

# Winter 2013 Guide to Delaware Vegetation Communities

Robert Coxe



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**[-Take me to the vegetation community keys-](#)**

## Introduction

The Guide to Delaware Vegetation Communities is intended to provide a Delaware flavor to the National Vegetation Classification System (NVCS). All common names of communities, except for those not in the NVCS, follow the NVCS. This document is designed for the web and CD only, but desired sections can be printed by users as needed. In this way, paper and therefore trees can be preserved and impacts to the communities discussed within can be minimized. In spirit of saving these communities please only print those community descriptions that you will use or print none at all.

The State of Delaware covers 1,524,863.4 acres of which 1,231,393.6 acres are terrestrial and 293,469.8 acres are water (Table 1). Currently 130 vegetation communities are known to occur in Delaware. Some of the largest vegetation communities/land covers in the state include:

**Table 1. Acreage of the largest Land Covers/Vegetation Communities in Delaware**

<b>Veg. Comm./Land Cover</b>	<b>Acreage</b>	<b>Square Miles</b>	<b>Percentage</b>
Agricultural Field	473,372.07	739.64	30.9
Water	286,282.94	447.32	18.7
Cultivated Lawn	180,354.4	281.8	11.8
Impervious Surface	96,322.52	150.5	6.3
Mid-Atlantic Mesic Mixed Hardwood Forest	51,912.01	81.1	3.4
All other Vegetation Communities/Land Covers	355834.8	555.99	23.2
Still to be identified	87,039.26	135.99	5.7
<b>Total</b>	<b>1,531,118</b>	<b>2,392</b>	<b>100</b>

The Guide will be updated each quarter (spring, summer, fall and winter) to reflect the continual flow of new information which comes in to the Delaware Natural Heritage. In the future it is hoped that the Guide to Delaware Vegetation Communities will be joined by “Companions” such as a:

**Watershed Companion:** will discuss the various watersheds within Delaware with information on geology, history and land use to provide a context of the vegetation communities.

**Landowners Companion:** will discuss management needs and techniques for vegetation communities in Delaware including exotic and invasive species, restoration and conservation plans.

**Tourists Companion:** will provide a roadmap for visiting the various vegetation communities in Delaware for non-residents and residents alike.

**Birdwatcher's Companion:** will provide information on what birds can be seen in the different vegetation communities in Delaware.

In addition it is hoped that the Flora of Delaware will be integrated into the Guide to provide an integrated document of the relationship between the flora and vegetation communities in Delaware.

### **Where is the Table of Contents?**

Unlike paper documents, electronic documents can be searched using the find key. Also this document contains a searching key that is more directed than a table of contents.

### **Use of the Identification Keys**

All of the Identification Keys (Forest, Woodland, Shrub, etc. are hot-linked and marked in **Blue** and will take you to the key for the particular County that you are located in.

#### **For Example: You are trying to identify a forest in New Castle County.**

Click on New Castle County (under the forest subheading), which would then take you to a key for forest types known to be in New Castle County.

Once you are in the County key you can then select the forest type that best matches the type you are trying to identify. Forest types are in alphabetical order. To select the forest type click on the C EGL00####) number which will take to the description of that community (see User's Guide below). If the description does not match what you are trying to identify then you can return to the County key by clicking the return to... key at the bottom of the description.

### **Distribution of the Communities**

Within the descriptions are watershed maps showing the known range of the community. In process of identifying your community you may find a new occurrence of a community, especially those that are not currently known to be in Delaware. If you identify a community and it is not marked as being in the watershed you are in please call Robert Coxe, Delaware Natural Heritage Program Ecologist at 302-653-2880 x122 or email at [Robert.Coxe@state.de.us](mailto:Robert.Coxe@state.de.us). We would like to know about it.

### **Hints on Searching**

If you already know the name of the community or C EGL number of the community you looking for you can use the find command (CTRL-F) under edit to locate the description in the document.



## **We would like to have your comments**

We are interested in hearing your comments about the Guide. You can contact us at 302-735-8672 or email at [Robert.Coxe@state.de.us](mailto:Robert.Coxe@state.de.us). If you would like to mail a letter our address is:

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# Users Guide

**Common Name of the Community**    **G** (G-rank)\*    **S** (S-rank)\*    **D** (D-rank)\*

**NVC Alliance:** NVC Alliance of the Community (Hot-linked to Natureserve website)

**NVC Association:** NVC Association of the Community (Hot-linked to Natureserve website)

**Delaware Type Locality:** Describes the location for the best example of the community in Delaware. A hot-link in [blue](#) is provided for a map of the location.

**Description:** General description of the community and species found in each strata layer. Hot-links in [blue](#) are provided for descriptions from Wikipedia for various species and other terms.

**Diagnostic Features:** The features of the community that distinguish it from all other communities in Delaware and in a sense the “final word” on how to identify the community.

**Geology and Environmental Features:** Specific geologic and other environmental factors related to the community.

**Landscape Position:** General location of the community in the landscape

**Associated Soil Series:** Soil series(s) on which the community is found

**NWI Classification:** For wetland communities, the National Wetland Inventory classification of where the community is found.

**Species documented from this community** (**Note:** These links are disabled on the webpage version)

**Animals:** Link to folder of all of the Animals documented from the community

**Non-Vascular Plants:** Link to spreadsheet of all of the Non-Vascular Plants documented from the community

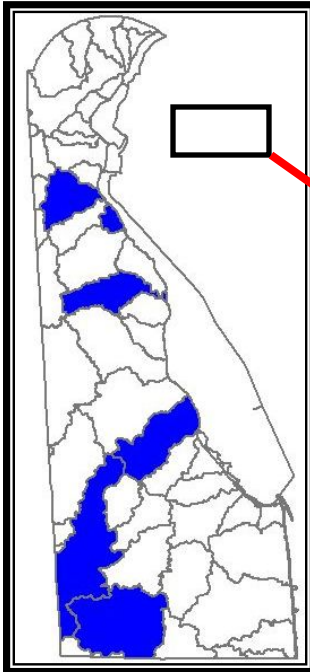
**Vascular Plants:** Link to a spreadsheet of all of the Vascular Plants documented from the community

**Associated Rare Species:**

**Animals:** Rare animals known to be in the community

**Non-Vascular Plants:** Rare non-vascular plants known to be in the community.

**Vascular Plants:** Rare vascular plants known to be in the community.



Distribution: Distribution of the community in Delaware and in North America. A map depiction showing the watersheds the community is documented from will be to the left of the description.

Box with the color of the community on Delaware Vegetation Maps

**Estimated acres in Delaware** = Acres of the community in Delaware (from statewide watershed vegetation mapping project, currently ongoing)

Equivalent or related communities in nearby states:

**Maryland:** Name of the equivalent community(ies) in Maryland if present

**New Jersey:** Name of the equivalent community(ies) in New Jersey if present

**Pennsylvania:** Name of the equivalent community(ies) in Pennsylvania if present

**Virginia:** Name of the equivalent community(ies) in Virginia if present

**-Back to...** (link to take you back to the county community key)-

\*See Appendix I for explanation of ranks

## Key to Vegetation Communities in Delaware

**Forest:** Communities that have a 60% or greater tree canopy coverage and have not been impacted by humans in the recent past or contain few exotic/native invasive species.

[New Castle County](#)

[Kent County](#)

[Sussex County](#)

**Woodland:** Communities that have less than 60% tree canopy coverage.

[New Castle County](#)

[Kent County](#)

[Sussex County](#)

**Shrubland:** Communities dominated by shrubs with sparse or no canopy.

[New Castle County](#)

[Kent County](#)

[Sussex County](#)

**Vineland:** Communities that are dominated by a species of vine such as poison ivy or common greenbrier.

[New Castle County](#)

[Kent County](#)

[Sussex County](#)

**Non-Tidal Marsh:** Herbaceous community that is subjected to continuous or frequent inundation.

[New Castle County](#)

[Kent County](#)

[Sussex County](#)

**Tidal Marsh:** Herbaceous community that is subjected to inundation diurnally.

[New Castle County](#)

[Kent County](#)

[Sussex County](#)

**Maritime Grasslands:** Grasslands that are found on dunes of the Atlantic Strand and the Delaware Bay shore.

[Kent County](#)

[Sussex County](#)

**Coastal Plain Ponds:** Seasonal ponds which are referred to as “Delmarva Bays” and “Carolina Bays” that contain water in the winter and spring and dry in the summer.

[New Castle County](#)

[Kent County](#)

[Sussex County](#)

**Herbaceous Vegetation:** Herbaceous communities that are not a Marsh, Interdune Swale, Aquatic, Piedmont Wetland or a Coastal Plain Pond.

[New Castle County](#)

[Kent County](#)

[Sussex County](#)

**Piedmont Herbaceous Wetlands:** Wetlands in the Piedmont that are dominated by herbaceous plants.

[New Castle County](#) (only)

**Modified/Successional Communities/Planted Forests:** Communities impacted by human activity, infested with exotic/invasive species or planted.

[New Castle County](#)

[Kent County](#)

[Sussex County](#)

**Interdunal Swales:** Wetlands located between coastal dunes along the lower Delaware Bay and Atlantic Strand of Delaware.

[Sussex County](#) (only)

**Aquatic Communities:** Communities that are dominated by floating or submersed vegetation.

[New Castle County](#)

[Kent County](#)

[Sussex County](#)

## New Castle County Forests

**Box-elder Floodplain Forest:** A forest that is dominated by box elder (*Acer negundo*) and associated by silver maple (*Acer saccharinum*) and sycamore (*Platanus occidentalis*). ([CEGL005033](#)) **Brandywine Creek; Christina River; Red Clay Creek**

**Central Appalachian Basic Seepage Swamp:** Seepage swamp in the northern Coastal Plain that is dominated or co-dominated by black ash (*Fraxinus nigra*). ([CEGL008416](#)) **Appoquinimink River; Blackbird Creek**

**Central Appalachian Dry-Mesic Chestnut Oak-Northern Red Oak Forest:** A forest that has a prominent presence of chestnut oak (*Quercus prinus*) and sweet birch (*Betula lenta*) in the canopy. ([CEGL006057](#)) **Brandywine Creek; Red Clay Creek**

**Central Appalachian/Northern Piedmont Chestnut Oak Forest:** A forest with chestnut oak (*Quercus prinus*) dominant in the canopy and mountain laurel (*Kalmia latifolia*) dominant in the understory/shrub layer. ([CEGL006299](#)) **Brandywine Creek; Red Clay Creek**

**Chesapeake Bay Nonriverine Wet Hardwood Forest:** Wet hardwood forest that is composed of red maple (*Acer rubrum*), swamp chestnut oak (*Quercus michauxii*), willow oak (*Quercus phellos*), loblolly pine (*Pinus taeda*), and blackgum (*Nyssa sylvatica*). A dense shrub layer of sweet pepperbush (*Clethra alnifolia*) is often present. ([CEGL004644](#))

**Chesapeake Bay River Bluff Chestnut Oak Forest:** Bluff forest in the Appoquinimink River watershed that is dominated by chestnut oak (*Quercus prinus*) in the canopy and has wavy hairgrass (*Deschampsia flexuosa*) in the herbaceous layer. ([CEGL006490](#)) **Appoquinimink River**

**Chesapeake/Piedmont Red Maple/Lizard's Tail Swamp:** Forest co-dominated by red maple (*Acer rubrum*) and green ash (*Fraxinus pennsylvanica*) and having a well defined herbaceous layer of lizard's tail (*Saururus cernuus*). ([CEGL006606](#)) **Blackbird Creek; White Clay Creek**

**Coastal Loblolly Pine Wetland Forest:** Wetland forest that is dominated by loblolly pine (*Pinus taeda*) and has an understory of red maple (*Acer rubrum*) and sweetgum (*Liquidambar styraciflua*). ([CEGL006137](#)) **Augustine Creek**

**Coastal Plain Oak Floodplain Swamp:** Forest with a canopy of willow oak (*Quercus phellos*), pin oak (*Quercus palustris*), swamp chestnut oak (*Quercus michauxii*), sweetgum (*Liquidambar styraciflua*) and red maple (*Acer rubrum*) and containing a prominent understory of stout wood reedgrass (*Cinna arundinacea*). ([CEGL006605](#)) **Blackbird Creek**

**Early to Mid-Successional Loblolly Pine Forest:** A forest that is dominated by at least 60% coverage of loblolly pine (*Pinus taeda*) and has a distinct canopy and understory. ([CEGL006011](#)) **Chester River; Choptank River; Leipsic River; Murderkill River; St. Jones River**

**Green Ash-Mixed Hardwood Floodplain Forest:** A forest that has green ash (*Fraxinus pennsylvanica*) co-dominant with black walnut (*Juglans nigra*) or sycamore (*Platanus occidentalis*). ([CEGL006575](#)) **Red Clay Creek; White Clay Creek**

**Loblolly Pine Plantation:** Planted forest of loblolly pine (*Pinus taeda*) that is often in rows and dense. ([CEGL007179](#)) **Appoquinimink River; Augustine Creek; Blackbird Creek; Bohemia River; Brandywine Creek; Chester River; Christina River; Dragon Run; Eastern C and D Canal; Red Clay Creek; Smyrna River**

**Mid-Atlantic Mesic Mixed Hardwood Forest:** Forest dominated by a mixture of tuliptree (*Liriodendron tulipifera*), American beech (*Fagus grandifolia*), sweetgum (*Liquidambar styraciflua*), white oak (*Quercus alba*) and red maple (*Acer rubrum*) ([CEGL006075](#)). **Appoquinimink River; Augustine Creek; Back Creek; Blackbird Creek; Bohemia River; Cedar Swamp; Chester River; Christina River; Eastern C and D Canal; Sassafras River; Smyrna River**

**Mid-Atlantic Terrace Hardwood Floodplain Forest:** Floodplain forest dominated by tuliptree (*Liriodendron tulipifera*) in the canopy and with Virginia bluebell (*Mertensia virginica*) in the herbaceous layer. ([CEGL006314](#)) **Brandywine Creek**

**Northeastern Coastal Plain/Piedmont Oak-Beech-Heath/Forest:** A forest that is co-dominated by American beech (*Fagus grandifolia*) and chestnut oak (*Quercus prinus*). ([CEGL006919](#)). **Brandywine Creek; Red Clay Creek; White Clay Creek**

**Northeastern Dry Oak-Hickory Forest:** A forest that is dominated by oaks (*Quercus* spp.) and lacks a prominent presence of tuliptree (*Liriodendron tulipifera*) and American beech (*Fagus grandifolia*). ([CEGL006336](#)) **There are no locations currently known in New Castle County, but it is likely here**

**Northeastern Modified Successional Forest:** Forest of mixed dominants that has been invaded by exotic/native invasive plants such as Oriental bittersweet (*Celastrus orbiculatus*), multiflora rose (*Rosa multiflora*), Osage-orange (*Maclura pomifera*), Japanese stiltgrass (*Microstegium vimineum*) and Morrow's honeysuckle (*Lonicera morrowii*). ([CEGL006599](#)) **Present in all watersheds of Delaware except North and South Atlantic Strand**

**Northeastern Pin Oak-Swamp White Oak Forest:** Depression (Coastal Plain Pond) forest that is dominated by pin oak (*Quercus palustris*) and/or swamp white oak (*Quercus bicolor*) and red maple (*Acer rubrum*). ([CEGL006240](#)) **Blackbird Creek; C and D Canal; Smyrna River**

**Northern Coastal Plain/Piedmont Basic Mesic Hardwood Forest:** A forest that is dominated by tuliptree (*Liriodendron tulipifera*) and associated by American beech (*Fagus grandifolia*) and contains a rich diversity of herbs. Often there can be dense understories of spicebush (*Lindera benzoin*) and pawpaw (*Asimina triloba*) present. ([CEGL006055](#)) **Augustine Creek; Blackbird Creek; Brandywine Creek**

**Northern Piedmont Mesic Oak-Beech Forest:** A forest that is dominated or co-dominated by American beech (*Fagus grandifolia*) and is associated by a mixture of oaks (*Quercus* spp.), tuliptree (*Liriodendron tulipifera*) and red maple (*Acer rubrum*). ([CEGL006921](#)) **Brandywine Creek; Christina River; Naamans Creek; Red Clay Creek; Shellpot Creek; Stoney Creek; White Clay Creek**



**Red Maple-Sweetgum Swamp:** A forest that is that is either dominated or co-dominated by red maple (*Acer rubrum*) and sweetgum (*Liquidambar styraciflua*) and has a high water table. ([CEGL006110](#)) **Army Creek; Brandywine Creek; Christina River; Dragon Run; Red Clay Creek**

**Riverine Floodplain Forest (Early-Successional Type):** A forest that has a co-dominance of sycamore (*Platanus occidentalis*) and green ash (*Fraxinus pennsylvanica*) and a sub-canopy of box elder (*Acer negundo*). ([CEGL006036](#)) **Red Clay Creek; White Clay Creek**

**Silver Maple-Elm Floodplain Forest:** Forest that is more than 50% dominated by silver maple (*Acer saccharinum*). ([CEGL006001](#)) **Brandywine Creek**

**Southern New England/Northern Piedmont Red Maple Seepage Swamp:** A forest that is dominated by red maple (*Acer rubrum*) and associated by green ash (*Fraxinus pennsylvanica*) or white ash (*Fraxinus americana*). ([CEGL006406](#)) **Brandywine Creek; Red Clay Creek**

**Southern Red Maple-Blackgum Swamp Forest:** Saturated swamp forest that has a co-dominance of red maple (*Acer rubrum*) and blackgum (*Nyssa sylvatica*), ([CEGL006238](#)) **Appoquinimink River**

**Successional Maritime Forest:** A forest that contains a canopy of wild black cherry (*Prunus serotina*), sweetgum (*Liquidambar styraciflua*) and sassafras (*Sassafras albidum*). This community is often next to salt marshes. ([CEGL006145](#)) **Augustine Creek; Blackbird Creek**

**Successional Sweetgum Forest:** A forest that is dominated by sweetgum (*Liquidambar styraciflua*). ([CEGL007216](#)) **Brandywine Creek; Christina River; Red Clay Creek**

**Successional Tuliptree Forest (Rich Type):** A forest that is dominated by tuliptree (*Liriodendron tulipifera*), often has an abundant layer of spicebush (*Lindera benzoin*) and a rich diversity of herbs. ([CEGL007220](#)) **Appoquinimink River; Brandywine Creek; Christina River; Red Clay Creek; Smyrna River; White Clay Creek**

\*7220 tends to be younger and has a higher dominance of tuliptree than the Northern Coastal Plain/Piedmont Basic Mesic Hardwood Forest ([CEGL006055](#)).

**Successional Virginia Pine Forest:** A dry forest dominated by Virginia pine (*Pinus virginiana*). ([CEGL002591](#)) **Dragon Run; Perch Creek; White Clay Creek**

[-Back to Key to Delaware Vegetation Communities-](#)

## Kent County Forests

**Central Appalachian Basic Seepage Swamp:** Seepage swamp in the northern Coastal Plain that is dominated or co-dominated by black ash (*Fraxinus nigra*). ([CEGL008416](#)) **Leipsic River**

**Central Coastal Plain Basin Swamp:** Forest dominated by sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*) and swamp blackgum (*Nyssa biflora*) with cypress swamp sedge (*Carex jorii*) present in the herbaceous layer. ([CEGL006223](#)) **Mispillion River**

**Chesapeake Bay River Bluff Chestnut Oak Forest:** Bluff forest in the Appoquinimink River watershed that is dominated by chestnut oak (*Quercus prinus*) in the canopy and has wavy hairgrass (*Deschampsia flexuosa*) in the herbaceous layer. ([CEGL006490](#)) **Murderkill River**

**Chesapeake/Piedmont Red Maple/Lizard's Tail Swamp:** Forest co-dominated by red maple (*Acer rubrum*) and green ash (*Fraxinus pennsylvanica*) and having a well-defined herbaceous layer of lizard's tail (*Saururus cernuus*). ([CEGL006606](#)) **Chester River; Mispillion River; St. Jones River**

**Coastal Loblolly Pine Wetland Forest:** Wetland forest that is dominated by loblolly pine (*Pinus taeda*) and has an understory of red maple (*Acer rubrum*) and sweetgum (*Liquidambar styraciflua*). ([CEGL006137](#)) **Mispillion River; Murderkill River**

**Coastal Plain Oak Floodplain Swamp:** Forest with a canopy of willow oak (*Quercus phellos*), pin oak (*Quercus palustris*), swamp chestnut oak (*Quercus michauxii*), sweetgum (*Liquidambar styraciflua*) and red maple (*Acer rubrum*) and containing a prominent understory of stout wood reedgrass (*Cinna arundinacea*). ([CEGL006605](#)) **There are no locations currently known in Kent County, but it is thought to be in the County**

**Early to Mid-Successional Loblolly Pine Forest:** A forest that is dominated by at least 60% coverage of loblolly pine (*Pinus taeda*) and has a distinct canopy and understory. ([CEGL006011](#)) **Chester River; Choptank River; Leipsic River; Murderkill River; St. Jones River**

**Loblolly Pine Plantation:** Planted forest of loblolly pine (*Pinus taeda*) that is often in rows and dense. ([CEGL007179](#)) **Chester River; Choptank River; Murderkill River; St. Jones River**

**Mid-Atlantic Mesic Mixed Hardwood Forest:** Forest dominated by a mixture of tuliptree (*Liriodendron tulipifera*), American beech (*Fagus grandifolia*), sweetgum (*Liquidambar styraciflua*), white oak (*Quercus alba*) and red maple (*Acer rubrum*) ([CEGL006075](#)). **Chester River; Choptank River; Duck Creek; Leipsic River; Little Creek; Mispillion River; Murderkill River; Nanticoke River; Simons River; Smyrna River**

**Mid to Late Successional Loblolly Pine-Sweetgum Forest:** Successional forest that has a canopy of loblolly pine (*Pinus taeda*) and sweetgum (*Liquidambar styraciflua*). ([CEGL008462](#))

**North Atlantic Coastal Oak/Holly Forest:** Forest on flatwoods of the Choptank River that are dominated by American holly (*Ilex opaca*) and have an understory of mountain laurel (*Kalmia latifolia*). ([CEGL006378](#)) **Choptank River**

**Northeastern Dry Oak-Hickory Forest:** A forest that is dominated by oaks (*Quercus* spp.) and lacks a prominent presence of tuliptree (*Liriodendron tulipifera*) and American beech (*Fagus grandifolia*). ([CEGL006336](#)) **Duck Creek; Leipsic River; Murderkill River**

**Northeastern Modified Successional Forest:** Forest of mixed dominants that has been invaded by exotic/native invasive plants such as Oriental bittersweet (*Celastrus orbiculatus*), multiflora rose (*Rosa multiflora*), Osage-orange (*Maclura pomifera*), Japanese stiltgrass (*Microstegium vimineum*) and Morrow's honeysuckle (*Lonicera morrowii*). ([CEGL006599](#)) **Present in all watersheds of Delaware except North and South Atlantic Strand**

**Northern Coastal Plain-Piedmont Basic Mesic Hardwood Forest:** A forest that is dominated by tuliptree (*Liriodendron tulipifera*) in the canopy and has a rich diversity of herbs such as bloodroot (*Sanguinaria canadensis*), Christmas fern (*Polystichum acrostichoides*), horsebalm (*Collinsonia canadensis*) and black cohosh (*Cimicifuga racemosa*). ([CEGL006055](#)) **Duck Creek; Leipsic River; St. Jones River**

**Red Maple-Sweetgum Swamp:** A swamp with red maple (*Acer rubrum*) and/or sweetgum (*Liquidambar styraciflua*) dominant and lacking green ash (*Fraxinus pennsylvanica*). ([CEGL006110](#)) **Choptank River; Duck Creek; Leipsic River; Little Creek; Mispillion River; Murderkill River; Simons River; St. Jones River**

**Southern Red Maple-Blackgum Swamp Forest:** Saturated swamp forest that has a co-dominance of red maple (*Acer rubrum*) and blackgum (*Nyssa sylvatica*), ([CEGL006238](#)) **Mispillion River; St. Jones River**

**Northeastern Coastal Plain Mixed Oak/Heath Forest:** A mesic to dry forest that has a high amount of southern red oak (*Quercus falcata*) associated by white oak (*Quercus alba*) and a shrub layer of lowbush blueberry (*Vaccinium pallidum*). ([CEGL006269](#)) **Choptank River; Mispillion River; Murderkill River**

**Successional Maritime Forest:** A forest that contains a canopy of wild black cherry (*Prunus serotina*), sweetgum (*Liquidambar styraciflua*) and sassafras (*Sassafras albidum*). This community is often next to salt marshes. ([CEGL006145](#)) **Duck Creek; Smyrna River**

**Successional Sweetgum Forest:** A forest that is dominated by sweetgum (*Liquidambar styraciflua*). ([CEGL007216](#)) **Chester River; Choptank River; St. Jones River**

**Successional Tuliptree Forest (Rich Type):** A forest that is dominated by tuliptree (*Liriodendron tulipifera*), often has an abundant layer of spicebush (*Lindera benzoin*) and a rich diversity of herbs. ([CEGL007220](#)) **Leipsic River; Murderkill River**

\*7220 tends to be younger and has a higher dominance of tuliptree than the Northern Coastal Plain/Piedmont Basic Mesic Hardwood Forest ([CEGL006055](#)).

**Successional Tuliptree-Loblolly Pine Upland Forest:** Forest that is co-dominated by tuliptree (*Liriodendron tulipifera*) and loblolly pine (*Pinus taeda*) in a successional situation. ([CEGL007521](#)) **Mispillion River**

**Successional Virginia Pine Forest:** A dry forest dominated by Virginia pine (*Pinus virginiana*). ([CEGL002591](#)) **Chester River; Choptank River; Mispillion River; Murderkill River; Simons River**

[-Back to Key to Delaware Vegetation Communities-](#)

## Sussex County Forests

**Ash-Swamp Tupelo Freshwater Tidal Swamp:** Tidal swamp that is dominated or co-dominated by pumpkin ash (*Fraxinus profunda*), green ash (*F. pennsylvanica*), swamp blackgum (*Nyssa biflora*), and red maple (*Acer rubrum*). ([CEGL006287](#)) **Broad Creek; Broadkill River; Deep Creek; Nanticoke River**

**Chesapeake Bay Cypress-Gum Swamp:** Swamp forest dominated by bald cypress (*Taxodium distichum*) and swamp blackgum (*Nyssa biflora*) and associated by green ash (*Fraxinus pennsylvanica*) and pumpkin ash (*Fraxinus profunda*). Often present on blackwater river channels. ([CEGL006214](#)) **Broad Creek; Deep Creek; Pocomoke River**

**Chesapeake/Piedmont Red Maple/Lizard's Tail Swamp:** Forest co-dominated by red maple (*Acer rubrum*) and green ash (*Fraxinus pennsylvanica*) and having a well-defined herbaceous layer of lizards tail (*Saururus cernuus*). ([CEGL006606](#)) **Indian River; Mispillion River; Nanticoke River**

**Coastal Loblolly Pine Wetland Forest:** Wetland forest that is dominated by loblolly pine (*Pinus taeda*) and has an understory of red maple (*Acer rubrum*) and sweetgum (*Liquidambar styraciflua*). ([CEGL006137](#)) **Assawoman Bay; Broad Creek; Cedar Creek; Indian River; Indian River Bay; Mispillion River; Nanticoke River; Red Mill Creek; Slaughter Creek**

**Coastal Oak/Laurel Forest:** Dry forest in the Coastal Plain that has scarlet oak (*Quercus coccinea*), chestnut oak (*Quercus prinus*), black oak (*Quercus velutina*) and white oak (*Quercus alba*) present in the canopy. Often there is a dense understory of mountain laurel (*Kalmia latifolia*). ([CEGL006374](#)) **Nanticoke River**

**Coastal Plain Atlantic White Cedar-Red Maple Swamp:** A swamp where Atlantic white cedar (*Chamaecyparis thyoides*) is dominant and is associated by red maple (*Acer rubrum*). ([CEGL006078](#)) **Broad Creek; Cedar Creek; Gravelly Branch; Indian River; Mispillion River; Nanticoke River; Prime Hook Creek**

**Central Coastal Plain Basin Swamp:** Forest dominated by sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*) and swamp blackgum (*Nyssa biflora*) with cypress swamp sedge (*Carex jorii*) present in the herbaceous layer. ([CEGL006223](#)) **Little Assawoman Bay**

**Coastal Plain Streamside Forest:** Forest in which sycamore (*Platanus occidentalis*) is dominant. ([CEGL006603](#)) **No locations are currently known in Delaware, but is thought to be in Sussex County**

**Early to Mid-Successional Loblolly Pine Forest:** A forest that is dominated by at least 60% coverage of loblolly pine (*Pinus taeda*) and has a distinct canopy and understory ([CEGL006011](#)) **Broad Creek; Broadkill River; Cedar Creek; Deep Creek; Gravelly Branch; Gum Branch; Indian River; Indian River Bay; Marshyhope Creek; Mispillion River; Nanticoke River; Pocomoke River; Rehoboth Bay; Slaughter Creek**

**Inland Dune Ridge Forest:** Dry forest that contains areas of exposed sand, southern red oak (*Quercus falcata*) dominant in the overstory and a high amount of sand hickory (*Carya pallida*) in the understory. ([CEGL006354](#)) **Broad Creek; Nanticoke River**

**Loblolly Pine Plantation:** Planted forest of loblolly pine (*Pinus taeda*) that is often planted in rows and dense. ([CEGL007179](#)) **Broad Creek; Broadkill River; Bunting Branch; Cedar Creek; Deep Creek; Gum Branch; Gravelly Branch; Indian River; Indian River Bay; Houston Branch; Lewes-Rehoboth Canal; Little Assawoman Bay; Marshyhope Creek; Mispillion River; Mockingbird Branch; Nanticoke River; Prime Hook Creek; Pocomoke River; Red Mill Creek; Rehoboth Bay; Tanyard Branch; Wicomico River**

**Mid-Atlantic Coastal Plain Maritime Forest:** A mature forest that is dominated by at 40% loblolly pine (*Pinus taeda*) and has an understory of oaks (*Quercus* spp.) and/or wild black cherry (*Prunus serotina*) and/or sassafras (*Sassafras albidum*). ([CEGL006040](#)) **Cedar Creek; Deep Creek; Gum Branch; Indian River; Mispillion River; Nanticoke River; Prime Hook Creek**

**Mid-Atlantic Mesic Mixed Hardwood Forest:** Forest dominated by a mixture of tuliptree (*Liriodendron tulipifera*), American beech (*Fagus grandifolia*), sweetgum (*Liquidambar styraciflua*), white oak (*Quercus alba*) and red maple (*Acer rubrum*) ([CEGL006075](#)). **Broadkill River; Bunting Branch; Cedar Creek; Deep Creek; Gum Branch; Indian River; Indian River Bay; Lewes-Rehoboth Canal; Little Assawoman Bay; Little Creek; Marshyhope Creek; Mispillion River; Murderkill River; Nanticoke River; Pocomoke River; Prime Hook Creek; Red Mill Creek; Rehoboth Bay**

**Mid to Late Successional Loblolly Pine-Sweetgum Forest:** Successional forest that has a canopy of loblolly pine (*Pinus taeda*) and sweetgum (*Liquidambar styraciflua*). ([CEGL008462](#)) **Deep Creek; Nanticoke River; Prime Hook Creek**

**North Atlantic Coastal Oak-Holly Forest:** Forest on floodplain benches of the Nanticoke River and flatwoods of the Choptank River that are dominated by American holly (*Ilex opaca*) and have an understory of mountain laurel (*Kalmia latifolia*). ([CEGL006378](#)) **Choptank River; Nanticoke River**

**Northeastern Dry Oak-Hickory Forest:** A forest that is dominated by oaks (*Quercus* spp.) and lacks a prominent presence of tuliptree (*Liriodendron tulipifera*) and American beech (*Fagus grandifolia*). ([CEGL006336](#)) **Rehoboth Bay**

**Northeastern Modified Successional Forest:** Forest of mixed dominants that has been invaded by exotic/native invasive plants such as Oriental bittersweet (*Celastrus orbiculatus*), multiflora rose (*Rosa multiflora*), Osage-orange (*Maclura pomifera*), Japanese stiltgrass (*Microstegium vimineum*) and Morrow's honeysuckle (*Lonicera morrowii*). ([CEGL006599](#)) **Present in all watersheds of Delaware except North and South Atlantic Strand**

**Northern Coastal Plain Successional Floodplain Forest:** A forest composed of red maple (*Acer rubrum*) and river birch (*Betula nigra*) that is either dominant or co-dominant. ([CEGL006976](#)) **Marshyhope Creek**

**Northern Coastal Plain-Piedmont Basic Mesic Hardwood Forest:** A forest that is dominated by tuliptree (*Liriodendron tulipifera*) in the canopy and has a rich diversity of herbs such as bloodroot (*Sanguinaria canadensis*), Christmas fern (*Polystichum acrostichoides*), horsebalm (*Collinsonia canadensis*) and black cohosh (*Cimicifuga racemosa*). ([CEGL006055](#)) **Mispillion River; Prime Hook Creek**

**Red Maple-Sweetgum Swamp:** A swamp with red maple (*Acer rubrum*) and/or sweetgum (*Liquidambar styraciflua*) dominant and lacking green ash (*Fraxinus pennsylvanica*). ([CEGL006110](#)) **Broad Creek; Cedar Creek; Deep Creek; Indian River; Indian River Bay; Mispillion River; Nanticoke River; Prime Hook Creek; Rehoboth Bay; Tanyard Branch**

**Southern Red Maple-Blackgum Swamp Forest:** Saturated swamp forest that has a co-dominance of red maple (*Acer rubrum*) and blackgum (*Nyssa sylvatica*), ([CEGL006238](#)) **Indian River Bay; Lewes and Rehoboth Canal; Mispillion River; Nanticoke River**

**Northeastern Coastal Plain Mixed Oak/Heath Forest:** A mesic to dry forest that has a high amount of southern red oak (*Quercus falcata*) associated by white oak (*Quercus alba*) and a shrub layer of lowbush blueberry (*Vaccinium pallidum*). ([CEGL006269](#)) **Broad Creek; Bunting Branch; Deep Creek; Gravelly Branch; Gum Branch; Indian River; Indian River Bay; Lewes and Rehoboth Canal; Mispillion River; Mockingbird Creek; Nanticoke River, Rehoboth Bay**

**Successional Maritime Forest:** A forest that contains a canopy of wild black cherry (*Prunus serotina*), sweetgum (*Liquidambar styraciflua*) and sassafras (*Sassafras albidum*). This community is often next to salt marshes. ([CEGL006145](#)) **Indian River Bay; Lewes and Rehoboth Canal; Little Assawoman Bay; Rehoboth Bay; Prime Hook Creek**

**Successional Sweetgum Forest:** A forest that is dominated by sweetgum (*Liquidambar styraciflua*). ([CEGL007216](#)) **Prime Hook Creek**

**Successional Tuliptree Forest (Rich Type):** A forest that is dominated by tuliptree (*Liriodendron tulipifera*), often has an abundant layer of spicebush (*Lindera benzoin*) and a rich diversity of herbs. ([CEGL007220](#)) **Broad Creek; Prime Hook Creek**

\*7220 tends to be younger and has a higher dominance of tuliptree than the Northern Coastal Plain/Piedmont Basic Mesic Hardwood Forest ([CEGL006055](#)).

**Successional Virginia Pine Forest:** A dry forest dominated by Virginia pine (*Pinus virginiana*). ([CEGL002591](#)) **Broad Creek; Cedar Creek; Deep Creek; Gravelly Branch; Gum Branch; Indian River Bay; Marshyhope Creek; Mispillion River; Nanticoke River; Wicomico River**

[-Back to Key to Delaware Vegetation Communities-](#)



## Box-elder Floodplain Forest

G4G5

S2

NVC Alliance: [A.278-Acer negundo Temporarily Flooded Forest Alliance](#)

NVC Association: [CEGL005033-Acer negundo Forest](#)

**Delaware Type Locality:** Floodplain of Brandywine Creek just upstream of Thompson Mill Bridge in New Castle County. ([39°49'16.87"N, 075°34'23.62"W](#))

**Description:** Box-elder Floodplain Forests are found on active [floodplains](#), sandbars, and areas of disturbance of large rivers and streams in the [Piedmont](#) of Delaware. These communities often receive temporary flooding in the spring. This is a successional community, but can sometimes be found as a mature community.

Besides the nominal species, other canopy associates may include sycamore ([Platanus occidentalis](#)), red maple ([Acer rubrum](#)), sweetgum ([Liquidambar styraciflua](#)), tuliptree ([Liriodendron tulipifera](#)) and silver maple ([Acer saccharinum](#)). The understory is generally composed of smaller members of the canopy plus spicebush ([Lindera benzoin](#)). The shrub and herb layers range from sparse to dense and can be joined by a thick vine layer. Common shrubs include elderberry ([Sambucus canadensis](#)), summer grape ([Vitis aestivalis](#)) and multiflora rose ([Rosa multiflora](#)). Herbs can include wild ginger ([Asarum canadense](#)), white violet ([Viola striata](#)), Virginia bluebells ([Mertensia virginica](#)) and lesser celandine ([Ficaria verna](#)).



**Brandywine Creek State Park  
New Castle County**

**Diagnostic Features:** Box-elder Floodplain Forest is the only forest in Delaware dominated by box-elder ([Acer negundo](#)) and tends to be early successional though some examples may persist to mature forests.

**Geology and Environmental Features:** Box-elder Floodplain Forests are found in naturally disturbed zones of floodplains or those places that get flooded a few times each year. Sometimes human disturbance, such as logging, in floodplains can mimic natural disturbance and create conditions favorable development conditions for this community.

**Landscape Position:** Box-elder Floodplain Forests are found in the floodplains of large Piedmont streams in Delaware.

**Associated Soil Series:**

Series	Acreage	% of acreage
Hatboro-Codurus Complex (frequently flooded)	8.3	9.8
Neshaminy-Montalto soils	7.8	9.3
Mattapex silt loam	6.7	8.0
Brinklow channery loam	4.1	4.9
Nassawango silt loam	2.3	2.7
Other series	54.9	65.2

**Status and Trends**

**Fair to Good:** Box-elder Floodplain Forests are located on Piedmont floodplains along the Brandywine and Red Clay Creeks. Most localities are protected in state parks or other private protected lands. Nearly all occurrences have some coverage of exotic invasive plant species and these exotics may become more common with warming temperatures and disturbance. One occurrence in the Coastal Plain—tidewater region of the Brandywine Creek watershed will likely be impacted by sea level rise.

**Species documented from this community**

Animals

Non-Vascular Plants

Vascular Plants

**Associated Rare Species:**

**Animals:** Warbling Vireo ([Vireo gilvus](#))

**Non-Vascular Plants:** Unknown

**Vascular Plants:** Squaw-root ([Conophilus americana](#))



**Distribution:** This community is found along larger streams in the Piedmont of Delaware. Nationally, Box-elder Floodplain Forests can be found along the lower east coast and west to the Midwest.

**Estimated Acres in Delaware = 84.1 (February 2012)**

**-Acres with 1 m sea level rise =  $84.1 - 0.3 = 83.8$**

**-Acres with 1.5 m sea level rise =  $84.1 - 0.3 = 83.8$**

**Equivalent or related communities in nearby states:**

**Maryland:** Box-elder Floodplain Forest (Harrison 2004)

**New Jersey:** unknown

**Pennsylvania:** Sycamore-(river birch)-box elder floodplain forest (in part) (Fike 1999)

**Virginia:** unknown

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Central Appalachian River Floodplain

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**New Castle County**

**[-Brandywine Creek State Park](#)**

**[-Back to New Castle County Forests-](#)**

## Central Appalachian Dry-Mesic Chestnut Oak-Northern Red Oak Forest G5 S1

**NVC Alliance:** A.250-*Quercus prinus*-*Quercus rubra* Forest Alliance

**NVC Association:** CEGLO06057-*Quercus prinus*-*Quercus rubra*/*Hamamelis virginiana* Forest

**Delaware Type Locality:** Northwest facing slope in Rockford Park (Wilmington State Park) in Wilmington, De (**39°46'7.09"N, 075°34'22.01"W**).

**Description:** Central Appalachian-Dry Mesic-Chestnut Oak-Northern Red Oak Forests are found on upper slopes and ridgetops that have thin acidic nutrient poor soils. The closed to partially open canopy requires occasional fire for regeneration, which makes this community uncommon due to fire suppression. Wind-throws occasional occur within stands of this community.

Chestnut oak ([Quercus prinus](#)) and sweet birch ([Betula lenta](#)) dominate the canopy of these forests and may be associated by northern red oak ([Quercus rubra](#)), black oak ([Q. velutina](#)), white oak ([Q. alba](#)), American beech ([Fagus grandifolia](#)) and tuliptree ([Liriodendron tulipifera](#)). The understory may include flowering dogwood ([Cornus florida](#)), wild black cherry ([Prunus serotina](#)), red maple ([Acer rubrum](#)), sassafras ([Sassafras albidum](#)), eastern hop hornbeam ([Ostrya virginiana](#)) and witch-hazel ([Hamamelis virginiana](#)). Shrubs can include maple-leaf viburnum ([Viburnum acerifolium](#)), pink azalea ([Rhododendron periclymenoides](#)), mountain laurel ([Kalmia latifolia](#)), arrow-wood ([V. dentatum](#)) and early lowbush blueberry ([Vaccinium pallidum](#)). Herbaceous density ranges from sparse to dense, and can be diverse and includes partridge berry ([Mitchella repens](#)), tall rattlesnake root ([Prenanthes altissima](#)), woodland goldenrod ([Solidago caesia](#)), wild sarsaparilla ([Aralia nudicaulis](#)), white wood aster ([Eurybia divaricata](#)), spotted wintergreen ([Chimaphila maculata](#)), solomon's seal ([Polygonatum biflorum](#)), jack-in-the-pulpit ([Arisaema triphyllum](#)), Christmas fern ([Polystichum acrostichoides](#)), Indian pipes ([Monotropa uniflora](#)), broad beech fern ([Phegopteris hexagonoptera](#)) and rattlesnake orchid ([Goodyera pubescens](#)).



**Slope above Red Clay Creek  
New Castle County**

**Diagnostic Features:** The presence of chestnut oak and sweet birch identifies this community and separates it from the Northeastern Coastal Plain/Piedmont Oak-Beech/Heath Forest ([CEGL006919](#)), which does not contain sweet birch. The presence of chestnut oak as a dominant or co-dominant separates this community from the Northern Piedmont Mesic Oak-Beech Forest ([CEGL006921](#)) which does not contain appreciable amounts of chestnut oak if any.

**Geology and Environmental Features:** Xeric upper slopes and ridgetops that have acidic and infertile soils.

**Landscape Position:** Steep and sometimes rocky slopes in the Piedmont

**Associated Soil Series:**

Series	Acreage	% of acreage
Glenelg loam	16.1	14.0
Neshaminy silt loam	6.5	5.7
Manor loam	6.2	5.4
Neshaminy-Montalto silt loam	4.3	3.7
Delanco-Codorus-Hatboro Complex	4.0	3.5
Other series	93.7	67.7

**Status and Trends**

**Good:** Central Appalachian Dry-Mesic Chestnut Oak-Northern Red Oak Forest is located on steep slopes in the Piedmont of Delaware. All known occurrences are mature and most lack much if any coverage of exotic invasive plant species, likely due in part to the dryness of the community. Most localities are protected in state or county parks. Sea-level rise is not a factor for this community because of the high elevation.

**Species documented from this community**

Animals

Non-Vascular Plants

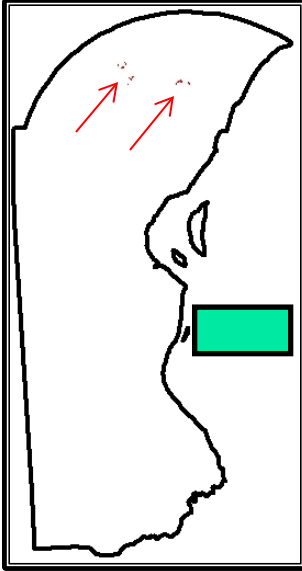
Vascular Plants

**Associated Rare Species:**

**Animals:** Unknown

**Non-Vascular Plants:** Unknown

**Vascular Plants:** Unknown



**Distribution:** This community is found in the Red Clay Creek and Brandywine Creek watersheds. Nationally this community is found from New Jersey west to West Virginia and south to Virginia.

**Estimated Acres in Delaware = 114.7 (February 2012)**

\*This community is not affected by sea level rise.

**Equivalent or related communities in nearby states:**

**Maryland:** Northern Appalachian Dry Oak Forest (Harrison 2004)

**New Jersey:** *Quercus prinus* - *Quercus (rubra, velutina)* / *Gaylussacia baccata* Forest (Breden et al 2001)

Chestnut Oak Forest (Collins and Anderson 1994)

**Pennsylvania:** Dry Oak-Heath Forest and Dry Oak-Heath Woodland (Fike 1999)

**Virginia:** Central Appalachian Dry-Mesic Chestnut Oak-Northern Red Oak Forest (Fleming, G.P., et al. 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Chestnut Oak-Black Birch Forest

**Northeast Wildlife Habitat Classification:** Northeastern Interior Dry-Mesic Oak Forest

**Landfire Classification Code:** unknown

**Public places to view this community**

**New Castle County**

-[Rockford Park \(Wilmington, De\)](#)

-[Brandywine Creek State Park](#)

**[-Back to New Castle County Forests-](#)**

## Central Appalachian/Northern Piedmont Chestnut Oak Forest

G5

S2 DNA

NVC Alliance: [A.248-\*Quercus prinus\*-\(\*Quercus coccinea\*, \*Quercus velutina\*\) Forest Alliance](#)

NVC Association: [CEGL006299-\*Quercus prinus\*-\*Quercus \(coccinea, velutina\)\*/\*Kalmia latifolia\*/\*Vaccinium pallidum\* Forest](#)

**Delaware Type Locality:** West facing slope above Brandywine Creek just downstream of Thompsons Bridge ([39°48'55.33"N](#), [075°34'3.78"W](#)).

**Description:** Central Appalachian/Northern Piedmont Chestnut Oak Forests occupy dry acidic soils on mid to upper slopes in the [Piedmont](#) and is the typical oak forest for these soils. Delaware examples often have boulders and cobbles of Wissahickon Gneiss in the substrate. The stands in Delaware appear to represent the northern red oak ([Quercus rubra](#)) variant of this forest where Chestnut Oak ([Quercus prinus](#)) dominates the canopy and northern red oak is present in high amounts. Associates may include black oak ([Quercus velutina](#)), white oak ([Quercus alba](#)), black gum ([Nyssa sylvatica](#)) and sassafras ([Sassafras albidum](#)). The understory is generally composed of red maple ([Acer rubrum](#)) and black gum ([Nyssa sylvatica](#)). Mountain laurel ([Kalmia latifolia](#)) is common in a shrub layer associated by maple-leaf viburnum ([Viburnum acerifolium](#)) and pink azalea ([Rhododendron periclymenoides](#)). The sparse herbaceous layer includes trailing arbutus ([Epigaea repens](#)), rattlesnake weed ([Hieracium venosum](#)), Indian pipes ([Monotropa uniflora](#)), spotted wintergreen ([Chimaphila maculata](#)) and bracken fern ([Pteridium aquilinum](#)).



**Diagnostic Features:** Central Appalachian/Northern Piedmont Chestnut Oak Forest can be identified by the dominance of chestnut oak in the canopy and the dominance of mountain laurel in the understory/shrub layer. It is separated from the Northeastern Coastal Plain/Piedmont Oak-Beech/Heath Forest ([CEGL006919](#)) by the lack of or low abundance of American beech ([Fagus grandifolia](#)).

**Brandywine Creek State Park**  
**New Castle County**

**Geology and Environmental Features:** These communities depend on occasional fires to prevent red maple from taking over dominance. Ice and wind, due to slope position are important disturbances in this community.

**Landscape Position:** Mid to upper slopes in the Piedmont



**Associated Soil Series:**

<b>Series</b>	<b>Acreage</b>	<b>% of acreage</b>
Neshaminy-Montalto soils	31.4	66.4
Brinklow-Blocktown complex	5.4	11.4
Brinklow channery loam	2.8	5.9
Urban land	2.1	4.4
Neshaminy silt loam	1.4	3.0
Other series	4.2	8.9

**Status and Trends**

**Good:** All locations of this community are on protected lands and do not face development pressure. Since they occur on steep slopes in the Piedmont they are not affected by sea level rise.

**Species documented from this community**

Animals

Non-Vascular Plants

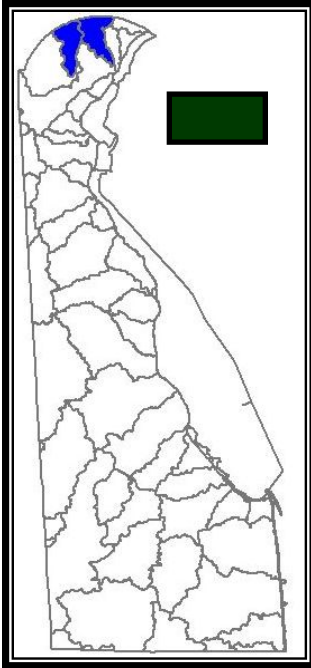
Vascular Plants

**Associated rare species:**

**Animals:** Unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Unknown



**Distribution:** This community is located in the Brandywine and Red Clay Creek watersheds in the Piedmont of Delaware. Nationally, this community ranges from Virginia and West Virginia north to Pennsylvania.

**Estimated Acres in Delaware = 47.3 (February 2012)**

\*This community is not affected by sea level rise.

**Equivalent or related communities in nearby states:**

**Maryland:** Central Appalachian/Northern Piedmont Chestnut Oak Forest (Harrison 2003)

**New Jersey:** not present

**Pennsylvania:** Dry Oak-mixed hardwood forest (Fike 1999)

**Virginia:** Central Appalachian/Northern Piedmont Chestnut Oak Forest (Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Central Appalachian Dry Oak-Pine Forest

**Landfire Classification Code:** unknown

**Public places to view this community**

**New Castle County**

[-Brandywine Creek State Park](#)

[-Back to New Castle County Forests-](#)

**Chesapeake Bay Nonriverine Wet Hardwood Forest      G2?      S4**  
**(Provisional)**

**NVC Alliance:** A.353-*Quercus michauxii*-*Quercus pagoda* Saturated Forest Alliance  
**NVC Association:** CEGLO04644-*Quercus (phellos, pagoda, michauxii)/Ilex opaca* var. *opaca*/*Clethra alnifolia*/*Woodwardia areolata* Forest

**Delaware Type Locality:** To be determined

**Description:** This forest community is found on flatwood areas and are generally dominated or co-dominated by either red maple (*Acer rubrum*) or sweetgum (*Liquidambar styraciflua*) in Delaware, likely due to young age and disturbance, though other places on the East Coast have more oaks. Associates in Delaware can include willow oak (*Quercus phellos*), swamp chestnut oak (*Quercus michauxii*), white oak (*Quercus alba*), pin oak (*Quercus palustris*), loblolly pine (*Pinus taeda*), and black gum (*Nyssa sylvatica*). The understory is composed of American holly (*Ilex opaca* var. *opaca*), sweetbay (*Magnolia virginiana*), and smaller members of the canopy. Shrubs typically include highbush blueberry (*Vaccinium corymbosum*), arrowwood (*Viburnum dentatum*), and sweet pepperbush (*Clethra alnifolia*), and may include in rare cases, winterberry (*Ilex verticillata*). Herbs in this community may range from virtually none to netted chain fern (*Woodwardia areolata*), cinnamon fern (*Osmunda cinnamomea*), and royal fern (*Osmunda regalis* var. *spectabilis*). Higher places may include speargrass (*Chasmanthium laxum*), bladder sedge (*Carex intumescens*), and weak stellate sedge (*Carex seorsa*).

**Diagnostic Features:** This community can be readily identified by its location in flatwoods and the dominance or co-dominance of red maple and/or sweetgum.

**Need Picture**

**Geology and Environmental Features:** This community is found in flatwoods which have poor drainage. As a result the groundwater is high and close to the surface.

**Landscape Position:** Flatwoods areas

**Associated Soil Series: AAA**

<b>Series</b>	<b>Acreage</b>	<b>% of acreage</b>

**Status and Trends**

**Good:** This community is very common in Delaware and is a component of a lot of the larger forest blocks in the state. A number of the occurrences are protected as state owned lands. Overall the prospects for this community are good.

**Species documented from this community**

Animals

Non-Vascular Plants

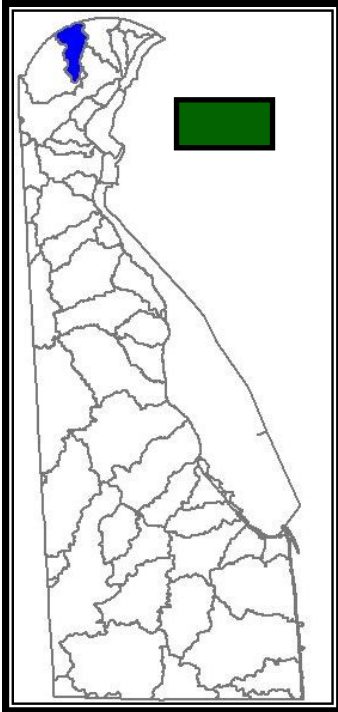
Vascular Plants

**Associated Rare Species:**

**Animals:** Unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Unknown



**Distribution:** This community is located through Delaware but is mainly located in the Coastal Plain.

**Estimated Acres in Delaware = AAA (February 2012)**

\*This community is not affected by sea level rise.

**Equivalent or related communities in nearby states:**

**Maryland:** AAA

**New Jersey:** AAA

**Pennsylvania:** AAA

**Virginia:** AAA

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest

**Landfire Classification Code:** unknown

**Public places to view this community**

**[-Back to New Castle County Forests-](#)**

## Mid-Atlantic Terrace Hardwood Floodplain Forest

GNR S1.1 D

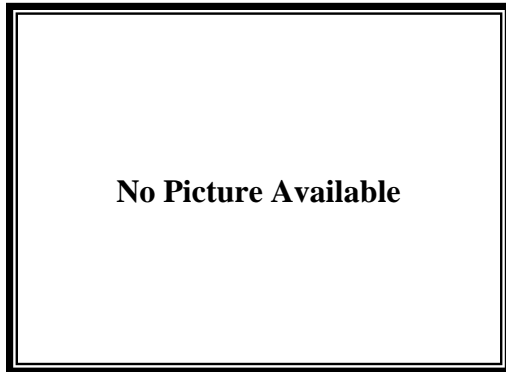
**NVC Alliance:** [A.302-Acer saccharinum-Carya cordiformis Temporarily Flooded Forest Alliance](#)

**NVC Association:** CEGLO06314-Liriodendron tulipifera-Fraxinus spp./Lindera benzoin-Viburnum prunifolium/Podophyllum peltatum Forest

**Delaware Type Locality:** There are currently no known locations in Delaware but it is likely that it is present in the state.

**Description:** This forest community is possibly in Delaware but there are presently no confirmed locations. Mid-Atlantic Terrace Floodplain Forests are rich forests that are found on the floodplains of large rivers.

Common canopy species include tuliptree ([Liriodendron tulipifera](#)), green ash ([Fraxinus pennsylvanica](#)), American beech ([Fagus grandifolia](#)), northern red oak ([Quercus rubra](#)), black gum ([Nyssa sylvatica](#)) and wild black cherry ([Prunus serotina](#)). Shrubs may include spicebush ([Lindera benzoin](#)), blackhaw viburnum ([Viburnum prunifolium](#)) and American hornbeam ([Carpinus caroliniana](#)). A vine layer of poison ivy ([Toxicodendron radicans](#)) and Virginia creeper ([Parthenocissus quinquefolia](#)) may be present. Common herbs include white wood aster ([Eurybia divaricata](#)), mayapple ([Podophyllum peltatum](#)), Virginia bluebell ([Mertensia virginica](#)) and white thoroughwort ([Ageratina altissima](#)).



**Diagnostic Features:** A floodplain forest with tuliptree in the canopy and Virginia bluebell in the herbaceous layer is indicative of this community.

### **Geology and Environmental Features:**

**Landscape Position:** Floodplains on larger streams in the Piedmont

**Associated Soil Series:** No current locations in Delaware but if found it would likely be in Codorus Silt Loam or Hatboro Silt Loam

### **Species documented from this community**

Animals

Non-Vascular Plants

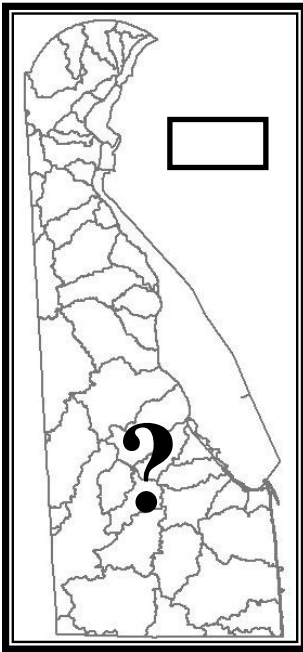
Vascular Plants

**Associated Rare Species:**

**Animals:** none documented

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** There are no known locations of this community in Delaware. If found it would likely be in the Piedmont. Nationally this community is known from Pennsylvania and New Jersey south to possibly Virginia.

**Estimated Acres in Delaware = 0+ (February 2012)**

**Equivalent or related communities in nearby states:**

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No locations in Delaware

**Northeast Wildlife Habitat Classification:** Central Appalachian River Floodplain

**Landfire Classification Code:** unknown

[-Back to New Castle County Forests-](#)



## Northeastern Coastal Plain/Piedmont Oak-Beech/Heath Forest

G4

S1

NVC Alliance: [A.229-Fagus grandifolia-Quercus rubra-Quercus alba Forest Alliance](#)

NVC Association: [CEGL006919-Quercus prinus-Quercus velutina-Fagus grandifolia/Kalmia latifolia Forest](#)

**Delaware Type Locality:** West facing slope in Brandywine Creek State Park in New Castle County. (39°48'30.10"N, 075°33'48.92"W)

**Description:** Northeastern Coastal Plain/Piedmont Oak-Beech/Heath Forests are located in the Piedmont on west to north-facing, mesic sheltered slopes. These slopes range from slightly sloping to steeply sloping and are generally mesic to dry-mesic.

Chestnut oak ([Quercus prinus](#)) and American beech ([Fagus grandifolia](#)) are co-dominant with American beech becoming the overall dominant species on north-facing slopes. Other associates in the canopy can include white oak ([Quercus alba](#)), scarlet oak ([Quercus coccinea](#)), tuliptree ([Liriodendron tulipifera](#)) and red maple ([Acer rubrum](#)). The understory may include flowering dogwood ([Cornus florida](#)) and American holly ([Ilex opaca](#)). The shrub layer is generally dominated by mountain laurel ([Kalmia latifolia](#)) with associates of pink azalea ([Rhododendron periclymenoides](#)), highbush blueberry ([Vaccinium corymbosum](#)), early lowbush blueberry ([V. pallidum](#)), maple-leaf viburnum ([Viburnum acerifolium](#)) and black huckleberry ([Gaylussacia baccata](#)). Common herbs include rattlesnake weed ([Hieracium venosum](#)), wavy hairgrass ([Deschampsia flexuosa](#)), yellow eyed grass ([Hypoxis hirsuta](#)), common wood rush ([Luzula multiflora](#)), shaved sedge ([Carex tonsa](#)), Pennsylvania sedge ([C. pennsylvanica](#)), resurrection fern ([Polypodium virginianum](#)) and partridge berry ([Mitchella repens](#)).



**Brandywine Creek State Park  
New Castle County**

**Diagnostic Features:** The co-dominance of chestnut oak and American beech and/or high presence of either help define and identify this community.

**Geology and Environmental Features:** This community is often found in places where there are large outcrops of Wissahickon Gneiss.

**Landscape Position:** Mid-slopes in the Piedmont

**Associated Soil Series:**

<b>Series</b>	<b>Acreage</b>	<b>% of acreage</b>
Gaila loam	40.2	42.9
Neshaminy-Montalto silt loams	31.5	33.6
Brinklow-Blocktown complex	6.1	6.5
Manor loam	4.2	4.5
Glenelg loam	3.7	3.9
Other series	20.2	21.6

**Status and Trends**

**Good:** All occurrences of this community are located on protected lands and do not face any development pressure. Exotic invasive plant species do not appear to like the dry conditions in this community and have not been noted as a problem in Delaware.

**Species documented from this community**

Animals

Non-Vascular Plants

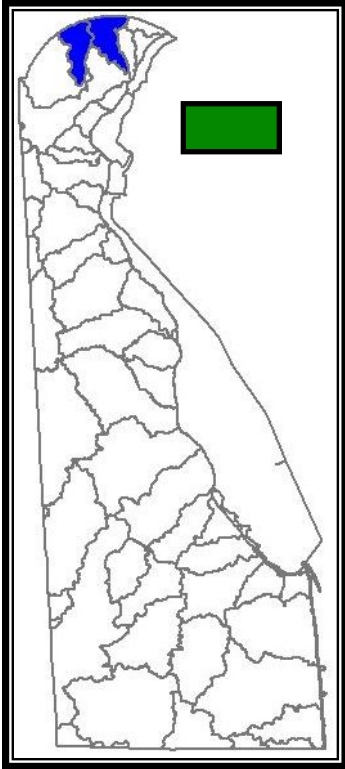
Vascular Plants

**Associated Rare Species:**

**Animals:** none documented

**Non-Vascular Plants:** unknown

**Vascular Plants:** Unknown



**Distribution:** This community is known from the Brandywine, Red Clay, and White Clay Creek watersheds in Delaware. Nationally it is known only from Delaware and New Jersey.

**Estimated Acres in Delaware = 93.7 (February 2012)**

\*This community is not affected by sea level rise.

**Equivalent or related communities in nearby states:**

**Maryland:** unknown

**New Jersey:** South Jersey Beech-Oak Forest (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** unknown

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Piedmont Oak-Beech-Mountain Laurel Forest

**Northeast Wildlife Habitat Classification:** Central Appalachian Dry Oak-Pine Forest

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**New Castle County**

[-Brandywine Creek State Park](#)

[-Back to New Castle County Forests-](#)

## Northeastern Dry Oak-Hickory Forest      G4G5      S1      D?

NVC Alliance: [A.239-Quercus alba-\(Quercus rubra, Carya spp.\) Forest Alliance](#)

NVC Association: [CEGL006336-Quercus \(alba, rubra, velutina\)/Cornus florida/Viburnum acerifolium Forest](#)

**Delaware Type Locality:** Bombay Hook National Wildlife Refuge at Parson Point in Kent County.  
(Need coordinates-AAA)

**Description:** Northeastern Dry Oak-Hickory Forests occur on well-drained slopes and other places where soil moisture is on the dry end of mesic. Ecologically it falls somewhere between a dry acid species poor forest and high diversity dry oak-hickory forest. This community has few mature examples and some are threatened by development pressure. Some locations of this type are succeeding to a more mesic type with red maple ([Acer rubrum](#)) but this process can be delayed by the use of controlled burns.

White Oak ([Quercus alba](#)), northern red oak ([Q. rubra](#)) and black oak ([Q. velutina](#)) are the most common canopy associates in this community. They are characteristically joined by pignut hickory ([Carya glabra](#)), shagbark hickory ([C. ovata](#)), mockernut hickory ([C. alba](#)), red maple ([Acer rubrum](#)), sassafras ([Sassafras albidum](#)) and serviceberry ([Amelanchier arborea](#)). The understory is composed of flowering dogwood ([Cornus florida](#)) and witch-hazel ([Hamamelis virginiana](#)). Sometimes early lowbush blueberry ([Vaccinium pallidum](#)) and huckleberry ([Gaylussacia](#) spp.) may be found here. Herbs common to this community include Pennsylvania sedge ([Carex pensylvanica](#)), rattlesnake weed ([Hieracium venosum](#)), false solomon's seal ([Maianthemum racemosum](#)), white wood aster ([Eurybia divaricata](#)) and spotted wintergreen ([Chimaphila maculata](#)).



**Bombay Hook National  
Wildlife Refuge  
Kent County**

**Diagnostic Features:** The lack of or low abundance of tuliptree ([Liriodendron tulipifera](#)) and American beech ([Fagus grandifolia](#)) in the canopy can separate this community from both the Northern Coastal Plain/Piedmont Basic Mesic Hardwood Forest ([CEGL006055](#)) and the Northern Piedmont Mesic Oak-Beech Forest ([CEGL006921](#)).

**Geology and Environmental Features:** Well drained loamy sand on mid to upper slopes, but can be found on a wide range of geologic types.

**Landscape Position:** Mid to upper slopes in the Piedmont and dry places in the Coastal Plain

**Associated Soil Series:**

<b>Series</b>	<b>Acreage</b>	<b>% of acreage</b>
Downer sandy loam	49.4	27.6
Tent silt loam	47.1	26.3
Pineyneck loam	26.2	14.6
Kentuck mucky silt loam	14.6	8.2
Carmichael loam	12.1	6.8
Other series	29.6	16.5

**Status and Trends**

**Fair:** This community occurs sporadically in the Coastal Plain of Delaware. Most occurrences are located in Bombay Hook National Wildlife Refuge, which will be affected by sea level rise under current scenarios. The potential of sea level rise losses gives this community a fair prognosis.

**Species documented from this community**

Animals

Non-Vascular Plants

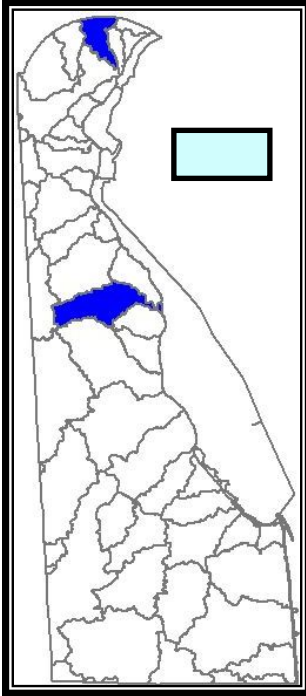
Vascular Plants

**Associated Rare Species:**

**Animals:** none documented

**Non-Vascular Plants:** unknown

**Vascular Plants:** none documented



**Distribution:** This community is found in the Piedmont and Coastal Plain of Delaware. Nationally, it is found on the east coast from Maine south to Virginia.

**Estimated acres in Delaware = 179.6 (February 2012)**

**-Acres with 0.5 m sea level rise =  $179.6 - 5.3 = 174.3$**

**-Acres with 1 m sea level rise =  $179.6 - 34.5 = 145.1$**

**-Acres with 1.5 m sea level rise =  $179.6 - 41.5 = 138.1$**

**Equivalent or related communities in nearby states:**

**Maryland:** Dry Oak-Hickory Forest (Harrison 2004)

**New Jersey:** Mesic Oak Forest (Breden et al 2001)

North Jersey Mixed Oak Forest (Collins and Anderson 1994)

**Pennsylvania:** Dry Oak- Mixed Hardwood Forest, and Red Oak- Mixed Hardwood Forest (Fike 1999)

**Virginia:** Northeastern Acidic Oak-Hickory Forest (Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Hardwood Forest (Coastal Plain Occurrences)

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Kent County**

[-Bombay Hook National Wildlife Refuge](#)

[-Woodland Beach Wildlife Area](#)  
[-Milford Neck Wildlife Area](#)

[\*\*-Back to Kent County Forests-\*\*](#)  
[\*\*-Back to Sussex County Forests-\*\*](#)

## Northeastern Pin Oak-Swamp White Oak Forest GNR S1

**NVC Alliance:** A.329-*Quercus palustris*-(*Quercus bicolor*) Seasonally Flooded Forest Alliance

**NVC Association:** CEG006240-*Quercus palustris*-(*Quercus bicolor*)-*Acer rubrum*/*Vaccinium corymbosum*/*Osmunda cinnamomea* Forest

**Delaware Type Locality:** TBD

**Description:** Northeastern Pin Oak-Swamp White Oak Forests are located in depressions that are seasonally flooded and are dominated primarily by pin oak (*Quercus palustris*) and swamp white oak (*Quercus bicolor*), but can be joined by red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*) and black gum (*Nyssa sylvatica*). The understory is composed of sweetbay (*Magnolia virginiana*) and a few American hollies (*Ilex opaca*). Highbush blueberry (*Vaccinium corymbosum*) and common greenbrier (*Smilax rotundifolia*) compose the shrub and vine layer. No herbs have been documented from this community.



**Diagnostic Features:** This community is essentially a Coastal Plain Pond with a forested canopy. The dominance or co-dominance of pin oak, swamp white oak, and a high amount of red maple readily identifies this community.

### Blackbird Reserve Wildlife Area New Castle County, Delaware

**Geology and Environmental Features:** This community often occurs on soils that have a hardpan underneath that impedes the drainage of water. The depressions fill with water during the winter and spring and then dry out in the late summer to fall.

**Landscape Position:** Flat wood areas with little slope.

#### Associated Soil Series:

Series	Acreage	% of acreage
Ingleside-Hammonton-Fallsington complex	7.9	59.3
Hammonton-Fallsington-Mullica complex	2.0	15.0
Downer sandy loam	1.1	8.3
Mattapex silt loam	0.6	4.5
Othello silt loam	0.6	4.5
Other series	1.1	8.4



### **Status and Trends**

**Good:** This community is located in Delmarva Bay depressions and is dependent on rainfall in the winter and early spring to provide a fluctuating water level. The fluctuating water levels keep out species which would otherwise invade. Most of the known occurrences are in protected areas such as the Brandywine Reserve Wildlife Area. Activities that decrease the groundwater level could negatively impact this community. None of the known occurrences are projected to be affected by sea level rise under current scenarios.

### **Species documented from this community**

Animals

Non-Vascular Plants

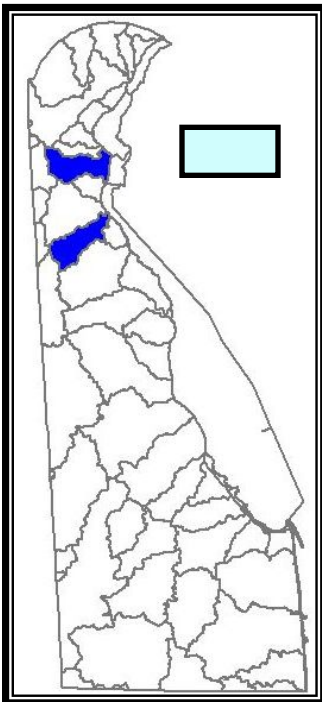
Vascular Plants

### **Associated Rare Species:**

**Animals:** none documented

**Non-Vascular Plants:** unknown

**Vascular Plants:** none documented



**Distribution:** This community is found in the Blackbird Creek, Back Creek, and C and D Canal watersheds. It is likely also found in the Chester River and Sassafras River watersheds. Nationally it is found on the east coast from New Hampshire south to Virginia.

**Estimated acres in Delaware = 47.87 (February 2012)**

\*This community is not affected by sea level rise.

**Equivalent or related communities in nearby states:**

**Maryland: ?**

**New Jersey: ?**

**Pennsylvania: ?**

**Virginia: ?**

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**New Castle County**

[-Blackbird Reserve Wildlife Area](#)

[-Back to New Castle County Coastal Plain Ponds-](#)

[-Back to New Castle County Forests-](#)

**Northern Coastal Plain Successional Floodplain Forest GNA SNA**

**NVC Alliance:** A.280-*Betula nigra*-(*Platanus occidentalis*) Temporarily Flooded Forest Alliance

**NVC Association:** CEG006976-*Betula nigra*-*Acer rubrum*-(*Liquidambar styraciflua*, *Platanus occidentalis*) Forest

**Delaware Type Locality:** Floodplain of Marshyhope Creek about 0.5 miles downstream of the DE 36 bridge across the creek (AAA)

**Description:** Northern Coastal Plain Successional Floodplain Forests are located on levees along large creeks and rivers in the Coastal Plain of Delaware. These communities can range from temporarily flooded to seasonally flooded and have nutrient poor soils.

