Park and Seashore State Park in Virginia, but it may also extend into Delaware. This type also has a restricted range and the environment in which it occurs is extremely limited. Coastal development is degrading what little remains. This community was described in the LAPS report.
Range: This community occurs on the Outer Coastal Plain and barrier islands from southern Virginia to North Carolina.
States/Provinces: NC:S1, VA:S?
TNC Ecoregions: 57:C, 58:C
USFS Ecoregions: 232Ch:CCC
Federal Lands:
Synonymy:
References: Clampitt 1991, Fleming 2001, Fleming et al. 2001, Schafale and Weakley 1990
Authors: SCS **Confidence:** 3 **Identifier:** CEGL006172

I.C.3.N.a.27. PINUS VIRGINIANA - QUERCUS (ALBA, STELLATA, FALCATA, VELUTINA) FOREST ALLIANCE

Virginia Pine - (White Oak, Post Oak, Southern Red Oak, Black Oak) Forest Alliance

PINUS VIRGINIANA - QUERCUS FALCATA - CARYA PALLIDA FOREST

Virginia Pine - Southern Red Oak - Sand Hickory Forest

Inland Dune Ridge Forest **G? (97-12-01)**

Ecological Group (SCS;MCS): Southeastern Coastal Plain Maritime Stable Dune Forests and Woodlands (240-50; n/a)

Concept: This xeric pine forest of the central Atlantic Coastal Plain occurs on inland sand dune ridges. *Pinus virginiana* is codominant with a variety of oak species, including *Quercus falcata, Quercus nigra, Quercus alba, Quercus stellata*, and *Quercus velutina*. *Carya pallida* and *Carya alba (= Carya tomentosa)* can also occur. Other canopy and subcanopy associates may include *Sassafras albidum, Pinus taeda, Quercus prinus, Quercus marilandica, Prunus serotina, Cornus florida, Nyssa sylvatica*, and *Diospyros virginiana*. The shrub layer may include *Gaylussacia frondosa, Ilex opaca, Vaccinium pallidum (= Vaccinium vacillans), Gaylussacia baccata, Kalmia angustifolia, Comptonia peregrina*, and *Vaccinium stamineum*. The herbaceous layer is generally sparse, but is more abundant in openings. Characteristic herbs may include *Cypripedium acaule, Carex tonsa, Carex nigromarginata, Carex albicans, Carex albicans var. emmonsii (= Carex emmonsii), Tephrosia virginiana, Tephrosia spicata, Dichanthelium commutatum, Dichanthelium ovale, Chimaphila maculata, Melampyrum lineare*, and *Mitchella repens*. Less frequent species may include *Euphorbia ipecacuanhae, Baptisia tinctoria, Lupinus perennis, Pteridium aquilinum, Chimaphila umbellata, Monotropa uniflora*, and *Desmodium strictum*. Lichens of the genera *Cladonia* and *Cladina* are common. Vines such as *Smilax glauca, Smilax rotundifolia, Parthenocissus quinquefolia*, and *Vitis rotundifolia* are common at low cover.

Comments: The origin of this type in New Jersey was suspected to be post-agricultural (Breden 1989), but this should be further explored, because of the recent identification of *Carya pallida* on the New Jersey Coastal Plain (A. Windisch pers. comm.). The ancient xeric dunes in Maryland may also be this type.

Range: Currently described from Delaware, Maryland, and New Jersey.

States/Provinces: DE:S?, MD:S?, NJ:S?, VA:S?

TNC Ecoregions: 58:C, 62:C

USFS Ecoregions: 232Ab:CCC, 232Ac:CCC, 232Br:CCC, 232Bt:CCC, 232Bx:CCC

Federal Lands:

Synonymy: Virginia pine - oak forest (Breden 1989)

References: Berdine 1998, Bowman 2000, Breden 1989, Breden et al. 2001, Clancy 1996, Fleming et al. 2001, Windisch pers. comm.

Authors: ECS **Confidence:** 3 **Identifier:** CEGL006354

I.C.3.N.b. Temporarily flooded mixed needle-leaved evergreen - cold-deciduous forest

I.C.3.N.b.5. PINUS TAEDA - LIRIODENDRON TULIPIFERA TEMPORARILY FLOODED FOREST ALLIANCE

Loblolly Pine - Tuliptree Temporarily Flooded Forest Alliance

PINUS TAEDA - LIRIODENDRON TULIPIFERA / LINDERA BENZOIN / CAREX CRINITA FOREST

Loblolly Pine - Tuliptree / Northern Spicebush / Fringed Sedge Forest

Loblolly Pine - Tuliptree Successional Bottomland Forest **GM (97-08-15)**

Ecological Group (SCS;MCS): Semi-Natural Swamps (900-46; n/a)

Concept: This broadly defined, successional wetland forest is dominated by *Pinus taeda* and *Liriodendron tulipifera*, but many other canopy species are usually present. *Lindera benzoin* is a typical shrub, and *Carex crinita* is a typical herb. More information is needed on the detailed floristics of this association. It develops in river floodplain alluvial terraces along streams following major disturbances such as blowdowns, logging, and agriculture.
Comments: On the Bankhead National Forest, this community was observed on previously farmed alluvial terraces along medium-sized streams. The canopy of this forest is dominated by *Pinus taeda* with *Liriodendron tulipifera, Liquidambar styraciflua*, and *Nyssa sylvatica* also present in the canopy. Midstory components include *Nyssa sylvatica, Magnolia macrophylla, Carpinus caroliniana*, and *Ostrya virginiana*. Shrubs include *Hamamelis virginiana, Lindera benzoin*, and *Asimina parviflora*. Jones et al. (1981a) describe an old-growth stand at the Boiling Springs Natural Area at the DOE Savannah River Plant (upper coastal plain, Barnwell County, South Carolina) as a "loblolly pine-bottomland hardwood stand" which has a "senescent upperstory" composed of *Pinus taeda* and *Liriodendron tulipifera*. In contrast, the analysis of common forest types at the Savannah River Plant by Jones et al. (1981b) and Jones and Churchill (1987) includes floodplain vegetation dominated by *Pinus taeda* and *Liquidambar styraciflua*.
Range: This association is known from the Cumberland Plateau, Piedmont, South Atlantic Coastal Plain, and Chesapeake Bay Lowlands. It is also probably found in the East Gulf Coastal Plain and Upper East Gulf Coastal Plain.
States/Provinces: AL:S?, GA:S?, NC:S?, SC:S?, VA:S?
TNC Ecoregions: 43:P, 50:C, 52:C, 53:P, 56:C, 57:P, 58:?
USFS Ecoregions: 231Aa:CCC, 231Ae:CCC, 231Af:CCC, 231An:CCC, 231Ao:CCP, 231Cd:CCC, 232Br:CCC
Federal Lands: DOE (Savannah River Site); NPS (Kennesaw Mountain); USFS (Bankhead, Oconee?, Sumter, Uwharrie)
Synonymy: IA8c. Lowland Pine - Oak Forest (Allard 1990), Loblolly Pine - Hardwood: 82 (Eyre 1980) B, Loblolly pine-bottomland hardwood (Jones et al. 1981a), Loblolly pine - Swamp gum - Naked withe-rod Community (Jones et al. 1981b) ?. ?, Bottomland Hardwood - Yellow Pine (46) (USFS 1988)
References: Allard 1990, Eyre 1980, Jones and Churchill 1987, Jones et al. 1981a, Jones et al. 1981b, NatureServe Ecology - Southeastern U.S. unpubl. data, Nelson 1986, Peet et al. 2002, USFS 1988, Weakley et al. 1998
Authors: S. Landaal, SCS **Confidence:** 2 **Identifier:** CEGL007546

I.C.3.N.d. Saturated mixed needle-leaved evergreen - cold-deciduous forest

A.448—CHAMAECYPARIS THYOIDES - ACER RUBRUM SATURATED FOREST ALLIANCE (I.C.3.N.d.8)

Atlantic White-cedar - Red Maple Saturated Forest Alliance

CEGL006078—CHAMAECYPARIS THYOIDES - ACER RUBRUM - MAGNOLIA VIRGINIANA FOREST

Atlantic White-cedar - Red Maple - Sweetbay Forest
Coastal Plain Atlantic White-cedar - Red Maple Swamp **GRank:** G? (97-12-01)
Ecological Group: Southeastern Coastal Plain Peatland Atlantic White-cedar Forests (370-20; n/a)

Summary: Mixed Atlantic white-cedar - red maple swamp of New Jersey, Delaware, and Maryland. In addition to *Chamaecyparis thyoides* and *Acer rubrum*, other canopy associates include *Nyssa sylvatica, Magnolia virginiana*. The shrub layer is characterized by *Vaccinium corymbosum* or *Vaccinium formosum, Clethra alnifolia, Ilex glabra, Gaylussacia frondosa, Rhododendron viscosum*. The herbaceous layer may be sparse to moderate cover and includes species such as *Mitchella repens, Sarracenia purpurea, Triadenum virginicum, Pogonia ophioglossoides*. In canopy openings, *Peltandra virginica, Orontium aquaticum, Iris versicolor* may also occur. Sphagnum mosses form a moderately dense to dense bryophyte layer; species include *Sphagnum magellanicum, Sphagnum pulchrum, Sphagnum flavicomans, Sphagnum recurvum*, and *Sphagnum fallax*.
Similar Associations:
Synonymy:
- Coastal Plain Atlantic White Cedar Swamp (Breden 1989) B

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

State	State Rank	State Name
DE	S?	*Chamaecyparis thyoides - Acer rubrum* Swamp Forest
MD	S?	

NJ S4 *Chamaecyparis thyoides - Acer rubrum - Magnolia virginiana* Forest

TNC Ecoregion	Status	Pattern	Distribution
61	?	SMALL PATCH	PERIPHERAL
62	C	LARGE PATCH	LIMITED

USFS Ecoregions: 232Ac:CCC, 232Bt:CPP, 232C:CP
Federal Lands:
Concept Author(s):
Origin: 1997-11-26. **Internal Author History:** . **Edition:**
References : Breden 1989, Breden et al. 2001, Clancy 1996, Karlin 1988, Olsson 1979

I.C.3.N.e. Tidal mixed needle-leaved evergreen - cold-deciduous forest

I.C.3.N.e.100. PINUS TAEDA - NYSSA BIFLORA - TAXODIUM DISTICHUM TIDAL FOREST ALLIANCE

Loblolly Pine - Swamp Blackgum - Bald-cypress Tidal Forest Alliance

PINUS TAEDA - NYSSA BIFLORA - TAXODIUM DISTICHUM / MORELLA CERIFERA / OSMUNDA REGALIS VAR. SPECTABILIS FOREST

Loblolly Pine - Swamp Blackgum - Bald-cypress / Wax-myrtle / Royal Fern Forest

Wind-Tidal Cypress – Gum Swamp **G2? (97-06-20)**

Ecological Group (SCS;MCS): Atlantic and Gulf Coast Tidal Hardwood Swamp Forests (202-90; n/a)

Concept: This community occurs on relatively firm, poorly decomposed, fibrous and root-rich peat, which usually overlies soupy, well-decomposed peat at depths of about 0.5-1.0 m. Microtopography frequently exhibits a strong hummock-and-hollow pattern, with hollows retaining standing water through much of the year. Flooding by wind tides is frequent, and habitats may be inundated to depths of 0.5 m or more by occasional powerful wind tide events. This community may have complex long term dynamics, related to inlet closing and opening. *Nyssa biflora* and *Taxodium distichum* dominate the canopy in variable proportions. *Pinus taeda* is also present and is diagnostic of this type in Virginia. *Acer rubrum* and *Liquidambar styraciflua* may also be important, especially in the subcanopy stratum. *Morella cerifera (= Myrica cerifera var. cerifera)* is characteristically dominant in the shrub layer, sometimes reaching subcanopy heights (6-10 m). Other small tree and shrub components include *Persea palustris, Itea virginica, Clethra alnifolia, Vaccinium corymbosum, Rosa palustris,* and *Magnolia virginiana*. *Smilax laurifolia* and *Smilax rotundifolia* are common vines, and *Toxicodendron radicans ssp. radicans* also occurs. *Osmunda regalis var. spectabilis* is often the strong dominant of the herbaceous stratum, but also occurs in a more mixed condition with *Carex* spp., *Osmunda cinnamomea, Polygonum* spp., and *Thelypteris palustris var. pubescens.* In some areas, *Carex hyalinolepis* forms dense swards in this community.
Comments: Excellent and large examples occur along the Northwest River and North Landing River in southeastern Virginia and may occur as well in northeastern North Carolina. An additional occurrence is also known from the Pocomoke River in Delaware.
Range:
States/Provinces: DE:S?, MD?, VA:S?
TNC Ecoregions: 57:C, 58:C
USFS Ecoregions: 232Bx:CCC, 232Ch:CCC
Federal Lands:
Synonymy: *Taxodium distichum - Nyssa biflora - Pinus taeda / Myrica cerifera / Osmunda regalis var. spectabilis* Tidally Flooded Forest (Fleming and Moorhead 1998)
References: Bowman 1999, Fleming 1998, Fleming and Moorhead 1998, Fleming et al. 2001
Authors: SCS **Confidence:** 2 **Identifier:** CEGL004651

II. WOODLAND

II.A.4.N.a. Rounded-crowned temperate or subpolar needle-leaved evergreen woodland

II.A.4.N.a.26. PINUS RIGIDA WOODLAND ALLIANCE
Pitch Pine Woodland Alliance

PINUS RIGIDA / HUDSONIA TOMENTOSA WOODLAND
Pitch Pine / Woolly Beach-heather Woodland
Pitch Pine Dune Woodland **G2 (98-12-08)**
Ecological Group (SCS;MCS): North Atlantic Coastal Plain Upland Pitch Pine Barrens (305-30; n/a)

Concept: This maritime pitch pine woodland occurs on coastal sand dunes from southern Maine to Cape Henlopen, Delaware. The community occurs on stabilized backdunes influenced by wind and salt spray. Substrate is dry, acidic, nutrient-poor sand. Active sand movement occurs with storm activity, causing the boundaries of the community to migrate over time. There is generally significant cover of bare sand, but where more stabilized, species diversity tends to increase. *Pinus rigida* dominates the canopy. Canopy associates are few but include *Juniperus virginiana*, and occasionally *Sassafras albidum*, with scattered individuals of *Quercus velutina* in the northern part of the range, and *Quercus falcata* and *Pinus virginiana* to the south. The shrub layer, if present, may include *Hudsonia tomentosa, Morella pensylvanica (= Myrica pensylvanica), Gaylussacia baccata, Gaylussacia frondosa, Vaccinium pallidum*, and occasionally *Hudsonia ericoides, Viburnum nudum var. cassinoides (= Viburnum cassinoides),* or *Alnus incana* in the far north. Vines may be present but scarce and include *Smilax rotundifolia, Smilax glauca, Parthenocissus quinquefolia*, and *Toxicodendron radicans*. The herbaceous layer is sparse but can include *Aralia nudicaulis, Dichanthelium ovale var. addisonii, Solidago odora, Chimaphila maculata, Lechea maritima, Pteridium aquilinum*, and *Trientalis borealis, Maianthemum canadense, Deschampsia caespitosa, Carex lucorum*, and *Arctostaphylos uva-ursi* in the north. Lichens are common, especially *Cladonia* spp., *Cladina* sp., and *Lepraria* sp.
Comments: Floristically this community is similar in composition to maritime shrub forests which lack a tree canopy. Occurrences are patchy within its distributional range and are part of a coastal zone mosaic of communities.
Range: This association occurs along the north Atlantic coast from southern Maine to Cape Henlopen, Delaware.
States/Provinces: DE:S1, MA:S1, ME:S1, NJ:S1?, NY:S3, RI:S?
TNC Ecoregions: 58:C, 62:C
USFS Ecoregions: 212Db:CCC, 221Ab:CCC, 221Ac:CCC, 221Ak:CCC, 232Aa:CCC, 232Ab:CCC, 232Ac:CC?
Federal Lands:
Synonymy: Pine forest (McDonnell 1979), Pine forest (Johnson 1985b), Pitch pine dune semiforest community (MENHP 1991), Coastal dune woodland (Breden 1989). in part, Maritime forest, dune subtype (Rawinski 1984)
References: Art 1976, Bowman 2000, Breden 1989, Breden et al. 2001, DENHP 1998, Edinger et al. 2002, Gawler 2001, Gawler 2002, Godfrey et al. 1978, Johnson 1985b, MENHP 1991, Martin 1959b, McDonnell 1979, Nelson and Fink 1980, RINHP n.d., Rawinski 1984, Reschke 1990, Swain and Kearsley 2001, Trudeau et al. 1977
Authors: M. Anderson, mod. S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006117

II.A.4.N.a.28. PINUS TAEDA WOODLAND ALLIANCE
Loblolly Pine Woodland Alliance

PINUS TAEDA / HUDSONIA TOMENTOSA WOODLAND
Loblolly Pine / Woolly Beach-heather Woodland
Loblolly Pine Dune Woodland **G1G2 (98-12-02)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Maritime Stable Dune Forests and Woodlands (240-50; n/a)

Concept: This maritime woodland occurs on sand dunes of barrier islands in Delaware, Maryland, and Virginia. Soils in this community are sandy and rapidly drained. This community often occurs directly adjacent to actively shifting foredunes and is exposed to salt spray, winds, and storms. The community also occurs on unstable sands of protected backdunes. In the denser woodlands, more pine duff accumulates, and herb diversity and cover are generally higher. Where woodlands are more open and trees sparse, growing conditions are harsh, less duff accumulates, and vast areas of exposed white sand are characteristic. Trees are generally characterized by low spreading branches and multiple trunks. A shrub layer is lacking; herbaceous cover is usually low. *Pinus taeda* dominates the canopy, but hardwoods such as *Quercus falcata, Quercus phellos*, and *Ilex opaca*

are frequent. Younger, smaller pines make up a sparse subcanopy. Tall shrubs are also sparse, although an occasional *Morella cerifera (= Myrica cerifera), Pinus taeda* sapling, or *Vaccinium corymbosum* can be found. Sparse low shrubs of *Hudsonia tomentosa* are more common. *Smilax glauca, Smilax rotundifolia*, and *Toxicodendron radicans* are typical vines. Herbs are sparse, yet much varied. *Andropogon virginicus* is commonly present. The typical pattern of herb distribution is on dry open sand, in direct sunlight. Here, small patches of *Dichanthelium acuminatum, Dichanthelium scoparium, Andropogon virginicus, Eupatorium rotundifolium, Erigeron* sp., *Euthamia caroliniana (= Euthamia tenuifolia), Solidago sempervirens, Aristida tuberculosa, Polygonella articulata*, and *Pseudognaphalium obtusifolium (= Gnaphalium obtusifolium)* are typically mixed with scattered *Hudsonia tomentosa* and *Smilax rotundifolia*. This community ranges from Delaware south along the coast to Virginia.
Comments: This community gained greater extent in some areas of Virginia and North Carolina barrier beaches following logging (Schafale and Weakley 1990, Higgins et al. 1971, Bratton and Davison 1987).
Range: This maritime woodland occurs on sand dunes of barrier islands in Delaware, Maryland, and Virginia.
States/Provinces: DE:S1?, MD:S?, VA:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232Ac:CCP, 232Bt:CCC, 232Bz:CCC, 232Ch:CCC
Federal Lands: NPS (Assateague Island)
Synonymy: Pine woodland (Higgins et al. 1971) B. Assateague Island., Woodland community (Hill 1986) B. Assateague Island.
References: Berdine 1998, Bowman 2000, Bratton and Davison 1987, Clampitt 1991, Fleming et al. 2001, Higgins et al. 1971, Hill 1986, Klotz 1986, Schafale and Weakley 1990, TNC 1995c
Authors: A. Berdine, ECS **Confidence:** 1 **Identifier:** CEGL006052

II.A.4.N.b. Conical-crowned temperate or subpolar needle-leaved evergreen woodland

II.A.4.N.b.2. JUNIPERUS VIRGINIANA WOODLAND ALLIANCE

Eastern Red-cedar Woodland Alliance

JUNIPERUS VIRGINIANA VAR. VIRGINIANA / MORELLA PENSYLVANICA WOODLAND
Eastern Red-cedar / Northern Bayberry Woodland
Maritime Red-cedar Woodland **G2 (97-11-18)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Maritime Stable Dune Forests and Woodlands (240-50; n/a)

Concept: This maritime woodland community dominated by *Juniperus virginiana* occurs on sand dunes, upper edges of salt marshes, and less commonly on rocky headlands of the northern and mid-Atlantic coast. The physiognomy of this association is variable, ranging from dense tall-shrub thickets to open woodlands; trees are generally shorter than 4 m. Canopy trees are stunted and salt-pruned. *Juniperus virginiana* may form pure stands, but more often grows in association with *Pinus rigida, Quercus stellata, Prunus serotina, Amelanchier canadensis, Ilex opaca*, or *Quercus velutina*, which tend to have low percent cover. In the southern portion of the range *Pinus taeda, Quercus falcata, Diospyros virginiana*, and *Quercus phellos* can be infrequent canopy associates. A shrub layer may be well-developed where the canopy is more open and include *Morella pensylvanica (= Myrica pensylvanica), Morella cerifera (= Myrica cerifera)* (at the southern end of the range), *Juniperus communis, Baccharis halimifolia, Iva frutescens*, or *Vaccinium corymbosum*. Vines can be dense in the shrub layer and extend into the canopy; species include *Toxicodendron radicans, Smilax rotundifolia, Smilax glauca*, and *Parthenocissus quinquefolia*. Herbs are usually patchily distributed in openings and include many species from the surrounding dune associations among others. They include *Opuntia humifusa, Dichanthelium ovale, Schizachyrium scoparium, Deschampsia flexuosa, Cyperus grayi, Polygonella articulata, Hieracium gronovii, Panicum amarum var. amarulum, Solidago sempervirens, Panicum virgatum, Spartina patens*, and *Lechea intermedia*.
Comments:
Range: This association occurs along the North Atlantic coast from Delaware to Massachusetts.
States/Provinces: DE:S1, MA:S1, MD:S?, NJ:S1, NY:S1, VA:S?
TNC Ecoregions: 58:C, 62:C
USFS Ecoregions: 221Aa:CC?, 221Ab:CCC, 232Aa:CCC, 232Ab:CC?, 232Ac:CCC, 232Bz:CCC
Federal Lands:

Synonymy: Coastal dune woodland (Breden 1989), High red cedar thicket, Red cedar woodland, Red cedar-pine woodland (Martin 1959b), Red Cedar Maritime Forest (Greller 1977), Maritime Forest on Dunes: Maritime Red Cedar Forest/Woodland Variant (Lundgren 2000), SNE Maritime Forest on Dunes/Maritime Juniper Forest (Rawinski 1984)
References: Bowman 2000, Breden 1989, Breden et al. 2001, Clancy 1996, Edinger et al. 2002, Fleming et al. 2001, Greller 1977, Lundgren 2000, Martin 1959b, Rawinski 1984, Reschke 1990, Swain and Kearsley 2001
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006212

II.A.4.N.e. Seasonally flooded temperate or subpolar needle-leaved evergreen woodland

II.A.4.N.e.3. CHAMAECYPARIS THYOIDES SEASONALLY FLOODED WOODLAND ALLIANCE

Atlantic White-cedar Seasonally Flooded Woodland Alliance

CHAMAECYPARIS THYOIDES / ALNUS MARITIMA WOODLAND
Atlantic White-cedar / Seaside Alder Woodland
Atlantic White Cedar / Seaside Alder Swamp **G? (00-04-17)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Peatland Atlantic White-cedar Forests (370-20; n/a)

Concept: 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. The tree canopy is characterized by low-stature *Chamaecyparis thyoides* in association with *Pinus taeda*. Other woody associates include *Alnus maritima, Morella cerifera (= Myrica cerifera), Ilex glabra*, and *Clethra alnifolia*. The herbaceous layer is comprised of *Decodon verticillatus, Peltandra virginica, Nymphaea odorata, Carex exilis, Dichanthelium dichotomum, Oxypolis rigidior, Triadenum virginicum, Dulichium arundinaceum, Glyceria obtusa, Rhynchospora alba, Carex atlantica, Selaginella apoda, Drosera rotundifolia, Juncus militaris, Vaccinium macrocarpon, Calopogon tuberosus,* and *Eriocaulon decangulare*. Floating mats within mill ponds have a unique species assemblage including *Xyris difformis, Fuirena* spp., *Hypericum mutilum, Juncus pelocarpus, Juncus canadensis, Fimbristylis* sp., and *Rhynchospora macrostachya*.
Comments:
Range: This swamp type occurs along streams of the Delmarva peninsula.
States/Provinces: DE:S?, MD:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232Bt:CCC, 232Bx:CCC, 232Bz:CCC
Federal Lands:
Synonymy:
References:
Authors: ECS **Confidence:** 3 **Identifier:** CEGL006307

II.B.2.N.c. Seasonally flooded cold-deciduous woodland

II.B.2.N.c.3. SALIX NIGRA SEASONALLY FLOODED WOODLAND ALLIANCE

Black Willow Seasonally Flooded Woodland Alliance

SALIX NIGRA SEASONALLY FLOODED WOODLAND
Black Willow Seasonally Flooded Woodland
Late-Successional Willow Interdunal Swale **G2G3 (02-04-09)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Wooded Interdune Swales and Backdunes (240-40; n/a)

Concept: This association comprises a late-successional stage of interdunal swale wetland vegetation occurring on larger barrier island systems along the Atlantic Coast of Virginia and possibly North Carolina. Interdunal swale wetlands form when the freshwater aquifer intersects the dune surface and substrate is saturated for durations of time that are long enough to

support peat development and accumulation. Substrate is peat over sand. This later successional phase results when the length of soil saturation is shorter, favoring the invasion of woody species. This phase is dominated by *Salix nigra*, growing in association with *Acer rubrum* in a short-statured canopy. The shrub layer is characterized by *Morella cerifera (= Myrica cerifera)*, and can be well-developed or sparse depending on the degree of peat development and variability in microtopography. The herb layer is characterized by *Hydrocotyle umbellata, Polygonum punctatum*, and *Bidens laevis*. Other herbaceous associates include *Thelypteris palustris var. pubescens, Boehmeria cylindrica, Triadenum virginicum, Peltandra virginica, Leersia oryzoides*, and others. Changes in the duration of soil saturation can invoke successional shifts in vegetation; decreased duration of soil saturation tends to maintain woody vegetation, whereas increased duration reverses succession and favors emergent herbaceous vegetation.
Comments:
Range: This association is currently described from the mid-Atlantic Coast, although its full geographic extent is not currently known.
States/Provinces: NC?, VA:S?
TNC Ecoregions: 57:C, 58:C
USFS Ecoregions: 232Bz:CCC
Federal Lands: USFWS (Chincoteague)
Synonymy:
References: Fleming et al. 2001, Fleming pers. comm., Rheinhardt and Brinson 1997, Rheinhardt and Faser 2001, TNC 1997a
Authors: S.L. Neid, ECS **Confidence:** 3 **Identifier:** CEGL006348

II.B.2.N.f. Tidal cold-deciduous woodland

II.B.2.N.f.1. ACER RUBRUM - FRAXINUS PENNSYLVANICA TIDAL WOODLAND ALLIANCE

Red Maple - Green Ash Tidal Woodland Alliance

FRAXINUS (PROFUNDA, PENNSYLVANICA) - (NYSSA BIFLORA) / POLYGONUM ARIFOLIUM WOODLAND

(Pumpkin Ash, Green Ash) - (Swamp Blackgum) / Halberd-leaf Tearthumb Woodland
Ash – Swamp Blackgum Freshwater Tidal Swamp **G3 (98-12-03)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Tidal Hardwood Swamp Forests (202-90; n/a)

Concept: This open- to closed-canopy swamp occurs on fresh tidal rivers from Delaware to Virginia and is best developed on the Chesapeake Bay drainage. It occurs at the upper reaches of tidal influence (and somewhat beyond in some cases) and generally receives diurnal or irregular tidal flooding. The canopy is dominated by few tree species, generally *Fraxinus profunda, Fraxinus pennsylvanica*, and *Nyssa biflora*. Other canopy associates vary among occurrences and often include *Nyssa sylvatica, Acer rubrum, Liquidambar styraciflua, Magnolia virginiana, Fraxinus profunda, Ulmus americana*, and *Pinus taeda*. The shrub layer is well-developed and includes *Lindera benzoin, Clethra alnifolia, Leucothoe racemosa, Ilex verticillata, Ilex opaca, Ilex laevigata, Alnus serrulata, Rhododendron viscosum, Viburnum dentatum, Viburnum nudum, Morella cerifera, Vaccinium corymbosum, Vaccinium fuscatum, Itea virginica, Rosa palustris*, and *Cornus foemina*. *Alnus maritima* is also characteristic in Delaware and Maryland. Vines may be dense and include *Smilax rotundifolia, Toxicodendron radicans, Apios americana, Parthenocissus quinquefolia, Bignonia capreolata*, and *Dioscorea villosa*. The herbaceous layer is variable in composition and richness. Common associates include *Polygonum arifolium, Polygonum sagittatum, Peltandra virginica, Saururus cernuus, Carex bromoides, Impatiens capensis, Boehmeria cylindrica, Carex intumescens, Leersia oryzoides, Commelina virginica, Cicuta maculata, Arisaema triphyllum, Thalictrum pubescens, Thelypteris palustris, Woodwardia areolata, Carex stricta, Zizania aquatica, Cinna arundinacea, Osmunda cinnamomea*, and *Osmunda regalis*. The invasive exotic *Murdannia keisak* can also occur in this association. This association is differentiated from tidal swamps to the north by the presence of species of southern affinity, including *Magnolia virginiana, Nyssa biflora*, and *Pinus taeda*.
Comments: *Acer rubrum - Fraxinus pennsylvanica / Polygonum* spp. Woodland (CEGL006165) is the northern analog of this association. This association is differentiated from tidal swamps to the north by the presence of species of southern affinity, including *Magnolia virginiana, Nyssa biflora*, and *Pinus taeda*.
Range: This association is restricted to tidal rivers in Delaware, Maryland, and Virginia.
States/Provinces: DE:S3S4, MD:S?, VA:S?
TNC Ecoregions: 57:P, 58:C
USFS Ecoregions: 232A:C?, 232Br:CCC, 232Bt:CCC, 232Bx:CCC, 232Ch:CCC

Federal Lands:
Synonymy: Ash-blackgum swamp (Rheinhardt 1992) F, Maple-sweetgum swamp (Rheinhardt 1992) F
References: Berdine 1998, Bowman 2000, Fleming 2001, Fleming et al. 2001, Rheinhardt 1991, Rheinhardt 1992, Tiner 1985a
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006287

III. SHRUBLAND

III.A.2.N.i. Saturated temperate broad-leaved evergreen shrubland

III.A.2.N.i.100. MORELLA CERIFERA SATURATED SHRUBLAND ALLIANCE
Wax-myrtle Saturated Shrubland Alliance

MORELLA CERIFERA - BACCHARIS HALIMIFOLIA / SPARTINA PATENS SHRUBLAND
Wax-myrtle - Groundsel-tree / Saltmeadow Cordgrass Shrubland
Maritime Wax-myrtle Shrubland **G3G5 (95-11-14)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Maritime Shrublands (240-30; n/a)

Concept: This mesic shrub community occurs on sheltered maritime backdunes of the mid-Atlantic states. The vegetation is not tidally flooded, although it is impacted by salt spray. The substrate is sand or loamy sand with little or no organic layer. The water table is often less than half a meter below the surface. This community is characterized by a moderately open canopy of *Morella cerifera (= Myrica cerifera), Baccharis halimifolia, Morella pensylvanica (= Myrica pensylvanica),* and *Rhus copallinum*. *Spartina patens* and *Toxicodendron radicans* are characteristic of the herbaceous layer, with other associates include *Panicum virgatum, Andropogon virginicus, Juncus dichotomus, Solidago sempervirens, Smilax* spp., *Parthenocissus quinquefolia, Vitis* spp., and *Schoenoplectus pungens (= Scirpus pungens).*
Comments: This association is differentiated from *Morella cerifera / Hydrocotyle verticillata* Shrubland (CEGL003840) by the absence of certain wetland species and muck soils, and from *Morella cerifera - Vaccinium corymbosum* Shrubland (CEGL003906) by the absence of bog species. This association can grade into maritime forest types.
Range: This type occurs from New Jersey to Virginia and possibly farther south to South Carolina.
States/Provinces: DE:S4?, MD:S?, NC?, NJ:S?, SC?, VA?
TNC Ecoregions: 57:P, 58:C, 62:C
USFS Ecoregions: 232Ab:CPP, 232Bz:CCC, 232Ch:CCP, 232Ci:CCP
Federal Lands: NPS (Assateague Island)
Synonymy: Mesic shrub community (Higgins et al. 1971) B. Assateague Island., Shrub succession community (Hill 1986) B. Assateague Island., Thicket community (Boule 1979) =. Virginia., Upland thicket (Klotz 1986) =. Virginia., Salt grass sea myrtle red cedar savanna (Martin 1959b) ?. New Jersey., Salt grass sea myrtle savanna (Martin 1959b) ?. New Jersey.
References: Berdine 1998, Boule 1979, Bowman 2000, Breden et al. 2001, Fleming 2001, Higgins et al. 1971, Hill 1986, Klotz 1986, Martin 1959b, Schafale and Weakley 1990
Authors: ECS **Confidence:** 3 **Identifier:** CEGL003809

MORELLA CERIFERA / HYDROCOTYLE VERTICILLATA SHRUBLAND
Wax-myrtle / Whorled Pennywort Shrubland
Wax-Myrtle Shrub Swamp **G? (97-12-01)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Maritime Shrublands (240-30; n/a)

Concept: This tall wet shrubland of sheltered maritime backdunes is restricted to the mid-Atlantic states. Although the hydrologic regime of this shrubland is somewhat variable, it is influenced by a shallow water table and surface water may be present in pools. A shallow to moderately deep layer of muck usually characterizes the soil profile. This community can form dense wet thickets, particularly in more protected areas. The vegetation is strongly dominated by tall, tree-like shrub growth of *Morella cerifera (= Myrica cerifera),* with associates including *Baccharis halimifolia, Rosa palustris,* and *Acer rubrum* saplings occurring at very low cover. Shrubs may reach heights of 6 m and appear tree-like in their growth form. Herbaceous vegetation can be quite lush and diverse. Common herbs include *Hydrocotyle verticillata, Hydrocotyle umbellata, Chasmanthium laxum, Woodwardia areolata, Osmunda regalis var. spectabilis, Carex longii, Leersia virginica, Polygonum pensylvanicum, Boehmeria cylindrica, Calystegia sepium, Ludwigia palustris, Juncus canadensis, Ptilimnium capillaceum,*