Canopy dominants include red maple (*Acer rubrum*), river birch (*Betula nigra*) and green ash (*Fraxinus pennsylvanica*). The understory is composed of smaller members of the overstory. Highbush blueberry (*Vaccinium corymbosum*), common greenbrier (*Smilax rotundifolia*) and poison ivy (*Toxicodendron radicans*) are common in the shrub and vine layer. Herbs may include (*Myosotis* spp.), lizard’s tail (*Saururus cernuus*), stinging nettle (*Urtica dioica*) and orange-spotted jewelweed (*Impatiens capensis*).



**Diagnostic Features:** This is the only forest in the Coastal Plain where river birch is co-dominant or dominant.

**Marshyhope Wildlife Area  
Sussex County, Delaware**

**Geology and Environmental Features:** This community is located on levees of large creeks and rivers in the Coastal Plain. Soils are silty to clayey and nutrient poor

**Landscape Position:** Levees in the Coastal Plain

**Associated Soil Series:** Longmarsh and Indiantown soils (frequently flooded)—100%

### Status and Trends

**Poor:** This community is only known from the Marshyhope Creek watershed in Delaware and the one occurrence is overrun by Japanese stiltgrass (*Microstegium vimineum*), which is preventing regeneration of the canopy and understory. Hydrology of the community has been affected by channelization of Marshyhope Creek.

### Species documented from this community

Animals

Non-Vascular Plants

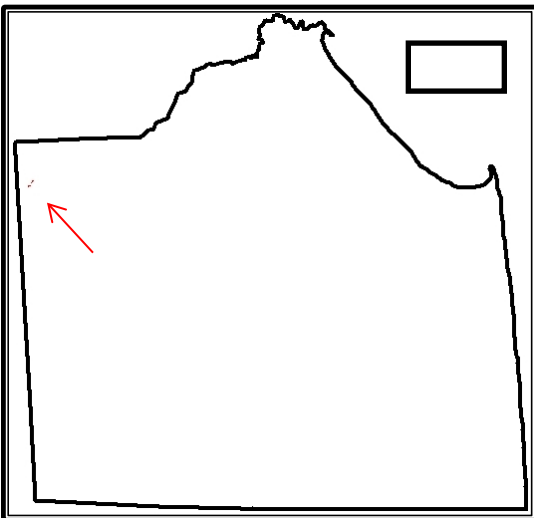
Vascular Plants

### Associated Rare Species:

**Animals:** none documented

**Non-Vascular Plants:** unknown

**Vascular Plants:** none documented



**Distribution:** This community is known from the Marshyhope Creek watershed. Nationally it is known on the Mid-Atlantic Coast from Virginia to New Jersey.

**Estimated acres in Delaware = 26.3 acres  
(February 2012)**

\*This community is not affected by sea level rise.

### Equivalent or related communities in nearby states:

**Maryland:** Northern Coastal Plain Successional Floodplain Forest

**New Jersey:** unknown

**Pennsylvania:** not present

**Virginia:** Coastal Plain/Piedmont Floodplain Forest

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** AAA

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Sussex County**

[-Marshyhope Wildlife Area](#)

[-Back to Sussex County Forests-](#)

**Northern Piedmont Mesic Oak-Beech Forest      GNR      S5      DNP**

**NVC Alliance:** [A.229-Fagus grandifolia-Quercus rubra-Quercus alba Forest Alliance](#)

**NVC Association:** [CEGL006921-Fagus grandifolia-Betula lenta-Quercus \(alba, rubra\)/Carpinus caroliniana Forest](#)

**Delaware Type Locality:** East facing slope above Brandywine Creek on the Granoque Property in New Castle County (**39°49'13.12"N, 075°34'31.10"W**)

**Description:** This forest community occurs on mesic substrates and is characterized by not being dominated by any one species but rather is a large heterogeneous mixture. The Northern Piedmont Mesic Oak-Beech Forest may have sweet birch ([Betula lenta](#)) present but not in high amount, whereas the Coastal Plain analogue, Mid-Atlantic Mesic Mixed Hardwood Forest ([CEGL006075](#)) has species such as American holly ([Ilex opaca](#)) and sweetgum ([Liquidambar styraciflua](#)). Northern Piedmont Mesic Oak-Beech Forests are the most common in the Piedmont of Delaware. In some older reports and the State Wildlife Action Plan this community may be called the Mesic Piedmont Mixed Hardwood Forest.

Tuliptree ([Liriodendron tulipifera](#)) and American beech ([Fagus grandifolia](#)) are frequent in the canopy and are associated by white oak ([Quercus alba](#)), northern red oak ([Quercus rubra](#)), black oak ([Quercus velutina](#)) and hickory ([Carya](#) spp.) Understory associates include American hornbeam ([Carpinus caroliniana](#)), sweet birch ([Betula lenta](#)), red maple ([Acer rubrum](#)), black gum ([Nyssa sylvatica](#)), American beech and flowering dogwood ([Cornus florida](#)). The shrub and herbaceous layers can vary depending upon site conditions. Common shrubs include spicebush ([Lindera benzoin](#)), arrow-wood ([Viburnum dentatum](#)) and blackhaw viburnum ([Viburnum prunifolium](#)). Mayapple ([Podophyllum peltatum](#)), jack-in-the-pulpit ([Arisaema triphyllum](#)), enchanter's nightshade ([Circaea lutetiana](#)), Christmas fern ([Polystichum acrostichoides](#)), white wood aster ([Eurybia divaricata](#)), solomon's seal ([Polygonatum biflorum](#)), bloodroot ([Sanguinaria canadensis](#)), white avens ([Geum canadense](#)), false solomon's seal ([Maianthemum racemosum](#)), Virginia creeper ([Parthenocissus quinquefolia](#)), smooth wild licorice ([Galium circaezans](#)), rattlesnake fern ([Botrychium virginianum](#)), and American hog peanut ([Amphicarpaea bracteata](#)) are common herbs found in this community.



**Beaver Branch in  
Brandywine Creek  
New Castle County**

**Diagnostic Features:** This community can at times be difficult to separate from the Successional Tuliptree Forest ([CEGL007220](#)) or the Northern Coastal Plain/Piedmont Basic Mesic Hardwood Forest ([CEGL006055](#)). The Northern Piedmont Mesic Oak-Beech Forest has a higher amount of American beech than either of the above forests and is not dominated by any one species but is rather a mixture. The Northern Coastal Plain/Piedmont Basic Mesic Hardwood Forest is generally a mature forest having a rich herbaceous layer.

**Geology and Environmental Features:** Gently sloping sites that can be rocky.

**Landscape Position:** Mesic slopes or flatwoods that are mesic being neither wet or dry.

**Associated Soil Series:**

Series	Acreage	% of acreage
Glenelg loam	921.0	14.5
Gaila loam	910.2	14.4
Delanco-Codorus-Hatboro complex	562.6	8.9
Brinklow channery loam	448.9	7.1
Brinklow-Blocktown complex	362.7	5.7
Other series	3,134.1	49.4

### **Status and Trends**

**Good:** Northern Piedmont Mesic Oak-Beech Forest is the most common forested community in the Piedmont of Delaware. A lot of occurrences face development pressure from increasing population but large expanses are present within protected areas as well. Exotic and native invasive species do not seem to be a problem in this community due to either hydrology or nutrient availability. A very small piece of this community will be affected at the bottom of the Brandywine Creek watershed with 1.5 m of sea level rise.

### **Species documented from this community**

Animals

Non-Vascular Plants

Vascular Plants

### **Associated Rare Species:**

**Animals:** Unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Unknown



**Distribution:** This community is present throughout the Piedmont of Delaware. Nationally this community is found from Pennsylvania and New Jersey south to Maryland.

**Estimated acres in Delaware = 6,649.02 (February 2012)**

**-Acres with 0.5 m sea level rise = 6,661.5-0.0 = 6,661.5**

**-Acres with 1 m sea level rise = 6,661.5-0.0 = 6,661.5**

**-Acres with 1.5 m sea level rise = 6,661.5-0.2 = 6,661.3**

**Equivalent or related communities in nearby states:**

**Maryland:** unknown

**New Jersey:** North Jersey Mixed Oak Forest (Collins and Anderson 1994)

**Pennsylvania:** Red Oak-Mixed Hardwood Forest

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Mesic Piedmont Mixed Hardwood Forest

**Northeast Wildlife Habitat Classification:** Northeastern Interior Dry-Mesic Oak Forest

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**New Castle County**

[-Brandywine Creek State Park](#)

[-White Clay Creek State Park](#)

[-Wilmington State Park](#)

[-Back to New Castle County Forests-](#)



## Red Maple-Sweetgum Swamp      G4G5      S2

NVC Alliance: [A.321-Liquidambar styraciflua-\(Acer rubrum\) Seasonally Flooded Forest Alliance](#)

NVC Association: [CEGL006110-Liquidambar styraciflua-Acer rubrum-Quercus phellos/Leucothoe racemosa Forest](#)

**Delaware Type Locality:** Nanticoke River floodplain north of DE 404 in Sussex County (38°42'32.86"N, 75°33'24.50"W).

**Description:** Red Maple-Sweetgum Swamps can occur in all floodplains and are characterized by seasonal overbank flooding. They can also be found in moist to wet depressions. This swamp community is dominated by red maple ([Acer rubrum](#)) and sweetgum ([Liquidambar styraciflua](#)) and typically lack green ash ([Fraxinus pennsylvanica](#)).

Besides red maple and sweetgum other species that may occur in the canopy include white oak ([Quercus alba](#)), sassafras ([Sassafras albidum](#)), black gum ([Nyssa sylvatica](#)), sweetbay ([Magnolia virginica](#)), American elm ([Ulmus americana](#)), American hornbeam ([Carpinus caroliniana](#)), persimmon ([Diospyros virginiana](#)) and tuliptree ([Liriodendron tulipifera](#)). The understory is typically composed of American holly ([Ilex opaca](#)) and spicebush ([Lindera benzoin](#)). Sweet pepperbush ([Clethra alnifolia](#)), highbush blueberry ([Vaccinium corymbosum](#)), elderberry ([Sambucus canadensis](#)) and swamp azalea ([Rhododendron viscosum](#)) compose the shrub layer. A vine layer of common greenbrier ([Smilax rotundifolia](#)), Virginia creeper ([Parthenocissus quinquefolia](#)) and Japanese honeysuckle ([Lonicera japonica](#)) is usually present. A diverse herb layer is generally composed of lizard's tail ([Saururus cernuus](#)), orange-spotted jewelweed ([Impatiens capensis](#)), skunk cabbage ([Symplocarpus foetidus](#)) and false nettle ([Boehmeria cylindrica](#)). Other herbs that may include jack-in-the-pulpit ([Arisaema triphyllum](#)), stout wood reedgrass ([Cinna arundinacea](#)), fowl mannagrass ([Glyceria striata](#)), white avens ([Geum canadense](#)), Canadian black snakeroot ([Sanicula canadensis](#)), netted chainfern ([Woodwardia areolata](#)) and sensitive fern ([Onoclea sensibilis](#)).



**Diagnostic Features:** This community can be distinguished from other swamp communities with red maple and sweetgum by its lack of green ash ([Fraxinus pennsylvanica](#)).

**Prime Hook National Wildlife  
Refuge  
Sussex County**

**Geology and Environmental Features:** The substrate of this community is characterized by mineral soils and generally acidic, gleyed or mottled, sandy or clay loams. The water table in this community may be perched.

**Landscape Position:** This community occurs in depressions and low areas of the Coastal Plain and is very scattered in the Piedmont.

**Associated Soil Series:**

Series	Acreage	% of acreage
Mullica-Berryland complex	8,124.1	15.3
Longmarsh and Indiantown soils (frequently flooded)	7,092.7	13.3
Manahawkin muck (frequently flooded)	3,709.3	7.0
Fallsington loam	3,030.9	5.7
Corsica mucky loam	2,600.9	4.9
Other series	28,705.3	53.9

**Status and Trends**

**Good:** Red Maple-Sweetgum Swamp is the most common forested community in Delaware. Much of the explosion of red maple and the persistence of this community are likely due to the suppression of occasional fire in the forestlands. This community will likely continue to increase in the future as clear-cuts re-vegetate.

**Species documented from this community**

Animals

Non-Vascular Plants

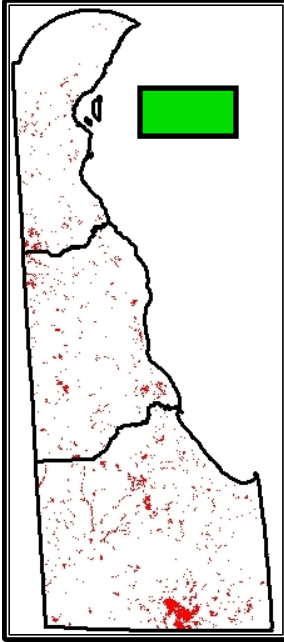
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Cypress Sedge ([Carex jooarii](#)), Yellow Passionflower ([Passiflora lutea](#))



**Distribution:** This community is generally located on the upper tributaries of most of the Coastal Plain streams and in the Piedmont in the Red Clay Creek and Brandywine Creek watersheds in Delaware. Nationally is located from New York south to Georgia and west to Louisiana and Arkansas.

**Estimated acres in Delaware = 52,833.06 (February 2012)**

**-Acres with 0.5 m sea level rise = 53,263.2-2,486.4 = 50,776.8**

**-Acres with 1 m sea level rise = 53,263.2-4,043.2 = 49,220.0**

**-Acres with 1.5 m sea level rise = 53,263.2-5,152.1 = 48,111.1**

**Equivalent or related communities in nearby states:**

**Maryland:** Red Maple-Sweetgum Swamp (Harrison 2004)

**New Jersey:** Red Maple-Sweetgum Swamp (Breden et al 2001)

Inner Coastal Plain Hardwood Swamp Forest (Collins and Anderson 1994)

**Pennsylvania:** unknown

**Virginia:** Coastal Plain Depression Swamp (Red Maple-Sweetgum-Willow Oak Type)  
(Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Red Maple-Streamside Swamp and Sweetgum-Red Maple Depression Swamp

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Stream and River; Northern Atlantic Coastal Plain Pond; Northern Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**New Castle County**

[-Blackbird Reserve Wildlife Area](#)

-Cedar Swamp Wildlife Area

### **Kent County**

-Blackiston Wildlife Area

-[Bombay Hook National Wildlife Refuge](#)

-Little Creek Wildlife Area

-[Milford Neck Wildlife Area](#)

-Norman G. Wilder Wildlife Area

-Ted Harvey Wildlife Area

-[Woodland Beach Wildlife Area](#)

### **Sussex County**

-Assawoman Wildlife Area

-Cape Henlopen State Park

-Marshyhope Wildlife Area

-Midlands Wildlife Area

-Nanticoke Wildlife Area

-Prime Hook Wildlife Area

-Redden State Forest

[-Back to Kent County Forests-](#)

[-Back to New Castle County Forests-](#)

[-Back to Sussex County Forests-](#)

## Riverine Floodplain Forest (Early Successional Type)

**GNR**            **S2**

**NVC Alliance:** [A.288-Platanus occidentalis-\(Fraxinus pennsylvanica, Celtis laevigata, Acer saccharinum\) Temporarily Flooded Forest Alliance](#)

**NVC Association:** [CEGL006036-Platanus occidentalis-Fraxinus pennsylvanica Forest](#)

**Delaware Type Locality:** Red Clay Creek floodplain just upstream of Wooddale Bridge in New Castle County ([39°46'2.32"N, 075°38'7.96"W](#)).

**Description:** Riverine Floodplain Forests are the typical sycamore (*Platanus occidentalis*) forest of the northeast that is located on medium gradient streams in the Piedmont. The floodplains on which they occur receive a high amount of flooding.

Sycamore and green ash (*Fraxinus pennsylvanica*) co-dominate the canopy and can be associated by black walnut (*Juqans nigra*), wild black cherry (*Prunus serotina*), red maple (*Acer rubrum*), tuliptree (*Liriodendron tulipifera*), flowering dogwood (*Cornus florida*) and silver maple (*Acer saccharinum*). Box-elder (*Acer negundo*) is common in the understory. Spicebush (*Lindera benzoin*) is common in the shrub layer. Poison ivy (*Toxicodendron radicans*) can often be found climbing the trees in this community. Common herbs include Mayapple (*Podophyllum peltatum*), skunk cabbage (*Symplocarpus foetidus*), enchanter's nightshade (*Circaea lutetiana*), false nettle (*Boehmeria cylindrica*), jack-in-the-pulpit (*Arisaema triphyllum*), orange-spotted jewelweed (*Impatiens capensis*), eastern waterleaf (*Hydrophyllum virginianum*) and violet (*Viola* spp.) Exotic invasive plant species such as Japanese honeysuckle (*Lonicera japonica*), Oriental bittersweet (*Celastrus orbiculatus*), Japanese stiltgrass (*Microstegium vimineum*), multiflora rose (*Rosa multiflora*) and lesser celandine (*Ficaria verna*) can be encountered in many of the floodplain forests of the Piedmont.



**Floodplain of Red Clay Creek  
New Castle County**

**Diagnostic Features:** Sycamore and green ash are the common canopy species in this community. Box-elder is characteristic of the subcanopy for this community.

**Geology and Environmental Features:** Cobble or sand substrate of islands or cobble shores

**Landscape Position:** Floodplains of larger streams in the Piedmont.

**Associated Soil Series:**

<b>Series</b>	<b>Acreage</b>	<b>% of acreage</b>
Hatboro-Codorus complex	16.8	70.9
Delanco-Codorus-Hatboro complex	2.7	11.4
Gaila loam	2.0	8.4
Glenville silt loam	1.2	5.1
Brinklow-Blocktown complex	0.6	2.5
Other series	0.4	1.7

**Status and Trends**

**Fair:** Like the Green Ash-Mixed Hardwood Floodplain Forest, this community is located in places where there is anthropogenic and natural disturbance. It is also affected by exotic and native invasive plant species. It also vulnerable due to the low acreage present in the state.

**Species documented from this community**

Animals

Non-Vascular Plants

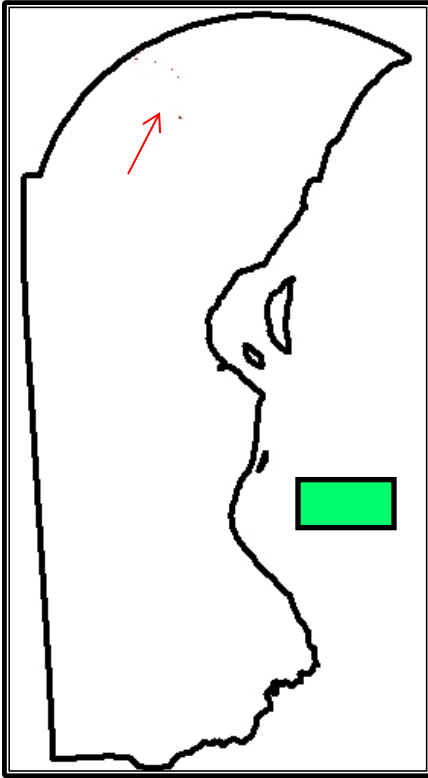
Vascular Plants

**Associated Rare Species:**

**Animals:** none documented

**Non-Vascular Plants:** unknown

**Vascular Plants:** Unknown



**Distribution:** This community is common on river floodplains in the Piedmont and adjacent Coastal Plain in Delaware. Nationally this community can be found in the Northeast and is disjunct south to Delaware and the District of Columbia.

**Estimated acres in Delaware = 127.88 (February 2012)**

\*This community is not projected to be affected by sea level rise.

**Equivalent or related communities in nearby states:**

**Maryland:** not present

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** Piedmont/Mountain Alluvial Forest (Tulip-Poplar-Green Ash Type) (Fleming, et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Sycamore-Green Ash Floodplain Forest

**Northeast Wildlife Habitat Classification:** Central Appalachian River Floodplain

**Landfire Classification Code:**

**Public places in Delaware to view this community**

This community is not currently known from any public places.

[-Back to New Castle County Forests-](#)

## Silver Maple-Elm Floodplain Forest

GNR

S?

**NVC Alliance:** A.299-*Acer (rubrum, saccharinum)*-*Ulmus americana* Temporarily Flooded Forest Alliance

**NVC Association:** CEG006001-*Acer saccharinum*-*Ulmus americana*/*Onoclea sensibilis* Forest

**Delaware Type Locality:** There are currently no confirmed locations for this community in Delaware.

**Description:** This forest community occupies floodplains that receive regular flooding on the Christina River and Brandywine Creek. The closed canopy may have scattered openings caused by scouring, uprooting or ice damage. Most examples in Delaware have been invaded by Japanese hops (*Humulus japonica*) and contain little of the natural diversity associated with this community.

Besides silver maple (*Acer saccharinum*) other species in the canopy may include sycamore (*Platanus occidentalis*), American elm (*Ulmus americana*), slippery elm (*Ulmus rubra*), black willow (*Salix nigra*), boxelder (*Acer negundo*), river birch (*Betula nigra*) and green ash (*Fraxinus pennsylvanica*). The understory is generally sparse from the disturbance and is composed of elderberry (*Sambucus canadensis*) and spicebush (*Lindera benzoin*). A vine layer of Virginia creeper (*Parthenocissus quinquefolia*), American ground nut (*Apios americana*) and American hog-peanut (*Amphicarpaea bracteata*) may be present. Typical herbs include goblet aster (*Symphotrichum lateriflorum*), false nettle (*Boehmeria cylindrica*), Virginia wild rye (*Elymus virginicus*), yellow jewelweed (*Impatiens pallida*), sensitive fern (*Onoclea sensibilis*) and stinging nettle (*Urtica dioica*). Some exotic invasive species may be present due to the disturbance conditions of the community and include Japanese honeysuckle (*Lonicera japonica*) and Japanese stiltgrass (*Microstegium vimineum*).

**Diagnostic Features:** This community can be identified by the greater than 50% dominance of silver maple in the canopy.

**Geology and Environmental Features:** This community is located in floodplains which receive annual flooding, usually in the spring. Floods may range from none at all during dry years to many. Debris (rack lines) and abandoned channels in the floodplain can often be found in this community, which are left from the flooding.

**Landscape Position:** Floodplains of larger streams in the Piedmont

**Associated Soil Series:**

### **Species documented from this community**

Animals

Non-Vascular Plants

Vascular Plants

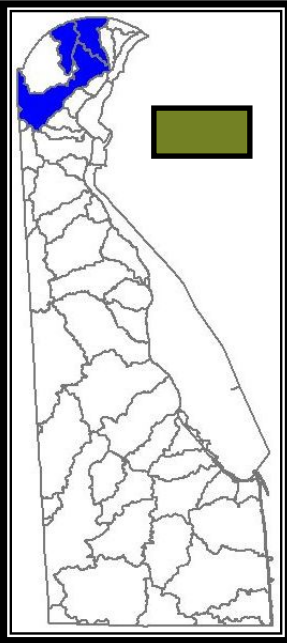


**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** Silver Maple-Elm forests likely occur on large creeks in the Piedmont of Delaware. Nationally, they are known from New Jersey and Delaware due west to Iowa and Missouri.

**Estimated Acres in Delaware = 0+ (February 2012)**

**Equivalent or related communities in nearby states:**

**Maryland:** Silver Maple-Elm-(Eastern Cottonwood) Forest (Harrison 2004)

**New Jersey:** Piedmont Swamp and Floodplain (Collins and Anderson 1994)

**Pennsylvania:** Silver Maple Floodplain Forest

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Central Appalachian River Floodplain

**Landfire Classification Code:** unknown

**[-Back to New Castle County Forests-](#)**

## Southern New England/Northern Piedmont Red Maple Seepage Swamp

**G4G5 S1 DNA**

**NVC Alliance:** [A.316-Acer rubrum-Fraxinus pennsylvanica Seasonally Flooded Forest Alliance](#)

**NVC Association:** [CEGL006406-Acer rubrum-Fraxinus \(pennsylvanica, americana\)/Lindera benzoin/Symplocarpus foetidus Forest](#)

**Delaware Type Locality:** Seepage flowing into the south side of Rocky Run in Brandywine Creek State Park in New Castle County ([39°48'49.91"N, 075°33'39.52"W](#)).

**Description:** Southern New England/Northern Piedmont Red Maple Seepage Swamps are dominated by red maple ([Acer rubrum](#)) in a seepage. These seepages occur in seasonally saturated situations on slightly sloping hillsides, along small streams and in basins that receive overland flooding in addition to groundwater influence. They are generally acidic.

Red maple is dominant in the canopy and is associated by green ash ([Fraxinus pennsylvanica](#)) or white ash ([F. americana](#)). Other canopy associates may include tuliptree ([Liriodendron tulipifera](#)), swamp white oak ([Quercus bicolor](#)), American elm ([Ulmus americana](#)) and slippery elm ([Ulmus rubra](#)). Black ash ([Fraxinus nigra](#)) may occur as scattered individuals in the understory. Shrubs may include winterberry ([Ilex verticillata](#)), swamp azalea ([Rhododendron viscosum](#)), sweet pepperbush ([Clethra alnifolia](#)), spicebush ([Lindera benzoin](#)) and highbush blueberry ([Vaccinium corymbosum](#)). The herbaceous layer characteristically includes skunk cabbage ([Symplocarpus foetidus](#)) and cinnamon fern ([Osmunda cinnamomea](#)) and are associated by orange-spotted jewelweed ([Impatiens capensis](#)), jack-in-the-pulpit ([Arisaema triphyllum](#)), tussock sedge ([Carex stricta](#)), false hellebore ([Veratrum viride](#)), Canadian clearweed ([Pilea pumila](#)) and manna grass ([Glyceria](#) spp.)



**Brandywine Creek State Park**  
**New Castle County**

**Diagnostic Features:** This is a community that is dominated by red maple and associated by green ash or white ash.

**Geology and Environmental Features:** Soils are usually shallow to moderately deep mucks over mineral soils.

**Landscape Position:** Piedmont seepages on floodplains and lower slopes in northern Delaware.

**Associated Soil Series:**

<b>Series</b>	<b>Acreage</b>	<b>% of acreage</b>
Glenelg loam	14.9	53.4
Neshaminy-Montalto silt loams	8.4	30.1
Hatboro-Codorus complex	2.6	9.3
Delanco-Codorus-Hatboro complex	1.6	5.7
Other series	0	0

**NWI Classification:**

**Status and Trends**

**Good:** All occurrences of this community are located on protected lands and do not face development pressure. In most cases the watersheds are also protected preserving the hydrologic conditions required for this community.

**Species documented from this community**

Animals

Non-Vascular Plants

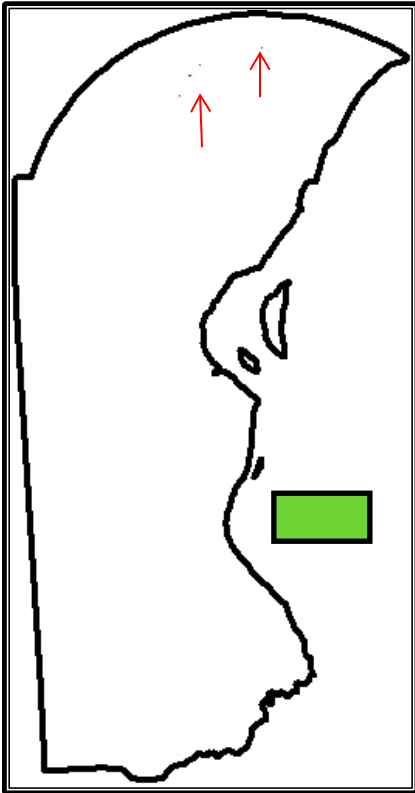
Vascular Plants

**Associated Rare Species:**

**Animals:** none documented

**Non-Vascular Plants:** unknown

**Vascular Plants:** Unknown



**Distribution:** This community is known from the Brandywine and Red Clay Creek watersheds in the Piedmont of Delaware. Nationally this community is found on the east coast from New Hampshire south to Virginia.

**Estimated acres in Delaware = 27.4 (February 2012)**

\*This community is not affected by sea level rise.

**Equivalent or related communities in nearby states:**

**Maryland:** Southern New England Red Maple Seepage Swamp (Harrison 2004)

**New Jersey:** Red Maple Swamp (Breden et al 2001)

Piedmont Swamp and Floodplain (Collins and Anderson 1994)

**Pennsylvania:** unknown

**Virginia:** Northern Piedmont/Lower New England Basic Seepage Swamp (Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Central Appalachian Stream and Riparian

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**New Castle County**

[-Brandywine Creek State Park](#)

[-Back to New Castle County Forests-](#)

## Successional Sweetgum Forest

GNA

SNA

DNA

NVC Alliance: A.234-*Liquidambar styraciflua* Forest Alliance

NVC Association: CEGLO07216-*Liquidambar styraciflua* Forest

**Delaware Type Locality:** Woods on the property of Concord High School in northern New Castle County ([39°49'55.98"N, 75°31'35.59"W](#)).

**Description:** Successional Sweetgum Forests are often located on abandoned agricultural fields, clear-cuts, and other places where there has been disturbance due to removal of the canopy. These forests are generally intermediate to a more mature forest containing oaks or mixed hardwoods but can in some instances, due to deer browsing, become a mature forest of its own, especially in the [Piedmont](#) of Delaware.

Most examples in Delaware are almost wholly dominated by sweetgum ([Liquidambar styraciflua](#)). In some stands there may be scattered individuals of loblolly pine ([Pinus taeda](#)), wild black cherry ([Prunus serotina](#)) and tuliptree ([Liriodendron tulipifera](#)) mixed in. More mature examples may have secondary layers containing spicebush ([Lindera benzoin](#)) and red maple ([Acer rubrum](#)) in the understory, highbush blueberry ([Vaccinium corymbosum](#)) and arrow-wood ([Viburnum dentatum](#)) in the shrub layer. Herbs in this community may include orange jewelweed ([Impatiens capensis](#)), jack-in-the-pulpit ([Arisaema triphyllum](#)), mayapple ([Podophyllum peltatum](#)), woodland sedge ([Carex blanda](#)) and swan's sedge ([Carex swanii](#)).



**Prime Hook National Wildlife  
Refuge  
Sussex County**

**Diagnostic Features:** The overwhelming dominance of young to mature age sweetgum identifies this community. This community is sometimes nearly 100% sweetgum.

**Geology and Environmental Features:** This community is not known to have a geological relationship and is a disturbance community.

**Landscape Position:** This community can occur anywhere there has been clearing of land.

**Associated Soil Series:**

Series	Acreage	% of acreage
Mullica-Berryland complex	306.7	18.7
Fallsington loam	112.2	6.8
Corsica mucky loam	84.1	5.1
Fallsington-Urban land complex	71.4	4.4
Othello silt loam	48.1	2.9
Other series	1,015.6	62.0

**Status and Trends**

**Good:** This community has many locations throughout the state and appears wherever there is regeneration. In the more southern parts of the state it face competition from loblolly pine (*Pinus taeda*), but in the more northern ends of the state it outcompetes the pine.

**Species documented from this community**

Animals

Non-Vascular Plants

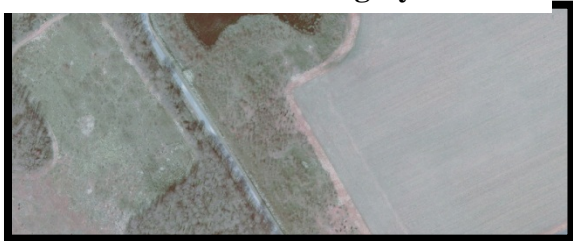
Vascular Plants

**Aerial Imagery Analysis**

This community has speckled appearance in all imagery sets. The famous Prime Hook Wildlife Area cross is composed entirely of sweetgum (*Liquidmbar styraciflua*) with a ring of sweetgum around the fields.



**2002 Aerial Imagery**



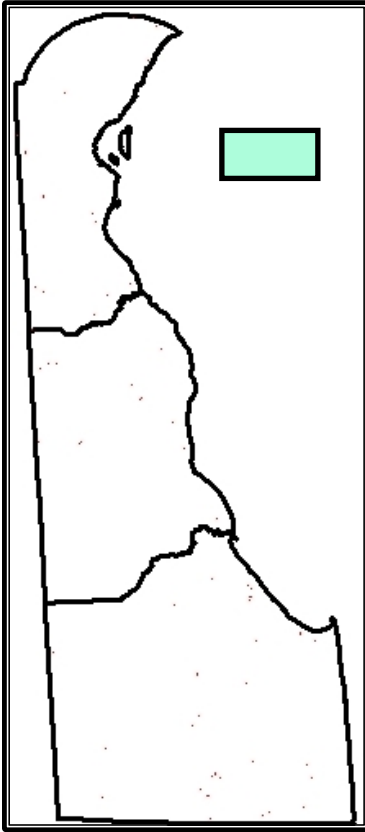
**Associated Rare Species:**

**Animals:** Unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Unknown





**Distribution:** This community is scattered throughout the State of Delaware and many more sites are likely to be found. Nationally it is known throughout the Southeast and north along the East Coast to New Jersey.

**Estimated acres in Delaware = 1,777.8 (February 2012)**

**-Acres with 0.5m sea level rise = 1,638.1-107.3 = 1,530.8**

**-Acres with 1m sea level rise = 1,638.1-195.8 = 1,442.3**

**-Acres with 1.5m sea level rise = 1,638.1-243.6 = 1,394.5**

**Equivalent or related communities in nearby states:**

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** not present

**Virginia:** unknown

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Red Maple-Sweetgum Upland Forest

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**New Castle County**

- Blackbird Reserve Wildlife Area
- Cedar Swamp Wildlife Area

### **Kent County**

- Blackiston Wildlife Area
- [Bombay Hook National Wildlife Refuge](#)
- Little Creek Wildlife Area
- Milford Neck Wildlife Area
- Ted Harvey Wildlife Area

### **Sussex County**

- Assawoman Wildlife Area
- Prime Hook National Wildlife Refuge

[-Back to Kent County Forests-](#)  
[-Back to New Castle County Forests-](#)  
[-Back to Sussex County Forests-](#)

## Successional Tuliptree Forest (Rich Type)

GNA

SNA

### DNA

NVC Alliance: [A.236-Liriodendron tulipifera Forest Alliance](#)

NVC Association: CEGLO07220-Liriodendron tulipifera/(Cercis canadensis)/(Lindera benzoin) Forest

**Delaware Type Locality:** Forest in the upper headwaters of Hurricane Run of Brandywine Creek in New Castle County ([39°49'21.17"N, 075°33'3.41"W](#)).

**Description:** Successional Tuliptree Forests are similar to mesic rich forests but is invaded by aggressive species and lacks the rich diversity of the true rich forest. The most severely invaded forests often walk the line between this community and a Northeastern Modified Successional Forests. It may have some of the species associated with a Northern Coastal Plain/Piedmont Basic Mesic Hardwood Forest such as bloodroot ([Sanguinaria canadensis](#)) and broad beech fern ([Phegopteris hexagonoptera](#)).

Tuliptree ([Liriodendron tulipifera](#)) occurring with or co-dominating with northern red oak ([Quercus rubra](#)) and white ash ([Fraxinus americana](#)) compose the canopy of this forest. Other canopy members may include white oak ([Quercus alba](#)), chestnut oak ([Quercus prinus](#)), mockernut hickory ([Carya alba](#)), bitternut hickory ([Carya cordiformis](#)), slippery elm ([Ulmus rubra](#)), black gum ([Nyssa sylvatica](#)), American beech ([Fagus grandifolia](#)) and black walnut ([Juglans nigra](#)). The understory is often of the canopy members plus red maple ([Acer rubrum](#)), spicebush ([Lindera benzoin](#)) and pawpaw ([Asimina triloba](#)). Maple-leaf viburnum ([Viburnum acerifolium](#)) and arrow-wood ([Viburnum dentatum](#)) are prominent shrubs. Most of the vine layer is composed of exotic species such as Oriental bittersweet ([Celastrus orbiculatus](#)), multiflora rose ([Rosa multiflora](#)) and Japanese barberry ([Berberis thunbergii](#)). One native can be found in the vine layer, white-leaf greenbrier ([Smilax glauca](#)). The rich herb layer of these forests are composed of jack-in-the-pulpit ([Arisaema triphyllum](#)), sensitive fern ([Onoclea sensibilis](#)), broad beech fern ([Phegopteris hexagonoptera](#)), Pennsylvania sedge ([Carex pennsylvanica](#)), hay-scented fern ([Dennstaedtia punctilobula](#)), bloodroot ([Sanguinaria canadensis](#)), mayapple ([Podophyllum peltatum](#)) and New York fern ([Thelypteris noveboracensis](#)).



Upper Hurricane Run  
New Castle County

**Diagnostic Features:** The dominance of tuliptree helps to identify this community. This community can be found in both the [Piedmont](#) and Coastal Plain.

**Geology and Environmental Features:** This community is often found in places where there are increased nutrients.

**Landscape Position:** Mid to upper slopes and flat areas in the Piedmont and Coastal Plain of Delaware

**Associated Soil Series:**

Series	Acreage	% of acreage
Neshaminy-Montalto silt loams	225.1	14.1
Glenelg loam	172.9	10.8
Hammonton sandy loam	112.4	7.0
Pineyneck loam	90.0	5.6
Brinklow-Blocktown complex	65.7	4.1
Other series	930.6	58.3

**Species documented from this community**

Animals

Non-Vascular Plants

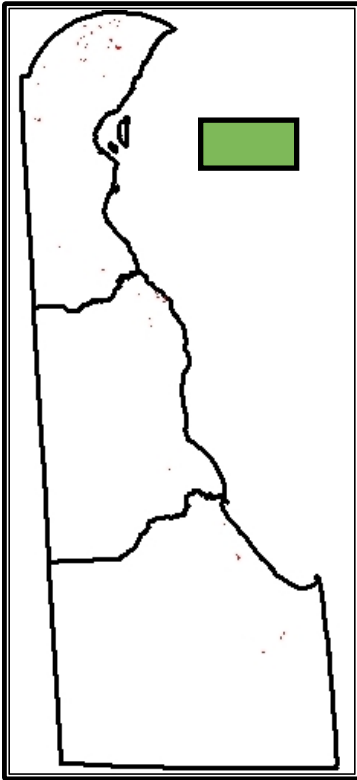
Vascular Plants

**Associated Rare Species:**

**Animals:** Mottled Duskywing (*Erynnis martialis*), Franck's Sphinx (*Sphinx franckii*), Longtail Salamander (*Eurycea longicauda*)

**Non-Vascular Plants:** unknown

**Vascular Plants:** Unknown



**Distribution:** This community is known from scattered locations around the Piedmont and Coastal Plain. Nationally, it is found from Virginia and West Virginia north into Pennsylvania.

**Estimated acres in Delaware = 1,652.65 (February 2012)**

**-Acres with 0.5m sea level rise = 1,596.7-85.3= 1,511.4**

**-Acres with 1m sea level rise = 1,596.7-327.3= 1,269.4**

**-Acres with 1.5m sea level rise = 1,596.7-445.8 = 1,150.9**

**Equivalent or related communities in nearby states:**

**Maryland:** unknown

**New Jersey:** not present

**Pennsylvania:** unknown

**Virginia:** Basic Mesic Forest (Fleming et al. 2001)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Tuliptree Rich Wood (Coastal Plain Variant) in part and Tuliptree Rich Wood (Piedmont Variant) in part

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantation

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**New Castle County**

-Brandywine Creek State Park

-Blackbird Reserve Wildlife Area

**Kent County**

-Milford Neck Wildlife Area

-Woodland Beach Wildlife Area

**Sussex County**

[-Back to Kent County Forests-](#)  
[-Back to New Castle County Forests-](#)  
[-Back to Sussex County Forests-](#)

## Successional Tuliptree-Loblolly Pine Upland Forest

GNA

SNA

### DNA

**NVC Alliance:** [A.236-Liriodendron tulipifera Forest Alliance](#)

**NVC Association:** CEGLO07521-Liriodendron tulipifera-Pinus taeda Forest

**Delaware Type Locality:** Forest at the Dickerson Tract in Milford Neck Wildlife Area just north of the Mispillion River.

**Description:** The only known occurrence of Successional Tuliptree-Loblolly Pine Upland Forest is found in a mesic flatwood just above the elevation of the Mispillion River in Milford Neck Wildlife Area. It is similar to the Successional Tuliptree Forest (**CEGL007220**) but is co-dominated by loblolly pine (*Pinus taeda*). Other associates in the canopy include red maple (*Acer rubrum*) and willow oak (*Quercus phellos*). The understory is composed of smaller members of the canopy plus white oak (*Quercus alba*), sweetgum (*Liquidambar styraciflua*), blackgum (*Nyssa sylvatica*), mockernut hickory (*Carya alba*), American holly (*Ilex opaca*), and wild black cherry (*Prunus serotina*). The shrub and vine layer is composed of poison ivy (*Toxicodendron radicans*), common greenbrier (*Smilax rotundifolia*), Japanese honeysuckle (*Lonicera japonica*), blackhaw viburnum (*Viburnum prunifolium*), multiflora rose (*Rosa multiflora*), and arrowwood (*Viburnum dentatum*). Common herbs in the rich herbaceous layer include partridge-berry (*Mitchella repens*), Virginia creeper (*Parthenocissus quinquefolia*), New York fern (*Thelypteris novaboracensis*), ebony spleenwort (*Asplenium platyneuron*), Japanese stiltgrass (*Microstegium vimineum*), enchanter's nightshade (*Circaea lutetiana*), swan's sedge (*Carex swanii*), and grape fern (*Botrychium virginianum*).



**Milford Neck Wildlife Area  
Kent County, Delaware**

**Diagnostic Features:** The co-dominance of tuliptree and loblolly pine identifies this community.

**Geology and Environmental Features:** This community is located on an area of slightly higher ground in a Red Maple-Sweetgum Swamp.

**Landscape Position:** Mesic woods in the Coastal Plain.

**Associated Soil Series:** Unicorn loam-100%

**Species documented from this community**

Animals

Non-Vascular Plants

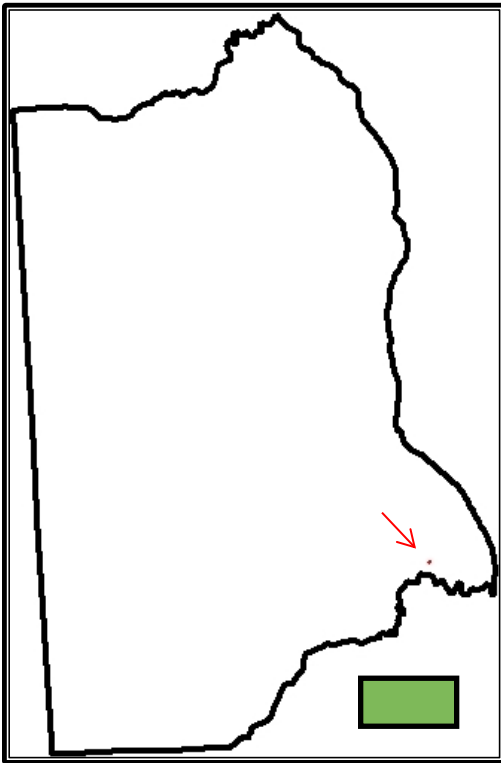
Vascular Plants

**Associated Rare Species:**

**Animals:** none known

**Non-Vascular Plants:** unknown

**Vascular Plants:** none known



**Distribution:** This community is currently known from one location. This community is found from Virginia and West Virginia north into Pennsylvania.

**Estimated acres in Delaware = 17.9 (February 2012)**

**-Acres with 0.5m sea level rise = 17.9-0= 17.9**

**-Acres with 1m sea level rise = 17.9-0.5= 17.4**

**-Acres with 1.5m sea level rise = 17.9-5.0 = 12.9**

**Equivalent or related communities in nearby states:**

**Maryland:** unknown

**New Jersey:** not present

**Pennsylvania:** unknown

**Virginia:** Basic Mesic Forest (Fleming et al. 2001)



**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Tuliptree Rich Wood (Coastal Plain Variant) in part and Tuliptree Rich Wood (Piedmont Variant) in part

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantation

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Kent County**

[-Milford Neck Wildlife Area](#)

[-Back to Kent County Forests-](#)

[-Back to New Castle County Forests-](#)

## Ash-Swamp Tupelo Freshwater Tidal Swamp      G3   S3   D

**NVC Alliance:** [A.356-Fraxinus pennsylvanica-Acer rubrum-Ulmus americana Tidal Forest Alliance](#)

**NVC Association:** [CEGL006287-Fraxinus \(profunda, pennsylvanica\)-\(Nyssa biflora\)/Polygonum arifolium Forest](#)

**Delaware Type Locality:** Nanticoke Wildlife Area across from Philips Landing in Sussex County (38°34'1.41"N, 075°40'12.30"W).

**Description:** Ash-Swamp Blackgum Freshwater Tidal Swamps can have an open to closed canopy and are found on the edges of tidal streams, such as the Nanticoke River and its tributaries. Pumpkin ash ([Fraxinus profunda](#)), green ash ([Fraxinus pennsylvanica](#)), swamp black gum ([Nyssa biflora](#)), red maple ([Acer rubrum](#)), and sweetgum ([Liquidambar styraciflua](#)) compose the canopy. The shrub layer is often well developed and thick. Common shrubs include sweet pepperbush ([Clethra alnifolia](#)), fetterbush ([Leucothoe racemosa](#)), winterberry ([Ilex verticillata](#)), seaside alder ([Alnus maritima](#)), possum-haw viburnum ([Viburnum nudum](#)) and highbush blueberry ([Vaccinium corymbosum](#)). The herb layer can be variable but common herbs include netted chain fern ([Woodwardia areolata](#)), Virginia chain fern ([Woodwardia virginica](#)), halbeard-leaf tearthumb ([Polygonum arifolium](#)), Canadian clearweed ([Pilea pumila](#)), blueflag iris ([Iris versicolor](#)), swamp beggar ticks ([Bidens discoidea](#)), Collins sedge ([Carex collinsii](#)) and stinging nettle ([Urtica dioica](#)).



**Swamp on the Nanticoke River  
Sussex County**

**Diagnostic Features:** The presence at the upper limits of tidal influence or somewhat beyond and a canopy of pumpkin ash, green ash and swamp black gum readily identifies this community.

**Geology and Environmental Features:** This community occurs on the edges of freshwater tidal rivers especially those in the [Chesapeake Bay](#) watershed. In the Delaware some of the best examples are on the [Nanticoke River](#), Deep Creek and Broad Creek. These communities receive diurnal tidal flooding and have hummock and hollow topography with the hollows flooded during high tide. This community tends to be stressed due to rising sea level and increasing salinity in some areas.

**Landscape Position:** Floodplains subject to diurnal flooding from freshwater.

**Associated Soil Series:**

Series	Acreage	% of acreage
Lenape-Nanticoke complex (very frequently flooded, tidal)	701.3	42.1
Lenape mucky peat (very frequently flooded, tidal)	273.1	16.4
Manahawkin muck (frequently flooded)	104.8	6.3
Puckum muck (frequently flooded)	104.5	6.3
Nanticoke and Mannington soils (very frequently flooded, tidal)	92.5	5.6
Other series	388.2	23.3

**Species documented from this community**

Animals

Non-Vascular Plants

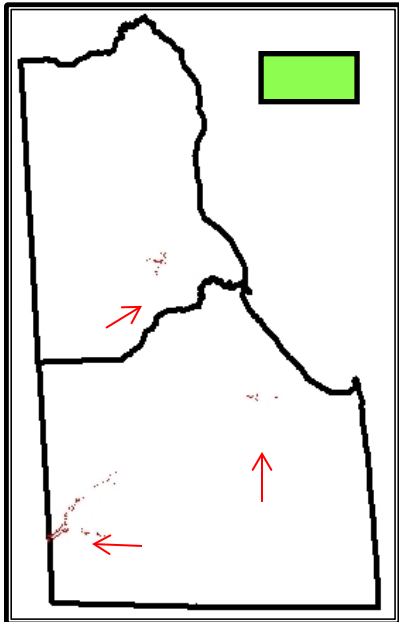
Vascular Plants

**Associated rare species:**

**Animals:** Brown Elfin (*Collophrys angustinus*), Pied-billed Grebe (*Podilymbus podiceps*)  
AAA

**Non-Vascular Plants:** unknown

**Vascular Plants:** Lang's Bitter-cress ([\*Cardamine longii\*](#))



**Distribution:** This community is known from the Nanticoke River, Broadkill River, and Murderkill River drainages in Delaware. Nationally, it is confined to the [Delmarva Peninsula](#).

**Estimated acres in Delaware = 1,270.4 (February 2012)**

**-Acres with 0.5 m sea level rise = 1,664.4-1,571.8 = 92.6**

**-Acres with 1 m sea level rise = 1,664.4-1,595.8 = 68.6**

**-Acres with 1.5 m sea level rise = 1,664.4-1,607.1 = 57.3**

**Equivalent or related communities in nearby states:**

**Maryland:** Ash-Blackgum Freshwater Tidal Swamp (Harrison 2004)

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** Mid-Atlantic Tidal Hardwood Swamp (Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Atlantic White Cedar-Red Maple-Pumpkin Ash Freshwater Tidal Swamp

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Tidal Swamp

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Sussex County**

[-Nanticoke Wildlife Area](#)

[-Back to Sussex County Forests-](#)

## Central Appalachian Basic Seepage Swamp

G3

S1

NVC Alliance: [A.347-Fraxinus nigra-Acer rubrum Saturated Forest Alliance](#)

NVC Association: [CEGL008416-Acer rubrum-Fraxinus americana-Fraxinus nigra-Liriodendron tulipifera/Carex bromoides-Caltha palustris Forest](#)

**Delaware Type Locality:** Blackbird State Forest on the Tybout Tract on the west side of Blackbird Creek in New Castle County ([39°20'36.10"N, 75°41'0.21"W](#)).

**Description:** Central Appalachian Basic Seepage Swamps are generally found at the headwaters of streams and bases of slopes where the groundwater reaches the surface.

Tuliptree ([Liriodendron tulipifera](#)), red maple ([Acer rubrum](#)) and American beech ([Fagus grandifolia](#)) are the common canopy species in this community. Black ash ([Fraxinus nigra](#)), spicebush ([Lindera benzoin](#)), serviceberry ([Amelanchier arborea](#)) and wild black cherry ([Prunus serotina](#)) are found in the understory. The shrub layer is composed of sweet pepperbush ([Clethra alnifolia](#)), winterberry ([Ilex verticillata](#)), arrow-wood ([Viburnum dentatum](#)) and smooth alder ([Alnus serrulata](#)). Common herbs include skunk cabbage ([Symplocarpus foetidus](#)), jack-in-the-pulpit ([Arisaema triphyllum](#)), fowl mannagrass ([Glyceria striata](#)), stalk-grain sedge ([Carex stipata](#)), orange-spotted jewelweed ([Impatiens capensis](#)) and sensitive fern ([Onoclea sensibilis](#)).



**Seepage along Blackbird Creek  
New Castle County**

**Diagnostic Features:** In Delaware this community can be determined by groups of black ash in a seepage area. Black ash is found in other places but not in the density seen around these seepages. Skunk cabbage is often found in association with these communities.

**Geology and Environmental Features:** These seepages are considered hydrologically to be “groundwater slope wetlands”, in which groundwater reaches the surface of the ground and flows away as a stream.

**Landscape Position:** seepages from lower slopes and floodplains

**Associated Soil Series:**

<b>Series</b>	<b>Acreage</b>	<b>% of acreage</b>
Downer sandy loam	11.9	38.1
Longmarsh and Indiantown soils (frequently flooded)	9.2	29.5
Zekiah sandy loam (frequently flooded)	1.6	5.1
Lenni silt loam	1.6	5.1
Keyport loam	1.3	4.2
Other series	5.6	17.9

**Species documented from this community**

Animals

Non-Vascular Plants

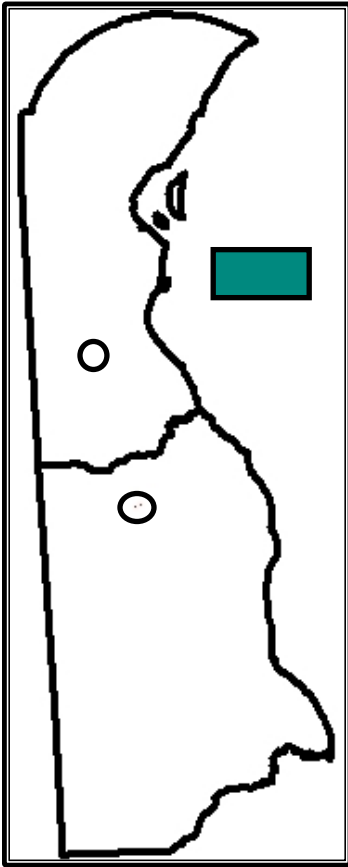
Vascular Plants

**Associated Rare Species:**

**Animals:** Sable Clubtail (*Gomphus rogersii*)

**Non-Vascular Plants:** unknown

**Vascular Plants:** Unknown



**Distribution:** This community is located in the [Piedmont](#) and northern [Coastal Plain](#) of Delaware in New Castle and Kent Counties. Nationally, this community is known from New Jersey south to Virginia and possibly as far west as West Virginia.

**Estimated acres in Delaware = 31.1 (February 2012)**

**-Acres with 0.5 m sea level rise = 31.2-7.1 = 24.1**

**-Acres with 1 m sea level rise = 31.2-7.8 = 23.4**

**-Acres with 1.5 m sea level rise = 31.2-7.9 = 23.3**

**Equivalent or related communities in nearby states:**

**Maryland:** Montane Black Ash Seepage Swamp (Harrison 2004)

**New Jersey:** Calcareous Seepage Swamp

**Pennsylvania:** not present

**Virginia:** Mountain/Piedmont Basic Seepage Swamp

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Black Ash Seepage Swamp

**Northeast Wildlife Habitat Classification:** North Central Interior and Appalachian Rich Swamp

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**New Castle County**

-Blackbird State Forest

**-Back to Kent County Forests-**  
**-Back to New Castle County Forests-**



## Central Coastal Plain Basin Swamp

G1G2

S1

D1?

NVC Alliance: [A.321-Liquidambar styraciflua-Acer rubrum Seasonally Flooded Forest Alliance](#)

NVC Association: CEGLO06223-Liquidambar styraciflua-Acer rubrum-Nyssa biflora/Carex jorii Forest

**Delaware Type Locality:** Milford Neck Wildlife Area in Kent County ([38°58'52.58"N, 075°20'51.21"W](#)).

**Description:** This swamp community occurs in basins that are flooded by groundwater. Currently there are only two known occurrences of this community in Delaware.

Dominant canopy species include sweetgum ([Liquidambar styraciflua](#)), red maple ([Acer rubrum](#)) and swamp blackgum ([Nyssa biflora](#)) and can be associated by persimmon ([Diospyros virginiana](#)). Associated shrubs may include ([Leucothoe racemosa](#)) and buttonbush ([Cephalanthus occidentalis](#)). Common herbs include cypress swamp sedge ([Carex jorii](#)), Walter's sedge ([Carex striata](#)), warty panicgrass ([Panicum verrucosum](#)) and slender fimbry ([Fimbristylis autumnalis](#)).



**Diagnostic Features:** This community is the only one in Delaware that has cypress swamp sedge and serves to identify it.

### Little Assawoman Bay Watershed

#### **Geology and Environmental Features:**

**Landscape Position:** saturated depressions

**Associated Soil Series:**

Series	Acreage	% of acreage
Mannahawkin muck	11.6	79.5
Corsica mucky loam	2.3	15.8
Pepperbox loamy sand	0.5	3.4
Other series	0.1	<0.1

### Species documented from this community

Animals

Non-Vascular Plants

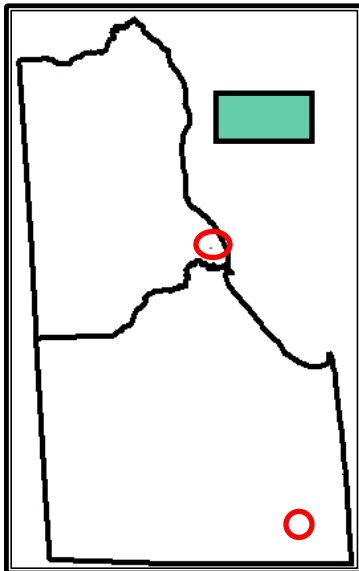
Vascular Plants

### Associated Rare Species:

**Animals:** none known

**Non-Vascular Plants:** unknown

**Vascular Plants:** Cypress-swamp Sedge, Button-snakeroot (*Eryngium aquaticum*)



**Distribution:** This community is known from two locations in Delaware. One is located on Milford Neck in the [Mispillion River](#) watershed and the other near Dirickson Creek in Little Assawoman Bay watershed. Nationally this community is known from Maryland and Virginia.

**Estimated acres in Delaware = 14.6 (February 2012)**

**-Acres with 0.5 m sea level rise = 14.6-0 = 14.6**

**-Acres with 1 m sea level rise = 14.6-7.8 = 6.8**

**-Acres with 1.5 m sea level rise = 14.6-14.0 = 0.6**

### Equivalent or related communities in nearby states:

**Maryland:** Central Coastal Plain Basin Swamp

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** Coastal Plain Seasonal Pond (Swamp Tupelo Type) in part (Fleming, G.P., et al 2006)

Coastal Plain Depression Swamp (Swamp Tupelo-Sweetgum Type) in part (Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Pond and Wet Hardwood Forest

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Kent County**

-Milford Neck Wildlife Area

**[-Back to Kent County Forests-](#)**

## Chesapeake Bay Cypress-Gum Swamp

GNR

S2

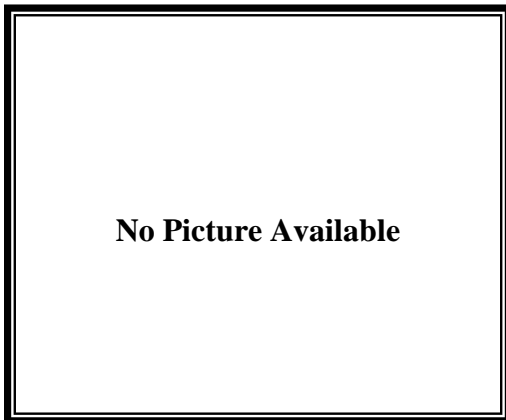
**NVC Alliance:** [A.337-Taxodium distichum-Nyssa \(aquatica, biflora, ogeche\) Seasonally Flooded Forest Alliance](#)

**NVC Association:** [CEGL006214-Taxodium distichum-Nyssa biflora Chesapeake Bay Forest](#)

**Delaware Type Locality:** TBD

**Description:** This swamp community is found in the channels of blackwater rivers and at the upper limits of millponds in the Chesapeake Bay region. The nominal species of this community, bald cypress (*Taxodium distichum*) reaches the northern limit of its range in Delaware.

Canopy of this community is dominated by bald cypress ([Taxodium distichum](#)) and swamp black gum ([Nyssa biflora](#)) that is associated by green ash ([Fraxinus pennsylvanica](#)) and/or pumpkin ash ([Fraxinus profunda](#)). A sparse shrub layer of sweet pepperbush ([Clethra alnifolia](#)), arrow-wood ([Viburnum dentatum](#)), Virginia willow ([Itea virginica](#)) and swamp azalea ([Rhododendron viscosum](#)) is commonly present. Herbs typically include lizard tail ([Saururus cernuus](#)), Cinnamon fern ([Osmunda cinnamomea](#)), netted chain fern ([Woodwardia areolata](#)), orange-spotted jewelweed ([Impatiens capensis](#)), follicle sedge ([Carex folliculata](#)), nodding sedge ([Carex crinita](#)) and bladder sedge ([Carex intumescens](#)).



**Diagnostic Features:** The co-dominance of bald cypress and swamp black gum in association with green ash and pumpkin ash distinguishes this community from any other in Delaware. Bald cypress is not common in Delaware and is restricted to only a few places in the state.

**Geology and Environmental Features:** This community occurs in channels of blackwater rivers in the [Chesapeake Bay](#) watershed and may or may not be tidally influenced but may be occasionally affected by storm surge. Soils are usually organic with acidic water.

**Landscape Position:** backwaters of rivers

**Associated Soil Series:**

Series	Acreage	% of acreage
Longmarsh and Indiantown soils (frequently flooded)	11.2	35.8
Puckum muck (frequently flooded)	8.0	25.6
Water	5.4	17.3
Mullica-Berryland complex	3.7	11.8
Hurlock loamy sand	2.4	7.7
Other series	0.6	1.9

**NWI Classification:**

**Species documented from this community**

Animals

Non-Vascular Plants

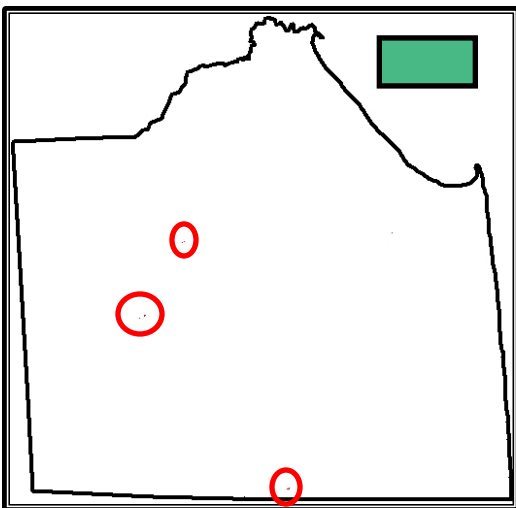
Vascular Plants

**Associated Rare Species:**

**Animals:** none known

**Non-Vascular Plants:** unknown

**Vascular Plants:** none known



**Distribution:** The largest examples of this community can be found in the [Great Cypress Swamp](#) at the headwaters of the [Pocomoke River](#). It can also be found in the headwaters of Broad Creek in the [Nanticoke River](#) watershed. Other examples may be in the Inland Bays region. Nationally this community is found from Delaware to Virginia primarily on the [Delmarva Peninsula](#).

**Estimated acres in Delaware = 31.3 acres (February 2012)**

\*This community is not affected by sea level rise.

**Equivalent or related communities in nearby states:**

**Maryland:** Chesapeake Bay Cypress-Gum Swamp (Harrison 2004)

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** Bald Cypress-Tupelo Swamp

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Baldcypress-Red Maple-Swamp Black Gum Swamp

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Pond

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Sussex County**

-Concord Pond Access Area

-Trap Pond State Park

**[-Back to Sussex County Forests-](#)**

## Chesapeake Bay River Bluff Chestnut Oak Forest GNR S2

**NVC Alliance:** A.249-*Quercus prinus*-*Quercus*(*alba*, *falcata*, *rubra*, *velutina*) Forest Alliance

**NVC Association:** CEG006490-*Quercus prinus*/*Deschampsia flexuosa*-*Solidago bicolor* Forest

**Delaware Type Locality:** Bluffs over the Appoquinimink River just downstream of the dam of Noxontown Lake in New Castle County ([39°26'10.57"N, 75°40'50.04"W](#)).

**Description:** This bluff community is found in the Appoquinimink River watershed on north-facing slopes. It is similar to the Northeastern Coastal Plain/Piedmont Oak-Beech/Heath Forest ([CEGL006919](#)) in the Piedmont, but it differs in that wavy hairgrass (*Deschampsia flexuosa*) is in the herbaceous layer.

Common canopy species include chestnut oak (*Quercus prinus*), American beech (*Fagus grandifolia*) which are associated by lesser amounts of black gum (*Nyssa sylvatica*), white oak (*Quercus alba*) and northern red oak (*Quercus rubra*). The understory is primarily smaller members of the canopy plus serviceberry (*Amelanchier arborea*), wild black cherry (*Prunus serotina*) and witch hazel (*Hamamelis virginiana*). The shrub layer includes lowbush blueberry (*Vaccinium pallidum*), deerberry (*V. stamineum*), maple-leaf viburnum (*Viburnum acerifolium*), white-leaf greenbrier (*Smilax glauca*) and on north-facing slopes mountain laurel (*Kalmia latifolia*). The herbaceous layer is composed of wavy hairgrass, beech-drops (*Epifagus virginiana*), oval-leaved sedge (*Carex cephalophora*), ribbed sedge (*Carex virescens*), slender wood sedge (*Carex digitalis*), rattlesnake weed (*Hieracium venosum*) and common wood rush (*Luzula multiflora*).



**Bluff over  
Appoquinimink River  
New Castle County**

**Diagnostic Features:** This is the only forest in the Coastal Plain that has a canopy of chestnut oak and American beech with a herbaceous layer of wavy hairgrass.

### Geology and Environmental Features:

**Landscape Position:** Mid to upper slopes in the Coastal Plain

**Associated Soil Series:**

Series	Acreage	% of acreage
Sassafras sandy loam	17.4	39.9
Reybold silt loam	9.3	21.3
Keyport sandy loam	8.4	19.2
Keyport silt loam	2.0	4.6
Zekiah sandy loam	1.0	2.3
Other series	5.5	12.6

**Species documented from this community**

Animals

Non-Vascular Plants

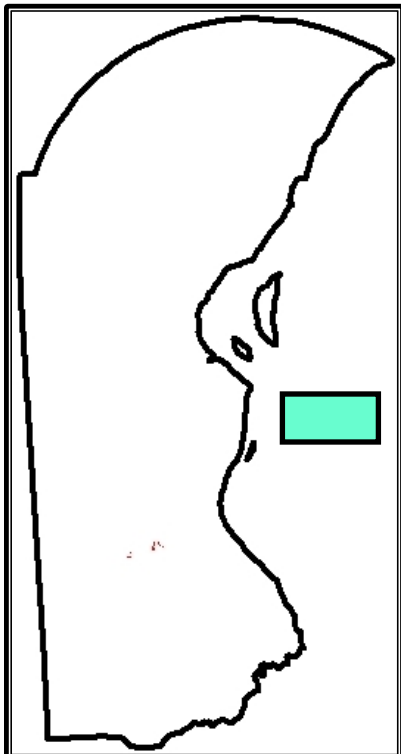
Vascular Plants

**Associated Rare Species:**

**Animals:** Rough Green Snake ([Opheodrys aestivus](#))

**Non-Vascular Plants:** unknown

**Vascular Plants:** Ribbed Sedge ([Carex virescens](#)), Flax-leaf Aster ([Ionactis linariifolius](#))



**Distribution:** This community is found on bluffs overlooking the [Appoquinimink River](#) and Drawyers Creek. Nationally this community is known from Maryland, Virginia and the District of Columbia.

**Estimated Acres in Delaware = 66.0 (February 2012)**

**-Acres with 0.5 m sea level rise = 43.6-7.6 = 36.0**

**-Acres with 1 m sea level rise = 43.6-10.1 = 33.5**

**-Acres with 1.5 m sea level rise = 43.6-13.1 = 30.5**



**Equivalent or related communities in nearby states:**

**Maryland:** unknown

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** unknown

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Chestnut Oak-Harigrass Forest

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Hardwood Forest

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

There no currently known public places in Delaware to view this community.

**[-Back to New Castle County Forests-](#)**

## Chesapeake/Piedmont Red Maple/Lizard's Tail Swamp GNR D?

S3

NVC Alliance: [A.3035-Acer rubrum-Fraxinus pennsylvanica Saturated Forest Alliance](#)

NVC Association: CEGLO06606-Acer rubrum-Fraxinus pennsylvanica/Saururus cernuus Forest

**Delaware Type Locality:** Floodplain of Cow Bridge Branch of the Indian River in the Doe Bridge Nature Preserve in Sussex County ([38°37'20.40"N, 75°18'32.01"W](#)).

**Description:** This swamp community is found within floodplains on Coastal Plain streams. The herbaceous layer is covered by a dense layer of lizard's tail (*Saururus cernuus*) in this community and is a definitive feature of it (see picture below).

Common canopy species include green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*), swamp blackgum (*Nyssa biflora*), white oak (*Quercus alba*), loblolly pine (*Pinus taeda*) and a few pond pine (*Pinus serotina*) sprinkled in. The understory includes sweetgum (*Liquidambar styraciflua*), green ash, American holly (*Ilex opaca*) and blackgum (*Nyssa sylvatica*). The shrub layer is thick in places with sweet pepperbush (*Clethra alnifolia*), arrow-wood (*Viburnum dentatum*), winterberry (*Ilex verticillata*) and swamp azalea (*Rhododendron viscosum*). Few vines are present and are composed mainly of white-leaf greenbrier (*Smilax glauca*). The herbaceous layer is dense with lizard's tail with netted chain fern (*Woodwardia areolata*), Canadian clearweed (*Pilea pumila*), spinulose wood fern (*Dryopteris carthusiana*), orange jewelweed (*Impatiens capensis*), hop sedge (*Carex lupulina*), A sedge (*C. lonchocarpa*), shallow sedge (*C. lurida*) and tussock sedge (*C. stricta*) being common herbs.



Floodplain of  
Cow Bridge Branch  
Sussex County

**Diagnostic Features:** The co-dominance of both red maple (*Acer rubrum*) and green ash (*Fraxinus pennsylvanica*) with a dense layer of lizard's tail generally identifies this community.

### **Geology and Environmental Features:**

**Landscape Position:** Coastal Plain streams with wide floodplains

**Associated Soil Series:**

Series	Acreage	% of acreage
Longmarsh and Indiantown soils (frequently flooded)	610.1	55.4
Puckum muck (frequently flooded)	123.7	11.2
Evesboro loamy sand	59.4	5.4
Hurlock sandy loam	47.0	4.3
Fallsington sandy loam	41.1	3.7
Other series	219.6	19.9

**Species documented from this community**

Animals

Non-Vascular Plants

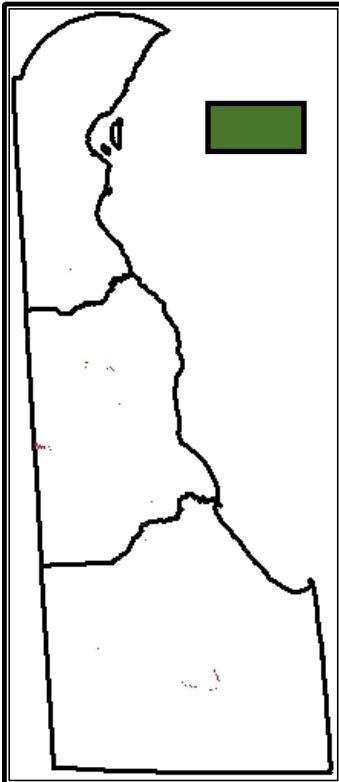
Vascular Plants

**Associated Rare Species:**

**Animals:** Unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Unknown



**Distribution:** Examples of this community are known from Kent County and south in the Coastal Plain of Delaware. Nationally this community is found from New Jersey south to Virginia.

**Estimated acres in Delaware = 1,234.3 acres (February 2012)**

**-Acres with 0.5 m sea level rise = 1,100.9-15.9 = 1,085.0**

**-Acres with 1 m sea level rise = 1,100.9-18.3 = 1,082.6**

**-Acres with 1.5 m sea level rise = 1,100.9-21.3 = 1,079.6**

**Equivalent or related communities in nearby states:**

**Maryland:** Chesapeake/Piedmont Red Maple/Lizard's Tail Swamp

**New Jersey:** unknown

**Pennsylvania:** not present

**Virginia:** Coastal Plain/Piedmont Floodplain Swamp (Green Ash-Red Maple Type)  
(Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Red Maple-Green Ash Floodplain Forest

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Stream and River

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Kent County**

-Blackiston Wildlife Area

[-Back to Kent County Forests-](#)  
[-Back to New Castle County Forests-](#)  
[-Back to Sussex County Forests-](#)

**Coastal Loblolly Pine Wetland Forest                    G3                    S3                    D?**

**NVC Alliance:** [A.3009-Pinus taeda Saturated Forest Alliance](#)

**NVC Association:** [CEGL006137-Pinus taeda/Morella cerifera/Osmunda regalis var. spectabilis Forest](#)

**Delaware Type Locality:** Milford Neck area to the west of Big Stone Beach in Kent County ([38°59'47.58"N, 75°20'42.99"W](#)).

**Description:** This wetland forest is characterized by a closed to partially open canopy of loblolly pine ([Pinus taeda](#)) occurring in backdune depressions with high water tables and fringing estuaries. Sometimes this community forms “islands” within high salt marshes. These communities may be maintained by fire.

Loblolly pine overwhelmingly dominates the canopy. Other associates may include red maple ([Acer rubrum](#)) and/or sweetgum ([Liquidambar styraciflua](#)). The understory is typically dominated by vines such as common greenbrier ([Smilax rotundifolia](#)) and associated by poison ivy ([Toxicodendron radicans](#)) and Virginia creeper ([Parthenocissus quinquefolia](#)). Southern bayberry ([Morella cerifera](#)) is often found in the shrub layer. The sparse herbaceous layer is composed of netted chain fern ([Woodwardia areolata](#)), royal fern ([Osmunda regalis](#) var. [spectabilis](#)), cinnamon fern ([O. cinnamomea](#)) and Pennsylvania smartweed ([Polygonum pennsylvanicum](#)).



**Milford Neck west of  
Big Stone Beach  
Kent County**

**Diagnostic Features:** This community is similar to the Loblolly Pine Plantation ([CEGL007179](#)) and the Mid-Atlantic Coastal Plain Loblolly Pine Forest ([CEGL006040](#)). It differs from both in having a wet hydrology and having a mixture of red maple and sweetgum but lacking oak ([Quercus](#) spp.).

**Geology and Environmental Features:** This community is often found on muck that is above organic sand. The depth of the water table below the sand determines whether moisture content of the soil. Where it is 0.5 meters or more above the water table the ground will be composed of un-decomposed duff. If the water intersects the ground muck will form.

**Landscape Position:** This community is found in places with more water availability than that found in the Mid-Atlantic Coastal Loblolly Pine Forest ([CEGL006040](#)).

**Associated Soil Series:**

Series	Acreage	% of acreage
Klej loamy sand	371.6	11.3
Hurlock loamy sand	348.8	10.7
Carmichael loam	275.9	8.4
Askecksy loamy sand	255.1	7.8
Corsica mucky loam	232.0	7.1
Other series	1,790.9	54.7

**Species documented from this community**

Animals

Non-Vascular Plants

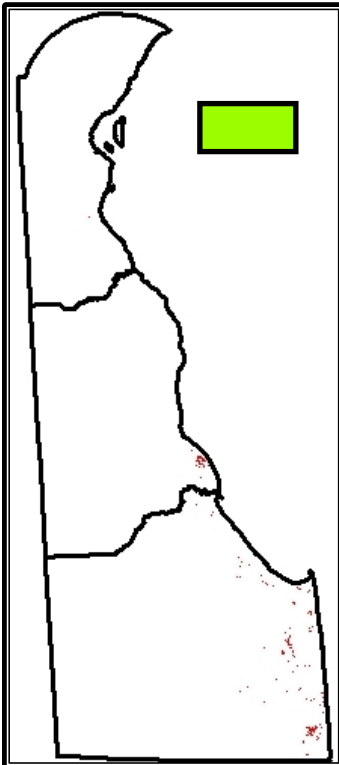
Vascular Plants

**Associated Rare Species:**

**Animals:** Unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Unknown



**Distribution:** This community is found in scattered locations around the Coastal Plain of Delaware. Generally it is found in places that are low in elevation and poorly drained. Nationally, it occurs on the Atlantic Coast from New Jersey south to North Carolina.

**Estimated Acres in Delaware = 3,401.5 acres (February 2012)**

**-Acres with 0.5 m sea level rise = 3,274.3-1,405.0 = 1,868.4**

**-Acres with 1 m sea level rise = 3,274.3-2,139.1 = 1,135.2**

**-Acres with 1.5 m sea level rise = 3,274.3-2,605.1 = 669.2**

**Equivalent or related communities in nearby states:**

**Maryland:** North Atlantic Coastal Loblolly Pine Wetland Forest (Harrison 2004)

**New Jersey:** *Pinus taeda* / *Morella cerifera* / *Osmunda regalis* var. *spectabilis* Forest (Breden et al 2001)

**Pennsylvania:** not present

**Virginia:** Mid-Atlantic Wet Loblolly Pine Forest (Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Coastal Loblolly Pine Wetland Forest

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Maritime Forest

**Landfire Classification Code:** Unknown

**Public places in Delaware to view this community**

**New Castle County**

-Augustine Wildlife Area (northernmost locality)

**Kent County**

-[Bombay Hook National Wildlife Refuge](#)

-Woodland Beach Wildlife Area

**Sussex County**

-Assawoman Wildlife Area

-Prime Hook Wildlife Area

[-Back to Kent County Forests-](#)  
[-Back to New Castle County Forests-](#)  
[-Back to Sussex County Forests-](#)

## Coastal Oak/Laurel Forest

GNR

S1.1

D?

NVC Alliance: [A.248-Quercus prinus-\(Quercus coccinea, Q. velutina\) Forest Alliance](#)

NVC Association: [CEGL006374-Quercus velutina-Quercus coccinea-Quercus prinus/Kalmia latifolia Forest](#)

**Delaware Type Locality:** Nanticoke Wildlife Area near Woodland Ferry in Sussex County ([38°36'31.27"N, 75°38'34.14"W](#)).

**Description:** This dry community is found on low elevation bluffs in the Nanticoke River watershed in Delaware. A dense layer of mountain laurel is common in this community.

Canopy species include scarlet oak ([Quercus coccinea](#)), chestnut oak ([Quercus prinus](#)), black oak ([Quercus velutina](#)) and white oak ([Quercus alba](#)). Virginia pine ([Pinus virginiana](#)) and loblolly pine ([P. taeda](#)) may join the canopy in some cases. Mountain laurel ([Kalmia latifolia](#)) is often the dominant shrub and can form dense patches associated by early lowbush blueberry ([Vaccinium pallidum](#)) and squaw huckleberry ([V. stamineum](#)). The usually sparse herbaceous layer is composed of bracken fern ([Pteridium aquilinum](#)), teaberry ([Gaultheria procumbens](#)), Pennsylvania sedge ([Carex pensylvanica](#)) and bellow-beaked sedge ([Carex albicans](#)).



Nanticoke Wildlife Area  
Sussex County

**Diagnostic Features:** This forest is on the dry end of the scale for [Coastal Plain](#) forests. The presence of chestnut oak and scarlet oak in a stand points to this community type.

**Geology and Environmental Features:** This community occurs on convex slopes that composed of sandy and gravelly soils, often containing more clay than other sites.

**Landscape Position:** Bluffs overlooking the [Nanticoke River](#) in Sussex County.

**Associated Soil Series:** Evesboro loamy sand—100%

### **Species documented from this community**

Animals

Non-Vascular Plants

Vascular Plants

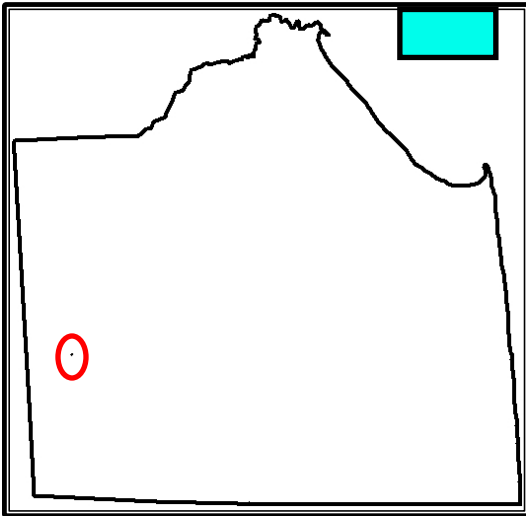


**Associated Rare Species:**

**Animals:** none known

**Non-Vascular Plants:** unknown

**Vascular Plants:** none known



**Distribution:** This community is present on slopes above the [Nanticoke River](#) in Sussex County and may be present above the [Christina River](#) in New Castle County. Nationally this community ranges from New Hampshire south to Virginia.

**Estimated acres in Delaware = 2.7 (February 2012)**

**-Acres with 0.5 m sea level rise = 2.7-0.5 = 2.2**

**-Acres with 1 m sea level rise = 2.7-0.8 = 1.9**

**-Acres with 1.5 m sea level rise = 2.7-0.9 = 1.8**

**Equivalent or related communities in nearby states:**

**Maryland:** *Quercus velutina-Quercus coccinea-Quercus prinus/Kalmia latifolia* Forest

**New Jersey:** Coastal Oak/Laurel Forest (Breden et al 2001)

**Pennsylvania:** not present

**Virginia:** unknown

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Dry Oak-Heath Forest

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Hardwood Forest

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Sussex County**

-Nanticoke Wildlife Area

[-Back to Sussex County Forests-](#)

## Coastal Plain Atlantic White Cedar-Red Maple Swamp GNR S3 D?

NVC Alliance: [A.448-Chamaecyparis thyoides-Acer rubrum Saturated Forest Alliance](#)

NVC Association: [CEGL006078-Chamaecyparis thyoides-Acer rubrum-Magnolia virginiana Forest](#)

**Delaware Type Locality:** In a pocket of the floodplain of Cow Bridge Branch in the Doe Bridge Nature Preserve in Sussex County (**38°36'58.37"N, 75°18'24.42"W**).

**Description:** This swamp community is located in both the Delaware and Chesapeake Bay watersheds and is often located at the margins of freshwater tidal swamps, at the heads of millponds and in upper tributaries. It is often found on Johnson Silt Loam with a layer of peat over it.

Both Atlantic white cedar (*Chamaecyparis thyoides*) and red maple (*Acer rubrum*) are co-dominants in this forest with associates of green ash (*Fraxinus pennsylvanica*), black gum (*Nyssa sylvatica*), persimmon (*Diospyros virginiana*) and loblolly pine (*Pinus taeda*). The subcanopy, shrub and herbaceous layers in this community may be quite diverse. Subcanopy associates can include American holly (*Ilex opaca*), seaside alder (*Alnus maritima*) and sweetbay (*Magnolia virginiana*). Common shrubs are sweet pepperbush (*Clethra alnifolia*), inkberry (*Ilex glabra*), highbush blueberry (*Vaccinium corymbosum*), possum-haw viburnum (*Viburnum nudum*), swamp azalea (*Rhododendron viscosum*) and fetterbush (*Leucothoe racemosa*). Jack-in-the-pulpit (*Arisaema triphyllum*), Collins sedge (*Carex collinsii*), false nettle (*Boehmeria cylindrica*), partridge berry (*Mitchella repens*), cinnamon fern (*Osmunda cinnamomea*), royal fern (*Osmunda regalis*), arrow-arum (*Peltandra virginica*), netted chainfern (*Woodwardia areolata*), tall meadow rue (*Thalictrum pubescens*), orange-spotted jewelweed (*Impatiens capensis*) and others make up the herbaceous layer.



**Diagnostic Features:** The dominance of Atlantic white cedar and association with red maple is diagnostic of this community.

### Doe Bridge Natural Area Sussex County

**Geology and Environmental Features:** This community usually forms where streams flow slowly through an unconsolidated sand/gravel substrate. Soils generally consist of poorly drained organic muck. In basins, peat can accumulate. Historical disturbances such as fire, wind throw, ice damage, cutting and flooding have probably had a considerable influence on the structure and composition of existing stands.

**Landscape Position:** Low elevation areas that are inundated or have a high water table.

**Associated Soil Series:**

Series	Acreage	% of acreage
Mullica-Berryland complex	869.2	30.7
Manahawkin muck (frequently flooded)	755.4	26.7
Longmarsh and Indiantown soils (frequently flooded)	316.9	11.2
Askecksy loamy sand	263.4	9.3
Puckum muck (frequently flooded)	195.9	6.9
Other series	431.4	15.2

**Species documented from this community**

Animals

Non-Vascular Plants

Vascular Plants

**Associated Rare Species:**

**Animals:** Unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Unknown



**Distribution:** Prominent examples of this community can be found on the [Nanticoke River](#), [Mispillion River](#), Cedar Creek, Tantrough Branch and other places in the state. Nationally this community is confined to the [Delmarva Peninsula](#) and adjacent New Jersey.

**Estimated acres in Delaware = 4,609.1 (February 2012)**

**-Acres with 0.5 m sea level rise = 2,832.2-135.6 = 2,696.6**

**-Acres with 1 m sea level rise = 2,832.2-176.8 = 2,655.4**

**-Acres with 1.5 m sea level rise = 2,832.2-232.7 = 2,599.5**

**Equivalent or related communities from nearby states:**

**Maryland:** Coastal Plain Atlantic White-cedar-Red Maple Swamp (Harrison 2004)

**New Jersey:** *Chamaecyparis thyoides* - *Acer rubrum* - *Magnolia virginiana* Forest (Breden et al 2001)

South Jersey Cedar swamp (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Delmarva Atlantic White Cedar Swamp

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Peat Swamp;  
Northern Atlantic Coastal Plain Stream and River

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Sussex County**

-Nanticoke Wildlife Area

**[-Back to Sussex County Forests-](#)**

## Coastal Plain Oak Floodplain Swamp

GNR

S3? D?

NVC Alliance: [A.327-Quercus \(phellos, laurifolia\) Seasonally Flooded Forest Alliance](#)

NVC Association: CEGLO06605-*Quercus (phellos, palustris, michauxii)*-*Liquidambar styraciflua*/*Cinna arundinacea* Forest

**Delaware Type Locality:** Confluence of Sandom Branch and Blackbird Creek, north of Eagles Nest Landing Road and east of DE 1 ([39°22'29.68"N, 075°39'11.38"W](#))

**Description:** This swamp community is possibly in Delaware but there are currently no known locations. Likely places for it to be found include topographic depressions in the floodplains of larger streams and small rivers.

Canopy dominants include willow oak ([Quercus phellos](#)), pin oak ([Quercus palustris](#)), swamp chestnut oak ([Quercus michauxii](#)), sweetgum ([Liquidambar styraciflua](#)) and red maple ([Acer rubrum](#)). The understory contains smaller members of the canopy plus American hornbeam ([Carpinus caroliniana](#)), American holly ([Ilex opaca](#)), arrow-wood ([Viburnum dentatum](#)) and winterberry ([Ilex verticillata](#)). Common herbs include stout wood reedgrass ([Cinna arundinacea](#)), white-edge sedge ([Carex debilis](#)), bladder sedge ([Carex intumescens](#)), fowl manna grass ([Glyceria striata](#)) and blunt broom sedge ([Carex tribuloides](#)).



**Diagnostic Features:** This community is similar to the Mesic Coastal Plain Oak Forest ([CEGL006390](#)) and the wet variant of the Mid-Atlantic Mesic Mixed Hardwood Forest ([CEGL006075](#)) but differs from both in that the Coastal Plain Oak Floodplain Swamp contains a prominent herbaceous layer of stout wood reedgrass.

### Blackbird Creek Floodplain New Castle County

#### Geology and Environmental Features:

**Landscape Position:** Topographic depressions

#### **Associated Soil Series:**

Series	Acreage	% of acreage
Longmarsh and Indiantown soils (frequently flooded)	13.0	71.8
Lenape mucky peat (very frequently flooded, tidal)	2.9	16.0
Sassafras sandy loam	1.8	9.9
Downer sandy loam	0.3	1.7
Other series	0	0

**Species documented from this community**

Animals

Non-Vascular Plants

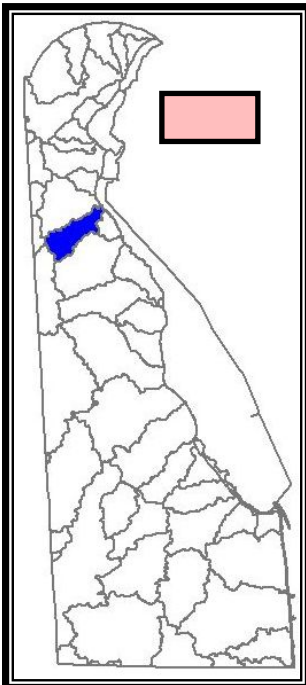
Vascular Plants

**Associated Rare Species:**

**Animals:** none known

**Non-Vascular Plants:** unknown

**Vascular Plants:** none known



**Distribution:** This community is known from the floodplain of Blackbird Creek in Delaware. Nationally it can be found from Virginia to New Jersey.

**Estimated acres in Delaware = 36.8 (February 2012)**

**-Acres with 0.5 m sea level rise = 18.1-17.7 = 0.4**

**-Acres with 1 m sea level rise = 18.1-18.0 = 0.1**

**-Acres with 1.5 m sea level rise = 18.1-18.0 = 0.1**

**Equivalent or related communities in nearby states:**

**Maryland:** Coastal Plain Oak Floodplain Swamp

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** Coastal Plain/Piedmont Floodplain Swamp (Mixed Oak-Red Maple Type) in part (Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Willow Oak-Basket Oak Swamp

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Stream and River

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

There are no currently known public locations for this community.

[-Back to Kent County Forests-](#)  
[-Back to New Castle County Forests-](#)



## Coastal Plain Streamside Forest      G3G4      S

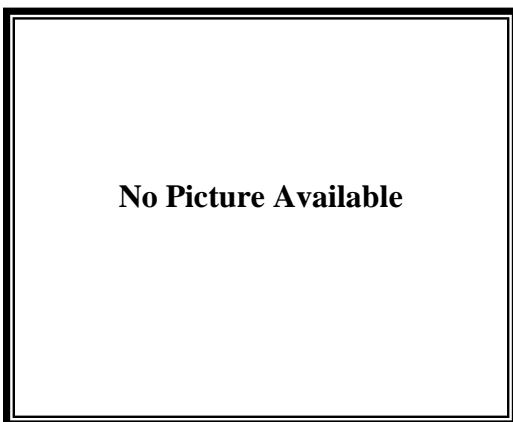
**NVC Alliance:** [A.289-Platanus occidentalis-\(Liquidambar styraciflua, Liriodendron tulipifera\)](#) Temporarily Flooded Forest Alliance

**NVC Association:** [CEGL006603-Platanus occidentalis-\(Liquidambar styraciflua, Liriodendron tulipifera\)/Asimina triloba](#) Forest

**Delaware Type Locality:** There are no known locations in Delaware for this community.

**Description:** This floodplain community occurs along braided and intermittent streams on active and former stream channels that receive annual flooding.

Canopy species include sycamore (*Platanus occidentalis*), sweetgum (*Liquidambar styraciflua*), river birch (*Betula nigra*), tuliptree (*Liriodendron tulipifera*) and red maple (*Acer rubrum*). Associates which may or may not be present include swamp chestnut oak (*Quercus michauxii*), American elm (*Ulmus americana*) and willow oak (*Quercus phellos*). Spicebush (*Lindera benzoin*), pawpaw (*Asimina triloba*), American hornbeam (*Carpinus caroliniana*) and American holly (*Ilex opaca*) are often in the understory. Vines include poison ivy (*Toxicodendron radicans*), Virginia creeper (*Parthenocissus quinquefolia*) and common greenbrier (*Smilax rotundifolia*). The most common herbs are typically jack-in-the-pulpit (*Arisaema triphyllum*) and false nettle (*Boehmeria cylindrica*) with Canadian clearweed (*Pilea pumila*), spring beauty (*Claytonia virginica*), kidney leaf buttercup (*Ranunculus abortivus*) and cutleaf toothwort (*Cardamine concatenata*) less encountered.



**Diagnostic Features:** Sycamore perhaps reaches its highest dominance in Delaware in this community. The dominance of this species in a stand points to this community.

**Geology and Environmental Features:** Substrate for this community generally contains some amount of clay either as an alluvial clay loam or sandy clay loam.

**Landscape Position:** Expected in floodplains

**Associated Soil Series:** No current locations in Delaware

### **Species documented from this community**

Animals

Non-Vascular Plants

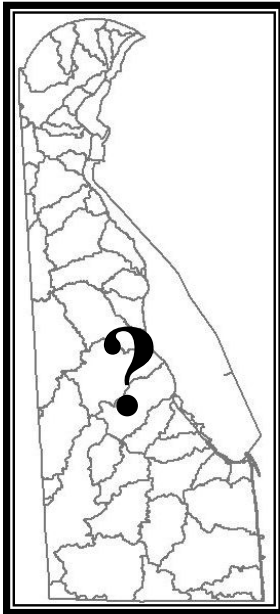
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** There are no known locations for this community in Delaware but it is thought to be in Sussex County. Nationally it is found from Pennsylvania south to Virginia.

**Estimated Acres in Delaware = 0+ (February 2012)**

**Equivalent or related communities in nearby states:**

**Maryland:** Coastal Plain Streamside Forest (Harrison 2004)

**New Jersey:** Piedmont Swamp and Floodplain (Collins and Anderson 1994)

**Pennsylvania:** unknown

**Virginia:** Coastal Plain/Piedmont Small-Stream Floodplain Forest (Mixed Herbs Type) in part (Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Stream and River

**Landfire Classification Code:** unknown

[-Back to Sussex County Forests-](#)

## Early to Mid-Successional Loblolly Pine Forest      GNA    SNA    DNA

**NVC Alliance:** A.130-*Pinus taeda* Forest Alliance

**NVC Association:** CEGLO06011: *Pinus taeda/Liquidambar styraciflua-Acer rubrum* var. *rubrum/Vaccinium stamineum* Forest

**Delaware Type Locality:** TBD

**Description:** This successional community is similar to the Mid to Late-Successional Loblolly Pine-Sweetgum Forest ([CEGL008462](#)) but it does not have sweetgum ([Liquidambar styraciflua](#)) present in the canopy. Sweetgum (*Liquidambar styraciflua*) is present although in the understory and shrub layer and with time these stands may become Mid to Late Successional Loblolly Pine-Sweetgum Forests. Other subcanopy and shrub species are similar to the above community as well.

In the canopy, besides loblolly pine ([Pinus taeda](#)), other species that may be present include Virginia pine ([Pinus virginiana](#)), tuliptree ([Liriodendron tulipifera](#)) and red maple ([Acer rubrum](#)). The understory is reflective of the local species mix and can include sweetgum, southern red oak ([Quercus falcata](#)), white oak ([Q. alba](#)), water oak ([Q. nigra](#)), scarlet oak ([Q. coccinea](#)), persimmon ([Diospyros virginiana](#)) and large tooth aspen ([Populus grandidentata](#)).



**Nanticoke Wildlife Area  
Sussex County**

**Diagnostic Features:** A young stand of loblolly pine with at least 60% coverage and without sweetgum in the canopy. It can be distinguished from young pine plantations ([CEGL007179](#)) by the formation of a distinct canopy and understory.

**Geology and Environmental Features:** This community often does not have a specific geologic affinity.

**Landscape Position:** Places where there is succession, most often in upland areas.

**Associated Soil Series:**

Series	Acreage	% of acreage
Hurlock loamy sand	2,206.6	11.0
Mullica-Berryland complex	1,802.6	9.0
Pepperbox-Rosedale complex	1,641.2	8.2
Rosedale loamy sand	1,390.5	7.0
Fallsington sandy loam	1,117.0	5.6
Other series	11,815.2	59.2

**Species documented from this community**

Animals

Non-Vascular Plants

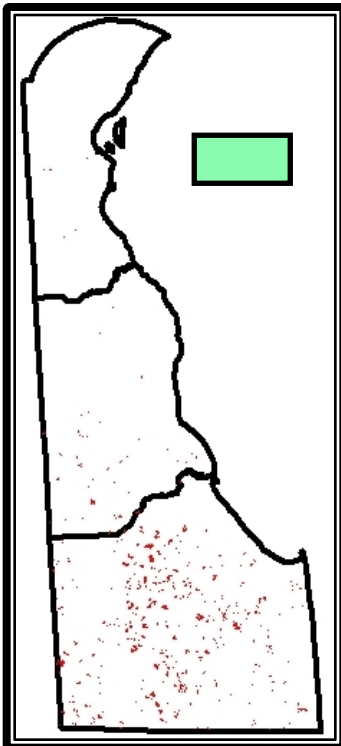
Vascular Plants

**Associated Rare Species:**

**Animals:** Unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Unknown



**Distribution:** This community is likely found throughout the Coastal Plain of Delaware and more likely in the southern half of the state. Nationally it is found throughout the Southeast.

**Estimated acres in Delaware = 20,908.0 (February 2012)**

**-Acres with 0.5 m sea level rise = 19,973.1-245.7 = 19,727.4**

**-Acres with 1 m sea level rise = 19,973.1-402.2 = 19,570.9**

**-Acres with 1.5 m sea level rise = 19,973.1-542.7 = 19,430.4**

**Equivalent or related communities in nearby states:**

**Maryland:** Early to Mid-Successional Loblolly Pine Forest

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** unknown

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Kent County**

-Milford Neck Wildlife Area

**Sussex County**

-Assawoman Wildlife Area  
-Marshyhope Wildlife Area  
-Nanticoke Wildlife Area  
-Prime Hook Wildlife Area

[-Back to Kent County Forests-](#)

[-Back to New Castle County Forests-](#)

[-Back to Sussex County Forests-](#)

## Inland Dune Ridge Forest

GNR

S1

D2?

NVC Alliance: [A.131-Pinus virginiana Forest Alliance](#)

NVC Association: [CEGL006354-Pinus virginiana-Quercus falcata-Carya pallida Forest](#)

**Delaware Type Locality:** Nanticoke Wildlife Area near Red House Landing in Sussex County (38°34'31.28"N, 075°39'47.51"W).

**Description:** Inland Dune Ridge Forests occur on relic sand dunes called “xeric sand ridges”. These dunes are believed to have originated during the last advance of ocean water before the last ice age.

Virginia pine (*Pinus virginiana*) is often co-dominant with southern red oak (*Quercus falcata*), water oak (*Q. nigra*), post oak (*Q. stellata*), black oak (*Q. velutina*), sand hickory (*Carya pallida*) and mockernut hickory (*C. alba*). Other possible canopy members may include sassafras (*Sassafras albidum*), chestnut oak (*Quercus prinus*), black-jack oak (*Q. marilandica*), wild black cherry (*Prunus serotina*), flowering dogwood (*Cornus florida*), loblolly pine (*Pinus taeda*), black gum (*Nyssa sylvatica*) and persimmon (*Diospyros virginiana*). The shrub layer ranges from dense to sparse and contains members of the canopy plus American holly (*Ilex opaca*), early lowbush blueberry (*Vaccinium pallidum*), squaw huckleberry (*V. stamineum*), blue huckleberry (*Gaylussacia frondosa*) and black huckleberry (*G. baccata*). Whiteleaf greenbrier (*Smilax glauca*), common greenbrier (*S. rotundifolia*), Virginia creeper (*Parthenocissus quinquefolia*) and muscadine grape (*Vitis rotundifolia*) are infrequently encountered vines. Herbs are sparse under the canopy but denser in openings. Pink lady’s slipper (*Cypripedium acaule*), sedge (*Carex* spp.) (Montanae group), variable witch grass (*Dichanthelium commutatum*), egg-leaf witch grass (*D. ovale*), spotted wintergreen (*Chimaphila maculata*), American cow-wheat (*Melampyrum lineare*) and partridge berry (*Mitchella repens*) are the most common herbs, with wild ipecac (*Euphorbia ipecacuanhae*), yellow wild indigo (*Baptisia tinctoria*), lupine (*Lupinus perennis*), bracken fern (*Pteridium aquilinum*), spotted wintergreen (*Chimaphila umbellata*), Indian pipe (*Monotropa uniflora*) and pineland tick trefoil (*Desmodium strictum*) being less common. Lichens are often abundant and include *Cladonia* spp. and *Cladina* spp.



**Diagnostic Features:** This community is distinguished by a high amount of exposed sand, the presence of sand hickory in the understory and a high amount of southern red oak in the canopy. They are similar to Inland Dune Ridge and Woodlands ([CEGL006851](#)) but have a denser overstory.

Nanticoke Wildlife Area  
Sussex County

**Geology and Environmental Features:** This community is often found primarily on Parsonsburg Sand (Evesboro Sand on Delaware maps) in the [Nanticoke River](#) Watershed. It exists on remnant sand dunes.

**Landscape Position:** Areas of higher elevation that are sandy in the [Coastal Plain](#) of Delaware.

**Associated Soil Series:**

Series	Acreage	% of acreage
Evesboro loamy sand	85.2	56.0
Galestown loamy sand	59.0	38.8
Mullica-Berryland complex	4.4	2.9
Pepperbox-Rosedale complex	2.8	1.8
Klej-Galloway complex	0.7	<0.1
Other series	0	0

**Species documented from this community**

Animals

Non-Vascular Plants

Vascular Plants

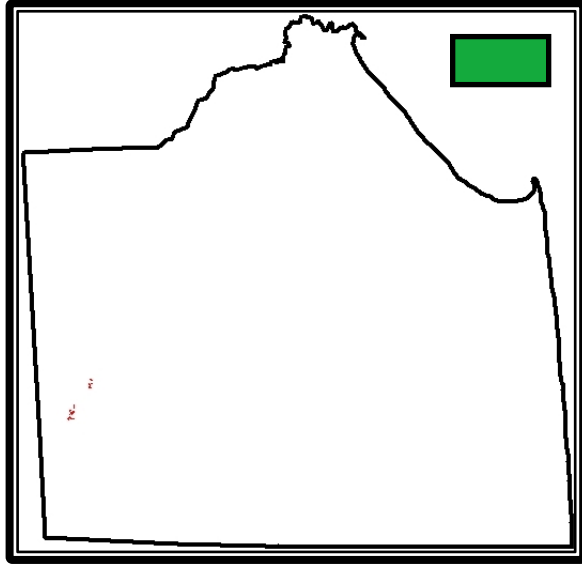
**Associated Rare Species:**

**Animals:** Unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Unknown





**Distribution:** This community is found primarily in the greater [Nanticoke River](#) Watershed in Delaware. Nationally it is found only on the [Delmarva Peninsula](#) from Delaware south to Virginia.

**Estimated Acres in Delaware = 152.1 (February 2012)**

**-Acres with 0.5 m sea level rise =  $152.1 - 0.3 = 151.8$**

**-Acres with 1 m sea level rise =  $152.1 - 2.5 = 149.6$**

**-Acres with 1.5 m sea level rise =  $152.1 - 18.9 = 133.2$**

**Equivalent or related communities in nearby states:**

**Maryland:** Inland Dune Ridge Forest (Harrison 2004)

**New Jersey:** *Pinus virginiana* - *Quercus falcata* - *Carya pallida* Forest (Breden et al 2001)

Virginia Pine Successional Forest (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** Coastal Plain Xeric Fluvial Terrace Woodland (Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Ancient Sand Ridge Forest

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Hardwood Forest

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Sussex County**

-Nanticoke Wildlife Area

**[-Back to Sussex County Forests-](#)**

## Mesic Coastal Plain Oak Forest

GNR

S5

D?

NVC Alliance: [A.243-\*Quercus falcata\* Forest Alliance](#)

NVC Association: [CEGL006390-\*Quercus falcata-Quercus phellos/Ilex opaca\* Forest](#)

**Delaware Type Locality:** TBD

**Description:** This wetland forest community represents the typical mesic oak forest in the central [Atlantic Coastal Plain](#). Often this community borders wetlands and is found on sand in areas with a high water table, but unlike the name it is often found on wet substrates.

Common canopy dominants include southern red oak ([Quercus falcata](#)), willow oak ([Quercus phellos](#)), white oak ([Quercus alba](#)), swamp white oak ([Quercus bicolor](#)), swamp chestnut oak ([Quercus michauxii](#)) and are associated by red maple ([Acer rubrum](#)) and sweetgum ([Liquidambar styraciflua](#)). In younger stands loblolly pine ([Pinus taeda](#)) and pond pine ([P. serotina](#)) may be present. American holly ([Ilex opaca](#)) and Canadian serviceberry ([Amelanchier canadensis](#)) make up the understory. Common shrubs include highbush blueberry ([Vaccinium corymbosum](#)) and blue huckleberry ([Gaylussacia frondosa](#)). The sparse herb layer is composed of Indian sea oats ([Chasmanthium laxum](#)), royal fern ([Osmunda regalis](#)) and partridge berry ([Mitchella repens](#)).



**Prime Hook National Wildlife  
Refuge  
Sussex County**

**Diagnostic Features:** The presence of willow oak and swamp chestnut oak serve to distinguish this community from the closely related Northeastern Coastal Plain Mixed Oak/Heath Forest ([CEGL006269](#)), which is generally also drier.

**Geology and Environmental Features:** Poorly drained sand generally makes up the substrate for this community. A high water table is often present.

**Landscape Position:** Flat interfluvial areas and low places.

**Associated Soil Series:**

Series	Acreage	% of acreage
Corsica mucky loam	4,815.7	28.9
Fallsington loam	4,514.5	27.1
Fallsington sandy loam	2,173.3	13.1
Kentuck mucky silt loam	971.3	5.8
Carmichael loam	768.5	4.6
Other series	3,396.2	20.5

**Species documented from this community**

Animals

Non-Vascular Plants

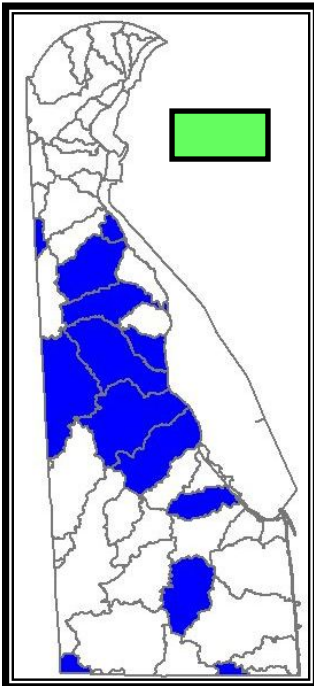
Vascular Plants

**Associated Rare Species:**

**Animals:** Unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Unknown



**Distribution:** This community can be found in scattered locations throughout the southern Coastal Plain; especially in the [Delaware Bay](#) area. Nationally it is found from New Jersey to Maryland.

**Estimated acres in Delaware = 16,788.2 acres (February 2012)**

**-Acres with 0.5 m sea level rise = 16,639.5-275.8 = 16,363.7**

**-Acres with 1 m sea level rise = 16,639.5-343.5 = 16,296.0**

**-Acres with 1.5 m sea level rise = 16,639.5-605.3 = 16,034.2**

**Equivalent or related communities in nearby states:**

**Maryland:** Mesic Coastal Plain Oak Forest (Harrison 2004)

**New Jersey:** *Quercus falcata* - *Quercus phellos* / *Ilex opaca* Forest (Breden et al 2001)

South Jersey Mixed Oak Forest (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Mesic Coastal Plain Oak Forest

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Kent County**

- Blackiston Wildlife Area
- Milford Neck Wildlife Area
- Norman G. Wilder Wildlife Area

**Sussex County**

- Prime Hook Wildlife Area

[-Back to Kent County Forests-](#)  
[-Back to New Castle County Forests-](#)  
[-Back to Sussex County Forests-](#)

## Mid-Atlantic Coastal Maritime Forest      G2      S2      D?

NVC Alliance: [A.406-Pinus taeda-Quercus nigra Forest Alliance](#)

NVC Association: [CEGL006040-Pinus taeda/Morella cerifera/Vitis rotundifolia Forest](#)

**Delaware Type Locality:** Pine Forest in Prime Hook National Wildlife Refuge in Sussex County ([38°49'19.65"N, 075°15'45.61"W](#)).

**Description:** This mesic to dry pine community occurs on the Outer Coastal Plain and on barrier islands in backdunes or adjacent to salt marshes that are sheltered from salt spray and overwash.

Loblolly pine (*Pinus taeda*) dominates the canopy and is associated by southern red oak (*Quercus falcata*), red maple (*Acer rubrum*), wild black cherry (*Prunus serotina*) and sassafras (*Sassafras albidum*). A tall shrub layer is present that includes southern bayberry (*Morella cerifera*) and highbush blueberry (*Vaccinium corymbosum*). A vine layer is characteristic of this community. Muscadine grape (*Vitis rotundifolia*) is the most common vine species, but poison ivy (*Toxicodendron radicans*), common greenbrier (*Smilax rotundifolia*), whiteleaf greenbrier (*Smilax glauca*) and Virginia creeper (*Parthenocissus quinquefolia*) may be present as well. The herb layer is typically sparse but in some cases Indian sea oats (*Chasmanthium laxum*) may be abundant. Other herbs that may be present include tall beach panicgrass (*Panicum amarum* var. *amarulum*), hyssop-leaf thoroughwort (*Eupatorium hyssopifolium*) and Carolina elephant-foot (*Elephantopus nudatus*).



**Prime Hook National Wildlife  
Refuge  
Sussex County**

**Diagnostic Features:** This community can be differentiated from others in Delaware by the dominance of loblolly pine and the presence of oak, wild black cherry and sassafras.

**Geology and Environmental Features:** The substrate is composed of a rapidly drained nutrient poor sand and sandy loams.

**Landscape Position:** These communities are found in places of higher elevation between major rivers. It often occupies places where a Mid-Atlantic Mesic Mixed Hardwood Forest ([CEGL006075](#)) or a Northeastern Coastal Plain Mixed Oak/Heath Forest ([CEGL006269](#)) would be and this community may in time succeed to either of these communities.

**Associated Soil Series:**

<b>Series</b>	<b>Acreage</b>	<b>% of acreage</b>
Fort Mott loamy sand	107.3	36.2
Rockawalkin loamy sand	27.5	9.3
Evesboro loamy sand	21.3	7.2
Fort Mott-Henlopen Complex	18.9	6.4
Henlopen loamy sand	15.7	5.3
Other series	106.1	35.6

**Species documented from this community**

Animals

Non-Vascular Plants

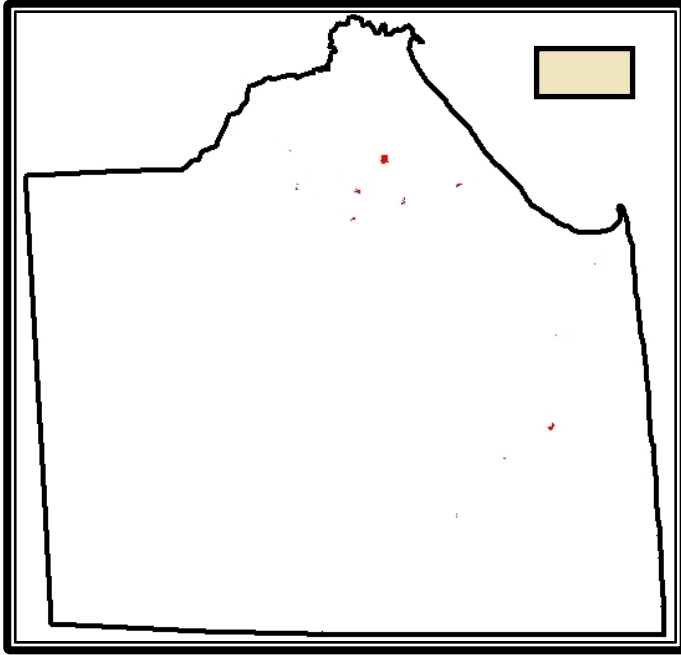
Vascular Plants

**Associated Rare Species:**

**Animals:** none known

**Non-Vascular Plants:** unknown

**Vascular Plants:** Unknown



**Distribution:** Scattered occurrences are located on the [Delaware Bay](#) in all Counties in the Coastal Plain. This community may also be found in scattered locations along the Atlantic Coast of Delaware. Nationally this community is found from New Jersey south to North Carolina.

**Estimated acres in Delaware = 304.5 (February 2012)**

**-Acres with 0.5 m sea level rise = 296.8-8.9 = 287.9**

**-Acres with 1 m sea level rise = 296.8-25.9 = 270.9**

**-Acres with 1.5 m sea level rise = 296.8-48.7 = 248.1**

**Equivalent or related communities in nearby states:**

**Maryland:** Mid-Atlantic Coastal Loblolly Pine Forest (Harrison 2004)

**New Jersey:** unknown

**Pennsylvania:** not present

**Virginia:** Mid-Atlantic Maritime Loblolly Pine Forest (Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Maritime Forest

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Sussex County**

-Assawoman Willdife Area

-Prime Hook National Wildlife Refuge

**[-Back to Sussex County Forests-](#)**

## Mid-Atlantic Mesic Mixed Hardwood Forest      G5      S5      D5

NVC Alliance: [A.229-Fagus grandifolia-Quercus rubra-Quercus alba Forest Alliance](#)

NVC Association: [CEGL006075-Fagus grandifolia-Quercus \(alba, rubra\)-Liriodendron tulipifera/Polystichum acrostichoides Forest](#)

Delaware Type Locality: TBD

**Description:** This mesic to moist forest community is defined by not being dominated by any one species and is roughly a Delaware version of Braun's Mixed Mesophytic Forest in the Southern Appalachians. It is perhaps the most common forest community in the northern part of the Coastal Plain of Delaware and perhaps all of Delaware. The Mid-Atlantic Mesic Mixed Hardwood Forest covers such a wide range of soil moisture conditions that it is divided into a "wet" variant and a "dry" variant.

Both of the variants share white oak ([Quercus alba](#)), tuliptree ([Liriodendron tulipifera](#)), American beech ([Fagus grandifolia](#)) and sweetgum ([Liquidambar styraciflua](#)) in the canopy. From here they diverge.

### Wet Variant

Additional species in the canopy include pin oak ([Quercus palustris](#)), willow oak ([Quercus phellos](#)) and southern red oak ([Quercus falcata](#)). The shrub layer in this variant can be quite dense is typically dominated by sweet pepperbush ([Clethra alnifolia](#)) and joined by highbush blueberry ([Vaccinium corymbosum](#)), American holly ([Ilex opaca](#)) and pink azalea ([Rhododendron periclymenoides](#)). A vine layer of common greenbrier ([Smilax rotundifolia](#)) is typically present. The herb layer in the wet variant is generally sparse and includes partridge berry ([Mitchella repens](#)), indian cucumber root ([Medeola virginiana](#)), tree clubmoss ([Dendrolycopodium obscurum](#)), cinnamon fern ([Osmunda cinnamomea](#)) and royal fern ([O. regalis](#)).

### Dry Variant

Additional canopy species include pignut hickory ([Carya glabra](#)), mockernut hickory ([Carya alba](#)), black oak ([Quercus velutina](#)) and northern red oak ([Quercus rubra](#)). The understory is composed of flowering dogwood ([Cornus florida](#)), American hornbeam ([Carpinus caroliniana](#)) and wild black cherry ([Prunus serotina](#)). The dense to sparse shrub layer may include highbush blueberry ([Vaccinium corymbosum](#)), strawberry bush ([Euonymus americanus](#)), maple-leaf viburnum ([Viburnum acerifolium](#)) and arrow-wood ([Viburnum dentatum](#)). Common vines include whiteleaf greenbrier ([Smilax glauca](#)), Virginia creeper ([Parthenocissus quinquefolia](#)) and grape ([Vitis](#) spp.) The herb layer, unlike that in the wet variant, tends to be diverse and rather dense. Solomon's seal ([Polygonatum biflorum](#)), false solomon's seal ([Maianthemum racemosum](#)), Indian cucumber root ([Medeola virginiana](#)), partridge berry ([Mitchella repens](#)), spotted wintergreen ([Chimaphila maculata](#)), Canada mayflower ([Maianthemum canadense](#)), pink lady's slipper ([Cypripedium acaule](#)), Indian pipes ([Monotropa uniflora](#)), rattlesnake plantain ([Goodyera pubescens](#)), swan's sedge ([Carex swanii](#)), cranefly orchid ([Tipularia discolor](#)) and bare-stemmed tick trefoil ([Desmodium nudiflorum](#)) are common herbs encountered.





**Diagnostic Features:** Mesic forest that contains a prominent presence of white oak, tuliptree and American beech.

**Armstrong Woods  
New Castle County**

**Geology and Environmental Features:** This community covers a wide range of geological conditions and is perhaps one of the most common communities in the Coastal Plain of Delaware.

**Landscape Position:** Mixed Hardwood Forests are often found in areas between rivers where there are there mesic conditions.

**Associated Soil Series:**

Series	Acreage	% of acreage
Fallsington loam	4,688.9	9.8
Fallsington sandy loam	3,411.5	7.1
Ingleside-Hammonton-Fallsington complex	2,557.2	5.3
Hammonton-Fallsington-Mullica complex	2,426.9	5.1
Corsica mucky loam	1,826.3	3.8
Other series	32,967.3	68.9

**Species documented from this community**

Animals

Non-Vascular Plants

[Vascular Plants](#)

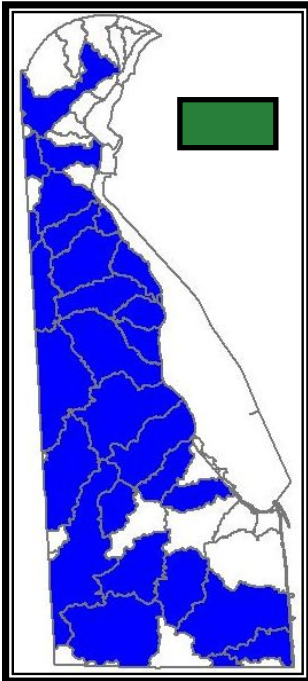
**Associated Rare Species:**

**Animals:** Smooth Earth Snake ([Virginia valeriae](#)), Ribbon Snake ([Thamnophis sauritus](#))

**Non-Vascular Plants:** unknown

**Vascular Plants:** American Wintergreen ([Pyrola americana](#)), American Pinesap ([Monotropa hypopithys](#)), Short-bristle Horn-rush ([Rhynchospora corniculata](#)), Large

Whorled Pogonia (*Isotria verticillata*), Southern Adder's Tongue (*Ophioglossum vulgatum*), Carolina Petunia (*Ruellia caroliniensis*)



**Distribution:** This is the most common forest type in the northern Coastal Plain of Delaware with scattered locations elsewhere. Nationally it ranges from Connecticut south to Virginia.

**Estimated Acres in Delaware = 51,912.0 (February 2012)**

**-Acres with 0.5 m sea level rise = 47,878.1-741.7 = 47,136.4**

**-Acres with 1 m sea level rise = 47,878.1-1,404.7 = 46,473.4**

**-Acres with 1.5 m sea level rise = 47,878.1-2,143.6 = 45,735.1**

**Equivalent or related communities in nearby states:**

**Maryland:** Northeastern Beech-White Oak Forest (Harrison 2004)

**New Jersey:** *Fagus grandifolia* - *Quercus alba* - *Liriodendron tulipifera* - *Carya* spp. Forest (Breden et al 2001)

South Jersey Beech-Oak Forest (Collins and Anderson 1994)

**Pennsylvania:** unknown

**Virginia:** Mesic Mixed Hardwood Forest (Piedmont/Northern Coastal Plain Type) (Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Mesic Coastal Plain Mixed Hardwood Forest

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Mesic Mixed Hardwood Forest

**Landfire Classification Code:** unknown

**Public places in Delaware to view to this community**

**New Castle County**

-Blackbird Reserve Wildlife Area

**Kent County**

-Blackiston Wildlife Area  
-Milford Neck Wildlife Area  
-Norman G. Wildlife Area

**Sussex County**

-Assawoman Wildlife Area  
-Prime Hook National Wildlife Refuge

**[-Back to Kent County Forests-](#)**  
**[-Back to New Castle County Forests-](#)**  
**[-Back to Sussex County Forests-](#)**

**North Atlantic Coastal Oak/Holly Forest      GNR      S1      D?**

**NVC Alliance:** [A.302-Acer saccharum-Carya cordiformis Temporarily Flooded Forest Alliance](#)

**NVC Association:** CEG006378-*Quercus velutina/Ilex opaca* Forest

**Delaware Type Locality:** Middleford Preserve upstream of Middleford Bridge in Sussex County ([38°40'48.12"N, 75°33'20.38"W](#)).

**Description:** This floodplain community is found on floodplain benches in the Nanticoke River watershed and on flatwoods in the Choptank River watershed.

Common canopy species include sweetgum ([Liquidambar styraciflua](#)), green ash ([Fraxinus pennsylvanica](#)), black oak ([Quercus velutina](#)), pond pine ([Pinus serotina](#)), loblolly pine ([Pinus taeda](#)) and American holly ([Ilex opaca](#)). The understory is locally dense with mountain laurel ([Kalmia latifolia](#)) and associated by highbush blueberry ([Vaccinium corymbosum](#)) and common greenbrier ([Smilax rotundifolia](#)). Herbaceous species are few to none in this community.



**Diagnostic Features:** This is only community in Delaware where mountain laurel is dominant in a floodplain on the [Coastal Plain](#).

**Middleford Preserve (TNC)  
Sussex County**

**Geology and Environmental Features:**

**Landscape Position:** Floodplains of the [Nanticoke River](#) in Sussex County and flatwoods in the Choptank River watershed.

**Associated Soil Series:**

Series	Acreage	% of acreage
Evesboro sandy loam	9.4	28.9
Rockawalkin sandy loam	5.3	16.3
Klej loamy sand	5.2	16.0
Corsica mucky loam	5.1	15.7
Fallsington loam	3.7	11.4
Other series	3.8	11.7

**Species documented from this community**

Animals

Non-Vascular Plants

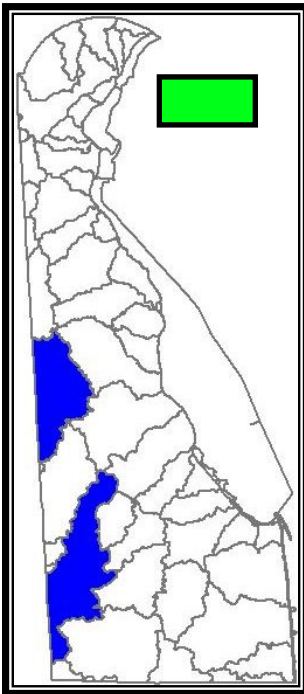
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** This community is known from higher floodplain benches on the [Nanticoke River](#) in Sussex County at the Middleford Preserve. It is also known from flatwoods in the Choptank River watershed in Kent County. Nationally it is known from Massachusetts south to Delaware along the coast.

**Estimated acres in Delaware = 32.5 (February 2012)**

**-Acres with 0.5 m sea level rise =  $32.5 - 0.3 = 32.3$**

**-Acres with 1 m sea level rise =  $32.5 - 1.6 = 30.9$**

**-Acres with 1.5 m sea level rise =  $32.5 - 7.0 = 25.5$**

**Equivalent or related communities in nearby states:**

**Maryland:** not present

**New Jersey:** Coastal Oak-Holly Forest (Breden, et al 2001)-not yet confirmed in New Jersey

**Pennsylvania:** not present

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Hardwood Forest

**Landfire Classification Code:** unknown

**Publics places in Delaware to view this community**

**Kent County**

-Norman G. Wilder Wildlife Area

[-Back to Kent County Forests-](#)

[-Back to Sussex County Forests-](#)

## Northern Coastal Plain/Piedmont Basic Mesic Hardwood Forest

G4? S2 D?

**NVC Alliance:** [A.227-Fagus grandifolia-Acer saccharum-\(Liriodendron tulipifera\) Forest Alliance](#)

**NVC Association:** [CEGL006055-Fagus grandifolia-Liriodendron tulipifera-Carya cordiformis/Lindera benzoin/Podophyllum peltatum Forest](#)

**Delaware Type Locality:** Tuliptree Woods in Brandywine Creek State Park in New Castle County ([39°48'29.51"N, 075°34'39.96"W](#)).

**Description:** This rich forest community occurs in sheltered ravines in soils derived from rocks rich in nutrients in the Piedmont and Coastal Plain. Historically this forest type has been termed a “rich forest” because of the rich diversity herbs as compared to any other forest in the state.

Tuliptree ([Liriodendron tulipifera](#)) and northern red oak ([Quercus rubra](#)) are the common species in the canopy of this community. They may be joined by white oak ([Quercus alba](#)), scarlet oak ([Quercus coccinea](#)), shagbark hickory ([Carya ovata](#)), bitternut hickory ([C. cordiformis](#)) and occasionally white ash ([Fraxinus americana](#)) and white basswood ([Tilia americana](#)). Flowering dogwood ([Cornus florida](#)), witch-hazel ([Hamamelis virginiana](#)) and sweet birch ([Betula lenta](#)) make up the understory. The shrub layer is composed of blackhaw viburnum ([Viburnum prunifolium](#)) and maple-leaf viburnum ([Viburnum acerifolium](#)). The herbaceous layer in this community may be very diverse from the richness of the soil. Common herbs include mayapple ([Podophyllum peltatum](#)), horsebalm ([Collinsonia canadensis](#)), bloodroot ([Sanguinaria canadensis](#)), Christmas fern ([Polystichum acrostichoides](#)), silvery false spleenwort ([Deparia acrostichoides](#)), black cohosh ([Actaea racemosa](#)) and false ginseng ([Panax trifolius](#)).



**Diagnostic features:** This community can be differentiated from other communities in the [Coastal Plain](#) and Piedmont by the dominance of tuliptree with American beech ([Fagus grandifolia](#)) and a rich herb layer with species such as bloodroot, Christmas fern, horsebalm and black cohosh. It generally contains more herbaceous species and fewer exotic species than the Successional Tuliptree Forest ([CEGL007220](#)).

**Brandywine Creek State Park**  
New Castle County

**Geology and Environmental Features:** This community is often found in rich soils that are derived from [amphibolite](#) and [mafic](#) rocks of the Wissahickon and Brandywine [Gneiss](#).

**Landscape Position:** Mid to upper slopes in the Piedmont and Coastal Plain.

**Associated Soil Series:**

<b>Series</b>	<b>Acreage</b>	<b>% of acreage</b>
Fort Mott loamy sand	27.3	27.6
Glengel loam	15.5	15.7
Gaila loam	12.1	12.2
Ingleside sandy loam	11.6	11.7
Mattapex silt loam	10.1	10.2
Other series	22.2	22.5

**Species documented from this community**

Animals

Non-Vascular Plants

Vascular Plants

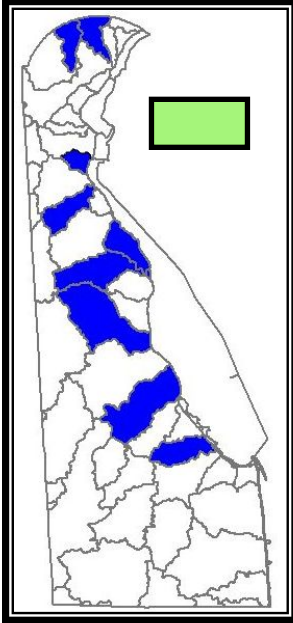
**Associated rare species:**

**Animals:** Unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Unknown





**Distribution:** This community is found in the [Coastal Plain](#) and [Piedmont](#) of Delaware with a slightly different species composition in each. Nationally, this community is known from Virginia and Maryland.

**Estimated acres in Delaware = 98.8 (February 2012)**

**-Acres with 0.5 m sea level rise =  $98.8 - 4.2 = 94.6$**

**-Acres with 1 m sea level rise =  $98.8 - 13 = 85.8$**

**-Acres with 1.5 m sea level rise =  $98.8 - 20.5 = 78.3$**

**Equivalent or related communities in nearby states:**

**Maryland:** Northern Coastal Plain/Piedmont Basic Mesic Hardwood Forest (Harrison 2004)

**New Jersey:** South Jersey Beech-Oak Forest (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** Coastal Plain/Outer Piedmont Basic Mesic Forest (Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Tuliptree Rich Wood (Coastal Plain Variant) and Tuliptree Rich Wood (Piedmont Variant)

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Calcareous Ravine

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**New Castle County**

-Brandywine Creek State Park

**Kent County**

-Milford Neck Wildlife Area

-Woodland Beach Wildlife Area

[-Back to Kent County Forests-](#)  
[-Back to New Castle County Forests-](#)  
[-Back to Sussex County Forests-](#)

## Southern Red Maple-Blackgum Swamp

G3?

S3

NVC Alliance: [A.348-Acer rubrum-Nyssa sylvatica Saturated Forest Alliance](#)

NVC Association: [CEGL006238-Acer rubrum-Nyssa sylvatica-Magnolia virginiana/Viburnum nudum var. nudum/Osmunda cinnamomea-Woodwardia areolata Forest](#)

**Delaware Type Locality:** TBD

**Description:** This swamp community is a nutrient-poor wetland forest occurring in groundwater-saturated stream bottoms and poorly drained depressions.

Besides the nominal species other canopy associates may include sweetgum ([Liquidambar styraciflua](#)), tuliptree ([Liriodendron tulipifera](#)) and loblolly pine ([Pinus taeda](#)). Sweetbay ([Magnolia virginiana](#)) may be in the canopy or in the understory with spicebush ([Lindera benzoin](#)). Common shrubs include winterberry ([Ilex verticillata](#)), sweet pepperbush ([Clethra alnifolia](#)), highbush blueberry ([Vaccinium corymbosum](#)) and swamp azalea ([Rhododendron viscosum](#)). Common herbs include skunk cabbage ([Symplocarpus foetidus](#)), marsh St. John's wort ([Triadenum virginicum](#)), royal fern ([Osmunda regalis](#) var. *spectabilis*), cinnamon fern ([O. cinnamomea](#)), netted chain fern ([Woodwardia areolata](#)), follicle sedge ([Carex folliculata](#)) and Atlantic sedge ([C. atlantica](#)).



**Swan Creek  
Sussex County**

**Diagnostic Features:** Presence and co-dominance of the red maple ([Acer rubrum](#)) and blackgum ([Nyssa sylvatica](#)).

**Geology and Environmental Features:** Surface water is seldom present but the nutrient poor soil can be saturated by groundwater for long periods of time during the growing season. Soil is usually deep muck over mineral soil. These sites often have *Sphagnum*-covered hummocks, braided channels, mucky depressions and areas of exposed sand and gravel. Soils tend to be very acidic.

**Landscape Position:** Saturated floodplains in the Coastal Plain

**Associated Soil Series:**

Series	Acreage	% of acreage
Longmarsh and Indiantown soils (frequently flooded)	40.5	42.7
Manahawkin muck (frequently flooded)	29.4	31.0
Lenape mucky peat (very frequently flooded, tidal)	8.9	9.4
Evesboro sandy loam	3.0	3.2
Downer sandy loam	1.1	1.2
Other series	12.0	12.6

**Species documented from this community**

Animals

Non-Vascular Plants

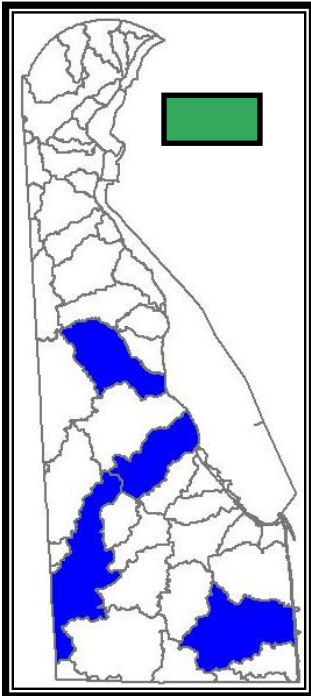
Vascular Plants

**Associated Rare Species:**

**Animals:** Trumpet Vine Sphinx (*Paratreia plebeja*)

**Non-Vascular Plants:** unknown

**Vascular Plants:** Swamp Pink (*Helonias bullata*)



**Distribution:** Red Maple-Black Gum Swamps are scattered throughout the southern Coastal Plain of Delaware. Nationally this community is known from New York south to Virginia.

**Estimated acres in Delaware = 272.1 (February 2012)**

**-Acres with 0.5 m sea level rise = 94.9-19.7 = 75.2**

**-Acres with 1 m sea level rise = 94.9-20.1 = 74.8**

**-Acres with 1.5 m sea level rise = 94.9-20.3 = 74.6**

**Equivalent or related communities in nearby states:**

**Maryland:** Southern Red Maple-Black Gum Swamp Forest (Harrison 2004)

**New Jersey:** *Acer rubrum* - *Nyssa sylvatica* - *Magnolia virginiana* Forest (Breden 2001)

Outer Coastal Plain Hardwood Swamp (Collins and Anderson 1994)

**Pennsylvania:** Red Maple-Magnolia Coastal Plain Palustrine Forest (Fike 1999)

**Virginia:** Coastal Plain/Outer Piedmont Acidic Seepage Swamp (Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Stream and River

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Kent County**

-Milford Neck Wildlife Area

[-Back to Kent County Forests-](#)

[-Back to Sussex County Forests-](#)

**Northeastern Coastal Plain Mixed Oak/Heath Forest    G4G5    S5  
D5**

**NVC Alliance:** [A.241-Quercus alba-Quercus \(falcata, stellata\) Forest Alliance](#)

**NVC Association:** [CEGL006269-Quercus alba-Quercus falcata-\(Pinus taeda\)/Gaylussacia frondosa Forest](#)

**Delaware Type Locality:** Forest upstream of Blairs Pond and east of Tantrough Branch in Sussex County ([38°53'50.44"N, 075°29'12.87"W](#)).

**Description:** This dry-mesic forest community represents the typical oak forest found in the [Coastal Plain](#) of Delaware and is common to the unglaciated [Coastal Plain](#) on the East Coast. These forests can vary from a closed canopy to an open forest; similar to a woodland. Periodic fires apparently once were a part of this forest type and encouraged oak regeneration. This community is one of the more common communities in the southern [Coastal Plain](#) of Delaware.

Common canopy dominants include white oak ([Quercus alba](#)), southern red oak ([Quercus falcata](#)) and black oak ([Quercus velutina](#)). Other associates, although less common, may include sassafras ([Sassafras albidum](#)), sweetgum ([Liquidambar styraciflua](#)), blackgum ([Nyssa sylvatica](#)), hickory ([Carya](#) spp.) and loblolly pine ([Pinus taeda](#)). At Prime Hook NWR, pond pine ([Pinus serotina](#)) can be in the mixture. Red maple ([Acer rubrum](#)), American holly ([Ilex opaca](#)) and flowering dogwood ([Cornus florida](#)) are often part of the understory. The shrub layer is well-developed and includes black huckleberry ([Gaylussacia baccata](#)), early lowbush blueberry ([Vaccinium pallidum](#)) and squaw huckleberry ([V. stamineum](#)). Typically the herb layer is sparse and includes bracken fern ([Pteridium aquilinum](#)), pink lady's slipper ([Cypripedium acaule](#)), spotted wintergreen ([Chimaphila maculata](#)) and teaberry ([Gaultheria procumbens](#)).



**Prime Hook National Wildlife  
Refuge  
Sussex County**

**Diagnostic Features:** This oak forest can be distinguished from the Mid-Atlantic Mesic Mixed Hardwood Forest ([CEGL006075](#)) by the low amount of tuliptree ([Liriodendron tulipifera](#)), red maple and American beech ([Fagus grandifolia](#)). In younger stands loblolly pine may be mixed in but not greater than 50%. Southern Red Oak/Heath Forests are drier than the Mesic Coastal Plain Oak Forest ([CEGL006390](#)) and do not have willow oak ([Quercus phellos](#)) or swamp chestnut oak ([Q. michauxii](#)).

**Geology and Environmental Features:** This community can be found on well-drained acidic soils, including loamy sands, sandy loams and silty/clay loams. Studies in Virginia have shown that the soils in this community are extremely acidic.

**Landscape Position:** Southern red oak/heath forests are found in areas of higher elevation in the Coastal Plain of Delaware.

**Associated Soil Series:**

Series	Acreage	% of acreage
Pepperbox-Rosedale complex	2,958.8	9.3
Fort Mott-Henlopen complex	2,582.9	8.1
Hurlock loamy sand	2,339.2	7.3
Rosedale loamy sand	1,863.9	5.8
Mullica-Berryland complex	1,636.6	5.1
Other series	AAA	

**Species documented from this community**

Animals

Non-Vascular Plants

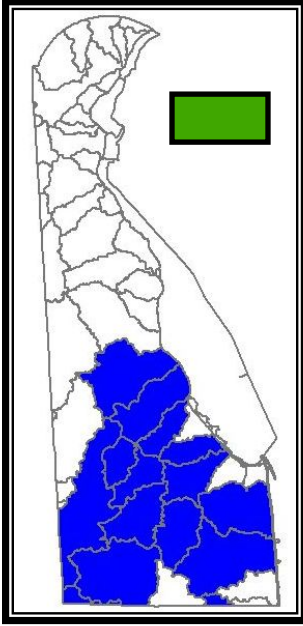
Vascular Plants

**Associated Rare Species:**

**Animals:** Yellow-throated Warbler ([Dendroica dominica](#)), Frosted Elfin ([Collophrys irus](#)), Delmarva Fox Squirrel ([Sciurus niger cinereus](#))

**Non-Vascular Plants:** unknown

**Vascular Plants:** Dark Green Sedge ([Carex venusta](#)), Long-stalk Greenbrier ([Smilax pseudochina](#)), Heller's Witch Grass ([Dichanthelium oligosanthes](#) var. *oligosanthes*), Virginia Dayflower ([Commelina virginica](#)), Purple Lupine ([Lupinus perennis](#)), Pineland Tick-trefoil ([Desmodium strictum](#)), Slender Dayflower ([Commelina erecta](#)), Carolina Anglepod ([Matelea caroliniensis](#)), Forked Nailwort ([Paronychia canadensis](#)), Arrow-leaved Violet ([Viola sagittata](#))



**Distribution:** This community is common in the southern [Coastal Plain](#) of Delaware and ranges as far north as southwestern New Castle County. Nationally, it is found in the Mid-Atlantic Region.

**Estimated acres in Delaware = 36,502.8 (February 2012)**

**-Acres with 0.5 m sea level rise = 31,916.2-411.0 = 31,505.2**

**-Acres with 1 m sea level rise = 31,916.2-851.2 = 31,065.0**

**-Acres with 1.5 m sea level rise = 31,916.2-1,299.8 = 30,616.4**

**Equivalent or related communities in nearby states:**

**Maryland:** unknown

**New Jersey:** *Quercus (falcata, alba, velutina) / Gaylussacia baccata - Vaccinium pallidum* Forest (Breden et al 2001)

South Jersey Mixed Oak Forest (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** Coastal Plain Mixed Oak/Heath Forest (Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Loblolly Pine-Mixed Oak Forest

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Hardwood Forest

**Landfire Classification Code:**

**Public places in Delaware to view this community**

**Sussex County**

- Nanticoke Wildlife Area
- Prime Hook National Wildlife Refuge

**[-Back to Kent County Forests-](#)**



[-Back to Sussex County Forests-](#)

## Successional Maritime Forest

G2G3

S3

D?

**NVC Alliance:** A.237-*Prunus serotina*-*Acer rubrum*-*Amelanchier canadensis*-*Quercus* spp. Forest Alliance

**NVC Association:** CEGLO06145-*Prunus serotina*-*Sassafras albidum*-*Amelanchier canadensis*-*Quercus velutina*/*Smilax rotundifolia* Forest

**Delaware Type Locality:** Wooded area west of the impounded marsh and north Broadkill Beach Road at Prime Hook National Wildlife Refuge in Sussex County ([38°49'28.33"N, 075°14'22.37"W](#)).

**Description:** In Delaware this maritime forest community most often occurs in places that are adjacent to salt marshes. The water table is close to the surface and the elevation is barely above that of the adjacent salt to brackish marshes. Due to the effects of salt spray and wind the canopy is shortened and trees can show stunting.

Common species in the canopy include wild black cherry ([Prunus serotina](#)), sassafras ([Sassafras albidum](#)) and sweetgum ([Liquidambar styraciflua](#)). Other species may include serviceberry ([Amelanchier canadensis](#)) and post oak ([Quercus stellata](#)). The known examples in Delaware often have a strong understory component of northern bayberry ([Morella pennsylvanica](#)). Common greenbrier ([Smilax rotundifolia](#)) can be found trailing on the ground. Few herbs are found in this and may include speargrass (*Chasmanthium laxum*).



**Diagnostic Features:** A stunted forest dominated by wild black cherry and sweetgum and the location adjacent to salt marsh is diagnostic of this community.

**Bombay Hook NWR  
Kent County, De**

Geology and Environmental Features:

**Landscape Position:** This community is found in adjacent to salt marshes in places barely higher than the marsh.

**Associated Soil Series:**

Series	Acreage	% of acreage
Sunken mucky silt loam	290.1	
Transquaking and Mispillion Soils	230.3	
Downer sandy loam	168	
Piney Neck loam	127.0	
Piney Neck loam	121.7	
Other series		

Askecksy Loamy Sand- 0 to 2 percent slopes

**Species documented from this community**

Animals

Non-Vascular Plants

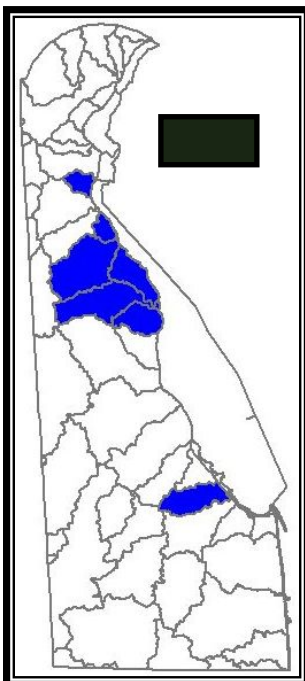
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** This community is scattered in the coastal areas on the edges of salt and brackish marshes. Nationally this community is found on the east coast of the United States from New Hampshire south to Delaware.

**Estimated Acres in Delaware = 2,862.5 (February 2012)**

**-Acres with 0.5 m sea level rise = 2,971.6-1,576.1 = 1,395.5**

**-Acres with 1 m sea level rise = 2,971.6-2,144.8 = 826.8**

**-Acres with 1.5 m sea level rise = 2,971.6-2,386.7 = 584.9**

**Equivalent or related communities in nearby states:**

**Maryland:** not present

**New Jersey:** unknown

**Pennsylvania:** not present

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Maritime Forest

**Landfire Classification:** 4322

**Public places in Delaware in to view this community**

**New Castle County**

-Augustine Wildlife Area

**Kent County**

-Bombay Hook National Wildlife Refuge

-Milford Neck Wildlife Area

-Woodland Beach Wildlife Area

**Sussex County**

-Assawoman Wildlife Area

-Cape Henlopen State Park

-Prime Hook National Wildlife Refuge

**[-Back to Kent County Forests-](#)**

**[-Back to Sussex County Forests-](#)**

## Successional Virginia Pine Forest

GNA

SNA

DNA

NVC Alliance: [A.131-Pinus virginiana Forest Alliance](#)

NVC Association: [CEGL002591-Pinus virginiana Successional Forest](#)

**Delaware Type Locality:** Woods at the Middleford Preserve upstream of Middleford Bridge in Sussex County ([38°40'30.47"N, 75°33'42.35"W](#)).

**Description:** This successional forest community can be found in places of disturbance where there are dry, open conditions and bare mineral soil including old fields, pastures and clearcuts. It can also occur on the Evesboro Sandy Loam that is found in Sussex County and is often in association with the Inland Dune Ridge Forest ([CEGL006354](#)) and the Northeastern Coastal Plain Mixed Oak/Heath Forest ([CEGL006269](#)).

A hallmark of this community is the dense coverage of Virginia pine ([Pinus virginiana](#)) in the canopy. Other species that may be present in the canopy include loblolly pine ([Pinus taeda](#)), red maple ([Acer rubrum](#)), sweetgum ([Liquidambar styraciflua](#)) and tuliptree ([Liriodendron tulipifera](#)). Exotic herb species, such as Japanese stiltgrass ([Microstegium vimineum](#)) may be present due to disturbance.



**Diagnostic Features:** The dominance of Virginia pine, disturbance and dry conditions are indicative of this community. No understory is usually present in this community due to the thick canopy and acidic conditions produced by the fallen pine needles.

**Nanticoke Wildlife Area  
Sussex County**

**Geology and Environmental Features:** This community is successional and is found in places where canopy removal has exposed bare mineral soil. Soils tend to be moderately to strongly acidic. In Delaware this community is found on nutrient poor sandy soil.

**Landscape Position:** This community often occurs in places of dry soil that have been disturbed and are of high elevation.