Lycopus americanus, Galium obtusum, Samolus valerandi ssp. parviflorus (= Samolus parviflorus), Pluchea odorata, Mikania scandens, and *Polygonum pensylvanicum. Toxicodendron radicans* can be very common and constitutes a large portion of the 'understory' cover. This community can be prone to invasion by *Phragmites australis.*
Comments: The classification of maritime shrublands dominated by *Morella cerifera* is murky and requires further data for clarification.
Range: Currently described from Maryland and Virginia.
States/Provinces: MD:S?, VA:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232A:CP, 232Bz:CCC, 232C:CC
Federal Lands: NPS (Assateague Island); USFWS (Chincoteague)
Synonymy: Mesic shrub zone (Higgins et al. 1971) B. Assateague Island., Shrub succession community (Hill 1986) B. Assateague Island., Thicket community (Boule 1979) B. Virginia., Swamp thicket (Klotz 1986) B. Virginia.
References: Berdine 1998, Boule 1979, Fleming 2001, Fleming et al. 2001, Higgins et al. 1971, Hill 1986, Klotz 1986
Authors: S.L. Neid, ECS **Confidence:** 3 **Identifier:** CEGL003840

III.A.2.N.l.1. MORELLA CERIFERA - ROSA PALUSTRIS TIDAL SHRUBLAND ALLIANCE

Wax-myrtle - Swamp Rose Tidal Shrubland Alliance

MORELLA CERIFERA - ROSA PALUSTRIS / THELYPTERIS PALUSTRIS VAR. PUBESCENS SHRUBLAND

Wax-myrtle - Swamp Rose / Marsh Fern Shrubland
Wind Tidal Wax-myrtle - Willow Thicket **G2G3 (97-06-23)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Tidal Shrublands (202-20; n/a)

Concept: This shrub community occurs in ecotonal sites between tidal marshes and tidal swamps in fresh to oligohaline portions of coastal rivers and embayments. It occupies soupy peats. It is a natural community, but likely has a long-term and complicated successional relationship with other (primarily marsh communities) in the landscape in which it occurs, related to hydrology and fire. *Morella cerifera (= Myrica cerifera var. cerifera)* is the characteristic dominant species (with 25-75% cover), with *Rosa palustris, Salix caroliniana,* and *Toxicodendron radicans ssp. radicans* as characteristic and constant companion species. Other woody species include *Persea palustris, Magnolia virginiana, Salix caroliniana, Vaccinium formosum, Smilax walteri,* and saplings of *Acer rubrum, Pinus taeda, Taxodium distichum,* and *Liquidambar styraciflua*. Herbaceous composition is diverse and varied, with many species 'recruited' from adjacent marshes and swamps. *Thelypteris palustris var. pubescens* is highly characteristic and appears to reach its nodal distribution in this landscape in this community. Other important species can include *Juncus roemerianus, Cladium mariscus ssp. jamaicense,* and *Decodon verticillatus*. *Murdannia keisak* is an aggressive alien weed.
States/Provinces: NC:S?, VA:S?
TNC Ecoregions: 57:C, 58:C
USFS Ecoregions: 232Bx:CCC, 232Bt:CCC, 232Bz:CCC, 232Ch:CCC, 232Ci:CCC
Synonymy: *Myrica cerifera - Salix caroliniana / Thelypteris palustris ssp. pubescens* Tidally Flooded Shrubland (Fleming 1998)
References: Fleming 1998, Fleming et al. 2001, Harrison 2003
Authors: SCS **Confidence:** 2 **Identifier:** CEGL004656

MORELLA CERIFERA – BACCHARIS HALIMIFOLIA / ELEOCHARIS FALLAX SHRUBLAND

Wax-myrtle – Groundsel Tree / Creeping Spikerush Shrubland
Brackish Tidal Creek Shrubland **G? (03-07-22)**
Ecological Group

Concept: This oligohaline tidal shrubland of brackish tidal waters in Maryland on firm, partially decomposed peat lacking pronounced hummock-hollow microtopography. This vegetation forms linear stands along tidal channels between freshwater tidal marshes and adjacent swamp forests. The shrub canopy is relatively open to moderately dense, and is dominated by *Morella cerifera*. *Baccharis halimifolia* is a common associate; others include *Acer rubrum,* and *Toxicodendron radicans.* The herbaceous layer is relatively diverse and characterized by *Eleocharis fallax, Kosteletskya virginica, Hibiscus moscheutos, Typha angustifolia, Polygonum punctatum, Cyperus filicinus, Panicum virgatum, Schoenoplectus americanus, Amaranthus cannabinus, Hydrocotyle verticillata, Pluchea purpurascens, Spartina alterniflora, Lythrum lineare, Asclepias incarnata, Ptilimnium capillaceum,* and *Carex hormathodes.*

Comments:
Range: This vegetation occurs on tidal rivers of the central Atlantic coast.
States / Provinces: MD:S?, DE:SP, VA:SP
TNC Ecoregions: 58:C
USFS Ecoregions: 232Bx:CCC
Federal Lands:
Synonymy:
References: Harrison 2003
Authors: J. Harrison / L. Sneddon **Confidence:** 2 **Identifier:**CEGL006846

III.B.2.N.a. Temperate cold-deciduous shrubland

III.B.2.N.a.9. MORELLA PENSYLVANICA - (PRUNUS MARITIMA) SHRUBLAND ALLIANCE

Northern Bayberry - (Beach Plum) Shrubland Alliance

MORELLA PENSYLVANICA / DIODIA TERES SHRUBLAND

Northern Bayberry / Rough Buttonweed Shrubland
Chesapeake Bay Maritime Shrubland **G2 (99-01-28)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Maritime Shrublands (240-30; n/a)

Concept: This community is a maritime shrubland dominated by *Morella pensylvanica (= Myrica pensylvanica)*, occurring with *Baccharis halimifolia, Rhus copallinum*, and stunted individuals of *Pinus taeda, Prunus serotina, Quercus virginiana*, and *Diospyros virginiana*. The constant movement of sand in this community limits the herbaceous cover. Typical herbaceous species include *Ammophila breviligulata, Panicum amarum var. amarulum, Cyperus grayi, Lechea maritima, Dichanthelium acuminatum, Spartina patens, Triplasis purpurea, Cenchrus tribuloides, Chamaesyce polygonifolia, Diodia teres, Hudsonia tomentosa, Oenothera humifusa, Parthenocissus quinquefolia, Rumex acetosella, Solidago sempervirens*, and *Toxicodendron radicans*. This maritime shrubland usually occupies the intermediate areas between the very unstable oceanward portions of the dunes and the more protected backdunes, where it forms partially open to dense shrub thickets. The substrate is sand with no soil profile development, and with variable amounts of accumulated leaf litter. Where this community occupies the lee side of foredunes, greater exposure to winds and storms contributes to a shorter stature and more open aspect of the vegetation. Here there are large patches of open unvegetated or sparsely vegetated sand. This community occurs from Delaware south to northern North Carolina.
Comments: This community is a maritime shrubland dominated by *Morella pensylvanica*. It supports the following species characteristic of the *Morella pensylvanica - (Prunus maritima)* Shrubland Alliance (A.902), including *Solidago sempervirens, Oenothera humifusa, Cyperus grayi, Ammophila breviligulata, Chamaesyce polygonifolia, Rhus copallinum*, and from Maryland and north, *Prunus maritima*. This association is further characterized by species that differentiate it from other communities in the alliance, most notably *Morella cerifera (= Myrica cerifera), Panicum amarum, Spartina patens, Baccharis halimifolia*, and stunted individuals of *Pinus taeda*. *Morella pensylvanica - Prunus maritima* Shrubland (CEGL006295) is the northern analog of this association.
Range: This association is restricted to backdunes of shorelines from Delaware to Nag's Head, North Carolina.
States/Provinces: DE:S?, MD:S?, NC:S3, VA:S?
TNC Ecoregions: 57:C, 58:C, 62:C
USFS Ecoregions: 232Ab:CPP, 232Ac:CPP, 232Bz:CCC, 232Ch:CCP, 232Ci:CCC
Federal Lands: NPS (Assateague Island)
Synonymy: *Prunus maritima, Myrica pensylvanica* coastal dune scrub association (Clancy 1993a) =. Delaware., Dunegrass-shrub transition zone (Higgins et al. 1971) =. Assateague Island., Shrub succession community (Hill 1986) B. Assateague Island., Upland (dune) thicket (Klotz 1986) B. Virginia.
References: Berdine 1998, Bowman 2000, Clancy 1993a, Fleming 2001, Fleming et al. 2001, Higgins et al. 1971, Hill 1986, Klotz 1986, Schafale and Weakley 1990, Sneddon et al. 1996
Authors: L.A. Sneddon, ECS **Confidence:** 2 **Identifier:** CEGL003881

III.B.2.N.a.300. PRUNUS SEROTINA - AMELANCHIER CANADENSIS - QUERCUS SPP. SHRUBLAND ALLIANCE

Black Cherry - Canada Serviceberry - Oak species Shrubland Alliance

PRUNUS SEROTINA / MORELLA CERIFERA / SMILAX ROTUNDIFOLIA SHRUBLAND
Black Cherry / Wax-myrtle / Common Greenbrier Shrubland
Chesapeake Bay Deciduous Maritime Shrub Forest **G1G2 (97-11-18)**
Ecological Group (SCS;MCS): Atlantic Zone Tidal Aquatic Vegetation (201-10; n/a)
Atlantic and Gulf Coast Maritime Shrublands (240-30; n/a)

Concept: This association comprises tall, temperate, deciduous maritime shrublands of the mid-Atlantic coast. It generally occurs on the lee side of sand dunes along the coast and is subject to salt spray and winds. The substrate varies from pure sand directly adjacent to the ocean to loamy sands in more sheltered areas of the coast. Although placed within the shrubland class, the physiognomy of this vegetation can be variable and ranges from open woodland to stunted forest to dense nearly impenetrable thicket (this association was previously placed in the forest class). Individual trees tend to be wind-pruned and multi-stemmed. The vegetation is dominated by *Prunus serotina, Amelanchier canadensis, Pinus taeda, Sassafras albidum, Photinia pyrifolia (= Aronia arbutifolia),* and *Diospyros virginiana* in varying proportions. *Morella cerifera (= Myrica cerifera)* and *Vaccinium corymbosum* may form a subcanopy, but if the community is particularly stunted, this species may contribute substantially to the canopy. Lianas are abundant in the canopy or over the ground layer, and species include *Smilax rotundifolia, Smilax glauca, Parthenocissus quinquefolia,* and *Toxicodendron radicans.* Herbs are generally scarce to lacking entirely, and when present are generally made up of tree and vine seedlings.
Comments: This community is similar to the *Prunus serotina - Sassafras albidum - Amelanchier canadensis / Smilax rotundifolia* Shrubland (CEGL006145) of the same alliance (Sneddon et al. 1994), which ranges from southern New Hampshire to New Jersey but is differentiated from this community by the presence of *Pinus taeda* and *Morella cerifera*.
Range: This association occurs along the mid-Atlantic coast from Virginia north to Cape May, New Jersey.
States/Provinces: DE:S?, MD:S?, NJ:S1, VA:S?
TNC Ecoregions: 58:C, 62:C
USFS Ecoregions: 232Ab:CCP, 232Bz:CCC, 232Ch:CCC
Federal Lands: NPS (Assateague Island)
Synonymy: Woodland community (Hill 1986) B. Assateague Island., Mixed woodland (Higgins et al. 1971) B. Assateague Island., Upland forest (Klotz 1986) I, Woodland (Boule 1979) =. Virginia., Oligotrophic woodland (Rawinski 1992) B, Dune woodland/dune shrubland (Breden 1989) B
References: Bellis 1992, Berdine 1998, Boule 1979, Bowman 2000, Breden 1989, Breden et al. 2001, Dunlop and Crow 1985, Fleming et al. 2001, Higgins et al. 1971, Hill 1986, Klotz 1986, Rawinski 1992, Sneddon et al. 1994, Stalter 1979
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006319

III.B.2.N.a.16. SMILAX SPP. - TOXICODENDRON RADICANS VINE-SHRUBLAND ALLIANCE

Greenbrier species - Poison-ivy Vine-Shrubland Alliance

SMILAX GLAUCA - TOXICODENDRON RADICANS VINE-SHRUBLAND
Whiteleaf Greenbrier - Poison-ivy Vine-Shrubland
North Atlantic Coastal Plain Vine Dune **G? (97-12-01)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Maritime Shrublands (240-30; n/a)

Concept: This community is best described as vine-covered maritime sand dunes. Generally confined to barrier beach systems of the North Atlantic, this vegetation is comprised of dense vines that cover the crests of dunes exposed to wind, salt spray and periodic overwash by storm tides. Very little soil development occurs, and the water table is well below 1 m in depth. The dominant species of any single dune may be one of several vine species such as *Smilax glauca, Smilax rotundifolia, Vitis rotundifolia, Parthenocissus quinquefolia,* or *Toxicodendron radicans.* In some cases, the vines are shallowly rooted in sand or growing over older vine stems or other living or dead shrubs such as *Morella pensylvanica (= Myrica pensylvanica).* Scattered dune grassland species may be present like *Ammophila breviligulata, Lechea maritima, Solidago sempervirens,* and *Hudsonia tomentosa*. Diagnostic species are *Smilax glauca, Smilax rotundifolia, Toxicodendron radicans,* and *Parthenocissus quinquefolia*. The vegetation is generally low to the ground (less than half a meter tall) and

generally covers 70-80% of the surface of the ground, the remainder being exposed sand. This vegetation is not widely described in the literature, but is likely to occur in New England south to Maryland and perhaps Virginia.
Comments:
Range: This type is likely to occur in New England south to Maryland and perhaps Virginia.
States/Provinces: DE:S?, MA:S2,S2,S3, MD:S?, NJ:S?, NY:S3, VA?
TNC Ecoregions: 58:C, 62:C
USFS Ecoregions: 221A:CC, 232Aa:CCC, 232Ab:CCC, 232Ac:CCC, 232Bt:CCP, 232Bz:CCC
Federal Lands: NPS (Assateague Island, Fire Island)
Synonymy: Greenbrier thicket (Martin 1959b). New Jersey., Coastal dune community (Rawinski 1984), SNE coastal rocky headland community (Rawinski 1984)
References: Berdine 1998, Bowman 2000, Edinger et al. 2002, Martin 1959b, Rawinski 1984, Reschke 1990, Sneddon and Lundgren 2001, Swain and Kearsley 2001
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL003886

III.B.2.N.d. Temporarily flooded cold-deciduous shrubland

III.B.2.N.d.2. ALNUS SERRULATA TEMPORARILY FLOODED SHRUBLAND ALLIANCE

Smooth Alder Temporarily Flooded Shrubland Alliance

CORNUS AMOMUM - ALNUS SERRULATA SHRUBLAND

Silky Dogwood - Smooth Alder Shrubland
Alluvial Alder Swamp **G? (00-10-10)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Floodplain Shrublands (385-25; 1.6.4.5)

Concept: This Coastal Plain alluvial shrubland occurs in the Chesapeake Bay Lowlands on the non-tidal portions of rivers and non-tidal bay mouths. The shrub canopy is characterized by *Cornus amomum* with other associates including *Alnus serrulata*, *Cephalanthus occidentalis* and *Viburnum* spp., as well as saplings of *Acer rubrum*, *Fraxinus pennsylvanica*, and *Salix nigra*. Herbaceous associates include *Osmunda regalis, Decodon verticillatus*, *Utricularia* spp., *Limnobium spongia*, and *Cicuta bulbifera*.
Comments:
Range: This Coastal Plain alluvial shrubland occurs in the Chesapeake Bay Lowlands.
States/Provinces: DE:S?, MD:S?, VA?
TNC Ecoregions: 58:C
USFS Ecoregions: 232:C
Federal Lands:
Synonymy:
References: Tiner 1985a
Authors: ECS **Confidence:** 3 **Identifier:** CEGL006414

III.B.2.N.e. Seasonally flooded cold-deciduous shrubland

III.B.2.N.e.3. CEPHALANTHUS OCCIDENTALIS SEASONALLY FLOODED SHRUBLAND ALLIANCE

Buttonbush Seasonally Flooded Shrubland Alliance

CEPHALANTHUS OCCIDENTALIS / POLYGONUM HYDROPIPEROIDES - PANICUM VERRUCOSUM SHRUBLAND

Buttonbush / Swamp Smartweed - Warty Panicgrass Shrubland
Buttonbush Coastal Plain Pond **G3? (98-12-14)**
Ecological Group (SCS;MCS): Northern Coastal Plain Shrub Swamps (490-18; n/a)

Concept: pond community is known from the Coastal Plain of Delaware and Maryland (and possibly other states), with disjunct examples in the Great Valley of Virginia. Examples include seasonally flooded shrublands that occur in relatively

small basins that draw down entirely during dry years, exposing some bare substrate by the end of the growing season. The substrate is a shallow organic layer overlying silt loam or clay loam. *Cephalanthus occidentalis* is the dominant shrub, but *Decodon verticillatus* may also be present. Characteristic herbs are *Panicum verrucosum, Dulichium arundinaceum, Polygonum hydropiperoides, Torreyochloa pallida, Rhexia virginica*, and *Panicum hemitomon*. Other associates may include *Bidens frondosa, Scirpus cyperinus, Proserpinaca palustris, Triadenum virginicum, Dichanthelium spretum (= Panicum spretum), Scleria reticularis*, and *Fimbristylis autumnalis*. Species composition of this community tends to be variable among occurrences.

Comments: With a geographic distribution similar to many of the region's unusual plants, Shenandoah Valley stands of this community type appear to be outliers of an association more widespread on the Coastal Plain. Excellent Coastal Plain examples of this community are found at the Grafton Ponds complex in York County (Rawinski 1997). Additional data and analysis are needed to determine whether the regional expressions in Virginia should be considered formal subtypes in the National Vegetation Classification (USNVC).

This vegetation often occurs with other community types in ponds exhibiting distinct hydrologic zonation. In these situations, it often occupies zones intermediate between the semipermanently flooded *Cephalanthus occidentalis / Dulichium arundinaceum* Shrubland (CEGL007854) and the more shortly seasonally flooded *Quercus palustris / Panicum rigidulum var. rigidulum - Panicum verrucosum - Eleocharis acicularis* Herbaceous Vegetation (CEGL007858).

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. There are at least 21 disjunct occurrences of the type documented from natural pond complexes along the western foot of the Blue Ridge in Augusta and Rockingham counties, Virginia.

States/Provinces: DE:S?, MA?, MD:S?, RI?, VA:S?

TNC Ecoregions: 58:C, 59:C, 62:C

USFS Ecoregions: 221:C, 232A:CC, 232B:CC, M221Ab:CCC

Federal Lands: USFS (George Washington)

Synonymy: *Cephalanthus occidentalis / Torreyochloa pallida - Decodon verticillatus* Association (Rawinski 1997), *Cephalanthus occidentalis / Proserpinaca palustris - Polygonum hydropiperoides* community (Fleming and Van Alstine 1999), *Cephalanthus occidentalis / Polygonum hydropiperoides - Glyceria acutiflora - Proserpinaca palustris* Shrubland (Fleming and Coulling 2001) F. VA Srank = S1, *Cephalanthus occidentalis / Polygonum hydropiperoides - Torreyochloa pallida - Panicum verrucosum* Shrubland (Fleming and Coulling 2001) F. VA Srank = S1

References: Berdine and Gould 1999, Bowman 2000, Buhlmann et al. 1999, Fleming and Coulling 2001, Fleming and Van Alstine 1999, Fleming et al. 2001, McAvoy and Clancy 1994, Rawinski 1997, Sneddon 1994, Tyndall et al. 1990

Authors: G. Fleming and P. Coulling, ECS **Confidence:** 2 **Identifier:** CEGL006242

III.B.2.N.e.25. MORELLA (CERIFERA, PENSYLVANICA) - VACCINIUM FORMOSUM SEASONALLY FLOODED SHRUBLAND ALLIANCE

(Wax-myrtle, Northern Bayberry) - Southern Highbush Blueberry Seasonally Flooded Shrubland Alliance

MORELLA CERIFERA - VACCINIUM CORYMBOSUM SHRUBLAND

Wax-myrtle - Highbush Blueberry Shrubland

Barrier Island Bog **G? (97-12-01)**

Ecological Group (SCS;MCS): Atlantic and Gulf Coast Wooded Interdune Swales and Backdunes (240-40; n/a)

Concept: This shrub bog community of Maryland, Delaware, and New Jersey occurs in interdunal depressions of barrier island dunes. This community is a relatively open, short-statured shrub wetland with a thin veneer of peat. The two most characteristic shrubs are *Morella cerifera (= Myrica cerifera)* and *Vaccinium corymbosum*. *Rosa palustris* and *Ilex glabra* also frequently occur. *Panicum virgatum, Andropogon glomeratus*, and other grasses are common. Other herbs include *Juncus canadensis, Juncus scirpoides, Juncus dichotomus, Pluchea foetida, Triadenum virginicum, Drosera intermedia, Lycopodiella appressa, Xyris torta*, and *Osmunda regalis*.

Comments:

Range: This shrub bog community occurs in Maryland, Delaware, and New Jersey.

States/Provinces: DE:S?, MD:S?, NJ:S1S2, VA:S?

TNC Ecoregions: 58:C, 62:C

USFS Ecoregions: 232A:CC, 232Bz:CCC, 232C:C?

Federal Lands: NPS (Assateague Island)

Synonymy: Mesic shrub zone (Higgins et al. 1971) B. Assateague Island., Shrub bog (Hill 1986) =. Assateague Island., Scrub-shrub/mixed herbaceous interdunal wetland association (McAvoy and Clancy 1994) ?, Mesic shrub thicket (Martin 1959b) ?. New Jersey., Dune shrubland (Breden 1989). in part
References: Breden 1989, Breden et al. 2001, Clancy 1993b, Higgins et al. 1971, Hill 1986, Martin 1959b, McAvoy and Clancy 1994, TNC 1995c
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL003906

III.B.2.N.f. Semipermanently flooded cold-deciduous shrubland

III.B.2.N.f.1. CEPHALANTHUS OCCIDENTALIS SEMIPERMANENTLY FLOODED SHRUBLAND ALLIANCE

Buttonbush Semipermanently Flooded Shrubland Alliance

CEPHALANTHUS OCCIDENTALIS / GLYCERIA CANADENSIS SHRUBLAND
Buttonbush / Rattlesnake Mannagrass Shrubland
Buttonbush Shrub Swamp **G? (03-03-25)**

Concept: Buttonbush swamps of the eastern and northeastern United States. These swamps experience prolonged or semipermanent flooding for much of the growing season with water tables receding below the soil surface only during drought or very late in the growing season. They occur in a variety of environmental settings including backwater sloughs or oxbow ponds, wet swales in floodplains, pond and lake borders, and small, isolated depressions where water levels recede very slowly, such as those with perched water tables. *Cephalanthus occidentalis* is dominant and often monotypic. Occasional associates depend on the environmental setting and most often occur in drier areas. They include *Vaccinium corymbosum, Rhododendron viscosum, Acer rubrum, Cornus* spp., closer to upland borders or *Acer saccharinum, Fraxinus pennsylvanica,* or *Viburnum dentatum* where adjacent to floodplains, or *Decodon verticillatus, Chamaedaphne calyculata,* and *Spiraea alba var. latifolia* in more stagnant basins. Herbaceous species tend to be sparse, but can include *Glyceria canadensis, Dulichium arundinaceum, Carex stricta, Scirpus cyperinus, Thelypteris palustris, Alisma plantago-aquatica, Polygonum* spp., *Sparganium* spp. and floating or submerged aquatic species like *Lemna minor, Potamogeton natans,* and *Nuphar lutea ssp. variegata (= Nuphar variegata).* Bryophytes, if present, cling to shrub bases and include *Warnstorfia fluitans (= Drepanocladus fluitans), Drepanocladus aduncus,* or *Sphagnum fallax*.
Comments: This type may be synonymous with *Cephalanthus occidentalis / Carex* spp. Northern Shrubland (CEGL002190), although it occurs south of the glaciation boundary in the east.
Range:
States/Provinces: CT:S?, DE:S?, MA:S5, MD?, ME:S5, NH:S4?,S3, NY:S5, PA:S?, RI:S?, VA:S?, VT:S2, WV?
TNC Ecoregions: 58:?, 59:C, 60:C, 61:C, 62:C, 63:C
USFS Ecoregions: 212D:CP, 212Fa:CCC, 212Fb:CCC, 212Fc:CCC, 212Fd:CCC, 212Ga:CCC, 212Gb:CCC, 221Ae:CCC, 221Af:CCC, 221Ag:CCC, 221Ah:CCC, 221Ai:CCC, 221Al:CCC, 221Ba:CCC, 221Bb:CCC, 221Bc:CCP, 221Bd:CCC, 221D:CC, 221E:CP, 231:C, 232A:CC, 232Bt:CCC, 232C:CC, 234:C, M212A:CP, M212Bb:CCC, M212Bd:CCC, M212Cb:CCC, M212Cc:CCC, M212De:CCC, M212Ea:CCC, M212Eb:CCC, M221Aa:CCC, M221Ab:CCC, M221Ac:CCC, M221Ad:CCC, M221Bb:CCC, M221Bd:CCC, M221Be:CCC, M221Bf:CCP, M221Da:CCC
Federal Lands:
Synonymy: Buttonbush semipermanently flooded shrub swamp (CAP pers. comm. 1998), Buttonbush Swamp (Kettle Basin Shrub Swamp) (Thompson 1996), Palustrine Broad-leaved Deciduous Scrub-Shrub Wetland, Seasonally Flooded (PSS1C)
References: Bowman 2000, CAP pers. comm. 1998, Cowardin et al. 1979, Edinger et al. 2002, Enser 1999, Fike 1999, Fleming et al. 2001, Gawler 2002, Metzler and Barrett 2001, Nichols et al. 2001, Sperduto 2000b, Swain and Kearsley 2001, Thompson 1996, Thompson and Sorensen 2000
Authors: S.L. Neid, ECS **Confidence:** 3 **Identifier:** CEGL006069

III.B.2.N.f.3. DECODON VERTICILLATUS SEMIPERMANENTLY FLOODED SHRUBLAND ALLIANCE

Swamp-loosestrife Semipermanently Flooded Shrubland Alliance

DECODON VERTICILLATUS SEMIPERMANENTLY FLOODED SHRUBLAND
Swamp-loosestrife Semipermanently Flooded Shrubland
Water-willow Shrub Swamp **G? (94-12-15)**
Ecological Group (SCS;MCS): Ecological Group Unassignable (999-00; 9.0.0.9)

Concept: Shrub border that occurs as a fringe along aquatic edges of lakes, streams and bog mats in Lower New England and elsewhere. *Decodon verticillatus* forms a dense, often monotypic, tangle. *Cephalanthus occidentalis* can occur, but with less abundance than *Decodon verticillatus.* Herbaceous species vary widely, but may include *Nuphar lutea ssp. variegata (= Nuphar variegata), Nymphaea odorata, Peltandra virginica, Pontederia cordata, Utricularia* spp., and *Potamogeton* spp. Where this vegetation occurs adjacent to bog mats, *Chamaedaphne calyculata* and *Myrica gale* can begin to occur, as well as *Carex canescens, Lysimachia terrestris,* and *Triadenum virginicum,* plus *Sphagnum recurvum, Sphagnum flexuosum, Sphagnum fimbriatum,* and occasionally *Sphagnum papillosum.*
Comments: This vegetation is often considered a zone within other community types.
Range:
States/Provinces: CT:S?, DE:S?, MA:S5,S3, MD:S?, NH:S3, NY:S5, ON:S?, PA:S?, WV:S?
TNC Ecoregions: 58:?, 61:C, 62:C
USFS Ecoregions: 221Ai:CCC, 221Al:CCC, 232Ac:CCC
Federal Lands:
Synonymy:
References: Bowman 2000, Edinger et al. 2002, Fike 1999, Metzler and Barrett 2001, Swain and Kearsley 2001
Authors: S.L. Neid, ECS **Confidence:** 3 **Identifier:** CEGL005089

III.B.2.N.h. Tidal cold-deciduous shrubland

III.B.2.N.h. AMORPHA FRUTICOSA TIDAL SHRUBLAND ALLIANCE
Tall Indigo Bush Tidal Shrubland Alliance

AMORPHA FRUTICOSA TIDAL SHRUBLAND
Amorpha fruticosa Tidal Shrubland
Amorpha fruticosa Tidal Shrubland **G? (03-07-22)**
Ecological Group

Concept: This freshwater tidal shrubland occurs on tidal rivers bordering the Chesapeake Bay on sandy levees and shorelines above mean high tide. Microtopography is variable, from pronounced hummock-and-hollow to essentially flat. Soils are well-drained sands and gravel to poorly drained peat in lower-lying depressions. The shrub canopy is relatively open and characterized by *Amorpha fruticosa*. Other associates may include *Acer rubrum, Fraxinus pennsylvanica, Decodon verticillata, Ilex verticillata,* and *Rosa palustris*. The herbaceous layer is diverse and comprised of a mixture of *Osmunda regalis, Hibiscus moscheutos, Thelypteris palustris, Boehmeria cylindrica, Leersia oryzoides, Peltandra virginica, Polygonum sagittatum, Sium suave,* and *Typha angustifolia.*
Comments:
Range: This vegetation occurs central Atlantic coast at the headwaters of the Chesapeake Bay.
States / Provinces: MD:S?, DE:SP, VA:SP
TNC Ecoregions: 58:C
USFS Ecoregions: 232Bx:CCC, 232Bz:CCC
Federal Lands:
Synonymy:
References: Harrison 2003
Authors: J. Harrison / L. Sneddon **Confidence:** 2 **Identifier:**CEGL006844

III.B.2.N.h.2. ALNUS (INCANA, SERRULATA) TIDAL SHRUBLAND ALLIANCE
(Speckled Alder, Smooth Alder) Tidal Shrubland Alliance

Concept: Tidal freshwater, or perhaps also oligohaline, shrublands dominated by *Alnus serrulata* and/or *Alnus incana*. In some examples one or both of these may be characteristically dominant or nearly so. Other examples may be more semi-open with a mixed canopy of *Alnus* with other shrubs such as *Cornus amomum, Rosa palustris,* and *Ilex verticillata*. Other woody plants which may be present include *Sambucus canadensis, Salix* spp., *Amorpha fruticosa, Cephalanthus occidentalis,* and *Toxicodendron radicans*. More northern examples may contain *Viburnum recognitum* and *Spiraea alba var. latifolia (= Spiraea latifolia)*. This alliance occurs along tidal freshwater reaches of rivers. One association is recognized along the south Atlantic Coast to South Carolina and possibly elsewhere. This can occur as a fringing shrubland, zonal between *Zizania aquatica* tidal marshes and tidal cypress - gum forests. Less commonly it occupies large patches in freshwater marshes. Other species characteristic of tidal situations often occur, including *Rosa palustris* and *Zizania aquatica*. Another association is recognized in coastal areas with tidally influenced river systems from Maine to Virginia. Flood waters are typically slightly acid (pH less than 5) and soils are usually mineral without significant peat deposits. In these examples, *Carex stricta* may also be present and there is a great deal of micro-relief (tussocks and furrows) leading to high species diversity. Some shrub associates include *Decodon verticillatus* and *Toxicodendron vernix*; some herbaceous associates are *Osmunda regalis, Thelypteris palustris, Galium* spp., *Typha latifolia, Peltandra virginica, Mikania scandens, Symphyotrichum novi-belgii (= Aster novi-belgii), Boehmeria cylindrica, Impatiens capensis, Triadenum walteri, Asclepias incarnata, Carex emoryi, Carex atlantica ssp. atlantica (= Carex incomperta), Eriophorum virginicum, Platanthera clavellata*, and *Xyris torta*.
Comments:
Range: This alliance is found in Georgia, South Carolina, Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Virginia, and possibly Florida (?), North Carolina (?), and others.
States/Provinces: CT DE FL? GA MA MD ME NC? NJ NY PA SC VA?
TNC Ecoregions: 43:P, 56:C, 57:C, 58:C, 61:C, 62:C
USFS Ecoregions: 221Aa:CCP, 221Ab:CCP, 221Ac:CCC, 221Ad:CCC, 221Ae:CCC, 221Ag:CCC, 221Ak:CCC, 221Ba:CCC, 221Bc:CCC, 222:C, 232Aa:CCP, 232Ab:CCC, 232Ac:CCC, 232Ad:CCC, 232Br:CCC, 232Bt:CCC, 232Bx:CCC, 232Bz:CCC, 232Cb:CCC, 232Ce:CCC, 232Ch:CC?, 232Ci:CC?
Federal Lands:
Synonymy: Estuarine Intertidal: Fresh/Brackish Tidal Shrubland (Swain and Kearsley 2001)
References: Sneddon et al. 1996, Swain and Kearsley 2001
Authors: A.S. WEAKLEY, MOD. L.A. S, RW, Southeast **Identifier:** A.1024

ALNUS (INCANA SSP. RUGOSA, SERRULATA) - CORNUS AMOMUM SHRUBLAND

(Speckled Alder, Smooth Alder) - Silky Dogwood Shrubland

North Atlantic Fresh Tidal Shrub Swamp **G? (97-08-15)**

Ecological Group (SCS;MCS): Atlantic Coast River - Tidal Ecotone Shrub Flats (202-60; n/a)