**Associated Soil Series:**

Series	Acreage	% of acreage
Evesboro loamy sand	517.7	22.7
Mullica-Berryland complex	224.1	9.8
Runclint loamy sand	154.6	6.8
Klej-Berryland complex	139.2	6.1
Galestown loamy sand	116.5	5.1
Other series	1,124.5	4.9

Evesboro Sandy Loam, Fort Mott Loamy Sand

**Species documented from this community**

Animals

Non-Vascular Plants

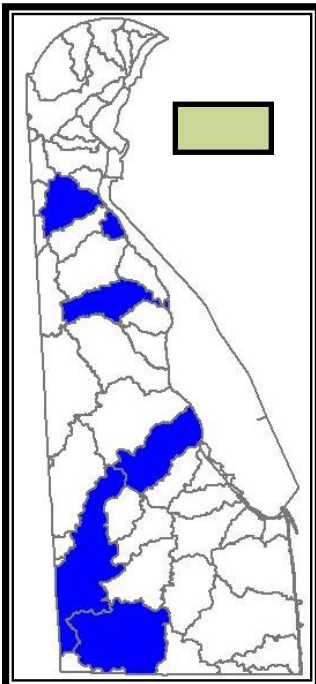
[Vascular Plants](#)

**Associated Rare Species:**

**Animals:** Unknown

**Non-Vascular Plants:** Unknown

**Vascular Plants:** Unknown



**Distribution:** This community is known from the [Coastal Plain](#) of Delaware. Large examples are known from the [Nanticoke River](#) and Broad Creek watersheds. Nationally this community is found throughout the southeast, Pennsylvania and New Jersey.

**Estimated Acres in Delaware = 2,272.6 (February 2012)**

**-Acres with 0.5 m sea level rise = 2,276.6-36.9 = 2,239.7**

**-Acres with 1 m sea level rise = 2,276.6-66.6 = 2,210.0**

**-Acres with 1.5 m sea level rise = 2,276.6-116.6 = 2,160.0**

**Equivalent or related communities in nearby states:**

**Maryland:** Virginia Pine Successional Forest

**New Jersey:** Virginia Pine Successional Forest (Collins and Anderson 1994)

**Pennsylvania:** unknown

**Virginia:** unknown

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Sussex County**

- Blair Pond Access Area
- Nanticoke Wildlife Area

[-Back to Kent County Forests-](#)  
[-Back to New Castle County Forests-](#)  
[-Back to Sussex County Forests-](#)

## New Castle County Woodlands

**Central Appalachian/Piedmont Bedrock Floodplain Woodland:** This community composed of stunted sycamore (*Platanus occidentalis*) and green ash (*Fraxinus pennsylvanica*) on a scoured floodplain. ([CEGL006476](#)) **Piedmont-Brandywine Creek**

**Freshwater Tidal Woodland:** Woodland that is dominated by red maple (*Acer rubrum*) at the edge of tidal influence. ([CEGL006165](#)) **Augustine Creek**

## Kent County Woodlands

**Freshwater Tidal Woodland:** Woodland that is dominated by red maple (*Acer rubrum*) at the edge of tidal influence. ([CEGL006165](#)) **Murderkill River**

**Maritime Red-cedar Woodland:** Woodland that is dominated by eastern red cedar (*Juniperus virginiana*) with an understory of prickly pear (*Opuntia humifusa*) and beach heather (*Hudsonia ericoides*). ([CEGL006212](#)) **Duck Creek; St. Jones River**

**Red Maple/Seaside Alder Woodland:** Woodland that is co-dominated by red maple (*Acer rubrum*) and seaside alder (*Alnus maritima*) and located in the Freshwater Impoundment at Bombay Hook National Wildlife Refuge. The example in Kent County does not have seaside alder. ([CEGL006317](#)) **Leipsic River**

[-Back to Key to Delaware Vegetation Communities-](#)



## Sussex County Woodlands

**Atlantic White Cedar/Seaside Alder Swamp:** Low woodland that is co-dominated by Atlantic white cedar (*Chamaecyparis thyoides*) and seaside alder (*Alnus maritima*). ([CEGL006307](#)) **Cedar Creek; Prime Hook Creek**

**Inland Dune and Ridge Forest/Woodland:** Woodland that has shortleaf pine (*Pinus echinata*) as a co-dominant along with southern red oak (*Quercus falcata*), white oak (*Quercus alba*) and/or water oak (*Quercus nigra*). An understory of sand hickory (*Carya pallida*) is often present. ([CEGL006851](#)) **Indian River; Indian River Bay; Nanticoke River**

**Loblolly Pine Dune Woodland:** Woodland that is dominated by loblolly pine (*Pinus taeda*) on dunes on the Atlantic strand in Delaware. ([CEGL006052](#)) **Lewes and Rehoboth Canal; Little Assawoman Bay**

**Loblolly Pine-Wax-myrtle-Salt Meadow Cordgrass Tidal Woodland:** Woodland located on the edges of salt marshes that is dominated by loblolly pine (*Pinus taeda*) in the canopy and has an understory of wax-myrtle (*Morella pennsylvanica*). Salt meadow hay (*Spartina patens*) from the adjacent marsh may come into the community. ([CEGL006849](#)) **Indian River Bay; Lewes-Rehoboth Canal; Mispillion River; Rehoboth Bay**

**Maritime Red-cedar Woodland:** Woodland that is dominated by eastern red cedar (*Juniperus virginiana*) with an understory of prickly pear (*Opuntia humifusa*) and beach heather (*Hudsonia ericoides*). ([CEGL006212](#)) **Broadkill River; Cedar Creek; Indian River Bay; Lewes-Rehoboth Canal; Mispillion River; Red Mill Creek**

**Pitch Pine Dune Woodland:** Woodland in Cape Henlopen State Park that is dominated by Pitch Pine (*Pinus rigida*). ([CEGL006117](#)) **Breakwater Harbor; Lewes-Rehoboth Canal; Northern Atlantic Strand; Rehoboth Bay;**

**Pitch Pine/Cranberry Interdunal Swale:** Swale with a woodland canopy of pitch pine (*Pinus rigida*) and an understory of cranberry (*Vaccinium macrocarpon*). ([CEGL006127](#)) **Lewes-Rehoboth Canal**

**Pitch Pine Lowland:** Low area that dominated by pitch pine (*Pinus rigida*) with an understory of highbush blueberry (*Vaccinium corymbosum*) and inkberry (*Ilex glabra*). ([CEGL006195](#)) **Lewes-Rehoboth Canal**

**Pond Pine Woodland:** Open woodland that is dominated by pond pine (*Pinus serotina*) with an understory of red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*) and sweetbay (*Magnolia virginiana*). ([CEGL006470](#)) **Indian River; Prime Hook Creek**

**Red Maple/Seaside Alder Woodland:** Woodland that is co-dominated by red maple (*Acer rubrum*) and seaside alder (*Alnus maritima*) and located at Prime Hook Creek in Prime Hook National Wildlife Refuge. ([CEGL006317](#)) **Prime Hook Creek**

**Red Maple/Upright Sedge Wooded Marsh:** Open wooded marsh with stunted red maple (*Acer rubrum*) and a dense herbaceous layer of tussock sedge (*Carex stricta*). ([CEGL006119](#)) **Indian River**

[-Back to Key to Delaware Vegetation Communities-](#)

## Central Appalachian/Piedmont Bedrock Floodplain Woodland

### G2? S1.1

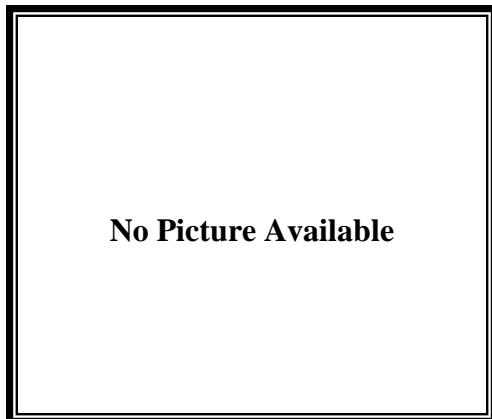
**NVC Alliance:** A.288-*Platanus occidentalis*-(*Fraxinus pennsylvanica*, *Celtis laevigata*, *Acer saccharinum*) Temporarily Flooded Forest Alliance

**NVC Association:** CEGLO06476-*Platanus occidentalis*-*Acer saccharinum*-*Betula nigra*-*Fraxinus pennsylvanica*/*Boehmeria cylindrica*-*Carex emoryii* Woodland

**Delaware Type Locality:** Floodplain of Brandywine Creek across from Bancroft Mills in New Castle County ([39°46'11.30"N, 75°33'58.00"W](#)).

**Description:** This stunted woodland community is located on the edge of a scoured floodplain on Brandywine Creek across from Bancroft Mills. It is a community that receives regular scouring from floods. Because of the scouring this community has a low canopy ranging from about 3 to 6 m and numerous wrack lines or woody debris are present throughout.

The low canopy includes green ash ([Fraxinus pennsylvanica](#)), box elder ([Acer negundo](#)), red maple ([Acer rubrum](#)), silver maple ([Acer saccharinum](#)) and black willow ([Salix nigra](#)). Understory species include honey locust ([Gleditsia tricanthos](#)), persimmon ([Diospyros virginiana](#)) and white mulberry ([Morus alba](#)). False indigo ([Amorpha fruticosa](#)), silky dogwood ([Cornus amomum](#)), multiflora rose ([Rosa multiflora](#)) and summer grape ([Vitis aestivalis](#)) make up the shrub layer. The herbs are many but some of the common ones include green-head coneflower ([Rudbeckia laciniata](#)), blue vervain ([Verbena hastata](#)), deer-tongue grass ([Dichanthelium clandestinum](#)), reed canary grass ([Phalaris arundinacea](#)), frank's sedge ([Carex frankii](#)), path rush ([Juncus tenuis](#)) and three-nerved Joe-pye-weed ([Eupatorium dubium](#)).



**Diagnostic Features:** This community is distinguished by stunted sycamore and green ash in scoured floodplain. Often there are numerous wrack lines present.

**Geology and Environmental Features:** Scoured floodplain of Brandywine Creek

**Landscape Position:** Scoured floodplains in the [Piedmont](#) of Delaware

**Associated Soil Series:** Othello-Fallsington Loam

#### **Species documented from this community**

Animals

Non-Vascular Plants

Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

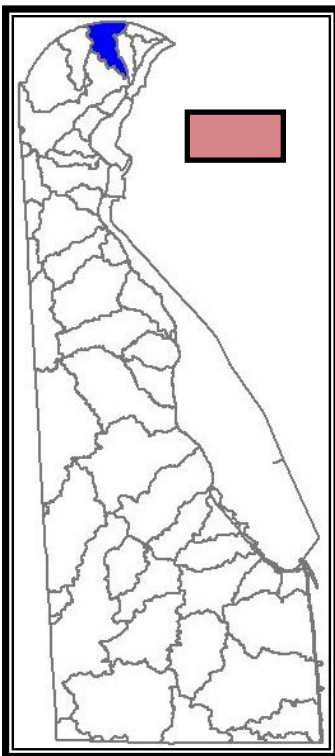
**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown

**Ecological Integrity Assessment (EIA)**

A = 0, B = 0, C = 1, D = 0

**Average EIA = 3.35      X=1**



**Distribution:** This community is known from one location in the [Brandywine Creek](#) watershed in Delaware. It may possibly be found at some point in the [White Clay Creek](#) watershed. Nationally this community is known from the [Potomac River](#) in Virginia and Maryland and has also been noted on the [Susquehanna River](#) near Havre de Grace, Maryland.

**Estimated acres in Delaware = 0.6 acres (February 2012)**

\*This community is not affected by sea level rise.

**Equivalent or related communities in nearby states:**

**Maryland:** Central Appalachian/Piedmont Bedrock Floodplain Woodland

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** unknown

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Central Appalachian Stream and Riparian

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**New Castle County**

-Alapocas Woods State Park

**[-Back to New Castle County Woodlands-](#)**

**Atlantic White Cedar/Seaside Alder Swamp      GNR      S1      D?**

**NVC Alliance:** [A.571-\*Chamaecyparis thyoides\* Seasonally Flooded Woodland Alliance](#)

**NVC Association:** CEGLO06307-*Chamaecyparis thyoides*/*Alnus maritima* Woodland

**Delaware Type Locality:** Cedar Creek upstream of Hudson Pond and just west of US 113 south of Milford in Sussex County (38°50'10.91"N, 075°26'23.61"W).

**Description:** This swamp community is restricted to stream floodplains and artificial mill ponds on the Delmarva Peninsula in Delaware and Maryland.

Atlantic white cedar (*Chamaecyparis thyoides*) is the dominant species and some cases may be joined by loblolly pine (*Pinus taeda*). Seaside alder (*Alnus maritima*) is present in the understory and on the edges of water and canopy gaps. Other woody species that may be found include common alder (*Alnus serrulata*), southern bayberry (*Morella cerifera*), ink-berry (*Ilex glabra*), sweet pepperbush (*Clethra alnifolia*) and swamp-loosestrife (*Decodon verticillatus*). Herbs may include arrow-arum (*Peltandra virginica*), three-way sedge (*Dulichium arundinaceum*), blunt mannagrass (*Glyceria obtusa*) and Atlantic sedge (*Carex atlantica*).



**Diagnostic Features:** This is the only woodland in Delaware where Atlantic white cedar and seaside alder are co-dominant.

**Cedar Creek upstream of  
Hudson Pond  
Sussex County**

**Geology and Environmental Features:** Substrate of peat and muck with a hummock and hollow topography

**Landscape Position:** In the wet floodplains and upper ends of millponds

**Associated Soil Series:** Manahawkin Muck, frequently flooded

**Species documented from this community**

Animals

Non-Vascular Plants

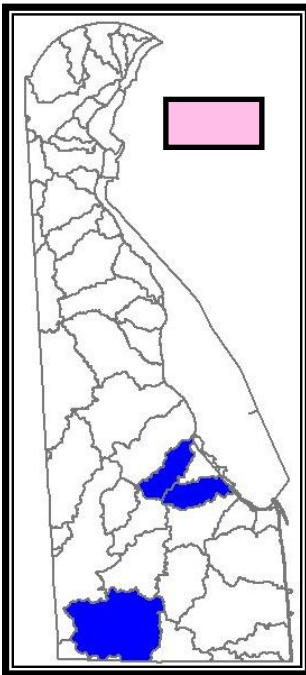
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Roundleaf Sundew (*Drosera rotundifolia*), Water Bulrush (*Schoenoplectus subterminalis*), coast sedge (*Carex exilis*), bayonet rush (*Juncus militaris*), flattened pipewort (*Eriocaulon compressum*), seaside alder (*Alnus maritima*)



**Distribution:** Three locations are known for this community in Delaware; upstream of Hudson Pond, one in Broad Creek and one in Prime Hook National Wildlife Refuge. Nationally this community is only found in Delaware and Maryland.

**Estimated Acres in Delaware = 61.3 (February 2012)**

\*This community is not affected by sea level rise.

**Equivalent or related communities in nearby states:**

**Maryland:** Atlantic White Cedar/Seaside Alder Swamp

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Stream and River

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Sussex County**

-Prime Hook National Wildlife Refuge

**[-Back to Sussex County Woodlands-](#)**



## Freshwater Tidal Woodland

G2

S2

D

**NVC Alliance:** [A.356-Fraxinus pennsylvanica-Acer rubrum-Ulmus americana Tidal Forest Alliance](#)

**NVC Association:** CEGLO06165-Acer rubrum-Fraxinus pennsylvanica/Polygonum spp. Forest

**Delaware Type Locality:** Grays Farm Tract at Milford Neck Wildlife Area on the Murderkill River.

**Description:** This woodland is found in places where sea level rise and tide have encroached upon a Red Maple-Sweetgum Swamp ([CEGL006110](#)) or a Southern Red Maple-Blackgum Swamp Forest ([CEGL006238](#)).

Canopy associates in Delaware include just red maple ([Acer rubrum](#)), but some places may include green ash (*Fraxinus pennsylvanica*), slippery elm (*Ulmus rubra*), and American hornbeam (*Carpinus caroliniana*). Some places may also have Atlantic white cedar ([Chamaecyparis thyoides](#)). The shrub layer is composed of winterberry ([Ilex verticillata](#)), common alder ([Alnus serrulata](#)), sweet pepperbush ([Clethra alnifolia](#)), swamp azalea ([Rhododendron viscosum](#)), spicebush ([Lindera benzoin](#)) and silky dogwood ([Cornus amomum](#)). The herb layer can be very diverse and composed of sensitive fern ([Onoclea sensibilis](#)), orange jewelweed ([Impatiens capensis](#)), jack-in-the-pulpit ([Arisaema triphyllum](#)) and others.

**Diagnostic Features:** A woodland dominated by red maple at the edge of tide distinguishes this community from others in Delaware.

**Geology and Environmental Features:** This community occurs in a very wet substrate.

**Landscape Position:** Floodplains at the upper limit of tide

**Associated Soil Series:** AAA

### **Species documented from this community**

Animals

Non-Vascular Plants

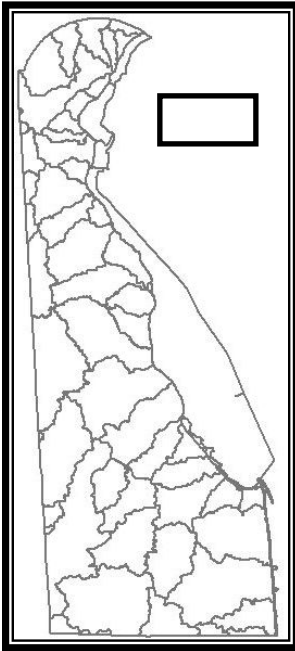
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** This community is documented from the Murderkill River and Augustine Creek areas and is likely present near the limits of tide on most of the Delaware Bay tributaries. Nationally this community is known from Massachusetts south to Delaware.

**Estimated Acres in Delaware = 676.6 (February 2012)**

**-Acres with 0.5 m sea level rise = 22.4-20.9 = 1.5**

**-Acres with 1 m sea level rise = 22.4-22.0 = 0.4**

**-Acres with 1.5 m sea level rise = 22.4-22.3 = 0.1**

**Equivalent or related communities in nearby states:**

**Maryland:** not present

**New Jersey:** unknown

**Pennsylvania:** not present

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Tidal Swamp

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**New Castle County**

-Augustine Wildlife Area

**Kent County**

-Milford Neck Wildlife Area

**[-Back to Kent County Woodlands-](#)**  
**[-Back to New Castle County Woodlands-](#)**

## Inland Dune and Ridge Forest/Woodland

G3

S2

D2

**NVC Alliance:** A.119-*Pinus echinata* Forest Alliance

**NVC Association:** CEGLO06851-*Pinus echinata/Quercus (falcata, nigra)/Vaccinium pallidum* Woodland

**Delaware Type Locality:** Doe Bridge Nature Preserve on the west side of Cow Bridge Branch in Sussex County ([38°37'3.94"N, 75°18'35.42"W](#)).

**Description:** This dry woodland community is located on ridges in the Nanticoke River, Indian River and Indian River Bay watersheds. Inland Dune Ridge and Woodland/Forests contain a high abundance of shortleaf pine ([Pinus echinata](#)) a species that is uncommon in the state. This community was recently described.

The canopy is composed of number of different species and is not particularly dominated by a specific species. Species in the canopy include Virginia pine ([Pinus virginiana](#)), shortleaf pine, northern red oak ([Quercus rubra](#)), white oak ([Quercus alba](#)), southern red oak ([Quercus falcata](#)), black gum ([Nyssa sylvatica](#)), mockernut hickory ([Carya alba](#)), black oak ([Quercus velutina](#)) and sweetgum ([Liquidambar styraciflua](#)). The understory is composed of sand hickory ([Carya pallida](#)), water oak ([Quercus nigra](#)), American holly ([Ilex opaca](#)), flowering dogwood ([Cornus florida](#)) and black gum ([Nyssa sylvatica](#)). The shrub layer is dense in places with low-bush blueberry ([Vaccinium pallidum](#)) and scattered mountain laurel ([Kalmia latifolia](#)). The herbs include mainly just partridge-berry ([Mitchella repens](#)).



**Woods west of Millsboro Pond  
Sussex County**

**Diagnostic Features:** This community is defined by the prominent presence of shortleaf pine that is associated by southern red oak and sand hickory. This combination of species is diagnostic of this community and separates it from the closely related Inland Dune Ridge Forest ([CEGL006354](#))

**Geology and Environmental Features:** This limited locations that we have in Delaware appear to prefer the Fort Mott-Henlopen complex soil series. These soils are dry and sandy and are similar to the Parsonsburg Sand that the Inland Dune Ridge Forest ([CEGL006354](#)) is found on.

**Landscape Position:** Higher elevation places on the soil series below.

**Associated Soil Series:** Fort Mott-Henlopen Complex, Evesboro loamy sand, Henlopen loamy sand

**Species documented from this community**

Animals

Non-Vascular Plants

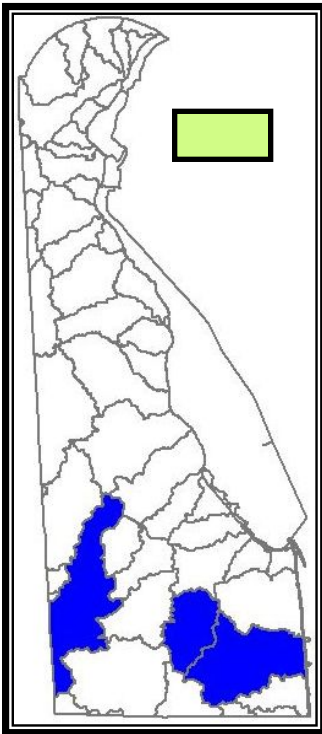
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Shortleaf Pine (*Pinus echinata*)



**Distribution:** This community has been found in the [Indian River](#), Indian River Bay and [Nanticoke River](#) watersheds in Delaware. Nationally it is known from Delaware, Maryland and New Jersey.

**Estimated acres in Delaware = 1,200.1 (February 2012)**

**-Acres with 0.5 m sea level rise = 748.8-7.9 = 740.9**

**-Acres with 1 m sea level rise = 748.8-20.7 = 728.1**

**-Acres with 1.5 m sea level rise = 748.8-37.8 = 711.0**

**Equivalent or related communities in nearby states:**

**Maryland:** Inland Dune and Ridge Woodland (Harrison, pers. comm.)

**New Jersey:** unknown

**Pennsylvania:** not present

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Upland Woodlands

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Hardwood Forest

**Landfire Classification Code:** unknown

**Public places to Delaware to view this community**

**Sussex County**

**[-Back to Sussex County Woodlands-](#)**

## Loblolly Pine Dune Woodland

G1G2

S1

D?

NVC Alliance: [A.526-Pinus taeda Woodland Alliance](#)

NVC Association: [CEGL006052-Pinus taeda/Hudsonia tomentosa Woodland](#)

**Delaware Type Locality:** [Fenwick Island State Park](#) on the west side of DE 1 just north of Fenwick Island ([38°29'55.94"N, 075° 3'20.52"W](#)).

**Description:** Loblolly Pine Dune Woodlands are located on the dunes of [barrier islands](#) that are exposed to actively shifting foredunes, salt spray, wind and storms. Additionally it can occur on unstable backdunes. In places where the woodland is dense, pine duff can accumulate and provide a substrate for a diverse coverage of herbs. In less dense woodlands there is less duff and areas of exposed white sand can be found. Most of the trees in this community have multiple trunks and low spreading branches.

Southern red oak ([Quercus falcata](#)), willow oak ([Quercus phellos](#)) and American holly ([Ilex opaca](#)) are frequent canopy associates for the nominal species (loblolly pine ([Pinus taeda](#))) in this community. Smaller members of the canopy compose a sparse understory. Shrubs are sparse as well and can include southern bayberry ([Morella cerifera](#)), loblolly pine ([Pinus taeda](#)) and highbush blueberry ([Vaccinium corymbosum](#)). A sparse low shrub layer of beach heather ([Hudsonia tomentosa](#)) is common to this community. Typical vines are common to many barrier island communities and include poison ivy ([Toxicodendron radicans](#)), whiteleaf greenbrier ([Smilax glauca](#)) and common greenbrier ([S. rotundifolia](#)). Broom sedge ([Andropogon virginicus](#)) is the most common herb encountered in the sparse herbaceous layer. Other herbs can include woolly witchgrass ([Dichanthelium acuminatum](#)), broom witchgrass ([D. scoparium](#)), round-leaf thoroughwort ([Eupatorium rotundifolium](#)), fleabane ([Erigeron](#) spp.), slender flat-top goldenrod ([Euthamia tenuifolia](#)), seaside goldenrod ([Solidago sempervirens](#)) and fragrant cudweed ([Gnaphalium obtusifolium](#)).



**Fenwick Island State Park  
Sussex County**

**Diagnostic Features:** Woodland dominated by loblolly pine located on barrier island dunes readily identifies this community.

**Geology and Environmental Features:** This community occurs on dry sandy soils that are rapidly drained.

**Landscape Position:** Barrier island dunes that are exposed to salt spray.

**Associated Soil Series:** Acquango-Beaches complex 0 to10 percent slopes

**Species documented from this community**

Animals

Non-Vascular Plants

Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

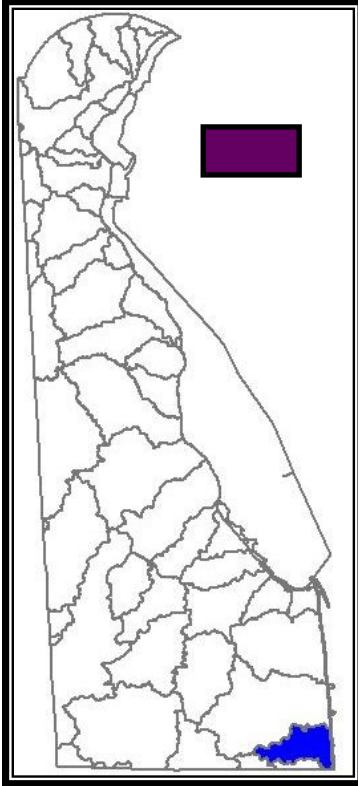
**Vascular Plants:** Carolina Fimbry ([Fimbristylis caroliniana](#)), Twisted Ladies-tresses' ([Spiranthes vernalis](#)), Bristly Foxtail ([Setaria parviflora](#))

**Ecological Integrity Assessment (EIA)**

A = 0, B = 5, C = 3, D = 0

**Average EIA = 3.69      X=8**





**Distribution:** This community is found within [Cape Henlopen State Park](#) and at [Fenwick Island State Park](#) in Delaware. Nationally this community is found on the coasts of Delaware, Maryland and Virginia.

**Estimated acres in Delaware = 137.2 (February 2012)**

**-Acres with 0.5 m sea level rise = 34.0-19.6 = 14.4**

**-Acres with 1 m sea level rise = 34.0-30.7 = 3.3**

**-Acres with 1.5 m sea level rise = 34.0-32.6 = 1.4**

**Equivalent or related communities in nearby states:**

**Maryland:** No common name (Harrison 2004)

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** Mid-Atlantic Xeric Dune Woodland (Loblolly Pine/Beach Heather Type)  
(Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Loblolly Pine Dune Woodland

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Maritime Forest

**Landfire Classification Code:** 4322

**Public places in Delaware to view this community**

**Sussex County**

- Assawoman Wildlife Area
- Cape Henlopen State Park

-Fenwick Island State Park

[-Back to Sussex County Woodlands-](#)

## Loblolly Pine/Wax-myrtle/Salt Meadow Cordgrass Tidal Woodland

GNR S3 D5

NVC Alliance: [A.536-Pinus taeda Woodland Alliance](#)

NVC Association: [CEGL006849-Pinus taeda/Morella cerifera/Spartina patens Woodland](#)

**Delaware Type Locality:** Angola Neck peninsula in Sussex County ([38°39'19.73"N, 075°8'31.76"W](#)).

**Description:** This community is often found on the edges of North Atlantic and Mid Atlantic High Salt Marshes. They can occasionally be covered by tidal flooding.

Loblolly pine (*Pinus taeda*) is about the only species in the canopy and this species is also prominent in the understory. The shrub layer is generally a dense layer of southern bayberry (*Morella cerifera*). The sparse herb layer may include salt meadow cordgrass (*Spartina patens*), switchgrass (*Panicum virgatum*) and seashore saltgrass (*Distichlis spicata*). On the edges, some pines may be dying due to tidal encroachment.



**Salt Pond Area  
Sussex County**

**Diagnostic Features:** This woodland can be told from others by the dense understory of southern bayberry and an herb layer of salt meadow cordgrass.

**Geology and Environmental Features:** This woodland receives occasional tidal water.

**Landscape Position:** Higher elevation areas on the edge of salt marshes.

**Associated Soil Series:** Askecksy Loamy Sand-0 to 2 percent slopes, Sunken mucky Silt Loam-0 to 2 percent slopes, occasionally flooded, tidal

### Species documented from this community

Animals

Non-Vascular Plants

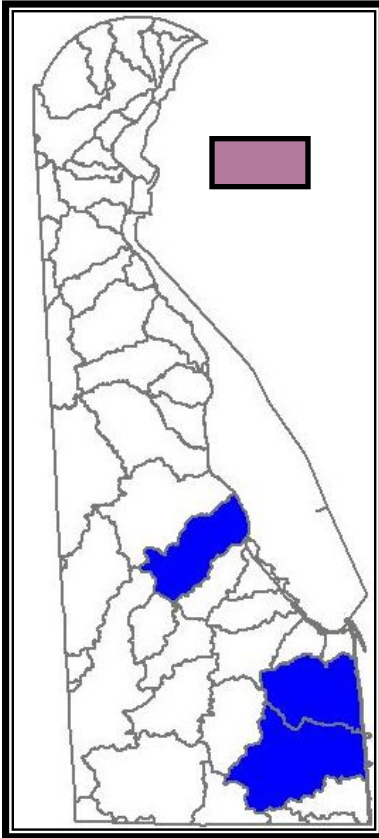
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** This community is known from the Inland Bays Region and scattered locations along the [Delaware Bay](#) in Delaware. Nationally it is only known from Delaware and Maryland.

**Estimated acres in Delaware = 272.5 (February 2012)**

**-Acres with 0.5 m sea level rise =  $340.5 - 265.8 = 74.7$**

**-Acres with 1 m sea level rise =  $340.5 - 328.1 = 12.4$**

**-Acres with 1.5 m sea level rise =  $340.5 - 337.4 = 3.1$**

**Equivalent or related communities in nearby states:**

**Maryland:** Loblolly Pine/Wax-myrtle/Salt Meadow Cordgrass Tidal Woodland

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Maritime Forest

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Sussex County**

- Assawoman Wildlife Area
- Bethany Beach Park
- Cape Henlopen State Park

**[-Back to Sussex County Woodlands-](#)**

## Maritime Red-cedar Woodland

G2

S2

D?

NVC Alliance: [A.545-Juniperus virginiana Woodland Alliance](#)

NVC Association: [CEGL006212-Juniperus virginiana var. virginiana/Morella pensylvanica Woodland](#)

**Delaware Type Locality:** Sandy island in the marsh to the west of Broadkill Beach in Prime Hook National Wildlife Refuge in Sussex County ([38°49'4.66"N, 75°12'14.80"W](#)).

**Description:** Maritime woodland community of sand dunes dominated by eastern red cedar ([Juniperus virginiana](#)) that is influenced by onshore winds and salt spray and tidal overwash from severe storms. The trees in the canopy are generally less than 4 meters in height. In Delaware this community may be the result of the grazing of ungulates in the early part of the 20<sup>th</sup> century but could also be due to the dry conditions of the community location.

Besides the nominal species other species in the canopy may include pitch pine ([Pinus rigida](#)), southern red oak ([Quercus falcata](#)), sassafras ([Sassafras albidum](#)), loblolly pine ([Pinus taeda](#)), persimmon ([Diospyros virginiana](#)) and wild black cherry ([Prunus serotina](#)). The shrub layer is composed of northern bayberry ([Morella pensylvanica](#)), southern bayberry ([Morella cerifera](#)), salt shrub ([Baccharis halimifolia](#)), southern marsh elder ([Iva frutescens](#)) and highbush blueberry ([Vaccinium corymbosum](#)). Vines may form a dense layer and include poison ivy ([Toxicodendron radicans](#)), Virginia creeper ([Parthenocissus quinquefolia](#)), whiteleaf greenbrier ([Smilax glauca](#)), common greenbrier ([S. rotundifolia](#)) and trumpet creeper ([Campsis radicans](#)). In places where there is a canopy of eastern red cedar no herbs may be present. In open areas, however, there may be a diverse layer of herbs typically found in salt marshes and dunes. Some of the common herbs include egg-leaf witchgrass ([Dichanthelium ovale](#)), switchgrass ([Panicum virgatum](#)), eastern prickly pear cactus ([Opuntia humifusa](#)), salt meadow cordgrass ([Spartina patens](#)), tall beach panicgrass ([Panicum amarum](#) var. [amarulum](#)), Gray's flatsedge ([Cyperus grayi](#)), little bluestem ([Schizachyrium scoparium](#)), eastern jointweed ([Polygonella articulata](#)), hawkweed ([Hieracium gronovii](#)) and seaside goldenrod ([Solidago sempervirens](#)).



**Prime Hook  
National Wildlife Refuge  
Sussex County**

**Diagnostic Features:** The dominance of eastern red cedar and its maritime location defines this community.

**Geology and Environmental Features:** In Delaware this community is found on dry sandy areas that are between the coast and salt marsh behind.

**Landscape Position:** Maritime Red Cedar Woodlands occur in sandy places behind the dunes on [Delaware Bay](#) where they are protected from the direct effects of salt spray. These locations are very dry.

**Associated Soil Series:** Broadkill mucky peat, very frequently flooded, Pawcatuck mucky peat

**Species documented from this community**

Animals

Non-Vascular Plants

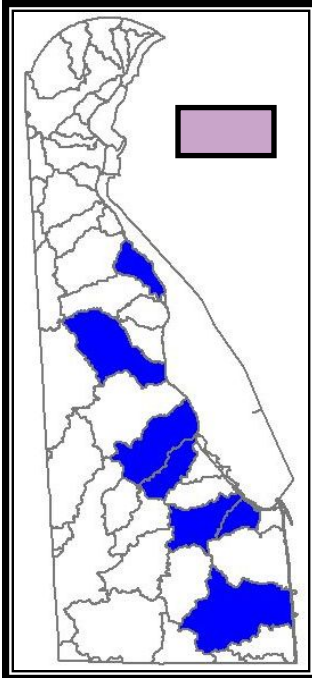
Vascular Plants

**Associated Rare Species:**

**Animals:** Southern broken dash (*Wallengrenia otho*), little glassywing (*Pompeius verna*), Delaware skipper (*Anatrytone. logan*), graphic moth ([Drasteria graphica](#))

**Non-Vascular Plants:** unknown

**Vascular Plants:** Golden Heather ([Hudsonia ericoides](#))



**Distribution:** In Delaware this community is located from Kitts Hummock south to Fenwick Island. The best examples can be found at [Cape Henlopen State Park](#). Nationally this community is found from Massachusetts south to Virginia.

**Estimated acres in Delaware = 134.7 (February 2012)**

**-Acres with 0.5 m sea level rise = 151.8-139.7 = 12.1**

**-Acres with 1 m sea level rise = 151.8-148.1 = 3.7**

**-Acres with 1.5 m sea level rise = 151.8-150.9 = 0.9**

**Equivalent or related communities in nearby states:**

**Maryland:** Maritime Red Cedar Woodland (Harrison 2004)

**New Jersey:** *Juniperus virginiana* var. *virginiana* / *Morella pensylvanica* Woodland (Breden et al 2001)

Dune Woodland Community (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** unknown

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Maritime Red Cedar Woodland

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Maritime Forest

**Landfire Classification Code:** 4322

**Public places in Delaware to view this community**

**Sussex County**

-Prime Hook Wildlife Area



[-Back to Kent County Woodlands-](#)  
[-Back to Sussex County Woodlands-](#)

## Pitch Pine Dune Woodland

G2G3

S1

D2

NVC Alliance: [A.524-Pinus rigida Woodland Alliance](#)

NVC Association: [CEGL006117-Pinus rigida/Hudsonia tomentosa Woodland](#)

**Delaware Type Locality:** [Cape Henlopen State Park](#)

**Description:** This pine community occurs on back dunes that are more stable than those found closer to the ocean. Active sand movement from storm activity causes the boundaries of this community to migrate over time. The canopy height ranges from 10-15 meters in height and is highly variable in cover. Fire plays an important role in maintaining this community.

Besides the nominal species, other canopy species are infrequent but may include sassafras ([Sassafras albidum](#)), eastern red cedar ([Juniperus virginiana](#)), southern red oak ([Quercus falcata](#)) and Virginia pine ([Pinus virginiana](#)). The sparse understory is composed of blackjack oak ([Quercus marilandica](#)), post oak ([Q. stellata](#)), blackgum ([Nyssa sylvatica](#)) and wild black cherry ([Prunus serotina](#)). Sometimes a shrub layer of black huckleberry ([Gaylussacia baccata](#)), blue huckleberry ([G. frondosa](#)) and early lowbush blueberry ([Vaccinium pallidum](#)) is present. A sparse vine layer is characteristic of this community and includes common greenbrier ([Smilax rotundifolia](#)), whiteleaf greenbrier ([S. glauca](#)), summer grape ([Vitis aestivalis](#)), Virginia creeper ([Parthenocissus quinquefolia](#)) and poison ivy ([Toxicodendron radicans](#)). A dwarf-shrub and herb layer is often present and composed of beach heather ([Hudsonia tomentosa](#)) for the dwarf shrubs and commons witchgrass ([Dichanthelium ovale](#) var. [addisonii](#)), sweet goldenrod ([Solidago odora](#)) and spotted wintergreen ([Chimaphila maculata](#)) in the herb layer. Many lichens may be present and include cup lichen ([Cladonia squamosa](#)), cup lichen ([C. strepsilis](#)), Carolina cup lichen ([C. caroliniana](#)) and dust lichen ([Lepraria incana](#)).



**Cape Henlopen State Park  
Sussex County, Delaware**

**Diagnostic Features:** There are very few communities in Delaware in which pitch pine ([Pinus rigida](#)) is the dominant species. The location of this community in a dune situation and the dominant species serves to identify this community.

**Geology and Environmental Features:** Stabilized backdunes that are influenced by wind and salt spray. The soil is dry, acidic and nutrient poor. During storms movement of the sand can occur causing the community to “migrate”.

**Landscape Position:** Pitch Pine Dune Woodlands are found on back dunes where there is more stability.

**Associated Soil Series:** unknown

**Species documented from this community**

Animals

Non-Vascular Plants

Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

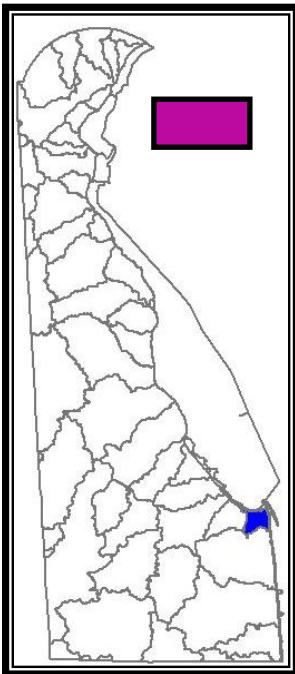
**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown

**Ecological Integrity Assessment (EIA)**

A = 0, B = 2, C = 0, D = 0

**Average EIA = 3.93     X=2**



**Distribution:** Pitch Pine woodlands are confined to Cape Henlopen State Park in Delaware. Nationally this community is found from Maine south to Delaware.

**Estimated Acres in Delaware = 900.3 (February 2012)**

**-Acres with 0.5 m sea level rise = 834.8-231.6 = 603.2**

**-Acres with 1 m sea level rise = 834.8-522.1 = 312.7**

**-Acres with 1.5 m sea level rise = 834.8-638.1 = 196.7**

**Equivalent or related communities in nearby states:**

**Maryland:** not present

**New Jersey:** *Pinus rigida* / *Hudsonia tomentosa* Woodland

Dune Woodland Community (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Pitch Pine Dune Woodland

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Maritime Forest

**Landfire Classification:** 4257

**Public places in Delaware to view this community**

**Sussex County**

-Cape Henlopen State Park

**[-Back to Sussex County Woodlands-](#)**

**Pitch Pine/Cranberry Interdunal Swale      GNR      S1**

**NVC Alliance:** [A.524-Pinus rigida Saturated Woodland Alliance](#)

**NVC Association:** CEGLO06127-Pinus rigida/Vaccinium macrocarpon Woodland

**Delaware Type Locality:** This community is known from [Cape Henlopen State Park](#).

**Description:** This pine community occurs on back dunes that are more stable than those found closer to the ocean. Active sand movement from storm activity causes the boundaries of this community to migrate over time. The canopy height ranges from 10-15 meters in height and is highly variable in cover. Fire plays an important role in maintaining this community.



**Diagnostic Features:** There are very few communities in Delaware in which pitch pine (*Pinus rigida*) is the dominant species. The location of this community in a dune situation and the dominant species serves to identify this community.

**Cape Henlopen State Park  
Sussex County, Delaware**

**Geology and Environmental Features:** Stabilized backdunes that are influenced by wind and salt spray. The soil is dry, acidic and nutrient poor. During storms movement of the sand can occur causing the community to “migrate”.

**Landscape Position:** Pitch Pine Dune Woodlands are found on back dunes where there is more stability.

**Associated Soil Series:** unknown

**Species documented from this community**

Animals

Non-Vascular Plants

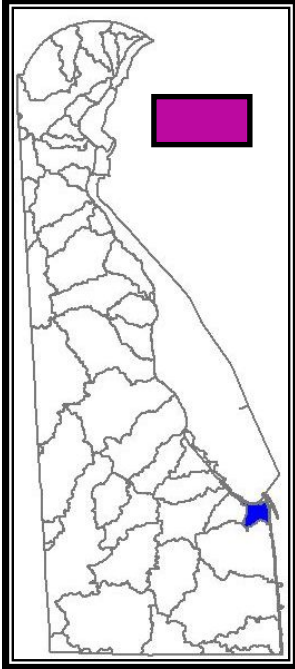
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** Pitch Pine woodlands are confined to Cape Henlopen State Park in Delaware. Nationally this community is found from Maine south to Delaware.

**Estimated Acres in Delaware = 1.0 (February 2012)**

\*This community is not affected by sea level rise.

**Equivalent or related communities in nearby states:**

**Maryland:** not present

**New Jersey:** *Pinus rigida* / *Hudsonia tomentosa* Woodland

Dune Woodland Community (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Pitch Pine Dune Woodland

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Maritime Forest

**Landfire Classification:** 4257

**Public places in Delaware to view this community**

**Sussex County**

-Cape Henlopen State Park

[-Back to Sussex County Woodlands-](#)

## Pitch Pine Lowland

G3

S1

D?

**NVC Alliance:** A.580-*Pinus rigida* Saturated Woodland Alliance

**NVC Association:** CEGLO06195-*Pinus rigida*/*Vaccinium corymbosum*-*Leucothoe racemosa*/*Sphagnum* spp. Woodland

**Delaware Type Locality:** This community is known from [Cape Henlopen State Park](#) north of Fort Miles.

**Description:** This pine community occurs in low places within the larger Pitch Pine Dune Woodland. Pitch pine (*Pinus rigida*) dominates the canopy with an understory of highbush blueberry (*Vaccinium corymbosum*), AAA.



**Diagnostic Features:** There are very few communities in Delaware in which pitch pine (*Pinus rigida*) is the dominant species. The location of this community in a lowland between dunes and the dominant species serve to identify this community.

### Cape Henlopen State Park Sussex County, Delaware

**Geology and Environmental Features:** Stabilized backdunes that are influenced by wind and salt spray. The soil is dry, acidic and nutrient poor. During storms movement of the sand can occur causing the community to “migrate”.

**Landscape Position:** Pitch Pine Dune Lowlands are found in low areas between dunes where there is more stability.

**Associated Soil Series:** unknown

### Species documented from this community

Animals

Non-Vascular Plants

Vascular Plants

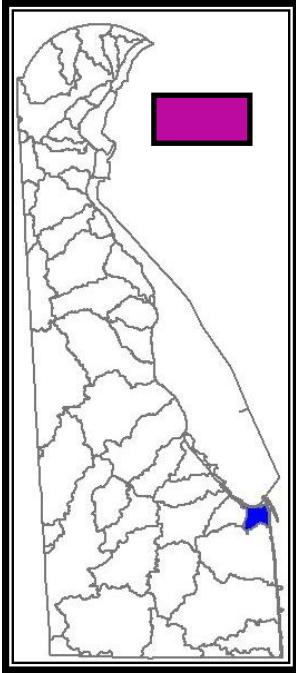
### Associated Rare Species:



**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** Pitch Pine lowlands are confined to Cape Henlopen State Park in Delaware. Nationally this community is found from AAA to AAA.

**Estimated Acres in Delaware = 7.3 (February 2012)**

**-Acres with 0.5 m sea level rise = 834.8-231.6 = 603.2**

**-Acres with 1 m sea level rise = 834.8-522.1 = 312.7**

**-Acres with 1.5 m sea level rise = 834.8-638.1 = 196.7**

**Equivalent or related communities in nearby states:**

**Maryland:** not present

**New Jersey:** *Pinus rigida* / *Hudsonia tomentosa* Woodland

Dune Woodland Community (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Pitch Pine Dune Woodland

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Maritime Forest

**Landfire Classification:** 4257

**Public places in Delaware to view this community**

**Sussex County**

-Cape Henlopen State Park

[-Back to Sussex County Woodlands-](#)

## Pond Pine Woodland

G?

S1

D1?

NVC Alliance: [A.581-Pinus serotina Saturated Woodland Alliance](#)

NVC Association: CEGLO06470-*Pinus serotina*/*Magnolia virginiana*/*Vaccinium corymbosum*/*Carex atlantica* Woodland

**Delaware Type Locality:** Doe Bridge Nature Preserve on the west side of Cow Bridge Branch in Sussex County ([38°36'44.23"N, 75°18'8.01"W](#)).

**Description:** This woodland community has a canopy dominated by pond pine (*Pinus serotina*) with an understory composed of red maple ([Acer rubrum](#)), sweetgum ([Liquidambar styraciflua](#)) and sweetbay ([Magnolia virginiana](#)). The shrub layer is dense and is dominated by highbush blueberry ([Vaccinium corymbosum](#)). Walter's greenbrier ([Smilax walteri](#)) occupies the vine layer along with occasional laurel leaf greenbrier ([Smilax laurifolia](#)). Common herbs include Atlantic sedge ([Carex atlantica](#)), shallow sedge ([C. lurida](#)), Virginia chainfern ([Woodwardia virginica](#)), brome-like sedge ([Carex bromoides](#)), royal fern ([Osmunda regalis](#)) and broad-leaf arrowhead ([Sagittaria latifolia](#)).



**Diagnostic Features:** Only one community in Delaware is dominated by pond pine. This fact serves to distinguish this community from others in the state.

### Doe Bridge Nature Preserve Sussex County

**Geology and Environmental Features:** This community occurs in saturated to inundated soil that is organic. Some hummocks may be present. At Prime Hook National Wildlife Refuge this community is located at the edge of the Red Maple-Seaside Alder Woodland ([CEGL006317](#)) and shares many of its characteristics.

**Landscape Position:** Pond pine woodlands are found on the edges of large shrub wetlands and marshes just above standing water.

**Associated Soil Series:** Puckum Muck, Transquaking and Mispillion Soils-very frequently flooded

### Species documented from this community

Animals

Non-Vascular Plants

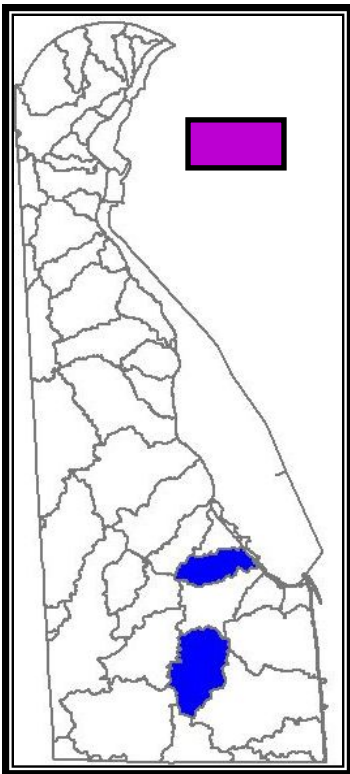
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** Currently this community is known only from two locations in Delaware one at Prime Hook National Wildlife Refuge and one at Doe Bridge Nature Preserve and a few locations in Maryland.

**Estimated Acres in Delaware = 11.0 (February 2012)**

\*This community is known affected by sea level rise.

**Equivalent or related communities in nearby states:**

**Maryland:** Present but name unknown

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Sussex County**

-Prime Hook Wildlife Area

**[-Back to Sussex County Woodlands-](#)**

**Red Maple/Seaside Alder Woodland**                      **GNA**                      **SNA**                      **DNA**

**NVC Alliance:** [A.657-Acer rubrum Saturated Woodland Alliance](#)

**NVC Association:** CEGLO06317-Acer rubrum/Alnus maritima Woodland

**Delaware Type Locality:** Prime Hook National Wildlife Refuge on Prime Hook Creek in Sussex County ([38°49'34.78"N, 075°16'10.15"W](#)).

**Description:** This woodland community is open to partially open and maintained by an artificial impoundment at Prime Hook National Wildlife Refuge.

It is almost if not wholly dominated by red maple ([Acer rubrum](#)) in the overstory. The edges and understory if any are composed of seaside alder ([Alnus maritima](#)). The dense shrub layer has water-willow ([Decodon verticillatus](#)), sweet pepperbush ([Clethra alnifolia](#)), northern bayberry ([Morella pensylvanica](#)), and occasionally buttonbush ([Cephalanthus occidentalis](#)) and swamp deciduous doghobble ([Eubotrys racemosa](#)). Poison ivy ([Toxicodendron radicans](#)) and common greenbrier ([Smilax rotundifolia](#)) compose the liana layer. Herbaceous species include royal fern ([Osmunda regalis](#)), Virginia marsh St. John's wort ([Triadenum virginicum](#)), cardinal flower ([Lobelia cardinalis](#)), weak stellate sedge ([Carex seorsa](#)), three-way sedge ([Dulichium arundinaceum](#)) and swamp smartweed ([Polygonum hydropiperoides](#)).

**Note:** This community is currently being impacted by an influx of saltwater coming from an inlet that formed during the 2008 Mother's Day Storm on Delaware Bay. The location at Prime Hook National Wildlife Refuge is the only location in Delaware and the United States. It is possible that this community may be lost from the saltwater impacts.



**Prime Hook NWR**  
**Sussex County**

**Diagnostic Features:** This community can be identified by a large expanse of stunted red maple in a large inundated impoundment. Currently it is known only from Prime Hook National Wildlife Refuge and Bombay Hook National Wildlife Refuge. The community at Bombay Hook NWR is without seaside alder.

**Geological and Environmental Features:** This community relies on a tidal control structure which maintains a freshwater impoundment on Prime Hook Creek. Hummocks of peat are very evident and are the substrate on which the forest grows.

**Landscape Position:** This woodland is located within a freshwater impoundment of Prime Hook Creek created by a tidal structure within Prime Hook National Wildlife Refuge.

**Associated Soil Series:** Transquaking and Mispillion Soils, very frequently flooded, tidal

**Species documented from this community**

Animals

Non-Vascular Plants

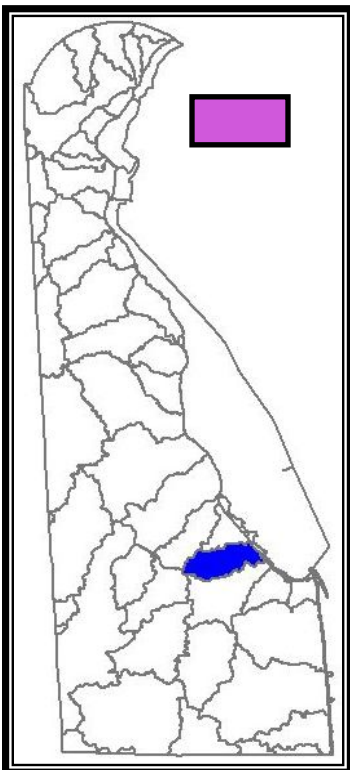
Vascular Plants

**Associated Rare Species:**

**Animals:** Great Purple Hairstreak (*Atlides halesus*), Carpenter Frog (*Rana virgatipes*), Cooper's Hawk (*Accipiter cooperii*)

**Non-Vascular Plants:** unknown

**Vascular Plants:** Seaside alder (*Alnus maritima*), Mitchell's Sedge (*Carex mitchelliana*), Umbrella Flatsedge (*Cyperus diandrus*), Small-fruit Beggar-tick's (*Bidens mitis*), Green-fringe Orchis (*Platanthera lacera*), Gibbous Grass (*Sacciolepis striata*)



**Distribution:** This community is known from a large area along Prime Hook Creek in Prime Hook National Wildlife Refuge and Bombay Hook National Wildlife Refuge. These two places are the only locations for this community in the United States.

**Estimated Acres in Delaware = 1,219.7 (February 2012)**

**-Acres with 0.5 m sea level rise = 1,217.4-1,098.4 = 119.0**

**-Acres with 1 m sea level rise = 1,217.4-1,214.7 = 2.7**

**-Acres with 1.5 m sea level rise = 1,217.4-1,216.7 = 0.7**

**Equivalent or related communities in nearby states:**

**Maryland:** not present

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Basin Peat Swamp

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Sussex County**

-Prime Hook National Wildlife Refuge

-Prime Hook Wildlife Area

[-Back to Kent County Woodlands-](#)  
[-Back to Sussex County Woodlands-](#)



## Red Maple/Upright Sedge Wooded Marsh

G3G5

S1

NVC Alliance: [A.653-Acer rubrum Seasonally Flooded Woodland Alliance](#)

NVC Association: CEGL006119-Acer rubrum/Carex stricta-Onoclea sensibilis Woodland

**Delaware Type Locality:** Floodplain of Cow Bridge Branch in Doe Bridge Nature Preserve in Sussex County ([38°36'52.00"N, 075°18'15.16"W](#)).

**Description:** This woodland/marsh community is found in the floodplain of Cow Bridge Branch just upstream of Millsboro Pond. It is located in peaty to mineral soils that are saturated to the surface.

The canopy is composed of an occasional red maple ([Acer rubrum](#)) with a herbaceous understory that is strongly dominated by tussock sedge ([Carex stricta](#)). The understory has an occasional sweetgum ([Liquidambar styraciflua](#)). The sparse shrub layer is dominated by smooth alder ([Alnus serrulata](#)) that is associated by winterberry ([Ilex verticillata](#)), highbush blueberry ([Vaccinium corymbosum](#)) and arrow-wood ([Viburnum dentatum](#)). Other herbaceous species include pickerelweed ([Peltandra virginica](#)), asymmetrical fringed sedge ([Carex crinita](#)), hollow-stem Joe-pye-weed ([Eupatorium fistulosum](#)), fowl mannagrass ([Glyceria striata](#)), spikerush ([Juncus effusus](#)) and halbeard-leaf tearthumb ([Polygonum arifolium](#)).



**Diagnostic Features:** A woodland community with a low canopy of red maple and an understory dominated by upright sedge readily identifies this community.

### Doe Bridge Nature Preserve Sussex County

**Geology and Environmental Features:** Peaty to mineral soils in the floodplain of Cow Bridge Branch in Sussex County.

**Landscape Position:** Floodplains of Coastal Plain streams.

**Associated Soil Series:** Puckum Muck, frequently flooded

### Species documented from this community

Animals

Non-Vascular Plants

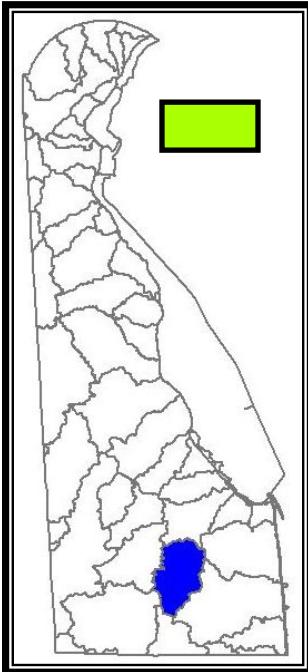
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Canada mannagrass ([Glyceria canadensis](#))



**Distribution:** This community is known only from the floodplain of Cow Bridge Branch in Sussex County. Nationally it is found from Maine south to Delaware.

**Estimated Acres in Delaware = 51.5 (February 2012)**

**-Acres with 0.5 m sea level rise = 51.2-0.0 = 51.2**

**-Acres with 1 m sea level rise = 51.2-0.0 = 51.2**

**-Acres with 1.5 m sea level rise = 51.2-40.9 = 10.3**

**Equivalent or related communities in nearby states:**

**Maryland:** not present

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** North Central Appalachian Acidic Swamp

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

There are no known public places to view this community.

**[-Back to Sussex County Woodlands-](#)**

## New Castle County Shrublands

**Alluvial Alder Swamp:** Shrubland dominated by smooth alder (*Alnus serrulata*) that is not tidal and is found in alluvial wetlands and seepage slopes. ([CEGL006414](#)) **Appoquinimink River; Christina River**

**Irregularly Flooded Eastern Tidal Salt Shrub:** A shrubland that is dominated by salt shrub (*Baccharis halimifolia*). ([CEGL003921](#)) **Blackbird Creek; Cedar Swamp; Smyrna River**

**North Atlantic Fresh Tidal Shrub Swamp:** Shrubland that is dominated by smooth alder and located on a tidal rivers and streams. ([CEGL006337](#)) **Christina River**

**Northeastern Buttonbush Shrub Swamp:** Shrubland that is not in a Delmarva Bay and is dominated by buttonbush (*Cephalanthus occidentalis*). ([CEGL006069](#)) **Blackbird Creek; Eastern C and D Canal; Little Assawoman Bay**

**Shrubby St. John's Wort Shrubland:** Shrubland that is dominated by shrubby St. John's wort (*Hypericum prolificum*) located in the Brandywine Creek watershed. ([NVC-TBD](#)) **Piedmont-Brandywine Creek**

**Willow River-Bar Shrubland:** Shrubland that is located on scour shores and rocks and is dominated by black willow (*Salix nigra*). ([CEGL006065](#)) **Brandywine Creek; Red Clay Creek**

## Kent County Shrublands

**Atlantic Coast Interdune Swale:** A coastal community that is co-dominated by northern bayberry (*Morella pensylvanica*) and southern bayberry (*Morella cerifera*) and has an understory of salt meadow cordgrass (*Spartina patens*). ([CEGL003839](#))

**Blueberry Wetland Thicket:** Shrub thicket that is dominated by highbush blueberry (*Vaccinium corymbosum*) and may have a canopy of scattered loblolly pine (*Pinus taeda*). ([CEGL006371](#)) **St. Jones River**

**Brackish Tidal Creek Shrubland:** A shrubland dominated by southern bayberry (*Morella cerifera*) that is located along tidal rivers and creeks. ([CEGL006846](#)) **Mispillion River**

**Irregularly Flooded Eastern Tidal Salt Shrub:** A shrubland that is dominated by salt shrub (*Baccharis halimifolia*). ([CEGL003921](#)) **Duck Creek; Leipsic River; Little Creek; Murderkill River; Simons River; St. Jones River**

**Swamp-loosestrife Shrub Swamp:** A shrubland dominated by swamp-loosestrife (*Decodon verticillatus*) that is located on the edges of lakes, ponds and streams. ([CEGL005089](#)) **Leipsic River; St. Jones River**

**Wax-myrtle Shrub Swamp:** Wet shrub swamp that is dominated by wax-myrtle (*Morella cerifera*). ([CEGL003840](#)) **Duck Creek; Mispillion River**

[-Back to Key to Delaware Vegetation Communities-](#)

## Sussex County Shrublands

**Atlantic Coast Interdune Swale:** A coastal community that is co-dominated by northern bayberry (*Morella pensylvanica*) and southern bayberry (*Morella cerifera*) and has an understory of salt meadow cordgrass (*Spartina patens*). ([CEGL003839](#)) **Lewes-Rehoboth Canal; Little Creek; Prime Hook Creek; Rehoboth Bay; Simons River; Slaughter Creek**

**Blueberry Wetland Thicket:** Shrub thicket that is dominated by highbush blueberry (*Vaccinium corymbosum*) and may have a canopy of scattered loblolly pine (*Pinus taeda*). ([CEGL006371](#)) **Nanticoke River**

**Brackish Shrubland:** A shrubland that is dominated by southern marsh elder (*Iva frutescens*) and has a high amount of big salt marsh cordgrass (*Spartina cynosuroides*). ([CEGL006847](#)) **There are no known locations for Delaware, but it is likely in Sussex County.**

**Brackish Tidal Creek Shrubland:** A shrubland dominated by southern bayberry (*Morella cerifera*) that is located along tidal rivers and creeks. ([CEGL006846](#)) **There are currently no known locations for Delaware, but it is likely in Sussex County.**

**Central Coast Beach Heather Dune Shrubland:** A dwarf-shrubland that is dominated by beach heather (*Hudsonia ericoides*) that forms mats on dunes. ([CEGL003950](#)) **Breakwater Harbor, Broadkill River; Indian River Bay; Lewes-Rehoboth Canal; Little Assawoman Bay; North Atlantic Strand; Red Mill Creek; Rehoboth Bay; South Atlantic Strand**

**Chesapeake Bay Maritime Shrubland:** A shrubland that is dominated by northern bayberry (*Morella pensylvanica*) and is associated by beach plum (*Prunus maritima*). ([CEGL003881](#)) **Breakwater Harbor; Northern Atlantic Strand; Rehoboth Bay; Southern Atlantic Strand**

**Chesapeake Bay Tall Maritime Shrubland:** A shrubland that is dominated by wild black cherry (*Prunus serotina*) and associated by loblolly pine (*Pinus taeda*), service berry (*Amelanchier arborea*), and sassafras (*Sassafras albidum*). ([CEGL006319](#)) **Breakwater Harbor; Lewes-Rehoboth Canal; Rehoboth Bay**

**Irregularly Flooded Eastern Tidal Salt Shrub:** A shrubland that is dominated by salt shrub (*Baccharis halimifolia*). ([CEGL003921](#)) **Broadkill River; Cedar Creek; Indian River Bay; Lewes-Rehoboth Canal; Little Assawoman Bay; Mispillion River; Red Mill Creek; Rehoboth Bay; Slaughter Creek;**

**Northeastern Buttonbush Shrub Swamp:** Shrubland that is not in a Delmarva Bay and is dominated by buttonbush (*Cephalanthus occidentalis*). ([CEGL006069](#)) **Prime Hook Creek**

**Hazel Alder Swamp:** Shrubland that is dominated by smooth alder (*Alnus serrulata*) that is found on muck at the bases of slopes. ([CEGL005082](#)) **Indian River**

**Southern Buttonbush Pond:** Shrubland that is dominated by buttonbush (*Cephalanthus occidentalis*). ([CEGL002191](#)) **There are no known locations for Delaware, but it is likely in Sussex County.**

**Swamp-loosestrife Shrub Swamp:** A shrubland dominated by swamp-loosestrife (*Decodon verticillatus*) that is located on the edges of lakes, ponds and streams. ([CEGL005089](#)) **Broadkill River; Cedar Creek; Indian River**

**Wax-myrtle Shrub Swamp:** Wet shrub swamp that is dominated by wax-myrtle (*Morella cerifera*). ([CEGL003840](#)) **Broadkill River; Cedar Creek; Indian River Bay; Lewes-Rehoboth Canal; Prime Hook Creek; Red Mill Creek; Rehoboth Bay;**

[-Back to Key to Delaware Vegetation Communities-](#)

## Shrubby St. John's Wort Shrubland

GNA

SNA

NVC Alliance: TBD

NVC Association: TBD

**Delaware Type Locality:** Shrubland to the west of the main entrance to Brandywine Creek State Park in New Castle County (39°48'9.65"N, 75°35'2.40"W).

**Description:** This shrubland is dominated by shrubby St. John's wort ([\*Hypericum prolificum\*](#)).

**Diagnostic Features:** This is the only shrubland in Delaware that has shrubby St. John's wort as a dominant species.

### **Geology and Environmental Features:**

**Landscape Position:** Seepage slopes on hills in the Piedmont.

**Associated Soil Series:** Hatboro Silt Loam

### **Species documented from this community**

Animals

Non-Vascular Plants

Vascular Plants

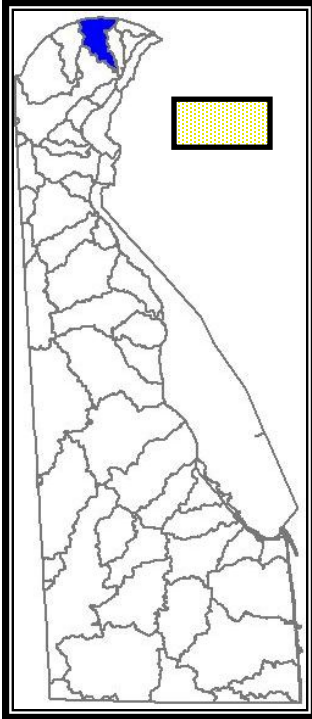
### **Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Shrubby St. John's wort (*Hypericum prolificum*)





**Distribution:** This community is known from Brandywine Creek State Park in the Brandywine Creek watershed in the Piedmont of Delaware. It is unknown whether this community is found outside of Delaware.

**Estimated acres in Delaware = 12.2 (February 2012)**

\*This community is not affected by sea level rise.

**Equivalent or related communities in nearby states:**

**Maryland:** not present

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** AAA

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**New Castle County**

-Brandywine Creek State Park

[-Back to New Castle County Shrublands-](#)

## Willow River-Bar Shrubland

GNA

SNA

NVC Alliance: [A.948-Salix nigra Temporarily Flooded Shrubland Alliance](#)

NVC Association: CEGL006065-Salix nigra/Phalaris arundinacea-Apocynum cannabinum  
Temporarily Flooded Shrubland

**Delaware Type Locality:** Shrubland located upstream of the Market Street Bridge in Wilmington on the left bank of Brandywine Creek ([39°45'2.67"N, 075°32'47.66"W](#))

**Description:** This sparse shrub community is located on scoured river bars and rocks in Brandywine Creek just above the fall line in Wilmington, De. Stunted black willow ([Salix nigra](#)) is the primary species with an occasional sycamore ([Platanus occidentalis](#)) mixed in. A few herbaceous plants may exist in these communities including sneezeweed ([Helenium autumnale](#)), Japanese knotweed ([Polygonum cuspidatum](#)) and cardinal flower ([Lobelia cardinalis](#)).



**Brandywine Creek  
New Castle County**

**Diagnostic Features:** The dominance of stunted black willow in a scour zone is diagnostic of this community.

**Geology and Environmental Features:** This community is found on thin sandy soils found in crevices in rocks that have been scoured by river water.

**Landscape Position:** Riverbanks and scour islands

**Associated Soil Series:** bare rock in streams

### **Species documented from this community**

Animals

Non-Vascular Plants

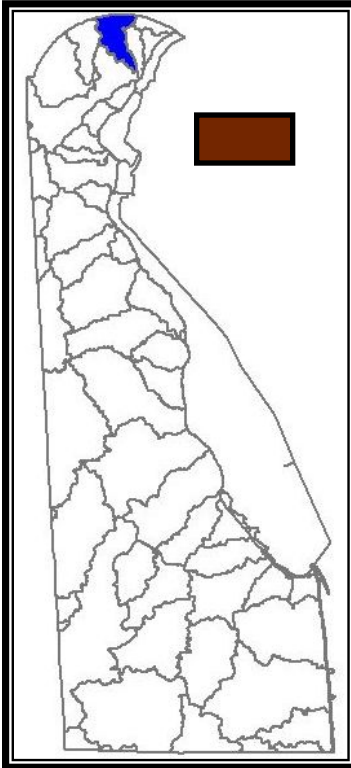
Vascular Plants

### **Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Bald Spikerush (*Eleocharis erythropoda*), Tall Dock (*Rumex altissimus*)



**Distribution:** This community is only known from Brandywine Creek just above the fall line in Delaware. Nationally this community is found on the east coast from Maine south to Maryland.

**Estimated Acres in Delaware = 0.4 (February 2012)**

**-Acres with 0.5 m sea level rise = 0.4-0.2 = 0.2**

**-Acres with 1 m sea level rise = 0.4-0.2 = 0.2**

**-Acres with 1.5 m sea level rise = 0.4-0.2 = 0.2**

**Equivalent or related communities in nearby states:**

**Maryland:** Present?

**New Jersey:** unknown

**Pennsylvania:** Black Willow Scrub / Shrub Wetland (Fike 1999)

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Central Appalachian Stream and Riparian

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**New Castle County**

-Wilmington State Park

[-Back to New Castle Shrublands-](#)

## Alluvial Alder Swamp

GNR

S1

D?

NVC Alliance: [A.943-\*Alnus serrulata\* Temporarily Flooded Shrubland Alliance](#)

NVC Association: [CEGL006414-\*Cornus amomum\*-\*Alnus serrulata\* Shrubland](#)

**Delaware Type Locality:** TBD

**Description:** This community is similar to the North Atlantic Freshwater Tidal Swamp ([CEGL006337](#)) except it is not tidal. It is found in alluvial floodplains and seepage slopes.

The canopy of shrubs is dominated by silky dogwood ([Cornus amomum](#)) and associated by Smooth alder ([Alnus serrulata](#)), buttonbush ([Cephalanthus occidentalis](#)) and arrow-wood ([Viburnum dentatum](#)). Some saplings of red maple ([Acer rubrum](#)), green ash ([Fraxinus pennsylvanica](#)) and black willow ([Salix nigra](#)) may be present. A small shrub layer of water-willow ([Decodon verticillatus](#)) is present. Common herbs include royal fern ([Osmunda regalis](#)) and rice-cut grass ([Leersia oryzoides](#)).



**Diagnostic Features:** The dominance of silky dogwood in a non-tidal situation can readily identify this community.

**Doe Bridge Nature Preserve  
Sussex County**

**Geology and Environmental Features:** Alluvial floodplains and seepage wetlands that have a high amount of water present.

**Landscape Position:** Saturated floodplains in the Coastal Plain

**Associated Soil Series:** Puckum Muck, frequently flooded

### Species documented from this community

Animals

Non-Vascular Plants

Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

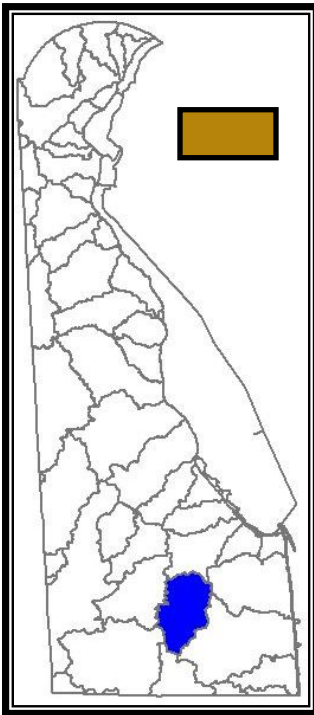
**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown

**Ecological Integrity Assessment (EIA)**

A = 1, B = 0, C = 1, D = 0      X = 2

**Average EIA = 3.71 (B)**



**Distribution:** This community is known from the floodplain of Cow Bridge Branch and the upper Christina River. Nationally it is found from Delaware south to Virginia.

**Estimated Acres in Delaware = 7.8 (February 2012)**

**-Acres with 0.5 m sea level rise = 8.0-1.5 = 6.5**

**-Acres with 1 m sea level rise = 8.0-2.4 = 5.6**

**-Acres with 1.5 m sea level rise = 8.0-6.9 = 1.1**

**Equivalent or related communities in nearby states:**

**Maryland:** unknown

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** unknown

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Stream and River

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

There are no known public places to view this community.

**[-Back to New Castle County Shrublands-](#)**

## Blueberry Wetland Thicket

G4

S1

D

**NVC Alliance:** [A.992-Vaccinium formosum-Vaccinium fuscatum-Vaccinium corymbosum Seasonally Flooded Shrubland Alliance](#)

**NVC Association:** [CEGL006371-Vaccinium corymbosum-Rhododendron viscosum-Clethra alnifolia Shrubland](#)

**Delaware Type Locality:** Nanticoke Wildlife Area south of Gum Branch and west of Woodland Ferry in Sussex County ([38°35'30.25"N, 075°38'21.84"W](#)).

**Description:** This tall shrubland occurs in places with a fluctuating water table, such as open basins and margins of Coastal Plain ponds.