Concept: This type comprises tidal freshwater, or perhaps also oligohaline, shrublands dominated by *Alnus serrulata* and/or *Alnus incana ssp. rugosa*. It is found in coastal areas with tidally influenced river systems in the North Atlantic. Flood waters are typically slightly acid (pH less than 5) and soils are usually mineral without significant peat deposits. In some examples one or both of these may be characteristically dominant or nearly so. Other examples may be more semi-open with a mixed canopy of *Alnus* with other shrubs such as *Cornus amomum, Rosa palustris, Ilex verticillata, Viburnum dentatum, Clethra alnifolia*, and *Lindera benzoin*. Other woody plants which may be present include *Sambucus canadensis, Salix* spp., *Amorpha fruticosa, Cephalanthus occidentalis, Decodon verticillatus, Toxicodendron vernix*, and *Toxicodendron radicans*. More northern examples may contain *Viburnum recognitum* and *Spiraea alba var. latifolia (= Spiraea latifolia)*. Some shrub associates include *Decodon verticillatus* and *Toxicodendron vernix*; some herbaceous associates are *Osmunda regalis var. spectabilis, Thelypteris palustris var. pubescens, Galium* spp., *Onoclea sensibilis, Pilea fontana, Polygonum punctatum, Apios americana, Typha latifolia, Peltandra virginica, Pontederia cordata, Mikania scandens, Symphyotrichum novi-belgii (= Aster novi-belgii), Boehmeria cylindrica, Impatiens capensis, Triadenum walteri, Asclepias incarnata, Carex atlantica (= Carex incomperta), Platanthera clavellata*, and *Xyris torta*. *Carex stricta* may also be present, and there is a great deal of micro-relief (tussocks and furrows) leading to high species diversity.
Comments: This type does not extend into the embayed coastal area of Virginia (G. Fleming pers. comm.) and as currently defined is not believed to be present in the Chesapeake Bay region of either VA or MD (P. Coulling pers. comm.).
Range: This association is found in coastal areas with tidally influenced river systems from Maine to Delaware in the North Atlantic.
States/Provinces: CT:S?, DE:S?, MA:S1, MD:S?, ME:SU, NJ:S?, NY:S1, PA:S?
TNC Ecoregions: 58:?, 61:C, 62:C
USFS Ecoregions: 221Ab:CCP, 221Ac:CCC, 221Ad:CCC, 221Ae:CCC, 221Ag:CCC, 221Ak:CC?, 221Ba:CCC, 221Bc:CCC, 232Ab:CCC, 232Ac:CCC, 232Ad:CCC, 232Br:CCC, 232Bt:CCC, 232Bx:CCC, 232Bz:CCC

Federal Lands:
Synonymy: Freshwater tidal swamp (Breden 1989), Freshwater tidal marsh (Collins and Anderson 1994), Southern New England / Gulf of Maine Fresh/ Brackish Tidal Swamp (Rawinski 1984) B. in part
References: Bowman 2000, Breden 1989, Breden et al. 2001, Collins and Anderson 1994, Coulling pers. comm., Edinger et al. 2002, Enser 1999, Fleming pers. comm., Gawler 2001, Gawler 2002, Hart 1990?, McCoy and Fleming 2000, Metzler and Barrett 2001, Rawinski 1984, Reschke 1990, Sneddon et al. 1996, Sperduto 2000b, Swain and Kearsley 2000, Swain and Kearsley 2001, Tiner 1995
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006337

ALNUS MARITIMA / ACORUS CALAMUS SHRUBLAND

Seaside Alder / Sweetflag Shrubland
Seaside Alder Tidal Shrubland **G? (03-07-22)**
Ecological Group

Concept: This tidal shrubland of the Delmarva peninsula on the central Atlantic coast occurs on freshwater tidal rivers and tributaries. Waters are generally oligohaline, but may receive pulses of higher salinities during spring high tides or low river discharge. The vegetation occurs on the ecotones between freshwater tidal marshes and tidal swamps. Hummocks and hollows are characteristic, and the substrate is poorly drained slightly acidic tidal muck with silts, fine sands and partially decomposed peat admixed. The shrub canopy is well developed, often dense, and dominated by *Alnus maritima*. Associated shrub species are few and at low cover, but may include *Viburnum dentatum*, *Cornus amomum* or *Sambucus canadensis*. Vines may include *Toxicodendron radicans* and *Mikania scandens.* The herbaceous layer is dominated by *Acorus calamus*, with other associates including *Impatiens capensis, Peltandra virginica, Polygonum sagittatum, Leersia oryzoides, Cinna arundinacea, Polygonum arifolium, Boehmeria cylindrica, Thalictrum polygamum*, and *Sambucus canadensis*.
Comments:
Range: This vegetation occurs on the Delmarva peninsula of the central Atlantic coast.
States / Provinces: MD:S?, DE:SP, VA:SP
TNC Ecoregions: 58:C
USFS Ecoregions: 232Bx:CCC, 232Bz:CCC
Federal Lands:
Synonymy:
References: Harrison 2003
Authors: J. Harrison / L. Sneddon **Confidence:** 2 **Identifier:**CEGL006841

ALNUS SERRULATA / (ZIZANIA AQUATICA, ZIZANIOPSIS MILIACEA) SHRUBLAND

Smooth Alder / (Indian Wild Rice, Southern Wild Rice) Shrubland
Tidal Freshwater Alder Shrubland **G3? (96-12-15)**
Ecological Group (SCS;MCS): Atlantic Coast River - Tidal Ecotone Shrub Flats (202-60; n/a)

Concept: This shrubland occurs along tidal freshwater reaches of rivers along the Atlantic Coast, possibly ranging from Florida northward to Virginia. In some parts of its range, this type can occur as a fringing shrubland, zonal between *Zizania aquatica* tidal marshes and tidal cypress - gum forests. Less commonly it occupies large patches in freshwater marshes. *Alnus serrulata* dominates, *Rosa palustris* may be present, and *Zizania aquatica* and/or *Zizaniopsis miliacea* are abundant herbs.
Comments: This concept currently includes diverse tidal shrublands near the upper tidal reaches in Virginia [see Coulling (2002)]. Examples are known from the lower reaches of the Waccamaw River (South Carolina), Pee Dee River (South Carolina), Edisto River (South Carolina), Savannah River (Georgia and South Carolina), and Altamaha River (Georgia).
Range: This shrubland possibly occurs from Florida northward to Virginia. It is best documented in South Carolina and Georgia.
States/Provinces: FL?, GA:S?, NC?, SC:S?, VA?
TNC Ecoregions: 56:C, 57:C, 58:C
USFS Ecoregions: 232Cb:CCC, 232Ce:CCC, 232Ch:CC?, 232Ci:CC?
Federal Lands:
Synonymy:
References: Coulling 2002
Authors: SCS **Confidence:** 2 **Identifier:** CEGL004627

III.B.2.N.h.1. BACCHARIS HALIMIFOLIA - IVA FRUTESCENS TIDAL SHRUBLAND ALLIANCE

Groundsel-tree - Maritime Marsh-elder Tidal Shrubland Alliance

Concept: This alliance includes maritime scrub communities typically dominated by *Iva frutescens* or *Baccharis halimifolia* or both, growing in association with salt marshes. These communities occur primarily in estuarine margin situations, especially on the sound sides of barrier islands. Characteristically, these communities form an ecotone between salt marsh and upland vegetation or in areas within the salt marsh having slightly higher elevations and lower salinity levels than the surrounding marsh. Storm-induced disturbance causes periodic die-back of the shrubs restricting the extent of their spread. Characteristic species include *Baccharis halimifolia, Iva frutescens, Rosa carolina, Spartina patens*, and *Panicum virgatum*.
Comments:
Range: This alliance is found in Alabama, Florida, Georgia, Louisiana (?), Mississippi, North Carolina, South Carolina, Texas, Connecticut, Delaware, Massachusetts, Maine, Maryland, New Hampshire, New Jersey, New York, Rhode Island, and Virginia.
States/Provinces: AL CT DE FL GA LA MA MD MS NC NJ NY RI SC TX VA
TNC Ecoregions: 31:C, 53:C, 55:?, 56:C, 57:C, 58:C, 62:C
USFS Ecoregions: 212P:PP, 221Aa:CCC, 221Ab:CCC, 221Ac:CCC, 221Ad:CCC, 221Ae:CCP, 221Aj:CC?, 221Ak:CCC, 221Dc:CPP, 231Fb:CCC, 232Aa:CCC, 232Ab:CCC, 232Ac:CCC, 232Ad:CC?, 232Bb:CC?, 232Bc:CCP, 232Bd:CCP, 232Br:CCC, 232Bx:CCC, 232Bz:CCC, 232Ce:CCC, 232Ch:CCC, 232Ci:CCC, 232Dc:CCC, 232Eb:CCC, 255Dc:CCC
Federal Lands: NPS (Assateague Island, Fire Island, Fort Pulaski); USFS (Croatan); USFWS (Anahuac, Aransas, Big Boggy, Bon Secour, Brazoria, Chincoteague, Matagorda Island, McFaddin, San Bernard)
Synonymy: Tidal Marsh, in part (FNAI 1992a); Salt Shrub, in part (Schafale and Weakley 1990); shrub succession community, in part (Higgins et al. 1971); Salt marsh community, in part (Hill 1986); swamp thicket, in part (Klotz 1986); salt marsh and upper border (Barry 1980); salt grass - marsh elder savanna (Martin 1959b); saltbush zone (Boule 1979); Estuarine scrub-shrub wetland (Tiner 1985b); Salt bush - salt meadow marsh (Daiber et al. 1976); *Iva frutescens-Baccharis halimifolia* (Good 1965); *Iva frutescens* (Klemas et al. 1973); *Baccharis halimifolia* (Klemas et al. 1973); Salt shrub (Reschke 1990); Salt marsh complex, marsh-upland border (Breden 1989); Estuarine Intertidal: Salt Marsh (Swain and Kearsley 2001)
References: Au 1974, Barry 1980, Boule 1979, Breden 1989, Daiber et al. 1976, FNAI 1992a, FNAI 1992b, Good 1965, Higgins et al. 1971, Hill 1986, Hillestad et al. 1975, Hosier 1975, Klemas et al. 1973, Klotz 1986, Martin 1959b, Nelson 1986, Reschke 1990, Schafale and Weakley 1990, Swain and Kearsley 2001, Tiner 1977, Tiner 1985b, Wharton 1978, Wolfe 1990
Authors: D.J. ALLARD, MOD. A.S. WE, JT, East **Identifier:** A.1023

BACCHARIS HALIMIFOLIA - IVA FRUTESCENS - MORELLA CERIFERA - (ILEX VOMITORIA) SHRUBLAND
Groundsel-tree - Maritime Marsh-elder - Wax-myrtle - (Yaupon) Shrubland
Coastal Salt Shrub Thicket **G4? (97-08-11)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Tidal Shrublands (202-20; n/a)

Concept: This shrubland, dominated by the nominal species, occurs in slightly elevated areas within salt flats and salt marshes as well as in marsh edges throughout much of the East Gulf, South Atlantic, and Mid-Atlantic coastal plains. This community is usually best developed at the upper limit of non-storm tidal inundation, on natural levees deposited by above-normal tides. The most common species are typically *Baccharis halimifolia, Morella cerifera (= Myrica cerifera), Iva frutescens ssp. frutescens, Yucca gloriosa, Juniperus virginiana var. silicicola, Lycium carolinianum, Baccharis angustifolia*, and *Ilex vomitoria*. Other species which may be present include *Borrichia frutescens, Fimbristylis castanea, Limonium carolinianum*, and *Solidago sempervirens*.
Comments: An example documented in South Carolina on Old Island had an emergent layer of *Juniperus virginiana var. silicicola*, over *Iva frutescens* and *Borrichia frutescens*. The herbaceous layer consisted of *Cynanchum angustifolium, Juncus roemerianus*, and *Fimbristylis castanea*. This type is not known to occur in VA (G.P. Fleming and P. Coulling pers. comm.).
Range:
States/Provinces: AL:S?, FL:S4, GA:S?, LA:S?, MD:S?, MS:S?, NC:S4, SC:S?
TNC Ecoregions: 53:C, 55:?, 56:C, 57:C, 58:C
USFS Ecoregions: 232Bz:CCC, 232Ce:CCC, 232Ch:CCC, 232Ci:CCP, 232Dc:CCC, 232Eb:CCC
Federal Lands: NPS (Assateague Island, Fort Pulaski); USFS (Croatan); USFWS (Bon Secour)
Synonymy: Salt Shrub (Inland High Subtype) (Schafale 2000)
References: Coulling pers. comm., FNAI 1992a, Fleming pers. comm., Lea 2002b, Schafale 2000, Wolfe 1990
Authors: SCS **Confidence:** 2 **Identifier:** CEGL003920

BACCHARIS HALIMIFOLIA - IVA FRUTESCENS / SPARTINA PATENS SHRUBLAND
Groundsel-tree - Maritime Marsh-elder / Saltmeadow Cordgrass Shrubland
Mid-Atlantic Maritime Salt Shrub **G5 (97-12-01)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Tidal Shrublands (202-20; n/a)

Concept: This maritime shrubland of the mid-Atlantic states occurs in association with salt marshes. In its natural condition, this community forms the ecotone between the high salt marsh and adjacent upland vegetation. It also occurs in patches on areas of slightly higher elevation within the salt marsh or on spoil mounds adjacent to ditches. *Baccharis halimifolia* and *Iva frutescens* are the most characteristic and dominant shrub species. Other associated shrubs include *Morella pensylvanica (= Myrica pensylvanica)* in the northern portion of the range, while *Borrichia frutescens, Morella cerifera (= Myrica cerifera)* and *Juniperus virginiana var. silicicola* are frequent associates in the southern part of the range. *Spartina patens* is a characteristic and usually abundant grass; other common herbaceous associates include *Panicum virgatum, Distichlis spicata, Hibiscus moscheutos, Toxicodendron radicans, Teucrium canadense, Festuca rubra, Limonium carolinianum, Atriplex prostrata, Sabatia stellaris, Sabatia dodecandra*, and in the north *Hierochloe odorata* and *Juncus gerardii*, and in the south, *Setaria parviflora*. This community often forms an abrupt transition from salt marsh to upland reflecting the relatively higher elevation and less frequent tidal flooding. Shrub cover in this situation tends to be fairly dense, and herbs are sparsely distributed. Where the topographic relief is more gradual, the community is characterized by an open and relatively evenly spaced shrub stratum with a well-developed herbaceous layer, reflecting an intergrading of this community with the adjacent high salt marsh. Storm-induced disturbance causes periodic die-back of the shrubs restricting the extent of their spread.
Comments: As shrub cover decreases, the community often grades into high salt marsh associations like *Panicum virgatum - Spartina patens* Herbaceous Vegetation (CEGL006150) or *Spartina patens*-dominated high marsh associations. Southern analogs of this salt marsh-upland border shrubland include *Baccharis halimifolia - Iva frutescens - Morella cerifera - (Ilex vomitoria)* Shrubland (CEGL003920) along the southern Atlantic coast from the Carolinas to Florida to Louisiana and *Iva frutescens ssp. frutescens - Baccharis halimifolia / Spartina spartinae* Shrubland (CEGL004616) along the Texas Gulf Coast. This community is differentiated from *Morella cerifera - Baccharis halimifolia / Spartina patens* Shrubland (CEGL003809) by the presence of *Iva frutescens* and by the influence of tidal flooding. According to G.P. Fleming and P. Coulling (pers. comm.), "This type represents the only salt scrub community type for which we have data in Virginia. Documented occurrences (including two from Chincoteague NWR) all contain Morella as a low-cover associate, but Spartina patens and Distichlis spicata are characteristically co-dominant with Iva and Baccharis. Perhaps Chris Lea can clarify the distribution of 3920 on the Delmarva Peninsula. I have wondered whether we need to define separate tidal and supratidal salt scrub types, since the former often lack Baccharis altogether, but we don't have sufficient data to support splitting this group at this time."
Range: This association ranges from Massachusetts to South Carolina.
States/Provinces: CT:S?, DE:S5, MA:S3, MD:S?, NC:S4, NJ:S2S3, NY:S4, RI:S?, SC:S?, VA:S?
TNC Ecoregions: 56:P, 57:C, 58:C, 62:C
USFS Ecoregions: 221Aa:CC?, 221Ab:CCC, 221Ac:CCC, 221Ad:CCC, 221Ak:CC?, 232Aa:CCC, 232Ab:CCC, 232Ac:CCC, 232Ad:CC?, 232Br:CCC, 232Bx:CCC, 232Bz:CCC, 232Ch:CCC
Federal Lands: NPS (Assateague Island, Fire Island); USFWS (Chincoteague)
Synonymy: Salt Shrub (High Subtype) (Schafale 2000), Shrub succession community (Higgins et al. 1971) B. Assateague Island., Salt marsh community (Hill 1986) B. Assateague Island., Swamp thicket (Klotz 1986) B. Virginia., Salt marsh and upper border (Barry 1980) =. South Carolina., Salt grass - marsh elder savanna (Martin 1959b) =. New Jersey., Saltbush zone (Boule 1979) =. Virginia., Estuarine scrub-shrub wetland (Tiner 1985a) =. Delaware., Estuarine scrub-shrub wetland (Tiner 1985b) =. New Jersey., Salt bush - salt meadow marsh (Daiber et al. 1976) =. Delaware., *Iva frutescens-Baccharis halimifolia* (Good 1965), *Iva frutescens* and *Baccharis halimifolia* (Klemas et al. 1973) =. Delaware., Salt Marsh Complex, marsh-upland border (Breden 1989) =. New Jersey., Salt shrub (Reschke 1990) =. New York., Salt Marsh (Rawinski 1984). formerly Southern New England and Gulf of Maine Salt Marshes.
References: Barry 1980, Berdine 1998, Boule 1979, Bowman 2000, Breden 1989, Breden et al. 2001, Coulling pers. comm., Daiber et al. 1976, Edinger et al. 2002, Enser 1999, Fleming 2001, Fleming et al. 2001, Fleming pers. comm., Good 1965, Higgins et al. 1971, Hill 1986, Klemas et al. 1973, Klotz 1986, Martin 1959b, Metzler and Barrett 2001, Rawinski 1984, Reschke 1990, Schafale 2000, Schafale and Weakley 1990, Swain and Kearsley 2001, TNC 1995c, Tiner 1985a, Tiner 1985b
Authors: ECS **Confidence:** 2 **Identifier:** CEGL003921

IVA FRUTESCENS / SPARTINA CYNOSUROIDES TIDAL SHRUBLAND
Marsh Elder / Big Cordgrass Shrubland
Brackish Shrubland **G? (03-07-22)**
Ecological Group

Concept: This brackish tidal shrubland occurs on the mesohaline portion of tidal rivers of the Chesapeake Bay on poorly drained peat overlying sand and mucky sandy. This vegetation forms linear bands along levees and bordering tidal guts.

Microtopography is relatively flat and lacks pronounced hummocks and hollows. The shrub canopy is moderately dense and co-dominated by *Iva frutescens* and *Spartina cynosuroides*. Other associates include *Baccharis halimifolia* and *Hibiscus moscheutos*. The species diversity of this vegetation is relatively low; associated herbs are often found on the edge of the stand and may include *Amaranthus cannabinus, Atriplex patula, Lythrum lineare, Polygonum punctatum, Schoenoplectus americanus, Solidago sempervirens, Spartina alterniflora,* and *Spartina patens.*

Comments:

Range: This vegetation occurs on tidal rivers of the Chesapeake Bay.

States / Provinces: MD:S4, DE:SP, VA:SP

TNC Ecoregions: 58:C

USFS Ecoregions: 232Ad:CCC, 232Bx:CCC, 232Bz:CCC

Federal Lands:

Synonymy:

References: Harrison 2003

Authors: J. Harrison / L. Sneddon **Confidence:** 2 **Identifier:**CEGL006847

III.B.2.N.h. SALIX NIGRA TIDAL SHRUBLAND ALLIANCE

Salix nigra Tidal Shrubland Alliance

SALIX NIGRA TIDAL SHRUBLAND

Black Willow Shrubland

Black Willow Tidal Shrubland **G? (03-07-22)**

Ecological Group

Concept: This tidal black willow shrubland of the Maryland coastal plain occurs on freshwater tidal rivers. It forms a zone between adjacent freshwater tidal marshes and uplands. Microtopography is variable, ranging from pronounced hummocks and hollows to flat. The substrate is partially decomposed peat with sand or silt admixed. The shrub canopy is relatively open dominated by *Salix nigra*, or mixed with other shrubs such as *Cephalanthus occidentalis, Acer rubrum, Alnus serrulata, Cornus amomum, Fraxinus pennsylvanica, Rosa palustrus,* and *Viburnum dentatum.* Vines include *Mikania scandens* and *Toxicodendron radicans*. The herbaceous layer is relatively diverse and is comprised of *Symphotrichum novi-belgii, Boehmeria cylindrica, Galium obtusum, Hibiscus moscheutos, Impatiens capensis, Leersia oryzoides, Peltandra virginica, Pilea pumila, Polygonum arifolium, Polygonum punctatum, Polygonum sagittatum,* and *Thalictrum polygamum.*

Comments:

Range: This vegetation occurs on the coastal plain of Virginia and Maryland.

States / Provinces: MD:S?, DE:SP, VA:S?

TNC Ecoregions: 58:C

USFS Ecoregions: 232Bx:CCC, 232Bz:CCC

Federal Lands:

Synonymy:

References: Harrison 2003

Authors: J. Harrison / L. Sneddon **Confidence:** 2 **Identifier:**CEGL006843

IV. DWARF-SHRUBLAND

IV.A.1.N.a. Caespitose needle-leaved or microphyllous evergreen dwarf-shrubland

IV.A.1.N.a.4. HUDSONIA TOMENTOSA DWARF-SHRUBLAND ALLIANCE

Woolly Beach-heather Dwarf-shrubland Alliance

HUDSONIA TOMENTOSA / PANICUM AMARUM VAR. AMARULUM DWARF-SHRUBLAND
Woolly Beach-heather / Coastal Panicgrass Dwarf-shrubland
Central Coast Beach Heather Dune Shrubland **G2 (98-10-14)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Dune and Coastal Grasslands (240-25; n/a)

Concept: This association is a maritime beach heather community of mid-Atlantic sand dunes. The unstable substrate is influenced by wind-deposited sand and supports no soil development; large patches of sparsely vegetated or unvegetated sand are common. The community is characterized by *Hudsonia tomentosa* occurring as discrete patches that may coalesce into a dense mat on older, more stabilized dunes. A number of other shrubs such as *Morella pensylvanica (= Myrica pensylvanica), Morella cerifera (= Myrica cerifera), Pinus taeda* saplings, and rarely *Prunus maritima* may occur but are low in abundance and cover. *Schizachyrium littorale (= Schizachyrium scoparium ssp. littorale), Ammophila breviligulata, Aristida tuberculosa, Spartina patens,* and *Panicum amarum var. amarulum* are common grasses of this community, and *Toxicodendron radicans* is a common vine. Other herbaceous associates include *Lechea maritima, Cyperus grayi, Artemisia stelleriana, Chamaesyce polygonifolia, Solidago sempervirens,* and *Diodia teres*. This community is locally common on coastal dunes from New Jersey to northern North Carolina.
Comments:
Range: The association is restricted to barrier beaches from New Jersey to northern North Carolina.
States/Provinces: DE:S2, MD:S?, NC:S?, NJ:S1S2, VA:S?
TNC Ecoregions: 57:C, 58:C, 62:C
USFS Ecoregions: 232Ac:CCC, 232Bz:CCC
Federal Lands: NPS (Assateague Island)
Synonymy: *Hudsonia* dunes (Higgins et al. 1971) =. Assateague Island., *Hudsonia* dune community (Hill 1986) =. Assateague Island., Dunegrass - beach heather - low thicket mixture (Martin 1959b) I. New Jersey., Beach heather community (Collins and Anderson 1994) =. New Jersey., Dune crest community (Clampitt 1991) B. Virginia., *Hudsonia tomentosa - Ammophila breviligulata* dune scrub association (Clancy 1993a) =. Delaware., Coastal dune shrubland (Breden 1989) B. New Jersey.
References: Berdine 1998, Bowman 2000, Breden 1989, Breden et al. 2001, Clampitt 1991, Clancy 1993a, Collins and Anderson 1994, Fleming 2001, Fleming et al. 2001, Higgins et al. 1971, Hill 1986, Martin 1959b, TNC 1995c
Authors: L.A. Sneddon, ECS **Confidence:** 2 **Identifier:** CEGL003950

IV.A.1.N.g. Saturated needle-leaved or microphyllous evergreen dwarf-shrubland

IV.A.1.N.g.3. VACCINIUM MACROCARPON SATURATED DWARF-SHRUBLAND ALLIANCE

Large Cranberry Saturated Dwarf-shrubland Alliance

CLADIUM MARISCOIDES / VACCINIUM MACROCARPON - MORELLA PENSYLVANICA DWARF-SHRUBLAND
Large Cranberry / Northern Bayberry Dwarf-shrubland
Northern Interdunal Cranberry Swale **G2 (97-10-22)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Wooded Interdune Swales and Backdunes (240-40; n/a)

Concept: This association is a small-patch seasonally flooded wetland within low swales behind backdunes of major dune systems of the northeastern coast. Vegetation is characterized by *Vaccinium macrocarpon, Sphagnum* spp., and scattered *Morella pensylvanica (= Myrica pensylvanica), Myrica gale*, and/or *Vaccinium corymbosum*. *Vaccinium macrocarpon* is generally dominant, but a number of rushes, sedges, grasses, and forbs co-occur and often obscure the low-growing *Vaccinium macrocarpon*. *Morella pensylvanica*, although a minor component of the vegetation and generally restricted to the wetland edge, characterizes this community as coastal. The wetland is seasonally flooded and is often dry on the surface late in the growing season. A shallow layer of peat overtops deep sand deposits. Associated species commonly include *Juncus* spp. (*Juncus canadensis, Juncus greenei, Juncus balticus, Juncus biflorus, Juncus scirpoides, Juncus pelocarpus* and/or others), *Cladium mariscoides, Xyris torta, Xyris difformis, Rhynchospora capitellata, Rhynchospora alba, Cyperus* spp., *Drosera rotundifolia, Drosera intermedia, Drosera filiformis, Pogonia ophioglossoides,* and scattered clumps of *Schoenoplectus pungens* or *Scirpus cyperinus* in small wet pockets. *Sphagnum* spp. (*Sphagnum rubellum, Sphagnum compactum,* and possibly others) cover the surface. Species occurring less frequently can include *Linum striatum, Lycopodiella inundata (= Lycopodium inundatum), Polygala cruciata, Calopogon* spp., *Platanthera* spp., *Utricularia subulata, Triadenum* sp., and others. Floristics can vary between swales due to hydrology, soils, or disturbance regime.
Comments:
Range: This community is confined to major dune systems of the northeastern coast. The greatest number of occurrences are found in Massachusetts, New York, New Jersey, with occasional occurrences in Rhode Island and Delaware. There are no known occurrences in Connecticut.
States/Provinces: DE:S?, MA:S1, NH:S1, NJ:S1S2, NY:S2S3, RI:S?
TNC Ecoregions: 58:C, 62:C
USFS Ecoregions: 221Ab:CCC, 221Ac:CCC, 221Ak:CCC, 232Aa:CCC, 232Bz:CCC
Federal Lands: NPS (Fire Island)
Synonymy: Wet swale (Dunlop and Crow 1985), Cranberry marsh (Johnson 1985b), Cranberry bog (Martin 1959b), *Vaccinium macrocarpon* - Mixed orchid / *Sphagnum* (McAvoy and Clancy 1994), Cranberry swale (McDonnell 1979), Cranberry swale (Lundgren 2000), Wet poor fen (Dowhan and Rozsa 1989), Interdunal swales (Breden 1989). in part, Coastal interdunal marsh/swale (Rawinski 1984)
References: Benedict 1977a, Bowman 2000, Breden 1989, Breden et al. 2001, Conard 1935, Dowhan and Rozsa 1989, Dunlop and Crow 1985, Edinger et al. 2002, Johnson 1981b, Johnson 1985b, Lundgren 1998, Lundgren 2000, Martin 1959b, McAvoy and Clancy 1994, McDonnell 1979, Moul 1969, Rawinski 1984, Sperduto 2000b, Swain and Kearsley 2001
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006141

V. HERBACEOUS VEGETATION

V.A.5.N.a. Tall sod temperate grassland

V.A.5.N.a.6. PHRAGMITES AUSTRALIS HERBACEOUS ALLIANCE
Common Reed Herbaceous Alliance

PHRAGMITES AUSTRALIS TEMPERATE UPLAND HERBACEOUS VEGETATION
Common Reed Temperate Upland Herbaceous Vegetation
Phragmites Upland Grassland **GW (97-12-01)**
Ecological Group (SCS;MCS): Exotic Species-Dominated Herbaceous Upland Vegetation (900-60; 8.0.0.4)

Concept: These communities occur in disturbed upland situations, most notably on dredge spoil such as occurs along the Intracoastal Waterway, and cover many thousands of hectares.
Comments:
Range:
States/Provinces: AL:S?, FL:S?, LA:S?, MS:S?, NC:S?, SC:S?, TX:S?, VA?
TNC Ecoregions: 53:C, 55:C, 56:C, 57:C, 58:?
USFS Ecoregions: 232A:CC, 232C:CC, 232Dc:CCC
Federal Lands:

Synonymy:
References:
Authors: SCS **Confidence:** 2 **Identifier:** CEGL004019

V.A.5.N.c. Medium-tall sod temperate or subpolar grassland

V.A.5.N.c.2. AMMOPHILA BREVILIGULATA HERBACEOUS ALLIANCE

American Beachgrass Herbaceous Alliance

AMMOPHILA BREVILIGULATA - PANICUM AMARUM VAR. AMARUM HERBACEOUS VEGETATION

American Beachgrass - Bitter Panicgrass Herbaceous Vegetation
Beachgrass - Panicgrass Dune Grassland **G2 (98-10-08)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Dune and Coastal Grasslands (240-25; n/a)

Concept: This community is a maritime dune grassland dominated by *Ammophila breviligulata* or *Panicum amarum var. amarum*. Plant cover is variable, ranging from 10-75% but is usually low. Other associated species include *Solidago sempervirens, Strophostyles helvula, Triplasis purpurea, Cenchrus tribuloides, Chamaesyce polygonifolia*. *Oenothera humifusa, Schoenoplectus pungens (= Scirpus pungens)* (where overwashed by sand), *Diodia teres, Cakile edentula ssp. edentula, Nuttallanthus canadensis, Salsola kali ssp. kali (= Salsola caroliniana), Lechea maritima* and *Spartina patens.* Sparse individuals of stunted *Morella pensylvanica (= Myrica pensylvanica)* shrubs and seedlings occur but make up less than 2% of the total vegetation cover. Diagnostic species are *Ammophila breviligulata, Solidago sempervirens, Panicum amarum var. amarum,* and *Oenothera humifusa*. This dune grassland community occurs almost exclusively on sandy, unstable, droughty substrates with no soil profile development. Eolian processes cause active sand deposition and erosion. The sand substrate is usually visible, and litter accumulation from plant debris is nearly absent. This community generally occurs on foredunes that receive the force of wind and salt spray, but is beyond the influence of most storm tides. It is found on maritime dunes from southern New Jersey (Cape May) south to the Chesapeake Bay, Virginia, as well as on the northern North Carolina coast.
Comments: This grassland often occurs in a complex with *Morella pensylvanica / Diodia teres* Shrubland (CEGL003881). It contains several species characteristic to *Cakile edentula ssp. edentula - Mertensia maritima* Sparse Vegetation (CEGL006106), but this grassland is differentiated by (1) its location beyond storm tide influence, (2) dominance by perennial rather than annual species, (3) greater plant cover on average, and (4) greater prevalence of *Solidago sempervirens*. *Ammophila breviligulata - Lathyrus japonicus* Herbaceous Vegetation (CEGL006274) is the northern analog of this association; it is the beach grass-dominated primary dune association of the North Atlantic Coast. This association differs in being codominated by *Panicum amarum*, whereas CEGL006274 lacks *Panicum amarum* as a significant component and has or is codominated by *Lathyrus japonicus*. These two associations overlap geographically in southern New Jersey.
Range: This community occurs on maritime dunes from Long Island, New York, south to North Carolina.
States/Provinces: DE:S2?, MD:S?, NC:S3, NJ:S1S2, VA:S?
TNC Ecoregions: 57:C, 58:C, 62:C
USFS Ecoregions: 232Ab:CCP, 232Ac:CCC, 232Bt:CCP, 232Bz:CCC, 232Ch:CCC
Federal Lands: NPS (Assateague Island)
Synonymy: Dune Grass (Northern Subtype) (Schafale 2000), Dunegrass community (Hill 1986) =. Assateague Island., Dunegrass community (Higgins et al. 1971) =. Assateague Island., Mid-Atlantic *Ammophila breviligulata, Panicum amarulum* dune grassland variant (Clancy 1993a) =. Delaware., *Ammophila, Panicum amarum* dunes (Harvill 1965) =. Virginia., *Panicum, Ammophila* community (Egler 1962) =. Virginia., Foredune (Klotz 1986) =. Virginia., Foredune (Boule 1979) =. Virginia., Dune community (Baumann 1978b) =. Virginia., Primary dune (Stalter and Lamont 1990) B. Assateague Island, Virginia., Dunegrass community (Clampitt 1991) B. Virginia., Coastal dune grass community (Breden 1989) B. New Jersey., Sand dune (Fender 1937) =. southern New Jersey.
References: Baumann 1978b, Berdine 1998, Boule 1979, Bowman 2000, Breden 1989, Breden et al. 2001, Clampitt 1991, Clancy 1993a, Egler 1962, Fender 1937, Fleming 2001, Fleming et al. 2001, Harvill 1965, Higgins et al. 1971, Hill 1986, Klotz 1986, Schafale 2000, Schafale and Weakley 1990, Stalter and Lamont 1990
Authors: L.A. Sneddon, ECS **Confidence:** 2 **Identifier:** CEGL004043

V.A.5.N.e. Short sod temperate or subpolar grassland

V.A.5.N.e.1. SPARTINA PATENS - (SCHOENOPLECTUS PUNGENS) HERBACEOUS ALLIANCE

Saltmeadow Cordgrass - (Threesquare) Herbaceous Alliance

SPARTINA PATENS - SCHOENOPLECTUS PUNGENS - SOLIDAGO SEMPERVIRENS HERBACEOUS VEGETATION
Saltmeadow Cordgrass - Threesquare - Seaside Goldenrod Herbaceous Vegetation
Overwash Dune Grassland **G2G3 (98-11-04)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Dune and Coastal Grasslands (240-25; n/a)