Dominant shrubs include highbush blueberry ([Vaccinium corymbosum](#)), winterberry ([Ilex verticillata](#)) and swamp azalea ([Rhododendron viscosum](#)) associated by sweet pepperbush ([Clethra alnifolia](#)), hardhack spiraea ([Spiraea tomentosa](#)), inkberry ([Ilex glabra](#)), fetterbush ([Leucothoe racemosa](#)), buttonbush ([Cephalanthus occidentalis](#)) water-willow ([Decodon verticillatus](#)) and Smooth alder ([Alnus serrulata](#)). A canopy of red maple ([Acer rubrum](#)), loblolly pine ([Pinus taeda](#)) may be present in some localities. Common herbs may include cinnamon fern ([Osmunda cinnamomea](#)), royal fern ([Osmunda regalis](#)), marsh fern ([Thelypteris palustris](#)), sensitive fern ([Onoclea sensibilis](#)), rice-cut grass ([Leersia oryzoides](#)), fowl mannagrass ([Glyceria striata](#)), marsh St. John's wort ([Triadenum virginicum](#)), spikerush ([Juncus effusus](#)) and Virginia chainfern ([Woodwardia virginica](#)).



**Nanticoke Wildlife Area  
Sussex County**

**Diagnostic Features:** A shrubland dominated by highbush blueberry is diagnostic of this community.

**Geology and Environmental Features:** Highbush blueberry thickets are found in mineral soil with an organic layer. They are often flooded in the spring and early summer followed by a drop in water table below the soil surface in late summer and fall.

**Landscape Position:** Depressions in flat woods

**Associated Soil Series:** Mullica-Berryland complex 0 to 2 percent slopes



**Species documented from this community**

Animals

Non-Vascular Plants

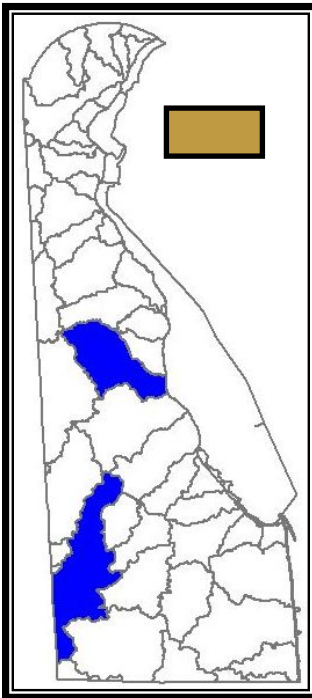
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** This community has been noted in the Nanticoke River watershed and on Cypress Branch, a tributary to the St. Jones River in Kent County. Nationally this community is found throughout the Northeastern United States from New Hampshire south to Delaware.

**Estimated Acres in Delaware = 1.9 acres (February 2012)**

\*This community is not projected to be affected by sea level rise.

**Equivalent or related communities in nearby states:**

**Maryland:** not present

**New Jersey:** unknown

**Pennsylvania:** Highbush blueberry-Meadow-sweet wetland (Fike 1999)

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Pond

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Sussex County**

-Nanticoke Wildlife Area

[-Back to Kent County Shrublands-](#)  
[-Back to Sussex County Shrublands-](#)

## Brackish Shrubland

GNR S D

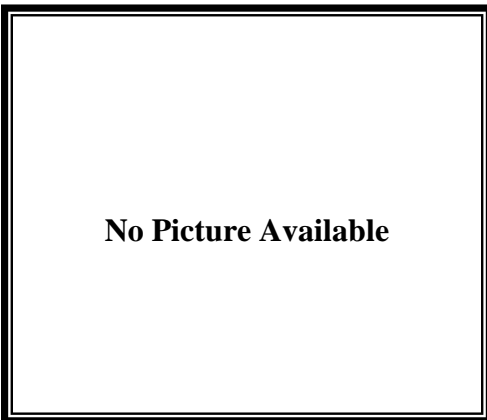
NVC Alliance: [A.1023-Baccharis halimifolia-Iva frutescens Tidal Shrubland Alliance](#)

NVC Association: [CEGL006847-Iva frutescens/Spartina cynosuroides Tidal Shrubland](#)

**Delaware Type Locality:** There are no known locations for this community in Delaware, but it is highly likely that it is present in the state.

**Description:** This shrubland occurs in mesohaline situations on tidal rivers.

The low, shrub canopy of this community is dominated by southern marsh elder (*Iva frutescens*) and big salt marsh cordgrass (*Spartina cynosuroides*) and can be associated by salt shrub (*Baccharis halimifolia*) and swamp rosemallow (*Hibiscus moscheutos*). Often the species diversity is low and can include waterhemp (*Amaranthus cannabinus*), spearscale (*Atriplex patula*), narrow loosestrife (*Lythrum lineare*), dotted smartweed (*Polygonum punctatum*), oley's three square bulrush (*Schoenoplectus americanus*), seaside goldenrod (*Solidago sempervirens*), salt marsh cordgrass (*Spartina alterniflora*) and salt meadow cordgrass (*Spartina patens*).



**Diagnostic Features:** Few communities in Delaware have a high percentage of both southern marsh elder and big salt marsh cordgrass. The combination of these two species serves to identify this community.

**Geology and Environmental Features:** This community is found on poorly drained peat which overlies sand and mucky sand.

**Landscape Position:** On the edges of tidal rivers in places with a high water table.

**Associated Soil Series:** No locations in Delaware

### Species documented from this community

Animals

Non-Vascular Plants

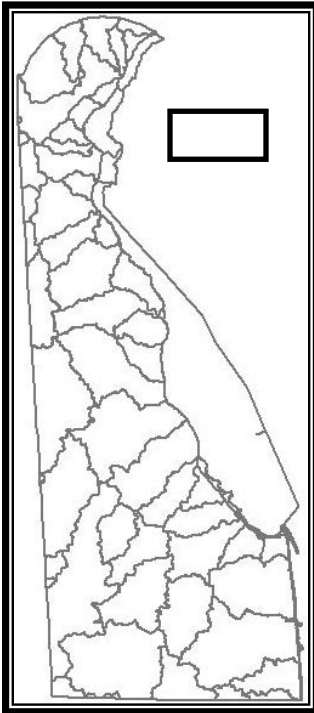
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** No locations for this community are currently known to be in Delaware, although it is likely that this community will be found in the state. If found it would likely be on the tidal rivers of southern New Castle county. Brackish shrublands are currently known only from Maryland and are possibly also in Virginia.

**Estimated Acres in Delaware = 0+ (February 2012)**

**Equivalent or related communities in nearby states:**

**Maryland:** Brackish Shrubland

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** Tidal Mesohaline Shrub Swamp (Marsh-Elder/Saltmeadow Cordgrass Type)  
(Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh

**Landfire Classification Code:** unknown

[-Back to Sussex County Shrublands-](#)

## Brackish Tidal Creek Shrubland      GNR      S3

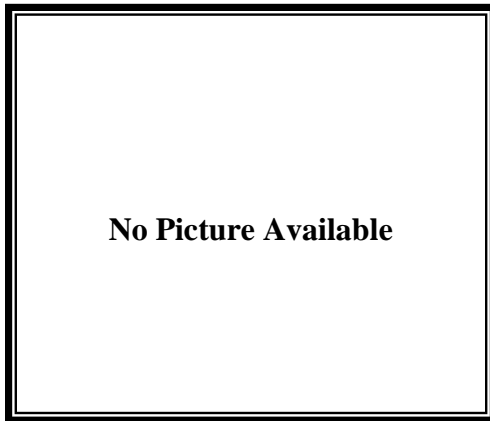
NVC Alliance: [A.806-Morella cerifera-Rosa palustris Tidal Shrubland Alliance](#)

NVC Association: [CEGL006846-Morella cerifera-Baccharis halimifolia/Eleocharis fallax Shrubland](#)

**Delaware Type Locality:** Prime Hook National Wildlife Refuge in Sussex County (**38°52'47.56"N, 075°16'52.99"W**).

**Description:** This shrubland community forms along tidal channels between oligohaline to freshwater tidal marshes and adjacent swamp forests.

Southern bayberry ([Morella cerifera](#)) is dominant in this community with salt shrub ([Baccharis halimifolia](#)) as an associate. Other possible associates include red maple ([Acer rubrum](#)), poison ivy ([Toxicodendron radicans](#)), and seashore mallow ([Kosteletzkya virginica](#)). The shrub layer may include swamp rosemallow ([Hibiscus moscheutos](#)). The diverse herb layer may include narrow-leaf cattail ([Typha angustifolia](#)), dotted smartweed ([Polygonum punctatum](#)), slender flatsedge ([Cyperus filicinus](#)), switchgrass ([Panicum virgatum](#)), olney's three square bulrush ([Schoenoplectus americanus](#)), waterhemp ([Amaranthus cannabinus](#)), marsh milkweed ([Asclepias incarnata](#)) and salt marsh cordgrass ([Spartina alterniflora](#)).



**Diagnostic Features:** This community is dominated by southern bayberry and is located along tidal rivers and creeks.

**Geology and Environmental Features:** Partially decomposed peat which lacks a pronounced hummock-and-hollow microtopography. This community may be flooded during extreme tide events such as storm surges.

**Landscape Position:** On edges of tidal creeks

**Associated Soil Series:** Sunken mucky silt loam, 0 to 2 percent slopes, occasionally flooded, tidal

**Species documented from this community**

Animals

Non-Vascular Plants

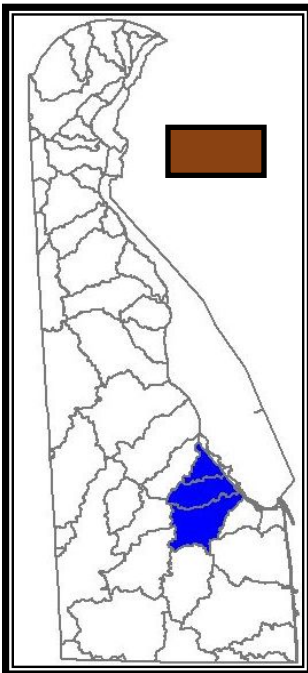
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** This community is currently only known from Prime Hook National Wildlife Refuge. Nationally this community is known from Delaware, Maryland and potentially also Virginia.

**Estimated Acres in Delaware = 113.7 (February 2012)**

**-Acres with 0.5 m sea level rise = 84.8-84.1 = 0.7**

**-Acres with 1 m sea level rise = 84.8-84.8 = 0.0**

**-Acres with 1.5 m sea level rise = 84.8-84.8 = 0.0**

\*This community is projected to be eliminated in its current distribution with 1 m of sea level rise.

**Equivalent or related communities in nearby states:**

**Maryland:** Brackish Tidal Creek Shrubland (Harrison 2004)

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** unknown

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Kent County**

-Milford Neck Wildlife Area

**[-Back to Sussex County Shrublands-](#)**



## Central Coast Beach Heather Dune Shrubland

G2

S2

NVC Alliance: [A.1062-Hudsonia tomentosa Dwarf Shrubland Alliance](#)

NVC Association: [CEGL003950: Hudsonia tomentosa/Panicum amarum var. amarulum Dwarf-Shrubland](#)

**Delaware Type Locality:** Delaware Seashore State Park south of the Indian River Inlet Bridge in Sussex County ([38°35'27.01"N, 075° 3'39.02"W](#)).

**Description:** This dwarf shrubland community occurs on sand dunes of the Atlantic Coast and Delaware Bay. These communities are affected by wind driven sand which creates large areas of unvegetated sand and no soil development. It is often directly impacted by salt spray. The main species, beach heather (*Hudsonia tomentosa*), is adapted to burial in the sand. This community is roughly intermediate between American beachgrass (*Ammophila breviligulata*) dunes and maritime shrub thickets containing southern bayberry (*Morella cerifera*), northern bayberry (*Morella pensylvanica*) and Japanese black pine (*Pinus thunbergii*). It is restricted to barrier island beaches.

Besides beach heather other shrubs that may occur in low abundance are northern bayberry, southern bayberry, pitch pine (*Pinus rigida*) saplings and beach plum (*Prunus maritima*). Poison ivy (*Toxicodendron radicans*) is a common vine and is joined by seaside bluestem (*Schizachyrium scoparium* ssp. *littorale*), American beachgrass, salt meadow cordgrass (*Spartina patens*) and tall beach panicgrass (*Panicum amarum* var. *amarulum*). Other herbs that may or may not be present include northern beach pinweed (*Lechea maritima*), seaside spurge (*Euphorbia polygonifolia*), fragrant cudweed (*Gnaphalium obtusifolium*), Canada frostweed (*Helianthemum canadense*), seaside goldenrod (*Solidago sempervirens*) and rough buttonweed (*Diodia teres*).



Delaware Seashore State Park  
Sussex County

**Diagnostic Features:** This community is characterized by beach heather occurring as discrete patches that may coalesce into a dense mat on older, more stabilized dunes.

**Geology and Environmental Features:** Beach heather communities are found in places where the substrate, sand, is unstable. Most of the sand is wind-deposited and there is no soil development. Large patches of unvegetated area are common.

**Landscape Position:** Sand dunes on the coast of the Atlantic Ocean and Delaware Bay.

**Associated Soil Series:** Acquango-Beaches complex 0 to 10 percent slopes

**Species documented from this community**

Animals

Non-Vascular Plants

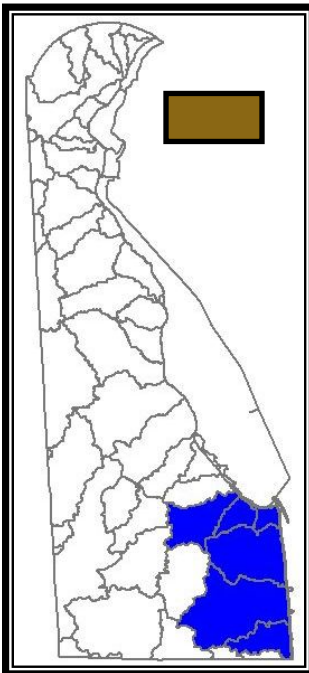
Vascular Plants

**Associated Rare Species:**

**Animals:** Bethany Beach Firefly (*Photuris bethaniensis*)

**Non-Vascular Plants:** unknown

**Vascular Plants:** White-bract Thoroughwort ([\*Eupatorium leucolepis\*](#))



**Distribution:** Locally abundant on protected dunes from Broadkill Beach on the Delaware Bay to Cape Henlopen and south to Fenwick Island on the Atlantic Ocean. Nationally, this community ranges from northern New York to North Carolina.

**Estimated acres in Delaware = 103.9 (February 2012)**

**-Acres with 0.5 m sea level rise = 156.2-5.2 = 151.0**

**-Acres with 1 m sea level rise = 156.2-31.2 = 125.0**

**-Acres with 1.5 m sea level rise = 156.2-69.7 = 86.5**

**Equivalent and related communities from nearby states:**

**Maryland:** Central Coast Beach Heather Dune Shrubland (Harrison 2004)

**New Jersey:** *Hudsonia tomentosa*/*Panicum amarum* Dwarf-shrubland (Breden et al 2001)

Coastal Beach Heather Community (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** Mid-Atlantic Beach Heather Dune Scrub (Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Beach Heather Dune Shrubland

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Dune and Swale

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Sussex County**

- Cape Henlopen State Park
- Delaware Seashore State Park
- Fenwick Island State Park

**[-Back to Sussex County Shrublands-](#)**

## Chesapeake Bay Maritime Shrubland      G2    S1      D

NVC Alliance: [A.902-Morella pensylvanica-\(Prunus maritima\) Shrubland Alliance](#)

NVC Association: CEGL006295-Morella pensylvanica-Prunus maritima Shrubland

**Delaware Type Locality:** Delaware Seashore State Park in Sussex County ([38°35'27.99"N, 75°3'37.25"W](#)).

**Description:** This maritime shrubland occupies the area between the ocean-ward portions of the dunes and the more protected backdunes. It can form partially open to dense shrub thickets. The movement of sand tends to limit the composition of the herb layer.

Beach plum (*Prunus maritima*) may in some cases join northern bayberry (*Morella pensylvanica*) and can make up a large part of the coverage. Other woody plants present can include salt shrub (*Baccharis halimifolia*), winged sumac (*Rhus copallina*), sassafras (*Sassafras albidum*), poison ivy (*Toxicodendron radicans*), common greenbrier (*Smilax rotundifolia*) and in Delaware, eastern red cedar (*Juniperus virginiana*) may join the canopy. Common herbs can include American beachgrass (*Ammophila breviliqulata*), American sea-rocket (*Cakile edentula*), dune sandbur (*Cenchrus tribuloides*), seaside spurge (*Chamaesyce polygonifolia*), Gray's sedge (*Cyperus grayi*), woolly witchgrass (*Dichanthelium acuminatum*), rough buttonweed (*Diodia teres*), beach heather (*Hudsonia tomentosa*), northern beach pinweed (*Lechea maritima*), sea beach evening primrose (*Oenothera humifusa*), tall beach panicgrass (*Panicum amarum* var. *amarulum*), eastern jointweed (*Polygonella articulata*), sheep sorrel (*Rumex acetosella*), seaside goldenrod (*Solidago sempervirens*), salt meadow cordgrass (*Spartina patens*) and purple sandgrass (*Triplasis purpurea*).



**Delaware Seashore State Park  
Sussex County**

**Diagnostic Features:** The dominance of northern bayberry and association by beach plum distinguishes this community.

**Geology and Environmental Features:** Sandy substrate with no profile development and varying amounts of leaf litter. On the lee side of foredunes, there is greater exposure to winds and storms and hence a shorter stature and more open aspect to the vegetation. Large patches of open unvegetated or sparsely vegetated sand can be found within this community.

**Landscape Position:** Dunes behind the beaches of Delaware Bay and the Atlantic Ocean

**Associated Soil Series:** Acquango-Beaches complex 0 to 10 percent slopes

**Species documented from this community**

Animals

Non-Vascular Plants

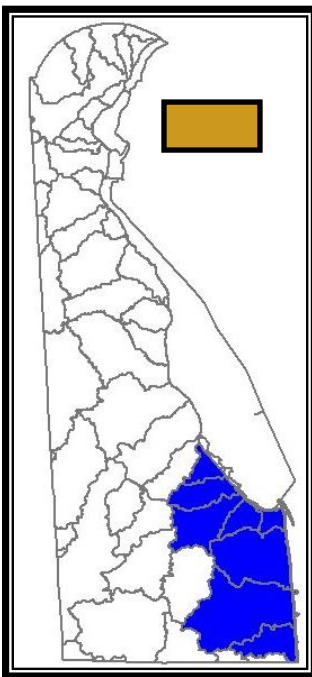
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** Small to medium sized occurrences, with a discontinuous distribution, are present on the Delaware Coast from Big Stone Beach south to Fenwick Island. Nationally this community ranges from North Carolina to Delaware.

**Estimated Acres in Delaware = 42.4 acres (February 2012)**

**-Acres with 0.5 m sea level rise = 32.3-5.8 = 26.5**

**-Acres with 1 m sea level rise = 32.3-12.1 = 20.2**

**-Acres with 1.5 m sea level rise = 32.3-19.5 = 12.8**

**Equivalent communities in nearby states:**

**Maryland:** Atlantic Coast Maritime Shrubland (Harrison 2004)

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** Mid-Atlantic Northern Bayberry Dune Scrub (Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Bayberry Beach Plum Maritime Shrubland

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Dune and Swale

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Sussex County**

- Prime Hook National Wildlife Refuge
- Cape Henlopen State Park
- Delaware Seashore State Park

**[-Back to Sussex County Shrublands-](#)**

## Chesapeake Bay Tall Maritime Shrubland

G1G2

S1

**NVC Alliance:** A.237-*Prunus serotina*-*Acer rubrum*-*Amelanchier canadensis*-*Quercus* spp. Forest Alliance

**NVC Association:** CEG006319: *Prunus serotina*/*Morella cerifera*/*Smilax rotundifolia* Scrub Forest

**Delaware Type Locality:** Cape Henlopen State Park in Sussex County

**Description:** This maritime shrubland is found in the back dunes but is still exposed to salt spray and winds. The substrate is often pure sand towards the ocean to loam farther back.

In Delaware, wild black cherry (*Prunus serotina*) often forms the stunted canopy in association with eastern red cedar (*Juniperus virginiana*), sassafras (*Sassafras albidum*), and loblolly pine (*Pinus taeda*). The short understory may be composed of persimmon (*Diospyros virginiana*), slippery elm (*Ulmus rubra*), American holly (*Ilex opaca*), and serviceberry (*Amelanchier arborea*). Shrubs and vines include southern bayberry (*Morella cerifera*) and common greenbrier (*Smilax rotundifolia*). Herbs may include speargrass (*Chasmanthium laxum*), and switchgrass (*Panicum virgatum*).



**Diagnostic Features:** The dominance of wild black cherry in a near coastal setting identifies this community.

**Cape Henlopen State Park  
Sussex County, Delaware**

**Geology and Environmental Features:** Sandy substrate with no profile development and varying amounts of leaf litter. On the lee side of foredunes, there is greater exposure to winds and storms and hence a shorter stature and more open aspect to the vegetation. Large patches of open unvegetated or sparsely vegetated sand can be found within this community.

**Landscape Position:** Dunes behind the beaches of Delaware Bay and the Atlantic Ocean

**Associated Soil Series:** Acquango-Beaches complex 0 to 10 percent slopes



**Species documented from this community**

Animals

Non-Vascular Plants

Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Ecological Integrity Assessment (EIA)**

A = 0, B = 4, C = 0, D = 0

**Average EIA = 3.98      X=4**

**Distribution:** Small to medium sized occurrences, with a discontinuous distribution, are present on the Delaware Atlantic Strand from Cape Henlopen State Park to Fenwick Island. Nationally this community ranges from Virginia to New Jersey.

**Estimated Acres in Delaware = 44.5 acres (February 2012)**

**-Acres with 0.5 m sea level rise = 13.4-1.4 = 12.0**

**-Acres with 1 m sea level rise = 13.4-8.7 = 4.7**

**-Acres with 1.5 m sea level rise = 13.4-10.8 = 2.6**

**Equivalent communities in nearby states:**

**Maryland:** Maritime Dune Scrub

**New Jersey:** *Prunus serotina/Morella cerifera/Smilax rotundifolia* Forest

**Pennsylvania:** not present

**Virginia:** unknown

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Bayberry Beach Plum Maritime Shrubland



**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Dune and Swale

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Sussex County**

-Cape Henlopen State Park

**[-Back to Sussex County Shrublands-](#)**

## Irregularly Flooded Eastern Tidal Salt Shrub G5 S5 D

NVC Alliance: [A.1023-Baccharis halimifolia-Iva frutescens Tidal Shrubland Alliance](#)

NVC Association: [CEGL003921: Baccharis halimifolia-Iva frutescens/Panicum virgatum Shrubland](#)

**Delaware Type Locality:** Marsh at Prime Hook National Wildlife Refuge to the west of Broad Kill Beach in Sussex County (38 48' 59" N, 075 12' 34' W).

**Description:** Irregularly Flooded Eastern Tidal Salt Shrub communities are associated with salt marshes and naturally form the border between the high salt marsh and adjacent upland vegetation. This community is often located in higher transition area between the marsh and upland. This area receives less frequent tidal flooding. It can also occur on areas of higher elevation, "islands", within the marsh and on spoil mounds adjacent to ditches. In places where the transition is steep, shrub cover can be dense and herbs are sparse. In more gradual relief the shrubs can be open and has a well-developed herb layer, reflecting the transition from the high marsh. Periods of higher tide during storms can result in a die-back of the shrubs keeping this community from spreading.

As the name implies, salt shrub ([Baccharis halimifolia](#)) and/or southern marsh elder ([Iva frutescens](#)) are the predominant shrub species. In some places only one of the two previous species may be present. Other associated shrubs include northern bayberry ([Morella pennsylvanica](#)), southern bayberry ([Morella cerifera](#)) and eastern red cedar ([Juniperus virginiana](#)). Characteristic herbs, that are often reflective of the adjacent marsh, include salt-meadow cordgrass ([Spartina patens](#)), switchgrass ([Panicum virgatum](#)) and seashore saltgrass ([Distichlis spicata](#)). Other herbs depending on location can include swamp rosemallow ([Hibiscus moscheutos](#)), poison ivy ([Toxicodendron radicans](#)), Canadian germander ([Teucrium canadense](#)), sea-lavender ([Limonium carolinianum](#)), spearscale ([Atriplex prostrata](#)), seaside goldenrod ([Solidago sempervirens](#)), common reed ([Phragmites australis](#)) and sea pink ([Sabatia stellaris](#)) and others.



**Prime Hook  
National Wildlife Refuge  
Sussex County**

**Diagnostic Features:** This community is distinguished by the dominance of one or more of the nominal species. In a lot of locations, only one of the species such as salt shrub, is present.

**Geology and Environmental Features:** Salt shrub communities are present on “islands” of higher elevation in tidal marshes.

**Landscape Position:** On places of higher elevation in salt and brackish marshes

**Associated Soil Series:** Transquaking and Mispillion soils, very frequently flooded, tidal Askecksy Loamy Sand, 0 to 2 percent slopes, Hammonton Loamy Sand, Hammonton Sandy Loam

**Species documented from this community**

Animals

Non-Vascular Plants

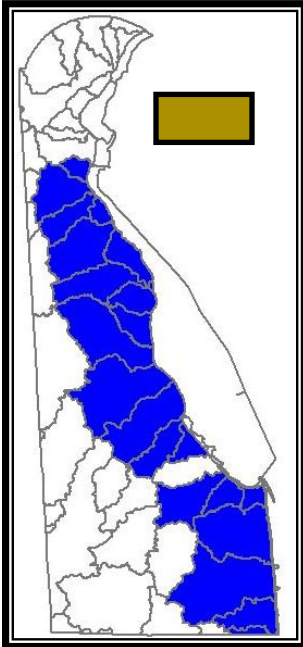
[Vascular Plants](#)

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** Abundant in places of higher elevation in salt marshes throughout Delaware. Nationally this community ranges from New Jersey south to South Carolina and perhaps further south and west.

**Estimated Acres in Delaware = 1,278.3 (February 2012)**

**-Acres with 0.5 m sea level rise = 1,061.3-1,045.7 = 15.6**

**-Acres with 1 m sea level rise = 1,061.3-1,060.3 = 1.0**

**-Acres with 1.5 m sea level rise = 1,061.3-1,061.1 = 0.2**

**Equivalent communities in nearby states:**

**Maryland:** Mid-Atlantic Maritime Salt Shrub (Harrison 2004)

**New Jersey:** *Baccharis halimifolia* - *Iva frutescens* ssp. *oraria* / *Spartina patens* Shrubland (Breden et al 2001)

Coastal Salt Marsh (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** Tidal Shrubland (Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Salt Shrub

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Tidal Salt Marsh

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**New Castle County**

- Cedar Swamp Wildlife Area
- Augustine Wildlife Area

**Kent County**

- Bombay Hook National Wildlife Refuge
- Little Creek Wildlife Area
- Milford Neck Wildlife Area
- Ted Harvey Wildlife Area
- Woodland Beach Wildlife Area

### **Sussex County**

- Assawoman Wildlife Area
- Cape Henlopen State Park
- Delaware Seashore State Park
- Fenwick Island State Park
- Milford Neck Wildlife Area
- Prime Hook National Wildlife Refuge

[-Back to Kent County Shrublands-](#)  
[-Back to Sussex County Shrublands-](#)

## North Atlantic Fresh Tidal Shrub Swamp

GNR

S1

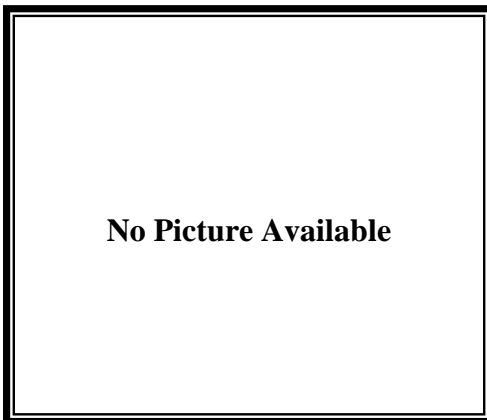
NVC Alliance: [A.1024-Alnus \(incana, serrulata, maritima\) Tidal Shrubland Alliance](#)

NVC Association: [CEGL006337-Alnus \(incana ssp. rugosa, serrulata\)-Cornus amomum Shrubland](#)

**Delaware Type Locality:** Lewden-Greene Park just east of DE 1 on the Christina River in New Castle County ([39°39'53.45"N, 75°38'51.93"W](#)).

**Description:** This shrub community is found on tidal floodplains of the Christina River. The water of the river in this area is acid and the soils mineral based. Most of the time this community is formed on rivers with a gradual elevation gradient and is positioned between the mean high tide level and the mean high water level of river flooding in the spring.

A shrub canopy that has a closed to semi-open canopy of smooth alder ([Alnus serrulata](#)), seaside alder ([Alnus maritima](#)), silky dogwood ([Cornus amomum](#)), highbush blueberry ([Viburnum corymbosum](#)), possumhaw ([Viburnum nudum](#)), winterberry ([Ilex verticillata](#)) and spicebush ([Lindera benzoin](#)) is typical of this community. The examples in New Castle County have a very scattered canopy of red maple ([Acer rubrum](#)), green ash ([Fraxinus pennsylvanica](#)) and pin oak ([Quercus palustris](#)). The diverse herbaceous layer includes halbeard-leaf tearthumb ([Polygonum arifolium](#)), orange-spotted jewelweed ([Impatiens capensis](#)), sensitive fern ([Onoclea sensibilis](#)), wetland blue violet ([Viola cucullata](#)), golden saxifrage ([Chrysosplenium americanum](#)) and fringed sedge ([Carex crinita](#)).



**Diagnostic Features:** The dominance of smooth alder and the location on a tidal rivers and streams identifies this community.

**Geology and Environmental Features:** Soils in this community are alluvial consisting of sandy loam or loamy sand with little peat deposits. Typically a hummock-and-hollow microtopography is present.

**Landscape Position:** Tidal floodplains on tidal rivers

**Associated Soil Series:** Tidal Marsh

**NWI Classification:**

**Species documented from this community**

Animals

Non-Vascular Plants

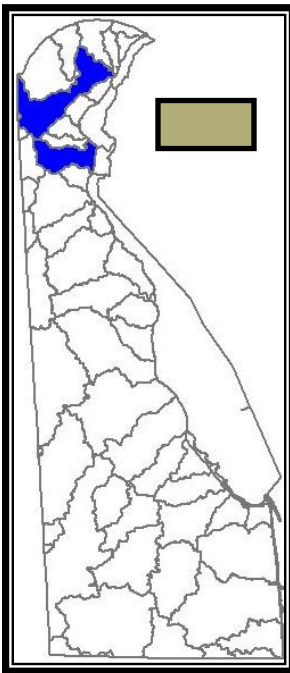
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** This community is found on the floodplain of the Christina River and on the edge of Thousand Acre Marsh in New Castle County. Nationally it ranges on the east coast from Maine south to Virginia.

**Estimated Acres in Delaware = 10.0 (February 2012)**

**-Acres with 0.5 m sea level rise = 10.0-9.5 = 0.5**

**-Acres with 1 m sea level rise = 10.0-9.7 = 0.3**

**-Acres with 1.5 m sea level rise = 10.0-9.8 = 0.2**

**Equivalent or related communities in nearby states:**

**Maryland:** unknown

**New Jersey:** *Alnus (incana ssp. rugosa, serrulata)* - *Cornus amomum* Shrubland (Breden et al 2001)

South Jersey Freshwater Tidal Marsh (Collins and Anderson 1994)

**Pennsylvania:** (Speckled Alder, Smooth Alder) - Silky Dogwood Shrubland

**Virginia:** Tidal Freshwater Shrub Swamp (Smooth Alder-Black Willow Type) (Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Smooth Alder-Silky Dogwood Shrub Swamp

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Tidal Swamp

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**New Castle County**

- Lewden-Greene Park (New Castle County Parks)
- Augustine Wildlife Area

**[-Back to New Castle County Shrublands-](#)**



## Northeastern Buttonbush Shrub Swamp

G4G5

S1

D?

NVC Alliance: [A.1011-Cephalantus occidentalis Semipermanently Flooded Shrubland](#)

NVC Association: [CEGL006069-Cephalanthus occidentalis-Decodon verticillatus Shrubland](#)

**Delaware Type Locality:** TBD

**Description:** This shrub community is of those buttonbush swamps that are semipermanently flooded but are not in a Delmarva Bay. These communities can occur in a variety of settings from floodplain pools, backwaters, places with perched water tables and borders of ponds and lakes.

The shrub canopy is dominated by the nominal species with additional associates of scattered red maple (*Acer rubrum*), dogwood (*Cornus* spp.), swamp azalea (*Rhododendron viscosum*) and water-willow (*Decodon verticillatus*). A few herbs may be scattered about and include three-way sedge (*Dulichium arundinaceum*), Canada mannagrass (*Glyceria canadensis*), tussock sedge (*Carex stricta*), smartweed (*Polygonum* spp.), American bur-reed (*Sparganium* spp.) and woolgrass bulrush (*Scirpus cyperinus*).



**Diagnostic Features:** This community is closely related to the **Buttonbush Coastal Plain Pond (CEGL006242)**. At some point the two communities may be merged. The primary difference lies in the fact that this community has more woody species present and fewer herbs than the Coastal Plain Pond. The Buttonbush Shrub Swamp occurs in more topological situations as well.

**Blackbird State Forest**  
**New Castle County**

**Geology and Environmental Features:** The substrate of these communities is often loose organic muck or silt loam.

**Landscape Position:** Flatwood depressions in the Coastal Plain

**Associated Soil Series:** Fallsington Sandy Loam

**NWI Classification:** Isolated Terrene

### Species documented from this community

Animals

Non-Vascular Plants

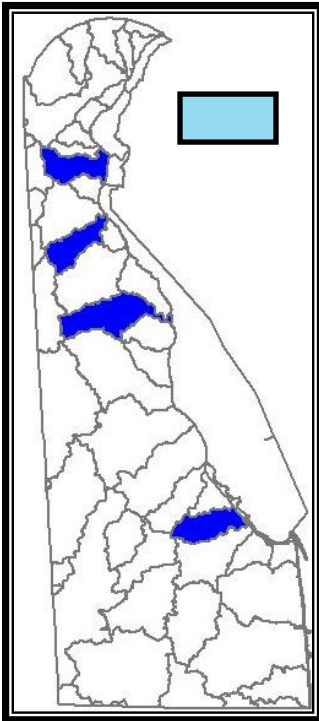
Vascular Plants

**Associated rare species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** This community is located in the Coastal Plain of Delaware. Nationally it is known from the eastern United States.

**Estimated Acres in Delaware = 32.1 (February 2012)**

**-Acres with 0.5 m sea level rise = 31.2-28.8 = 2.4**

**-Acres with 1 m sea level rise = 31.2-30.2 = 1.0**

**-Acres with 1.5 m sea level rise = 31.2-30.9 = 0.3**

**Equivalent or related communities in nearby states:**

**Maryland:** *Cephalanthus occidentalis/Glyceria canadensis* Shrubland (Harrison 2004)

**New Jersey:** unknown

**Pennsylvania:** Buttonbush Wetland

**Virginia:** Coastal Plain Semipermanent Impoundment

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Buttonbush Shrub Swamp

**Northeast Wildlife Habitat Classification:** Central Appalachian River Floodplain

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

???

[-Back to New Castle County Shrublands-](#)

[-Back to Sussex County Shrublands-](#)

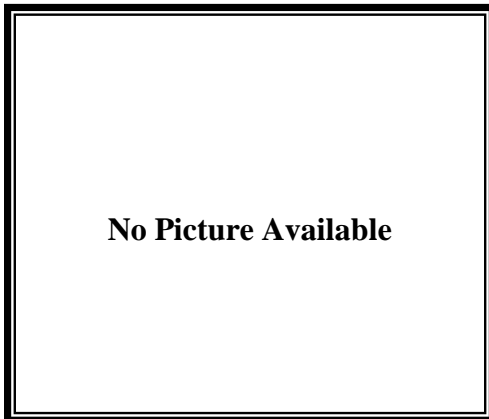
**Hazel Alder Swamp      G4G5      S1      D?**

**NVC Alliance:**

**NVC Association:** CEGLO05082-*Alnus serrulata* Swamp Shrubland

**Delaware Type Locality:** Swamp on the west floodplain of Cow Bridge Branch upstream of Millsboro Pond in Doe Bridge Nature Preserve in Sussex County ([38°36'37.36"N, 075°18'10.27"W](#)).

**Description:** This shrubland community is generally found on muck (not peat) that overlies mineral soils that is on the edges of swamps or the bases of slopes. The shrub layer is dominated by smooth alder ([Alnus serrulata](#)) and may be associated by saplings of red maple ([Acer rubrum](#)), swamp rose ([Rosa palustris](#)), buttonbush ([Cephalanthus occidentalis](#)), swamp-loosestrife ([Decodon verticillatus](#)) and swamp azalea ([Rhododendron viscosum](#)). Common herbaceous plants include purple pitcher plant ([Sarracenia purpurea](#)), Atlantic sedge ([Carex atlantica](#)), Canada spikerush ([Juncus canadensis](#)) and tussock sedge ([Carex stricta](#)).



**Diagnostic Features:** A shrubland dominated by smooth alder that is found on muck and location at the bases of slopes.

**Geology and Environmental Features:**

**Landscape Position:** Backwater depression on floodplains in the Coastal Plain.

**Associated Soil Series:** Puckum Muck

**Species documented from this community**

Animals

Non-Vascular Plants

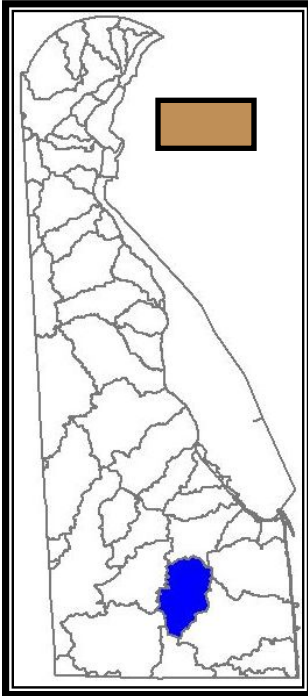
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** This community is currently known only in the Indian River watershed. It may possibly be present in other places in the Inland Bays region. Nationally it is found from Maine south to Virginia and west to Ohio.

**Estimated Acres in Delaware = 3.7 (February 2012)**

**Number of occurrences in Delaware = 1 (July 2010)**

**Average size in Delaware = 3.7 acres (July 2010)**

**Equivalent or related communities in nearby states:**

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Central Appalachian River Floodplain

**Landfire Classification Code:** unknown

**[-Back to Sussex County Shrublands-](#)**

## Swamp-loosestrife Shrub Swamp

GNR

S3

D?

**NVC Alliance:** [A.1013-\*Decodon verticillatus\* Semipermanently Flooded Shrubland Alliance](#)

**NVC Association:** [CEGL005089-\*Decodon verticillatus\* Semipermanently Flooded Shrubland](#)

**Delaware Type Locality:** Swamp on Finis Branch in Bombay Hook NWR in Kent County (39°16'18.10"N, 75°29'32.69"W).

**Description:** This shrub community occurs in shallow areas and on the edges of lakes and streams. It is typified by dense, monotypic tangles of swamp-loosestrife (*Decodon verticillatus*).

Other than the species above other associates may include buttonbush (*Cephalanthus occidentalis*). Common herbs include floating spatterdock (*Nuphar lutea* ssp. *variegata*), waterlily (*Nymphaea odorata*), arrow-arum (*Peltandra virginica*), pickerelweed (*Pontederia cordata*), bladderwort (*Utricularia* spp.) and pondweed (*Potamogeton* spp.).



**Diagnostic Features:** This community is one of two that is dominated by water-willow. The location of this community in shallow areas and edges of lakes, ponds and streams separates it from the Swamp-loosestrife Coastal Plain Pond ([CEGL006087](#)) which is found in Coastal Plain ponds.

### Doe Bridge Nature Preserve Sussex County

**Geology and Environmental Features:** Mucky soils in shallow places and shores of lakes, ponds and back-channels

**Landscape Position:** Shallow water and adjacent shorelines of back-channels to streams and on lakeshores.

**Associated Soil Series:** Puckum Muck, frequently flooded, Nanticoke and Mannington Soils, very frequently flooded, tidal

### Species documented from this community

Animals

Non-Vascular Plants

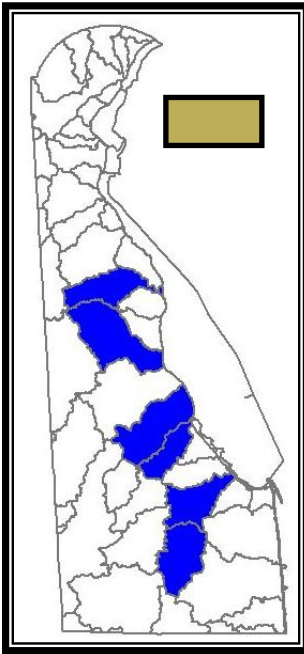
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Sword Bogmat (*Wolffiella gladiata*), Featherfoil (*Hottonia inflata*)



**Distribution:** This community occurs in the marsh areas of Prime Hook National Wildlife Refuge in Sussex County. Nationally, it occurs from New Hampshire south to Maryland and west to West Virginia and Ontario.

**Estimated Acres in Delaware = 415.3 (February 2012)**

**-Acres with 0.5 m sea level rise = 414.4-68.7 = 345.7**

**-Acres with 1 m sea level rise = 414.4-283.4 = 131.0**

**-Acres with 1.5 m sea level rise = 414.4-310.1 = 104.3**

**Equivalent or related communities in nearby states:**

**Maryland:** Water-willow Shrub Swamp (Harrison 2004)

**New Jersey:** not present

**Pennsylvania:** Water-willow (*Decodon verticillatus*) shrub wetland

**Virginia:** not present

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** Water-willow Shrub Swamp

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Stream and River

**Landfire Classification Code:** Unknown

**Public places in Delaware to view this community**

**Kent County**

-Milford Neck Wildlife Area

**Sussex County**

-Millsboro Pond Access Area

**[-Back to Kent County Shrublands-](#)**  
**[-Back to Sussex County Shrublands-](#)**



## Wax-myrtle Shrub Swamp

G2G3 S2 D?

**NVC Alliance:** A.1906-*Morella cerifera* Saturated Shrubland Alliance

**NVC Association:** CEGLO03840-*Morella cerifera*/*Hydrocotyle verticillata* Shrubland

**Delaware Type Locality:** Swamp to the north of Stratman Road on Kings Causeway Branch of the Mispillion River in Kent County (**38°58'27.99"N, 075°22'33.30"W**).

**Description:** This inundated shrub community is found on maritime backdunes that are sheltered and along tidal streams. It often has a shallow water table or is inundated as the picture below shows. At Prime Hook National Wildlife Refuge this community is found on old dunes that were once part of the coastline for Delaware Bay.

This community is dominated by tall wax-myrtle (*Morella cerifera*) that are associated by salt shrub (*Baccharis halimifolia*) and red maple (*Acer rubrum*). Herbs vary and can include speargrass (*Chasmanthium laxum*), netted chain fern (*Woodwardia areolata*), royal fern (*Osmunda regalis* var. *spectabilis*), false nettle (*Boehmeria cylindrica*), and Pennsylvania smartweed (*Polygonum pennsylvanicum*).



**Diagnostic Features:** This community is dominated by wax-myrtle and associated by salt shrub (*Baccharis halimifolia*) and red maple (*Acer rubrum*).

### Milford Neck Wildlife Area Kent County

#### **Geology and Environmental Features:**

**Landscape Position:** Small tidal streams at the head of tide above the brackish marsh

**Associated Soil Series:** Manahawkin muck, frequently flooded

#### **Species documented from this community**

Animals

Non-Vascular Plants

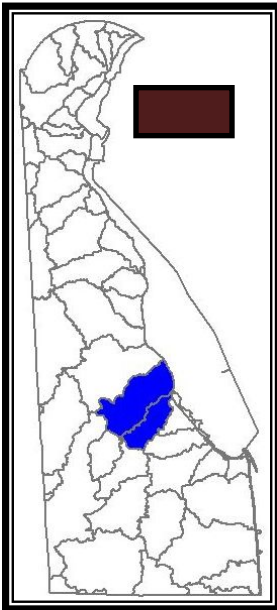
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** This community is located on King's Causeway in the Mispillion River watershed. Nationally it is known from Maryland and Virginia.

**Estimated Acres in Delaware = 849.7 (February 2012)**

**-Acres with 0.5 m sea level rise = 907.8-649.9 = 257.9**

**-Acres with 1 m sea level rise = 907.8-732.3 = 175.5**

**-Acres with 1.5 m sea level rise = 907.8-773.1 = 134.7**

**Equivalent or related communities in nearby states:**

**Maryland:** Wax-myrtle Shrub Swamp

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** Mid-Atlantic Maritime Shrub Swamp (Fleming, G.P., et al 2006)

**Names in other classifications:**

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Dune and Swale

**Landfire Classification Code:** unknown

**Public places in Delaware to view this community**

**Kent County**

-Milford Neck Wildlife Area

**Sussex County**

-Assawoman Wildlife Area

-Prime Hook Wildlife Area

[-Back to Kent County Shrublands-](#)

[-Back to Sussex County Shrublands-](#)

## New Castle County Tidal Marsh

**Atlantic Coast Tidal Oligohaline Spikerush Marsh:** Spikerush lawn of creeping spikerush (*Eleocharis fallax*), beaked spikerush (*Eleocharis rostellata*) and Olney's three square bulrush (*Schoenoplectus americanus*). ([CEGL004628](#)) **Brackish** There are no current locations for this community in Delaware, but it is likely to be found in New Castle County.

**Atlantic Coast Wild Rice Tidal Marsh:** Marsh dominated by wild rice (*Zizania aquatica*) on a freshwater tidal river. ([CEGL004202](#)) **Fresh** **Appoquinimink River; Army Creek; Christina River**

**Atlantic Big Cordgrass Marsh:** Tidal marsh that is dominated or co-dominated by giant cordgrass (*Spartina cynosuroides*). ([CEGL004195](#)) **Salty to Brackish** **Appoquinimink River; Blackbird Creek; Smyrna River**

**Bulrush Deepwater Marsh:** Marsh that is dominated by a species of bulrush (*Schoenoplectus* spp.). ([CEGL006275](#)) **Fresh** **Eastern C and D Canal**

**Freshwater Tidal Mixed High Marsh:** Freshwater marsh that is dominated or co-dominated by arrow-arum (*Peltandra virginica*), orange-spotted jewelweed (*Impatiens capensis*), broadleaf arrowhead (*Sagittaria latifolia*) and/or narrow-leaf cattail (*Typha angustifolia*). ([CEGL006325](#)) **Fresh** **Eastern C and D Canal**

**Mesohaline Seepage Marsh:** Marsh that is co-dominated by salt marsh fleabane (*Pluchea odorata*), northern tickseed sunflower (*Bidens coronata*) and Virginia sea-shore mallow (*Kosteletzkya virginica*). ([CEGL006418](#)) **Brackish** **Appoquinimink River; Augustine Creek; Blackbird Creek**

**North Atlantic High Salt Marsh:** Tidal marsh that is dominated by salt meadow cordgrass (*Spartina patens*) and is slightly higher in elevation than the North Atlantic Low Salt Marsh ([CEGL006006](#)) **Appoquinimink River; Augustine Creek; Blackbird Creek; Cedar Swamp; Smyrna River**

**North Atlantic Low Salt Marsh:** Tidal marsh that is dominated by salt marsh cordgrass (*Spartina alternifolia*). This marsh can have a "tall" and "low" form. ([CEGL004192](#)) **Appoquinimink River; Augustine Creek; Blackbird Creek; Cedar Swamp; Eastern C and D Canal; Smyrna River**

**Oligohaline Mixed Forbs Tidal Marsh:** Tidal marsh that contains variable species, see description from link. ([CEGL006181](#)) **Brackish** **Delaware River; Eastern C and D Canal**

**Pickerelweed Tidal Marsh:** Marsh that is co-dominated by arrow-arum (*Peltandra virginica*) and pickerelweed (*Pontederia cordata*). ([CEGL004706](#)) **Fresh** **Smyrna River**

**Broadleaf Pond-lily Tidal Marsh:** Tidal marsh that is co-dominated by pond-lily (*Nuphar lutea* ssp. *advena*) and water-lily (*Nymphaea odorata*). ([CEGL004472](#)) **Fresh** **Christina River; Dragon Run**

**Reed Tidal Marsh:** Tidal marsh that is dominated by eastern reed grass (*Phragmites australis*). ([CEGL004187](#)) **Fresh to Brackish** Appoquinimink River; Augustine Creek; Blackbird Creek; Broad Dyke; C and D Canal; Cedar Swamp; Christina River; Red Lion Creek; Smyrna River; Upper Delaware Bay; White Clay Creek

**River Bulrush Flooded Grassland:** Marsh that is dominated almost wholly by river bulrush (*Schoenoplectus fluviatilis*). ([CEGL006366](#)) **Fresh** Christina River

**Sweetflag Tidal Marsh:** Marsh that has greater than 50% coverage of sweet flag. ([CEGL006833](#)) **Fresh** Christina River

[-Back to Key to Delaware Vegetation Communities-](#)

## Kent County Tidal Marsh

**American Lotus Tidal Marsh:** Marsh that is dominated by American lotus ([CEGL006913](#)) **Fresh St. Jones River**

**Atlantic Big Cordgrass Marsh:** Tidal marsh that is dominated or co-dominated by giant cordgrass (*Spartina cynosuroides*). ([CEGL004195](#)) **Salty to Brackish Little Creek**

**Cattail Brackish Tidal Marsh:** Brackish marsh dominated by narrow-leaf cattail (*Typha angustifolia*) and/or wide-leaf cattail (*Typha latifolia*). ([CEGL004201](#)) **Mispillion River; Murderkill River**

**North Atlantic Low Salt Marsh:** Tidal marsh that is dominated by salt marsh cordgrass (*Spartina alternifolia*). This marsh can have a “tall” and “low” form. ([CEGL004192](#)) **Salty Statewide in the Coastal Plain**

**North Atlantic High Salt Marsh:** ([CEGL006006](#)) **Duck Creek; Leipsic River; Little Creek; Mispillion River; Murderkill River; Simons River; Smyrna River; St. Jones River**

**Pickerelweed Tidal Marsh:** Marsh that is co-dominated by arrow-arum (*Peltandra virginica*) and pickerelweed (*Pontederia cordata*). ([CEGL004706](#)) **Fresh Smyrna River**

**Broadleaf Pond-lily Tidal Marsh:** Tidal marsh that is co-dominated by pond-lily (*Nuphar lutea* ssp. *advena*) and water-lily (*Nymphaea odorata*). ([CEGL004472](#)) **Fresh St. Jones River**

**Reed Tidal Marsh:** Tidal marsh that is dominated by eastern reed grass (*Phragmites australis*). ([CEGL004187](#)) **Fresh to Brackish Duck Creek; Leipsic River; Little Creek; Mispillion River; Murderkill River; Simons River; Smyrna River; St. Jones River**

**Transitional Tidal Marsh:** Marsh that is dominated by Olney’s three square bulrush (*Schoenoplectus americanus*). ([CEGL006612](#)) **Brackish Smyrna River**

**Water-hemp Tidal Marsh:** Tidal marsh that is dominated by water hemp (*Amaranthus cannabinus*). ([CEGL006080](#)) **Brackish Leipsic River**

[-Back to Key to Delaware Vegetation Communities-](#)

## Sussex County Tidal Marsh

**Alkali Bulrush Brackish Marsh:** Salt marsh that is co-dominated by salt marsh bulrush (*Schoenoplectus robustus*) and salt marsh cordgrass (*Spartina alterniflora*). ([CEGL006416](#)) **Salty to Brackish** There are no current locations for this community in Delaware, but it is likely to be found in Sussex County.

**Atlantic Coast Wild Rice Tidal Marsh:** Marsh dominated by wild rice (*Zizania aquatica*) on a freshwater tidal river. ([CEGL004202](#)) **Fresh Broad Creek; Broadkill River; Deep Creek; Nanticoke River**

**Brackish Meadow:** Marsh that is dominated by switchgrass (*Panicum virgatum*) and associated by or co-dominated by salt meadow cordgrass (*Spartina patens*). ([CEGL006150](#)) **Brackish**

**Bulrush Deepwater Marsh:** Marsh that is dominated by a species of bulrush (*Schoenoplectus* spp.). ([CEGL006275](#)) **Fresh This community may be present in Sussex County.**

**Freshwater Tidal Mixed High Marsh:** Freshwater marsh that is dominated or co-dominated by arrow-aram (*Peltandra virginica*), orange-spotted jewelweed (*Impatiens capensis*), broadleaf arrowhead (*Sagittaria latifolia*) and/or narrow-leaf cattail (*Typha angustifolia*). ([CEGL006325](#)) **Fresh Broad Creek; Broadkill River; Nanticoke River**

**Interdune Switchgrass Brackish Depression:** Brackish Marsh that is dominated by switchgrass (*Panicum virgatum*). ([CEGL004129](#)) **Brackish to Fresh Prime Hook Creek**

**Mesohaline Seepage Marsh:** Marsh that is co-dominated by salt marsh fleabane (*Pluchea odorata*), northern tickseed sunflower (*Bidens coronata*) and Virginia sea-shore mallow (*Kosteletzkya virginica*). ([CEGL006418](#)) **Brackish Broadkill River**

**Mid- and Southern Atlantic High Salt Marsh:** Tidal marsh that is co-dominated by both salt meadow cordgrass (*Spartina patens*) and Needlerush (*Juncus roemerianus*). ([CEGL004197](#)) **Salty Indian River Bay; Little Assawoman Bay**

**Needlerush High Marsh:** Tidal marsh that is dominated by needlerush (*Juncus roemerianus*) and occurs slightly higher than the North Atlantic Low Salt Marsh. This community is restricted to the Inland Bays region. ([CEGL004186](#)) **Salty Assawoman Bay; Little Assawoman Bay; Indian River Bay; Lewes-Rehoboth Canal; Rehoboth Bay**

**North Atlantic Low Salt Marsh:** Tidal marsh that is dominated by salt marsh cordgrass (*Spartina alterniflora*). This marsh can have a “tall” and “low” form. ([CEGL004192](#)) **Salty Statewide in the Coastal Plain**

**North Atlantic High Salt Marsh:** Tidal marsh that is dominated by salt meadow cordgrass (*Spartina patens*) and is slightly higher in elevation than the North Atlantic Low Salt Marsh. This community does not contain needlerush (*Juncus roemerianus*). ([CEGL006006](#)) **Salty Assawoman Bay; Broadkill River; Cedar Creek; Indian River Bay; Lewes-Rehoboth Canal; Little Assawoman Bay; Mispillion River; Prime Hook Creek; Red Mill Creek; Rehoboth Bay; Slaughter Creek**

**Pickerelweed Tidal Marsh:** Marsh that is co-dominated by arrow-arum (*Peltandra virginica*) and pickerelweed (*Pontederia cordata*). ([CEGL004706](#)) **Fresh** This community may be found in **Sussex County**.

**Broadleaf Pond-lily Tidal Marsh:** Tidal marsh that is co-dominated by pond-lily (*Nuphar lutea* ssp. *advena*) and water-lily (*Nymphaea odorata*). ([CEGL004472](#)) **Fresh Broad Creek; Deep Creek; Nanticoke River**

**Oligohaline Mixed Forbs Tidal Marsh:** Tidal marsh that contains halbeard leaf tearthumb (*Polygonum arifolium*), ([CEGL006181](#)) **Brackish Broad Creek**

**Reed Tidal Marsh:** Tidal marsh that is dominated by eastern reed grass (*Phragmites australis*). ([CEGL004187](#)) **Fresh to Brackish Assawoman Bay; Broadkill River; Bunting Branch; Indian River Bay; Lewes-Rehoboth Canal; Little Assawoman Bay; Mispillion River; Nanticoke River; Prime Hook Creek; Red Mill Creek; Rehoboth Bay; Slaughter Creek**

**River Seedbox Marsh:** Marsh that is dominated by river seedbox (*Ludwigia leptocarpa*) and is located at Prime Hook National Wildlife Refuge. ([CEGL006468](#)) **Fresh Prime Hook Creek**

**Transitional Tidal Marsh:** Marsh that is dominated by Olney's three square bulrush (*Schoenoplectus americanus*). ([CEGL006612](#)) **Brackish Rehoboth Bay**

[-Back to Key to Delaware Vegetation Communities-](#)



## New Castle County Non-Tidal Marsh

**American Lotus Herbaceous Vegetation:** Non-tidal wetland that is dominated by American lotus (*Nelumbo lutea*) in a pond or impoundment. (CEGL004323) **Fresh White Clay Creek**

**Eastern Cattail Marsh:** Marsh dominated by cattail (*Typha* sp.). ([CEGL006153](#)) **Fresh Brandywine Creek**

**Eastern Reed Marsh:** Marsh that is dominated by eastern reed marsh (*Phragmites australis*). ([CEGL004141](#)) **Fresh Appoquinimink River; Army Creek; Blackbird Creek; Bohemia River; Brandywine Creek; Broad Dyke; Cedar Swamp; Chesapeake and Delaware Canal; Chester River; Christina River; Naamans Creek; Perch Creek; Red Clay Creek; Red Lion Creek; Sassafras River; Shellpot Creek; Smyrna River; Stoney Creek; White Clay Creek**

**Broadleaf Pond-lily Tidal Marsh:** Tidal marsh that is co-dominated by pond-lily (*Nuphar lutea* ssp. *advena*) and water-lily (*Nymphaea odorata*). This marsh has one non-tidal occurrence on Dragon Run. ([CEGL004472](#)) **Fresh Blackbird Creek; Christina River; Dragon Run; Red Lion Creek; Smyrna River**

**Reed Canarygrass Eastern Marsh:** A marsh that is dominated by reed canarygrass (*Phalaris arundinacea*). ([CEGL006044](#)) **Fresh Back Creek; Naamans Creek**

**Woolgrass Marsh:** Marsh that has woolgrass (*Scirpus cyperinus*) as a dominant or co-dominant. ([CEGL006349](#)) **Fresh Appoquinimink River; Smyrna River**

[-Back to Key to Delaware Vegetation Communities-](#)

## Kent County Non-Tidal Marsh

**Eastern Cattail Marsh:** Marsh dominated by cattail (*Typha* sp.). ([CEGL006153](#)) **Fresh Leipsic River**

**Eastern Reed Marsh:** A marsh that is dominated by eastern reed marsh (*Phragmites australis*). ([CEGL004141](#)) **Fresh Chester River; Choptank River; Duck Creek; Leipsic River; Little Creek; Marshyhope Creek; Murderkill River; Smyrna River; Simons River; St. Jones River;**

**Interdune Switchgrass Brackish Depression:** Brackish Marsh that is dominated by switchgrass (*Panicum virgatum*). ([CEGL004129](#)) **Brackish to Fresh Simons River**

**Woolgrass Marsh:** Marsh that has woolgrass (*Scirpus cyperinus*) as a dominant or co-dominant. ([CEGL006349](#)) **Fresh St. Jones River**

[-Back to Key to Delaware Vegetation Communities-](#)

## Sussex County Non-Tidal Marsh

**Eastern Reed Marsh:** A marsh that is dominated by eastern reed marsh (*Phragmites australis*). ([CEGL004141](#)) **Fresh Broad Creek; Broadkill River; Deep Creek; Cedar Creek; Gravelly Branch; Gum Branch; Indian River; Indian River Bay; Lewes-Rehoboth Canal; Little Assawoman Bay; Mispillion River; Nanticoke River; Prime Hook Creek; Red Mill Creek; Rehoboth Bay; Slaughter Creek**

**Interdune Switchgrass Brackish Depression:** Brackish Marsh that is dominated by switchgrass (*Panicum virgatum*). ([CEGL004129](#)) **Brackish to Fresh Prime Hook Creek**

**Reed Canarygrass Eastern Marsh:** A marsh that is dominated by reed canarygrass (*Phalaris arundinacea*). ([CEGL006044](#)) **Fresh Rehoboth Bay**

**River Seedbox Marsh:** Marsh that is dominated by river seedbox (*Ludwigia leptocarpa*) and is located at Prime Hook National Wildlife Refuge. ([CEGL006468](#)) **Fresh Prime Hook Creek**

[-Back to Key to Delaware Vegetation Communities-](#)

## Atlantic Big Cordgrass Marsh

G4

S3

D?

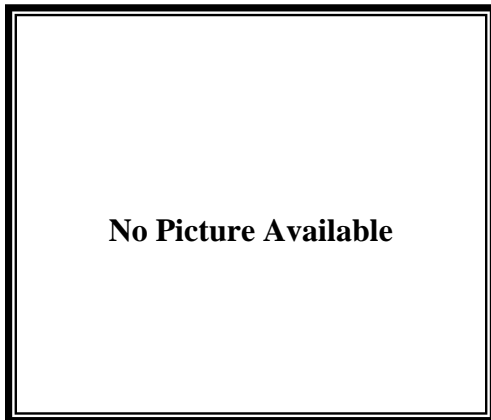
NVC Alliance: [A.1480-Spartina cynosuroides Tidal Herbaceous Alliance](#)

NVC Association: [CEGL004195-Spartina cynosuroides Herbaceous Vegetation](#)

**Delaware Type Locality:** Marsh to the north of DE 6 west of Woodland Beach (**39°18'58.84"N, 075°29'28.69"W**).

**Description:** Giant cordgrass marshes can form narrow, sometimes almost pure stands of giant cordgrass ([Spartina cynosuroides](#)) along tidal creeks and sloughs. In Delaware they are most often found as patchy concentrations of giant cordgrass within a larger North Atlantic Low Salt Marsh ([CEGL004192](#)).

Associates of the nominal species can include three-square ([Schoenoplectus pungens](#)), salt marsh bulrush ([Bulboschoenus robustus](#)), softstem bulrush ([S. tabernaemontani](#)), salt meadow hay ([Spartina alterniflora](#)), northern gammagrass ([Tripsacum dactyloides](#)), pickerelweed ([Pontederia cordata](#)), arrow-aryum ([Peltandra virginica](#)) and narrow-leaf cattail ([Typha angustifolia](#)).



**Diagnostic Features:** Giant cordgrass is the dominant species of this community and identifies it.

**Geology and Environmental Features:** This community is often found on tidal creeks, guts and levees in irregularly flooded high marsh situations.

**Landscape Position:** This community is located in tidal marshes at or just above the elevation of the North Atlantic Low Salt Marsh.

**Associated Soil Series:** Broadkill-Appoquinimink Complex, very frequently flooded, tidal

**NWI Classification:** Estuarine

### Species documented from this community

Animals

Non-Vascular Plants

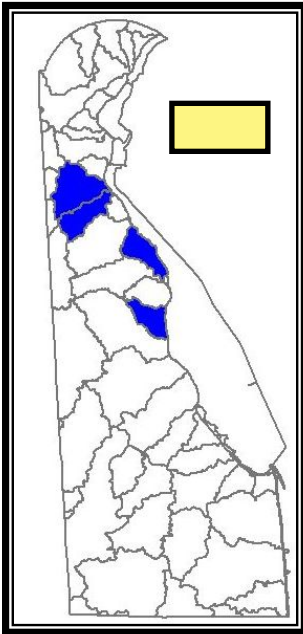
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is believed to be common in Delaware, but in small stands. Nationally this community is found on the east coast from Massachusetts to Georgia.

**Estimated Acres in Delaware = 47.3 (February 2012)**

**-Acres with 0.5 m sea level rise = 47.3-47.3 = 0**

**-Acres with 1 m sea level rise = 47.3-47.3 = 0**

**-Acres with 1.5 m sea level rise = 47.3-47.3 = 0**

\*This community is eliminated in its current distribution at 0.5 m of sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** Atlantic Giant Cordgrass Marsh (Harrison 2004)

**New Jersey:** *Spartina cynosuroides* Herbaceous Vegetation (Breden et al 2001)

Coastal Brackish Marsh (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** Tidal Oligohaline Marsh (Big Cordgrass Type) (Fleming, G.P., et al 2006)

Tidal Oligohaline Marsh (Big Cordgrass-Dotted Smartweed Type) (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Giant Cordgrass Tidal Marsh

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Brackish Tidal Marsh

**Landfire Classification Code:** unknown

Public places in Delaware to view this community

**Kent County**

-Woodland Beach Wildlife Area

[-Back to Kent County Tidal Marsh-](#)  
[-Back to New Castle County Tidal Marsh-](#)

## Mid and Southern Atlantic High Salt Marsh      G4G5      S4

NVC Alliance: [A.1481-Spartina patens-\(Distichlis spicata\)](#) Tidal Herbaceous Alliance

NVC Association: [CEGL004197-Spartina patens-Distichlis spicata-Juncus roemerianus](#)  
[Herbaceous Vegetation](#)

**Delaware Type Locality:** Marsh to the north of the Bethany Beach Nature Center in Sussex County ([38°32'34.08"N, 075° 4'23.05"W](#)).

**Description:** This southern salt marsh is characterized by the dominance of salt meadow cordgrass ([Spartina patens](#)) and the presence of needlerush ([Juncus roemerianus](#)) and is located at a slightly higher elevation than the North Atlantic Low Salt Marsh ([CEGL004192](#)). This marsh receives irregular tidal flooding above the mean high tide level. Salt Pannes may be interspersed within this community.

Other than the two species above another prominent associate may include seashore saltgrass ([Distichlis spicata](#)) in some examples. Other herbs that may include sea-lavender ([Limonium carolinianum](#)), salt marsh false foxglove ([Agalinus maritima](#)), glasswort ([Salicornia](#) spp.), sea pink ([Sabatia stellaris](#)), narrow loosestrife ([Lythrum lineare](#)), three-square bulrush ([Schoenoplectus pungens](#)), seaside goldenrod ([Solidago sempervirens](#)), marsh fimbry ([Fimbristylis castanea](#)), salt marsh fleabane ([Pluchea odorata](#)), swamp rosemallow ([Hibiscus moscheutos](#)) and southern bayberry ([Morella cerifera](#)).

**Diagnostic Features:** Mid and Southern Atlantic High Salt Marshes can be readily identified by the dominance of salt meadow cordgrass and the presence of needlerush and its location slightly higher in elevation above the North Atlantic Low Salt Marsh ([CEGL004192](#)). The North Atlantic High Salt Marsh ([CEGL006006](#)) does not have needlerush in it.

**Geology and Environmental Features:** The soil of the marsh is often mucky but with less mud than the low marsh and is composed of peat which overlies sand, silt or bedrock. High salt marshes are found in the zone from the mean high tide limit and the limit of spring high tides.

**Landscape Position:** Slightly higher than the North Atlantic Low Salt Marsh

**Associated Soil Series:** Purnell Peat, very frequently flooded, tidal

**NWI Classification:** Estuarine

### Species documented from this community

Animals

Non-Vascular Plants

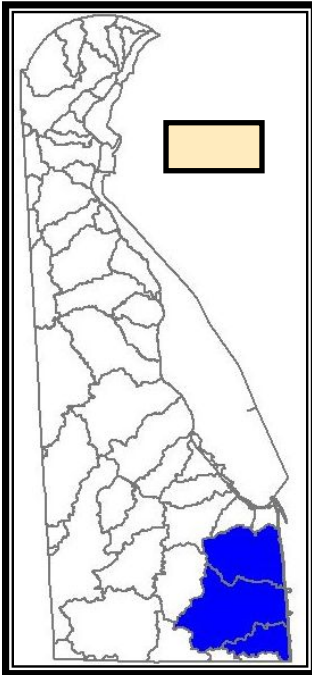
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: Mid and Southern Atlantic High Salt Marshes are found only in the Inland Bays in Delaware. Nationally this community is found from New Jersey south to Florida.

**Estimated Acres in Delaware = 37.7 (October 2011)**

**-Acres with 0.5 m sea level rise = 85.3-82.7 = 2.6**

**-Acres with 1 m sea level rise = 85.3-83.5 = 1.8**

**-Acres with 1.5 m sea level rise = 85.3-84.6 = 0.7**

Equivalent or related communities in nearby states:

**Maryland:** Mid and Southern Atlantic High Salt Marsh (Harrison 2004)

**New Jersey:** *Spartina patens*-*Distichlis spicata*-*Plantago maritima* Herbaceous Vegetation (Breden et al 2001)

Coastal Salt Marsh (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** High Salt Marsh (Fleming, G.P., et al 2006)

Salt Meadow (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** *Spartina* High Salt Marsh

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Tidal Salt Marsh



**Landfire Classification Code:** unknown

Public places in Delaware to view this community

**Sussex County**

- Assawoman Wildlife Area
- Bethany Beach Park
- Delaware Seashore State Park

[-Back to Sussex County Tidal Marsh-](#)

## Needlerush High Marsh

G5

S2

D?

NVC Alliance: [A.1475-Juncus roemerianus Tidal Herbaceous Alliance](#)

NVC Association: [CEGL004186-Juncus roemerianus Herbaceous Vegetation](#)

**Delaware Type Locality:** Marsh to the south of Bethany Beach in Fenwick Island State Park on Little Assawoman Bay in Sussex County ([38°30'30.71"N, 075° 3'23.61"W](#)).

**Description:** This high marsh community can be found within both “high” and “low” marshes and is generally irregularly flooded. The community may occur as isolated patches within the North Atlantic Low Salt Marsh ([CEGL004192](#)) or may dominate the heads of the creeks that drain the marsh. Roemer’s bulrush (*Juncus roemerianus*) reaches the northern limit of its Delaware range just south of Rehoboth Beach, making this community rare in Delaware. This community and species could potentially become more common as it moves north as the result of climate change.

Other than Roemer’s bulrush other associates that may occur in low amounts include salt meadow cordgrass (*Spartina alterniflora*), salt marsh false foxglove (*Agalinus maritima*), black-grass rush (*Juncus gerardii*), salt marsh fleabane (*Pluchea odorata*), seashore saltgrass (*Distichlis spicata*), sea lavender (*Limonium carolinianum*), southern marsh elder (*Iva frutescens*), salt shrub (*Baccharis halimifolia*), sea pink (*Sabatia stellaris*), seaside goldenrod (*Solidago sempervirens*), salt marsh bulrush (*Schoenoplectus robustus*), annual salt marsh aster (*Symphotrichum subulatus*) and hastate orache (*Atriplex prostrata*).



**Diagnostic Features:** The dominance of Roemer’s bulrush in a marsh community serves to distinguish this community from others in Delaware.

### Needlerush High Marsh Sussex County

**Geology and Environmental Features:** Soils in this community are poorly to very poorly drained and often have standing water flooding peat accumulations (averaging 15 cm in depth) that overlie gleyed sands.

**Landscape Position:** This community is found just above the elevation of the North Atlantic Low Salt Marsh and equal to the Mid and Southern Atlantic High Salt Marsh.

**Associated Soil Series:** Purnell Peat, very frequently flooded, tidal

**NWI Classification:** Estuarine

Species documented from this community

Animals

Non-Vascular Plants

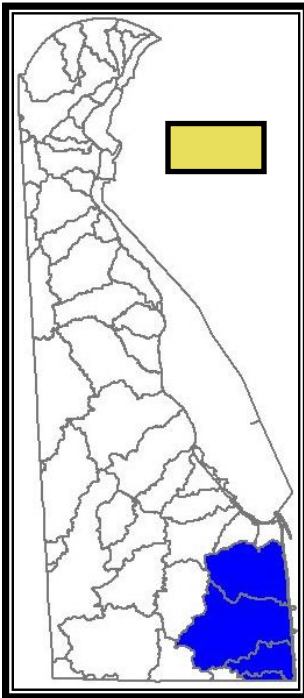
Vascular Plants

Associated Rare Species:

**Animals:** Maritime Sunflower Borer Moth (*Papaipema maritima*)

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: In Delaware, this community is restricted to the Inland Bays region. Excellent occurrences are known from the Little Assawoman Bay Estuary. Nationally this community is found on the East and Gulf Coasts from Delaware to Texas.

**Estimated Acres in Delaware = 35.0 (February 2012)**

**-Acres with 0.5 m sea level rise = 31.2-31.2 = 0**

**-Acres with 1 m sea level rise = 31.2-31.2 = 0**

**-Acres with 1.5 m sea level rise = 31.2-31.2 = 0**

\*This community in its current distribution is eliminated at 0.5 m of sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** Needlerush High Marsh (Harrison 2004)

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** Tidal Mesohaline Black Needlerush Marsh (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Needlerush Salt Marsh

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Tidal Salt Marsh

**Landfire Classification Code:** unknown

Public places in Delaware to view this community

**Sussex County**

- Assawoman Wildlife Area
- Delaware Seashore State Park

[-Back to Sussex County Tidal Marsh-](#)

## North Atlantic High Salt Marsh

G5

S4

D5

NVC Alliance: [A.1481-Spartina patens-\(Distichlis spicata\) Tidal Herbaceous Alliance](#)

NVC Association: [CEGL006006-Spartina patens-Distichlis spicata-\(Juncus gerardii\) Herbaceous Vegetation](#)

**Delaware Type Locality:** TBD

**Description:** This northern salt marsh is characterized by the dominance of salt meadow cordgrass (*Spartina patens*) and elevation slightly higher than the North Atlantic Low Salt Marsh ([CEGL004192](#)). This marsh receives irregular tidal flooding being above the mean high tide level. Salt Pannes may be interspersed within this community.

Salt meadow cordgrass dominates the marsh and can be associated by or co-dominant with seashore saltgrass (*Distichlis spicata*) in some examples. Other herbs that may be found include sea-lavender (*Limonium carolinianum*), salt marsh false foxglove (*Agalinus maritima*), glasswort (*Salicornia* spp.), sea pink (*Sabatia stellaris*), narrow loosestrife (*Lythrum lineare*), three-square bulrush (*Schoenoplectus pungens*), seaside goldenrod (*Solidago sempervirens*), Roemer's rush (*Juncus roemerianus*), marsh fimbry (*Fimbristylis castanea*), salt marsh fleabane (*Pluchea odorata*), swamp rosemallow (*Hibiscus moscheutos*) and southern bayberry (*Morella cerifera*).



**Indian River Bay  
Sussex County**

**Diagnostic Features:** North Atlantic High Salt Marshes can be readily identified by the dominance or monoculture of salt meadow cordgrass and its elevation slightly higher above the North Atlantic Low Salt Marsh ([CEGL004192](#)). This community does not contain Needlerush which separates it from the more southern Mid and Southern Atlantic High Salt Marsh ([CEGL004197](#)).

**Geology and Environmental Features:** The marsh soil is often mucky but with less mud than the low marsh and is composed of peat which overlies sand, silt or bedrock. High salt marshes are found in the zone from the mean high tide limit and the limit of spring high tides.

**Landscape Position:** Slightly higher than the North Atlantic Low Salt Marsh

**Associated Soil Series:** Broadkill-Appoquinimink Complex, very frequently flooded, tidal, Broadkill Mucky Peat, , very frequently flooded, tidal Purnell Peat, very frequently flooded, tidal

**NWI Classification:** Estuarine

**Status and Trends**

**Poor:** North Atlantic High Salt Marsh has in most areas, with the exception of Little Creek Wildlife Area, been declining at an increasing rate. Figure 1 below shows the average loss and gain of acreage in the managed areas mapped so far in Delaware. The same has shown that there has been a net loss of 25 acres of marsh between 2002 and 2007.

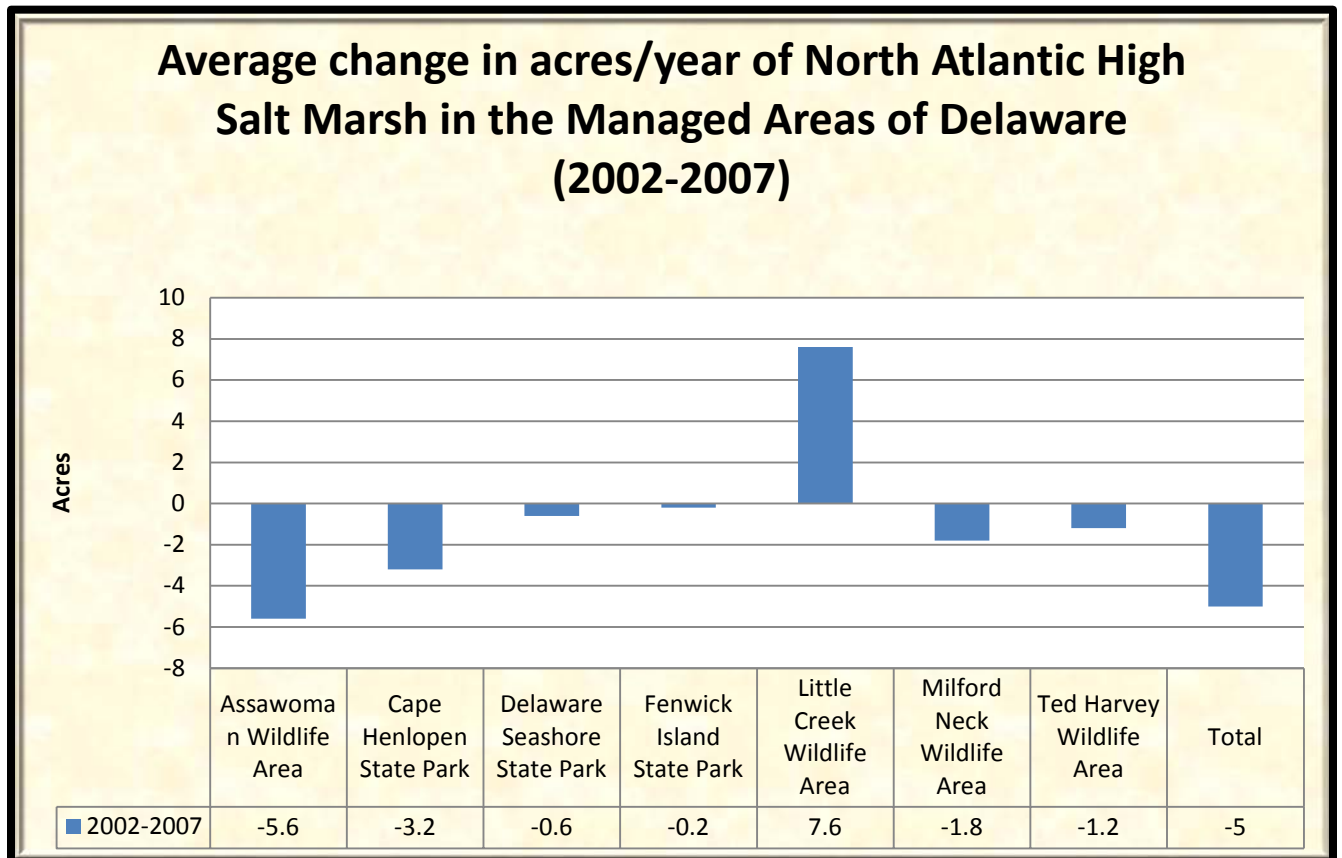


Figure AAA. Average change in acres/year of North Atlantic High Salt Marsh in the Managed Areas of Delaware (2002-2007)

**Species documented from this community**

Animals

Non-Vascular Plants

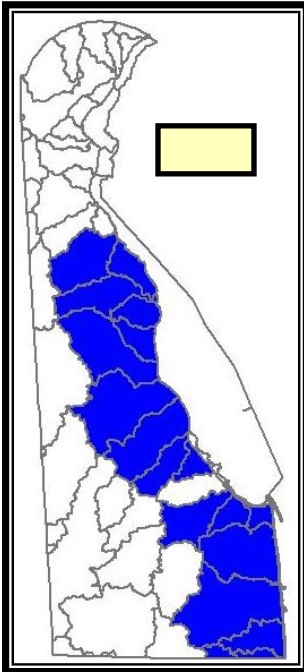
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: North Atlantic High Salt Marshes are common throughout the shore of the Delaware Bay and Atlantic Shore. It occurs occasionally in the Inland Bay area. Nationally this community is found on the Atlantic Coast from Maine south to Maryland.

**Estimated Acres in Delaware = 5,783.0 (February 2012)**

**-Acres with 0.5 m sea level rise = 5,674.7-5,655.6 = 19.1**

**-Acres with 1 m sea level rise = 5,674.7-5,673.6 = 1.1**

**-Acres with 1.5 m sea level rise = 5,674.7-5,674.5 = 0.2**

Equivalent or related communities in nearby states:

**Maryland:** Mid and Southern Atlantic High Salt Marsh (Harrison 2004)

**New Jersey:** *Spartina patens*-*Distichlis spicata*-*Plantago maritima* Herbaceous Vegetation (Breden et al 2001)

Coastal Salt Marsh (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** Tidal Mesohaline/Polyhaline Marsh (Fleming et al. 2001)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** *Spartina* High Salt Marsh

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Tidal Salt Marsh

**Landfire Classification Code:** unknown

Public places in Delaware to view this community

**Kent County**

- Bombay Hook National Wildlife Refuge
- Little Creek Wildlife Area
- Milford Neck Wildlife Area
- Ted Harvey Wildlife Area
- Woodland Beach Wildlife Area

### **Sussex County**

- Assawoman Wildlife Area
- Cape Henlopen State Park
- Delaware Seashore State Park
- Milford Neck Wildlife Area
- Prime Hook National Wildlife Refuge

[-Back to Kent County Tidal Marsh-](#)  
[-Back to New Castle County Tidal Marsh-](#)  
[-Back to Sussex County Tidal Marsh-](#)



## North Atlantic Low Salt Marsh

G5

S5

D5

NVC Alliance: [A.1471-Spartina alterniflora Tidal Herbaceous Alliance](#)

NVC Association: [CEGL004192-Spartina alterniflora/\(Ascophyllum nodosum\) Acadian/Virginian Zone Herbaceous Vegetation](#)

**Delaware Type Locality:** Great Marsh to the northwest of Lewes, De in the Broadkill River watershed ([38°47'32.05"N, 075°11'0.99"W](#)).

**Description:** This is the only “low marsh” community in Delaware and is the typical low salt marsh of the Northeastern United States. It is found in the zone between mean sea level and mean high water level. Salt marsh cordgrass ([Spartina alterniflora](#)) is limited to the low marsh zone by moderate salinity. Salt marsh cordgrass can occur in two forms, a short form that grows 0.3 to 0.61 m in height and a tall form that is 1.0 to 2.1 m in height (Carey 1996).

Salt marsh cordgrass is the characteristic dominant in this community and occurs in nearly pure stands. Other herbs present may include sea lavender ([Limonium carolinianum](#)), glasswort ([Salicornia](#) spp.), hastate orache ([Atriplex prostrata](#)), tidal-marsh amaranth ([Amaranthus cannabinus](#)), sweetscent ([Pluchea odorata](#)), eastern mock grama ([Tripsacum dactyloides](#)), salt meadow hay ([Spartina patens](#)), giant cordgrass ([S. cynosuroides](#)), saltmarsh rush ([Juncus gerardii](#)), Roemer’s bulrush ([J. roemerianus](#)), coastal salt grass ([Distichlis spicata](#)) and eastern reed grass ([Phragmites australis](#)). Shrubs that may be present include salt shrub ([Baccharis halimifolia](#)), marsh elder ([Iva frutescens](#)), swamp mallow ([Kosteletzkya virginica](#)), crimson-eyed rose mallow ([Hibiscus moscheutos](#)),



**Indian River Bay  
Sussex County**

**Diagnostic Features:** Low salt marsh dominated by salt marsh cordgrass and the location within the daily tide serves to identify this community. The tall form can be identified by a plant height above 1 m and the short form is less than 1 m.

**Geology and Environmental Features:** Low marshes often have a substrate of peat mixed in with or overlying a layer of sand or silty muck. The tall form of *Spartina* grows in places that receive daily tidal flooding, while the short form grows in a slightly higher elevation at the upper limit of the tide.

**Landscape Position:** Within mean sea level and mean high sea level

**Associated Soil Series:** Broadkill-Appoquinimink Complex, very frequently flooded, tidal

Purnell Peat, very frequently flooded, tidal  
 Broadkill mucky peat, very frequently flooded, tidal  
 Transquaking and Mispillion Soils, very frequently flooded, tidal

**NWI Classification:** Estuarine

Species documented from this community

Animals

Non-Vascular Plants

Vascular Plants

Associated Rare Species:

**Animals:**

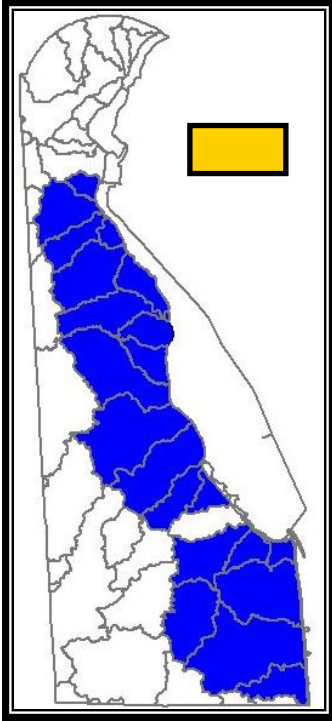
Saltmarsh Sharp-tailed Swallow	<a href="#"><i>Ammodramus caudacutus</i></a>
Short-eared Owl	<a href="#"><i>Asio flammeus</i></a>
American Bittern	<a href="#"><i>Botaurus lentiginosus</i></a>
Broad-winged Hawk	<a href="#"><i>Buteo platypterus</i></a>
A Tiger Beetle	<i>Cicindela marginata</i>
Northern Harrier	<a href="#"><i>Circus cyaneus</i></a>
Sedge Wren	<a href="#"><i>Cistothorus platensis</i></a>
Snowy Egret	<a href="#"><i>Egretta thula</i></a>
Tricolored Heron	<a href="#"><i>Egretta tricolor</i></a>
American Oystercatcher	<a href="#"><i>Haematopus palliatus</i></a>
Bald Eagle	<a href="#"><i>Haliaeetus leucocephalus</i></a>
Great Black-backed Gull	<a href="#"><i>Larus marinus</i></a>
Black Rail	<a href="#"><i>Laterallus jamaicensis</i></a>
Bank Swallow	<a href="#"><i>Riparia riparia</i></a>
Forster's Tern	<a href="#"><i>Sterna forsteri</i></a>
Common Tern	<a href="#"><i>Sterna hirundo</i></a>

**Non-Vascular Plants:** unknown

**Vascular Plants:**

Small-fruit Beggar-ticks	<i>Bidens mitis</i>
Erect Coinleaf	<i>Centella erecta</i>
Small-fruited Panic Grass	<i>Dichanthelium dichotomum</i> var. <i>roanokense</i>
Beaked Spikerush	<i>Eleocharis rostellata</i>

Rattlesnake Master	<i>Eryngium aquaticum</i> var. <i>aquaticum</i>
Carolina fimbry	<i>Fimbristylis caroliniana</i>
Holy Grass	<i>Hierochloe odorata</i>
Sessile-leaved Bugleweed	<i>Lycopus amplexans</i>
Common Reed (native)	<i>Phragmites australis</i>
Bushy Knotweed	<i>Polygonum ramosissimum</i>
Dwarf Glasswort	<i>Salicornia bigelovii</i>
Virginia Glasswort	<i>Salicornia virginica</i>
Woody Glasswort	<i>Sarcocornia perennis</i>
Saltmarsh Bulrush	<i>Schoenoplectus novae-angliae</i>
Buckthorn Bumelia	<i>Sideroxylon lycoides</i>
Saw Greenbrier	<i>Smilax bona-nox</i>
Hyssop-leaf Hedge-nettle	<i>Stachys hyssopifolia</i>



Distribution: North Atlantic Low Salt Marshes are present in Delaware from the [Chesapeake and Delaware Canal](#) south to Fenwick Island on the Atlantic Ocean. Nationally they along the

**Estimated Acres in Delaware = 50,175.0 (February 2012)**

**-Acres with 0.5 m sea level rise = 50,142.0-49,602.3 = 539.7**

**-Acres with 1 m sea level rise = 50,142.0-49,952.7 = 189.3**

**-Acres with 1.5 m sea level rise = 50,142.0-50,005.7 = 136.3**

Equivalent or related communities in nearby states:

**Maryland:** *Spartina* Low Marsh (Harrison 2004)

**New Jersey:** *Spartina alterniflora* / (*Ascophyllum nodosum*) Acadian/Virginian Zone Herbaceous Vegetation (Breden et al 2001)

Coastal Salt Marsh (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** Low Salt Marsh (Saltmarsh Cordgrass-Salt Grass Type) (Fleming, G.P., et al 2006)

Low Salt Marsh (Saltmarsh Cordgrass-Saltmeadow Cordgrass Type) (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** *Spartina* Low Salt Marsh

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Tidal Salt Marsh

**Landfire Classification Code:** unknown

Public places in Delaware to view this community

Nearly all public places on the coast below the Christina River have this community.

[-Back to Kent County Tidal Marsh-](#)  
[-Back to New Castle County Tidal Marsh-](#)  
[-Back to Sussex County Tidal Marsh-](#)

## Alkali Bulrush Brackish Marsh

GNR

S?

D?

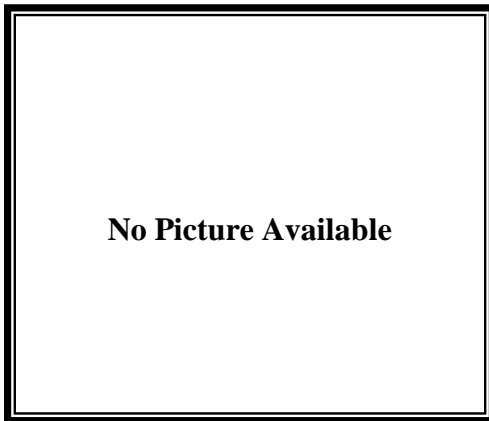
**NVC Alliance:** [A.1434-Schoenoplectus robustus Semipermanently Flooded Herbaceous Alliance](#)

**NVC Association:** [CEGL006416-Schoenoplectus robustus-Spartina alterniflora Herbaceous Vegetation](#)

**Delaware Type Locality:** There are no locations for this community in Delaware, though it is likely it is here.

**Description:** This marsh community occurs on brackish tidal rivers.

This marsh is co-dominated by salt marsh bulrush (*Schoenoplectus robustus*) and salt marsh cordgrass (*Spartina alterniflora*). Other associated species include big salt marsh cordgrass (*Spartina cynosuroides*), perennial salt marsh aster (*Symphotrichum tenuifolium*), long-leaved aster (*S. novi-belgii*), narrow-leaved cattail (*Typha angustifolia*), swamp dock (*Rumex verticillatus*), waterhemp (*Amaranthus cannabinus*), dotted smartweed (*Polygonum punctatum*) and rice-cut grass (*Leersia oryzoides*).



**Diagnostic Features:** The presence of salt marsh bulrush plus salt marsh cordgrass is characteristic of this community.

**Geology and Environmental Features:**

**Landscape Position:** Edges of brackish rivers

**Associated Soil Series:** no locations in Delaware

**NWI Classification:** Estuarine

**Species documented from this community**

Animals

Non-Vascular Plants

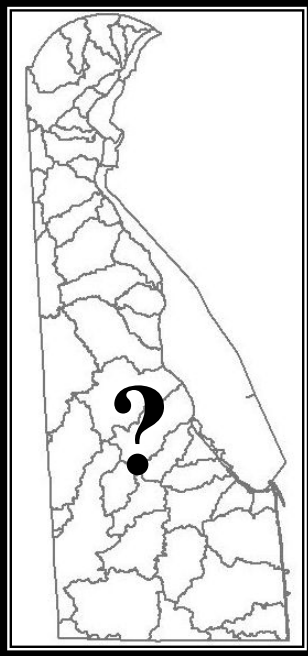
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: There are no known locations for this community in Delaware but it is likely here. Nationally this community is found in New Jersey and Virginia.

**Estimated Acres in Delaware = 0+ (February 2012)**

Equivalent or related communities in nearby states:

**Maryland:** not present

**New Jersey:** unknown

**Pennsylvania:** not present

**Virginia:** Riverine Tidal Mesohaline Marsh (Saltmarsh Bulrush-Saltmarsh Cordgrass Type) (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Brackish Tidal Marsh

**Landfire Classification Code:** unknown

[-Back to Sussex County Tidal Marsh-](#)

## Atlantic Coast Tidal Oligohaline Spikerush Marsh

**G1G2 S? D?**

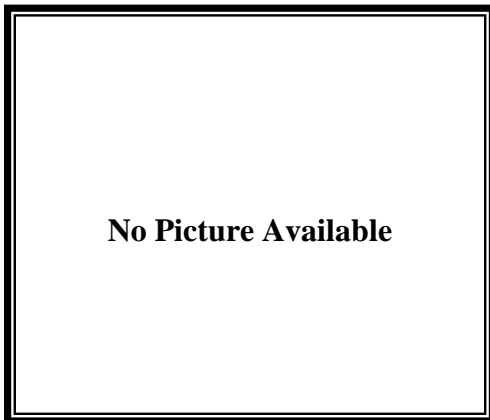
**NVC Alliance:** [A.1474-\*Eleocharis fallax\*-\*Eleocharis rostellata\*](#) Tidal Herbaceous Alliance

**NVC Association:** [CEGL004628-\*Eleocharis fallax\*-\*Eleocharis rostellata\*-\*Schoenoplectus americanus\*-\*Sagittaria lancifolia\*](#) Herbaceous Vegetation

**Delaware Type Locality:** There are no locations for this community in Delaware though it is likely that it is here.

**Description:** This community is the oligohaline marsh of the Atlantic Coast. They have sometimes been called “spikerush lawns.”

Creeping spikerush ([Eleocharis fallax](#)), beaked spikerush ([Eleocharis rostellata](#)), Olney’s three square bulrush ([Schoenoplectus americanus](#)), pickerelweed ([Pontederia cordata](#)), bull-tongue arrowhead ([Sagittaria lancifolia](#)) are often the dominant species. Other species may include erect coin leaf ([Centella erecta](#)), ten-angle pipewort ([Eriocaulon decangulare](#)) and twig-rush ([Cladium mariscoides](#)).



**Diagnostic Features:** This community is dominated by various species of spikerushes.

**Geology and Environmental Features:** Most of these sites are peaty and are well away from tidal guts. Salinity ranges from 0.5 to 5 ppt.

**Landscape Position:** This community would be found within tidal marshes by the coast.

**Associated Soil Series:** no locations in Delaware

**NWI Classification:** Estuarine

### Species documented from this community

Animals

Non-Vascular Plants



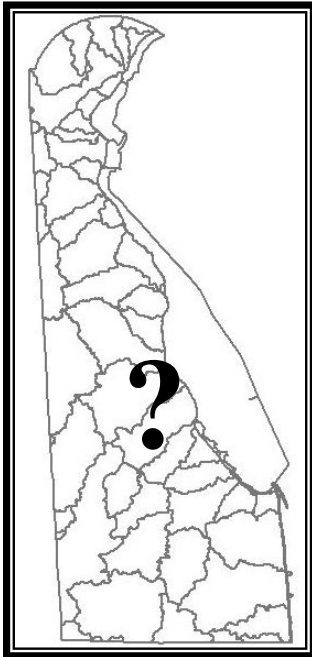
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: There is some question about whether this community actually occurs in Delaware. Nationally this community is found on the east coast from Delaware south to North Carolina.

**Estimated Acres in Delaware = 0+ (February 2012)**

Equivalent or related communities in nearby states:

**Maryland:** Atlantic Coast Tidal Oligohaline Spikerush Marsh (Harrison 2004)

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** Wind-Tidal Oligohaline Marsh (Creeping Spikerush-Bull-Tongue Arrowhead Type) (Fleming, G.P., et al 2006)

Wind-Tidal Oligohaline Marsh (Beaked Spikerush Type) (Fleming, G.P., et al 2006)

Wind-Tidal Oligohaline Marsh (Bull-Tongue Arrowhead-Royal Fern-Twigrush Type) (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Beaked Spikerush Brackish Tidal Marsh

**Northeast Wildlife Habitat Classification:** ?

**Landfire Classification Code:** unknown

[-Back to Sussex County Tidal Marsh-](#)

## Brackish Meadow

GNR

S3?

D

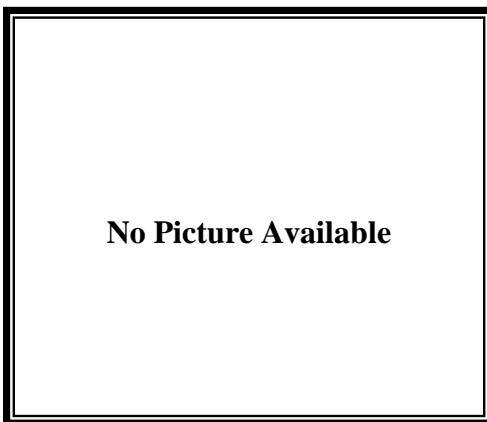
NVC Alliance: [A.1476-Panicum virgatum Tidal Herbaceous Alliance](#)

NVC Association: [CEGL006150-Panicum virgatum-Spartina patens Herbaceous Vegetation](#)

Delaware Type Locality: TBD

Description: This marsh community occupies places that are between tidal marsh communities and upland habitats. Often this community is found near to Irregularly Flooded Eastern Tidal Salt Shrub communities.

Other than switchgrass ([Panicum virgatum](#)) other species can include salt meadow cordgrass ([Spartina patens](#)), marsh bentgrass ([Agrostis stolonifera](#)), poison ivy ([Toxicodendron radicans](#)), Olney's three square bulrush ([Schoenoplectus americanus](#)), seaside goldenrod ([Solidago sempervirens](#)), salt shrub ([Baccharis halimifolia](#)) and Canadian germander ([Teucrium canadense](#)). More southern examples may have the addition of twig-rush ([Cladium mariscoides](#) ssp. *jamaicense*) and big salt marsh cordgrass ([Spartina cynosuroides](#)).



Diagnostic Features: The dominance of switchgrass and the location serves to identify this community. Occasionally this community can be co-dominated by salt meadow cordgrass.

Geology and Environmental Features: The elevation of this community is generally higher than the adjacent salt marsh and is irregularly flooded. Substrate is often shallow peat over glacial till with a salinity of 0.5 to 18 ppt. In some places, this community can be found on anthropogenic dredge spoils.

**Landscape Position:**

**Associated Soil Series:**

**NWI Classification:** Estuarine

Species documented from this community

Animals

Non-Vascular Plants

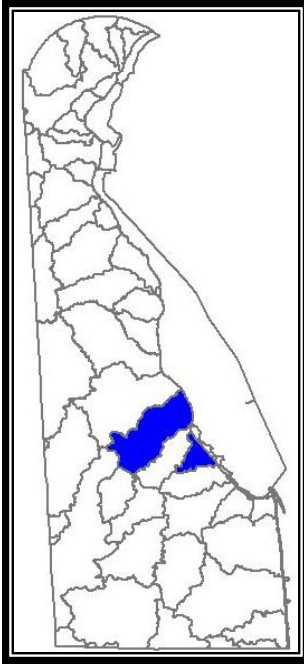
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: Brackish Meadows are found on Milford Neck and Prime Hook National Wildlife Refuge in Delaware. Nationally this community is known from the East Coast from Massachusetts to Virginia.

**Estimated Acres in Delaware = 0+ (February 2012)**

Equivalent or related communities in nearby states:

**Maryland:** Brackish Meadow (Harrison 2004)

**New Jersey:** *Panicum virgatum* - *Carex silicea* Herbaceous Vegetation (Breden et al 2001)

Coastal Brackish Marsh (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** not present

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Switchgrass Tidal Marsh

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Tidal Salt Marsh

**Landfire Classification Code:** unknown

[-Back to Sussex County Tidal Marsh-](#)

## Cattail Brackish Tidal Marsh

G4G5

S3

D?

NVC Alliance: [A.1472-Typha \(angustifolia, domingensis\) Tidal Herbaceous Alliance](#)

NVC Association: [CEGL004201-Typha angustifolia-Hibiscus moscheutos Herbaceous Vegetation](#)

**Delaware Type Locality:** marsh just to the west of Big Stone Beach in the Mispillion River watershed in Kent County ([38°59'59.33"N, 075°19'56.28"W](#)).

**Description:** This marsh community occurs on tidal rivers and places where salinity ranges from 0.5 to 18.0 ppt such as the margins of high salt marshes and salt ponds. Often there is more narrow-leaf cattail ([Typha angustifolia](#)) present in those places that receive more freshwater seepage. As the salinity increases more salt meadow cordgrass ([Spartina patens](#)) and Olney's three square bulrush ([Schoenoplectus americanus](#)) can be found.

Narrow-leaf cattail is the dominant species and may in some cases be co-dominant with native eastern reed grass ([Phragmites australis](#)) or wide-leaved cattail ([Typha latifolia](#)). Other species in the marsh can include swamp rosemallow ([Hibiscus moscheutos](#)), three square bulrush ([Schoenoplectus pungens](#)), orange-spotted jewelweed ([Impatiens capensis](#)), waterhemp ([Amaranthus cannabinus](#)), arrow-aryum ([Peltandra virginica](#)) and beggar's tick ([Bidens](#) spp.) Less common species include climbing hempweed ([Mikania scandens](#)), dotted smartweed ([Polygonum punctatum](#)), salt marsh fleabane ([Pluchea odorata](#)) and spike rush ([Eleocharis](#) spp.).

**Diagnostic Features:** The dominant presence of narrow-leaf cattail and the brackish location can serve to identify this community.

**Geology and Environmental Features:** Substrate can include muck or peat.

**Landscape Position:** This community is located in protected areas of marshes often adjacent to North Atlantic Low Salt Marshes ([CEGL004192](#)) and North Atlantic High Salt Marshes ([CEGL006006](#)).

**Associated Soil Series:** Transquaking and Mispillion Soils, very frequently flooded, tidal

**NWI Classification:** Estuarine

### Species documented from this community

Animals

Non-Vascular Plants

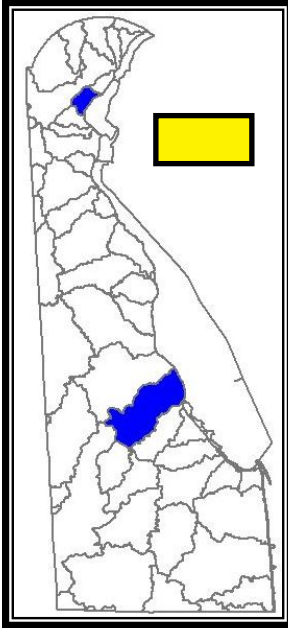
Vascular Plants

### Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is occasional in the brackish marshes on the Delaware Coast. Nationally it is found on the East Coast from Maine south to Virginia and possibly into South Carolina.

**Estimated Acres in Delaware = 118.0 (February 2012)**

**-Acres with 0.5 m sea level rise = 81.3-81.2 = 0.1**

**-Acres with 1 m sea level rise = 81.3-81.3 = 0**

**-Acres with 1.5 m sea level rise = 81.3-81.3 = 0**

\*This community in its current distribution is eliminated at 1 m of sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** Brackish Tidal Marsh (Cattail Type) (Harrison 2004)

**New Jersey:** *Typha angustifolia* - *Hibiscus moscheutos* Herbaceous Vegetation (Breden et al 2001)

Coastal Brackish Marsh (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** Tidal Oligohaline Marsh (Narrow-Leaved Cattail Type) (Fleming, G.P., et al 2006)

Tidal Oligohaline Marsh (Narrow-Leaved Cattail-Spotted Jewelweed Type) (Fleming, G.P., et al 2006)

Tidal Oligohaline Marsh (Narrow-Leaved Cattail-Eastern Rose Mallow-Arrow-Arum Type) (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Brackish Tidal Marsh

**Landfire Classification Code:** unknown

Public places in Delaware to view this community

**Kent County**

-Milford Neck Wildlife Area

[-Back to Kent County Tidal Marsh-](#)  
[-Back to Sussex County Tidal Marsh-](#)



## Interdune Switchgrass Brackish Depression      G2G4      S?

NVC Alliance: [A.1362-Panicum virgatum Seasonally Flooded Herbaceous Alliance](#)

NVC Association: [CEGL004129-\(Morella cerifera\)-Panicum virgatum-Spartina patens Herbaceous Vegetation](#)

**Delaware Type Locality:** Prime Hook National Wildlife Refuge on west side of marsh just north of Broadkill Beach Road in Sussex County ([38°49'22.91"N, 075°14'42.48"W](#)).

**Description:** These marsh communities occur landward of backdunes and is typified by a 40 to 85 percent cover of switchgrass (*Panicum virgatum*). Freshwater maintains these depressions as saturated or seasonally flooded and somewhat poorly drained. This community may represent a successional phase leading to a Barrier Island Bog ([CEGL003906](#)) on those communities that are located in dunes. More shrubs tend to colonize as the swale gets drier and more peat accumulates.

Switchgrass is the dominant species and is associated by salt meadow cordgrass (*Spartina patens*), Canada rush (*Juncus canadensis*), seaside goldenrod (*Solidago sempervirens*), red fescue (*Festuca rubra*), creeping spikerush (*Eleocharis palustris*), greenish-white sedge (*Carex albolutescens*) and tiny-flowered flat-top goldenrod (*Euthamia tenuifolia*). Some woody species, such as southern bayberry (*Morella cerifera*) and salt shrub (*Baccharis halimifolia*), may occur at less than 10% cover.



**Prime Hook National Wildlife  
Refuge  
Sussex County**

**Diagnostic Features:** The presence of switchgrass at 40 to 85 percent coverage and the location is diagnostic of this community.

**Geology and Environmental Features:** Soils are typically composed of an organic layer overlying loamy sand or sand.

**Landscape Position:** Depressions adjacent to marshes on the coast.

**Associated Soil Series:** Askecky Loamy Sand, 0 to 2 percent slopes  
Hurlock Sandy Loam, 0 to 2 percent slopes

**NWI Classification:**

Species documented from this community

Animals

Non-Vascular Plants

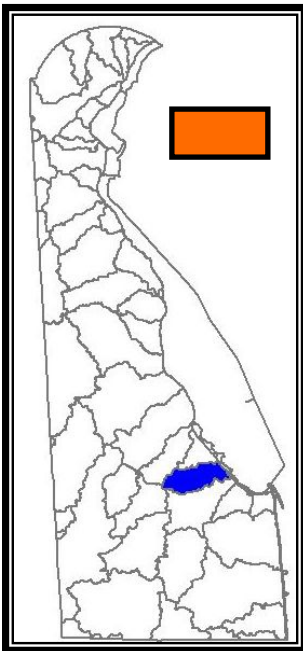
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is known from Prime Hook National Wildlife Refuge in Sussex County. Nationally this community ranges from Massachusetts south to North Carolina.

**Estimated Acres in Delaware = 9.8 (February 2012)**

**-Acres with 0.5 m sea level rise = 13.5-9.9 = 5.6**

**-Acres with 1 m sea level rise = 13.5-13.2 = 0.3**

**-Acres with 1.5 m sea level rise = 13.5-13.5 = 0**

Equivalent or related communities in nearby states:

**Maryland:** Interdune Switchgrass Freshwater Depression (Harrison 2004)

**New Jersey:** *Panicum virgatum* - *Spartina patens* Herbaceous Vegetation (Breden et al 2001)

Coastal Salt Marsh (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** Freshwater Interdune Pond (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Coastal Plain Dune and Swale

**Landfire Classification Code:** unknown

Public places in Delaware to view this community

**Kent County**

[-Back to Sussex County Non-Tidal Marsh-](#)

## Mesohaline Seepage Marsh

GNR

S4

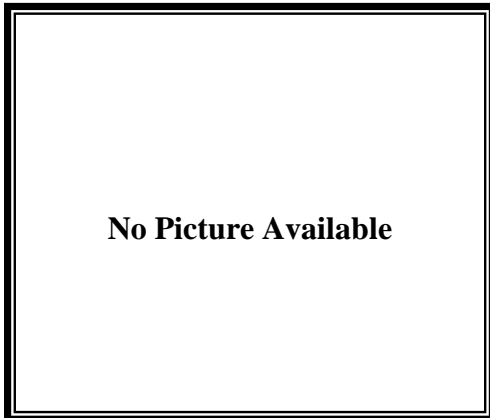
NVC Alliance: [A.1471-Spartina alterniflora Tidal Herbaceous Alliance](#)

NVC Association: [CEGL006418-Spartina alterniflora-Ptilimnium capillaceum-Polygonum punctatum Herbaceous Vegetation](#)

**Delaware Type Locality:** Blackbird Creek Marsh near DE 9 in New Castle County ([39°24'15.30"N, 075°35'51.69"W](#)).

**Description:** This marsh occurs in silty mud in meanders of rivers where there is freshwater seepage.

Co-dominant species include salt marsh fleabane ([Pluchea odorata](#)), northern tickseed sunflower ([Bidens coronata](#)) and Virginia sea-shore mallow ([Kosteletzkya virginica](#)). Frequent associates include small spikerush ([Eleocharis parvula](#)), slender flatsedge ([Cyperus filicinus](#)), swamp rosemallow ([Hibiscus moscheutos](#)) and waterhemp ([Amaranthus cannabinus](#)). Less common associates include creeping spikerush ([Eleocharis palustris](#)), marsh milkweed ([Asclepias incarnata](#)), hemlock water-parsnip ([Sium suave](#)), soft-stem club-rush ([Schoenoplectus tabernaemontani](#)), chairmaker's club-rush ([S. americanus](#)), seaside club-rush ([S. robustus](#)), long-awl cock's spur grass ([Echinochloa walteri](#)), wide-leaf cattail ([Typha latifolia](#)), green arrow-arum ([Peltandra virginica](#)), and duck potato ([Sagittaria latifolia](#)).



**Diagnostic Features:** A marsh that has a combination of the co-dominants above helps to identify this marsh. This community can often be hard to identify.

**Geology and Environmental Features:** This community is found adjacent to uplands.

**Landscape Position:** In the upper sections of brackish marshes of larger rivers in the Delaware Estuary.

**Associated Soil Series:** Tidal Marsh

**NWI Classification:** Estuarine

Species documented from this community

Animals

Non-Vascular Plants

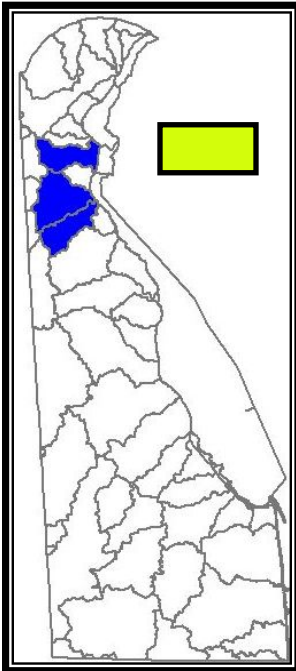
Vascular Plants

Associated Rare Species:

**Animals:** Bronze Copper (*Lycaena hyllus*), Bald Eagle ([\*Haliaeetus leucocephalus\*](#))

**Non-Vascular Plants:** unknown

**Vascular Plants:** Common Reed (*Phragmites australis*)-native type



Distribution: This community is known from Blackbird Creek, Appoquinimink River and the Eastern C and D Canal in New Castle County. Nationally it is present from New Jersey south to Maryland.

**Estimated Acres in Delaware = 1,273.4 (February 2012)**

**-Acres with 0.5 m sea level rise = 1,038.8-970.7 = 68.1**

**-Acres with 1 m sea level rise = 1,038.8-975.1 = 63.7**

**-Acres with 1.5 m sea level rise = 1,038.8-1,036.3 = 2.5**

Equivalent or related communities in nearby states:

**Maryland:** Mesohaline Seepage Marsh (Harrison 2004)

**New Jersey:** unknown

**Pennsylvania:** not present

**Virginia:** not present

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Smooth Cordgrass-Water Hemp Tidal Marsh

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Brackish Tidal Marsh

**Landfire Classification Code:** unknown

[-Back to New Castle County Tidal Marsh-](#)

**Oligohaline Mixed Forbs Tidal Marsh                    GNR                    S1**

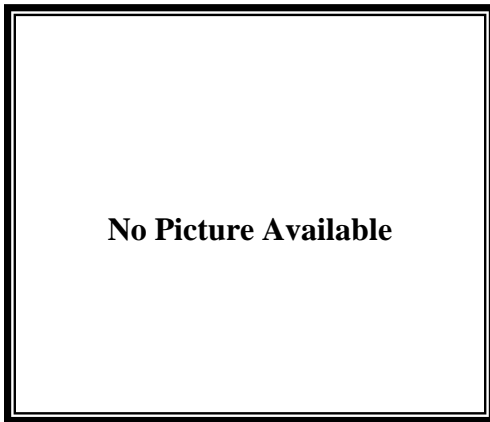
**NVC Alliance:** [A.1703-Peltandra virginica-Pontederia cordata Tidal Herbaceous Alliance](#)

**NVC Association:** [CEGL006181-Hibiscus moscheutos-Polygonum arifolium-Leersia oryzoides-\(Carex stricta\) Tidal Herbaceous Vegetation](#)

**Delaware Type Locality:** On the shores of Deep Branch of the Mispillion River southeast of Milford in Sussex County. ([38°54'55.84"N, 075°24'26.90"W](#))

**Description:** This marsh community is an oligohaline marsh of variable species. It is found on tidal shores where the salinity is barely brackish to fresh.

Species that can be dominant and form patches include halbeard-leaf tearthumb ([Polygonum arifolium](#)), swamp rosemallow ([Hibiscus moscheutos](#)), dotted smartweed ([Polygonum punctatum](#)), arrow-arum ([Peltandra virginica](#)), rice-cut grass ([Leersia oryzoides](#)), arrow-leaf tearthumb ([Polygonum sagittatum](#)), big salt marsh cordgrass ([Spartina cynosuroides](#)) and poison ivy ([Toxicodendron radicans](#)). Less common species can include Walter’s barnyard grass ([Echinochloa walteri](#)), Virginia seashore mallow ([Kosteletzkya virginica](#)), salt marsh fleabane ([Pluchea odorata](#)) and swamp dock ([Rumex verticillatus](#)). In some places tussock sedge ([Carex stricta](#)) can be present in locally dense patches. Scattered individuals of swamp rose ([Rosa palustris](#)) and buttonbush ([Cephalanthus occidentalis](#)) can often be found in this community.



**Diagnostic Features:** A marsh with a species composition of the species above points to this marsh.

**Geology and Environmental Features:** This community is often at the edges of extensive tidal marshes.

**Landscape Position:** On the edges of freshwater to slightly brackish tidal rivers.

**Associated Soil Series:** Manahawkin Muck, frequently flooded

**NWI Classification:** Estuarine

Species documented from this community

Animals

Non-Vascular Plants

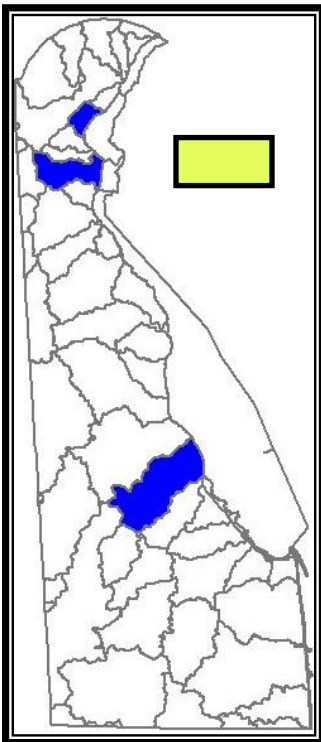
Vascular Plants

Associated Rare Species:

**Animals:** Loggerhead Shrike ([Lanius ludovicianus](#)), Bank Swallow ([Riparia riparia](#))

**Non-Vascular Plants:** unknown

**Vascular Plants:** Tick-seed Sunflower ([Bidens coronata](#)), American frog-bit ([Limnobium spongia](#)), Dense-flowered Smartweed ([Polygonum densiflorum](#))



Distribution: This community is known from the Mispillion River, Delaware River and the Eastern C and D Canal. It is likely at the headwaters of other tidal rivers as well. Nationally this community is found from New Jersey south to Virginia.

**Estimated Acres in Delaware = 120.3 (February 2012)**

**-Acres with 0.5 m sea level rise = 55.2-55.2 = 0.0**

**-Acres with 1 m sea level rise = 55.2-55.2 = 0.0**

**-Acres with 1.5 m sea level rise = 55.2-55.2 = 0.0**

\*This community is projected to be eliminated in its current distribution with 0.5 meters of sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** Oligohaline Mixed Forbs Marsh (Harrison 2004)

**New Jersey:** unknown

**Pennsylvania:** not present

**Virginia:** Tidal Oligohaline Marsh (Mixed Forbs Type) (Fleming, G.P., et al 2006)

Oligohaline Mixed Forbs Tidal Marsh (Fleming et al. 2001)



Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh

**Landfire Classification Code:** unknown

[-Back to New Castle County Tidal Marsh-](#)

[-Back to Sussex County Tidal Marsh-](#)

**Transitional Tidal Marsh                    GNR                    S**

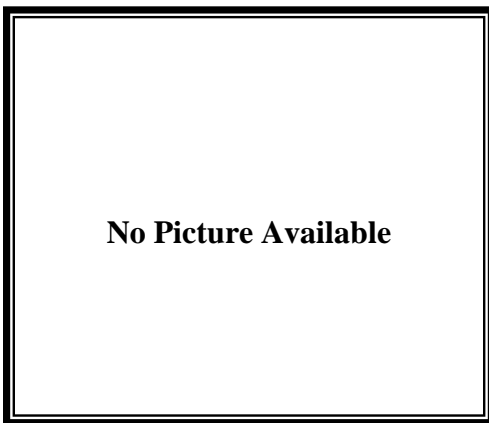
**NVC Alliance:** [A.2007-Schoenoplectus americanus Tidal Herbaceous Alliance](#)

**NVC Association:** [CEGL006612-Schoenoplectus americanus-Spartina patens Herbaceous Vegetation](#)

**Delaware Type Locality:**

Description: Brackish marsh that occurs in wet depressions in the upper reaches of irregularly flooded tidal marshes of the mid-Atlantic. This community is often found in the ecotone between high and low salt marshes. It is irregularly flooded and more frequently flooded than a North Atlantic High Salt Marsh. It is best developed in those places where the elevation gradient is gradual.

Chairmaker’s club-rush ([Schoenoplectus americanus](#)) makes up 40-75% of the total vegetative cover with the rest being composed of salt marsh fleabane ([Pluchea odorata](#)), Roemer’s rush ([Juncus roemerianus](#)), salt marsh cordgrass ([Spartina alterniflora](#)), big salt marsh cordgrass ([Spartina cynosuroides](#)), seashore saltgrass ([Distichlis spicata](#)) and sea lavender ([Limonium carolinianum](#)). Often cattail ([Typha](#) spp.) and eastern reed grass ([Phragmites australis](#)) are in the mix as well.



Diagnostic Features: Marsh that has 40-75% cover of chairmaker’s club-rush.

Geology and Environmental Features: This community occurs in the ecotone between low and high salt marshes.

**Landscape Position:** No current locations in Delaware

**Associated Soil Series:** No current locations in Delaware

**NWI Classification:**

Species documented from this community

Animals

Non-Vascular Plants

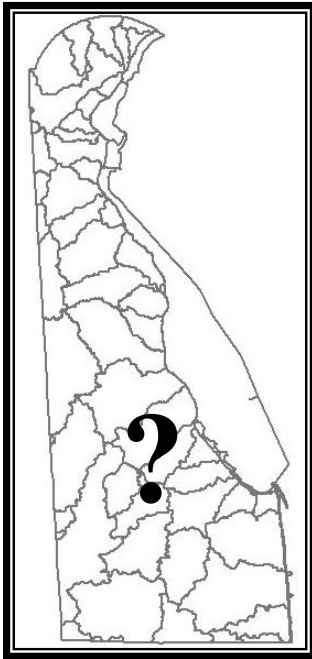
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution This community is known from Rehoboth Bay and Smyrna River watersheds. Nationally this community is known from New Jersey south to Virginia and possibly extends south to Georgia.

**Estimated Acres in Delaware = 0+ (February 2012)**

Equivalent or related communities in nearby states:

**Maryland:** Transitional Tidal Marsh

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** Tidal Oligohaline Marsh (Saltmeadow Cordgrass-Olney Three-Square Low Interior Marsh Type) (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Common Threesquare Tidal Marsh

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Brackish Tidal Marsh

**Landfire Classification Code:** unknown

[-Back to Sussex County Tidal Marsh-](#)

## Water-hemp Tidal Marsh

G3G5

S3?

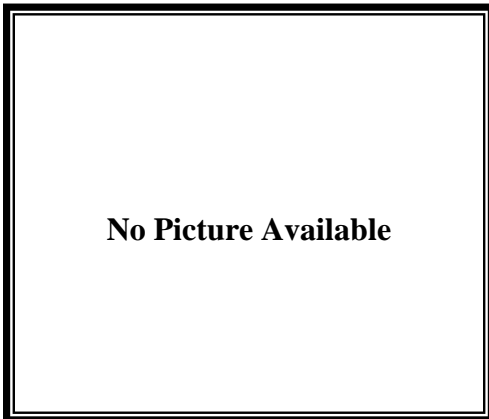
NVC Alliance: [A.1706-Amaranthus cannabinus Tidal Herbaceous Alliance](#)

NVC Association: [CEGL006080-Amaranthus cannabinus Tidal Herbaceous Vegetation](#)

**Delaware Type Locality:** Leipsic River marsh on the west side of DE 9 in Kent County near Leipsic ([39°14'38.76"N, 075°31'5.54"W](#)).

**Description:** This marsh community is a brackish marsh that is found on sandy intertidal river shores that are ice-scoured and have coarse substrate where tidal flooding drains. Often it is in a mid-tidal location. The dominance by annual species causes the species composition and ratio to change from year to year.

In this community, water hemp ([Amaranthus cannabinus](#)) is joined by wild rice ([Zizania aquatica](#)), three-square bulrush ([Schoenoplectus pungens](#)), river bulrush ([S. fluviatilis](#)), beggar's tick ([Bidens](#) spp.), rice-cut grass ([Leersia oryzoides](#)), broad-leaf arrowhead ([Sagittaria latifolia](#)) and dodder ([Cuscuta](#) spp.)



**Diagnostic Features:** This is the only community in Delaware where water hemp is the dominant species.

**Geology and Environmental Features:** This marsh is found on coarse substrate ranging from fine sand to gravel and rocky shores. Regular inundation is present but the floodwaters freely drain.

**Landscape Position:** In places at the upper end of tide

**Associated Soil Series:** Broadkill-Appoquinimink Complex, very frequently flooded, tidal

**NWI Classification:** Estuarine

### Species documented from this community

Animals

Non-Vascular Plants

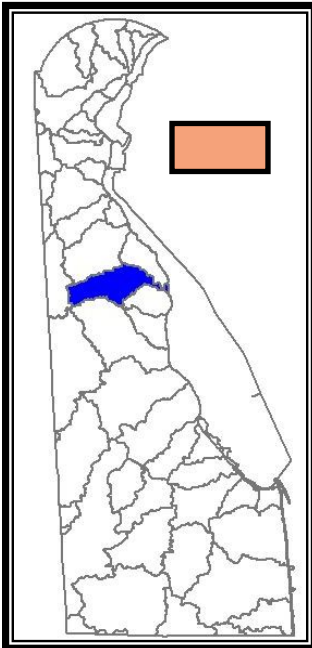
Vascular Plants

Associated Rare Species:

**Animals:** Bronze Copper (*Lycaena hyllus*)

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is known from tidal rivers and streams in Kent and New Castle Counties. Nationally this community is found on the east coast from Maine south to Maryland.

**Estimated Acres in Delaware = 55.4 (February 2012)**

**-Acres with 0.5 m sea level rise = 55.4-55.3 = 0.1**

**-Acres with 1 m sea level rise = 55.4-55.4 = 0.0**

**-Acres with 1.5 m sea level rise = 55.4-55.4 = 0.0**

\*This community is projected to be eliminated in its current distribution with 1 meter of sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** Water-hemp Tidal Marsh (Harrison 2004)

**New Jersey:** *Amaranthus cannabinus* Tidal Herbaceous Vegetation (Breden et al 2001)

South Jersey Freshwater Tidal Marsh (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** not present

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Water-hemp Brackish Marsh

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Brackish Tidal Marsh

**Landfire Classification Code:** unknown

[-Back to Kent County Tidal Marsh-](#)

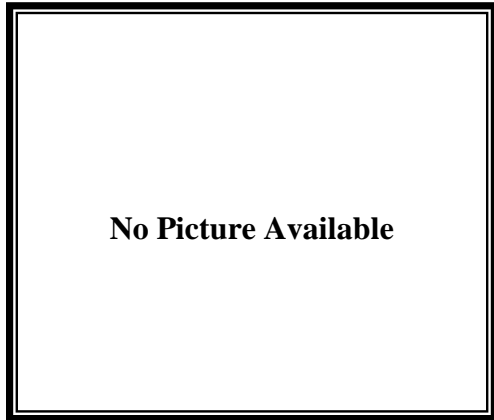
**American Lotus Herbaceous Vegetation    G4?            SNA            D**

**NVC Alliance:** A.3020-*Nelumbo lutea* Permanently Flooded Temperate Herbaceous Alliance

**NVC Association:** C EGL004323-*Nelumbo lutea* Herbaceous Vegetation

**Delaware Type Locality:** Pond on the Judge Morris Estate in White Clay Creek State Park

**Description:** This community is composed entirely of American lotus ([\*Nelumbo lutea\*](#)) in a non-tidal pond or impoundment. The one location for Delaware is located in a small pond near the Judge Morris house on the Judge Morris Estate of White Clay Creek State Park.



**Diagnostic Features:** This is the only community in Delaware where American lotus is dominant in a non-tidal situation.

**Geology and Environmental Features:**

**Landscape Position:** Small pond in White Clay Creek State Park

**Associated Soil Series:** Water

**Species documented from this community**

Animals

Non-Vascular Plants

Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** American lotus (*Nelumbo lutea*)



Distribution: This community is known from one location in White Clay Creek State Park. Nationally this community is found from Ontario south to South Carolina and west to Texas.

**Estimated Acres in Delaware = 0.2 acres (February 2012)**

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** Freshwater Tidal Marsh (American Lotus Mud Flat Type) (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** unknown

**Landfire Classification Code:** unknown

[-Back to New Castle County Non-Tidal Marsh-](#)

## American Lotus Tidal Marsh

GNA

SNA

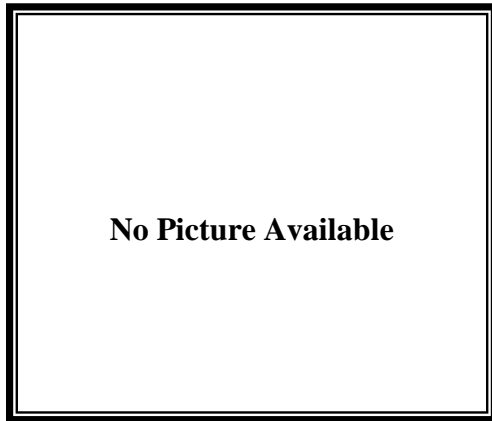
D

**NVC Alliance:** A.3020-*Nelumbo lutea* Tidal Herbaceous Alliance

**NVC Association:** CEGLO06913-*Nelumbo lutea* Tidal Herbaceous Vegetation

**Delaware Type Locality:** Marsh on the St. Jones River in Kent County ([39° 8'49.30"N, 075°30'48.58"W](#)).

**Description:** This community exists in a small cove that is protected from saltwater on the St. Jones River. It is nearly entirely dominated by American lotus ([Nelumbo lutea](#)).



**Diagnostic Features:** This is the only community in Delaware where American lotus is dominant in a tidal situation.

### Geology and Environmental Features:

**Landscape Position:** Tidal marsh on the St. Jones River

**Associated Soil Series:** Water

### Species documented from this community

Animals

Non-Vascular Plants

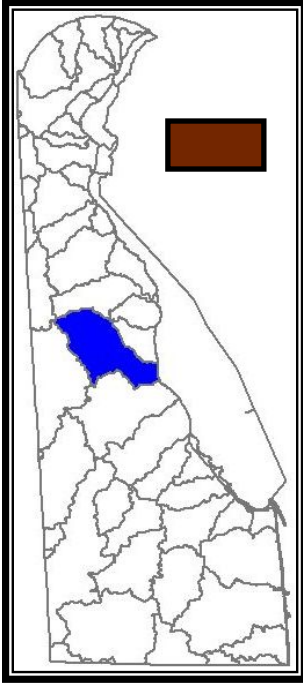
Vascular Plants

### Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** American lotus (*Nelumbo lutea*)



Distribution: This community is known from one location on the St. Jones River. Nationally this community is found from New Jersey south to Virginia.

**Estimated Acres in Delaware = 0.2 acres (July 2010)**

AAA

Equivalent or related communities in nearby states:

**Maryland:** American Lotus Tidal Marsh

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** Freshwater Tidal Marsh (American Lotus Mud Flat Type) (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh

**Landfire Classification Code:** unknown

[-Back to Kent County Tidal Marsh-](#)

## Atlantic Coast Wild Rice Tidal Marsh

G4?

S3

NVC Alliance: [A.1484-Zizania aquatica Herbaceous Alliance](#)

NVC Association: [CEGL004202-Zizania aquatica Tidal Herbaceous Vegetation](#)

**Delaware Type Locality:** marsh on tributary to Drawyers Creek next to Marl Pit Road in New Castle County (39°27'46.58"N, 075°40'14.96"W).

**Description:** Wild rice marshes fringe freshwater tidal rivers and are dominated by wild rice ([Zizania aquatica](#)). Co-dominants or associates may include smooth bur-marigold ([Bidens laevis](#)), arrow-arum ([Peltandra virginica](#)) and halbeard-leaf tearthumb ([Polygonum arifolium](#)). Wild rice marshes associated with tidal rivers in water that has less than 1 ppt salinity. This community provides an important food source for migratory birds.

On the Nanticoke River these marshes are often in a complex with Pond-lily Tidal Marsh ([CEGL004472](#)) being in the deepest water, Atlantic Coast Wild Rice Tidal Marsh on the immediate shore and Ash-Swamp Tupelo Freshwater Tidal Swamp ([CEGL006287](#)) behind the wild rice marsh going landward. Long strands of this complex can be found from Seaford, De downstream to the Maryland State Line.

In places where wild rice comprises less than 50 percent cover, additional associates may include orange-spotted jewelweed ([Impatiens capensis](#)), rice-cut grass ([Leersia oryzoides](#)), waterhemp ([Amaranthus cannabinus](#)), broadleaf arrowhead ([Sagittaria latifolia](#)), hemlock water parsnip ([Sium suave](#)), Walter's barnyard grass ([Echinochloa walteri](#)), narrow-leaved cattail ([Typha angustifolia](#)), wide-leaved cattail ([T. latifolia](#)), arrow-leaved tearthumb ([Polygonum sagittatum](#)), dotted smartweed ([P. punctatum](#)), sweet flag ([Acorus americanus](#)), Gronovius' dodder ([Cuscuta gronovii](#)) and river bulrush ([Schoenoplectus fluviatilis](#)).



**Diagnostic Features:** The dominance of wild rice on a freshwater tidal river defines this community.

### Marsh on the Delaware River New Castle County

**Geology and Environmental Features:** Soils are highly variable and are composed of varying amounts of silts, silty mucks, peat to coarse sands.

**Landscape Position:** These communities are often found at the edges of tidal rivers. On the Nanticoke River they are often found between the Pond-lily Tidal

Marsh (in the river water) and the Ash-Swamp Blackgum Freshwater Tidal Swamp (behind it going back from the river).

**Associated Soil Series:** Nanticoke and Mannington Soils, very frequently flooded, tidal  
Lenape-Nanticoke Complex, very frequently flooded, tidal

**NWI Classification:**

Species documented from this community

Animals

Non-Vascular Plants

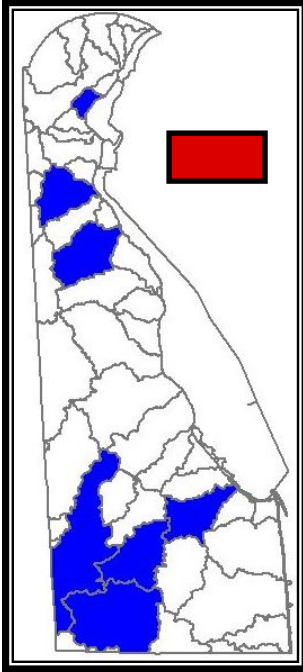
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** Wild Rice marshes are abundant in the upper reaches of freshwater tidal habitats throughout the Delaware River estuary especially on the Smyrna and Christina Rivers, Drawyers Creek and the Nanticoke River and its tributaries in the Chesapeake drainage. Nationally, this community is found along the coast from Maine south to Florida and west to Mississippi.

**Estimated Acres in Delaware = 395.9 (February 2012)**

**-Acres with 0.5 m sea level rise = 382.1-371.9 = 10.2**

**-Acres with 1 m sea level rise = 382.1-376.9 = 5.2**

**-Acres with 1.5 m sea level rise = 382.1-378.6 = 3.5**

Equivalent or related communities in nearby states:

**Maryland:** Atlantic Coast Wild Rice Tidal Marsh (Harrison 2004)

**New Jersey:** *Zizania aquatica* Tidal Herbaceous Vegetation (Breden et al 2001)

South Jersey Freshwater Tidal Marsh (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** Tidal Freshwater Marsh (Mixed Low Marsh Type) (Fleming, G.P., et al 2006)

Freshwater Tidal Marsh (Wild Rice-Dotted Smartweed Type) (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Wild Rice Freshwater Tidal Marsh

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh

**Landfire Classification Code:** unknown

[-Back to Kent County Tidal Marsh-](#)  
[-Back to New Castle County Tidal Marsh-](#)  
[-Back to Sussex County Tidal Marsh-](#)

## Bulrush Deepwater Marsh

GNR

S1

D?

**NVC Alliance:** [A.1443-Schoenoplectus acutus-\(Schoenoplectus tabernaemontani\)](#)

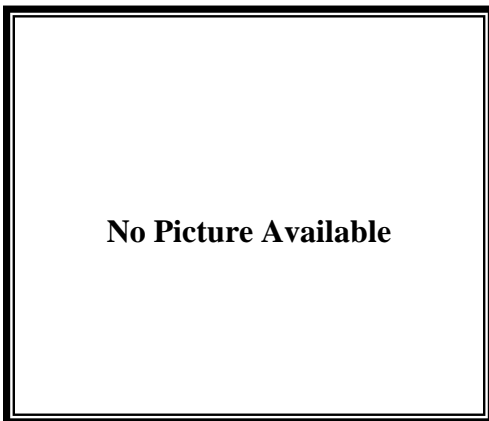
[Semipermanently Flooded Herbaceous Alliance](#)

**NVC Association:** [CEGL006275-Schoenoplectus \(tabernaemontani, acutus\) Eastern Herbaceous Vegetation](#)

**Delaware Type Locality:** North end of Shingle Landing in Thousand Acre Marsh in New Castle County, De ([39°32'39.01"N, 075°35'47.55"W](#)).

**Description:** This marsh community occurs in deep water (0.4 to 1 m) and is dominated by one or more species of club-rush (*Schoenoplectus* spp.) Spring flooding and heavy rain may provide nutrients to these communities. These communities are important to birds providing cover and nesting habitat.

Hard-stem club-rush (*Schoenoplectus acutus*), soft-stem club-rush (*S. tabernaemontani*) and chairmaker's club-rush (*S. americanus*) are the dominant plant species in this community. Associates may include wide-leaf cattail (*Typha latifolia*), eastern reed grass (*Phragmites australis*) and duckweed (*Lemna* spp.) In deeper places there may be floating or submerged plants such as pondweed (*Potamogeton* spp.) and Canadian waterweed (*Elodea canadensis*).



**Diagnostic Features:** This community can be distinguished by the dominance of a bulrush species.

**Geology and Environmental Features:** Substrate is generally deep muck which overtops mineral soil. In some cases, where there is wave action the mineral soil may be exposed. In dry years the soil may be exposed.

**Landscape Position:** Edges of tidal oligohaline marshes

**Associated Soil Series:** Tidal Marsh

**NWI Classifications:**

Species documented from this community

Animals

Non-Vascular Plants

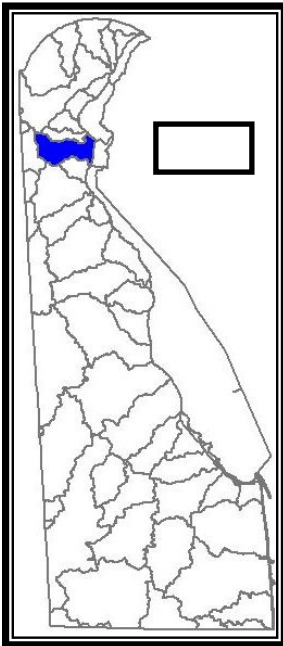
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Spongy Arrowhead (*Sagittaria spathulata*)



Distribution: This community is known from Thousand Acre Marsh in the C and D Canal watershed in New Castle County. Nationally this community is found from Maine south to Virginia and west to West Virginia.

**Estimated Acres in Delaware = 0.7 acres (February 2012)**

**-Acres with 0.5 m sea level rise = 0.7-0.7 = 0.0**

**-Acres with 1 m sea level rise = 0.7-0.7 = 0.0**

**-Acres with 1.5 m sea level rise = 0.7-0.7 = 0**

\*This community is projected to be eliminated in its current distribution with 0.5 meters of sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** Bulrush Deepwater Marsh (Harrison 2004)

**New Jersey:** *Schoenoplectus (tabernaemontani, acutus)* Eastern Herbaceous Vegetation (Breden et al 2001)

North Jersey Freshwater Marsh (Collins and Anderson 1994)

**Pennsylvania:** Bulrush Marsh

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Bulrush Deepwater Marsh



**Northeast Wildlife Habitat Classification:** Laurentian-Acadian Freshwater Marsh

**Landfire Classification Code:** unknown

[-Back to Sussex County Tidal Marsh-](#)

## Eastern Cattail Marsh

G5

S4

D?

**NVC Alliance:** A.1436-*Typha* (*angustifolia*, *latifolia*)-(*Schoenoplectus* spp.)

Semipermanently Flooded Herbaceous Alliance

**NVC Association:** CEGLO06153-*Typha* (*angustifolia*, *latifolia*)-(*Schoenoplectus* spp.)

Eastern Herbaceous Vegetation

**Delaware Type Locality:** Wetland in Woodley Park at the head of Husbands Run in New Castle County. ([39°48'12.53"N, 075°33'11.73"W](#))

**Description:** This freshwater marsh community is a monoculture of by narrow-leaf cattail ([Typha angustifolia](#)), hybrid cattail (*T. glauca* (*latifolia* X *angustifolia*)) and/or wide-leaf cattail ([T. latifolia](#)) or may be associated with other emergent marsh species. Often this community is found on the margins of ponds, shallow basins or in river backwaters in those places that are the scenes of natural or human disturbance. Scattered shrubs are often present and total less than 25% of the cover.

Wide-leaf cattail, narrow-leaf cattail and hybrid cattail dominate these marshes. Shrubs may include winterberry ([Ilex verticillata](#)) and narrowleaf white meadowsweet ([Spiraea alba](#)). Herb species that may or may not be present include sallow sedge ([Carex lurida](#)), tussock sedge (*C. stricta*), woolgrass bulrush ([Scirpus cyperinus](#)), Olney's three square bulrush ([Schoenoplectus americanus](#)), sensitive fern ([Onoclea sensibilis](#)), marsh fern ([Thelypteris palustris](#)) and blue vervain ([Verbena hastata](#)). The deeper edges of the marsh may be rimmed by duckweed ([Lemna minor](#)).



**Tidbury Creek  
Kent County**

**Diagnostic Features:** The dominance of cattail ([Typha](#) spp.) separates this community from others in Delaware.

**Geology and Environmental Features:** In lacustrine situations the cattails are rooted in a muck-bottom on the shoreline and go out towards the center suspended in a buoyant peaty mat. Both species reach their maximum growth in water that is 50 cm deep, although narrow-leaf cattail can grow in deeper water (Grace and Wetzel 1981).

**Landscape Position:** Topographic low places

**Associated Soil Series:** Transquaking and Mispillion Soils, very frequently flooded, tidal

**NWI Classification:**

Species documented from this community

Animals

Non-Vascular Plants

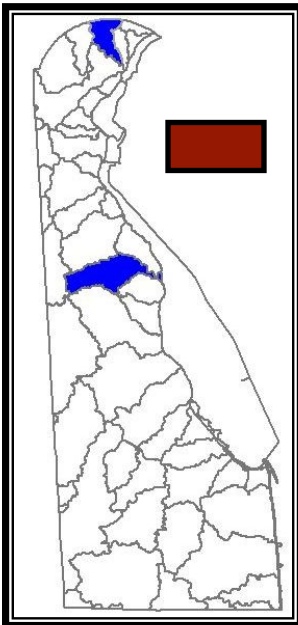
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: Cattail marshes are scattered throughout the Delaware. Nationally cattail marshes can be found from Maine south to North Carolina.

**Estimated Acres in Delaware = 111.3 (February 2012)**

Equivalent or related communities in nearby states:

**Maryland:** Eastern Cattail Marsh (Harrison 2004)

**New Jersey:** *Typha (angustifolia, latifolia)* - (*Schoenoplectus* spp.) Eastern Herbaceous Vegetation (Breden et al 2001)

North Jersey/South Jersey Freshwater Marsh (Collins and Anderson 1994)

**Pennsylvania:** Cattail Marsh (Fike 1999)

**Virginia: ?**

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Cattail Marsh

**Northeast Wildlife Habitat Classification:** Laurentian-Acadian Freshwater Marsh

**Landfire Classification Code:** unknown

[-Back to Kent County Non-Tidal Marsh-](#)  
[-Back to New Castle County Non-Tidal Marsh-](#)

## Eastern Reed Marsh

GNA

SNA

DNA

**NVC Alliance:** A.1431-*Phragmites australis* Semipermanently Flooded Herbaceous Alliance

**NVC Association:** CEG004141-*Phragmites australis* Eastern North America Temperate Semi-Natural Herbaceous Vegetation

**Delaware Type Locality:** This marsh community is dominated by an exotic invasive species and is unfortunately common throughout the state and ubiquitous in every watershed.

**Description:** This community is composed almost entirely of eastern reed grass (*Phragmites australis*), an exotic invasive plant. It is often found in semi-permanently flooded marshes, ditches, impoundments and other places where there is disturbance or opening. This particular type includes those places dominated by the nominal species that are not tidally flooded.

Eastern reed grass is generally the only plant species present in this community.



**Diagnostic Features:** The dominance of eastern reed grass in a wetland that is non-tidal is representative of this community.

**Tributary to Swan Creek  
Sussex County**

**Geology and Environmental Features:** This community is found in non-tidal wetlands in a variety of substrates.

**Landscape Position:** Topographic lows that have been disturbed

**Associated Soil Series:** This community is dominated by an exotic invasive species and is not particular to a specific soil type.

**NWI Classification:**

### Species documented from this community

Animals

Non-Vascular Plants

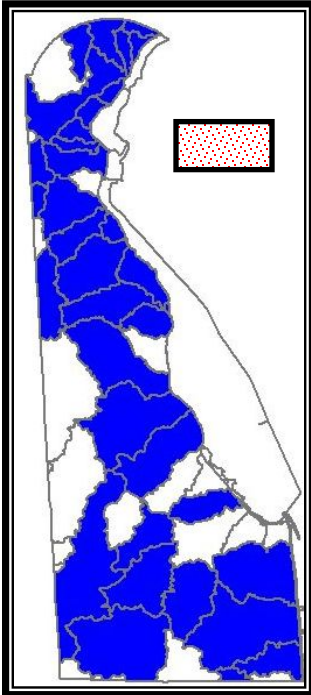
Vascular Plants

Associated Rare Species

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is found throughout Delaware and throughout the United States and Canada.