Concept: This community is an upland dune grassland of mid-Atlantic barrier islands on embryo dunes forming from overwash terraces from Delaware to North Carolina. It forms a drier, later successional phase beginning from water-deposited sand of storm overwash. Sand movement, plant burial, and dune formation rates are not so high as to form *Ammophila breviligulata*-dominated primary dunes, but can be found as a fringe around the outer edge of those dunes. *Spartina patens* is dominant, ranging from quite sparse (25% cover) to dense, and can be monotypic in early successional expressions. As the vegetation develops, common associated species can include *Schoenoplectus pungens (= Scirpus pungens)* or *Solidago sempervirens*. Less common associates can include *Cyperus grayi, Cenchrus tribuloides, Setaria parviflora, Festuca rubra*, and occasional scattered individuals of *Toxicodendron radicans* and seedlings of *Baccharis halimifolia*. Bare sand is often visible through the vegetation, and there is no soil profile development. *Ammophila breviligulata* or *Uniola paniculata* may invade from the surrounding dunes. This community appears to be a successional step between interdunal herbaceous wetlands and interdunal herbaceous/shrub uplands.
Comments: This community differs ecologically from dune grasslands dominated by *Ammophila breviligulata* or *Uniola paniculata*, which are primarily impacted by wind-deposited sand. This community is impacted by wave-deposited sand. It is drier than brackish swales and vegetation that immediately colonizes water-borne sand from storm overwash, like *Spartina patens - Eleocharis parvula* Herbaceous Vegetation (CEGL006342). *Spartina patens - Schizachyrium maritimum - Solidago sempervirens* Herbaceous Vegetation (CEGL008445) is a southern analog of this association that occurs along the Gulf Coast.
Range: This community is an upland dune grassland of mid-Atlantic barrier islands from Delaware to North Carolina.
States/Provinces: DE:S2S3?, MA?, MD:S?, NC:S2, NJ:S?, NY:S5, VA:S?
TNC Ecoregions: 57:C, 58:C, 62:C
USFS Ecoregions: 221Ab:CCC, 232Aa:CCC, 232Ab:CCC, 232Ac:CCC, 232Bz:CCC, 232Ci:C??
Federal Lands: NPS (Assateague Island, Fire Island)
Synonymy: Maritime Dry Grassland (Typic Subtype) (Schafale 2000), Wash (Hill 1986) =. Assateague Island., Wash (Higgins et al. 1971) =. Assateague Island., Dunegrass community (Higgins et al. 1971) B. Assateague Island., Grassland community (Baumann 1978b) =. Virginia., Low dune community (Boule 1979) =. Virginia., Dry community of barrier flats (Travis and Godfrey 1976) B. North Carolina., Secondary dunes (Klotz 1986) B. Virginia., Dry maritime grassland (Lea 2002b). Assateague Island.
References: Baumann 1978b, Berdine 1998, Boule 1979, Bowman 2000, Breden et al. 2001, Edinger et al. 2002, Fleming et al. 2001, Higgins et al. 1971, Hill 1986, Klotz 1986, Lea 2002b, Reschke 1990, Schafale 2000, Schafale and Weakley 1990, TNC 1995c, Travis and Godfrey 1976, Zaremba and Leatherman 1984
Authors: L.A. Sneddon, ECS **Confidence:** 2 **Identifier:** CEGL004097

V.A.5.N.k. Seasonally flooded temperate or subpolar grassland

V.A.5.N.k.65. CAREX STRIATA SEASONALLY FLOODED HERBACEOUS ALLIANCE

Peatland Sedge Seasonally Flooded Herbaceous Alliance

CAREX STRIATA VAR. BREVIS HERBACEOUS VEGETATION
Northern Peatland Sedge Herbaceous Vegetation
Northern Peatland Sedge Coastal Plain Pond **G? (97-12-01)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Emergent Ponds and Marshes (345-30; n/a)

Concept: This vegetation occupies Coastal Plain depression meadows around the perimeter of Coastal Plain ponds and is dominated by *Carex striata var. brevis (= Carex walteriana var. brevis)*. Examples include vegetation on the outer margins of Coastal Plain pond shores in New York, Maryland and Delaware or in localized swales in the New Jersey pine barrens. The substrate is typically composed of sand and gravel but some community types may occur on organic muck. *Carex striata* usually occurs in dense stands with few other associates, which may include seedlings of *Cephalanthus occidentalis* and *Acer rubrum*, as well as *Cladium mariscoides, Rhexia virginica, Bidens frondosa, Rhynchospora macrostachya, Rhynchospora chalarocephala, Fimbristylis autumnalis, Juncus canadensis, Dulichium arundinaceum, Hypericum mutilum*, and *Panicum hemitomon*. *Sphagnum* is often abundant.
Comments:
Range:
States/Provinces: DE:S?, MD:S?, NC:S?, NJ:S1S3, NY:S?, SC:S?, VA:S?
TNC Ecoregions: 56:C, 57:C, 58:C, 62:C
USFS Ecoregions: 232A:C?, 232Bt:CCC, 232Cb:CCC, 232Ch:CCC
Federal Lands:
Synonymy: Coastal Plain Intermittent Pond (Breden 1989) B
References: Berdine and Gould 1999, Bowman 2000, Breden 1989, Breden et al. 2001, Fleming et al. 2001, Nelson 1986, Tyndall et al. 1990
Authors: ECS **Confidence:** 1 **Identifier:** CEGL004120

V.A.5.N.k.7. CLADIUM MARISCOIDES SEASONALLY FLOODED HERBACEOUS ALLIANCE

Twig-rush Seasonally Flooded Herbaceous Alliance

CLADIUM MARISCOIDES - COELORACHIS RUGOSA HERBACEOUS VEGETATION

Twig-rush - Wrinkled Jointgrass Herbaceous Vegetation
Cape May - Delmarva Depression Meadow **G1 (97-11-18)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Open Ponds and Marshes (345-05; n/a)

Concept: This seasonally flooded, Coastal Plain, depressional wetland occurs in southern New Jersey and Delaware. The substrate is sandy loam over sandy clay loam. The vegetation is diverse with *Cladium mariscoides* arguably the most characteristic species. Herbaceous associates may include *Dichanthelium spretum (= Panicum spretum), Coelorachis rugosa, Boltonia asteroides, Eryngium aquaticum, Rhexia virginica, Fimbristylis autumnalis, Scleria reticularis, Sclerolepis uniflora*, and others. Additional species at the site in Delaware include *Panicum hemitomon, Rhynchospora chalarocephala, Scleria reticularis, Proserpinaca pectinata, Fimbristylis autumnalis, Panicum hirstii, Rhexia aristosa, Sabatia difformis*, and *Xyris smalliana*.
Comments:
Range: This wetland occurs in southern New Jersey and Delaware.
States/Provinces: DE:S?, NJ:S1
TNC Ecoregions: 58:C, 62:C
USFS Ecoregions: 232Ab:CCC
Federal Lands:
Synonymy:
References: Bowman 2000, Breden et al. 2001
Authors: ECS **Confidence:** 3 **Identifier:** CEGL006332

V.A.5.N.k.37. DULICHIUM ARUNDINACEUM SEASONALLY FLOODED HERBACEOUS ALLIANCE

Threeway Sedge Seasonally Flooded Herbaceous Alliance

DULICHIUM ARUNDINACEUM - JUNCUS CANADENSIS HERBACEOUS VEGETATION (PROVISIONAL)
Threeway Sedge - Canada Rush Herbaceous Vegetation
Three-way Sedge – Canada Rush Coastal Plain Pond **G? (00-11-15)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Open Ponds and Marshes (345-05; n/a)

Concept: This Coastal Plain pond community occurs in Delaware and Maryland. The vegetation is dominated by *Dulichium arundinaceum* and *Juncus canadensis*. Other associated species include, Scirpus cyperinus, Polygonum punctatum, Utricularia spp., *Triadenum virginicum*, and *Scirpus cyperinus*.
Comments: This vegetation is described provisionally and is based on a single site in Delaware, although other occurrences may be likely. More data are needed to confirm the classification of this type.
Range: This coastal plain pondshore community occurs in Delaware and Maryland.
States/Provinces: DE:S?, NY:S2, VA?
TNC Ecoregions: 58:C
USFS Ecoregions: 232Br:CCC
Federal Lands:
Synonymy:
References: Bowman 2000, Rawinski 1997
Authors: ECS **Confidence:** 3 **Identifier:** CEGL006415

V.A.5.N.k.11. FIMBRISTYLIS CASTANEA - SCHOENOPLECTUS PUNGENS SEASONALLY FLOODED HERBACEOUS ALLIANCE

Chestnut Fimbry - Threesquare Seasonally Flooded Herbaceous Alliance

SCHOENOPLECTUS PUNGENS - FIMBRISTYLIS (CASTANEA, CAROLINIANA) HERBACEOUS VEGETATION
Threesquare - (Chestnut Fimbry, Tufted Fimbry) Herbaceous Vegetation
Chesapeake Bay Interdunal swale **G? (97-12-01)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Interdune Herbaceous Wetlands (240-20; n/a)

Concept: This interdunal swale community of the Atlantic coast (Chesapeake and Delaware drainages) is characterized by dense cover of *Schoenoplectus pungens (= Scirpus pungens)* in association with *Spartina patens* and *Fimbristylis castanea*. There is usually standing water present in these swales in the spring, when *Schoenoplectus pungens* is generally dominant with few other associates except species of *Eleocharis*. By late summer a number of other species such as *Fimbristylis castanea* and *Sabatia stellaris* contribute more substantial cover. Other herbs contribute very little to the overall vegetative cover. These associated species include *Andropogon virginicus, Eleocharis rostellata, Phragmites australis, Pluchea foetida, Juncus scirpoides, Hydrocotyle umbellata, Eleocharis parvula, Panicum amarum, Fimbristylis autumnalis, Sabatia stellaris, Ptilimnium capillaceum, Fuirena pumila*, and *Juncus canadensis*. Diagnostic species are *Schoenoplectus pungens* and *Fimbristylis castanea*. Related vegetation of the Atlantic coast from North Carolina southward is accommodated under *Fimbristylis castanea - Schoenoplectus pungens* Seasonally Flooded Herbaceous Vegetation (CEGL003790).
Comments: This association is similar to *Juncus (dichotomus, scirpoides) - Drosera intermedia* Herbaceous Vegetation (CEGL004111) in environment, but lacks *Xyris* spp., *Pogonia* spp., and *Lycopodiella appressa (= Lycopodium appressum)*. It may represent a successional phase or be slightly more brackish.
Range: Currently described from Maryland and Virginia.
States/Provinces: MD:S?, VA:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232Bz:CCC, 232Ci:CC?
Federal Lands: NPS (Assateague Island)
Synonymy: Fresh marsh community (Higgins et al. 1971) B. Assateague Island., Fresh marsh community (Hill 1986) B. Assateague Island., *Scirpus-Hydrocotyle* community (Tyndall and Levy 1978). Virginia., *Spartina-Scirpus* community (Tyndall and Levy 1978). Virginia., *Juncus scirpoides-Scirpus pungens* interdunal wetland association (McAvoy and Clancy 1994). Delaware., Wet community of barrier flats (Travis and Godfrey 1976) ?. North Carolina., Maritime Wet Grassland (Threesquare Subtype) (Schafale 2000)
References: Berdine 1998, Fleming 2001, Fleming et al. 2001, Higgins et al. 1971, Hill 1986, McAvoy and Clancy 1994, Peet et al. 2002, Schafale 2000, Sneddon et al. 1996, TNC 1995c, Travis and Godfrey 1976, Tyndall and Levy 1978
Authors: ECS **Confidence:** 2 **Identifier:** CEGL004117

V.A.5.N.k.66. JUNCUS DICHOTOMUS SEASONALLY FLOODED HERBACEOUS ALLIANCE

Forked Rush Seasonally Flooded Herbaceous Alliance

JUNCUS (DICHOTOMUS, SCIRPOIDES) - DROSERA INTERMEDIA HERBACEOUS VEGETATION
(Forked Rush, Needle-pod Rush) - Water Sundew Herbaceous Vegetation
Forked Rush Dune Swale **G? (97-12-01)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Interdune Herbaceous Wetlands (240-20; n/a)

Concept: This interdunal swale community of the Atlantic coast (Chesapeake Bay and Delaware Bay drainages) occurs in small, shallow, seasonally flooded depressions. Soils are characterized by a shallow organic layer overlying sands. Sedges and rushes are strongly dominant, including species such as *Juncus dichotomus, Juncus canadensis, Juncus biflorus, Juncus scirpoides, Juncus acuminatus, Juncus megacephalus, Juncus canadensis, Cyperus odoratus, Scleria verticillata, Rhynchospora colorata*, and *Fimbristylis castanea*. Common associates include *Drosera intermedia, Linum medium, Lycopodiella appressa, Utricularia subulata, Utricularia juncea, Triadenum virginicum, Fuirena pumila, Xyris jupicai, Xyris caroliniana, Andropogon virginicus*, and *Solidago sempervirens.*
Comments: This community occurs in close association, and often as part of a finely textured mosaic, with *Morella cerifera - Vaccinium corymbosum* Shrubland (CEGL003906) and *Morella cerifera / Hydrocotyle verticillata* Shrubland (CEGL003840). It is similar to *Schoenoplectus pungens - Fimbristylis (castanea, caroliniana)* Herbaceous Vegetation (CEGL004117) and may represent a successional phase.
Range: This community occurs from New Jersey south to Virginia.
States/Provinces: DE:S2, MD:S?, NJ:S?, VA:S?
TNC Ecoregions: 57:P, 58:C, 62:C
USFS Ecoregions: 232A:C?, 232Bz:CCC, 232C:C?
Federal Lands: NPS (Assateague Island)
Synonymy: Bog community (Hill 1986) =. Assateague Island., *Andropogon* community (Tyndall and Levy 1978) ?. Virginia., Interdunal wetlands (Jones 1992a) ?. Virginia.
References: Berdine 1998, Bowman 2000, Breden et al. 2001, Fleming 2001, Fleming et al. 2001, Hill 1986, Jones 1992a, Sneddon et al. 1994, Sneddon et al. 1996, TNC 1995c, Tyndall and Levy 1978
Authors: ECS **Confidence:** 2 **Identifier:** CEGL004111

V.A.5.N.k.14. JUNCUS EFFUSUS SEASONALLY FLOODED HERBACEOUS ALLIANCE

Soft Rush Seasonally Flooded Herbaceous Alliance

JUNCUS EFFUSUS SEASONALLY FLOODED HERBACEOUS VEGETATION
Soft Rush Seasonally Flooded Herbaceous Vegetation
Rush Marsh **G5 (01-03-28)**
Ecological Group (SCS;MCS): Eastern Emergent Marshes (480-20; 1.4.1.2)

Concept: This broadly defined type represents freshwater marsh vegetation dominated by *Juncus effusus*. Additional types may be developed as more information becomes available. This vegetation may occur in natural or artificial ponds, including beaver-enhanced ones. In various parts of its broad range as currently defined, associated species may include *Andropogon glomeratus, Cyperus* spp., *Typha latifolia, Scirpus cyperinus, Triadenum walteri, Apios americana*, and *Galium aparine*. This type includes seasonally to temporarily flooded vegetation dominated or codominated by *Juncus effusus* in the central and southern Appalachians.
Comments: Though this association was not seen at the Bankhead National Forest, it is expected to occur there.
Range: The range of this broadly defined association has not been fully described. It is confirmed as occurring in the Central Appalachians and is thought to occur in the Interior Low Plateau, Cumberland Plateau, Southern Ridge and Valley, Southern Blue Ridge, Piedmont, Chesapeake Bay Lowlands, and the Coastal Plain from the Mid-Atlantic to the Upper East Gulf Coastal Plain.
States/Provinces: AL:S?, AR:S?, FL:S?, GA:S?, KY:S?, LA:S?, MS:S?, NC:S?, OK:S?, SC:S?, TN:S?, TX:S?, VA:S?
TNC Ecoregions: 43:C, 44:C, 50:P, 51:C, 52:P, 53:P, 56:P, 57:P, 58:P, 59:C
USFS Ecoregions: 222Eb:CCC, 231Ca:CPP, 231Cd:CPP, 231Db:CCC, M221Ab:CCC, M221Dc:CCC, M221Dd:CCC
Federal Lands: DOD (Arnold, Fort Benning); NPS (Carl Sandburg Home, Great Smoky Mountains); USFS (Bankhead, Cherokee?, Oconee?, Talladega)

Synonymy: IID6a. Natural Impoundment Pond (Allard 1990) B. in part, Beaver Dam Type (Wharton 1978)
References: Allard 1990, Fleming et al. 2001, Hoagland 1998c, Hoagland 2000, Peet et al. 2002, TNC 1998a, Wharton 1978
Authors: SCS **Confidence:** 2 **Identifier:** CEGL004112

V.A.5.N.k.15. JUNCUS REPENS - ELEOCHARIS MICROCARPA SEASONALLY FLOODED HERBACEOUS ALLIANCE

Creeping Rush - Small-fruit Spikerush Seasonally Flooded Herbaceous Alliance

JUNCUS REPENS - BOLTONIA ASTEROIDES HERBACEOUS VEGETATION

Creeping Rush - White Doll's Daisy Herbaceous Vegetation
Creeping Rush – Boltonia Coastal Plain Pond **G? (00-04-17)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Open Ponds and Marshes (345-05; n/a)

Concept: This seasonally flooded, Coastal Plain wetland vegetation occurs on the central Atlantic Coastal Plain, and is known from a single site in Delaware. The vegetation is characterized by *Boltonia asteroides, Sclerolepis uniflora, Juncus repens, Ludwigia alternifolia, Dichanthelium spretum, Rhynchospora macrostachya, Rhexia virginica, Polygonum hydropiperoides, Xyris smalliana, Pluchea foetida*, and *Proserpinaca palustris*.
Comments: This association is documented from a single site at the Assawoman Wildlife Management Area in Delaware. More data are needed to confirm the classification of this type.
Range:
States/Provinces: DE:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232B:CC
Federal Lands:
Synonymy:
References: Bowman 2000
Authors: ECS **Confidence:** 3 **Identifier:** CEGL006610

V.A.5.N.k.18. PANICUM HEMITOMON SEASONALLY FLOODED TEMPERATE HERBACEOUS ALLIANCE

Maidencane Seasonally Flooded Temperate Herbaceous Alliance

PANICUM HEMITOMON - PANICUM VERRUCOSUM HERBACEOUS VEGETATION

Maidencane - Warty Panicgrass Herbaceous Vegetation
Panicgrass Pondshore **G? (97-08-28)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Open Ponds and Marshes (345-05; n/a)

Concept: This seasonally flooded, Coastal Plain wetland occurs in small topographically isolated basins on the central Atlantic Coastal Plain. This vegetation usually occurs on the relatively higher, outer margin of the basin, occurring on loamy sands. *Panicum hemitomon* is the dominant species, often occurring in monotypic stands. Associates that may occur at low cover include *Cladium mariscoides, Dulichium arundinaceum, Panicum verrucosum, Dichanthelium spretum (= Panicum spretum), Carex striata, Juncus repens*, and *Eleocharis quadrangulata*. Occasional seedlings of *Liquidambar styraciflua, Acer rubrum*, and *Diospyros virginiana* also may occur.
Comments:
Range:
States/Provinces: DE:S?, MD:S?, NJ:S1S2
TNC Ecoregions: 58:C, 62:C
USFS Ecoregions: 232A:CC, 232B:CC
Federal Lands:
Synonymy:
References: Berdine and Gould 1999, Bowman 2000, Breden et al. 2001
Authors: ECS **Confidence:** 3 **Identifier:** CEGL006338

V.A.5.N.k.1. PANICUM VIRGATUM SEASONALLY FLOODED HERBACEOUS ALLIANCE
Switchgrass Seasonally Flooded Herbaceous Alliance

(MORELLA CERIFERA) - PANICUM VIRGATUM - SPARTINA PATENS HERBACEOUS VEGETATION
(Wax-myrtle) - Switchgrass - Saltmeadow Cordgrass Herbaceous Vegetation
Interdune Switchgrass Brackish Depression **G? (97-12-01)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Interdune Herbaceous Wetlands (240-20; n/a)

Concept: This medium-tall grassland association occurs in seasonally flooded basins, or interdunal swales, landward of maritime backdunes along the mid-Atlantic coast. The water table is at or close to the surface in the spring. Freshwater maintains these depressions as saturated or seasonally flooded and somewhat poorly drained. The community is generally strongly dominated by *Panicum virgatum* but can be variable in its expression. Associated species include *Spartina patens, Juncus canadensis, Solidago sempervirens, Eleocharis palustris, Toxicodendron radicans, Linum medium, Carex longii*, and *Euthamia caroliniana (= Euthamia tenuifolia).* This community is typically dominated by 40-85% cover of *Panicum virgatum* and occurs in larger interdunal depressions (up to one-half hectare). Variability occurs in the cover of *Panicum virgatum* and the richness of associated species. When *Panicum virgatum* is not as dense, it is most often associated with an even mixture of *Schoenoplectus pungens (= Scirpus pungens)* or *Spartina patens*. In some cases, *Morella cerifera (= Myrica cerifera)* or *Baccharis halimifolia* will constitute less than 10% shrub cover, but shrub coverage is usually much less or none, and other herbs codominate. Soils are characterized by a shallow organic layer (usually a few centimeters in depth) overlying loamy sand or sand. The range of this vegetation is poorly known due to the low confidence of the classification. The vegetation is similar in total floristic composition to *Morella cerifera - Vaccinium corymbosum* Shrubland (CEGL003906), but shrubs are generally lacking or at very low cover, and grasses are much more abundant. The community apparently occurs in New Jersey, Delaware, Maryland, and may extend to North Carolina, but the full range will require further study.
Comments: This association is very similar floristically to *Panicum virgatum - Spartina patens* Herbaceous Vegetation (CEGL006150); more data are needed.
Range: The community apparently occurs in New Jersey, Delaware, Maryland, and may extend to North Carolina, but the full range will require further study.
States/Provinces: CT:S?, DE:S?, MD:S?, NC:S2?, NJ:S?, VA:S?
TNC Ecoregions: 57:?, 58:C, 62:C
USFS Ecoregions: 232Aa:CCC, 232Bt:CCC, 232Bz:CCC, 232Ci:C??
Federal Lands: NPS (Assateague Island)
Synonymy: Fresh marsh community (Hill 1986) B. in part, Mesic shrub community (Higgins et al. 1971) B. in part, Freshwater marsh (Fender 1937) B. in part, *Panicum virgatum* Wetland Association (Heckscher et al. 1995) B. in part, Maritime Wet Grassland (Switchgrass Subtype) (Schafale 2000)
References: Berdine 1998, Bowman 2000, Breden et al. 2001, Fender 1937, Fleming 2001, Fleming et al. 2001, Heckscher et al. 1995, Higgins et al. 1971, Hill 1986, Metzler and Barrett 2001, Schafale 2000, Schafale and Weakley 1990, Sneddon et al. 1996
Authors: ECS **Confidence:** 3 **Identifier:** CEGL004129

V.A.5.N.k.23. RHYNCHOSPORA SPP. - PANICUM (RIGIDULUM, VERRUCOSUM) - RHEXIA VIRGINICA SEASONALLY FLOODED HERBACEOUS ALLIANCE
Beaksedge species - (Redtop Panicgrass, Warty Panicgrass) - Virginia Meadow-beauty Seasonally Flooded Herbaceous Alliance

LEERSIA HEXANDRA - (PANICUM VERRUCOSUM, SCLERIA RETICULARIS) HERBACEOUS VEGETATION [PROVISIONAL]
Southern Cutgrass - (Warty Panicgrass, Netted Nutrush) Herbaceous Vegetation
Small Depression Pond (Cutgrass Prairie Type) **G2G3 (03-04-03)**

Concept: This depression pond type covers examples which are typically found in small, flat Carolina bays or other depressions with loamy soils and a hydroperiod slightly shorter than other marsh types. The stands of vegetation are dominated by or have a substantial component of *Leersia hexandra*. The vegetation varies dramatically in response to rainfall cycles. In wetter periods, *Leersia hexandra* dominates more strongly, while in drier times *Panicum verrucosum* and *Scleria reticularis* are also abundant. In long droughts, *Panicum hemitomon* and various woody species may invade. Other species

found in Maryland at low cover include *Panicum spretum, Juncus repens,Fimbristylis autumnalis,* and *Rhynchospora macrostachya.*
Comments: The Cutgrass Prairie Type is distinguished by the dominance or codominance of *Leersia hexandra* during wet periods and a continued substantial presence of it during droughts. This type should generally not be classified in the same depression as other emergent types. Nifong (1998) emphasized the successional relationships between the three of his associations that are included in this type, suggesting that they are different phases that can occur in the same site at different times in normal climatic cycles.
Range: These seasonally flooded upland depressions occur in the Inner Coastal Plain of North Carolina and discontinuously north to the Maryland Outer Coastal Plain.
States / Provinces: MD:S?, NC:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232Bz:CCC
Federal Lands:
Synonymy:
- *Leersia* Prairie (2.0.1) (Nifong 1998)
- *Pinus taeda/Panicum hemitomon/Leersia* "successional prairie" (2.0.3) (Nifong 1998)
- *Leersia/Panicum verrucosum* Prairie (2.0.2) (Nifong 1998)
- *Leersia hexandra-(Panicum verrucosum, Scleria reticularis)* HV (Schafale pers. comm.)

References: Berdine and Gould 1999, Nifong 1998, Schafale pers. comm.
Authors: M.P. Schafale **Confidence:** 2 **Identifier:** CEGL004047

SACCHARUM GIGANTEUM - (DICHANTHELIUM SPRETUM, PANICUM VERRUCOSUM) HERBACEOUS VEGETATION
Giant Plumegrass - (Eaton's Witchgrass, Warty Panicgrass) Herbaceous Vegetation
Delmarva Bay Tall Grassland **G1G2 (00-04-17)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Emergent Ponds and Marshes (345-30; n/a)

Concept: This seasonally flooded, Coastal Plain wetland occurs on the central Atlantic Coastal Plain in topographically defined basins. This vegetation occurs on the relatively higher, outer margin of the basin. The substrate is a thin organic horizon overtopping deep sandy loam. The dominant species are *Saccharum giganteum, Panicum verrucosum, Dichanthelium spretum (= Panicum spretum),* and *Fimbristylis autumnalis*. Other associates include *Polygonum hydropiperoides, Panicum rigidulum, Scirpus cyperinus, Proserpinaca pectinata, Rhynchospora corniculata, Juncus repens, Rhexia virginica, Scleria reticularis, Carex striata, Woodwardia virginica, Oldenlandia uniflora*, and *Triadenum virginicum.*
Comments:
Range:
States/Provinces: MD:S?, VA?
TNC Ecoregions: 58:C
USFS Ecoregions: 232B:CC
Federal Lands:
Synonymy:
References: Berdine and Gould 1999, Fleming et al. 2001
Authors: ECS **Confidence:** 1 **Identifier:** CEGL006609

V.A.5.N.k.25. SCIRPUS CYPERINUS SEASONALLY FLOODED HERBACEOUS ALLIANCE
Woolgrass Bulrush Seasonally Flooded Herbaceous Alliance

SCIRPUS CYPERINUS SEASONALLY FLOODED HERBACEOUS VEGETATION
Woolgrass Bulrush Seasonally Flooded Herbaceous Vegetation
Woolgrass Marsh **G? (97-12-01)**
Ecological Group (SCS;MCS): Northern Marshes (490-20; n/a)

Concept: Seasonally flooded marshes dominated or characterized by *Scirpus cyperinus.* Composition is variable. Associates include *Glyceria* spp., *Thelypteris palustris,* as well as other species of *Scirpus* including *Scirpus microcarpus (= Scirpus rubrotinctus)* and *Scirpus atrovirens.*
Comments:
Range:

States/Provinces: CT:S?, DE:S?, MA:S4, MD?, ME:S5, NH:S?,S?, NJ:S?, NY:S5, PA:S?, RI:S?, VA:S?, VT:S4, WV:S?
TNC Ecoregions: 57:?, 58:C, 60:?, 61:C, 62:C, 64:C
USFS Ecoregions: 232:C
Federal Lands: USFWS (Chincoteague)
Synonymy: Shallow emergent marsh (Cowardin et al. 1979)
References: Breden et al. 2001, Cowardin et al. 1979, Fike 1999, Gawler 2002
Authors: ECS **Confidence:** 3 **Identifier:** CEGL006349

V.A.5.N.k.29. SPARTINA PATENS SEASONALLY FLOODED HERBACEOUS ALLIANCE
Saltmeadow Cordgrass Seasonally Flooded Herbaceous Alliance

SPARTINA PATENS - ELEOCHARIS PARVULA HERBACEOUS VEGETATION
Saltmeadow Cordgrass - Dwarf Spikerush Herbaceous Vegetation
Northeastern Atlantic Brackish Interdunal Swale **G? (97-12-01)**
Ecological Group (SCS;MCS): Virginian Zone Tidal Aquatic Vegetation (201-20; n/a)
Atlantic and Gulf Coast Interdune Herbaceous Wetlands (240-20; n/a)

Concept: This brackish, interdunal swale and overwash community of the northeastern Atlantic coast occurs in low areas behind primary or secondary sand dunes. The substrate is sand with little or no organic accumulation. The water source for this wetland community is variable, including seasonally high groundwater table, salt spray, and sporadic tidal overwash, resulting in widely variable salinity levels. The dominant species is generally *Spartina patens*, but it can be *Eleocharis parvula, Schoenoplectus pungens (= Scirpus pungens), Cyperus polystachyos*, and/or *Juncus articulatus*. Associated species depend on salinity and hydrology of a site and can include *Leptochloa fusca ssp. fascicularis (= Diplachne maritima), Schoenoplectus maritimus (= Scirpus maritimus), Juncus ambiguus (= Juncus bufonius var. halophila), Juncus scirpoides, Ptilimnium capillaceum, Rumex maritimus, Symphyotrichum subulatum (= Aster subulatus), Chenopodium rubrum, Pluchea odorata, Hibiscus moscheutos ssp. moscheutos (= Hibiscus palustris), Polygonum ramosissimum, Triglochin maritima, Panicum virgatum, Schoenoplectus robustus*, and *Argentina anserina (= Potentilla anserina)*. *Iva frutescens* and *Baccharis halimifolia* may occur on hummocks within the swale. Mats of blue-green and/or brown algae can proliferate across the soil surface.
Comments: This association is similar to coastal salt pond vegetation, *Schoenoplectus pungens - Eleocharis parvula* Herbaceous Vegetation (CEGL006398).
Range: This association is currently described from Maryland, New Jersey, New York, Massachusetts, and New Hampshire. It likely occurs in other states.
States/Provinces: MA:S1, MD:S?, NH:S2, NJ:S1S2, NY:S1S2, VA?
TNC Ecoregions: 57:?, 58:C, 62:C
USFS Ecoregions: 221Ac:CCC, 221Ak:CCC, 232Aa:CCC, 232Bz:CCC
Federal Lands: NPS (Fire Island)
Synonymy: Overwash Community (Lea 2002b), Coastal interdunal marsh/swale (Rawinski 1984)
References: Breden et al. 2001, Edinger et al. 2002, Lea 2002b, Lundgren 1998, Rawinski 1984, Reschke 1990, Sneddon and Lundgren 2001, Sperduto 2000b, Swain and Kearsley 2001
Authors: D. Hunt, mod. S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006342

V.A.5.N.l. Semipermanently flooded temperate or subpolar grassland

V.A.5.N.l.2. ELEOCHARIS SPP. - ERIOCAULON AQUATICUM SEMIPERMANENTLY FLOODED HERBACEOUS ALLIANCE
Spikerush species - Seven-angle Pipewort Semipermanently Flooded Herbaceous Alliance

ELEOCHARIS FLAVESCENS - XYRIS DIFFORMIS HERBACEOUS VEGETATION
Yellow Spikerush - Bog Yellow-eyed-grass Herbaceous Vegetation
Deep Muck Coastal Plain Pond **G? (97-12-01)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Open Ponds and Marshes (345-05; n/a)

Concept: Low, graminoid-dominated vegetation of deep muck often associated with Coastal Plain ponds. Characteristic species include *Eleocharis flavescens, Juncus pelocarpus, Fimbristylis autumnalis, Rhynchospora scirpoides (= Psilocarya scirpoides), Xyris difformis,* as well as occasional individuals of aquatic species such as *Nymphaea odorata*. 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.
Comments: This vegetation is described from Delaware, where it was seen as floating mats in an area where impoundments may have altered the hydrology. This association (if the classification is confirmed) has been noted to occur on Long Island, New York and Cape Cod, Massachusetts as well as in the Connecticut River Valley in Massachusetts
Range:
States/Provinces: DE:S?, MA:S2, NY?
TNC Ecoregions: 58:?, 61:C, 62:C
USFS Ecoregions: 221Ab:PPP, 221Af:PPP, 232Aa:CCP, 232Ac:CCC
Federal Lands:
Synonymy: New England coastal plain pondshore (Rawinski 1984)
References: Rawinski 1984, Swain and Kearsley 2001
Authors: ECS **Confidence:** 2 **Identifier:** CEGL006400

V.A.5.N.l.9. TYPHA (ANGUSTIFOLIA, LATIFOLIA) - (SCHOENOPLECTUS SPP.) SEMIPERMANENTLY FLOODED HERBACEOUS ALLIANCE

(Narrowleaf Cattail, Broadleaf Cattail) - (Clubrush species) Semipermanently Flooded Herbaceous Alliance

TYPHA (ANGUSTIFOLIA, LATIFOLIA) - (SCHOENOPLECTUS SPP.) EASTERN HERBACEOUS VEGETATION

(Narrowleaf Cattail, Broadleaf Cattail) - (Clubrush species) Eastern Herbaceous Vegetation
Eastern Cattail Marsh **G5 (97-12-01)**
Ecological Group (SCS;MCS): Eastern Emergent Marshes (480-20; 1.4.1.2)

Concept: These tall emergent marshes are common throughout the northeastern United States and adjacent Canadian provinces. They occur in permanently flooded basins, often part of a larger wetland mosaic and associated with lakes, ponds, or slow-moving streams. The substrate is muck over mineral soil. Lacustrine cattail marshes typically have a muck-bottom zone bordering the shoreline, where cattails are rooted in the bottom substrate, and a floating mat zone, where the roots grow suspended in a buoyant peaty mat. Tall graminoids dominate the vegetation; scattered shrubs are often present (usually totaling less than 25% cover), and are frequently shorter than the graminoids. Trees are absent. Bryophyte cover varies, and is rarely extensive; bryophytes are mostly confined to the hummocks. *Typha angustifolia, Typha latifolia*, or their hybrid *Typha X glauca* dominate, either alone or in combination with other tall emergent marsh species. Associated species vary widely; sedges such as *Carex aquatilis, Carex lurida, Carex rostrata, Carex pellita (= Carex lanuginosa), Scirpus cyperinus,* and bulrushes such as *Schoenoplectus americanus (= Scirpus americanus)* and *Schoenoplectus acutus (= Scirpus acutus)* occur, along with patchy grasses such as *Calamagrostis canadensis*. Broad-leaved herbs include *Thelypteris palustris, Asclepias incarnata, Calla palustris, Impatiens capensis, Sagittaria latifolia, Scutellaria lateriflora, Sparganium eurycarpum,* and *Verbena hastata*. Floating aquatics, such as *Lemna minor,* may be common in deeper zones. Shrub species vary across the geographic range of this type; in the northern part of its range, *Myrica gale, Ilex verticillata,* and *Spiraea alba* are common. The invasive exotic plants *Lythrum salicaria* and *Phragmites australis* may be abundant in parts of some occurrences. This association is distinguished from other northeastern freshwater marshes by the strong dominance of *Typha* spp.
Comments: *Typha angustifolia* can grow in deeper water compared to *Typha latifolia*, although both species reach maximum growth at a water depth of 50 cm (Grace and Wetzel 1981). *Typha* often occurs in pure stands and can colonize areas recently exposed by either natural or human causes.
Range:
States/Provinces: CT:S?, DE:S?, MA:S4, MD:S?, ME:S5, NC:S?, NH:S4?, NJ:S5, NY:S5, PA:S?, RI:S?, VA:S?, VT:S4, WV:S?
TNC Ecoregions: 48:C, 52:C, 58:P, 59:C, 60:C, 61:C, 62:C, 63:C, 64:C
USFS Ecoregions: 212Cb:CCC, 212Da:CCC, 212Db:CCC, 212Fa:CCC, 212Fb:CCC, 212Fc:CCC, 212Fd:CCC, 212Ga:CCC, 212Gb:CCC, 221Ae:CCP, 221Al:CCC, 221Ba:CCP, 221Bb:CCC, 221Bc:CCP, 221Bd:CCC, 222:C, 231:C, M212A:CP, M212B:CP, M212C:CP, M212D:CC, M212Ea:CCC, M212Eb:CCC, M221Aa:CCC, M221Ab:CCC, M221Ac:CCC, M221Ad:CCC, M221Ba:CCC, M221Bb:CCC, M221Bc:CCC, M221Bd:CCC, M221Be:CCC, M221Bf:CCC, M221Da:CCC, M221Db:CCP, M221Dc:CCP, M221Dd:CCP