**Estimated Acres in Delaware = 3,365.6 (February 2012)**

**-Acres with 0.5 m sea level rise = 3,343.8-680.9 = 2,662.9**

**-Acres with 1 m sea level rise = 3,343.8-1,120.6 = 2,223.2**

**-Acres with 1.5 m sea level rise = 3,343.8-1,275.4 = 2,068.4**

Equivalent or related communities in nearby states:

**Maryland:** Eastern Reed Marsh

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** *Phragmites* Marsh

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

[-Back to Kent County Non-Tidal Marsh-](#)  
[-Back to New Castle County Non-Tidal Marsh-](#)  
[-Back to Sussex County Non-Tidal Marsh-](#)

**Freshwater Tidal Mixed High Marsh GNR S1 D?**

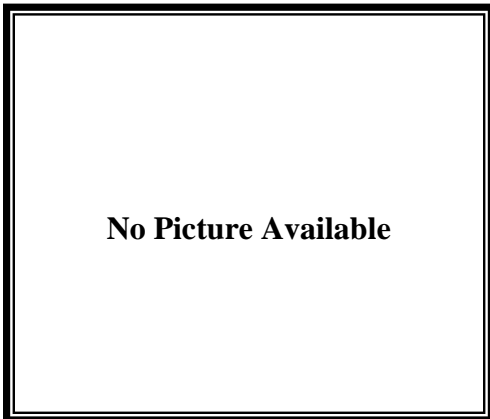
**NVC Alliance:** [A.1703-Peltandra virginica-Pontederia cordata Tidal Herbaceous Alliance](#)

**NVC Association:** [CEGL006325-Impatiens capensis-Peltandra virginica-Sagittaria latifolia-\(Typha angustifolia\) Tidal Herbaceous Vegetation](#)

**Delaware Type Locality:** North side of Broad Creek upstream of Philips Landing in Sussex County ([38°34'14.69"N, 75°38'22.34"W](#)).

**Description:** These freshwater marsh communities occur in flooded swales and backmarshes in freshwater tidal marshes.

This community is dominated or co-dominated by arrow-arum ([Peltandra virginica](#)), orange-spotted jewelweed ([Impatiens capensis](#)), broad-leaf arrow-head ([Sagittaria latifolia](#)), and/or narrow-leaf cattail ([Typha angustifolia](#)). Other associated species include pickerelweed ([Pontederia cordata](#)), halbeard-leaf tearthumb ([Polygonum arifolium](#)), arrow-leaved tearthumb ([Polygonum sagittatum](#)), mild water pepper ([P. hydropiperoides](#)), dotted smartweed ([P. punctatum](#)), smooth bur-marigold ([Bidens laevis](#)), devil's beggar's ticks ([B. frondosa](#)), northern tickseed sunflower ([B. coronata](#)), river bulrush ([Schoenoplectus fluviatilis](#)), rice-cut grass ([Leersia oryzoides](#)), wild rice ([Zizania aquatica](#)), waterhemp ([Amaranthus cannabinus](#)), hemlock water-parsnip ([Sium suave](#)), American ground-nut ([Apios americana](#)) and blueflag iris ([Iris versicolor](#)).



**Diagnostic Features:** A tidal marsh that is composed of the above species and location in freshwater points to this community.

**Geology and Environmental Features:** Salinity ranges from fresh to brackish in this community. Substrates range from silt, silty muck, peats or sands.

**Landscape Position:** Edges of freshwater tidal areas

**Associated Soil Series:** Nanticoke and Mannington Soils, very frequently flooded, tidal  
Lenape-Nanticoke Complex, very frequently flooded, tidal

**NWI Classification:**



Species documented from this community

Animals

Non-Vascular Plants

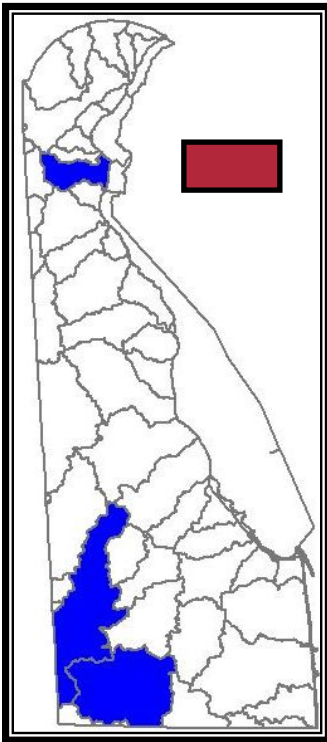
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: In Delaware this community is found in places where there is tidal freshwater such as the Nanticoke River, Broad Creek and Thousand Acre Marsh. Nationally this community is found on the East Coast from Maine south to Virginia.

**Estimated Acres in Delaware = 176.2 (February 2012)**

**-Acres with 0.5 m sea level rise = 176.2-171.1 = 5.1**

**-Acres with 1 m sea level rise = 176.1-171.8 = 4.3**

**-Acres with 1.5 m sea level rise = 176.1-172.2 = 3.9**

Equivalent or related communities in nearby states:

**Maryland:** Freshwater Tidal Mixed Forbs High Marsh (Harrison 2004)

**New Jersey:** Mixed Forbs High Marsh Tidal Herbaceous Vegetation (Breden et al 2001)

South Jersey Freshwater Tidal Marsh (Collins and Anderson 1994)

**Pennsylvania:** Freshwater Intertidal Marsh (PNHP website 2008)

**Virginia:** Tidal Freshwater Marsh (Mixed Forbs/High Marsh Type) (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Broadleaf Freshwater Tidal Marsh

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh

**Landfire Classification Code:** unknown

[-Back to New Castle County Tidal Marsh-](#)

[-Back to Sussex County Tidal Marsh-](#)

## Pickerelweed Tidal Marsh

G3G4

S4

D?

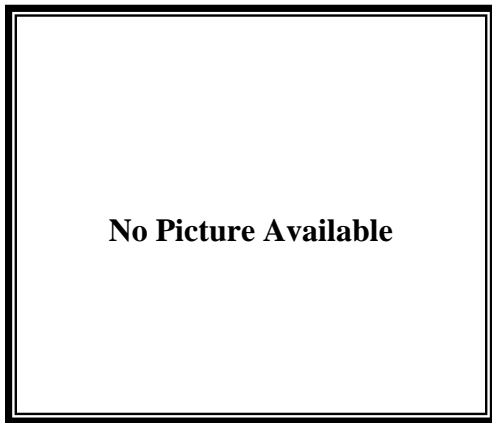
NVC Alliance: [A.1703-Peltandra virginica-Pontederia cordata Tidal Herbaceous Alliance](#)

NVC Association: CEGLO04706-Peltandra virginica-Pontederia cordata Tidal Herbaceous Vegetation

**Delaware Type Locality:** Marsh near Smyrna Landing at the Kent and New Castle County border (39°18'35.15"N, 075°35'38.22"W).

**Description:** This marsh community is found at low elevations in freshwater tidal marshes bordering open water. It is inundated by long periods of tide and is only exposed for a short period of time when the tide is out. Pickerelweed marshes can often grade into other marshes including the Pond-lily Tidal Marsh ([CEGL004472](#)) and Atlantic Coast Wild Rice Tidal Marsh ([CEGL004202](#)).

Arrow-arum ([Peltandra virginica](#)) and pickerelweed ([Pontederia cordata](#)) are co-dominant and associated by wild rice ([Zizania aquatica](#)), broadleaf arrowhead ([Sagittaria latifolia](#)), halbeard-leaf tearthumb ([Polygonum arifolium](#)), mild water pepper ([Polygonum hydropiperoides](#)) and arrow-leaved tearthumb ([Polygonum sagittatum](#)).



**Diagnostic Features:** This community is found at a higher elevation than the Pond-lily Tidal Marsh ([CEGL004472](#)) and the Freshwater Tidal Mixed High Marsh ([CEGL006325](#)) has a more varied species composition than this community. These differences separate this community from communities of similar type.

**Geology and Environmental Features:** This community is found in mucky soil.

**Landscape Position:** Pickerelweed marshes are found at the edge of open water in larger tidal streams.

**Associated Soil Series:** Lenape-Nanticoke Complex, very frequently flooded, tidal

**NWI Classification:**

Species documented from this community

Animals

Non-Vascular Plants

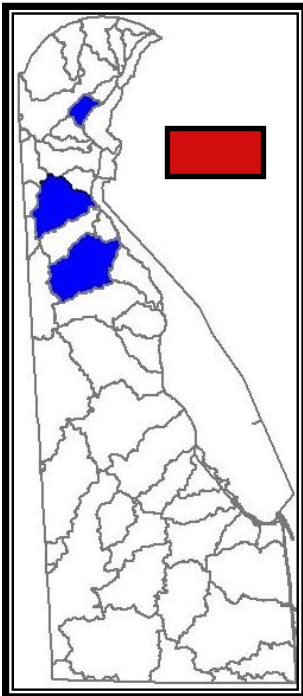
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is found in scattered places in the Coastal Plain of Delaware. Nationally this community is found on the East Coast from Massachusetts south to Virginia.

**Estimated Acres in Delaware = 95.0 (February 2012)**

**-Acres with 0.5 m sea level rise = 61.8-59.2 = 2.6**

**-Acres with 1 m sea level rise = 61.8-60.3 = 1.5**

**-Acres with 1.5 m sea level rise = 61.8-60.7 = 1.1**

Equivalent or related communities in nearby states:

**Maryland:** No common name (Harrison 2004)

**New Jersey:** *Peltandra virginica* - *Pontederia cordata* Tidal Herbaceous Vegetation (Breden et al 2001)

South Jersey Freshwater Tidal Marsh (Collins and Anderson 1994)

**Pennsylvania:** ?

**Virginia:** Tidal Freshwater Marsh (Mixed Low Marsh Type) (Fleming, G.P., et al 2006)

Freshwater Tidal Marsh (Arrow-Arum Low Marsh Type) (Fleming, G.P., et al 2006)

Freshwater Tidal Marsh (Pickerelweed Low Marsh Type) (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Arrow-Arum-Pickerelweed Freshwater Tidal Marsh

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh

**Landfire Classification Code:** unknown

[-Back to Kent County Tidal Marsh-](#)

[-Back to Sussex County Tidal Marsh-](#)

## Broadleaf Pond-lily Tidal Marsh

G4G5

S4

D?

NVC Alliance: [A.1708-Nuphar lutea Tidal Herbaceous Alliance](#)

NVC Association: [CEGL004472-Nuphar lutea ssp. advena Tidal Herbaceous Vegetation](#)

**Delaware Type Locality:** At the confluence of Broad Creek and the Nanticoke River near Philips Landing in Sussex County (**38°34'4.44"N, 075°40'27.40"W**).

**Description:** This marsh community is dominated by pond lily (*Nuphar advena*). The water depth of these communities is usually 2-3 meters or less. One location on Dragon Run occurs in a former tidal area that is now non-tidal due to a tide control structure.

Besides the dominant species other associates can include Nuttall's pondweed (*Potamogeton epihydrus*), arrow-arum (*Peltandra virginica*), pickerelweed (*Pontederia cordata*) and wild rice (*Zizania aquatica*).



**Tidbury Creek  
Kent County**

**Diagnostic Features:** The co-dominance of pond lily and water-lily (*Nymphaea odorata*) in a tidal situation readily identifies this community. The related Water-lily Aquatic Wetland ([CEGL002386](#)) is found in non-tidal situation but otherwise has the same dominants.

**Geology and Environmental Features:** Pond-lily Tidal Marshes occur in nearly pure stands below mean low water on mudflats that are exposed at low tide and submerged point bars on meanders.

**Landscape Position:** This community is found on the edges of tidal rivers in the water. In the Nanticoke River it is often the first community that one comes to in going from the river channel to the shore.

**Associated Soil Series:** Mucky soil at the bottom of rivers, lakes or ponds.

**NWI Classification:**

### Species documented from this community

Animals

Non-Vascular Plants

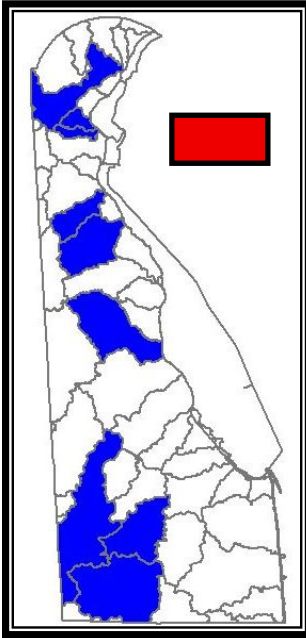
Vascular Plants

Associated Rare Species:

**Animals:** Lilypad Forktail (*Ischnura kellicotti*)

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is common in fresh or slightly brackish water in most of Delaware's tidal streams. Exceptional examples are known from the Nanticoke and Christina Rivers. Nationally this community is found on the East Coast from Maine and discontinuously south to North Carolina.

**Estimated Acres in Delaware = 444.2 (February 2012)**

**-Acres with 0.5 m sea level rise = 538.8-436.6 = 102.2**

**-Acres with 1 m sea level rise = 538.8-439.7 = 99.1**

**-Acres with 1.5 m sea level rise = 538.8-440.9 = 97.9**

Equivalent or related communities in nearby states:

**Maryland:** No common name (Harrison 2004)

**New Jersey:** *Nuphar lutea* ssp. *advena* Tidal Herbaceous Vegetation (Breden et al 2001)

South Jersey Freshwater Tidal Marsh (Collins and Anderson 1994)

**Pennsylvania:** unknown

**Virginia:** Freshwater Tidal Marsh (Spatterdock Mud Flat Type) (Fleming, G.P., et al 2006)

Freshwater Tidal Marsh (Spatterdock-Arrow-Arums Low Marsh Type) in part? (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh

**Landfire Classification Code:** unknown

[-Back to Kent County Tidal Marsh-](#)  
[-Back to New Castle County Tidal Marsh-](#)  
[-Back to New Castle County Non-Tidal Marsh-](#)  
[-Back to Sussex County Tidal Marsh-](#)



## Reed Canarygrass Eastern Marsh

G S

NVC Alliance: [A.1381-Phalaris arundinacea Seasonally Flooded Herbaceous Alliance](#)

NVC Association: CEGLO06044-*Phalaris arundinacea* Eastern Herbaceous Vegetation

**Delaware Type Locality:** Marsh that is just north of Naamans Road ([39°49'27.23"N, 75°29'23.76"W](#))

**Description:** Reed canarygrass communities are most often on the floodplains of large streams and rivers.

Other than the nominal species, associated species may be smooth alder ([Alnus serrulata](#)) and arrow-wood ([Viburnum dentatum](#)).



**Diagnostic Features:** A wet grassland community that is dominated by reed canary grass ([Phalaris arundinacea](#)) is most likely this community.

**Floodplain of Brandywine  
Creek  
New Castle County**

**Geology and Environmental Features:**

**Landscape Position:** Wet depressions, seepages and river banks

**Associated Soil Series:** Watchung and Calvert Silt Loams

**NWI Classification:**

**Species documented from this community**

Animals

Non-Vascular Plants

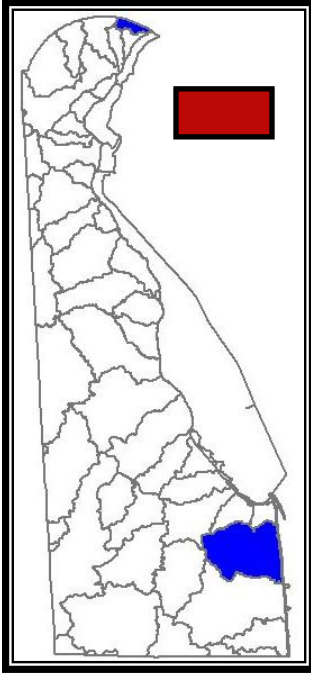
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is scattered throughout Delaware. Nationally it is located throughout the United States and Canada.

**Estimated Acres in Delaware = 142.8 (February 2012)**

**-Acres with 0.5 m sea level rise = 51.2-33.5 = 17.7**

**-Acres with 1 m sea level rise = 51.2-38.7 = 12.5**

**-Acres with 1.5 m sea level rise = 51.2-44.1 = 7.1**

Equivalent or related communities in nearby states:

**Maryland:** Reed Canarygrass Eastern Marsh (Harrison, 2004)

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** North-Central Interior Floodplain

**Landfire Classification Code:** unknown

[-Back to New Castle County Non-Tidal Marsh-](#)  
[-Back to Sussex County Non-Tidal Marsh-](#)

## River Seedbox Marsh

G5

SX

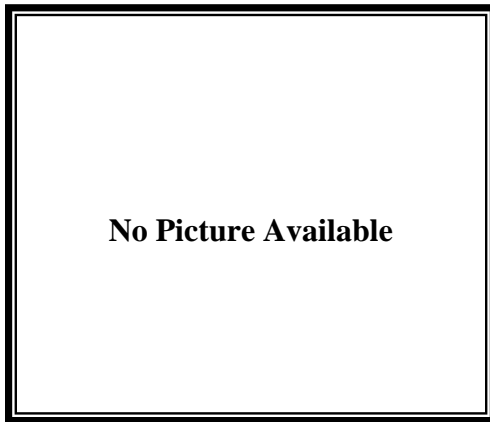
D?

**NVC Alliance:** [A.3033-Ludwigia leptocarpa Semipermanently Flooded Herbaceous Alliance](#)

**NVC Association:** C EGL006468-Ludwigia leptocarpa Semipermanently Flooded Herbaceous Vegetation

**Delaware Type Locality:** Marsh on the south end of Prime Hook Beach Road just west of Prime Hook Beach in Prime Hook NWR in Sussex County (**38°50'43.81"N, 75°15'10.09"W**).

**Description:** This marsh community is composed almost entirely of an exotic invasive species, river seedbox (*Ludwigia leptocarpa*) in inundated marshes of Prime Hook Creek.



**Diagnostic Features:** This is the only community in Delaware that contains river seedbox, which identifies it.

### Geology and Environmental Features:

**Landscape Position:** Inundated marshes along the coast of Delaware Bay

**Associated Soil Series:** Transquaking and Mispillion Soils, very frequently flooded, tidal

Broadkill Mucky Peat, very frequently flooded, tidal

### Species documented from this community

Animals

Non-Vascular Plants

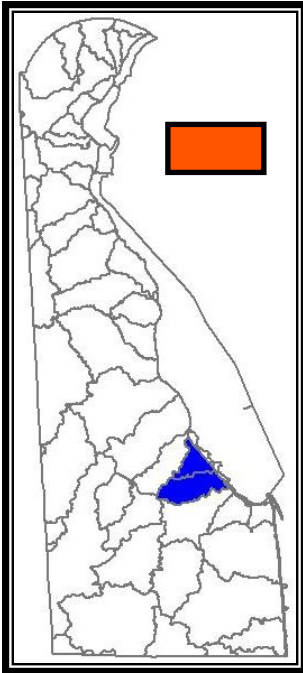
Vascular Plants

### Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is located in Prime Hook National Wildlife Refuge in Sussex County. Nationally this community is found Delaware and Maryland.

**Estimated Acres in Delaware = 0 acres (February 2012)**

**Note:** Community has been impacted and probably eliminated by brackish water from inlet that formed during the May 2008 storm at Prime Hook NWR.

Equivalent or related communities in nearby states:

**Maryland:** not present

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** not present

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

[-Back to Sussex County Non-Tidal Marsh-](#)

**River Bulrush Flooded Grassland      GNR      S1.1**

**NVC Alliance:** A.1443-*Schoenoplectus acutus*-(*Schoenoplectus tabernaemontani*)

Semipermanently Flooded Herbaceous Alliance

**NVC Association:** CEG006366-*Schoenoplectus fluviatilis* Herbaceous Vegetation

**Delaware Type Locality:** North floodplain of the Christina River just west of DE Route 1 in New Castle County, Delaware.

**Description:** This freshwater tidal marsh community is nearly wholly dominated by river bulrush (*Schoenoplectus fluviatilis*) and known in Delaware only on the Christina River.

**Diagnostic Features:** This is the only community in Delaware that has river bulrush as the dominant species.

**Geology and Environmental Features:** In Delaware this community is found near the head of tide on the Christina River. In other states it can be found on floodplains that are irregularly flooded.

**Landscape Position:** Tidally flooded floodplains on large rivers.

**Associated Soil Series:** ???

Species documented from this community

Animals

Non-Vascular Plants

Vascular Plants

Associated Rare Species:

**Animals:** unknown

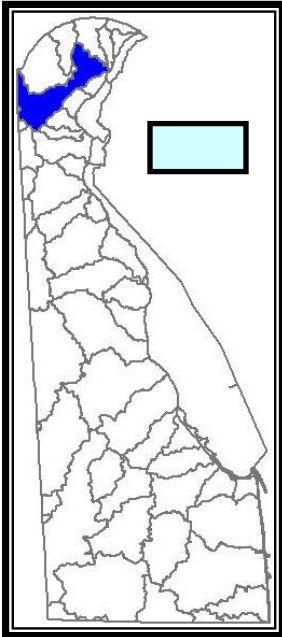
**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown

## Ecological Integrity Assessment (EIA)

A = 0, B = 0, C = 1, D = 0      X = 1

**Average EIA = 3.29**



Distribution: This community is currently only known from one place on the Christina River in Delaware. Nationally it is known from Connecticut and Massachusetts.

**Estimated Acres in Delaware = 5.3 (February 2012)**

**-Acres with 0.5 m sea level rise = 5.3-5.2 = 0.1**

**-Acres with 1 m sea level rise = 5.3-5.3 = 0.0**

**-Acres with 1.5 m sea level rise = 5.3-5.3 = 0.0**

Equivalent or related communities in nearby states:

**Maryland:** not present

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** not present

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Laurentian-Acadian Freshwater Marsh

**Landfire Classification Code:** unknown

[-Back to New Castle County Forests-](#)

## Sweetflag Tidal Marsh

GNR S1

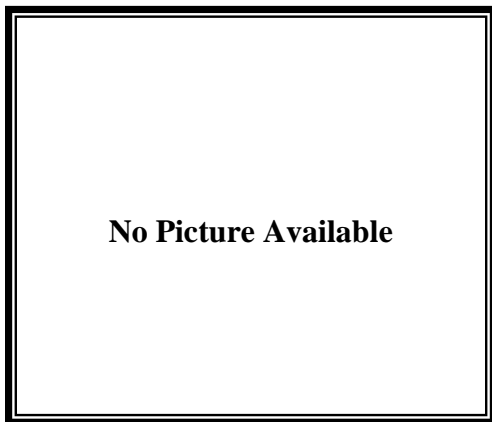
NVC Alliance: [A.3018-Acorus calamus Tidal Herbaceous Alliance](#)

NVC Association: [CEGL006833-Acorus calamus Tidal Herbaceous Vegetation](#)

**Delaware Type Locality:** Churchman's Marsh on the Christina River in New Castle County.  
([39°41'43.36"N, 075°37'54.59"W](#))

**Description:** This marsh community occurs in fresh to oligohaline area of tidal rivers on the east coast. The best examples of this community can be found in places that are flooded irregularly in freshwater marshes. It can also occur in places that experience the full range of tide. Sweet flag can form large clonal colonies and create its own backmarsh areas.

Sweet flag ([Acorus calamus](#)) is the dominant species and associated by river bulrush ([Schoenoplectus fluviatilis](#)), arrow-arum ([Peltandra virginica](#)), broad-leaf arrowhead ([Sagittaria latifolia](#)) and orange-spotted jewelweed ([Impatiens capensis](#)). Other species present may include wide-leaved cattail ([Typha latifolia](#)), rice-cut grass ([Leersia oryzoides](#)) and wild rice ([Zizania aquatica](#)).



**Diagnostic Features:** A greater than 50% coverage of sweet flag defines this community.

**Geology and Environmental Features:** Tidal marshes are poorly drained and are inundated for long periods of time. Soils can range from silty muck to peat and sand.

**Landscape Position:** Backwater marshes of tidal rivers

**Associated Soil Series:** Tidal Marsh

**NWI Classification:**

### Species documented from this community

Animals

Non-Vascular Plants

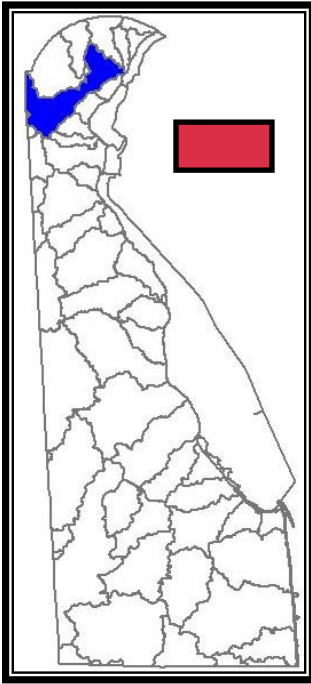
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is known from the Christina River drainage in Delaware. Nationally, it ranges from Massachusetts to Virginia.

**Estimated Acres in Delaware = ~1 acre (February 2012)**

Equivalent or related communities in nearby states:

**Maryland:** No common name (Harrison 2004)

**New Jersey:** South Jersey Freshwater Tidal Marsh (Collins and Anderson 1994)

**Pennsylvania:** unknown

**Virginia:** Tidal Freshwater Marsh (Sweetflag Type) (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh

**Landfire Classification Code:** unknown



[-Back to New Castle County Tidal Marsh-](#)

**Lamp Rush Marsh                      GNR                      S1**

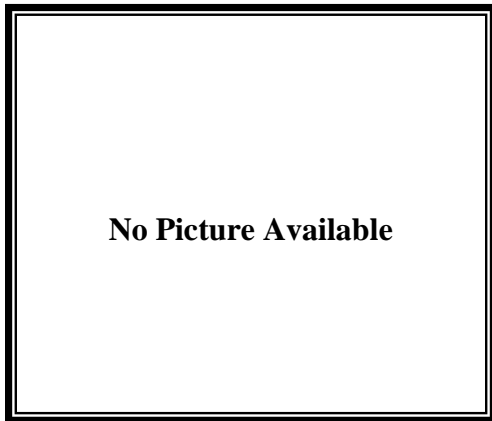
**NVC Alliance:** [A.1386-Scirpus cyperinus Seasonally Flooded Herbaceous Alliance](#)

**NVC Association:** [CEGL006349-Scirpus cyperinus Seasonally Flooded Herbaceous Vegetation](#)

**Delaware Type Locality:** Marsh on the west side of US 301 south of Mount Pleasant (39°29'56.91"N, 075°42'49.89"W).

**Description:** This freshwater marsh community is found in seasonally flooded marshes or emergent upland depression ponds in the Coastal Plain. They may experience inundation in the winter and drying in the summer.

Wool-grass bulrush (*Scirpus cyperinus*) is the most common species in this community. Other common herbs may include sedge (*Carex* spp.), panic grass (*Dichanthelium* spp.), three-way sedge (*Dulichium arundinaceum*), manna grass (*Glyceria* spp.), spikerush (*Juncus* spp.), cut-grass (*Leersia* spp.) and others. Sometimes there may be scattered woody plants present including Smooth alder (*Alnus serrulata*), red maple (*Acer rubrum*) and buttonbush (*Cephalanthus occidentalis*).



**Diagnostic Features:** The dominance or co-dominance of wool-grass bulrush defines this community.

**Geology and Environmental Features:** This community is characterized by seasonal water fluctuations.

**Landscape Position:** Wet depressions and ditches

**Associated Soil Series:** Woodstown Sandy Loam

**NWI Classification:**

Species documented from this community

Animals

Non-Vascular Plants

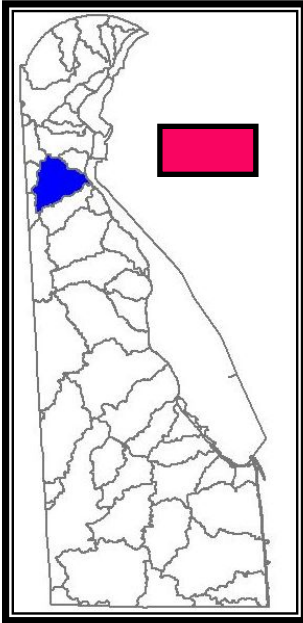
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community has been found in the Appoquinimink River watershed but is likely in the rest of the Coastal Plain. It is found on the east coast from Maine south to Virginia.

**Estimated Acres in Delaware = 0.4 (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** No common name (Harrison 2004)

**New Jersey:** *Scirpus cyperinus* Seasonally Flooded Herbaceous Vegetation (Breden et al 2001)

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Laurentian-Acadian Freshwater Marsh

**Landfire Classification Code:** unknown

[-Back to New Castle County Non-Tidal Marsh-](#)

## Kent County Maritime Grasslands

**Beachgrass-Panicgrass Dune Grassland:** Dune Grassland that is co-dominated by beachgrass (*Ammophila breviligulata*) and panicgrass (*Panicum amarum*). ([CEGL004043](#)) **Duck Creek; Leipsic River; Little Creek; Murderkill River; Simons River; Smyrna River; St. Jones River**

**Overwash Dune Grassland:** Grassland that is dominated by salt meadow cordgrass (*Spartina patens*) and olney's three square bulrush (*Schoenoplectus americanus*). ([CEGL004097](#)) **Murderkill River**

## Sussex County Maritime Grasslands

**Beachgrass-Panicgrass Dune Grassland:** Dune Grassland that is co-dominated by beachgrass (*Ammophila breviligulata*) and panicgrass (*Panicum amarum*). ([CEGL004043](#)) **Broadkill River; Lewes-Rehoboth Canal; Mispillion River; Prime Hook Creek; Red Mill Creek; Slaughter Creek**

**Mid-Atlantic Coast Backdune Grassland:** Dune grassland that is dominated by seaside bluestem (*Schizachyrium littorale*), broom sedge (*Andropogon virginicus*), beach panic grass (*Panicum amarum*) and beachgrass (*Ammophila breviligulata*). ([CEGL004240](#)) **Northern Atlantic Strand.**

**Overwash Dune Grassland:** Grassland that is dominated by salt meadow cordgrass (*Spartina patens*) and olney's three square bulrush (*Schoenoplectus americanus*). ([CEGL004097](#)) **Broadkill River; Slaughter Creek; Rehoboth Bay**

[-Back to Key to Delaware Vegetation Communities-](#)

## Beachgrass-Panicgrass Dune Grassland

G2

S2

NVC Alliance: [A.1207-Ammophila breviliqulata Herbaceous Alliance](#)

NVC Association: [CEGL004043-Ammophila breviliqulata-Panicum amarum var. amarum Herbaceous Vegetation](#)

**Delaware Type Locality:** Delaware Seashore State Park south of the Indian River Inlet Bridge in Sussex County ([38°35'57.57"N, 075° 3'36.97"W](#)).

**Description:** This grassland community represents a lot of the beach dune grass communities in the Mid-Atlantic region. It is often in a complex with the Chesapeake Bay Maritime Shrubland ([CEGL003881](#)). Herbaceous coverage is generally low, but can range from 10 to 75%. Rhizomes of the American beachgrass ([Ammophila breviliqulata](#)) in this community help to stabilize the dunes in this community. The species diversity tends to increase away from the effects of the beach where the dunes are more stable.

Other than the two nominal species other species associated with this community include seaside goldenrod ([Solidago sempervirens](#)), purple sand grass (*Triplasis purpurea*), sand-dune sandburr ([Cenchrus tribuloides](#)), seaside sandmat (*Chamaesyce polygonifolia*), Gray's sedge ([Cyperus grayi](#)) and coastal jointweed ([Polygonella articulata](#)). In more sheltered places eastern prickly pear cactus ([Opuntia humifusa](#)), beach pinweed (*Lechea maritima*), broom-sedge ([Andropogon virginicus](#)) and little false bluestem ([Schizachyrium scoparium](#)). Southern bayberry ([Morella cerifera](#)) shrubs and seedlings can be found but make up less than two percent of the total cover.



**Cape Henlopen State Park  
Sussex County**

**Diagnostic Features:** American beachgrass and beach panicgrass (*Panicum amarum*) are diagnostic of this community. The Beachgrass-Panicgrass Dune Grassland is closely related to the North Atlantic Upper Ocean Beach ([CEGL004400](#)) community and shares some of the same species. The dune grassland can be differentiated by its location above the storm tides, dominance by perennial versus annual species, greater plant cover and greater amount of seaside goldenrod.

**Geology and Environmental Characteristics:** Sandy, unstable, droughty substrates with no soil profile development. Aeolian processes cause active sand deposition and erosion. The sand substrate is usually visible and litter accumulation from plant debris is nearly absent. This community occurs on foredunes that receive the force of wind and salt spray, but is beyond the influence of most storm tides.

**Landscape Position:** This community is found on the tops of dunes behind the immediate Foredune of the beach.

**Associated Soil Series:** Acquango-Beaches Complex, 0 to 10 percent slopes

Species documented from this community

Animals

Non-Vascular Plants

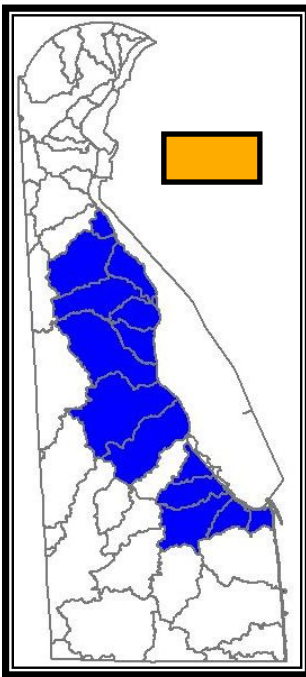
Vascular Plants

Associated Rare Species:

**Animals:** Beach Tiger Beetle (*Cicindela hirticollis*)

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is found on dunes of the Atlantic Coast and Delaware Bay. Nationally this community can be found from Maine to North Carolina and west into the Great Lakes.

**Estimated Acres in Delaware = 534.3 (February 2012)**

**-Acres with 0.5 m sea level rise = 375.2-29.9 = 345.3**

**-Acres with 1 m sea level rise = 375.2-97.7 = 277.5**

**-Acres with 1.5 m sea level rise = 375.2-184.5 = 190.7**

Equivalent or related communities in nearby states:

**Maryland:** Beachgrass-Panicgrass Dune Grassland (Harrison 2004)

**New Jersey:** *Ammophila breviligulata*-*Panicum amarum* Herbaceous Vegetation (Breden et al 2001)

Coastal Dunegrass Community (Collins and Anderson 1994)



**Pennsylvania:** not present

**Virginia:** Beachgrass-Bitter Panic Grass Dune Grassland (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Beachgrass-Panicgrass Dune Grassland

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Dune and Swale

**Landfire Classification Code:** unknown

[-Back to Kent County Maritime Grasslands-](#)

[-Back to Sussex County Maritime Grasslands-](#)

## Mid-Atlantic Coast Backdune Grassland

G2

S1

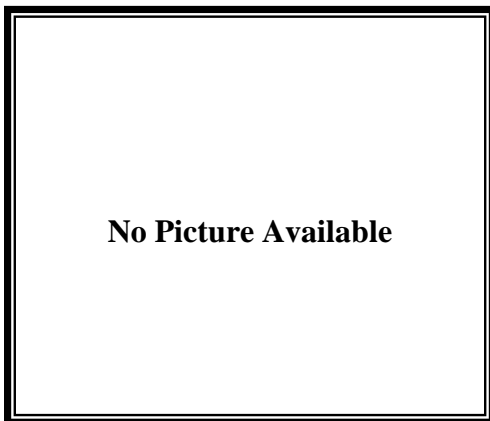
NVC Alliance: [A.1533-Schizachyrium littorale Shrub Herbaceous Alliance](#)

NVC Association: [CEGL004240-Morella \(pensylvanica, cerifera\)/Schizachyrium littorale-Eupatorium hyssopifolium Shrub Herbaceous Vegetation](#)

**Delaware Type Locality:** There are no known locations for this community in Delaware although it is highly likely that it is here. If found it would likely be within Cape Henlopen State Park.

**Description:** This grassland community is confined to barrier islands occurring on dune flats that are protected from overwash. It often ranges in size from less than one acre to almost 20 acres. Bunch grasses cover about 25-50% of the area.

The shrub layer of this community is dominated by northern bayberry (*Morella pensylvanica*). Seaside bluestem (*Schizachyrium littorale*) is the dominant herbaceous species and is associated by broom sedge (*Andropogon virginicus*), beach panic grass (*Panicum amarum*) and American beachgrass (*Ammophila brevigulata*) with one or two species dominating over the others. Poison ivy (*Toxicodendron radicans*) is frequently found in this community. Other herbs can include seaside goldenrod (*Solidago sempervirens*), fragrant cudweed (*Pseudognaphalium obtusifolium*), rough buttonweed (*Diodia teres*) and eastern prickly pear cactus (*Opuntia humifusa*).



**Diagnostic Features:** The dominance of northern bayberry in the sparse shrub layer, and dominance of seaside bluestem and association by hyssop-leaf thoroughwort (*Eupatorium hyssopifolium*) and round-leaf thoroughwort (*Eupatorium rotundifolium*) in the herbaceous layer separate this community from the closely related Beachgrass-Panicgrass Dune Grassland ([CEGL004043](#)). Poison ivy in dense tangles is characteristic of this community.

**Geology and Environmental Features:** Well-drained sands of leveled interdunes and backdunes. Often this community is within reach of salt spray and offshore wind.

**Landscape Position:** Washed out dunes at the coast.

**Associated Soil Series:** Sand

Species documented from this community

Animals

Non-Vascular Plants

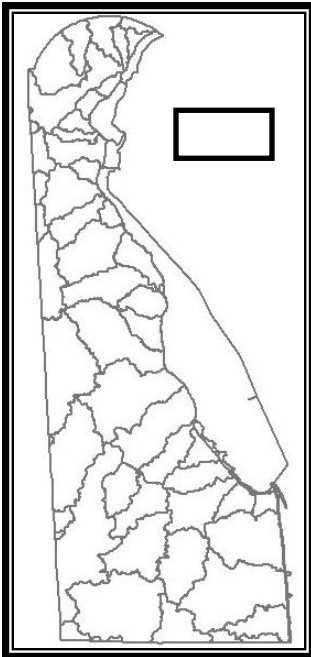
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is known from the dunes at Cape Henlopen State Park. Nationally this community is known from New Jersey south to North Carolina.

**Estimated Acres in Delaware = 243.3 (February 2012)**

**-Acres with 0.5 m sea level rise = 127.1-1.1 = 126**

**-Acres with 1 m sea level rise = 127.1-9.0 = 118.1**

**-Acres with 1.5 m sea level rise = 127.1-34.0 = 93.1**

Equivalent or related communities in nearby states:

**Maryland:** Mid-Atlantic Coast Backdune Grassland (Harrison 2004)

**New Jersey:** *Morella pensylvanica/Schizachyrium littorale-Eupatorium hyssopifolium* Shrub Herbaceous Vegetation

**Pennsylvania:** not present

**Virginia:** Maritime Dune Grassland (Fleming et al. 2001)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Dune and Swale

**Landfire Classification Code:** unknown

[-Back to Sussex County Maritime Grasslands-](#)

## Overwash Dune Grassland

G2G3

S2S3?

NVC Alliance: [A.1274-Spartina patens-\(Schoenoplectus pungens\) Herbaceous Alliance](#)

NVC Association: [CEGL004097-Spartina patens-Schoenoplectus pungens-Solidago sempervirens Herbaceous Vegetation](#)

**Delaware Type Locality:** Prime Hook National Wildlife Refuge just north of Fowler's Beach in Sussex County (**38°53'15.82"N, 075°16'40.33"W**).

**Description:** Upland dune grassland of mid-Atlantic barrier islands in which storm overwash is a prevalent feature. Total vegetation cover is variable, ranging from about 25 percent to dense. This community is ephemeral as it is often buried by sand deposition. It may in fact be a successional step between interdunal herbaceous wetlands and interdunal herbaceous/shrub uplands. Species diversity can vary from few species in the northern part of the range to many in the southern reaches. Overwash dunes are found in specialized habitats and are particularly vulnerable to human development along the coast.

Salt meadow cordgrass ([Spartina patens](#)) and/or olney's three square bulrush ([Schoenoplectus pungens](#)) are dominant in this community. Other species can include trailing wild bean ([Strophostyles helvula](#)), seaside goldenrod ([Solidago sempervirens](#)), dune sandbur ([Cenchrus tribuloides](#)), bristly foxtail ([Setaria parviflora](#)), seashore saltgrass ([Distichlis spicata](#)), American beachgrass, narrow-leaf seepweed ([Suaeda linearis](#)), salt marsh sand spurry ([Spergularia salina](#)), spearscale ([Atriplex patula](#)), seaside spurge ([Euphorbia polygonifolia](#)), marsh fimbry ([Fimbristylis castanea](#)) and American sea rocket ([Cakile edentula](#) ssp. *edentula*).



**Diagnostic Features:** This community is impacted by water-borne sand and is dominated by salt meadow cordgrass and/or olney's three square bulrush, unlike the Beachgrass-panicgrass dune grassland ([CEGL004043](#)), which is impacted by wind-borne sand and dominated by American beachgrass ([Ammophila breviligulata](#)) and panicgrass ([Panicum amarum](#)). This difference serves to separate these closely related communities.

### Horse Island (Rehoboth Bay) Sussex County

**Geology and Environmental Features:** Bare sand is often visible through the vegetation and there is no soil profile development.

**Landscape Position:** Overwash dunes occur in "blow-outs" of dunes. Many times they extend into the marsh behind the dunes and are formed as the result of storm action.

**Associated Soil Series:** Acquango-Beaches Complex, 0 to 10 percent slopes

Species documented from this community

Animals

Non-Vascular Plants

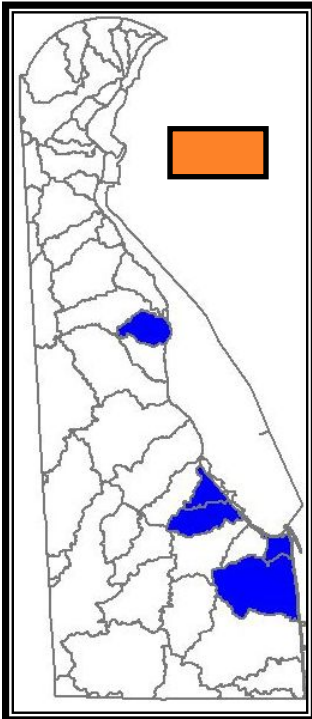
Vascular Plants

Associated Rare Species

**Animals:** Piping Plover, American Oystercatcher, Beach Tiger Beetle (*Cicindela hirticollis*)

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community occurs from South Bowers Beach on Delaware Bay, south to Fenwick Island on the Atlantic Coast. Nationally this community is discontinuous on the east coast from Massachusetts south to North Carolina.

**Estimated Acres in Delaware = 214.0 (February 2012)**

**-Acres with 0.5 m sea level rise = 292.9-236.5 = 56.4**

**-Acres with 1 m sea level rise = 292.9-278.2 = 14.7**

**-Acres with 1.5 m sea level rise = 292.9-289.2 = 3.7**

Equivalent or related communities in nearby states:

**Maryland:** Overwash Dune Grassland (Harrison 2004)

**New Jersey:** Overwash Dune Grassland (Breden et al. 2001)

**Pennsylvania:** not present

**Virginia:** Mid-Atlantic Overwash Dune Grassland (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Overwash Dune Grassland

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Dune and Swale

**Landfire Classification Code:** unknown

[-Back to Kent County Maritime Grasslands-](#)  
[-Back to Sussex County Maritime Grasslands-](#)

## **Non-Vascular Vegetation**

**Toothed Peatmoss Non-Vascular Vegetation: (CEGL004384) Gravelly Branch**



## New Castle County Coastal Plain Ponds

**Buttonbush Coastal Plain Pond:** Coastal plain pond that is dominated by buttonbush (*Cephalanthus occidentalis*) with algae (*Fontinalis sullivanii* and *Dichelyma capillaceum*) draped limbs. ([CEGL006242](#)) **Appoquinimink River; Blackbird Creek**

**Northeastern Pin Oak-Swamp White Oak Forest:** Depression (Coastal Plain Pond) forest that is dominated by pin oak (*Quercus palustris*) and/or swamp white oak (*Quercus bicolor*) and red maple (*Acer rubrum*). ([CEGL006240](#)) **Blackbird Creek; C and D Canal; Smyrna River**

**Swamp Cottonwood Coastal Plain Pond:** Coastal Plain pond that has a canopy dominated by swamp cottonwood (*Populus heterophylla*). ([CEGL006469](#)) **Blackbird Creek; Bohemia River**

[-Back to Key to Delaware Vegetation Communities-](#)

## Kent County Coastal Plain Ponds

**Buttonbush Coastal Plain Pond:** Coastal plain pond that is dominated by buttonbush (*Cephalanthus occidentalis*) with algae (*Fontinalis sullivanii* and *Dichelyma capillaceum*) draped limbs. ([CEGL006242](#)) **Leipsic River**

**Swamp-loosestrife Coastal Plain Pond:** Coastal Plain pond that is dominated by swamp-loosestrife (*Decodon verticillatus*). ([CEGL006087](#)) **Leipsic River**

[-Back to Key to Delaware Vegetation Communities-](#)

## Sussex County Coastal Plain Ponds

**Buttonbush Coastal Plain Pond:** Coastal plain pond that is dominated by buttonbush (*Cephalanthus occidentalis*) with algae (*Fontinalis sullivantii* and *Dichelyma capillaceum*) draped limbs. ([CEGL006242](#)) **Prime Hook Creek**

**Coastal Plain Muck Pondshore:** A Coastal Plain pond that contains warty panicgrass (*Panicum verrucosum*), spreading panicgrass (*Panicum dichotomiflorum*) and eaton's witchgrass (*Dichanthelium spretum*). ([CEGL006264](#)) **Prime Hook Creek**

**Coastal Plain Pond:** A Coastal Plain pond that is dominated by waterlily (*Nymphaea odorata*) and Robbin's spikerush (*Eleocharis robbinsii*). ([CEGL006086](#)) **Rehoboth Bay**

**Coastal Plain Pondshore:** Coastal Plain pond that is dominated by three-way sedge (*Dulichium arundinaceum*) and/or Canada spikerush (*Juncus canadensis*). ([CEGL006415](#)) **There are currently no locations for this community in Delaware, though it is highly likely to be found in Sussex County.**

**Creeping Rush-Boltonia Coastal Plain Pond:** Coastal Plain pond that is co-dominated by aster-like boltonia (*Boltonia asteroides*) and creeping rush (*Juncus repens*). ([CEGL006610](#)) **Little Assawoman Bay**

**Deep Muck Coastal Plain Pond:** Coastal Plain pond with yellow spikerush (*Eleocharis flavescens*), brown-fruit rush (*Juncus pelocarpus*) and slender fimbry (*Fimbristylis autumnalis*). ([CEGL006400](#))

**Northern Peatland Sedge Coastal Plain Pond:** An herbaceous Coastal Plain pond that is dominated by Walter's sedge (*Carex striata*). ([CEGL004120](#)) **Gravelly Branch**

**Panicgrass Pondshore:** ([CEGL006338](#)) **There are no current locations for this community in Delaware, but it is likely to be found in Sussex County.**

**Swamp Cottonwood Coastal Plain Pond:** Coastal Plain pond that has a canopy dominated by swamp cottonwood (*Populus heterophylla*). ([CEGL006469](#)) **Prime Hook Creek**

[-Back to Key to Delaware Vegetation Communities-](#)

## Buttonbush Coastal Plain Pond

G3?

S3

D?

NVC Alliance: [A.988-Cephalanthus occidentalis Seasonally Flooded Shrubland Alliance](#)

NVC Association: [CEGL006242-Cephalanthus occidentalis/Polygonum hydropiperoides-Panicum verrucosum Shrubland](#)

**Delaware Type Locality:** TBD

**Description:** This pond which is part of the ponds locally called Delmarva Bays is known primarily from Delaware and Maryland. These ponds fill in the winter and early spring and draw down during the summer and early fall. In dry years they may drain completely. The bottoms have a shallow organic layer underlain by a silt or clay loam. “Drapes” of algae on the branches of the buttonbush are characteristic of this community and can be seen during the summer when the water is drawn down.

Buttonbush ([Cephalanthus occidentalis](#)) dominates the woody vegetation of this community and is sometimes associated by water-willow (*Decodon verticillatus*). Herbs commonly present include warty panicgrass ([Panicum verrucosum](#)), three-way sedge ([Dulichium arundinaceum](#)), mild water pepper ([Polygonum hydropiperoides](#)), water smartweed ([Polygonum amphibian](#)) and marsh mermaidweed (*Proserpinaca palustris*).

Many species of bryophytes can be found associated with this community. Fountain moss (*Fontinalis sullivantii*) and a moss (*Dichelyma capillaceum*) can be found draped to the branches of buttonbush just below the high water mark. After drawdown, the bottoms of the ponds can contain several species of sphagnum including largeleaf peatmoss (*Sphagnum macrophyllum*), giant peatmoss (*S. torreyanum*), Atlantic peatmoss (*S. atlanticum*) and toothed peatmoss (*S. cuspidatum*). Toothed peatmoss can be found in denser carpets than the other species.



**Headwaters of Leipsic River  
Kent County**

**Diagnostic Features:** The presence of buttonbush with algae draped on the limbs can be an indicator. Oftentimes it is hard to separate this community from a Buttonbush Shrub Swamp ([CEGL006069](#)). The context of the location, i.e. in a Delmarva Bay can serve as an indicator of this community.

**Geology and Environmental Features:** Delmarva Bays are formed in depressions that are in the Calvert Geological Formation found in southern New Castle and northern Kent Counties. These ponds fill with water late in the winter and spring and then dry in the

summer and early fall. The plants in this habitat must be able to handle seasonally fluctuating water levels.

**Landscape Position:** The ponds are located on higher elevation flat areas in the Coastal Plain.

**Associated Soil Series:** Hambrook Sandy Loam  
Fallsington Sandy Loam

**NWI Classification:** Isolated Terrene

Species documented from this community

Animals

Non-Vascular Plants

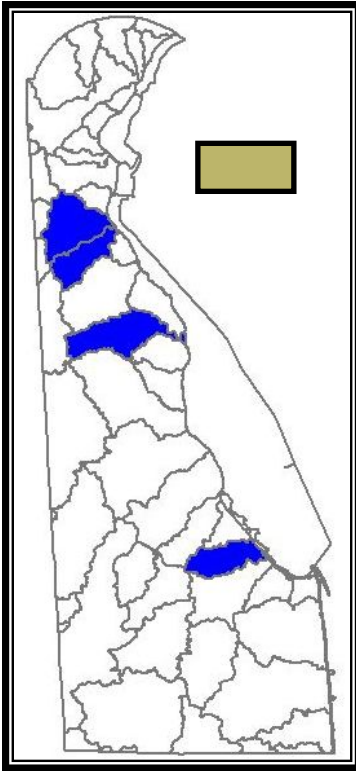
Vascular Plants

Associated Rare Species:

**Animals:** Tiger Salamander ([Ambystoma tigrinum](#))

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is most common in the Blackbird and Appoquinimink watersheds in southern New Castle County. Nationally they are known from the Delmarva Peninsula and scattered occurrences are known from the Ridge and Valley of Virginia.

**Estimated Acres in Delaware = 15.2 acres (February 2012)**

**-Acres with 0.5 m sea level rise = 14.6-0.4 = 14.2**

**-Acres with 1 m sea level rise = 14.6-0.4 = 14.2**

**-Acres with 1.5 m sea level rise = 14.6-1.7 = 12.9**

Equivalent or related communities in nearby states:

**Maryland:** Buttonbush Coastal Plain Pond (Harrison 2004)

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** Northern Coastal Plain Buttonbush Pond, in part (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Buttonbush-Mannagrass-Smartweed Coastal Plain Seasonal Pond Vegetation

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Pond

**Landfire Classification Code:** unknown

[-Back to New Castle County Coastal Plain Ponds-](#)

[-Back to Kent County Coastal Plain Ponds-](#)

[-Back to Sussex County Coastal Plain Ponds-](#)

## Coastal Plain Muck Pondshore

G2G3

S1.1

D?

**NVC Alliance:** [A.1384-Rhynchospora spp.-Panicum \(rigidulum, verrucosum\)-Rhexia virginica Seasonally Flooded Herbaceous Alliance](#)

**NVC Association:** [CEGL006264-Rhexia virginica-Panicum verrucosum Herbaceous Vegetation](#)

**Delaware Type Locality:** Huckleberry Pond in Sussex County (**38°50'31.84"N, 75°18'1.37"W**).

**Description:** Coastal Plain muck pondshores are found on the broad margins of shallow groundwater basins. The only known occurrence in Delaware, Huckleberry Pond, is considered to be a Carolina Bay (A Carolina Bay is not formed on the Calvert Formation like the Delmarva Bays of Kent and New Castle Counties. In the past more examples of this community likely existed in Delaware but were probably lost from agriculture, filling and draining.

The most common plant species found in this community include warty panicgrass ([Panicum verrucosum](#)), spreading panicgrass ([P. dichotomiflorum](#)), eaton's witchgrass ([Dichanthelium spretum](#)), squarestem spikerush ([Eleocharis quadrangulata](#)), Robbin's spikerush ([E. robbinsii](#)), small fruited spikerush ([E. microcarpa](#)) and reticulated nutrush ([Scleria reticularis](#)). Other associates that occur in lesser numbers include lance-leaf violet ([Viola lanceolata](#)), tiny flowered flat-top goldenrod ([Euthamia tenuifolia](#)), spoon-leaved sundew ([Drosera intermedia](#)), tall beakrush ([Rhynchospora macrostachya](#)), loose-head beakrush ([R. chalarocephala](#)), short-beaked beakrush ([R. nitens](#)), small's yellow eyed grass ([Xyris smalliana](#)), rose coreopsis ([Coreopsis rosea](#)), twining bartonia ([Bartonia paniculata](#)), slender fimbry ([Fimbristylis autumnalis](#)) and walter's pasalum ([Paspalum dissectum](#)).



**Huckleberry Pond**  
**Sussex County**

**Diagnostic Features:** The widely fluctuating water levels and the presence of the species above serve to identify this community.

**Geology and Environmental Features:** The substrate can be variable being loamy sand, sandy loam and sand with no organic layer to 20 cm.

**Landscape Position:** Topographic depressions known as Carolina Bays in the Coastal Plain of Delaware.

**Associated Soil Series:** Hurlock Sandy Loam

**NWI Classification:** Isolated Terrene

Species documented from this community

Animals

Non-Vascular Plants

Vascular Plants

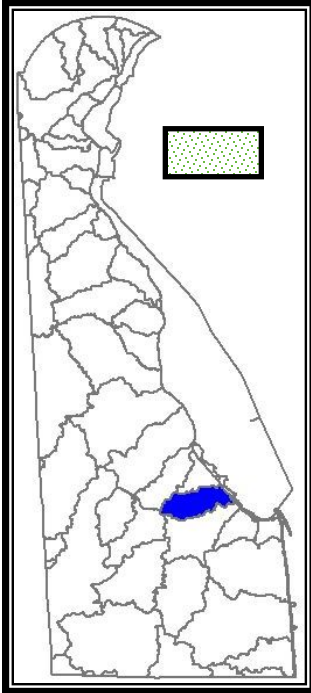
Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Carolina Redroot ([\*Lachnanthes caroliniana\*](#)), Rose Coreopsis ([\*Coreopsis rosea\*](#)), Three-angle Spikerush ([\*Eleocharis tricostata\*](#)), Wright's Witch Grass ([\*Dichanthelium wrightianum\*](#)), Blue Maidencane (*Amphicarpum purshii*), Creeping St. John's Wort (*Hypericum adpressum*), Wrinkled Jointgrass (*Coelorachis rugosa*), Small's Yellow-eyed-grass (*Xyris smalliana*), Short-beaked Bald-rush (*Rhynchospora nitens*), Black-fruited Spike-rush (*Eleocharis melanocarpa*), Reticulated Nutrush (*Scleria reticularis*)





Distribution: This community is known only from Huckleberry Pond in Sussex County in Delaware. Nationally it occurs discontinuously along the coast from Massachusetts south to Delaware.

**Estimated Acres in Delaware = 12.9 (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** Coastal Plain Muck Pondshore (Breden et al. 2001)

**Pennsylvania:** not present

**Virginia:** not present

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Mixed Grass Depression Meadow

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Pond

**Landfire Classification Code:** unknown

[-Back to Sussex County Coastal Plain Ponds-](#)

**Coastal Plain Pond      G2                      S1.1                      D1?**

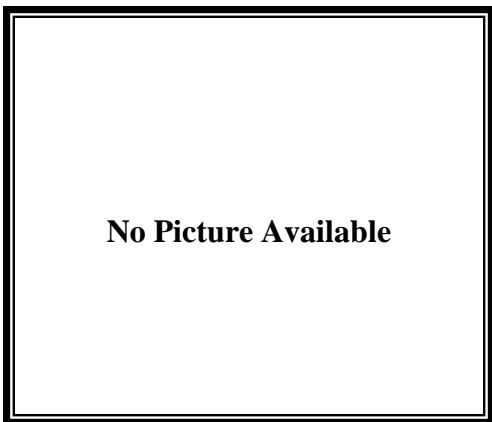
**NVC Alliance:** [A.1984-Nymphaea odorata-Nuphar spp. Permanently Flooded Temperate Herbaceous Alliance](#)

**NVC Association:** [CEGL006086-Nymphaea odorata-Eleocharis robbinsii Herbaceous Vegetation](#)

**Delaware Type Locality:** Still Pond in Sussex County ([38°44'9.46"N, 075°12'38.68"W](#)).

**Description:** This Coastal Plain Pond community occurs in standing water and may dry only in the most severe of droughts.

Waterlily ([Nymphaea odorata](#)), little floating heart ([Nymphoides cordata](#)) and Robbin’s spikerush ([Eleocharis robbinsii](#)) are the most common species and are associated by reticulated nutrush ([Sceleria reticularis](#)), golden-hedge hyssop ([Gratiola aurea](#)), combleaf mermaidweed ([Proserpinaca pectinata](#)), southern bladderwort ([Utricularia juncea](#)), watershield ([Brasenia schreberi](#)), pickerelweed ([Pontederia cordata](#)), seedbox ([Ludwigia](#) spp.) and seven-angled pipewort ([Eriocaulon aquaticum](#)).



**Diagnostic Features:** This community is characterized by the dominance of waterlily and Robbin’s spikerush in a Coastal Plain pond.

**Geology and Environmental Features:** Deep muck, except in oligotrophic ponds where the organic layer may be absent or much reduced, whereby the vegetation is rooted in sand or mucky sand.

**Landscape Position:** Topographic depressions known as Carolina Bays in the Coastal Plain of Delaware

**Associated Soil Series:** Water, Hurlock Loamy Sand

**NWI Classification:** Isolated Terrene

Species documented from this community

Animals

Non-Vascular Plants

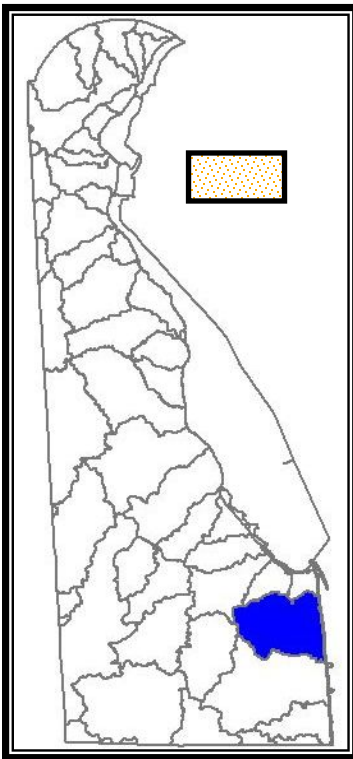
Vascular Plants

Associated Rare Species:

**Animals:** Barking Treefrog ([Hyla gratiosa](#))

**Non-Vascular Plants:** unknown

**Vascular Plants:** Brown-fruited Rush ([Juncus pelocarpus](#)), Grassleaf Arrowhead ([Sagittaria graminea](#) var. *graminea*), Creeping St. John's Wort ([Hypericum adpressum](#)), Carolina Redroot ([Lachnanthes caroliniana](#)), Reticulated Nutrush (*Scleria reticularis*), Wright's Witch Grass ([Dichanthelium wrightianum](#)), Floating-heart ([Nymphoides cordata](#)), Three-angle Spike-rush ([Eleocharis tricostata](#))



Distribution: Still Pond in Sussex County is the only place where this community is known in Delaware. Nationally this community is found on the east coast from New Hampshire south to Maryland.

**Estimated Acres in Delaware = ~1 (February 2012)**

Equivalent or related communities in nearby states:

**Maryland:** Coastal Plain Pond (Harrison 2004)

**New Jersey:** Coastal Plain Pond (Breden et al. 2001)

**Pennsylvania:** not present

**Virginia:** not present

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Waterlily Deepwater Coastal Plain Seasonal Pond

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Pond

**Landfire Classification Code:** unknown

[-Back to Sussex County Coastal Plain Ponds-](#)

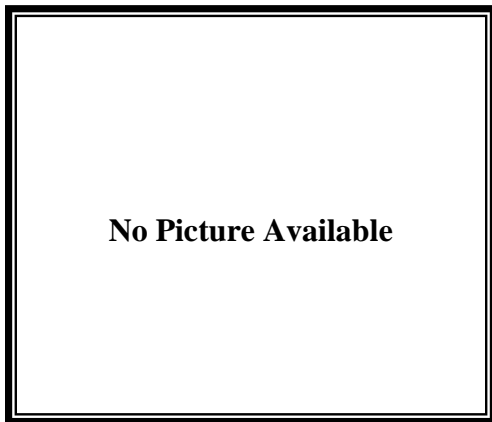
**Coastal Plain Pondshore GNR S? D?**

**NVC Alliance:** [A.1398-Dulichium arundinaceum Seasonally Flooded Herbaceous Alliance](#)

**NVC Association:** [CEGL006415-Dulichium arundinaceum-Juncus canadensis-Juncus pelocarpus Herbaceous Vegetation](#)

**Delaware Type Locality:** There are no known locations for this community in Delaware though it is likely it is here.

**Description:** This Coastal Plain Pond community is dominated by three-way sedge ([Dulichium arundinaceum](#)) and Canada Spikerush ([Juncus canadensis](#)) and is associated by lesser amounts of woolgrass bulrush ([Scirpus cyperinus](#)), dotted smartweed ([Polygonum punctatum](#)), bladderwort ([Utricularia](#) spp.) and marsh St. John's Wort ([Triadenum virginicum](#)).



**Diagnostic Features:** A Coastal Plain pond that is dominated by three-way sedge and/or Canada spikerush.

**Geology and Environmental Features:** Coastal Plain pond

**Landscape Position:** Topographic depressions known as Carolina Bays in the Coastal Plain of Delaware

**Associated Soil Series:** No locations in Delaware

**NWI Classification:**

Species documented from this community

Animals

Non-Vascular Plants

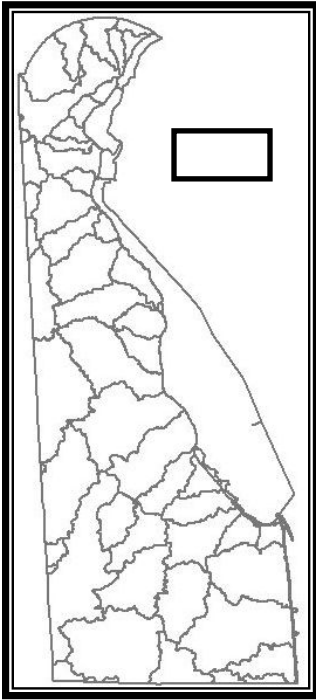
Vascular Plants

Associated Rare Species

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: There are no known locations for this community in Delaware. Nationally this community occurs in Maryland and Delaware.

**Estimated Acres in Delaware = 0+ (February 2012)**

Equivalent or related communities in nearby states:

**Maryland:** not present

**New Jersey:** unknown

**Pennsylvania:** not present

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Three-way Sedge-Canada Rush Coastal Plain Pond  
Seasonal Pond Vegetation

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Pond

**Landfire Classification Code:** unknown

[-Back to Sussex County Coastal Plain Ponds-](#)

**Creeping Rush-Boltonia Coastal Plain Pond GNR S1.1 D1.1**

**NVC Alliance:** A.1376-*Juncus repens*-*Eleocharis microcarpa* Seasonally Flooded Herbaceous Alliance

**NVC Association:** [CEGL006610-\*Juncus repens\*-\*Boltonia asteroides\* Herbaceous Vegetation](#)

**Delaware Type Locality:** Assawoman Pond in Assawoman Wildlife Area in Sussex County ([38°30'2.20"N, 075° 5'59.98"W](#)).

**Description:** This Coastal Plain Pond community is found only from a single site in Delaware. It is located in the Assawoman Wildlife Management Area in Sussex County.

This community is composed of aster-like boltonia ([Boltonia asteroides](#)), one-flowered bog button ([Sclerolepis uniflora](#)), creeping rush ([Juncus repens](#)), bushy seedbox ([Ludwigia alterniflora](#)), eaton's witchgrass ([Dichanthelium spretum](#)), tall beakrush ([Rhynchospora macrostachya](#)), Virginia meadow beauty ([Rhexia virginica](#)), mild water pepper ([Polygonum hydropiperoides](#)), small's yellow eyed grass ([Xyris smalliana](#)), stinking camphorweed ([Pluchea foetida](#)) and marsh mermaidweed ([Proserpinaca palustris](#)).

**Diagnostic Features:** A coastal plain pond that is dominated by aster-like boltonia and creeping rush helps identify this community.

**Geology and Environmental Features:** Low lying topographic depression

**Landscape Position:** Topographic depressions known as Carolina Bays in the Coastal Plain of Delaware

**Associated Soil Series:** Askecksy Loamy Sand, 0 to 2 percent slopes

**NWI Classification:** Isolated Terrene

Species documented from this community

Animals

Non-Vascular Plants

Vascular Plants

Associated Rare Species:

**Animals:** Comet Darner (*Anax longipes*)

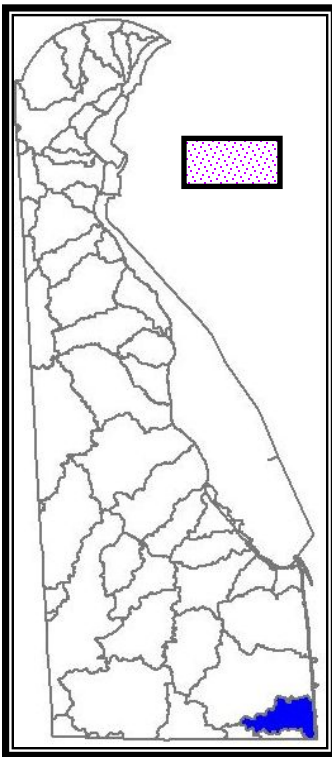
**Non-Vascular Plants:** unknown

**Vascular Plants:** Coppery St. John's Wort (*Hypericum denticulatum*), Harper's Beakrush (*Rhynchospora harperi*), Wrinkled Jointgrass (*Coelorachis rugosa*), Drowned Beak-rush (*Rhynchospora inundata*), One-flower Sclerolepis (*Sclerolepis uniflora*), Small's Yellow-eyed grass (*Xyris smalliana*), Two-formed Pink (*Sabatia difformis*), Aster-like Boltonia (*Boltonia asteroides*), Hirst Brother's Panic Grass (*Dichanthelium hirstii*), Reticulated Nutrush (*Scleria reticulatus*), Flattened Pipewort (*Eriocaulon compressum*), Awned Meadow Beauty (*Rhexia aristosa*)

**Ecological Integrity Assessment (EIA)**

A = 1, B = 0, C = 0, D = 0

**Average EIA = 4.53      X=1**



**Distribution:** This community is known from a single location in the Assawoman Wildlife Area in Delaware. Nationally this community is known from Delaware and New Jersey.

**Estimated Acres in Delaware = 2.1 acres (February 2012)**

\*This community is not projected to be affected by sea level rise directly but may be affected indirectly by water table rise.

**Equivalent or related communities in nearby states:**

**Maryland:** not present

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** not present



Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Creeping Rush-Boltonia Coastal Plain Seasonal Pond  
Vegetation

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Pond

**Landfire Classification Code:** unknown

[-Back to Sussex County Coastal Plain Ponds-](#)

## Deep Muck Coastal Plain Pond

GNR

S1

D?

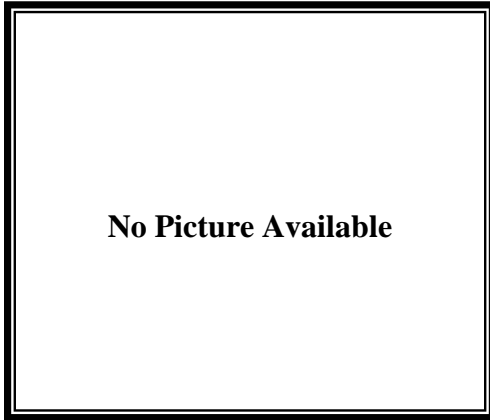
**NVC Alliance:** [A.1429-\*Eleocharis\* spp.-\*Eriocaulon aquaticum\* Semipermanently Flooded Herbaceous Alliance](#)

**NVC Association:** [CEGL006400-\*Eleocharis flavescens\*-\*Xyris difformis\* Herbaceous Vegetation](#)

**Delaware Type Locality:** This community has been described for Delaware but the location is unknown.

**Description:** This community is found in the deep muck of Coastal Plain ponds. Vegetation in these ponds tends to appear after the water levels have decreased and in years of high rainfall, it may not appear at all.

Yellow spikerush ([Eleocharis flavescens](#)), brown-fruit rush ([Juncus pelocarpus](#)), slender fimbry ([Fimbristylis autumnalis](#)), lob-beak beak sedge ([Rhynchospora scirpoides](#)) and bog-yellow eyed grass ([Xyris difformis](#)) are typical species of this community.



**Diagnostic Features:** The presence of yellow spikerush, brown-fruit rush and slender fimbry in the deep muck of a Coastal Plain pond identify this community.

**Geology and Environmental Features:** Deep muck associated with Coastal Plain ponds.

**Landscape Position:** Topographic depressions known as Carolina Bays in the Coastal Plain of Delaware

**Associated Soil Series:** unknown

**NWI Classification:** Isolated Terrene

### Species documented from this community

Animals

Non-Vascular Plants

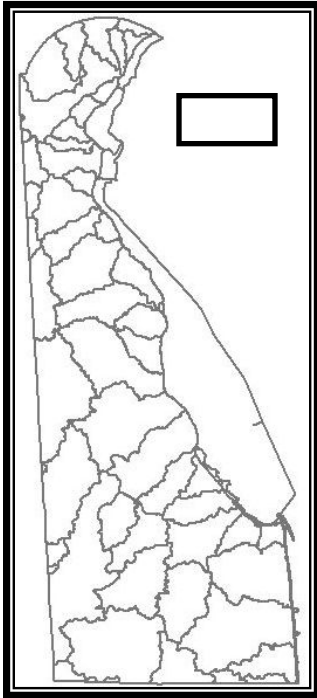
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is described from a single site in Delaware but the location is unknown. Nationally it may be present in New York and Massachusetts as well.

**Estimated Acres in Delaware = 0+ (February 2012)**

Equivalent or related communities in nearby states:

**Maryland:** not present

**New Jersey:** unknown

**Pennsylvania:** not present

**Virginia:** not present

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Pond

**Landfire Classification Code:** unknown

[-Back to Sussex County Coastal Plain Ponds-](#)

**Northern Peatland Sedge Coastal Plain Pond  
D?**

**G3G4**

**S1.1**

**NVC Alliance:** [A.1426-Carex striata Seasonally Flooded Herbaceous Alliance](#)

**NVC Association:** [CEGL004120-Carex striata var. brevis Herbaceous Vegetation](#)

**Delaware Type Locality:** Redden State Forest north of Sawmill Road in Sussex County (38°46'45.73"N, 075°23'43.95"W).

**Description:** This sedge community is found on the shores of the Coastal Plain Ponds. It is commonly composed of dense walter's sedge (*Carex striata*) and few other associates.

Other plants that may occur include seedlings of buttonbush (*Cephalanthus occidentalis*) and red maple (*Acer rubrum*) which may be scattered within the community. Herbs may include twig rush (*Cladium mariscoides*), Virginia meadow beauty (*Rhexia virginica*), devil's beggar ticks (*Bidens frondosa*), tall beakrush (*Rhynchospora macrostachya*), loose-head beakrush (*Rhynchospora chalarocephala*), slender fimbry (*Fimbristylis autumnalis*), Canada rush (*Juncus canadensis*), three way sedge (*Dulichium arundinaceum*) and slender St. John's wort (*Hypericum mutilum*). Peat moss (*Sphagnum* spp.) can be interspersed around the community.