Federal Lands: NPS (Acadia)
Synonymy: Robust Emergent Marsh (Breden 1989), Cattail marsh (CAP pers. comm. 1998), Southern New England nutrient-poor streamside/lakeside marsh (Rawinski 1984), Southern New England nutrient-rich streamside/lakeside marsh (Rawinski 1984), Cattail Marsh (Thompson 1996), Palustrine Narrow-leaved Persistent Emergent Wetland, Permanently Flooded (PEM5H) (Cowardin et al. 1979)
References: Breden 1989, Breden et al. 2001, CAP pers. comm. 1998, Cowardin et al. 1979, Edinger et al. 2002, Fike 1999, Gawler 2002, Grace and Wetzel 1981, Metzler and Barrett 2001, Northern Appalachian Ecology Working Group 2000, Rawinski 1984, Sperduto 2000b, Swain and Kearsley 2001, Thompson 1996, Thompson and Sorensen 2000
Authors: S.C. Gawler, ECS **Confidence:** 3 **Identifier:** CEGL006153

V.A.5.N.m. Saturated temperate or subpolar grassland

V.A.5.N.m.1. CLADIUM MARISCOIDES SATURATED HERBACEOUS ALLIANCE
Twig-rush Saturated Herbaceous Alliance

CLADIUM MARISCOIDES - DROSERA INTERMEDIA - ELEOCHARIS ROSTELLATA HERBACEOUS VEGETATION
Twig-rush - Water Sundew - Beaked Spikerush Herbaceous Vegetation
Sea Level Fen **G1 (97-11-14)**
Ecological Group (SCS;MCS): Atlantic Coast Sea-level Fens (202-80; n/a)

Concept: This association comprises "sea-level fens" of the central and north Atlantic coast. These are small-patch communities occurring at the edge of salt marshes adjacent to sandy or gravelly slopes where there is acidic, oligotrophic groundwater seepage. Although its association with salt marshes is diagnostic, it is only infrequently influenced by salt or brackish overwash during unusually high tides. The physiognomy is dominated by herbs, occasionally with some scattered shrubs or short trees. The diagnostic species include *Cladium mariscoides, Rhynchospora alba, Eleocharis rostellata, Drosera intermedia*, and *Schoenoplectus pungens (= Scirpus pungens)*. Other associated species may include *Symphyotrichum novi-belgii (= Aster novi-belgii), Carex exilis, Carex hormathodes, Carex leptalea, Eleocharis fallax, Juncus canadensis, Juncus pelocarpus, Lysimachia terrestris, Rosa palustris, Vaccinium macrocarpon, Sanguisorba canadensis, Teucrium canadense*, and *Schoenoplectus americanus (= Scirpus americanus)* and *Eriocaulon decangulare* in the southern portion of the association range. Woody species occurring at low cover may include *Morella pensylvanica (= Myrica pensylvanica), Baccharis halimifolia, Juniperus virginiana, Iva frutescens*, and in the southern portion of the range, *Morella cerifera (= Myrica cerifera).* Substrate is sedgy peat over sand or gravel.
Comments:
Range: This type occurs from Virginia to Massachusetts, and possibly New Hampshire.
States/Provinces: CT:S?, DE:S1, MA:S1, MD:S?, NH?, NJ:S?, NY:S1, RI:S?, VA:S1
TNC Ecoregions: 58:C, 62:C
USFS Ecoregions: 221Ab:CCC, 221Ac:CC?, 221Ad:CCC, 221Ak:CC?, 232Aa:CCC, 232Ab:CC?, 232Bx:CCC, 232Bz:CCC
Federal Lands:
Synonymy: *Myrica cerifera / Eriocaulon decangulare - Eleocharis rostellata* Sparse Shrubland (Grossman et al. 1994)
References: Berdine 1998, Bowman 2000, Breden et al. 2001, Edinger et al. 2002, Fleming 2001, Fleming et al. 2001, Grossman et al. 1994, Ludwig 1995, Metzler and Barrett 2001, Reschke 1990, Swain and Kearsley 2001
Authors: C. Ludwig, mod. S.L. Neid, ECS **Confidence:** 1 **Identifier:** CEGL006310

V.A.5.N.n. Tidal temperate or subpolar grassland

V.A.5.N.n.300. ACORUS CALAMUS TIDAL HERBACEOUS ALLIANCE
Sweetflag Tidal Herbaceous Alliance

ACORUS CALAMUS TIDAL HERBACEOUS VEGETATION
Sweetflag Tidal Herbaceous Vegetation
Sweetflag Tidal Marsh **G? (02-05-10)**

Concept: This is an association of tidal freshwater marsh dominated by *Acorus calamus* that occurs in fresh to oligohaline reaches of tidal rivers along the Atlantic coast from Massachusetts to Virginia. This association is best developed in higher, irregularly flooded elevations within freshwater tidal marshes but can occur in areas with a wide tidal range. Substrate is generally fine-particled, but varies from silts and silty mucks to peats and sands. The setting within the tidal marsh tends to be poorly drained; tidal flooding is ponded and of longer duration than other areas. *Acorus calamus* is dominant, generally comprising at least 50% cover, over extensive patches within the interior of high marshes. Associated species are variable and can include *Schoenoplectus fluviatilis, Peltandra virginica, Sagittaria latifolia, Polygonum punctatum*, and *Impatiens capensis*. Species that can occasionally occur include *Pontederia cordata, Zizania aquatica, Leersia oryzoides, Typha latifolia, Polygonum arifolium, Bidens coronata, Hibiscus moscheutos*, and other *Schoenoplectus* spp. *Murdannia keisak* has been noted in the southern portion of the range. *Acorus calamus* is conspicuously dominant in spring and early summer. Later in the season, culms tend to lodge and form mats and be overtopped by other species.
Comments: This vegetation is considered a modified type by the Delaware Natural Heritage Program. Although the native status of *Acorus calamus* has been debated, North American specimens are apparently sterile triploids introduced from Europe (Coulling 2002).
Range: Currently described from Massachusetts to Virginia.
States/Provinces: CT:S?, DE:S?, MA:S1, MD:S4?, NJ:S?, VA:S?
TNC Ecoregions: 58:C, 62:C
USFS Ecoregions: 221Ad:CCC, 221Af:CCP, 221Ak:CCC, 232Ac:CCC, 232Ad:CCP, 232Br:CCC, 232Bt:CCC, 232Bx:CCC
Federal Lands:
Synonymy:
References: Barrett 1989, Barrett 1994, Caldwell 1990, Coulling 2002, Fleming 2001, Harrison 2001, McCormick and Ashbaugh 1972, Metzler and Barrett 2001, Odum et al. 1984
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006833

V.A.5.N.n.301. CAREX HYALINOLEPIS TIDAL HERBACEOUS ALLIANCE
Shoreline Sedge Tidal Herbaceous Alliance

CAREX HYALINOLEPIS TIDAL HERBACEOUS VEGETATION
Shoreline Sedge Tidal Herbaceous Vegetation
Shoreline Sedge Tidal Marsh **G? (02-05-10)**

Concept: This oligohaline marsh, dominated by *Carex hyalinolepis*, forms adjacent to main tidal river channels in the Chesapeake Bay. *Carex hyalinolepis* forms nearly monospecific stands. Associated species occurring with low cover include *Hibiscus moscheutos ssp. moscheutos, Kosteletzkya virginica*, and *Spartina cynosuroides*.
Comments: On the Rapphannock River (White Marsh) a sampled stand is codominated by *Carex hyalinolepis* and *Acorus calamus* and supports much greater diversity, but analysis suggests that this plot represents a compositionally different, possibly ecotonal community type. *Carex hyalinolepis* forms extensive dominance patches in the understories of tidal and wind-tidal oligohaline *Taxodium distichum* woodlands along the James, North Landing and Northwest rivers. A similar herb stratum has been documented from an apparently seasonally flooded *Acer rubrum - Pinus taeda* forest adjacent to a tidal marsh along a tributary of Back River in James City County (Coulling 2002).
Range: This community type has been documented only from the Pamunkey River (Hill and Lee marshes) in Virginia.
States/Provinces: MD:S?, VA:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232Br:CCC, 232Bt:CCC
Federal Lands:
Synonymy: *Carex hyalinolepis* Tidal Herbaceous Vegetation (Coulling 2002)
References: Coulling 2002, Harrison pers. comm.
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006177

V.A.5.N.n.4. ELEOCHARIS FALLAX - ELEOCHARIS ROSTELLATA TIDAL HERBACEOUS ALLIANCE

Creeping Spikerush - Beaked Spikerush Tidal Herbaceous Alliance

ELEOCHARIS FALLAX - ELEOCHARIS ROSTELLATA - SCHOENOPLECTUS AMERICANUS - SAGITTARIA LANCIFOLIA HERBACEOUS VEGETATION

Creeping Spikerush - Beaked Spikerush - Chairmaker's Bulrush - Lanceleaf Arrowhead Herbaceous Vegetation
Atlantic Coast Tidal Oligohaline Spikerush Marsh **G1 (00-01-23)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Oligohaline and Fresh Tidal Marshes (202-40; n/a)

Concept: This association represents oligohaline tidal marshes of the Atlantic coast dominated by *Eleocharis fallax, Eleocharis rostellata, Schoenoplectus americanus (= Scirpus americanus), Pontederia cordata, Sagittaria lancifolia*, and others. Other characteristic species can include *Centella erecta, Eriocaulon decangulare, Ludwigia alata, Cyperus haspan, Cladium mariscoides, Sabatia dodecandra, Eryngium aquaticum, Proserpinaca palustris, Ludwigia alata*, and *Juncus* spp. Sites are peaty, oligohaline marshes, well away from tidal guts, and have been called 'spikerush lawns.' Salinity is 0.5-5 ppt.
Comments: Marshes in North Carolina and Virginia have been described as having somewhat different species composition. It is not clear, though, that the differences are significant. They are grouped together here at this time.
Range:
States/Provinces: DE:S1, MD:S?, NC:S3, VA:S?
TNC Ecoregions: 57:C, 58:C
USFS Ecoregions: 232Bz:CCC, 232Ch:CCC
Federal Lands:
Synonymy: Tidal Freshwater Marsh (Oligohaline Low Marsh Subtype) (Schafale 2000), *Eleocharis fallax - Sagittaria lancifolia - Polygonum punctatum* Tidally Flooded Herbaceous Vegetation (Fleming and Moorhead 1998), *Eleocharis rostellata - Eleocharis fallax - Cladium mariscoides* Tidally Flooded Herbaceous Vegetation (Fleming and Moorhead 1998)
References: Bowman 2000, Fleming 1998, Fleming and Moorhead 1998, Fleming et al. 2001, Frost et al. 1990, Harrison 2001, Schafale 2000, Schafale and Weakley 1990
Authors: SCS **Confidence:** 1 **Identifier:** CEGL004628

ELEOCHARIS ROSTELLATA - SPARTINA PATENS HERBACEOUS VEGETATION

Beaked Spikerush - Saltmeadow Cordgrass Herbaceous Vegetation
Spikerush Lawn Tidal Marsh **G? (00-04-17)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Salt and Brackish Tidal Marshes (202-30; n/a)

Concept: This association is an irregularly flooded brackish marsh occurring as a narrow band in the transition zone between high salt marsh and salt shrub vegetation. Groundwater seepage dilutes tidal floodwaters. It occurs on peat or muck of variable depth over sand. It is heavily dominated by *Eleocharis rostellata*, growing in association with *Spartina patens, Schoenoplectus pungens (= Scirpus pungens), Typha angustifolia, Distichlis spicata, Juncus gerardii, Cladium mariscoides, Eleocharis fallax, Lythrum lineare, Samolus valerandi ssp. parviflorus (= Samolus parviflorus)*, and *Galium tinctorium*, and *Centella erecta* and *Fimbristylis castanea* in the southern extent of the range. *Baccharis halimifolia* and *Iva frutescens* can occur sporadically. It is currently described from barrier islands along the Mid- and North Atlantic Coast.
Comments:
Range: This association occurs along the Atlantic Coast from Virginia and Maryland, and northward to New York.
States/Provinces: MD:S?, NY:S3S4, VA:S?
TNC Ecoregions: 58:C, 62:C
USFS Ecoregions: 232Aa:CCC, 232Br:CCC, 232Bx:CCP, 232Bz:CCC, 232C:CC
Federal Lands: NPS (Assateague Island, Fire Island); USFWS (Chincoteague)
Synonymy:
References: Bowman 2000, Coulling 2002, Edinger et al. 2002, Sneddon and Lundgren 2001
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006611

V.A.5.N.n.5. JUNCUS ROEMERIANUS TIDAL HERBACEOUS ALLIANCE

Black Needlerush Tidal Herbaceous Alliance

JUNCUS ROEMERIANUS HERBACEOUS VEGETATION
Black Needlerush Herbaceous Vegetation
Needlerush High Marsh **G5 (01-03-29)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Salt and Brackish Tidal Marshes (202-30; n/a)

Concept: This broad-ranging *Juncus roemerianus* salt marsh community is characterized by discrete, dense patches usually strongly dominated by *Juncus roemerianus* with few other associates. As currently defined, this community occurs in a variety of settings in different marsh regions including both "high" and "low" marshes. For example, large expanses of this type are found in northwest Florida at or below the mean high water line. In other regions it may be found as isolated patches within high salt marsh, or may dominate vast areas at the heads of tidal creeks. In general, the prevalence of *Juncus roemerianus* in Florida indicates the prevalence of high marshes (above mean high water). Its hydrology is generally irregularly tidally flooded.
Comments: This community is common on the southeastern seaboard, but large undisturbed areas are of high conservation concern. Although this community exhibits little floristic variation across its range, the associated animal species may vary to a greater extent. Further analysis may suggest a further subdivision of this community; two variants are recognized in Virginia, one depauperate lunar tidal type and another more species diverse wind-tidal type. This community may not occur west of Texas.

Juncus roemerianus was found to be lower in elevation than the associated *Spartina patens* type and mixed type (Cooper and Waits 1973).
Range: This community is widespread along the Atlantic and Gulf coasts of North America ranging from Delaware south to Florida, and west to Texas.
States/Provinces: AL:S2S3, DE:S2S3, FL:S?, GA:S?, LA?, MD:S4, MS:S3, NC:S5, SC:S?, TX:S4, VA:S?
TNC Ecoregions: 31:C, 53:C, 54:C, 55:C, 56:C, 57:C, 58:C
USFS Ecoregions: 231Fb:CCC, 232Ad:CCC, 232Br:CCC, 232Bx:CCC, 232Bz:CCC, 232Cb:CCC, 232Ce:CCC, 232Ch:CCC, 232Ci:CCC, 232Cj:CCC, 232Db:CCP, 232Dc:CCC, 232Dd:CCC, 232De:CCP, 232Eb:CCC, 232Ec:CC?, 232Ed:CCC, 232Gb:CCC, 255Da:CCP, 255Dc:CCC
Federal Lands: NPS (Assateague Island, Fort Pulaski); USFS (Croatan); USFWS (Anahuac, Big Boggy, Bon Secour, Brazoria, McFaddin, San Bernard, Texas Point)
Synonymy: Brackish Marsh (Needlerush Subtype) (Schafale 2000), Saline Marsh (Wieland 1994a) B. in part, Brackish Marsh (Wieland 1994b) B. in part, Salt marsh community (Hill 1986) B. Assateague Island., Salt marsh (Higgins et al. 1971) B. Assateague Island., *Spartina - Distichlis - Juncus* associes (Penfound 1952) B, *Juncus roemerianus* association of the low marsh (Adams 1963) =. North Carolina., *Juncus* type (Cooper and Waits 1973) =. North Carolina., Irregularly flooded salt marsh (Jenkins 1974) =. Chesapeake Bay., Lower high marsh (Stalter 1973a) =. South Carolina., Needlerush - saltmeadow type (Nicholson and Van Deusen 1954) =. Maryland., Needlerush Marsh. [common name], Smooth Cordgrass Series (Diamond 1993) B
References: Adams 1963, Bowman 2000, Cooper and Waits 1973, Diamond 1993, Eleuterius and Caldwell 1984, Eleuterius and Eleuterius 1979, Fleming et al. 2001, Hackney and de la Cruz 1981, Hackney and de la Cruz 1982, Harrison 2001, Higgins et al. 1971, Hill 1986, Jenkins 1974, Kruczynski et al. 1978, Lynch 1941, Montague and Wiegert 1990, Nelson 1986, Nicholson and Van Deusen 1954, Peet et al. 2002, Penfound 1952, Schafale 2000, Schafale and Weakley 1990, Smith 1996a, Stalter 1973a, Stalter 1973b, Stout 1984, Wieland 1994a, Wieland 1994b, Wieland 2000b
Authors: R.E. Evans, SCS **Confidence:** 1 **Identifier:** CEGL004186

V.A.5.N.n.6. PANICUM VIRGATUM TIDAL HERBACEOUS ALLIANCE
Switchgrass Tidal Herbaceous Alliance

PANICUM VIRGATUM - SPARTINA PATENS HERBACEOUS VEGETATION
Switchgrass - Saltmeadow Cordgrass Herbaceous Vegetation
Brackish Meadow **G? (97-12-01)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast High Tidal Marsh Grasslands (202-45; n/a)

Concept: This brackish meadow of the northern Atlantic coast occurs at the upland border of high salt marshes. It occurs on freely drained, shallow, sandy peat that is moist from upland seepage and brackish from irregular tidal flooding. Vegetation is dominated by *Panicum virgatum* and occasionally codominated by *Spartina patens*. Common associates can include *Schoenoplectus americanus, Solidago sempervirens, Teucrium canadense, Distichlis spicata, Carex silicea,* and *Juncus* spp. (*Juncus gerardii* in the north, *Juncus roemerianus* in the south). Additional species can include *Kosteletzkya virginica, Hibiscus moscheutos, Amaranthus cannabinus,* and *Typha* spp., especially in oligohaline situations. Shrubs may occur

sporadically, especially *Baccharis halimifolia, Morella pensylvanica (= Myrica pensylvanica), Prunus maritima*, and *Iva frutescens*. Vegetation can be quite diverse and is a mixture of freshwater and brackish species. This association is best developed in salt marshes with a gradual elevation gradient that lends itself to vegetation zonation. The diagnostic species of this association is *Panicum virgatum* in brackish settings near upland-marsh borders.
Comments: This association is similar in species composition to the herbaceous component of *Baccharis halimifolia - Iva frutescens / Spartina patens* Shrubland (CEGL003921). This association is less developed in the northern edge of its range (New Hampshire).
Range: This association occurs from New Hampshire to Delaware.
States/Provinces: CT:S?, DE:S3?, MA:S3,S1, MD:S?, NJ:S2S3, NY:S1S2, RI:S?, VA:S?
TNC Ecoregions: 58:C, 61:C, 62:C
USFS Ecoregions: 221Ab:CCC, 221Ac:CCC, 221Ad:CCC, 221Ak:CCC, 232Aa:CCC, 232Ab:CCC, 232Ac:CCC, 232Ad:CCC, 232Bx:CCC, 232Bz:CCC
Federal Lands: NPS (Assateague Island, Fire Island)
Synonymy: Salt marsh complex, upland border (Breden 1989), *Panicum virgatum* upland border (Nixon 1982), Salt Marsh (Rawinski 1984). formerly Southern New England and Gulf of Maine Salt Marshes., Brackish Tidal Marsh (Rawinski 1984). formerly Southern New England and Gulf of Maine., Fresh marsh (Hill 1986) B. Assateague Island., Mesic shrub community (Higgins et al. 1971) B. Assateague Island., Freshwater marsh (Fender 1937) B. New Jersey., *Panicum virgatum* Wetland Association (Heckscher et al. 1995) B. Delaware.
References: Bowman 2000, Breden 1989, Breden et al. 2001, Edinger et al. 2002, Enser 1999, Fender 1937, Harrison 2001, Heckscher et al. 1995, Higgins et al. 1971, Hill 1986, Hunt 2000, Lundgren et al. 2000, Metzler and Barrett 2001, Nixon 1982, Rawinski 1984, Sperduto 2000b, Swain and Kearsley 2001
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006150

V.A.5.N.n.7. PHRAGMITES AUSTRALIS TIDAL HERBACEOUS ALLIANCE
Common Reed Tidal Herbaceous Alliance

PHRAGMITES AUSTRALIS TIDAL HERBACEOUS VEGETATION
Common Reed Tidal Herbaceous Vegetation
Reed-grass Marsh **GW (97-11-22)**
Ecological Group (SCS;MCS): Semi-natural Wetland Herbaceous Vegetation (900-47; 8.0.0.5)

Concept: This community is a dense tall grassland indicative of disturbance. It occurs in a range of tidal wetland habitats from fresh to brackish in salinity. This community is a broadly defined reed-grass marsh. It is characterized by dense stands of *Phragmites australis*, a species which tends to grow in colonies of tall, stout, leafy plants often to the exclusion of all other vascular plant species. Associated species are highly variable, depending on the community that has been invaded. Spreading in large colonies, *Phragmites* eventually dominates disturbed areas at coverage up to 100%. More typically, though, scattered individuals of other species may occur, such as sparse *Morella cerifera (= Myrica cerifera)* shrubs, *Kosteletzkya virginica, Calystegia sepium, Boehmeria cylindrica, Typha angustifolia, Apocynum cannabinum, Rosa palustris, Polygonum* sp., and *Mikania scandens*. Vines of *Toxicodendron radicans* are also frequent, but typically occur at low cover. This community has a broad geographic range, including coastal areas of the eastern and southeastern United States and Canada.
Comments: Although *Phragmites australis* rhizomes have been noted in salt marsh sediments exceeding three thousand years in age (Niering and Warren 1977) and is thus a native component of salt marshes in some areas in North America, the growth of the species in its native condition was likely to have been significantly different than the dense monotypic stands that characterize this community in parts of its range today. The invasive, non-native strain has been labeled haplotype M (Saltonstall 2002). The presence of the *Phragmites australis* community in wetlands today generally indicates human-induced disturbance, either through direct habitat manipulation or through passive introduction of reproductive material to naturally disturbed substrates. Historically, without alteration, these sites would generally be more saline. In New England, *Phragmites* tends to invade behind artificial/man-made levees where regular salt input is blocked, making the sites more brackish and less saline than prior to levee construction and anthropogenic modification. In cases where *Phragmites australis* is a significant component of the vegetation but the vegetation retains sufficient species composition to retain its identity, the site is considered an unhealthy or degraded example of that original community. On the other hand, in cases where *Phragmites australis* cover is so high that native species have been excluded and the original community is no longer recognizable, the occurrence is then treated as an example of the V.A.5.N.n *Phragmites australis* Tidal Herbaceous Alliance (A.1477).
Range: This community has a broad geographic range, including coastal areas of the eastern and southeastern United States and Canada.

States/Provinces: AL:S?, CT:S?, DE:SW, FL:S?, GA:S?, LA:S?, MA:S1, MD:S?, ME:S?, MS:S?, NC:S?, NF?, NH:S?, NJ:S?, NS?, NY:S3S4, PA:S?, PE?, QC?, RI:S?, SC:S?, TX:S?, VA:S?
TNC Ecoregions: 53:C, 56:C, 57:C, 58:C, 62:C
USFS Ecoregions: 232A:CC, 232Bz:CCC, 232Ch:CCC, 232Ci:CCC, 232Dc:CCC
Federal Lands: NPS (Assateague Island); USFWS (Bon Secour)
Synonymy: Salt Marsh Complex (Breden 1989) B, *Phragmites australis* Association (Fleming 1998), *Phragmites australis* community (Metzler and Barrett 1992), *Phragmites australis* tidal marsh association (Clancy 1993b), Brackish Tidal Marsh (Rawinski 1984). formerly Southern New England and Gulf of Maine., Reed-grass Marsh. [common name]
References: Bowman 2000, Breden 1989, Clancy 1993b, Edinger et al. 2002, Fleming 1998, Harrison 2001, Metzler and Barrett 1992, Metzler and Barrett 2001, Nelson 1986, Niering and Warren 1977, Odum et al. 1984, Rawinski 1984, Saltonstall 2002, Schafale and Weakley 1990, Swain and Kearsley 2001
Authors: SCS **Confidence:** 1 **Identifier:** CEGL004187

V.A.5.N.n.100. SCHOENOPLECTUS AMERICANUS TIDAL HERBACEOUS ALLIANCE

Chairmaker's Bulrush Tidal Herbaceous Alliance

SCHOENOPLECTUS AMERICANUS - SPARTINA PATENS HERBACEOUS VEGETATION

Chairmaker's Bulrush - Saltmeadow Cordgrass Herbaceous Vegetation
Transitional Tidal Marsh **G? (00-04-17)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Salt and Brackish Tidal Marshes (202-30; n/a)

Concept: This brackish marsh occurs in wet depressions at the upper reaches of irregularly flooded tidal marshes of the mid-Atlantic coast. It occurs at the ecotone between low and high salt marsh zones. It is irregularly flooded, occurring just above the zone of regular tidal flooding, but is more frequently flooded than *Spartina patens*-dominated high marsh. This community is dominated by colonies of *Schoenoplectus americanus*, which often accounts for 40-75% of the total vegetation cover or codominant with *Spartina patens* at some sites. Associated species can include *Pluchea odorata, Juncus roemerianus, Spartina alterniflora, Spartina cynosuroides, Distichlis spicata,* and *Limonium carolinianum* plus *Typha* spp. and *Phragmites australis*. This community often grades into *Spartina patens*- or *Juncus roemerianus*-dominated high marsh landward or *Spartina alterniflora*- or *Spartina cynosuroides*-dominated low marsh seaward. This association is best developed where the elevation gradient across the marsh is more gradual, allowing for greater diversity of physical conditions of duration and frequency of flooding.
Comments: The relationship between this alliance and the similar *Spartina patens - (Distichlis spicata)* Tidal Herbaceous Alliance (A.1481) is not well understood. Dominance patterns are likely related to gradients in salinity and hydrology. *Schoenoplectus americanus* may dominate in areas with higher average water levels, lower salinities, and lower frequency of flooding than areas typically dominated by *Spartina patens.*
Range: This association is currently described from mid-Atlantic states of Delaware, Maryland and Virginia. It possibly extends south to Georgia.
States/Provinces: DE:S?, GA?, MD:S4, NC?, SC?, VA:S?
TNC Ecoregions: 56:?, 57:C, 58:C, 62:C
USFS Ecoregions: 232Ac:CCC, 232Br:CCC, 232Bx:CCC, 232Bz:CCC, 232Ch:CCC
Federal Lands:
Synonymy:
References: Bowman 2000, Fleming 2001, Fleming et al. 2001, Harrison 2001
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006612

V.A.5.N.n.8. SCHOENOPLECTUS PUNGENS TIDAL HERBACEOUS ALLIANCE

Threesquare Tidal Herbaceous Alliance

SCHOENOPLECTUS PUNGENS TIDAL HERBACEOUS VEGETATION

Threesquare Tidal Herbaceous Vegetation
Atlantic Coast Brackish Tidal Marsh **G? (97-12-01)**
Ecological Group (SCS;MCS): Atlantic Coast Rivershore - Tidal Salt Marshes (202-70; n/a)

Concept: This association occurs on fresh to brackish, mid-tidal, sandy/gravelly rivershores along the north and mid-Atlantic coast. It occurs in low areas where there is a longer duration of flooding. Wave and ice scour can have a significant

influence on the year-to-year appearance of the vegetation, which tends to be sparse. This vegetation often occurs in nearly pure stands of *Schoenoplectus pungens (= Scirpus pungens)* but can be intermixed with *Spartina alterniflora* or *Spartina cynosuroides* in more brackish areas. Species diversity tends to be low due to winter storm scour, but associates can include *Amaranthus cannabinus, Polygonum punctatum, Cyperus bipartitus (= Cyperus rivularis),* and *Bidens* spp. *Sagittaria graminea, Sagittaria latifolia, Eleocharis palustris (= Eleocharis smallii), Gratiola virginiana, Elatine americana, Isoetes riparia*, and *Cyperus bipartitus* can occur, but are absent in the northern part of the range. As the salinity decreases *Zizania aquatica* can also be an associate.
Comments: The nominal species has long been known as *Scirpus americanus.*
Range: This association occurs along the Atlantic coast from New Hampshire to Virginia.
States/Provinces: CT:S?, MA:S1, MD:S?, NH:S1S2,S?, NJ:S1S3, VA:S?
TNC Ecoregions: 57:C, 58:C, 62:C
USFS Ecoregions: 221Ad:CCC, 232Ad:CCC, 232Bt:CCC, 232Ch:CCC
Federal Lands:
Synonymy: *Scirpus* marsh community (brackish mid-tidal marsh border) (Barrett 1989), *Scirpus* complex zone (Metzler and Rosza 1982), Brackish intertidal marsh complex (Breden 1989), Brackish Tidal Marsh (Rawinski 1984). formerly Southern New England and Gulf of Maine.
References: Barrett 1989, Breden 1989, Breden et al. 2001, Caldwell 1990, Fleming 2001, Fleming et al. 2001, Metzler and Barrett 2001, Metzler and Rosza 1982, Rawinski 1984, Swain and Kearsley 2001
Authors: S.L. Neid, ECS **Confidence:** 3 **Identifier:** CEGL004188

V.A.5.N.n.1. SPARTINA ALTERNIFLORA TIDAL HERBACEOUS ALLIANCE

Saltmarsh Cordgrass Tidal Herbaceous Alliance

SCHOENOPLECTUS ROBUSTUS - SPARTINA ALTERNIFLORA HERBACEOUS VEGETATION

Alkali Bulrush - Saltmarsh Cordgrass Herbaceous Vegetation
Alkali Bulrush Brackish Marsh **G? (00-11-15)**
Ecological Group (SCS;MCS): Atlantic Coast Rivershore - Tidal Salt Marshes (202-70; n/a)

Concept: This brackish marsh occurs on tidal rivers of Virginia and possibly elsewhere. Dominant species are *Schoenoplectus robustus (= Scirpus robustus)* and *Spartina alterniflora*. Other associates may include *Spartina cynosuroides, Borrichia frutescens, Symphyotrichum tenuifolium (= Aster tenuifolius), Symphyotrichum novi-belgii var. novi-belgii (= Aster novi-belgii), Typha angustifolia, Rumex verticillatus, Pontederia cordata, Echinochloa walteri, Peltandra virginica, Amaranthus cannabinus, Polygonum punctatum*, and *Leersia oryzoides*. In general, this association is depauperate with few other associated species.
Comments: This association differs from *Spartina alterniflora - Lilaeopsis chinensis* Herbaceous Vegetation (CEGL004193) and *Spartina alterniflora - Amaranthus cannabinus* Herbaceous Vegetation (CEGL006417) in that it is distinctly brackish with *Schoenoplectus robustus* as the primary dominant species. *Spartina alterniflora - Lilaeopsis chinensis* Herbaceous Vegetation (CEGL004193) tends to occur on larger tidal rivers (i.e., Connecticut River, Delaware River). *Spartina alterniflora - Amaranthus cannabinus* Herbaceous Vegetation (CEGL006417) occurs in oligohaline habitat.
Range: Currently described only from Virginia (Mattaponi, Pamunkey, and York rivers).
States/Provinces: VA:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232Br:CCC
Federal Lands:
Synonymy:
References: Coulling pers. comm., Fleming 2001, Fleming et al. 2001
Authors: Chesapeake Bay Ecology Group, mod. S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006416

SPARTINA ALTERNIFLORA - AMARANTHUS CANNABINUS HERBACEOUS VEGETATION

Saltmarsh Cordgrass - Water-hemp Herbaceous Vegetation
Central Atlantic Brackish Marsh **G? (00-11-15)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Salt and Brackish Tidal Marshes (202-30; n/a)

Concept: This oligohaline brackish marsh occurs in the mid-tidal range of tidal rivers in Delaware and Maryland. The dominant species are *Spartina alterniflora* and *Amaranthus cannabinus*, with other associates, such as *Kosteletzkya virginica,*

Hibiscus moscheutos, Symphyotrichum subulatum (= Aster subulatus), Schoenoplectus robustus (= Scirpus robustus), Spartina patens, and *Atriplex prostrata*, occurring infrequently. The shrub *Baccharis halimifolia* sometimes occurs at low cover.
Comments: This association contains perennials with *Spartina alterniflora* as a strong component, whereas *Amaranthus cannabinus* Tidal Herbaceous Vegetation (CEGL006080) is dominated by annuals. However, the types may reflect seasonal variation within freshwater tidal marsh systems and be similar enough to warrant merging. *Spartina alterniflora - Lilaeopsis chinensis* Herbaceous Vegetation (CEGL004193) occurs along oligo- to mesohaline reaches of large tidal rivers (Delaware River, Connecticut River), whereas this association occurs along smaller tidal rivers and creeks.
Range: Currently described from Maryland and Delaware.
States/Provinces: DE:S?, MD:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232Bt:CCC
Federal Lands:
Synonymy:
References: Bowman 2000
Authors: P. Bowman, ECS **Confidence:** 2 **Identifier:** CEGL006417

SPARTINA ALTERNIFLORA - PTILIMNIUM CAPILLACEUM - POLYGONUM PUNCTATUM HERBACEOUS VEGETATION
Saltmarsh Cordgrass - Mock Bishopweed - Dotted Smartweed Herbaceous Vegetation
Mesohaline Seepage Marsh **G? (00-11-15)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Salt and Brackish Tidal Marshes (202-30; n/a)

Concept: This oligohaline to mesohaline marsh occurs in silty mud along meanders in tidal rivers and creeks where there is significant freshwater seepage. It is often adjacent to uplands. The taxonomic relationship of this type has not been fully assessed. The vegetation is diverse and is codominated by *Spartina alterniflora, Ptilimnium capillaceum*, and *Polygonum punctatum*. Other associates include *Pluchea odorata, Bidens coronata, Kosteletzkya virginica, Eleocharis parvula, Cyperus filicinus, Hibiscus moscheutos, Amaranthus cannabinus, Eleocharis palustris, Asclepias incarnata, Sium suave, Schoenoplectus tabernaemontani (= Scirpus tabernaemontani), Schoenoplectus americanus (= Scirpus americanus), Schoenoplectus robustus (= Scirpus robustus), Echinochloa walteri, Typha angustifolia, Peltandra virginica, Pontederia cordata, Lobelia cardinalis,* and *Sagittaria latifolia*.
Comments: The taxonomic relationship of this type has not been fully assessed. It differs from *Spartina alterniflora - Lilaeopsis chinensis* Herbaceous Vegetation (CEGL004193) and *Spartina alterniflora - Amaranthus cannabinus* Herbaceous Vegetation (CEGL006417) by having greater species diversity presumably from the freshwater seepage input.
Range: Currently described from Delaware and Maryland.
States/Provinces: DE:S?, MD:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232Bt:CCC, 232Bx:CCC
Federal Lands:
Synonymy:
References: Bowman 2000
Authors: P. Bowman, ECS **Confidence:** 3 **Identifier:** CEGL006418

SPARTINA ALTERNIFLORA / (ASCOPHYLLUM NODOSUM) ACADIAN/VIRGINIAN ZONE HERBACEOUS VEGETATION
Saltmarsh Cordgrass / (Yellow Tang) Acadian/Virginian Zone Herbaceous Vegetation
North Atlantic Low Salt Marsh **G5 (97-12-01)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Salt and Brackish Tidal Marshes (202-30; n/a)

Concept: This tall grassland dominated by *Spartina alterniflora* forms the low salt marsh of the north and mid-Atlantic coast. It is diurnally flooded by tides, occurring in the intertidal zone between mean high tide and mean sea level in protected inlets behind barrier beaches or in the seaward reaches of drowned river valleys. It forms a coarse peat over sandy substrate. The low salt marsh occurs elevationally between high marsh that occurs landward and subtidal communities that occur seaward. *Spartina alterniflora* is limited to the low marsh zone by interspecific competition and by moderate salinity; it can withstand longer submergence than other salt marsh grasses but still requires periodic exposure of the substrate. *Spartina alterniflora* forms nearly monotypic stands with little variation across the geographic range of the community. Tall form

Spartina alterniflora occurs adjacent to salt water and colonizes unvegetated flats. This association also grades into short form *Spartina alterniflora* landward. Associated species occur in low abundance and commonly include *Limonium carolinianum, Salicornia virginica, Salicornia bigelovii, Spergularia maritima, Spergularia canadensis,* and *Suaeda maritima*. Brown algae can form extensive mats at the bases of the grass culms, especially *Ascophyllum nodosum, Fucus vesiculosus, Enteromorpha* spp., and *Ulva* spp. Macroalgae associates may be sparse or absent at the southern edge of the range. This community occurs from Nova Scotia to Cape Hatteras, North Carolina. Low marshes at the northern edge of the geographic range are far less extensive in size than those farther south due to differences in geomorphology and time since last glaciation.
Comments: The northern limit of this type occurs where there is a slower accumulation of silt and corresponding absence of algal species (Chapman 1937). The southern limit corresponds with the southern limit of the Virginian province of the American Atlantic Temperate Region, a transitional area harboring animal species of both southern and northern affinities (Gosner 1979, Cowardin 1979). Southern occurrences, where *Ascophyllum nodosum* may be sparse or absent, are placed within this type because of the associated characteristic faunal assemblage, including *Uca pugnax, Littorina saxatilis, Littorina obtusata*, and *Brachidontes demissus.* Analogous low salt marsh associations in other geographic areas include *Spartina alterniflora* Carolinian Zone Herbaceous Vegetation (CEGL004191) and *Spartina alterniflora - Juncus roemerianus - Distichlis spicata* Louisianian Zone Salt Tidal Herbaceous Vegetation (CEGL004190) for the Atlantic Coast of the southeastern U.S. (Cape Hatteras, North Carolina, to Florida) and the Gulf Coast (Florida to Texas), respectively (see Cowardin 1979 for regional boundaries). *Spartina alterniflora - Lilaeopsis chinensis* Herbaceous Vegetation (CEGL004193) is a *Spartina alterniflora*-dominated association occurring in the mid-tidal range of tidal rivers that have a minimum tidal range of one meter.
Range: This association occurs along the Atlantic coastline from Nova Scotia and New Brunswick south to Cape Hatteras, North Carolina.
States/Provinces: CT:S?, DE:S5, MA:S3, MD:S5, ME:S4, NB:S?, NC:S5, NH:S?, NJ:S5, NS:S?, NY:S3S4, RI:S?, VA:S?
TNC Ecoregions: 57:C, 58:C, 62:C, 63:C
USFS Ecoregions: 212Cb:CCC, 212Db:CCC, 212Dc:CCC, 221Ab:CCC, 221Ac:CCC, 221Ad:CCC, 221Ak:CCC, 232Aa:CCC, 232Ab:CCC, 232Ac:CCC, 232Ad:CCC, 232Ae:CCC, 232Br:CCC, 232Bt:CCC, 232Bx:CCC, 232Bz:CCC, 232Ch:CCC, 232Ci:CCC
Federal Lands: NPS (Acadia, Assateague Island, Fire Island)
Synonymy: Salt marsh (Higgins et al. 1971) B. Assateague Island., Salt marsh community (Hill 1986) B. Assateague Island., Salt marsh complex, low marsh (Breden 1989). New Jersey., *Spartina alterniflora* salt marsh (Clancy 1993b). Delaware., Low salt marsh (Reschke 1990). New York., Cordgrass saltmarsh community (MENHP 1991). Maine., Low salt marsh (Enser 1993). Rhode Island., Low salt marsh community (Sperduto 1994). New Hampshire., Salt Marsh (Virginian Subtype) (Schafale 2000), Salt Marsh (Rawinski 1984). formerly Southern New England and Gulf of Maine Salt Marshes., *Spartina alterniflora* community (Metzler and Barrett 1992). Connecticut.
References: Adams 1963, Bertness 1988, Bowman 2000, Breden 1989, Breden et al. 2001, Chapman 1937, Clancy 1993b, Cowardin et al. 1979, Edinger et al. 2002, Enser 1993, Enser 1999, Fleming et al. 2001, Gawler 2001, Gawler 2002, Gosner 1979, Higgins et al. 1971, Hill 1986, MENHP 1991, Metzler and Barrett 1992, Metzler and Barrett 2001, Moul 1973, Rawinski 1984, Reschke 1990, Schafale 2000, Schafale and Weakley 1990, Sperduto 1994, Sperduto 2000b, Swain and Kearsley 2001, Teal 1986
Authors: S.L. Neid, ECS **Confidence:** 1 **Identifier:** CEGL004192

V.A.5.N.n.10. SPARTINA CYNOSUROIDES TIDAL HERBACEOUS ALLIANCE
Giant Cordgrass Tidal Herbaceous Alliance

SPARTINA CYNOSUROIDES HERBACEOUS VEGETATION
Giant Cordgrass Herbaceous Vegetation
Atlantic Giant Cordgrass Marsh **G4 (97-08-13)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Oligohaline and Fresh Tidal Marshes (202-40; n/a)

Concept: This community includes narrow, almost pure stands of *Spartina cynosuroides* along tidal creeks and sloughs or on levees of oligohaline tidal marshes along the mid- to north Atlantic coast. Some *Spartina cynosuroides* communities are nearly monospecific, while others have a diverse component of other graminoids and forbs. Where mixed, associated plants include *Schoenoplectus pungens (= Scirpus pungens), Schoenoplectus robustus (= Scirpus robustus), Schoenoplectus americanus (= Scirpus olneyi), Kosteletzkya virginica, Hibiscus moscheutos, Amaranthus cannabinus, Panicum virgatum*, and *Polygonum punctatum*. Where more saline, *Spartina alterniflora* and *Iva frutescens* can become more frequent. Where less saline, associates can include *Schoenoplectus tabernaemontani (= Scirpus validus), Pontederia cordata, Peltandra*

virginica, Leersia oryzoides, Mikania scandens, Rumex verticillatus, Echinochloa walteri, Polygonum hydropiperoides, and *Typha angustifolia* (or *Typha domingensis* in the south), among others. In more disturbed areas, this association can be displaced by *Phragmites australis*.
Comments: *Spartina cynosuroides - Panicum virgatum - Phyla lanceolata* Herbaceous Vegetation (CEGL007741) is similar in terms of dominant and codominant species, however, associated species differ somewhat and CEGL007741 occurs in wind-tidal situations in North Carolina and Virginia. North of New Jersey, *Spartina cynosuroides* is a component of brackish high marsh associations, but does not tend to dominate.
Range: This association occurs along the Atlantic coast from New Jersey to Georgia.
States/Provinces: DE:S3?, GA:S?, MD:S4?, NC:S3,S5, NJ:S3, SC:S?, VA:S?
TNC Ecoregions: 56:C, 57:C, 58:C, 62:C
USFS Ecoregions: 232Ab:CCP, 232Ac:CCP, 232Ad:CCC, 232Br:CCP, 232Bt:CCC, 232Bx:CCC, 232Bz:CCC, 232Cb:CCP, 232Ce:CCC, 232Ch:CCC, 232Ci:CCC
Federal Lands: NPS (Fort Pulaski)
Synonymy: Brackish Marsh (Wharton 1978) B. in part, Big Cordgrass Community Type (Odum et al. 1984), Brackish tidal marsh complex (Breden 1989). in part, Tidal Freshwater Marsh (Giant Cordgrass Subtype) (Schafale 2000)
References: Bowman 2000, Breden 1989, Breden et al. 2001, Fleming 2001, Fleming and Moorhead 1998, Fleming et al. 2001, Harrison 2001, Nelson 1986, Odum 1988, Odum and Smith 1981, Odum et al. 1984, Schafale 2000, Schafale and Weakley 1990, Wharton 1978
Authors: S.L. Neid, SCS **Confidence:** 2 **Identifier:** CEGL004195

V.A.5.N.n.11. SPARTINA PATENS - (DISTICHLIS SPICATA) TIDAL HERBACEOUS ALLIANCE

Saltmeadow Cordgrass - (Saltgrass) Tidal Herbaceous Alliance

SPARTINA PATENS - DISTICHLIS SPICATA - JUNCUS ROEMERIANUS HERBACEOUS VEGETATION

Saltmeadow Cordgrass - Saltgrass - Black Needlerush Herbaceous Vegetation
Mid-Atlantic High Salt Marsh **G4G5 (97-12-01)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Salt and Brackish Tidal Marshes (202-30; n/a)

Concept: This coastal community is an irregularly tidally flooded high salt marsh of the mid- and southern Atlantic coast. It is dominated by *Spartina patens,* which forms meadows with a distinct "cowlicked" appearance. These meadows occur at slightly higher elevations than adjacent, regularly flooded low salt marsh occupying the zone extending from mean high tide landward approximately to the limit of high spring tides. The substrate is peat of variable depths overlying sand. *Distichlis spicata* can be codominant. Additional associated species that generally occur in low abundance can include *Limonium carolinianum, Agalinis maritima, Salicornia virginica, Juncus roemerianus, Sabatia stellaris, Borrichia frutescens, Lythrum lineare, Solidago sempervirens, Pluchea odorata (= Pluchea purpurascens), Hibiscus moscheutos ssp. moscheutos (= Hibiscus palustris),* or *Atriplex prostrata (= Atriplex patula var. hastata).* Shrub seedlings of *Baccharis halimifolia, Iva frutescens,* and/or *Morella cerifera (= Myrica cerifera)* may occur sporadically. Diagnostic species are *Spartina patens, Distichlis spicata, Borrichia frutescens, Kosteletzkya virginica,* and *Pluchea odorata*. This community ranges from Delaware south to Florida.
Comments: This community is differentiated from *Spartina patens - Distichlis spicata - (Juncus gerardii)* Herbaceous Vegetation (CEGL006006), which occurs to the north, by the absence or relative infrequent occurrence of *Juncus gerardii, Plantago maritima,* and *Triglochin maritima* (in pannes), and by the importance of species of southern distribution such as *Borrichia frutescens, Kosteletzkya virginica, Fimbristylis castanea,* and *Lythrum lineare*. If discrete patches of *Juncus roemerianus* occur in substantial size (several acres), the community is considered *Juncus roemerianus* Herbaceous Vegetation (CEGL004186). Currently, some unusually diverse variants exist in Virginia that may warrant recognition as a separate association.
Range: This association occurs along the Atlantic coast from Delaware to Florida.
States/Provinces: DE:S4, FL:S?, GA:S?, MD:S5, NC:S5, SC:S?, VA:S?
TNC Ecoregions: 56:C, 57:C, 58:C, 62:C
USFS Ecoregions: 232Br:CCC, 232Bx:CCC, 232Bz:CCC, 232Ch:CCC
Federal Lands: NPS (Assateague Island, Fort Pulaski)
Synonymy: Brackish Marsh (Salt Meadow Cordgrass Subtype) (Schafale 2000), Salt marsh community (Hill 1986) B. Assateague Island., Salt marsh (Higgins et al. 1971) B. Assateague Island., *Spartina patens - Distichlis spicata* high marsh (Clancy 1993b) =. Delaware., *Spartina - Distichlis - Juncus* associes (Penfound 1952) =. of southern salt marshes., *Spartina patens* type (Cooper and Waits 1973) =. North Carolina., *Aster tenuifolius - Distichlis spicata - Fimbristylis castanea -*

Borrichia frutescens - Spartina patens association (Adams 1963) =. of the high marsh described from North Carolina., High marsh (Cooper 1974) =. of the high marsh of south Atlantic and Gulf coast marshes.
References: Adams 1963, Bowman 2000, Clancy 1993b, Cooper 1974, Cooper and Waits 1973, Fleming 2001, Fleming et al. 2001, Higgins et al. 1971, Hill 1986, Nelson 1986, Peet et al. 2002, Penfound 1952, Schafale 2000, Schafale and Weakley 1990
Authors: ECS **Confidence:** 2 **Identifier:** CEGL004197

V.A.5.N.n.2. TYPHA (ANGUSTIFOLIA, DOMINGENSIS) TIDAL HERBACEOUS ALLIANCE
(Narrowleaf Cattail, Southern Cattail) Tidal Herbaceous Alliance

TYPHA ANGUSTIFOLIA - HIBISCUS MOSCHEUTOS HERBACEOUS VEGETATION
Narrowleaf Cattail - Eastern Rosemallow Herbaceous Vegetation
Cattail Brackish Tidal Marsh **G? (97-12-01)**
Ecological Group (SCS;MCS): Atlantic Coast Rivershore - Tidal Salt Marshes (202-70; n/a)

Concept: This community is a brackish tidal marsh of the northern to central Atlantic coast, occurring along the margin of tidal rivers and at the upper margins of some high salt marshes and coastal salt ponds where water salinity ranges from 0.5-18.0 ppt. Brackish marshes are most extensive on large tidal rivers, but smaller marshes of this alliance also occur at the upper limits of larger tidal creeks. The vegetation of this tall grassland is a mixture of freshwater and saltmarsh species dominated by *Typha angustifolia*. *Phragmites australis* and/or *Typha latifolia* can be codominant. The *Phragmites australis* component is the native strain. Common associates include *Hibiscus moscheutos, Schoenoplectus pungens, Impatiens capensis, Amaranthus cannabinus, Peltandra virginica,* and *Bidens* spp., plus *Spartina cynosuroides* in the south. Other infrequent associates include *Mikania scandens, Polygonum punctatum, Pluchea odorata, Eleocharis* spp., and *Schoenoplectus robustus,* plus *Schoenoplectus americanus* farther south. Species from adjacent high salt marsh may also be present. Substrate is muck or peat, and there is often an accumulation of *Typha* litter.
Comments: A non-tidal barrier wetland documented at the Cove Point Wetland, Calvert County, Maryland (Steury 1999), appears to fit this concept.
Range: This association occurs along the Atlantic coast from Maine to Virginia and possibly to South Carolina.
States/Provinces: CT:S?, DE:S4, MA:S1, MD:S4, ME:S3, NC?, NH:S?, NJ:S4, NY:S3S4, RI:S?, SC?, VA:S?,S?
TNC Ecoregions: 56:?, 57:C, 58:C, 62:C, 63:C
USFS Ecoregions: 212Cb:CCC, 221Ab:CCC, 221Ac:CCC, 221Ad:CCC, 221Ak:CCC, 232Aa:CCC, 232Ab:CCC, 232Ac:CCC, 232Ad:CCC, 232Br:CCC, 232Bt:CCC, 232Bx:CCC, 232Bz:CCC, 232Cb:CCC, 232Ch:CCC, 232Ci:CCC
Federal Lands: NPS (Acadia, Assateague Island, Fire Island)
Synonymy: Tidal Freshwater Marsh (Narrowleaf Cattail Subtype) (Schafale 2000), Cattail Community Type (Odum et al. 1984), Transitional fresh marsh (Hill 1986) B. Assateague Island., Brackish tidal marsh complex (Breden 1989). New Jersey., Brackish tidal marsh community (MENHP 1991). Maine., Brackish marsh (Sperduto 1994). New Hampshire., *Hibiscus* marsh (Cahoon and Stevenson 1986). Maryland., Narrowleaf cattail type (McCormick and Ashbaugh 1972). New Jersey., *Typha angustifolia* community (Good and Good 1975b). New Jersey., *Typha angustifolia* type (Ferren et al. 1981). New Jersey., Fresh-brackish marsh (Klotz 1986). Virginia., Brackish Tidal Marsh (Rawinski 1984). formerly Southern New England and Gulf of Maine., *Typha angustifolia - Hibiscus palustris* community (Metzler and Barrett 1992). Connecticut., Brackish tidal marsh (Reschke 1990). New York., *Typha* association (Shreve et al. 1910) =. Maryland.
References: Bowman 2000, Breden 1989, Breden et al. 2001, Cahoon and Stevenson 1986, Coulling 2002, Edinger et al. 2002, Ferren et al. 1981, Fleming 2001, Fleming and Moorhead 1998, Fleming et al. 2001, Gawler 2002, Good and Good 1975b, Harrison 2001, Hill 1986, Klotz 1986, MENHP 1991, McCormick and Ashbaugh 1972, Metzler and Barrett 1992, Metzler and Barrett 2001, Odum et al. 1984, Rawinski 1984, Reschke 1990, Saltonstall 2002, Schafale 2000, Schafale and Weakley 1990, Shreve et al. 1910, Sperduto 1994, Sperduto 1997a, Sperduto 2000b, Steury 1999, Swain and Kearsley 2001
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL004201

TYPHA LATIFOLIA – SCHOENOPLECTUS FLUVIATILIS – CAREX COMOSA HERBACEOUS VEGETATION
Cattail – River Bulrush – Comosa Sedge Herbaceous Vegetation
River Bulrush Freshwater Tidal Marsh **G? (03-07-22)**
Ecological Group

Concept: This freshwater tidal marsh of the Chesapeake Bay region is characterized by a highly diverse assemblage of species. Characteristic are *Schoenoplectus fluviatilis* and *Typha latifolia.* Other associates include *Boehmeria cylindrica,*

Apios americana, Polygonum arifolium, Hibiscus moscheutos, Lycopus americanus, Pontederia cordata, aned *Peltandra virginica*.
Comments:
Range: This vegetation occurs on the Virginia coastal plain.
States / Provinces: MD:SP, DE:SP, VA:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232Ad:CCC
Federal Lands:
Synonymy:
References: Coulling 2002
Authors: P. Coulling / L. Sneddon **Confidence:** 2 **Identifier:**CEGL006096

V.A.5.N.n.14. ZIZANIA AQUATICA TIDAL HERBACEOUS ALLIANCE
Indian Wild Rice Tidal Herbaceous Alliance

ZIZANIA AQUATICA TIDAL HERBACEOUS VEGETATION
Indian Wild Rice Tidal Herbaceous Vegetation
Atlantic Coast Wild Rice Tidal Marsh **G4? (97-08-13)**
Ecological Group (SCS;MCS): Atlantic Coast Rivershore - Tidal Fresh Marshes (202-75; n/a)

Concept: This is a freshwater tidal marsh characterized by *Zizania aquatica* that occurs in oligohaline zones of tidal rivers along the north and mid-Atlantic coast of North America. These marshes occur in the lower reaches of freshwater tidal systems, in fresh to slightly brackish areas along flats that are infrequently exposed at very low tides. Soils are highly variable and are composed of varying amounts of silts, silty mucks, fine peat, to very coarse sands. *Zizania aquatica* is dominant, although only conspicuously so in mid to late summer, when it overtops early season vegetation. This community can be codominated by species such as *Pontederia cordata, Peltandra virginica, Polygonum arifolium, Polygonum punctatum,* and/or *Bidens* spp. Common associates are generally a mixture of freshwater and brackish species and can include *Sagittaria latifolia, Ludwigia palustris, Impatiens capensis, Leersia oryzoides, Amaranthus cannabinus, Hibiscus moscheutos, Sium suave, Acorus americanus,* and *Schoenoplectus fluviatilis*. This vegetation provides an important food source for migratory birds.
Comments:
Range: This association occurs along the Atlantic Coastal Plain from Maine and Massachusetts south to North Carolina, possibly extending into South Carolina and Georgia.
States/Provinces: CT:S?, DE:S3, FL?, GA?, MA:S1, MD:S3, ME:S2, MS:S?, NC:S3, NJ:S2S3, NY:S2, RI:S?, SC?, VA:S?
TNC Ecoregions: 56:?, 57:C, 58:C, 61:C, 62:C
USFS Ecoregions: 221Ad:CCC, 221Af:CCC, 221Ag:CCC, 232Ab:CCC, 232Ad:CCC, 232Br:CCC, 232Bt:CCC, 232Bx:CCC, 232Bz:CCC, 232Cb:CCP, 232Ce:CCC, 232Ch:CCP, 232Ci:CCP, 232Cj:CCP
Federal Lands: USFS (Croatan)
Synonymy: Tidal Freshwater Marsh (Wild Rice Subtype) (Schafale 2000), Wild Rice Community Type (Odum et al. 1984), Freshwater Tidal Marsh: Wild Rice - Smartweed Type (McCoy and Fleming 2000), Freshwater tidal marsh complex, midtidal zone (Breden 1989), *Zizania aquatica* marsh community (Barrett 1989), *Zizania aquatica - Polygonum punctatum* Tidal Herbaceous Vegetation (Coulling 2002), FW Tidal Marsh (Rawinski 1984). formerly Southern New England FW Tidal.
References: Barrett 1989, Barrett 1994, Bowman 2000, Breden 1989, Breden et al. 2001, Coulling 2002, Edinger et al. 2002, Enser 1999, Ferren and Good 1977, Fleming et al. 2001, Gawler 2001, Gawler 2002, Good and Good 1975b, Harrison 2001, McCormick and Ashbaugh 1972, McCormick et al. 1970, McCoy and Fleming 2000, Metzler and Barrett 2001, Metzler and Rosza 1982, Odum et al. 1984, Rawinski 1984, Reschke 1990, Schafale 2000, Schafale and Weakley 1990, Swain and Kearsley 2001, Wharton 1978
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL004202

V.A.5.N.n.15. ZIZANIOPSIS MILIACEA TIDAL HERBACEOUS ALLIANCE
Southern Wild Rice Tidal Herbaceous Alliance

ZIZANIOPSIS MILIACEA TIDAL HERBACEOUS VEGETATION
Southern Wild Rice Tidal Herbaceous Vegetation
Southern Wild Rice Tidal Marsh **G3G5 (97-08-13)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Oligohaline and Fresh Tidal Marshes (202-40; n/a)

Concept: Tidal marshes, often occurring as fringing marshes, dominated by *Zizaniopsis miliacea*. Wharton (1978) reports that marshes are dominated by *Zizaniopsis* where water levels are stabilized by daily tides or other phenomena. Other dominants that may occur include *Zizania aquatica, Pontederia cordata, Peltandra virginica*; other common plants are *Saccharum giganteum, Rhynchospora corniculata, Cicuta maculata,* and *Boltonia asteroides*.
Comments:
Range:
States/Provinces: AL:S?, FL?, GA:S?, LA?, MS:S?, NC:S3, SC:S?, VA:S?
TNC Ecoregions: 31:?, 53:C, 56:C, 57:C, 58:C
USFS Ecoregions: 232Br:CCC, 232Ci:CCC, 232Dc:CCC
Federal Lands:
Synonymy: *Zizaniopsis miliacea* Tidal Herbaceous Vegetation (Coulling 2002)
References: Coulling 2002, Fleming 2001, Fleming et al. 2001, Peet et al. 2002, Schafale and Weakley 1990, Wharton 1978
Authors: SCS **Confidence:** 1 **Identifier:** CEGL004705

V.A.7.N.g. Medium-tall temperate or subpolar grassland with a sparse cold-deciduous shrub layer

V.A.7.N.g.1. SCHIZACHYRIUM LITTORALE SHRUB HERBACEOUS ALLIANCE
Seaside Bluestem Shrub Herbaceous Alliance

MORELLA (PENSYLVANICA, CERIFERA) / SCHIZACHYRIUM LITTORALE - EUPATORIUM HYSSOPIFOLIUM SHRUB HERBACEOUS VEGETATION
(Northern Bayberry, Wax-myrtle) / Seaside Bluestem - Hyssopleaf Thoroughwort Shrub Herbaceous Vegetation
Mid-Atlantic Coast Backdune Grassland **G2 (98-12-02)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Dune and Coastal Grasslands (240-25; n/a)

Concept: These mid-Atlantic maritime grasslands occurs on deep well-drained sands of old leveled interdunes and backdunes. They usually occur within the influence of offshore winds and salt spray. Although highly variable in species composition, the typical expression of this community is characterized by a predominance (25-50% cover) of bunch grasses including *Schizachyrium littorale (= Schizachyrium scoparium ssp. littorale), Andropogon virginicus, Panicum amarum var. amarulum, Ammophila breviligulata, Dichanthelium scoparium,* and *Dichanthelium acuminatum*. Generally one or two of these species will dominate while the others occur as more infrequent, scattered clumps. Occasionally *Spartina patens,* growing in a dry 'wispy' condition, will form the dominant graminoid cover. Shrubs of *Morella pensylvanica (= Myrica pensylvanica)* and/or *Morella cerifera (= Myrica cerifera)* are sparse and stunted *Baccharis halimifolia, Prunus maritima,* and *Diospyros virginiana* are even less frequent. Dense tangles of *Toxicodendron radicans* are very characteristic of this community as they sprawl over the bare ground and sparse vegetation. *Rubus argutus* and *Rhus copallinum* are also scattered throughout. Much of the remaining dry sands are exposed with sparsely distributed herbs. Characteristic herb species include *Cirsium horridulum, Solidago sempervirens, Pseudognaphalium obtusifolium (= Gnaphalium obtusifolium), Nuttallanthus canadensis, Euthamia caroliniana (= Euthamia tenuifolia), Oenothera humifusa, Oenothera oakesiana, Pityopsis falcata, Opuntia humifusa,* and *Diodia teres*. The range of this community is not well known; North Carolina is likely the southern extent. This community is related to maritime grasslands of New England and New York. Further analysis is required to determine the classification, and thus the range, with confidence. Diagnostic species are *Morella pensylvanica, Schizachyrium littorale, Eupatorium hyssopifolium,* and *Eupatorium rotundifolium*.
Comments:
Range: This community ranges from New Jersey to Virginia and possibly North Carolina on coastal dunes.
States/Provinces: DE:S?, MD:S?, NC?, NJ:S2?, VA:S?
TNC Ecoregions: 57:C, 58:C, 62:C
USFS Ecoregions: 232Ab:CCC, 232Bz:CCC, 232Ci:CCC
Federal Lands: NPS (Assateague Island)

Synonymy: Maritime Dry Grassland (Northern Bayberry Subtype) (Schafale 2000), Shrub succession community (Hill 1986) B. Assateague Island., Xeric shrub community (Higgins et al. 1971) B. Assateague Island (particularly at lower elevations)., Sandplain grassland (Dunwiddie et al. 1993) ?, Maritime grassland (Reschke 1990) ?. New York.
References: Berdine 1998, Blizzard 1931, Breden et al. 2001, Dunwiddie et al. 1993, Fleming 2001, Fleming et al. 2001, Higgins et al. 1971, Hill 1986, Reschke 1990, Schafale 2000, Sneddon et al. 1996, TNC 1995c
Authors: A. Berdine, mod. S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL004240

V.B.2.N.e. Semipermanently flooded temperate perennial forb vegetation

V.B.2.N.e.100. LUDWIGIA PEPLOIDES SEMIPERMANENTLY FLOODED HERBACEOUS ALLIANCE

Floating Water-primrose Semipermanently Flooded Herbaceous Alliance

HOTTONIA INFLATA – LUDWIGIA PALUSTRIS CALLITRICHE HETEROPHYLLA HERBACEOUS VEGETATION (PROVISIONAL)
Featherfoil – Water-purselane – Greater Water Starwort Herbaceous Vegetation
Coastal Plain Water-purslane Marsh **G? (03-07-22)**
Ecological Group

Concept: . This coastal plain aquatic bed occurs on seasonally to semipermanently flooded impoundments along floodplains of small rivers. They likely developed as a result of beaver activity damming former stream channels. The vegetation is a floating bed dominated by *Hottonia inflata* and *Ludwigia palustris. Callitriche heterophylla* is a constant associate; *Nuphar advena* may be codominant where it occurs.
Comments:
Range: This vegetation occurs on the coastal plain of Virginia.
States / Provinces: MD:SP, DE:SP, VA:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232Br:CCC
Federal Lands:
Synonymy:
References: Coulling 2002
Authors: P. Coulling, VADCR **Confidence:** 3 **Identifier:**CEGL006102

A.1669—PONTEDERIA CORDATA - PELTANDRA VIRGINICA SEMIPERMANENTLY FLOODED HERBACEOUS ALLIANCE (V.B.2.N.e.1)

Pickerelweed - Green Arrow-arum Semipermanently Flooded Herbaceous Alliance

PONTEDERIA CORDATA - PELTANDRA VIRGINICA SEMIPERMANENTLY FLOODED HERBACEOUS VEGETATION
Pickerelweed - Green Arrow-arum Semipermanently Flooded Herbaceous Vegetation
Pickerelweed Marsh **G? (97-12-01)**
Ecological Group (SCS;MCS): Eastern Open Ponds and Marshes (480-10; 1.4.1.1)

Concept: This is a placeholder for community association(s) to be developed in this alliance. This type includes very wet or partially submerged forb vegetation of rivershores and lakeshores, and sometimes of artificial ponds, lakes, and impoundments. *Pontederia cordata* and *Peltandra virginica* are typical, the latter dropping out in the northern portions of the range. Associates include *Nuphar lutea*, *Glyceria striata*, *Schoenoplectus tabernaemontani (= Scirpus validus)*, *Schoenoplectus americanus (= Scirpus americanus)*, and *Sagittaria latifolia*.
States/Provinces: AR:S?, KY:S?, ON:S?, SC:S?, TN:S?, VA:S?, WV:S?
TNC Ecoregions: 38:P, 42:C, 43:C, 44:C, 48:?, 49:?, 52:C, 57:P, 58:P, 59:C
USFS Ecoregions: 221Bd:CCP, 222Ch:CCC, 222Db:CCC, 231:C, 232:P, 234An:CCC, M212Ea:CCP, M212Eb:CCP, M221Ac:CCC, M221Ad:CCC

Synonymy: Pickerelweed-arrow arum emergent vegetation (CAP pers. comm. 1998), Palustrine Broad-leaved Nonpersistent Emergent Wetland, Permanently Flooded (PEM4H) (Cowardin et al. 1979)
References: CAP pers. comm. 1998, Cowardin et al. 1979, Fleming et al. 2001
Authors: SCS **Confidence:** 3 **Identifier:** CEGL004291

V.B.2.N.g. Tidal temperate perennial forb vegetation

V.B.2.N.g.6. AMARANTHUS CANNABINUS TIDAL HERBACEOUS ALLIANCE

Water-hemp Tidal Herbaceous Alliance

AMARANTHUS CANNABINUS TIDAL HERBACEOUS VEGETATION

Water-hemp Tidal Herbaceous Vegetation
Water-hemp Tidal Marsh **G3G5 (97-12-01)**
Ecological Group (SCS;MCS): Atlantic Coast Rivershore - Tidal Salt Marshes (202-70; n/a)

Concept: This brackish marsh vegetation occupies a mid-tidal position on sandy intertidal rivershores along the north and mid-Atlantic coast where floodwaters are oligohaline to mesohaline. *Amaranthus cannabinus* is dominant and can be mixed with *Bidens* spp., *Polygonum punctatum, Sagittaria latifolia, Zizania aquatica*, and *Schoenoplectus pungens*. This association occurs on wave- and ice-scoured riverbanks or other brackish marsh habitat with coarse substrate and where tidal flooding freely drains. Species composition and abundance can change dramatically from year to year.
Comments: This association is dominated by annuals whereas *Spartina alterniflora - Amaranthus cannabinus* Herbaceous Vegetation (CEGL006417) contains perennials with *Spartina alterniflora* as a strong component. However, the types may reflect seasonal variation within freshwater tidal marsh systems and be similar enough to warrant merging.
Range: This association occurs along tidal rivers from Maine to Virginia.
States/Provinces: CT:S?, DE:S?, MA:S1, MD:S?, ME:S2, NJ:S2S3, NY:S2, RI:S?
TNC Ecoregions: 58:C, 61:C, 62:C
USFS Ecoregions: 221A:CC, 221B:CC, 232Ac:CCC, 232Bt:CCC, 232C:CP
Federal Lands:
Synonymy: Freshwater tidal marsh complex, midtidal zone (Breden 1989), FW Tidal Marsh (Rawinski 1984). formerly Southern New England FW Tidal.
References: Bowman 2000, Breden 1989, Breden et al. 2001, Caldwell 1990, Edinger et al. 2002, Enser 1999, Gawler 2001, Gawler 2002, Metzler and Barrett 2001, Rawinski 1984, Reschke 1990, Swain and Kearsley 2000, Swain and Kearsley 2001
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006080

V.B.2.N.g.1. ERIOCAULON PARKERI TIDAL HERBACEOUS ALLIANCE

Estuary Pipewort Tidal Herbaceous Alliance

ERIOCAULON PARKERI - POLYGONUM PUNCTATUM HERBACEOUS VEGETATION

Estuary Pipewort - Dotted Smartweed Herbaceous Vegetation
Estuary Pipewort Freshwater Intertidal Flat **G2 (98-11-09)**
Ecological Group (SCS;MCS): Atlantic Coast Rivershore - Tidal Fresh Marshes (202-75; n/a)

Concept: This freshwater tidal community occurs in estuaries of the northern Atlantic coast generally confined to low marsh where it is subjected to high levels of flood disturbance. As a result, the substrate is generally sandy or gravelly with low organic matter content. The vegetation is low, generally less than 35 cm in height, with variable cover of scattered to fairly dense *Eriocaulon parkeri*. Associates include *Polygonum punctatum, Isoetes riparia, Lindernia dubia, Bidens eatonii*, and *Ludwigia palustris*.
Comments: The floristics and environmental setting of this association show overlap with *Isoetes riparia* Tidal Herbaceous Vegetation (CEGL006058).
Range:
States/Provinces: CT:S?, DE:S1, MA:S1, MD:S?, ME:S2, NB?, NC:S?, NJ:S2?, NS?, NY:S1S2,S2, SC?, VA:S?
TNC Ecoregions: 57:C, 58:C, 61:?, 62:C
USFS Ecoregions: 212Da:CCC, 212Dc:CCC, 221Ac:CCC, 221Ad:CCC, 221Ak:CCC, 232Bt:CCC

Federal Lands:
Synonymy: Palustrine (Cowardin et al. 1979) B, Freshwater tidal marsh complex, lower intertidal mudflat (Breden 1989), Freshwater tidal marsh, mudflat zone (MENHP 1991), FW Tidal Marsh (Rawinski 1984). formerly Southern New England FW Tidal.
References: Barrett 1994, Bowman 2000, Breden 1989, Breden et al. 2001, Cowardin et al. 1979, Edinger et al. 2002, Fleming et al. 2001, Gawler 2002, Haines 2001, MENHP 1991, Metzler and Barrett 2001, Rawinski 1984, Swain and Kearsley 2001
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006352

V.B.2.N.g.301. ISOETES RIPARIA TIDAL HERBACEOUS ALLIANCE

Riverbank Quillwort Tidal Herbaceous Alliance

ISOETES RIPARIA TIDAL HERBACEOUS VEGETATION

Riverbank Quillwort Tidal Herbaceous Vegetation
Estuary Quillwort Tidal Flat **G? (97-12-01)**
Ecological Group (SCS;MCS): Atlantic Coast Rivershore - Tidal Fresh Marshes (202-75; n/a)

Concept: This freshwater tidal flat community of the central and northern Atlantic coast occurs on mud, sand, or gravelly banks of freshwater tidal streams. The vegetation is sparse, but is characterized by *Isoetes riparia*. Associated species include *Cyperus bipartitus (= Cyperus rivularis), Elatine americana, Sagittaria graminea, Sagittaria subulata, Sagittaria calycina, Sagittaria montevidensis, Heteranthera reniformis, Crassula aquatica (= Tillaea aquatica), Eriocaulon parkeri, Orontium aquaticum, Gratiola virginiana, Eleocharis obtusa (= var. peasei),* and in more muddy areas, *Schoenoplectus smithii (= Scirpus smithii).* This is the potential habitat of *Micranthemum micranthemoides*.
Comments: The floristics of this association show overlap with *Eriocaulon parkeri - Polygonum punctatum* Herbaceous Vegetation (CEGL006352). This association may be too small to be mapped in most locations. More information is needed on the range of variability present in this association and its relationship to related vegetation, namely CEGL006352. There is a possibility that these associations may be similar enough to lump due to species overlap (S. Neid pers. obs.)
Range:
States/Provinces: CT:S?, DE:S1, MA:S3, MD:S?, NC:S?, NJ:S2S3, NY:S1S2, RI:S?, VA?
TNC Ecoregions: 57:C, 58:?, 62:C
USFS Ecoregions: 221A:??, 232Ac:CCC
Federal Lands:
Synonymy: Tidal Mud Flat (Quillwort Subtype) (Schafale 2000), Freshwater tidal marsh complex, lower intertidal flat (Breden 1989), Southern New England/Gulf of Maine Saline/ Brackish Intertidal Flat (Rawinski 1984), Southern New England/Gulf of Maine Fresh/ Brackish Subtidal Estuarine Community. (Rawinski 1984)
References: Bowman 2000, Breden 1989, Breden et al. 2001, Edinger et al. 2002, Rawinski 1984, Schafale 2000, Swain and Kearsley 2001, Whitlatch 1982
Authors: S.L. Neid, ECS **Confidence:** 3 **Identifier:** CEGL006058

V.B.2.N.g.300. NELUMBO LUTEA TIDAL HERBACEOUS ALLIANCE

American Lotus Tidal Herbaceous Alliance

NELUMBO LUTEA TIDAL HERBACEOUS VEGETATION

American Lotus Tidal Herbaceous Vegetation
American Lotus Tidal Marsh **G? (97-12-01)**

Concept: This community type occurs as a distinct zone along tidal rivers in the Coastal Plain. *Nelumbo lutea* forms a thin band of vegetation along the river that is 2-3 m deep at low tide.
Comments: Description based on GAP project sample taken along Salem River (SALEM2). Also found in Virginia and Maryland.
Range: Currently observed from New Jersey, Maryland, and Virginia.
States/Provinces: MD:S?, NJ:S?, VA:S?
TNC Ecoregions: 58:C, 62:C
USFS Ecoregions: 232Ab:CCC, 232Bt:CCC, 232Bx:CCC, 232Ch:CCC
Federal Lands:

Synonymy:
References: Coulling pers. comm., NJNHP unpubl. data
Authors: ECS **Confidence:** **Identifier:** CEGL006913

V.B.2.N.g.8. NUPHAR LUTEA TIDAL HERBACEOUS ALLIANCE
Yellow Pond-lily Tidal Herbaceous Alliance

Concept: Tidal mudflats dominated by *Nuphar lutea*. This alliance includes vegetation of freshwater tidal rivers where the water depth is approximately 2-3 m or less. *Nuphar lutea* and *Nymphaea odorata* are dominant; these species quickly spread from their rhizomes and shade out other vegetation. Other species may include *Potamogeton epihydrus, Peltandra virginica, Nymphoides cordata*, and *Zizania aquatica*. In Delaware, this alliance occurs in nearly pure stands below mean low water on mudflats that are exposed at low tide and on the submerged point bars of stream meanders.
Comments:
Range: This alliance is found in North Carolina, Connecticut, Delaware, the District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Virginia.
States/Provinces: DC DE MD ME NC NJ NY PA VA
TNC Ecoregions: 57:C, 58:C, 61:C, 62:C
USFS Ecoregions: 221A:CC, 232Ac:CCC, 232Ad:CCC, 232Br:CCC, 232Bt:CCC, 232Bx:CCC, 232Bz:CCC, 232Ch:CCC, 232Ci:CCC
Federal Lands:
Synonymy: Spatterdock: 31 (McCormick and Somes 1982); Spatterdock Community Type (Odum et al. 1984); V.C.2.a.2. *Nuphar lutea* Herbaceous Alliance. in part? (Sneddon et al. 1996)
References: McCormick and Somes 1982, Odum et al. 1984, Sneddon et al. 1996
Authors: ECS/SCS, JT, East **Identifier:** A.1708

NUPHAR LUTEA SSP. ADVENA TIDAL HERBACEOUS VEGETATION
Broadleaf Pond-lily Tidal Herbaceous Vegetation
Pond Lily Tidal Marsh **G? (97-12-01)**
Ecological Group (SCS;MCS): Atlantic Coast Rivershore - Tidal Fresh Marshes (202-75; n/a)

Concept: This association comprises submerged freshwater tidal mud flats of coastal rivers along the Atlantic coast that are dominated by *Nuphar lutea ssp. advena*. This association occurs at low elevations within freshwater tidal marshes, within tidal range but beyond the influence of salinity. It generally occurs below mean low water level where water depth is approximately 1-3 m or less. It receives a relatively long duration of flooding and is infrequently exposed at only the lowest tides. The association occurs on unconsolidated tidal mud flats and submerged point bars of large coastal river meanders adjacent to open water of river or tidal creek channels. Substrate is silty alluvial mud that is high in organic matter content. Vegetation of this association is characterized by large clonal stands of dense leafy forbs dominated by *Nuphar lutea ssp. advena*. Associated species tend to occur as scattered individuals and include *Peltandra virginica*, which can also be locally codominant, *Pontederia cordata, Zizania aquatica, Sagittaria latifolia, Bidens laevis, Acorus calamus,* and/or *Schoenoplectus fluviatilis*. *Nuphar lutea ssp. advena* forms nearly monotypic stands early in the growing season. Associated species emerge later in the season and can eventually overtop *Nuphar* plants, which senesce and tend to become insect-infested in late summer. Submerged aquatic species can occur in this association, including *Potamogeton epihydrus, Ceratophyllum demersum*, and the invasive exotic *Hydrilla verticillata*.
Comments: This association differs from *Nuphar lutea ssp. advena - Nymphaea odorata* Herbaceous Vegetation (CEGL002386) in that it is tidal rather than inland marsh.
Range: This association occurs along tidal rivers from New York to North Carolina.
States/Provinces: DC:S?, DE:S4, MD:S4, ME:S2, NC:S3, NJ:S2S3, NY:S2, PA:S?, VA:S?
TNC Ecoregions: 57:C, 58:C, 61:C, 62:C
USFS Ecoregions: 221:C, 232Ac:CCC, 232Ad:CCC, 232Br:CCC, 232Bt:CCC, 232Bx:CCC, 232Bz:CCC, 232C:CC
Federal Lands:
Synonymy: Tidal Freshwater Marsh (Pondlily Subtype) (Schafale 2000), Freshwater Tidal Marsh: Mud Flat Type (McCoy and Fleming 2000), Freshwater Tidal Marsh complex (Breden 1989), *Nuphar advena - (Ceratophyllum demersum)* Tidal Herbaceous Vegetation (Coulling 2002), *Nuphar advena - Peltandra virginica* Tidal Herbaceous Vegetation (Coulling 2002), FW Tidal Marsh (Rawinski 1984). formerly Southern New England FW Tidal.
References: Bowman 2000, Breden 1989, Breden et al. 2001, Brumback and Mehrhoff 1996, Coulling 2002, Edinger et al. 2002, Fleming 2001, Fleming et al. 2001, Gawler 2002, Good and Good 1975b, Harrison 2001, McCormick and Ashbaugh

1972, McCormick et al. 1970, McCoy and Fleming 2000, Odum et al. 1984, Peet et al. 2002, Rawinski 1984, Reschke 1990, Schafale 2000, Schafale and Weakley 1990
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL004472

NUPHAR LUTEA SSP. SAGITTIFOLIA TIDAL HERBACEOUS VEGETATION
Narrow-leaf Pond-lily Tidal Herbacous Vegetation
Chesapeake Bay Yellow Pond-lily Tidal Marsh **G? (03-07-22)**
Ecological Group

Concept: This freshwater tidal vegetation occurs on the low intertidal to subtidal portion of rivers on the Virgina coastal plain. The vegetation occurs as essentially monospecific stands of *Nuphar lutea* ssp. *sagittifolia.*
Comments: This association is described from the Chickahominy River drainage.
Range: This vegetation occurs on the coastal plain of Virginia.
States / Provinces: MD:SP, DE:SP, VA:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232Br:CCC
Federal Lands:
Synonymy:
References: Coulling 2002
Authors: P. Coulling / L. Sneddon **Confidence:** 3 **Identifier:**CEGL006094

V.B.2.N.g.3. PELTANDRA VIRGINICA - PONTEDERIA CORDATA TIDAL HERBACEOUS ALLIANCE

Green Arrow-arum - Pickerelweed Tidal Herbaceous Alliance

HIBISCUS MOSCHEUTOS - POLYGONUM ARIFOLIUM - LEERSIA ORYZOIDES - (CAREX STRICTA) TIDAL HERBACEOUS VEGETATION
Eastern Rosemallow - Halberd-leaf Tearthumb - Rice Cutgrass - (Tussock Sedge) Tidal Herbaceous Vegetation
Oligohaline Mixed Forbs Marsh **G? (02-05-12)**

Concept: This association is a diverse oligohaline marsh characterized by variable dominance of species found in the Chesapeake Bay. Species that form locally dominant patches can include *Polygonum arifolium, Hibiscus moscheutos ssp. moscheutos, Polygonum punctatum, Peltandra virginica, Leersia oryzoides, Polygonum sagittatum, Mikania scandens, Spartina cynosuroides* and *Toxicodendron radicans*, among others. All of these species are able to tolerate a broad range of halinity, and the high mean species richness of this type suggests that it is generally restricted to only slightly oligohaline habitats. Infrequently present are several species that are more specific to oligohaline conditions, including *Echinochloa walteri, Kosteletzkya virginica, Pluchea odorata, Rumex verticillatus, Sagittaria lancifolia*, and *Teucrium canadense*. The colonial sedge *Carex stricta* often forms local dominance patches, characteristically on hummocks raised 20-25 cm above the primary marsh surface.
Comments: In Virginia, occurrences are known from the Mattaponi (New and Gleason marshes), Pamunkey (Sweet Hall, Cousiac, and Cohoke marshes), and Rappahannock (Otterburn Marsh) rivers. In Maryland, an occurrence documented from the Pocomoke River (Cypress Swamp) is currently attributed to this type. In New Jersey, an occurrence is known from Rancocas Creek.
Range: Currently described from Virginia, Maryland, and New Jersey.
States/Provinces: MD:S?, NJ:S?, VA:S?
TNC Ecoregions: 58:C, 62:C
USFS Ecoregions: 232Ab:CCC, 232Br:CCC, 232Bt:CCC
Federal Lands:
Synonymy: *Hibiscus moscheutos - Polygonum arifolium - Leersia oryzoides - (Carex stricta)* Tidal Herbaceous Vegetation (Coulling 2002)
References: Coulling 2002, Harrison pers. comm.
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006181

IMPATIENS CAPENSIS - PELTANDRA VIRGINICA - SAGITTARIA LATIFOLIA - (TYPHA ANGUSTIFOLIA) TIDAL HERBACEOUS VEGETATION

Orange Jewelweed - Green Arrow-arum - Broadleaf Arrowhead - (Narrowleaf Cattail) Tidal Herbaceous Vegetation

Freshwater Tidal Mixed Forbs High Marsh **G? (97-12-01)**

Ecological Group (SCS;MCS): Atlantic and Gulf Coast Oligohaline and Fresh Tidal Marshes (202-40; n/a)

Concept: This association occurs in reliably flooded swales or backmarshes within the upper reaches of freshwater tidal marshes along tidal rivers of the Atlantic coast. Salinity is fresh to slightly brackish. These low-lying depressions are flooded for a longer duration than the surrounding habitat as they trap floodwaters as tides recede. Species composition and abundance in these small-patch wet depression are highly variable. They are best characterized by the presence and/or dominance of *Peltandra virginica, Impatiens capensis, Sagittaria latifolia*, and/or *Typha angustifolia*. Associated species commonly include *Pontederia cordata, Polygonum* spp. (*Polygonum arifolium, Polygonum sagittatum, Polygonum hydropiperoides, Polygonum punctatum*), *Bidens* spp. (*Bidens laevis, Bidens frondosa, Bidens coronata*), *Schoenoplectus fluviatilis, Leersia oryzoides, Zizania aquatica, Amaranthus cannabinus, Sium suave, Apios americana, Iris versicolor, Echinochloa walteri*, and others. The exotic *Murdannia keisak* has been noted in this community in the southern portion of the range. Species of the surrounding oligohaline or mesohaline marshes or from palustrine setting can occur in these microhabitats, but are usually not dominant. Substrate is highly variable ranging from silts, silty mucks, peats, or sands.
Comments: Species composition can differ between swales within the high marsh and those in low marsh settings.
Range: This association occurs in freshwater tidal marshes along the Atlantic coast from Maine to Virginia.
States/Provinces: CT:S?,S?, DE:S4, MA:S1, MD:S4?, ME:S2, NJ:S3, NY:S2, PA?, VA:S?
TNC Ecoregions: 58:C, 61:C, 62:C
USFS Ecoregions: 221Ac:CCC, 221Ad:CCC, 221Ak:CCC, 221Ba:CCC, 221D:CP, 232Ac:CCC, 232Br:CCC, 232Bt:CCC, 232Bx:CCC, 232C:CP
Federal Lands:
Synonymy: Freshwater Tidal Marsh Complex, upper tidal zone (Breden 1989), *Peltandra* backmarsh (Barrett 1989), *Impatiens capensis - Polygonum sagittatum - Zizania aquatica - (Bidens laevis, coronata)* Tidal Herbaceous Vegetation (Coulling 2002), FW Tidal Marsh (Rawinski 1984). formerly Southern New England FW Tidal.
References: Barrett 1989, Barrett 1994, Bowman 2000, Breden 1989, Breden et al. 2001, Coulling 2002, Edinger et al. 2002, Fleming 2001, Fleming et al. 2001, Gawler 2002, Harrison 2001, Metzler and Barrett 2001, Rawinski 1984, Reschke 1990, Swain and Kearsley 2001
Authors: S.L. Neid, ECS **Confidence:** 3 **Identifier:** CEGL006325

PELTANDRA VIRGINICA - PONTEDERIA CORDATA TIDAL HERBACEOUS VEGETATION

Green Arrow-arum - Pickerelweed Tidal Herbaceous Vegetation

Pickerelweed Tidal Marsh **G3G4 (98-11-04)**

Ecological Group (SCS;MCS): Atlantic Coast Rivershore - Tidal Fresh Marshes (202-75; n/a)

Concept: These are freshwater tidal marshes dominated by variable mixtures of *Peltandra virginica* and *Pontederia cordata* that are best expressed along the north Atlantic coast southward to Virginia. It occurs at low elevations within the freshwater tidal zone, often bordering open water. *Peltandra virginica* and *Pontederia cordata* are codominant. Associated species can include *Bidens* spp., *Zizania aquatica, Sagittaria latifolia, Acorus americanus, Polygonum arifolium, Polygonum hydropiperoides*, and *Polygonum sagittatum*. This community occurs on mucky substrates of variable depth.
Comments: This community occurs in very similar environmental settings as *Nuphar lutea ssp. advena* Tidal Herbaceous Vegetation (CEGL004472), low freshwater tidal marshes with a long duration of flooding. Species composition has some overlap. These two associations are best expressed where the elevation gradient is very mild, allowing the associations to occupy different zones, with this association occurring at slightly higher elevation than *Nuphar lutea ssp. advena* Tidal Herbaceous Vegetation. *Impatiens capensis - Peltandra virginica - Sagittaria latifolia - (Typha angustifolia)* Tidal Herbaceous Vegetation (CEGL006325) is a small-patch community that tends to form in ponded areas within freshwater high marsh and differs in having a much more varied species composition.
Range: Occurs from Maine to Virginia, excluding Rhode Island and New Hampshire.
States/Provinces: DE:S?, MA:S1, MD:S?, NJ:S?, NY:S2, VA:S?
TNC Ecoregions: 58:C, 61:C, 62:C
USFS Ecoregions: 232Ab:CCP, 232Ac:CCP, 232Ad:CCC, 232Br:CCC, 232Bx:CCP, 232Ch:CCP
Federal Lands:

Synonymy: Arrow-arum/Pickerelweed Community Type (Odum et al. 1984), *Peltandra virginica* Tidal Herbaceous Vegetation (Coulling 2002), *Pontederia cordata* Tidal Herbaceous Vegetation (Coulling 2002)
References: Bowman 2000, Breden et al. 2001, Coulling 2002, Edinger et al. 2002, Fleming 2001, Fleming et al. 2001, Harrison 2001, McCoy and Fleming 2000, Odum et al. 1984, Peet et al. 2002
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL004706

V.B.2.N.g.10. SAGITTARIA SUBULATA - LIMOSELLA AUSTRALIS TIDAL HERBACEOUS ALLIANCE

Awl-leaf Arrowhead - Awlwort Tidal Herbaceous Alliance

Concept: Low intertidal marshes, characterized by sparse to more dense vegetation of *Sagittaria subulata* and *Limosella australis*.
Comments:
Range: This alliance is found in North Carolina, Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island (?), and Virginia, and in Canada.
States/Provinces: CT DE MA MD ME NB? NF? NH NJ NS? NY PE? QC? RI VA?
TNC Ecoregions: 57:C, 58:C, 62:C, 63:C
USFS Ecoregions: 212Dc:CCC, 221Ab:CCC, 221Ad:CCC, 221Af:CCP, 221Ag:CCC, 221Ak:CCC, 232Ab:CCP, 232Ac:CCC, 232Ad:CCP, 232Bt:CCC, 232Bx:CCC, 232Bz:CCP, 232Ch:CCC
Federal Lands:
Synonymy: Estuarine Intertidal: Saline/Brackish Flats (Swain and Kearsley 2001)
References: Swain and Kearsley 2001, Whitlatch 1982
Authors: ECS/SCS, JT, East **Identifier:** A.1710

SAGITTARIA SUBULATA - LIMOSELLA AUSTRALIS TIDAL HERBACEOUS VEGETATION
Awl-leaf Arrowhead - Awlwort Tidal Herbaceous Vegetation
North Atlantic Coast Intertidal Mud Flat **G? (97-12-01)**
Ecological Group (SCS;MCS): Atlantic Coast Rivershore - Tidal Fresh Marshes (202-75; n/a)

Concept: This brackish tidal flat community occurs along the northeastern Atlantic coast on muddy to sandy substrates of broad, flat tidal river shores. The flats are exposed at low tide and submerged at high tide. Vegetation is of variable cover and may be quite sparse. Characteristic plants are low-growing rosette species such as *Sagittaria subulata, Sagittaria calycina var. spongiosa (= Sagittaria spathulata), Limosella australis (= Limosella subulata), Lilaeopsis chinensis, Zannichellia palustris*, and *Eleocharis parvula*.
Comments:
Range: This association occurs along the Atlantic coast from Maine to Virginia. It may also occur in Canada.
States/Provinces: CT:S?, DE:S1, MA:S3, MD:S?, ME:S3, NB?, NF?, NH:S?, NJ:S1S3, NS?, NY:S1S2, PE?, QC?, RI:S?, VA?
TNC Ecoregions: 57:C, 58:C, 62:C, 63:C
USFS Ecoregions: 212Dc:CCC, 221Ab:CCC, 221Ad:CCC, 221Af:CCP, 221Ag:CCC, 221Ak:CCC, 232Ac:CCC, 232Bt:CCC, 232C:CC
Federal Lands:
Synonymy: Southern New England/Gulf of Maine Saline/ Brackish Intertidal Flat (Rawinski 1984), Southern New England/Gulf of Maine Fresh/ Brackish Subtidal Estuarine Community (Rawinski 1984)
References: Bowman 2000, Breden et al. 2001, Edinger et al. 2002, Enser 1999, Gawler 2002, Metzler and Barrett 2001, Rawinski 1984, Reschke 1990, Sperduto 2000b, Swain and Kearsley 2001, Whitlatch 1982
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL004473

V.B.2.N.g.4. SARCOCORNIA PERENNIS - (DISTICHLIS SPICATA, SALICORNIA SPP.) TIDAL HERBACEOUS ALLIANCE

Woody Glasswort - (Saltgrass, Saltwort species) Tidal Herbaceous Alliance

SALICORNIA (VIRGINICA, BIGELOVII, MARITIMA) - SPARTINA ALTERNIFLORA HERBACEOUS VEGETATION
(Virginia Glasswort, Dwarf Glasswort, Sea Saltwort) - Saltmarsh Cordgrass Herbaceous Vegetation
Salt Panne **G5 (97-12-01)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Salt Pannes and Hypersaline Coastal Flats (202-55; n/a)

Concept: This association represents tidally flooded hypersaline flats or very shallow depressions (pannes) dominated by halophytic herbs, including *Salicornia virginica, Salicornia bigelovii, Salicornia maritima*, and stunted *Spartina alterniflora*, that occur along the Atlantic coast. Vegetation of this association tends to develop in shallow depressions within high salt marshes where drainage is poor. The depressions are flooded by high tides, but as the water evaporates during low tide, the salinity concentration increases forming 'salt pannes.' Formation of the pannes may result from ice scouring, rafting flotsam, peat compaction, mosquito ditch levees, or erosion of tidal creek banks, which create small, sparsely vegetated to unvegetated impoundments. Pannes form in both high and low salt marsh habitats; this community is regularly to irregularly flooded by tides. Bare peat and/or mucky soils are prevalent (up to 85% bare soils). Total vegetative cover is variable in pannes, from near total absence of vascular plants to a dense cover of *Salicornia virginica, Salicornia bigelovii, Salicornia maritima*, or *Spartina alterniflora* (short form). Common associates include *Limonium carolinianum, Plantago maritima var. juncoides, Triglochin maritima, Suaeda maritima*, and *Atriplex* spp. Algal mats are characteristically present, visible even in densely vegetated pannes. Blue-green algae are an important component of these mats, in some cases contributing significantly more biomass to the community than do vascular species. Diagnostic species include *Salicornia bigelovii* and *Salicornia virginica*.
Comments: This community occurs in coastal salt marshes from Nova Scotia to the Carolinas, north of the range of *Batis maritima*. Salt pannes can potentially be classified based on morphology, salinity gradients, or substrate (Godfrey et al. 1978), which may elucidate further variation.
Range: This association occurs along the Mid- and North Atlantic Coast from the Canadian maritime provinces south to North Carolina.
States/Provinces: CT:S?, DE:S3, MA:S3, MD:S?, ME:S3, NB:S?, NC?, NH:S?, NJ:S3S4, NS:S?, NY:S3, RI:S?, SC?, VA:S?
TNC Ecoregions: 57:P, 58:C, 62:C, 63:C
USFS Ecoregions: 212C:PP, 212D:PP, 221Aa:CCC, 221Ab:CCC, 221Ac:CCC, 221Ad:CCC, 221Ak:CCC, 232Aa:CCC, 232Ab:CCC, 232Ac:CCC, 232Ad:CC?, 232Bx:CCC, 232Bz:CCC, 232Ci:CCP
Federal Lands: NPS (Assateague Island, Fire Island)
Synonymy: Salt Flat (Schafale 2000), Pans (Hill 1986) =. Assateague Island., Pans (Higgins et al. 1971) =. Assateague Island., Salt marsh complex, pannes (Breden 1989) =. New Jersey., Salt panne (Reschke 1990) =. New York., *Spartina alterniflora / Salicornia europaea* community (Clancy 1993b) =. Delaware., Salt panne (Clancy 1993b) =. Delaware., Pan (Nichols 1920) =. Connecticut., Panne (Good 1965) =. New Jersey., *Salicornia* tidal flat (Clovis 1968) =. Virginia., Salt pan (Klotz 1986) =. Virginia., *Salicornia - Bassia* salt flat (Harvill 1965) =. Virginia., *Salicornietum ambiguae* (Conard 1935) =. New York., Salt panne (Miller and Egler 1950) =. Connecticut., Stunted *Spartina alterniflora* community (Miller and Egler 1950) =. Connecticut., Panne marsh (Baumann 1978b) =. Virginia., Salt Marsh (Rawinski 1984). formerly Southern New England and Gulf of Maine Salt Marshes., *Salicornia europaea - Spartina alterniflora* community (Metzler and Barrett 1992) =. Connecticut.
References: Baumann 1978b, Berdine 1998, Bertness et al. 1992, Bowman 2000, Breden 1989, Breden et al. 2001, Clancy 1993b, Clovis 1968, Conard 1935, Edinger et al. 2002, Enser 1999, Fleming 2001, Fleming et al. 2001, Gawler 2001, Gawler 2002, Godfrey et al. 1978, Good 1965, Harvill 1965, Higgins et al. 1971, Hill 1986, Klotz 1986, Metzler and Barrett 1992, Metzler and Barrett 2001, Miller and Egler 1950, Nichols 1920, Niering and Warren 1980, Peet et al. 2002, Rawinski 1984, Redfield 1972, Reschke 1990, Schafale 2000, Schafale and Weakley 1990, Sperduto 2000b, Swain and Kearsley 2001, Webber 1967
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL004308

V.B.2.N.h. Seasonally flooded temperate perennial forb vegetation

V.B.2.N.h.1. BACOPA MONNIERI - ELEOCHARIS ALBIDA SEASONALLY FLOODED HERBACEOUS ALLIANCE

Coastal Water-hyssop - White Spikerush Seasonally Flooded Herbaceous Alliance

BACOPA MONNIERI - ELEOCHARIS ALBIDA HERBACEOUS VEGETATION
Coastal Water-hyssop - White Spikerush Seasonally Flooded Herbaceous Vegetation
Water-hyssop - Spikerush Interdunal Swale **G1Q (97-12-01)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Interdune Herbaceous Wetlands (240-20; n/a)

Concept: This association comprises vegetation in broad, flat, seasonally flooded ponds within maritime dunes. Vegetation is often dominated by floating aquatic species, especially *Bacopa monnieri*. Common associates include *Eleocharis albida, Stuckenia pectinata (= Potamogeton pectinatus), Pluchea odorata, Schoenoplectus pungens (= Scirpus pungens), Hydrocotyle umbellata, Hydrocotyle verticillata, Phyla lanceolata,* and *Cyperus odoratus.* Algae may occur in abundance. Standing water may be present during much of the year. Soils are generally a shallow organic layer over wet sand. These interdunal ponds generally occur only in large dune systems.
Comments: Clarification of interdunal pond vegetation classification will require further data collection and analysis.
Range: This association is currently described from Virginia but possibly occurs in North Carolina and southward.
States/Provinces: VA:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232Bz:CCC
Federal Lands: USFWS (Chincoteague)
Synonymy: Fresh marsh (Higgins et al. 1971)
References: Fleming 2001, Fleming et al. 2001, Higgins et al. 1971
Authors: S.L. Neid, ECS **Confidence:** 3 **Identifier:** CEGL006350

V.B.2.N.h.3. WOODWARDIA VIRGINICA SEASONALLY FLOODED HERBACEOUS ALLIANCE

Virginia Chainfern Seasonally Flooded Herbaceous Alliance

WOODWARDIA VIRGINICA / SPHAGNUM CUSPIDATUM HERBACEOUS VEGETATION
Virginia Chainfern / Toothed Peatmoss Herbaceous Vegetation
Chainfern Small Depression Pond **G2? (97-12-01)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Open Sandhill Ponds and Emergent Marshes (345-20; n/a)

Concept: This generally defined association covers seasonally flooded wetland depressions, often strongly dominated by *Woodwardia virginica*, which occur in acid sands of the Coastal Plain. Vegetation is tall, up to 1.5 meters in height. Additional associates include *Triadenum virginicum, Carex striata, Hypericum mutilum* and *Decodon verticillatus.* Woody associates typically occur at the periphery of the pond, and may include scattered and stunted individuals of *Acer rubrum, Pinus taeda, Liquidambar styraciflua, Clethra alnifolia, Rhododendron viscosum,* or *Vaccinium corymbosum*. More information is needed on this vegetation type. It is attributed to various states in the Atlantic Coastal Plain from Delaware to Florida.
Comments:
Range: It is attributed to various states in the Atlantic Coastal Plain from Delaware to Florida.
States/Provinces: DE:S?, FL:S?, GA:S?, MD:S?, NC:S2, SC:S?
TNC Ecoregions: 53:P, 55:C, 56:C, 57:C, 58:C
USFS Ecoregions: 232Bf:CC?, 232Bz:CC?, 232Ca:CCP, 232Cb:CCC, 232Ch:CCC, 232Ga:CCC
Federal Lands:
Synonymy: Small Depression Drawdown Meadow/Savanna (Boggy Pool Subtype) (Schafale 2000)
References: Berdine and Gould 1999, Laessle 1942, Schafale 2000, Schafale and Weakley 1990
Authors: SCS **Confidence:** 2 **Identifier:** CEGL004475

V.C.2.N.a. Permanently flooded temperate or subpolar hydromorphic rooted vegetation

V.C.2.N.a.100. NELUMBO LUTEA PERMANENTLY FLOODED TEMPERATE HERBACEOUS ALLIANCE

American Lotus Permanently Flooded Temperate Herbaceous Alliance

NELUMBO LUTEA HERBACEOUS VEGETATION

American Lotus Herbaceous Vegetation

American Lotus Aquatic Wetland **G4? (01-09-19)**

Ecological Group (SCS;MCS): Eastern Open Ponds and Marshes (480-10; 1.4.1.1)

Concept: The American lotus type occurs in natural wetlands or artificial impoundments across the eastern United States and southern Ontario. Stands are essentially monospecific *Nelumbo lutea* communities. This association may be divided as more information becomes available. In Wisconsin, this type is located primarily in the backwaters and impoundments of the Mississippi River and along the deep marshes of the lower Wolf River system. In the Central Appalachians this association includes mixed or monospecific *Nelumbo lutea* communities of natural wetlands or artificial impoundments, sometimes with scattered *Cephalanthus occidentalis*. Other floating-leaved aquatic plant species, such as *Nuphar lutea* and *Nymphaea odorata*, may be present, as may emergent species such as *Schoenoplectus tabernaemontani (= Scirpus tabernaemontani), Pontederia cordata, Juncus effusus, Typha latifolia, Eichhornia crassipes* (alien), *Hydrocotyle* spp., and floating aquatics, such as *Salvinia minima, Spirodela* spp., *Lemna* spp., and *Azolla caroliniana*. The hydrology of this association is highly variable; the hydrologic placement is debatable.

Comments: It is unclear whether natural stands (ponds) can be separated from semi-natural stands (cultural impoundments that are invaded by *Nelumbo lutea*), complicating the classification and the assessment of the rarity of this type. This type is relatively uncommon in Wisconsin, but several of the occurrences are quite large (hundreds of acres) and reasonably well protected (E. Epstein pers. comm. 2003).

Range: This type is found locally across many parts of the eastern/southeastern United States, from Kentucky and Virginia northeast to Ontario and Wisconsin, south to Texas, and east to Georgia.

States/Provinces: AL:S?, AR:S?, GA:S?, IA:S?, IL?, IN:S?, KY:S?, LA:S?, MI:S?, MO?, MS:S?, NC:S4, OK:S?,S?, ON:S?, SC:S?, TN:S?, TX:S?, VA:S?, WI:S3

TNC Ecoregions: 31:C, 32:P, 36:C, 37:P, 38:C, 39:C, 40:P, 41:C, 42:C, 43:C, 44:C, 46:C, 48:C, 51:?, 52:P, 53:C, 56:P, 57:P, 58:?, 59:C

USFS Ecoregions: 222Ab:CCC, 222Ag:CCC, 222Ah:CCC, 222An:CCC, 222Ch:CCC, 222Db:CCC, 222Ka:CCC, 222Kb:CCC, 222Ke:CCC, 222Kf:CCC, 222Kh:CCC, 222Lb:CCC, 222Lc:CCC, 222Ld:CCC, 222Le:CCC, 231Ga:CCC, 231Gb:CCC, 231Gc:CCC, 232:C, 234An:CCC, 251Df:CCC, 255Dc:CCC, M221Ad:CCC, M222Aa:CCC, M222Ab:CCC, M231Aa:CCC, M231Ab:CCC, M231Ac:CCC, M231Ad:CCC

Federal Lands: DOD (Fort Benning); USFS (Kisatchie, Ouachita, Ozark); USFWS (Aransas?, Big Lake, Brazoria, Eufaula, McFaddin, Reelfoot)

Synonymy: IID6a. Natural Impoundment Pond (Allard 1990) B. in part, Water lily emergent vegetation (CAP pers. comm. 1998)

References: ALNHP 2002, Allard 1990, Blair 1938, Blair and Hubbell 1938, CAP pers. comm. 1998, Epstein pers. comm., Fleming et al. 2001, Hoagland 2000, McAlister and McAlister 1995, Penfound 1953, Schafale and Weakley 1990

Authors: SCS **Confidence:** 1 **Identifier:** CEGL004323

V.C.2.N.a.102. NYMPHAEA ODORATA - NUPHAR SPP. PERMANENTLY FLOODED TEMPERATE HERBACEOUS ALLIANCE

White Water-lily - Yellow Pond-lily species Permanently Flooded Temperate Herbaceous Alliance

NUPHAR LUTEA SSP. ADVENA - NYMPHAEA ODORATA HERBACEOUS VEGETATION

Broadleaf Pond-lily - White Water-lily Herbaceous Vegetation

Water-lily Aquatic Wetland **G4G5 (96-10-03)**

Ecological Group (SCS;MCS): Eastern Open Ponds and Marshes (480-10; 1.4.1.1)

Concept: This rooted aquatic or open marsh community occupies shallow water depressions, oxbow ponds, backwater sloughs of river floodplains, slow moving streams, ponds, and small lakes throughout the central and eastern United States. It is dominated by rooted, floating-leaved aquatic species, with both submergent and emergent aquatics also present. *Nuphar lutea ssp. advena* and *Nymphaea odorata* are dominants. Other species present may include *Brasenia schreberi,* various *Potamogeton* spp., *Polygonum amphibium*, and *Polygonum amphibium var. emersum (= Polygonum coccineum).* Submerged

aquatics more common in the southern part of the range include *Cabomba caroliniana, Ceratophyllum demersum*, and *Heteranthera dubia*.
Comments: Occurs in borrow pits on Kisatchie National Forest. On the Conecuh National Forest (Alabama), vegetation of this alliance occurs in Gum Pond and Open Pond as a mix of *Nymphaea odorata* and *Nuphar lutea ssp. advena*.
Range: This rooted aquatic community occupies shallow, quiet waters throughout the central and eastern United States, extending from Maine to Ontario and Minnesota, south to Oklahoma and east to Georgia.
States/Provinces: AL:S?, AR:S?, CT:S?, DE:S?, GA:S?, IA:SU, IL:S?, IN:S?, KY:S?, LA:S?, MA:S4, MD:S?, ME:S5, MI:S?, MN:S?, MO:S?, MS:S?, NC:S2, NH:S?, NJ:S4, NY:S5, OH:S?, OK:S?,S?, ON:S?, PA:S?, RI:S?, SC:S?, TN:S?, TX:S?, VA:S?, VT:S4, WI:S?, WV:S?
TNC Ecoregions: 31:C, 32:P, 36:C, 37:C, 39:C, 40:P, 41:C, 42:C, 43:C, 44:C, 45:C, 46:C, 47:C, 48:C, 49:C, 50:C, 51:C, 52:C, 53:C, 55:P, 56:C, 57:C, 58:C, 59:C, 60:C, 61:C, 62:C, 63:C
USFS Ecoregions: 212Aa:CCC, 212Ba:CCC, 212Bb:CCC, 212Ca:CCC, 212Cb:CCC, 212Da:CCC, 212Db:CCP, 212Dc:CCC, 212Fa:CCP, 212Fb:CCP, 212Fc:CCP, 212Fd:CCP, 212Ga:CCP, 212Gb:CCP, 212Hb:CPP, 212Ja:CCP, 212Jb:CCP, 212Jc:CCP, 212Je:CCP, 212Jf:CCP, 212Jj:CCP, 212Jl:CCP, 212Jm:CCC, 212Ka:CPP, 221Ah:CCC, 221Ai:CCC, 221Al:CCC, 221Am:CCC, 221Bd:CCP, 221Da:CCC, 221Db:CCC, 221Ea:CCC, 221Ed:CC?, 221Ef:CCC, 221He:CCC, 222Ch:CCC, 222Db:CCC, 222Gc:C??, 222Ha:CCC, 222Ja:CCC, 222Jb:CCC, 222Ji:CCC, 222Jj:CCC, 222Kf:CCC, 222Kg:CCC, 222Kh:CCC, 222Kj:CCC, 231Bc:CCC, 231Ga:CCC, 231Gb:CCC, 231Gc:CCC, 232Bf:CCC, 232C:CC, 232D:CC, 234Ac:CC?, 234An:CCC, 251Cf:CCC, 251Dd:CCC, 251Dg:CCC, 251Eb:CCC, M212Af:CCC, M212Bc:CCC, M212Bd:CCC, M212Cb:CCC, M212Cc:CCC, M212Ea:CCP, M212Eb:CCP, M221Aa:CCC, M221Ab:CCC, M221Ac:CCC, M221Ad:CCC, M221Ba:CCC, M221Bb:CCC, M221Bc:CCC, M221Bd:CCC, M221Be:CCC, M221Bf:CCC, M221Da:CCC, M221Dc:CCC
Federal Lands: DOD (Fort Benning); NPS (Acadia, Carl Sandburg Home); USFS (Angelina, Conecuh, Davy Crockett, Kisatchie, Ocala, Ozark, Sabine NF, Sam Houston?, Talladega); USFWS (Reelfoot)
Synonymy: Open Water/Aquatic Bed Veg., Natural Impoundment Pond (Ambrose 1990a) B, New England coastal plain pondshore (Rawinski 1984), L5D2aI1a. *Nuphar lutea* (Foti et al. 1994), Open water marsh with floating-leaved plants (NAP pers. comm. 1998)
References: Ambrose 1990a, Anderson 1982, Breden et al. 2001, FNAI 1990, Fike 1999, Fleming et al. 2001, Foti et al. 1994, Gawler 2002, Hoagland 2000, NAP pers. comm. 1998, NatureServe Ecology - Southeastern U.S. unpubl. data, Peet et al. 2002, Penfound 1953, Rawinski 1984, Schafale and Weakley 1990, Swain and Kearsley 2001, Zanoni et al. 1979
Authors: D. Faber-Langendoen, MCS **Confidence:** 3 **Identifier:** CEGL002386

NYMPHAEA ODORATA - ELEOCHARIS ROBBINSII HERBACEOUS VEGETATION
White Water-lily - Robbins Spikerush Herbaceous Vegetation
Coastal Plain Pond **G2 (98-12-07)**
Ecological Group (SCS;MCS): Southeastern Coastal Plain Open Ponds and Marshes (345-05; n/a)

Concept: 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. Characteristic species include *Nymphaea odorata, Nymphoides cordata*, and *Eleocharis robbinsii*, with frequent associates including *Scleria reticularis, Gratiola aurea, Proserpinaca pectinata, Utricularia juncea, Brasenia schreberi, Pontederia cordata, Ludwigia* spp., *Utricularia* spp., and *Eriocaulon aquaticum*.
Comments:
Range: This association is limited to the Atlantic and Coastal plains from southern New England to Maryland.
States/Provinces: DE:S?, MA:S2, MD:S?, NH:S?, NJ:S1S2, NY:S?, RI:S?
TNC Ecoregions: 58:C, 61:C, 62:C
USFS Ecoregions: 221A:CC, 221B:CC, 232Ac:CCC, 232C:CP
Federal Lands:
Synonymy: Coastal Plain Intermittent Pond (Breden 1989) B, New England coastal plain pondshore (Rawinski 1984)
References: Breden 1989, Breden et al. 2001, Rawinski 1984, Sneddon 1994, Swain and Kearsley 2001
Authors: ECS **Confidence:** 1 **Identifier:** CEGL006086

V.C.2.N.a.101. ORONTIUM AQUATICUM - (SCHOENOPLECTUS SUBTERMINALIS) PERMANENTLY FLOODED HERBACEOUS ALLIANCE

Golden Club - (Water Bulrush) Permanently Flooded Herbaceous Alliance

Concept: This alliance consists of aquatic vegetation of highly acidic, oligotrophic waters of the southeastern Coastal Plain and, rarely, similar situations elsewhere, as in the Great valley of Virginia. *Orontium aquaticum* and *Schoenoplectus subterminalis* are diagnostic. In addition, *Orontium*-dominated vegetation is reported from Appalachian Kentucky.
Comments:
Range: This alliance is found in Delaware, Kentucky, Virginia, North Carolina, and South Carolina. Examples occur in the Maple Flats pond complex (Augusta County, Virginia). In addition, *Orontium*-dominated vegetation is reported from Appalachian Kentucky.
States/Provinces: DE NC SC VA
TNC Ecoregions: 50:C, 56:P, 57:C, 58:C, 59:C
USFS Ecoregions: 221Ha:CCC, 221Hc:CCC, 232Bq:CCC, M221Ab:CCC, M221Cd:CCC
Federal Lands: DOD (Fort Bragg, Fort Jackson?); USFS (Daniel Boone, George Washington); USFWS (Carolina Sandhills?)
Synonymy:
References:
Authors: A.S. WEAKLEY, MP, Southeast **Identifier:** A.1931

ORONTIUM AQUATICUM - SCHOENOPLECTUS SUBTERMINALIS - ERIOCAULON AQUATICUM HERBACEOUS VEGETATION
Golden Club - Water Bulrush - Seven-angle Pipewort Herbaceous Vegetation
Golden Club Pond **G1 (99-01-07)**
Ecological Group (SCS;MCS): Appalachian and Interior Highlands Herbaceous Depression Ponds and Pondshores (475-30; 1.5.4.2)

Concept: This community occurs in semipermanently flooded depression ponds developed by solution and collapse of carbonate rocks underlying acidic colluvial materials deposited on the eastern edge of the Great Valley of Virginia, in Augusta County, Virginia. Tentatively, it is also ascribed to acidic sites in the Coastal Plain of Virginia and Delaware. This community is limited among these ponds to Spring Pond, a cold, permanently flooded pond with water levels constantly replenished by groundwater inputs. *Orontium aquaticum* is the dominant plant; other species present are *Schoenoplectus subterminalis (= Scirpus subterminalis), Brasenia schreberi, Eleocharis robbinsii, Eriocaulon aquaticum, Panicum hemitomon*, and *Woodwardia virginica*.
Comments: Examples occur at Spring Pond in the Maple Flats pond complex (Augusta County, Virginia). Beaver activity at Spring Pond needs careful monitoring and remedial action if necessary to protect this community. If water levels are raised so high that the aquatic species cannot bottom-root, then the entire community could be extirpated from the pond. While some might argue that periodic beaver impacts on such wetlands are "natural," it would be a tragedy and a great loss to Virginia's biodiversity if the finest (and possibly the only) example of this extraordinary vegetation type were destroyed.
Range: This community is definitely known from the Maple Flats Pond complex in Augusta County, Virginia. Tentatively, the type is also ascribed to a pond in the Ridge and Valley province of Pennsylvania, and to acidic semipermanent impoundments (beaver ponds, old mill ponds) in the Coastal Plain of Virginia and Delaware.
States/Provinces: DE:S?, VA:S?
TNC Ecoregions: 58:P, 59:C
USFS Ecoregions: M221Ab:CCC
Federal Lands: USFS (George Washington)
Synonymy: *Orontium aquaticum - Scirpus subterminalis* community (Fleming and Van Alstine 1999), *Orontium aquaticum - Schoenoplectus subterminalis - Eriocaulon aquaticum* Herbaceous Vegetation (Fleming and Coulling 2001)
References: Buhlmann et al. 1999, Fleming and Coulling 2001, Fleming and Van Alstine 1999, Fleming et al. 2001, Roble 1999
Authors: G. Fleming and P. Coulling, SCS **Confidence:** 2 **Identifier:** CEGL007859

V.C.2.N.b. Permanently flooded-tidal temperate or subpolar hydromorphic rooted vegetation

V.C.2.N.b.2. CERATOPHYLLUM DEMERSUM PERMANENTLY FLOODED - TIDAL HERBACEOUS ALLIANCE

Coontail Permanently Flooded - Tidal Herbaceous Alliance

Concept: Wind-tidally flooded floating/submergent wetlands of fresh to oligohaline, river basin guts and large pools. This community is dominated (or codominated) by *Ceratophyllum demersum*. Other abundant species can include *Utricularia macrorhiza* and *Nymphaea odorata*. Other species include *Elodea nuttallii, Spirodela polyrrhiza, Wolffiella gladiata, Lemna* spp., and *Utricularia purpurea*. This alliance likely occurs in Louisiana, where it occupies lower (tidal) reaches of bayous.
Comments:
Range: This alliance is found in Virginia, and possibly in Louisiana (?) and North Carolina (?).
States/Provinces: MD NC? VA
TNC Ecoregions: 57:C, 58:C
USFS Ecoregions: 232Ad:CCC, 232Br:CCC, 232Bt:CCC, 232Bx:CCC, 232Ch:CCC, 232Cj:CCC
Federal Lands:
Synonymy:
References: Fleming 1998
Authors: G.P. FLEMING/A.S. WEAKLEY, JT, Southeast **Identifier:** A.1767

CERATOPHYLLUM DEMERSUM - VALLISNERIA AMERICANA - NAJAS SPP. TIDAL HERBACEOUS VEGETATION

Coontail - Tape-grass - Waternymph species Tidal Herbaceous Vegetation
Mixed Freshwater Subtidal Community **G? (02-05-13)**

Concept: This association comprises mixed freshwater subtidal aquatic beds of the mid-Atlantic coast. It occurs in fresh reaches of upper bays and tributaries within estuarine systems. Species composition is variable and includes *Vallisneria americana, Ceratophyllum demersum, Heteranthera dubia, Elodea canadensis, Najas guadalupensis, Najas gracillima, Najas minor, Potamogeton pusillus,* and others. There is often a strong component of exotic species that can be locally or extensively dominant including *Myriophyllum spicatum, Hydrilla verticillata,* and *Potamogeton crispus,* which may be indicative of poorer water quality. This association can have dramatic seasonal fluctuations in species composition and biomass.
Comments: This association is similar to *Stuckenia pectinata - Potamogeton perfoliatus - (Zannichellia palustris)* Tidal Herbaceous Vegetation (CEGL006027) in environment and has some overlap in species composition. It is distinguished by its higher species diversity (including the presence of several exotics) and the lack of dominance by *Potamogeton* species.
Range: The geographic range of this type is centered in the Chesapeake Bay estuary, it but likely occurs in other locations.
States/Provinces: MD:S?, VA:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232Ad:CCC, 232Br:CCC, 232Bt:CCC, 232Bx:CCC, 232Ch:CCC, 232Cj:CCC
Federal Lands:
Synonymy: Freshwater Mixed Community (Moore et al. 2000)
References: Fleming 2001, Fleming et al. 2001, Moore et al. 2000, Orth and Moore 1988
Authors: S.L. Neid, ECS **Confidence:** 3 **Identifier:** CEGL006048

V.C.2.N.b.4. RUPPIA MARITIMA PERMANENTLY FLOODED - TIDAL TEMPERATE HERBACEOUS ALLIANCE

Beaked Ditch-grass Permanently Flooded - Tidal Temperate Herbaceous Alliance

RUPPIA MARITIMA ACADIAN/VIRGINIAN ZONE TEMPERATE HERBACEOUS VEGETATION

Beaked Ditch-grass Acadian/Virginian Zone Temperate Herbaceous Vegetation
Northern Atlantic Coast Beaked Ditch-grass Bed **G? (97-12-01)**
Ecological Group (SCS;MCS): Atlantic Zone Tidal Aquatic Vegetation (201-10; n/a)

Concept: This brackish/saline tidal community of the central and northern Atlantic coast is dominated by *Ruppia maritima*. It occurs in large beds in estuarine bays as well as small patches within brackish tidal creeks. Substrates are sand or muck, and salinity is generally brackish. *Ruppia maritima* has a wide range of salinity tolerance and overlaps with other species, although generally not in the same locations. Common associates include *Zannichellia palustris, Stuckenia pectinata (=*

Potamogeton pectinatus), and *Potamogeton perfoliatus* in brackish/fresh areas or *Zostera marina* as waters get deeper and more saline. There can also be a diverse array of macroalgae.
Comments: *Ruppia maritima* tends to occur in shallower and slightly less saline waters than *Zostera marina* (Orth and Moore 1988). The range of this type is consistent with the "Virginian Province" and "Acadian Province" of Cowardin et al. (1979).
Range: This association occurs along the mid- and north Atlantic coast from Maine to North Carolina.
States/Provinces: CT:S?, DE:S4?, MA:S4, MD:S?, ME:S3, NC?, NH:S?,S?, NJ:S3S4, NY:S3S4,S3S4, RI:S?,S?, VA:S?
TNC Ecoregions: 57:?, 58:C, 62:C, 63:C
USFS Ecoregions: 212Db:CCP, 221Aa:CCP, 221Ab:CCC, 221Ac:CCC, 221Ad:CCC, 221Ae:CCP, 221Af:CCC, 221Ak:CCC, 221Ba:CCP, 232Ac:CCC, 232Br:CCC, 232Bx:CCC, 232Bz:CCC, 232Ch:CCC
Federal Lands: NPS (Assateague Island)
Synonymy: Polyhaline subtidal aquatic bed (Breden 1989). in part, *Ruppia* Community (Moore et al. 2000), Southern New England & Gulf of Maine Saline/ Brackish Subtidal Estuarine Community (Rawinski 1984)
References: Bowman 2000, Breden 1989, Breden et al. 2001, Cowardin et al. 1979, Edinger et al. 2002, Enser 1999, Fleming 2001, Fleming et al. 2001, Gawler 2002, Metzler and Barrett 2001, Moore et al. 2000, Orth and Moore 1988, Rawinski 1984, Reschke 1990, Schafale and Weakley 1990, Sperduto 2000b, Swain and Kearsley 2001, Thayer et al. 1984
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006167

V.C.2.N.b.3. STUCKENIA PECTINATA - ZANNICHELLIA PALUSTRIS PERMANENTLY FLOODED - TIDAL HERBACEOUS ALLIANCE

Sago Pondweed - Horned Pondweed Permanently Flooded - Tidal Herbaceous Alliance

STUCKENIA PECTINATA - POTAMOGETON PERFOLIATUS - (ZANNICHELLIA PALUSTRIS) TIDAL HERBACEOUS VEGETATION

Sago Pondweed - Clasping-leaf Pondweed - (Horned Pondweed) Tidal Herbaceous Vegetation
Central Atlantic Freshwater Subtidal River Bed **G3G5 (97-12-01)**
Ecological Group (SCS;MCS): Atlantic Zone Tidal Aquatic Vegetation (201-10; n/a)

Concept: This type includes vegetation of shallow subtidal fresh to slightly brackish water and mud or sand sediments exposed at extreme low tide occurring along the mid- and north Atlantic coast. Common and dominant species include *Stuckenia pectinata (= Potamogeton pectinatus), Zannichellia palustris, Vallisneria americana, Najas guadalupensis, Elodea nuttallii*, and *Ceratophyllum demersum*. *Ruppia maritima* may occur sporadically, but it is more prevalent in brackish and saline habitats. Invasive exotics often occur in this habitat, including *Myriophyllum spicatum* and *Trapa natans*. This association grades almost imperceptibly into brackish/saline aquatic bed vegetation.
Comments: The vegetation composition of this association intergrades with that of saline/brackish subtidal aquatic beds. This association can be distinguished from *Ruppia maritima* Acadian/Virginian Zone Temperate Herbaceous Vegetation (CEGL006167) in that *Stuckenia pectinata* and *Zannichellia palustris* rather than *Ruppia maritima* are strongly dominant. Southern analogs of fresh to oligohaline subtidal aquatic bed vegetation include *Ceratophyllum demersum - Utricularia macrorhiza - Nymphaea odorata* Herbaceous Vegetation (CEGL004661), which occurs in wind-tidal situations in the Chesapeake Bay area, and *Vallisneria americana* Estuarine Bayou Herbaceous Vegetation (CEGL004634) in the Gulf Coast. The vegetation composition of this association is very similar to, if not indistinguishable from, that of non-tidal submerged aquatic beds.
Range: This association occurs along the mid- and north Atlantic coast from Massachusetts to Virginia.
States/Provinces: CT:S?, DE:S1, MA:S2, MD:S?, NJ:S2S3, NY:S3S4,S3, VA:S?
TNC Ecoregions: 58:C, 62:C
USFS Ecoregions: 212Db:CCP, 221Aa:CCP, 221Ab:CCC, 221Ac:CCC, 221Ad:CCC, 221Ae:CCP, 221Ak:CCC, 221Ba:CCP, 232Aa:CCC, 232Ab:CCP, 232Ac:CCC, 232Br:CCP, 232Bx:CCP, 232Bz:CCP, 232Ch:CCP
Federal Lands:
Synonymy: Polyhaline subtidal aquatic bed (Breden 1989). in part, *Potamogeton* Community (Moore et al. 2000), Southern New England & Gulf of Maine Fresh /Brackish Subtidal Estuarine Communities (Rawinski 1984)
References: Berdine 1998, Bowman 2000, Breden 1989, Breden et al. 2001, Edinger et al. 2002, Enser 1999, Fleming 2001, Fleming et al. 2001, Metzler and Barrett 2001, Moore et al. 2000, Rawinski 1984, Reschke 1990, Swain and Kearsley 2001
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL006027

V.C.2.N.b.1. ZOSTERA MARINA PERMANENTLY FLOODED - TIDAL HERBACEOUS ALLIANCE

Eel-grass Permanently Flooded - Tidal Herbaceous Alliance

ZOSTERA MARINA HERBACEOUS VEGETATION

Eel-grass Herbaceous Vegetation

North Atlantic Eel-grass Bed **G? (97-12-01)**

Ecological Group (SCS;MCS): Atlantic Zone Tidal Aquatic Vegetation (201-10; n/a)

Concept: These aquatic beds occur in the subtidal zone along the north Atlantic coast, south to North Carolina. *Zostera marina* is dominant and occurs most often in nearly pure stands. *Ruppia maritima* can occur sporadically in this association, especially as waters become less saline. Additional associated species include macroalgae, especially *Ulva lactuca, Enteromorpha* spp., *Cladophora* spp., and *Polysiphonia* spp. Where water is less saline, *Enteromorpha, Chaetomorpha, Gracilaria, Agardhiella, Ectocarpus*, and *Pilayella* can occur. Elevation/depth of the beds is determined by low tide level at the upper end and light penetration at the lower end, the latter being a function of water depth and turbidity. The beds generally occur in areas with only moderate wave action where salinity fluctuations are minor. Eel-grass beds tend to stabilize and enrich substrate and provide habitat for epiphytes and other marine organisms.
Comments: According to Thayer et al. (1984) *Zostera marina* has a range of approximately 3090 km along the North American Atlantic coast which may be represented as 4 smaller subregions. The bulk of the southern range corresponds with the Virginian Zone of Cowardin et al. (1979). *Zostera marina* is extirpated from Delaware.
Range: This community occurs in subtidal habitat along the north and mid-Atlantic coast.
States/Provinces: CT:S?, DE:SX, MA:S4,S4,S4,S2, MD:S?, ME:S?, NC:S?, NH:S1, NJ:S3, NY:S3, RI:S?, VA:S?
TNC Ecoregions: 57:C, 58:C, 62:C, 63:C
USFS Ecoregions: 212Db:CCC, 212Dc:CCC, 221Aa:CCC, 221Ab:CCC, 221Ac:CCC, 221Ad:CCC, 221Ak:CCC, 221Ba:CCP, 232Aa:CCC, 232Ab:CCC, 232Ad:CCP, 232Af:CCC, 232Br:CCC, 232Bx:CCC, 232Bz:CCC, 232Ci:CCC, 232Cj:CCC
Federal Lands: NPS (Assateague Island)
Synonymy: Polyhaline subtidal aquatic bed (Breden 1989), *Zostera* Community (Moore et al. 2000), Southern New England & Gulf of Maine Saline/ Brackish Subtidal Estuarine Community (Rawinski 1984), Coastal Salt Pond (Rawinski 1984)
References: Berdine 1998, Bowman 2000, Breden 1989, Breden et al. 2001, Cowardin et al. 1979, Edinger et al. 2002, Enser 1999, Fleming 2001, Fleming et al. 2001, Metzler and Barrett 2001, Moore et al. 2000, Orth and Moore 1988, Rawinski 1984, Reschke 1990, Sperduto 2000b, Swain and Kearsley 2001, Thayer et al. 1984
Authors: S.L. Neid, ECS **Confidence:** 3 **Identifier:** CEGL004336

V.D.2.N.g. Seasonally flooded temperate annual grassland

V.D.2.N.g.1. ERAGROSTIS HYPNOIDES - LIPOCARPHA MICRANTHA - MICRANTHEMUM UMBROSUM SEASONALLY FLOODED HERBACEOUS ALLIANCE

Creeping Lovegrass - Small-flower Hemicarpha - Shaded Mudflower Seasonally Flooded Herbaceous Alliance

ERAGROSTIS HYPNOIDES - LUDWIGIA SPHAEROCARPA - POLYGONUM HYDROPIPEROIDES HERBACEOUS VEGETATION

Creeping Lovegrass - Globe-fruit Seedbox - Swamp Smartweed Herbaceous Vegetation

Creeping Lovegrass Coastal Plain Pond **G? (00-04-17)**

Ecological Group (SCS;MCS): Southeastern Coastal Plain Emergent Ponds and Marshes (345-30; n/a)

Concept: 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. In years of high rainfall resulting in incomplete drawdown, many species of this association persist in the seedbank below standing water. The substrate is an organic layer over black clay loam. The vegetation is dominated by small-statured herbs, including *Eragrostis hypnoides, Hottonia inflata, Polygonum hydropiperoides, Polygonum amphibium, Ludwigia sphaerocarpa, Oldenlandia uniflora, Cyperus strigosus, Bidens frondosa, Bidens discoidea, Fimbristylis perpusilla, Fimbristylis autumnalis*, and *Juncus*

pelocarpus. Other species of taller stature may be present, including seedlings or small saplings of *Cephalanthus occidentalis* and herbaceous species *Panicum rigidulum, Carex striata, Carex gigantea,* and *Torreyochloa* sp.
Comments:
Range:
States/Provinces: MD:S?, VA:S?
TNC Ecoregions: 58:C
USFS Ecoregions: 232A:CC, 232B:CC
Federal Lands:
Synonymy: *Lindernia dubia - Eragrostis hypnoides - Panicum dichotomiflorum* Association (Rawinski 1997)
References: Berdine and Gould 1999, Coulling 2002, Fleming et al. 2001, Rawinski 1997
Authors: ECS **Confidence:** 2 **Identifier:** CEGL006608

VII. SPARSE VEGETATION

VII.C.2.N.a. Sand flats

VII.C.2.N.a.2. CAKILE EDENTULA SPARSELY VEGETATED ALLIANCE
Sea-rocket Sparsely Vegetated Alliance

CAKILE EDENTULA SSP. EDENTULA - CHAMAESYCE POLYGONIFOLIA SPARSE VEGETATION
Sea-rocket - Northern Seaside Spurge Sparse Vegetation
North Atlantic Upper Ocean Beach **G4G5 (97-12-01)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Beach Vegetation (230-10; n/a)

Concept: This is a sparsely vegetated upper beach community occurring on unstable sands and often gravels and cobbles just above mean high tide on maritime beaches and foredunes along the middle and northern Atlantic coast. This association occurs at the wrack line; there is regular deposition of wave-deposited flotsam. They are irregularly flooded by spring or storm tides. Vegetation cover is variable, depending on the amount of exposure to wave and wind action, but is generally sparse and characterized by annuals and biennials. Species composition can change dramatically from year to year but frequently includes *Cakile edentula ssp. edentula*, as well as *Salsola kali ssp. kali (= Salsola caroliniana), Chamaesyce polygonifolia, Honckenya peploides, Cenchrus tribuloides, Amaranthus retroflexus, Chenopodium album, Erechtites hieraciifolia, Xanthium strumarium*, and *Atriplex cristata (= Atriplex arenaria)*. Globally rare species such as *Polygonum glaucum* and *Amaranthus pumilus* occur in this habitat. Sparse *Ammophila breviligulata* can occur sporadically as a common associate, colonizing from the adjacent beachgrass community. Diagnostic species are *Cakile edentula ssp. edentula, Salsola kali ssp. kali, Atriplex cristata (= Atriplex pentandra),* and *Chamaesyce polygonifolia*. This community occurs in maritime coastal areas from southern Maine to Cape Hatteras, North Carolina.
Comments: This community is common on maritime dunes of the Northeast, but is vulnerable to development and shifting wave action due to jetties.
Range: This association ranges from southern Maine to Virginia.
States/Provinces: CT:S?, DE:S?, MA:S3, MD:S?, ME:S4, NC:S3, NH:S2, NJ:S1S2, NY:S5, RI:S?, VA:S?
TNC Ecoregions: 57:C, 58:C, 62:C
USFS Ecoregions: 221Ab:CCC, 221Ac:CCC, 221Ak:CCC, 232Aa:CCC, 232Ab:CCC, 232Ac:CCC, 232Bz:CCC, 232Ch:CCC
Federal Lands: NPS (Assateague Island, Fire Island)

Synonymy: Beach community (Baumann 1978b) =. Virginia., Beach community (Hill 1986) =. Assateague Island., Beach community (Johnson 1985b), Beach (Fender 1937) =. New Jersey., Beach (Higgins et al. 1971) =. Assateague Island., Beach (McDonnell 1979) =. Massachusetts., Pioneer beach community (Boule 1979) =. Virginia., Dune-strand area (Clovis 1968) =. Virginia., Dune community (Jenkins 1974) =. Chesapeake Bay., Middle beach (Shreve et al. 1910) =. Maryland., Middle beach (Nichols 1920) =. Connecticut., *Cakiletum edentula* (Conard 1935) =. New York., Sea-strand vegetation, beach formation (Harshberger 1900) =. New Jersey., Embryo dune (Klotz 1986) =, Beach vegetation (Moul 1973) =. Massachusetts., Marine sandy beach (Clancy 1993b) =. Delaware., Marine intertidal gravel/sand beach community (Breden 1989) =. New Jersey., Coastal beach strand (Sperduto 1994) =. New Hampshire., Beach strand community (MENHP 1991) =. Maine., *Cakile edentula - Chenopodium album* community (Metzler and Barrett 1992) =. Connecticut., Dune and swale community (Stalter 1990) B. Virginia portion of Assateague., Coastal beach strand community (Rawinski 1984), Maritime beach (Reschke 1990) =. New York.
References: Baumann 1978b, Berdine 1998, Boule 1979, Bowman 2000, Breden 1989, Breden et al. 2001, Clancy 1993b, Clovis 1968, Conard 1935, Edinger et al. 2002, Enser 1999, Fender 1937, Fleming et al. 2001, Gawler 2001, Gawler 2002, Godfrey et al. 1978, Harshberger 1900, Higgins et al. 1971, Hill 1986, Jenkins 1974, Johnson 1985b, Klotz 1986, MENHP 1991, McDonnell 1979, Metzler and Barrett 1992, Metzler and Barrett 2001, Moul 1973, Nichols 1920, Rawinski 1984, Reschke 1990, Schafale and Weakley 1990, Shreve et al. 1910, Sperduto 1994, Sperduto 2000b, Stalter 1990, Swain and Kearsley 2001
Authors: S.L. Neid, ECS **Confidence:** 2 **Identifier:** CEGL004400

VII.C.2.N.d. Tidal sand flats

VII.C.2.N.d.3. SESUVIUM SPP. - ATRIPLEX SPP. - SUAEDA SPP. TIDAL SPARSELY VEGETATED ALLIANCE

Sea-purslane species - Saltbush species - Sea-blite species Tidal Sparsely Vegetated Alliance

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SESUVIUM PORTULACASTRUM - ATRIPLEX SPP. - SUAEDA SPP. SPARSE VEGETATION
Shoreline Sea-purslane - Saltbush species - Sea-blite species Sparse Vegetation
Coastal Bay Shore / Succulent Beach **G3 (97-08-11)**
Ecological Group (SCS;MCS): Atlantic and Gulf Coast Beach Vegetation (230-10; n/a)

Concept: This association represents irregularly flooded beach vegetation along the Atlantic and northern Gulf of Mexico coasts. Examples tend to occur on the back side of the ends of barrier islands; where they are only irregularly flooded. In contrast to *Salicornia*- or *Distichlis*-dominated areas they apparently accumulate less salt. Its physiognomy tends to be of scattered mound-like clumps of vegetation (mostly *Sesuvium portulacastrum*) in a wet sand flat.
Comments:
Range: This community occurs along the Atlantic Ocean and portions of the northern Gulf of Mexico.
States/Provinces: AL:S?, FL?, GA?, MD:S?, MS?, NC:S3, SC:S?, VA:S?
TNC Ecoregions: 53:C, 56:P, 57:C, 58:C
USFS Ecoregions: 232Ci:CCC, 232Dd:CCC
Federal Lands: NPS (Assateague Island); USFWS (Bon Secour)
Synonymy:
References: Fleming et al. 2001, Lea 2002b, Nelson 1986, Schafale and Weakley 1990
Authors: SCS **Confidence:** 2 **Identifier:** CEGL004406

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