**Redden State Forest  
Sussex County**

**Diagnostic Features:** This Coastal Plain Pond is characterized by the dominance of walter's sedge.

**Geology and Environmental Features:** Sand and gravel and sometimes in organic muck.

**Landscape Position:** Topographic depressions known as Carolina Bays in the Coastal Plain of Delaware

**Associated Soil Series:** Askecksy Loamy Sand, Hurlock Loamy Sand

**NWI Classification:** Isolated Terrene

Species documented from this community

Animals

Non-Vascular Plants

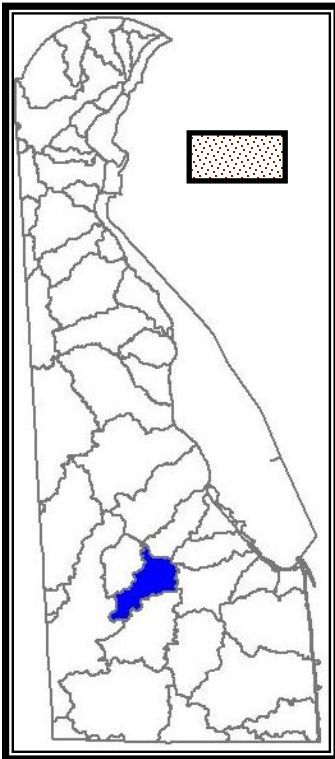
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Peanut Grass (*Amphicarpum purshii*) (S2), Canby's Lobelia ([Lobelia canbyii](#)) (S2), Capitulate Beakrush ([Rhynchospora cephalantha](#)) (S2), Harper's Beakrush ([Rhynchospora harperi](#)) (S1), Reticulated Nutrush ([Scleria reticularis](#)) (S2)



Distribution: Northern Peatland Coastal Plain ponds are known from the Gravelly Creek watershed in Delaware. Nationally, they are found on the Atlantic Coast from New York south to Florida.

**Estimated Acres in Delaware = 0.1 (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** No common name (Harrison 2004)

**New Jersey:** Northern Peatland Sedge Coastal Plain Pond (Breden et al. 2001)

**Pennsylvania:** not present

**Virginia:** Coastal Plain Seasonal Pond (Pocosin Sedge Type) (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Walter's Sedge-Eaton's Witchgrass Coastal Plain Seasonal Pond Vegetation

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Pond

**Landfire Classification Code:** unknown

[-Back to Sussex County Coastal Plain Ponds-](#)

## Panicgrass Pondshore

GNR S1 D?

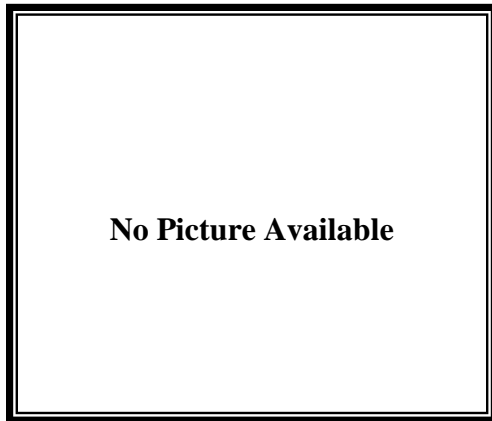
**NVC Alliance:** [A.1379-Panicum hemitomum Seasonally Flooded Temperate Herbaceous Alliance](#)

**NVC Association:** [CEGL006338-Panicum hemitomom-Panicum verrucosum Herbaceous Vegetation](#)

**Delaware Type Locality:** Pond to the west of Hartly, De in western Kent County (**39°10'17.61"N, 075°44'6.51"W**).

**Description:** This community occurs on the edges of isolated basins in the Coastal Plain on loamy sand, though it has yet to be found in Delaware.

Maidencane ([Panicum hemitomom](#)) is the dominant species and can occur in monotypic stands. Other associates may include twig rush ([Cladium mariscoides](#)), three way sedge ([Dulichium arundinaceum](#)), warty panicgrass ([Panicum verrucosum](#)), eaton's witchgrass ([Dichanthelium spretum](#)), walter's sedge ([Carex striata](#)), creeping rush ([Juncus repens](#)) and squarestem spikerush ([Eleocharis quadrangulata](#)). In some examples there may be small seedlings of sweetgum ([Liquidambar styraciflua](#)), red maple ([Acer rubrum](#)) and persimmon ([Diospyros virginiana](#)) present.



**Diagnostic Features:** This is the only community in Delaware in which maidencane is dominant.

**Geology and Environmental Features:** Loamy sand at the edge of isolated basins.

**Landscape Position:** Shores of lakes and ponds

**Associated Soil Series:** Corsica Mucky Loam

**NWI Classification:** Isolated Terrene

Species documented from this community

Animals

Non-Vascular Plants



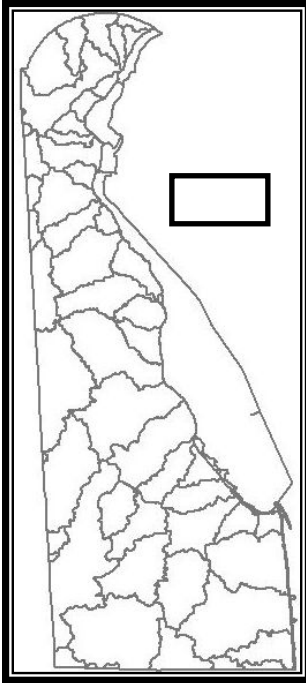
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is located in the Chester and Choptank River watersheds in western Kent County. Nationally it is known from Delaware, Maryland, and New Jersey.

**Estimated Acres in Delaware = ? (October 2011)**

**Note:** The community color is white.

Equivalent or related communities in nearby states:

**Maryland:** Panicgrass Pondshore (Harrison 2004)

**New Jersey:** Panicgrass Pondshore (Breden et al. 2001)

**Pennsylvania:** not present

**Virginia:** not present

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Maidencane Coastal Plain Seasonal Pond Vegetation

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Pond

**Landfire Classification Code:** unknown

[-Back to Sussex County Coastal Plain Ponds-](#)

## Swamp Cottonwood Coastal Plain Pond

GNR

S1

D?

NVC Alliance: [A.348-Acer rubrum-Nyssa sylvatica Saturated Forest Alliance](#)

NVC Association: CEGLO06469-*Populus heterophylla*-*Acer rubrum*-*Quercus palustris*-*Liquidambar styraciflua* Forest

**Delaware Type Locality:** Ponds west of Prime Hook Beach in Prime Hook NWR (38°51'2.56"N, 075°16'38.77"W).

**Description:** This forested Coastal Plain Pond community includes small, isolated ponds dominated by swamp cottonwood (*Populus heterophylla*) in upland situations. Some examples in Prime Hook National Wildlife Refuge are present in beaver impoundments others in New Castle County are in classic Delmarva Bays.

The treed canopy is co-dominated by swamp cottonwood, red maple (*Acer rubrum*), pin oak (*Quercus palustris*), black gum (*Nyssa sylvatica*) and sweetgum (*Liquidambar styraciflua*). Few species are present in the understory layer and include red maple, green ash (*Fraxinus pennsylvanica*) and sweet pepperbush (*Clethra alnifolia*). The herbaceous layer is covered by Japanese stiltgrass (*Microstegium vimineum*), royal fern (*Osmunda regalis*) and mild water pepper (*Polygonum hydropiperoides*).



**Prime Hook National Wildlife  
Refuge  
Sussex County**

**Diagnostic Features:** Wetland that is dominated by swamp cottonwood.

### Geology and Environmental Features:

**Landscape Position:** Topographic depressions known as Carolina Bays and Delmarva Bays in the Coastal Plain of Delaware

**Associated Soil Series:** Carmichael Loam

### Species documented from this community

Animals

Non-Vascular Plants

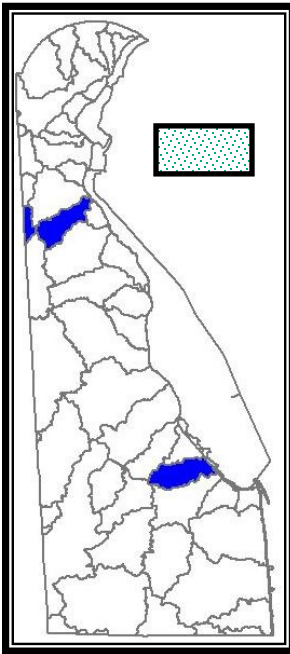
Vascular Plants

Associated Rare Species:

**Animals:** Marbled Underwing (*Catocala marmorata*)

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is currently known to occur in Prime Hook National Wildlife Refuge and Blackbird State Forest. Additional examples of this community may be present in New Jersey and on Long Island in New York.

**Estimated Acres in Delaware = 1.4 (February 2012)**

**-Acres with 0.5 m sea level rise = 1.4-1.4 = 0.0**

**-Acres with 1 m sea level rise = 1.4-1.4 = 0.0**

**-Acres with 1.5 m sea level rise = 1.4-1.4 = 0**

Equivalent or related communities in nearby states:

**Maryland:** not present

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** not present

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Pond

**Landfire Classification Code:** unknown

[-Back to New Castle County Coastal Plain Ponds-](#)  
[-Back to Sussex County Coastal Plain Ponds-](#)

## Swamp-loosestrife Coastal Plain Pond

GNR

SX

D?

NVC Alliance: [A.990-\*Decodon verticillatus\* Seasonally Flooded Shrubland Alliance](#)

NVC Association: [CEGL006087-\*Decodon verticillatus\*/Triadenum virginicum Shrubland](#)

**Delaware Type Locality:** Pond on the west side of the Delaware Airpark in Kent County (39°12'55.84"N, 075°36'19.82"W).

**Description:** This Coastal Plain Pond community is found on the edges of larger water bodies which are permanent or in Coastal Plain Ponds. The ponds in which this community occurs are often flooded longer than other Coastal Plain ponds. In dry years the water level may go below the surface.

Swamp-loosestrife (*Decodon verticillatus*) is the most common species in this community. In dry years when the substrate is exposed other species that may occur include spoon-leaved sundew (*Drosera intermedia*), slender St. John's Wort (*Hypericum mutilum*) and lance-leaf violet (*Viola lanceolata*). Other less common species are rice cut-grass (*Leersia oryzoides*), northern bugleweed (*Lycopus uniflorus*), purple stem beggar ticks (*Bidens connata*), swamp loosestrife (*Lysimachia terrestris*), Canada rush (*Juncus canadensis*) and Virginia chainfern (*Woodwardia virginica*).



**Diagnostic Features:** This community is similar to the Swamp-loosestrife shrub swamp ([CEGL005089](#)) but this community is found in Coastal Plain ponds with fluctuating water levels. .

**Note:** The community pictured was eliminated in 2008.

### Delaware Airpark Kent County

**Geology and Environmental Features:** Mucky substrate that is deep to moderately deep.

**Landscape Position:** Topographic depressions, called Delmarva Bays, in the northern Coastal Plain of Delaware.

**Associated Soil Series:** Fallsington Loam

**NWI Classification:** Isolated Terrene

Species documented from this community

Animals

Non-Vascular Plants

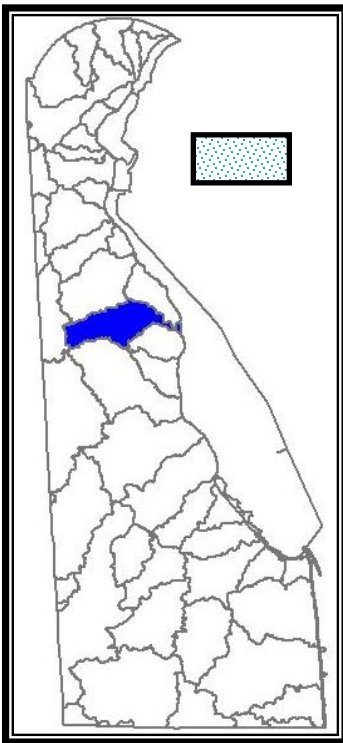
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is often found on the margins of ponds in the Coastal Plain. Nationally this community is found on the east coast from Massachusetts south to Delaware.

**Estimated Acres in Delaware = 0+ (February 2012)**

**\*Note:** This community was known from near Delaware Airpark but was eliminated in an airport improvement project in the summer of 2008. It is not known if there are any other locations in Delaware.

Equivalent or related communities in nearby states:

**Maryland:** not present

**New Jersey:** unknown

**Pennsylvania:** not present

**Virginia:** not present

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain

**Landfire Classification Code:** unknown

[-Back to Kent County Coastal Plain Ponds-](#)



## New Castle County Modified/Successional Communities/Planted Forests

**Successional Black Locust Forest:** Forest dominated by black locust (*Robinia pseudoacacia*) that is often found on river levees ([CEGL007279](#)) **Cedar Swamp; C and D Canal**

**Chinese Chestnut Planted Forest:** Planted forest that is composed of Chinese chestnut (*Castanea mollissima*). (No NVC Association) **Brandywine Creek**

**Cultivated Lawn:** Land that is covered by lawn grasses and other ornamental herbs, shrubs and trees, includes residential and commercial lawns, cemeteries and golf courses. ([CEGL006486](#))  
**Present in every watershed**

**Golden Bamboo Shrubland:** Shrubland that is dominated by bamboo (*Phyllostachys* spp.) ([CEGL008560](#)) **Brandywine Creek; Red Clay Creek**

**Japanese Stiltgrass Meadow:** Grassland that is dominated by Japanese stiltgrass (*Microstegium vimineum*) and is often in disturbed areas (No NVC Association) **Brandywine Creek**

**Little Bluestem Old Field:** Grassland that is dominated by little bluestem (*Schizachyrium scoparium*) and has an abundance of other warm-season grasses. ([CEGL006333](#)) **Brandywine Creek; Red Clay Creek; White Clay Creek**

**Loblolly Pine Plantation:** Planted forest of loblolly pine (*Pinus taeda*) that is often in rows and dense. ([CEGL007179](#)) **Appoquinimink River; Augustine Creek; Blackbird Creek; Bohemia River; Brandywine Creek; Chester River; Christina River; Dragon Run; Eastern C and D Canal; Red Clay Creek; Smyrna River**

**Northeastern Modified Successional Forest:** Forest of mixed dominants that has been invaded by exotic/native invasive plants such as Oriental bittersweet (*Celastrus orbiculatus*), multiflora rose (*Rosa multiflora*), Osage-orange (*Maclura pomifera*), Japanese stiltgrass (*Microstegium vimineum*) and Morrow's honeysuckle (*Lonicera morrowii*). ([CEGL006599](#)) **Present in all watersheds except North and South Atlantic Strand**

**Northeastern Old Field:** Grassland that is mowed once a year or less and is dominated by cool-season grasses such as red fescue (*Festuca rubra*), orchard grass (*Dactylis glomerata*) and timothy (*Phleum pratense*). ([CEGL006107](#)) **Present in all watersheds except North and South Atlantic Strand**

**Northeastern Successional Shrubland:** Successional shrubland of exotic/native invasive species including raspberry (*Rubus* spp.), autumn olive (*Elaeagnus umbellata*) and Morrow's honeysuckle (*Lonicera morrowii*). ([CEGL006451](#)) **Present in all watersheds except North and South Atlantic Strand**

**Norway Spruce Plantation:** Planted forest of Norway Spruce (*Picea abies*). ([CEGL007167](#)) **Brandywine Creek; Red Clay Creek**

**Red Pine Plantation:** Planted forest of red pine (*Pinus resinosa*). ([CEGL007177](#)) **Brandywine Creek; Red Clay Creek**

**Red Spruce Plantation:** Planted forest of red spruce (*Picea rubens*). ([CEGL004758](#)) **Brandywine Creek; C and D Canal; Red Clay Creek**

**Reed Tidal Marsh:** Tidal marsh that is dominated by eastern reed grass (*Phragmites australis*). ([CEGL004187](#)) **Fresh Appoquinimink River; Army Creek; Augustine Creek; Blackbird Creek; Broad Dyke; C and D Canal; Cedar Swamp; Christina River; Red Lion Creek; Smyrna River; Stoney Creek; Upper Delaware Bay**

**Successional Broom-sedge Vegetation:** Successional grassland that is dominated by broom-sedge (*Andropogon virginicus*). ([CEGL004044](#)) **Dragon Run**

**Successional Sweetgum Forest:** A forest that is dominated by sweetgum (*Liquidambar styraciflua*). ([CEGL007216](#)) **Brandywine Creek; Christina River**

**Upland Switchgrass Vegetation:** Upland grassland that is dominated by switchgrass (*Panicum virgatum*). ([CEGL006616](#)) **Appoquinimink River; Army Creek**

**White Pine Plantation:** Planted forest of white pine (*Pinus strobus*). ([CEGL007178](#)) **Appoquinimink River; Army Creek; Augustine Creek; Bohemia River; Brandywine Creek; Dragon Run; Naamans Creek; Red Clay Creek; Red Lion Creek; Sassafras River**

[-Back to Key to Delaware Vegetation Communities-](#)

## Kent County

### Modified/Successional Communities/Planted Forests

**Successional Black Locust Forest:** Forest dominated by black locust (*Robinia pseudoacacia*) that is often found on river levees. ([CEGL007279](#)) **St. Jones River**

**Common Reed Temperate Upland Herbaceous Vegetation:** Upland grassland that is dominated by eastern reed grass (*Phragmites australis*). In Delaware this community often occurs on dredge spoils and coal ash spoils. ([CEGL004019](#)) **St. Jones River**

**Cultivated Lawn:** Land that is covered by lawn grasses and other ornamental shrubs and trees, includes residential and commercial lawns, cemeteries and golf courses. ([CEGL006486](#)) **Present in every watershed**

**Japanese Knotweed Gravel Bar:** Herbaceous community that is entirely composed of Japanese knotweed (*Polygonum cuspidatum*). ([CEGL008472](#)) **Smyrna River**

**Loblolly Pine Plantation:** Planted forest of loblolly pine (*Pinus taeda*) that is often in rows and dense. ([CEGL007179](#)) **Chester River; Choptank River; Murderkill River; St. Jones River**

**Mid to Late Successional Loblolly Pine-Sweetgum Forest:** Successional forest that has a canopy of loblolly pine (*Pinus taeda*) and sweetgum (*Liquidambar styraciflua*). ([CEGL008462](#))

**Northeastern Modified Successional Forest:** Forest of mixed dominants that has been invaded by exotic/native invasive plants such as Oriental bittersweet (*Celastrus orbiculatus*), multiflora rose (*Rosa multiflora*), Osage-orange (*Maclura pomifera*), Japanese stiltgrass (*Microstegium vimineum*) and Morrow's honeysuckle (*Lonicera morrowii*). ([CEGL006599](#)) **Present in all watersheds except North and South Atlantic Strand**

**Northeastern Old Field:** Grassland that is mowed once a year or less and is dominated by cool-season grasses such as red fescue (*Festuca rubra*), orchard grass (*Dactylis glomerata*) and timothy (*Phleum pratense*). ([CEGL006107](#)) **Present in all watersheds except North and South Atlantic Strand**

**Northeastern Successional Shrubland:** Successional shrubland of exotic/native invasive species including raspberry (*Rubus* spp.), autumn olive (*Elaeagnus umbellata*) and Morrow's honeysuckle (*Lonicera morrowii*). ([CEGL006451](#)) **Present in all watersheds except North and South Atlantic Strand**

**Reed Canarygrass Eastern Marsh:** A marsh that is dominated by reed canarygrass (*Phalaris arundinacea*). ([CEGL006044](#)) **Fresh St. Jones River**

**Reed Tidal Marsh:** Tidal marsh that is dominated by eastern reed grass (*Phragmites australis*). ([CEGL004187](#)) **Fresh Duck Creek; Leipsic River; Little Creek; Mispillion River; Simons River; Smyrna River; St. Jones River**

**Successional Sweetgum Forest:** A forest that is dominated by sweetgum (*Liquidambar styraciflua*). ([CEGL007216](#)) **Chester River; St. Jones River**

**Upland Switchgrass Vegetation:** Upland grassland that is dominated by switchgrass (*Panicum virgatum*). ([CEGL006616](#)) **Chester River**

**White Pine Plantation:** Planted forest of white pine (*Pinus strobus*). ([CEGL007178](#)) **Leipsic River; Mispillion River; Murderkill River**

[-Back to Key to Delaware Vegetation Communities-](#)

## Sussex County

### Modified/Successional Communities/Planted Forests

**Successional Black Locust Forest:** Forest dominated by black locust (*Robinia pseudoacacia*) that is often found on a fly spoil island. ([CEGL007279](#)) **Indian River Bay**

**Common Reed Temperate Upland Herbaceous Vegetation:** Upland grassland that is dominated by eastern reed grass (*Phragmites australis*). In Delaware this community often occurs on dredge spoils and coal ash spoils. ([CEGL004019](#)) **Indian River Bay; Nanticoke River**

**Cultivated Lawn:** Land that is covered by lawn grasses and other ornamental shrubs and trees, includes residential and commercial lawns, cemeteries and golf courses. ([CEGL006486](#)) **Present in all watersheds**

**Early to Mid-Successional Loblolly Pine Forest:** A forest that is dominated by at least 60% coverage of loblolly pine (*Pinus taeda*) and has a distinct canopy and understory. ([CEGL006011](#)) **Broad Creek; Broadkill River; Cedar Creek; Deep Creek; Gravelly Branch; Gum Branch; Indian River; Indian River Bay; Marshyhope Creek; Mispillion River; Nanticoke River; Pocomoke River; Rehoboth Bay; Slaughter Creek**

**Japanese Black Pine Forest:** Forest that is dominated by Japanese black pine (*Pinus thunbergiana*) and is located on dunes on the Atlantic Strand. ([CEGL006012](#)) **Indian River Bay; Little Assawoman Bay; North Atlantic Strand; Rehoboth Bay; South Atlantic Strand**

**Loblolly Pine Plantation:** Planted forest of loblolly pine (*Pinus taeda*) that is often planted in rows and dense. ([CEGL007179](#)) **Broad Creek; Broadkill River; Bunting Branch; Cedar Creek; Deep Creek; Gum Branch; Gravelly Branch; Indian River; Indian River Bay; Houston Branch; Lewes-Rehoboth Canal; Little Assawoman Bay; Marshyhope Creek; Mispillion River; Mockingbird Branch; Nanticoke River; Prime Hook Creek; Pocomoke River; Red Mill Creek; Rehoboth Bay; Tanyard Branch; Wicomico River**

**Mid to Late Successional Loblolly Pine-Sweetgum Forest:** Successional forest that has a canopy of loblolly pine (*Pinus taeda*) and sweetgum (*Liquidambar styraciflua*). ([CEGL008462](#)) **Nanticoke River**

**Northeastern Modified Successional Forest:** Forest of mixed dominants that has been invaded by exotic/native invasive plants such as Oriental bittersweet (*Celastrus orbiculatus*), multiflora rose (*Rosa multiflora*), Osage-orange (*Maclura pomifera*), Japanese stiltgrass (*Microstegium vimineum*) and Morrow's honeysuckle (*Lonicera morrowii*). ([CEGL006599](#)) **Present in all watersheds except North and South Atlantic Strand**

**Northeastern Old Field:** Grassland that is mowed once a year or less and is dominated by cool-season grasses such as red fescue (*Festuca rubra*), orchard grass (*Dactylis glomerata*) and timothy (*Phleum pratense*). ([CEGL006107](#)) **Present in all watersheds except North and South Atlantic Strand**

**Northeastern Successional Shrubland:** Successional shrubland of exotic/native invasive species including raspberry (*Rubus* spp.), autumn olive (*Elaeagnus umbellata*) and Morrow's honeysuckle (*Lonicera morrowii*). ([CEGL006451](#)) **Present in all watersheds except North and South Atlantic Strand**

**Reed Canarygrass Eastern Marsh:** A marsh that is dominated by reed canarygrass (*Phalaris arundinacea*). ([CEGL006044](#)) **Fresh Marshyhope Creek; Rehoboth Bay**

**Reed Tidal Marsh:** Tidal marsh that is dominated by eastern reed grass (*Phragmites australis*). ([CEGL004187](#)) **Fresh Assawoman Bay; Broadkill River; Bunting Branch; Indian River Bay; Lewes-Rehoboth Canal; Mispillion River; Nanticoke River; Red Mill Creek; Rehoboth Bay**

**Successional Broom-sedge Vegetation:** Successional grassland that is dominated by broom-sedge (*Andropogon virginicus*). ([CEGL004044](#)) **Nanticoke River**

**Successional Maritime Forest:** A forest that contains a canopy of wild black cherry (*Prunus serotina*), sweetgum (*Liquidambar styraciflua*) and sassafras (*Sassafras albidum*). This community is often next to salt marshes. ([CEGL006145](#)) **Broadkill River; Indian River Bay; Lewes-Rehoboth Canal**

**Successional Sweetgum Forest:** A forest that is dominated by sweetgum (*Liquidambar styraciflua*). ([CEGL007216](#)) **Prime Hook Creek**

**Upland Switchgrass Vegetation:** Upland grassland that is dominated by switchgrass (*Panicum virgatum*). ([CEGL006616](#)) **Nanticoke River**

**White Pine Plantation:** Planted forest of white pine (*Pinus strobus*). ([CEGL007178](#)) **Mispillion River**

[-Back to Key to Delaware Vegetation Communities-](#)

**Loblolly Pine Plantation                      GNA                      SNA                      D5**

**NVC Alliance:** A.99-*Pinus taeda* Planted Forest Alliance

**NVC Association:** CEGLO07179-*Pinus taeda* Planted Forest

**Delaware Type Locality:** Pine Plantation in Ellendale State Forest in Sussex County  
([38°46'13.90"N, 075°25'50.16"W](#)).

**Description:** This planted/artificial community is composed of planted loblolly pine ([Pinus taeda](#)). This community differs from other stands of loblolly pine in that the pine is planted in rows or in dense stands. In most cases no other woody species are found in these stands. Some do include Virginia pine ([Pinus virginiana](#)) and inkberry ([Ilex glabra](#)). The herb layer is generally non-existent due to the dense canopy and the acidity of the pine needles.

Loblolly pine is the dominant species, though it can be associated by Virginia pine in some stands.



**Diagnostic Features:** The presence and dominance of loblolly pine, often planted in rows is characteristic of this community.

**Ellendale State Forest  
Sussex County**

**Geology and Environmental Features:** These communities are human created and are not related to any particularly environmental or geological feature.

**Landscape Position:** Variable

**Associated Soils:** This community is planted and is not particular to a specific soil type.

Species documented from this community

Animals

Non-Vascular Plants

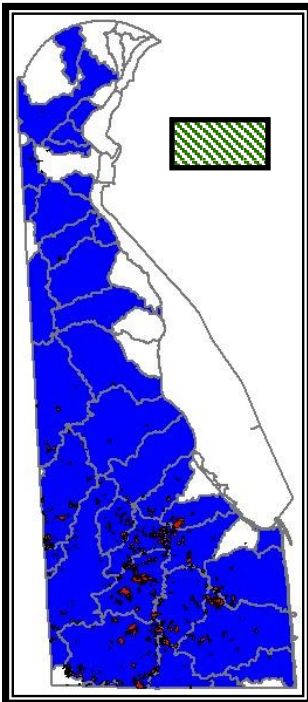
Vascular Plants

Associated Rare Species:

**Animals:** Copperhead ([Agkistrodon contortix](#)), Cooper's Hawk ([Accipiter cooperii](#)), Cypress-swamp Sedge ([Carex jorii](#)), beakrush ([Rhynchospora globularis](#))

**Non-Vascular Plants:** unknown

**Vascular Plants:** Staghorn Clubmoss ([Lycopodium clavatum](#)) Dark Green Sedge ([Carex venusta](#)), Britton's Spike-rush ([Eleocharis brittonii](#)), Pink Sundew ([Drosera capillaris](#)), Cross-leaved Milkwort ([Polygala cruciata](#)),



Distribution: These communities are located primarily south of Dover in southern Kent and Sussex Counties. Nationally they can be found throughout the southeast.

**Estimated Acres in Delaware = 27,020.5 (February 2012)**

**-Acres with 0.5 m sea level rise = 27,575.6-35.9 = 27,539.7**

**-Acres with 1 m sea level rise = 27,575.6-77.2 = 27,498.4**

**-Acres with 1.5 m sea level rise = 27,575.6-130.2 = 27,445.4**

Equivalent or related communities in nearby states:

**Maryland:** Loblolly Pine Planted Forest (Harrison 2004)

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Loblolly Pine Plantation

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations



**Landfire Classification Code:** unknown

[-Back to Kent County Modified Communities-](#)  
[-Back to New Castle County Modified Communities-](#)  
[-Back to Sussex County Modified Communities-](#)

**Mid to Late-Successional Loblolly Pine-Sweetgum Forest**      **GNA**  
**SNA**      **DNA**

**NVC Alliance:** A.130-*Pinus taeda* Forest Alliance

**NVC Association:** CEGLO08462-*Pinus taeda-Liquidambar styraciflua* Semi-Natural Forest

**Delaware Type Locality:** Nanticoke Wildlife Area west of Woodland Ferry in Sussex County (38°36'13.66"N, 075°39'53.55"W).

Description: This community is the result of past disturbance including agriculture and clear cuts and land clearing. While the short canopy is predominantly loblolly pine (*Pinus taeda*) and sweetgum (*Liquidambar styraciflua*), the understory is very variable and often reflective of the local species in the area. This community will generally succeed to an oak or oak-pine forest.

Besides the nominal species other species in the canopy may include Virginia pine (*Pinus virginiana*), water oak (*Quercus nigra*) and red maple (*Acer rubrum*). The understory is usually thick and has a very variable composition depending on the location. Possible understory species include water oak, sweetgum, red maple, scarlet oak (*Quercus coccinea*), southern red oak (*Quercus falcata*), American hornbeam (*Carpinus caroliniana*), black gum (*Nyssa sylvatica*), white oak (*Quercus alba*), American holly (*Ilex opaca*) and persimmon (*Diospyros virginiana*). The shrub layer also thick and contains highbush blueberry (*Vaccinium corymbosum*), poison ivy (*Toxicodendron radicans*), common greenbrier (*Smilax rotundifolia*), sweet pepperbush (*Clethra alnifolia*) and white-leaf greenbrier (*Smilax glauca*). The herb layer is typically rather sparse due to the thick understory. Some of the more common herbs include fireweed (*Erechtites hieracifolia*), spotted wintergreen (*Chimaphila maculata*), common bushy broom sedge (*Andropogon glomeratus*) and yellow wild indigo (*Baptisia tinctoria*).



**Near Georgetown, De  
Sussex County**

Diagnostic Features: The co-dominance of loblolly pine and sweetgum in a shortened canopy generally identifies this community.

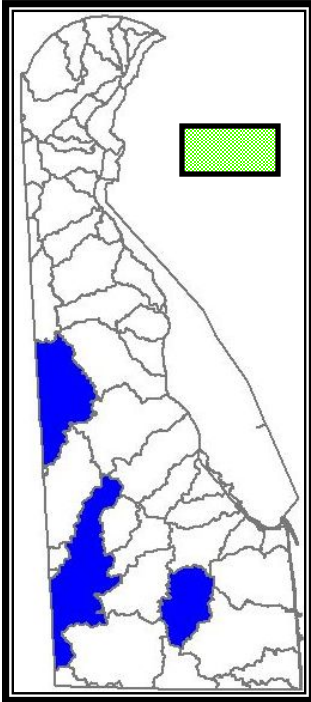
Geology and Environmental Features: This community is found in mesic to dry mesic conditions which generally contain acidic soils.

Species documented from this community

Animals

Non-Vascular Plants

Vascular Plants



Distribution: This community is currently only known from Sussex County in the Nanticoke River watershed. It is likely more common but can be hard to separate from the Early to Mid-Successional Loblolly Pine Forest ([CEGL006011](#)) in some cases. Nationally this community is found throughout the southeastern United States.

**Estimated Acres in Delaware = 6,683.7 (February 2012)**

**-Acres with 0.5 m sea level rise = 6,405.5-17.8 = 6,387.7**

**-Acres with 1 m sea level rise = 6,405.5-38.2 = 6,367.3**

**-Acres with 1.5 m sea level rise = 6,405.5-6,333.5**

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

[-Back to Kent County Forests-](#)  
[-Back to Sussex County Forests -](#)

[-Back to Kent County Modified Communities-](#)  
[-Back to Sussex County Modified Communities-](#)

## Norway Spruce Plantation

GNA

SNA

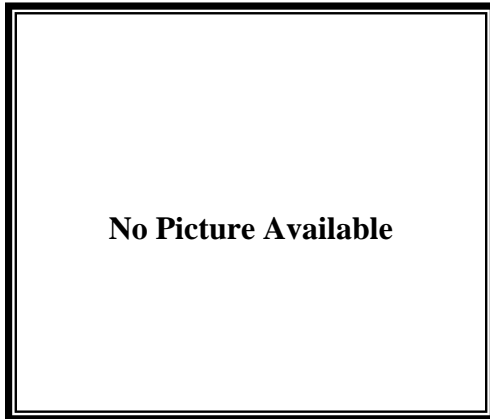
DNA

**NVC Alliance:** A.91-*Picea abies* Planted Forest Alliance

**NVC Association:** CEGLO07167-*Picea abies* Planted Forest

**Delaware Type Locality:** TBD

**Description:** This planted community is defined by a monoculture of Norway spruce (*Picea abies*). These trees are often planted in rows as part of a plantation. This species was often used by the Soil Conservation Service in 1950 and 1960's for reforestation. Norway spruce is typically the only species with little or no understory present.



**Diagnostic Features:** A stand which is a monoculture of Norway spruce.

**Geology and Environmental Features:** This community is planted and does not have geological or environmental preference.

**Landscape Position:** Variable

**Associated Soil Series:** This community is planted and is not particular to a specific soil type.

### Species documented from this community

Animals

Non-Vascular Plants

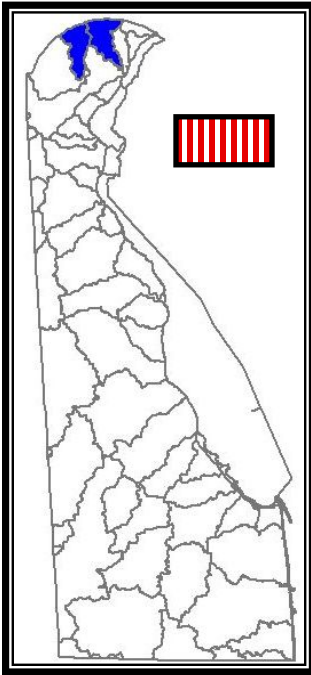
Vascular Plants

### Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community often occurs in small woodlots in the Piedmont of Delaware. Nationally it has been documented in North Carolina, Virginia and Vermont but is likely in many other states on the east coast of North America.

**Estimated Acres in Delaware = 25.9 (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** not present

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

[-Back to New Castle County Modified Communities-](#)

## Red Pine Plantation

GNA

SNA

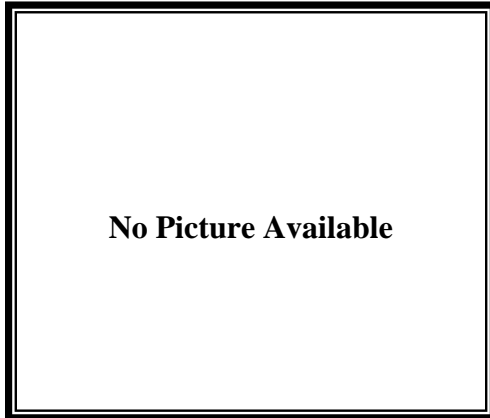
DNA

**NVC Alliance:** A.97-*Pinus resinosa* Planted Forest Alliance

**NVC Association:** CEGLO07177-*Pinus resinosa* Planted Forest

**Delaware Type Locality:** Hilltop to the north of Smith Bridge Road in the Brandywine Creek watershed of New Castle County ([39°50'3.88"N, 75°35'10.65"W](#)).

**Description:** This planted community is a monoculture of red pine ([Pinus resinosa](#)). Red pine is the primary species with hardly to any understory.



**Diagnostic Features:** A stand of trees that is a monoculture of red pine.

**Geology and Environmental Features:** This community is artificially planted and has no specific geological preference.

**Landscape Position:** variable

**Associated Soil Series:** This community is planted and is not particular to a specific soil type.

### Species documented from this community

Animals

Non-Vascular Plants

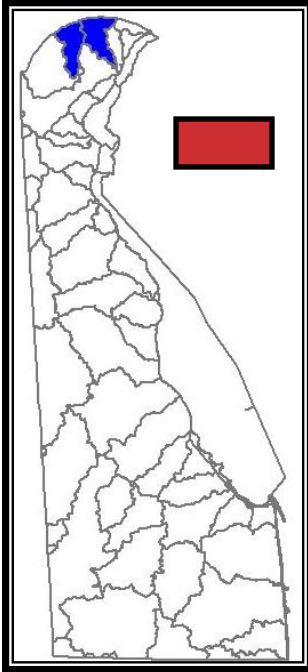
Vascular Plants

### Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** This community is currently known from a location in the northern part of New Castle County in the Brandywine Creek Watershed. Nationally this community is known from the east coast of North America from Vermont south to North Carolina.

**Estimated Acres in Delaware = 14.0 (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** *Pinus resinosa* Planted Forest

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

[-Back to New Castle County Modified Communities-](#)



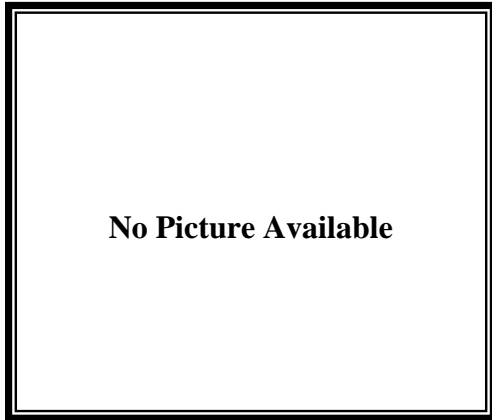
**Red Spruce Plantation    GNA            SNA            DNA**

**NVC Alliance:** A.92-*Picea rubens* Planted Forest Alliance

**NVC Association:** CEGLO04758-*Picea rubens* Planted Forest

**Delaware Type Locality:** Brandywine Creek State Park to the north of the confluence of Rocky Run and Brandywine Creek in New Castle County. ([39°48'55.91"N, 075°33'59.07"W](#))

**Description:** This planted community is dominated by a monoculture of red spruce ([Picea rubens](#)) that is often planted in rows. Red spruce is often the only species in the canopy.



**Diagnostic Features:** A monoculture of red spruce usually in rows is a hallmark of this community.

**Geology and Environmental Features:** This community does not have a specific geological or environmental preference.

**Landscape Position:** variable

**Associated Soil Series:** This community is planted and is not particular to a specific soil type.

Species documented from this community

Animals

Non-Vascular Plants

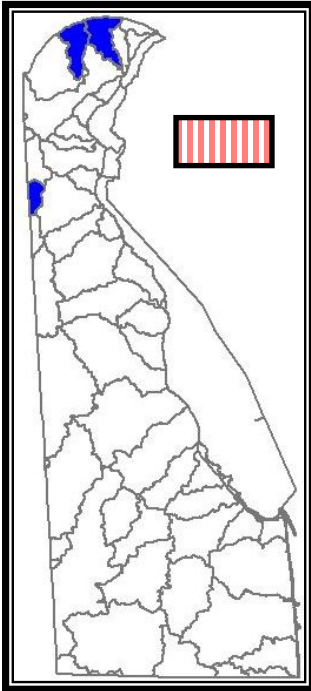
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community likely occurs in most watersheds of the state but it has only confirmed so far in three. It is likely to occur elsewhere in the state. Nationally this forest type is currently known from Virginia and West Virginia but is likely in other states.

**Estimated Acres in Delaware = 26.5 (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** not documented

**New Jersey:** not documented

**Pennsylvania:** not documented

**Virginia:**

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

[-Back to New Castle County Modified Communities-](#)

## White Pine Plantation

GNA

SNA

DNA

**NVC Alliance:** A.98-*Pinus strobus* Planted Forest Alliance

**NVC Association:** CEGLO07178-*Pinus strobus* Planted Forest

**Delaware Type Locality:** Just south and upstream of the confluence of Rocky Run and Brandywine Creek on Rocky Run in Brandywine Creek State Park in New Castle County.  
([39°48'43.70"N, 075°33'57.00"W](#))

**Description:** This planted community is a monoculture of white pine ([Pinus strobus](#)) which is often planted for the forest industry. Most examples in Delaware community is used a large hedgerow along driveways and roads.

White pine is often the only canopy species. The understory may contain arrow-wood ([Viburnum dentatum](#)), wild black cherry ([Prunus serotina](#)), Oriental bittersweet ([Celastrus orbiculatus](#)) and poison ivy ([Toxicodendron radicans](#)). Herbs can include pokeweed ([Phytolacca americana](#)), Virginia creeper ([Parthenocissus quinquefolia](#)), ground ivy ([Glechoma hederacea](#)), rattlesnake weed ([Hieracium pratense](#)) and cinquefoil ([Potentilla canadensis](#)).



**Diagnostic Features:** Monoculture of white pine in a planted forest.

### **Killens Pond State Park Kent County**

**Geology and Environmental Features:** This community occurs on a wide variety of geological types and soils.

**Landscape Position:** variable

**Associated Soil Series:** This community is planted and is not particular to a specific soil type.

#### Species documented from this community

Animals

Non-Vascular Plants

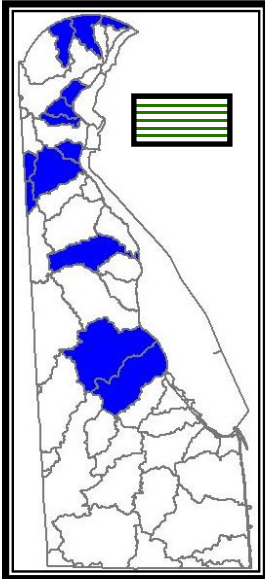
Vascular Plants

Associated Rare Species

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: White Pine Planted Forests are scattered throughout the State of Delaware mainly in residential areas. Nationally it is found throughout Eastern North America.

**Estimated Acres in Delaware = 300.3 (February 2012)**

**-Acres with 0.5 m sea level rise = 265.2-0.4 = 264.8**

**-Acres with 1 m sea level rise = 265.2-1.0 = 264.2**

**-Acres with 1.5 m sea level rise = 265.2-1.5 = 263.7**

Equivalent or related communities in nearby states:

**Maryland:** *Pinus strobus* Planted Forest

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

[-Back to Kent County Modified Communities-](#)  
[-Back to New Castle County Modified Communities-](#)

[-Back to Sussex County Modified Communities-](#)

## Successional Black Locust Forest

GNA

SNA

DNA

**NVC Alliance:** A.256-*Robinia pseudoacacia* Forest Alliance

**NVC Association:** CEGLO07279-*Robinia pseudoacacia* Forest

**Delaware Type Locality:** Levee above the Delaware River at Fox Point State Park in New Castle County (39°45'58.87"N, 075°28'59.89"W).

**Description:** This modified forest community is found on areas of past disturbance such as agricultural fields, pastures or floodplain terraces on the Delaware River.

As the name implies the canopy in these forests is dominated by black locust (*Robinia pseudoacacia*). The understory may contain black willow (*Salix nigra*) and shrubs are generally Morrow's honeysuckle (*Lonicera morrowii*). Herbs tend to sparse and may include eastern reed grass (*Phragmites australis*) and Japanese stiltgrass (*Microstegium vimineum*).



**Diagnostic Features:** This is the only community in Delaware where black locust is dominant in the canopy.

**Note:** The forest pictured was eliminated in 2008.

### Fox Point State Park New Castle County

**Geology and Environmental Features:** This community is often found on river levees such as those on the Delaware and St. Jones Rivers where there has been disturbance.

**Landscape Position:** Floodplain terraces and abandoned agricultural fields.

**Associated Soil Series:** Othello-Fallsington-Urban Land Complex  
Sassafras Soils

### Species documented from this community

Animals

Non-Vascular Plants

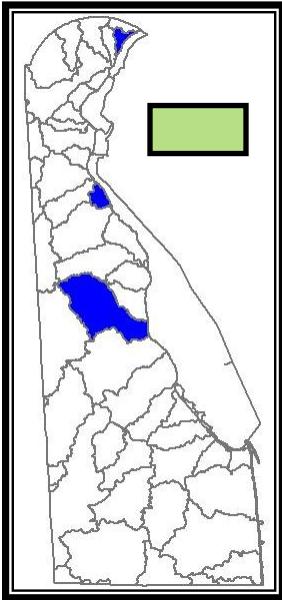
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is known from Stoney Creek, Cedar Swamp and St. Jones River watersheds in Delaware. Nationally these communities are found throughout the East Coast of the United States.

**Estimated Acres in Delaware = 16.9 (February 2012)**

\*This community is not projected to be affected by sea level rise.

**Note:** This community has likely been eliminated from Delaware due to restoration projects along the Delaware River and on the St. Jones River.

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

[-Kent County Modified Communities-](#)  
[-New Castle County Modified Communities-](#)  
[-Sussex County Modified Communities-](#)



## Common Reed Temperate Upland Herbaceous Vegetation

**GNA            SNA            DNA**

**NVC Alliance:** A.1196-*Phragmites australis* Herbaceous Alliance

**NVC Association:** C EGL004019-*Phragmites australis* Temperate Upland Herbaceous Vegetation

**Delaware Type Locality:** Burton Island east of the NRG Power Plant in Sussex County.

**Description:** This is an upland grassland that is dominated by eastern reed grass (*Phragmites australis*).

**Diagnostic Features:** This community is related to the Eastern Reed Marsh ([CEGL004141](#)) but is in an upland situation and is not a wetland.

**Geology and Environmental Features:**

**Landscape Position:** Spoil areas

**Associated Soil Series:** Urban land complex (Disturbed soils)

### Species documented from this community

Animals

Non-Vascular Plants

Vascular Plants

### Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown

Distribution: This community is known from the Nanticoke River and Indian River Bay watersheds. It is found on spoil mounds. This community is documented mostly from the southeast region of the United States.



**Estimated Acres in Delaware = 370.2 (February 2012)**

**-Acres with 0.5 m sea level rise = 85.2-5.3 = 79.9**

**-Acres with 1 m sea level rise = 85.2-7.3 = 77.9**

**-Acres with 1.5 m sea level rise = 85.2-14.0 = 71.2**

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

[-Back to Sussex County Modified Communities-](#)

## **Cultivated Lawn**

**GNA**

**SNA**

**DNA**

**NVC Alliance:** A.1213-*Lolium (arundinaceum, pratense)* Herbaceous Alliance

**NVC Association:** CEGLO06486-*Lolium arundinaceum-Poa pratensis-Trifolium repens*  
Herbaceous Vegetation

**Delaware Type Locality:** TBD

**Description:** This grassland community covers the various ornamental lawns associated with residential, institutional, commercial structures, cemeteries and golf courses.

**Diagnostic Features:** This community can be similar to the Northeastern Old Field but is different in that the Northeastern Old Field is mowed annually or not at all and the Cultivated Lawn is mowed more than once a year and in many cases once a month or more.

**Geology and Environmental Features:**

**Landscape Position:** Anywhere except in wetlands

**Associated Soil Series:** This community is planted and is not particular to a specific soil type.

**Species documented from this community**

Animals

Non-Vascular Plants

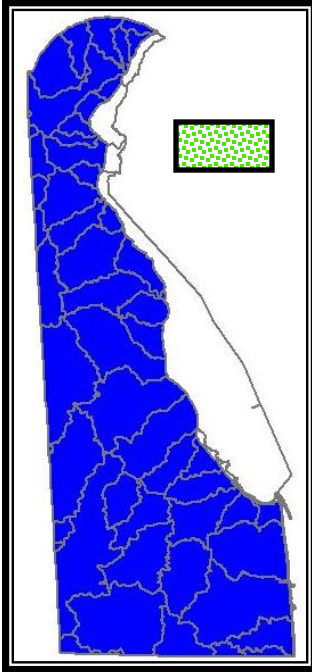
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: Cultivated lawns are found throughout the State of Delaware and throughout the United States.

**Estimated Acres in Delaware = 180,354.4 (February 2012)**

**-Acres with 0.5 m sea level rise = 172,584.4-1,987.6 = 170,596.8**

**-Acres with 1 m sea level rise = 172,584.4-4,579 = 168,005.4**

**-Acres with 1.5 m sea level rise = 172,584.4-6,956.9 = 165,627.5**

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

[-Back to Kent County Modified Communities-](#)  
[-Back to New Castle County Modified Communities-](#)  
[-Back to Sussex County Modified Communities-](#)

## Japanese Knotweed Gravel Bar

GNA

SNA

DNA

**NVC Alliance:** A.2005-*Polygonum cuspidatum* Temporarily Flooded Herbaceous Alliance

**NVC Association:** C EGL008472-*Polygonum cuspidatum* Temporarily Flooded Herbaceous Vegetation

**Delaware Type Locality:** Mouth of the Smyrna River at the end of Lighthouse Road in Kent County.

**Description:** This herbaceous community is entirely composed of Japanese knotweed (*Polygonum cuspidatum*). It often found in places where there is ample sunlight and disturbance of the substrate is present.

**Diagnostic Features:** This is the only community in Delaware that is dominated by Japanese knotweed.

**Geology and Environmental Features:**

**Landscape Position:** bayshores

**Associated Soil Series:** This community is found on sandy substrates in Delaware.

**Species documented from this community**

Animals

Non-Vascular Plants

Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown

Distribution: There currently only one known location of this community in Delaware at the mouth of the Smyrna River. It is has been noted from the high banks of the Delaware River near Pennsylvania but was eliminated in a reclamation project. This community is noted throughout the eastern United States.

**Estimated Acres in Delaware = ? (February 2012)**

Equivalent or related communities in nearby states:

**Maryland**: unknown

**New Jersey**: unknown

**Pennsylvania**: unknown

**Virginia**: unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP)**: No equivalent community

**Northeast Wildlife Habitat Classification**: Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code**: unknown

[-Back to Kent County Modified Communities-](#)

## Golden Bamboo Shrubland

GNA

SNA

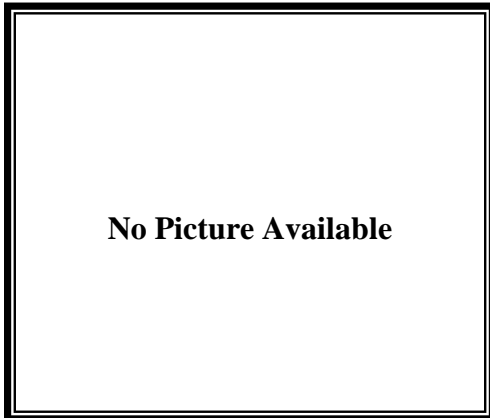
DNA

**NVC Alliance:** A.2010-*Phyllostachys aurea* Shrubland Alliance

**NVC Association:** CEGLO08560-*Phyllostachys aurea* Shrubland

**Delaware Type Locality:** On the Granoque property in northern New Castle County ([39°49'38.39"N, 075°34'55.82"W](#)).

**Description:** This modified shrub community is dominated by golden bamboo (*Phyllostachys aurea*) or another species of bamboo. Because of the density of the stems of bamboo there are generally no other species present in the community.



**Diagnostic Features:** This is the only community in Delaware where bamboo is dominant.

**Geology and Environmental Features:** This community is not restricted to a particular geological or environmental type.

**Landscape Position:** any

**Associated Soil Series:** This community is planted and is not particular to a specific soil type

### Species documented from this community

Animals

Non-Vascular Plants

Vascular Plants

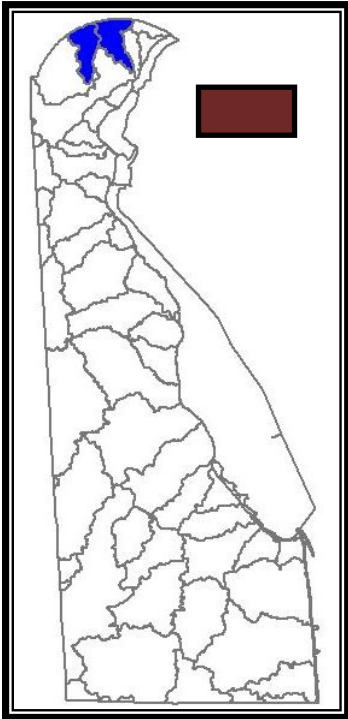
### Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown





Distribution: This community is only known from the Piedmont of Delaware in the Brandywine and Red Clay Creek watersheds.

**Estimated Acres in Delaware = 2.3 (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

[-Back to New Castle County Modified Communities-](#)

## Japanese Black Pine Forest

GNA

SNA

DNA

**NVC Alliance:** A.3016-*Pinus thunbergiana* Forest Alliance

**NVC Association:** CEGLO06012-*Pinus thunbergiana* – (*Pinus nigra*) Forest

**Delaware Type Locality:** TBD

**Description:** This community is found on the dunes on the Atlantic strand in Delaware. It is dominated by Japanese black pine ([Pinus thunbergiana](#)) almost to the exclusion of all other species.



**Diagnostic Features:** This community can readily be identified by the dominance of Japanese black pine.

**Delaware Seashore State Park  
Sussex County**

**Geology and Environmental Features:** Sandy dunes on the Atlantic Strand

**Landscape Position:** Dunes on the Atlantic Coast

**Associated Soil Series:** Acquango-Beaches Complex, 0 to 10 percent slopes

**Species documented from this community**

Animals

Non-Vascular Plants

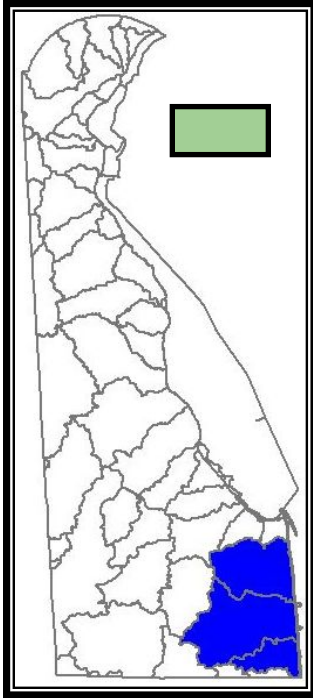
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is found along the Atlantic Coastal Strand in Delaware from Cape Henlopen south to Fenwick Island. Nationally it is found along the East Coast.

**Estimated Acres in Delaware = 44.6 acres (February 2012)**

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

[-Back to Sussex County Modified Communities-](#)

## Little Bluestem Old Field

GNA

SNA

DNA

**NVC Alliance:** A.1208-*Andropogon virginicus* Herbaceous Alliance

**NVC Association:** CEGLO06333-*Schizachyrium scoparium*-(*Andropogon virginicus*)-*Solidago* spp. Herbaceous Vegetation

**Delaware Type Locality:** Brandywine Creek State Park northeast of Tuliptree Woods in New Castle County (**39°48'35.90"N, 075°34'28.33"W**).

**Description:** This successional grassland community is composed mainly of warm-season grasses in which little bluestem (*Schizachyrium scoparium*) is present. The species composition of this community is variable and the species list below is local for the examples in Delaware.

Common species in this community include little bluestem, early goldenrod (*Solidago juncea*), gray goldenrod (*Solidago nemoralis*), dogbane (*Apocynum cannabinum*), yarrow (*Achillea millefolium*), indian tobacco (*Linaria canadensis*) and mock strawberry (*Duchesnea* sp.). Less common species include tall fescue (*Festuca arundinacea*), woolly witchgrass (*Dichanthelium acuminatum*), pussytoes (*Antennaria plantaginifolia*), hawkweed (*Hieracium pratense*) and (*Pycnanthemum verticillata*). Some scattered woody plants such as morrow's honeysuckle (*Lonicera morrowii*) and multiflora rose (*Rosa multiflora*) may be present.



**Brandywine Creek State Park  
New Castle County**

**Diagnostic Features:** The presence of and dominance of little bluestem and an abundance of warm-season grasses helps to distinguish this community from others in Delaware.

**Geology and Environmental Features:** This community is found in places of nutrient poor soil.

**Landscape Position:** Mid-slopes with nutrient poor soil

**Associated Soil Series:** Glenelg and Manor Loams

### Species documented from this community

Animals

Non-Vascular Plants

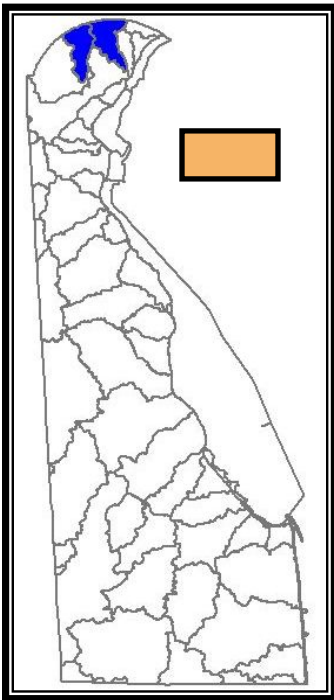
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Green Milkweed (*Asclepias viridiflora*), Bush's Sedge (*Carex bushii*), Midland Sedge (*Carex mesochorea*), Scribner's Witch Grass (*Dichanthelium oligoanthes*), Philadelphia panicgrass (*Panicum philadelphicum*), Smooth Beardtongue (*Penstemon laevigatus*), Whorled Mountain-mint (*Pycnanthemum verticillatum*), Bird's Foot Violet (*Viola pedata*)



Distribution: Little Bluestem Old Fields are found in the Piedmont of Delaware. Nationally they are found on the East Coast of the United States from Maine south to Delaware.

**Estimated Acres in Delaware = 75.5 (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** ???

**Landfire Classification Code:** unknown

**[-Back to New Castle County Modified Communities-](#)**

## Northeastern Modified Successional Forest

GNA

SNA DNA

**NVC Alliance:** A.237-*Prunus serotina*-*Acer rubrum*-*Amelanchier canadensis*-*Quercus* spp. Forest Alliance

**NVC Association:** CEGLO06599-*Prunus serotina*-*Liriodendron tulipifera*-*Acer rubrum*-*Fraxinus americana* Forest

**Delaware Type Locality:** Brandywine Creek State Park west of Brandywine Creek in New Castle County ([39°48'45.28"N, 075°34'13.26"W](#)).

**Description:** This modified forest community includes those that have been invaded by exotic/native invasive species and have dense understories, shrub and vine layers and are degraded from a “natural” condition. A lot of times these forests are degraded examples of the Successional Tuliptree Forest ([CEGL007220](#)) and the Northern Coastal Plain/Piedmont Basic Mesic Hardwood Forest ([CEGL006055](#)). The readily available nutrients in these forests make them a savory target for aggressive species. These forests are also a potential target for restoration since the exotics can be eradicated and these forests could be restored to the above two forests.

The canopies of these forests vary depending on the location and region. Some of the more common canopy species include tuliptree ([Liriodendron tulipifera](#)), wild black cherry ([Prunus serotina](#)), black locust ([Robinia pseudoacacia](#)), northern red oak ([Quercus rubra](#)) and white oak ([Quercus alba](#)). The understories are often smaller members of the canopy plus tree-of-heaven ([Ailanthus altissima](#)), sassafras ([Sassafras albidum](#)) and sweet cherry ([Prunus avium](#)). The often dense layer includes Morrow’s honeysuckle ([Lonicera morrowii](#)), chinese privet ([Ligustrum sinense](#)), multiflora rose ([Rosa multiflora](#)) and Siebold’s viburnum ([Viburnum sieboldii](#)). The dense and sometimes impenetrable vine layers can include Oriental bittersweet ([Celastrus orbiculatus](#)), Japanese honeysuckle ([Lonicera japonica](#)) raspberry ([Rubus](#) spp.) and poison ivy ([Toxicodendron radicans](#)). Common herbs include Japanese stiltgrass ([Microstegium vimineum](#)), garlic mustard ([Alliaria petiolata](#)) in the Piedmont and many others.



**Dragon Run Park  
New Castle County**

**Diagnostic Features:** A forest with a dense shrub layer of the above species and a chaotic structure in all layers points to this community.

Geology and Environmental Features:

**Landscape Position:** variable

**Associated Soil Series:** Glenelg and Manor Loams

Species documented from this community

Animals

Non-Vascular Plants

Vascular Plants

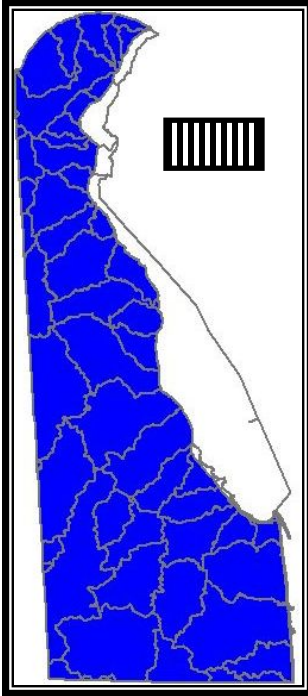
Associated Rare Species:

**Animals:** Blue-winged Warbler ([Vermivora pinus](#)), Chestnut-sided Warbler ([Dendroica pensylvanica](#)), Black-shouldered Spinyleg (*Dromogomphus spinosus*)

**Non-Vascular Plants:** unknown

**Vascular Plants:** Common Dittany (*Cunila oreganoides*), Bird's Foot Violet ([Viola pedata](#)), Yellow-flowered leafcup (*Smallanthus uvedalia*), American Ginseng ([Panax quinquefolius](#)), Large Tick-trefoil ([Desmodium glutinosum](#)), Golden-seal ([Hydrastis canadensis](#)), Hairy Wood Brome Grass ([Bromus pubescens](#)), Green Violet ([Hybanthus concolor](#)), Purple Milkweed ([Asclepias purpurascens](#)), Red-stem Bulrush ([Scirpus expansus](#)), Shinleaf ([Pyrola elliptica](#)), Squawroot (*Conophilus americanus*), Slender Muhly ([Muhlenbergia tenuiflora](#)), Two-leaf Bishop's Cap ([Mitella diphylla](#)), Bladderfern ([Cystopteris tenuis](#)), Teal Love-grass ([Eragrostis hypnoides](#)), Davis' Sedge ([Carex davisii](#)), Emory's Sedge ([Carex emoryii](#)), Swamp Wedgescale (*Sphenopholis pensylvanica*), Early Meadow-rue ([Thalictrum dioicum](#))





Distribution: These communities are found throughout the State of Delaware. They are found throughout the Northeastern United States.

**Estimated Acres in Delaware = 14,699.9 (February 2012)**

**-Acres with 0.5 m sea level rise = 10,409.7-603.2 = 9,806.5**

**-Acres with 1 m sea level rise = 10,409.7-983.0 = 9,426.7**

**-Acres with 1.5 m sea level rise = 10,409.7-1,281.5 = 9,128.2**

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

[-Back to Kent County Modified Communities-](#)  
[-Back to New Castle County Modified Communities-](#)  
[-Back to Sussex County Modified Communities-](#)

## Northeastern Old Field

GNA

SNA

D?

NVC Alliance: [A.1190-Dactylis glomerata-Rumex acetosella Herbaceous Alliance](#)

NVC Association: CEGL006107-Dactylis glomerata-Phleum pratense-Festuca spp.-Solidago spp. Herbaceous Vegetation

**Delaware Type Locality:** Fields by the entrance to Winterthur in New Castle County ([39°48'22.05"N, 075°36'37.63"W](#)).

**Description:** Northeastern Old Fields are defined as those fields in Delaware that are planted or have succeeded to cool-season grasses and are mowed annually or less. These communities include pastures that are grazed by cattle or other livestock. The exact species composition varies depending on whether it is in the Piedmont or the Coastal Plain.

Common species in this community include red fescue ([Festuca rubra](#)), red clover ([Trifolium pratense](#)), Queen Anne's lace ([Daucus carota](#)), sweet vernal grass ([Anthoxanthum odoratum](#)), orchard grass ([Dactylis glomerata](#)), rough bluegrass ([Poa trivialis](#)), common velvet grass ([Holcus lanatus](#)), meadow timothy ([Phleum pratense](#)) and love-grass ([Eragrostis](#) sp.).



**Field in Red Clay Creek  
Watershed  
New Castle County**

**Diagnostic Features:** A field that is mowed annually or less and is dominated by cool-season grasses distinguishes this community from others in Delaware.

### Geology and Environmental Features:

**Landscape Position:** variable

**Associated Soil Series:** Glenelg and Manor Loams, Chester Loam, Neshaminy and Montalto Silt Loam

### Species documented from this community

Animals

Non-Vascular Plants

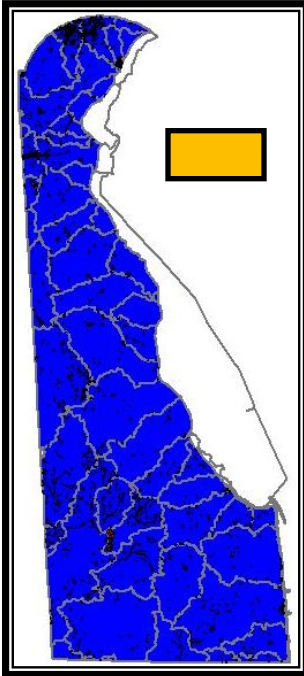
Vascular Plants

Associated Rare Species:

**Animals:** Baltimore Checkspot ([Euphydryas phaeton](#))

**Non-Vascular Plants:** unknown

**Vascular Plants:** Basil Bee-balm ([Monarda clinopodia](#)), Rough Avens ([Geum laciniatum](#) var. *laciniatum*)



Distribution: These communities are found throughout the State of Delaware. Nationally they are found from Maine south to Virginia and west to Kentucky.

**Estimated Acres in Delaware = 20,497.3 (February 2012)**

**-Acres with 0.5 m sea level rise = 19,668.4-627.0 = 19,041.4**

**-Acres with 1 m sea level rise = 19,668.4-1,137.5 = 18,530.9**

**-Acres with 1.5 m sea level rise = 19,688.4-1,501.1 = 18,167.3**

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

[-Back to Kent County Modified Communities-](#)  
[-Back to New Castle County Modified Communities-](#)  
[-Back to Sussex County Modified Communities-](#)

## Northeastern Successional Shrubland

GNA

SNA

DNA

NVC Alliance: [A.3558-Cornus drummondii Shrubland Alliance](#)

NVC Association: CEGLO06451-*Elaeagnus umbellata*-*Cornus racemosa*-*Rosa multiflora*-*Juniperus virginiana* Shrubland

**Delaware Type Locality:** TBD

Description: This community is composed of shrubby old fields and other places that have succeeded to shrubs. Often they are located on the sides of roads and railroads.

Common shrubs in these communities include multiflora rose (*Rosa multiflora*), Morrow's honeysuckle (*Lonicera morrowii*), Japanese barberry (*Berberis thunbergii*), autumn olive (*Elaeagnus umbellata*) and raspberry (*Rubus* spp.). Some trees such as black locust (*Robinia pseudoacacia*), osage-orange (*Maclura pomifera*) and wild black cherry (*Prunus serotina*) may be mixed in. Due the dense woody layer few if any herbs are present in this community.



Diagnostic Features: A shrubby field or hedgerow often defines this community in Delaware.

**Fox Point State Park**  
**New Castle County**

Geology and Environmental Features:

**Landscape Position:** variable

**Associated Soil Series:** This community is successional and is often composed of exotic species that are not particular to a specific type of soil.

Species documented from this community

Animals

Non-Vascular Plants

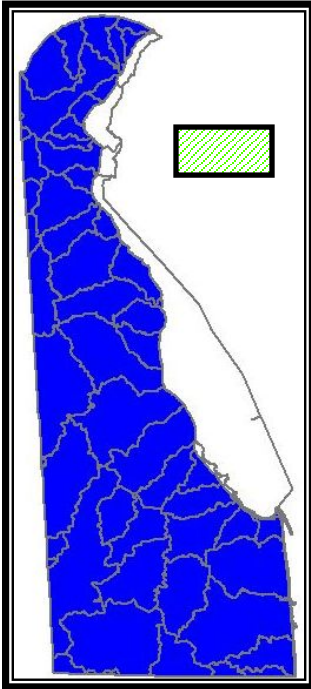
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is found throughout Delaware. Nationally it is located on the East Coast from Massachusetts south to Delaware.

**Estimated Acres in Delaware = 6,813.5 (February 2012)**

**-Acres with 0.5 m sea level rise = 6,484.8-411.1 = 6,073.7**

**-Acres with 1 m sea level rise = 6,484.8-722.9 = 5,761.9**

**-Acres with 1.5 m sea level rise = 6,484.8-993.7 = 5,491.1**

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Shrub/Brush Early Successional Upland Habitats

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

~~[-Back to Kent County Modified Communities-](#)~~  
~~[-Back to New Castle County Modified Communities-](#)~~  
~~[-Back to Sussex County Modified Communities-](#)~~

**Reed Tidal Marsh                      GNA                      SNA                      DNA**

**NVC Alliance:** [A.1477-Phragmites australis Tidal Herbaceous Alliance](#)

**NVC Association:** [CEGL004187-Phragmites australis Tidal Herbaceous Vegetation](#)

**Delaware Type Locality:** Tidal edge of the Mispillion River in Sussex County just downstream of the DE 1 bridge ([38°55'12.80"N, 075°24'0.97"W](#)).

**Description:** This community is the Eastern Reed Marsh ([CEGL004141](#)) of tidal locations. It is characterized by dense stands of eastern reed grass ([Phragmites australis](#)) up to 100% coverage.

Other than the nominal species, other species that may be scattered in the marsh include Virginia sea-shore mallow ([Kosteletzkya virginica](#)), false nettle ([Boehmeria cylindrica](#)), dogbane ([Apocynum cannabinum](#)), narrow-leaf cattail ([Typha angustifolia](#)), southern bayberry ([Morella cerifera](#)) and swamp rose ([Rosa palustris](#)).



**Diagnostic Features:** A marsh that is heavily dominated by eastern reed grass in a tidal area is very likely this community.

**Shore of the Mispillion River  
Sussex County**

**Geology and Environmental Features:** There is no geological preference for this community and it can occur in saline to fresh water.

**Landscape Position:** On the edges of tidal rivers

**Associated Soil Series:** Transquaking and Mispillion Soils, very frequently flooded, tidal  
Tidal Marsh

**NWI Classification:**

Species documented from this community

Animals

Non-Vascular Plants

Vascular Plants

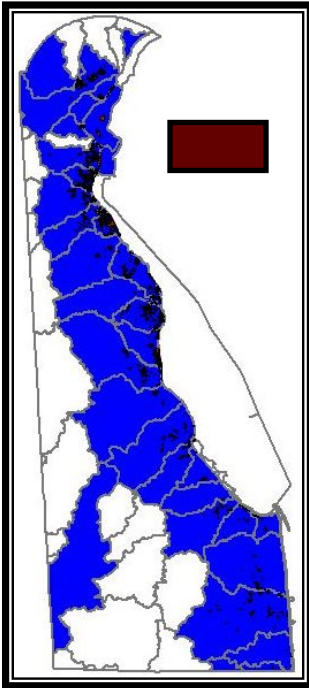


Associated Rare Species

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is located along the tidal areas of the Delaware and nationally on the coasts of the United States and Canada.

**Estimated Acres in Delaware = 13,555.7 (February 2012)**

**-Acres with 0.5 m sea level rise = 14,501.0-12,996.0 = 1,505.0**

**-Acres with 1 m sea level rise = 14,501.0-14,203.0 = 298.0**

**-Acres with 1.5 m sea level rise = 14,501.0-14,354.4 = 146.4**

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** *Phragmites* Tidal Marsh

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Tidal Salt Marsh

**Landfire Classification Code:** unknown

[-Back to Kent County Modified Communities-](#)  
[-Back to New Castle County Modified Communities-](#)  
[-Back to Sussex County Modified Communities-](#)  
[-Back to Kent County Tidal Marsh-](#)  
[-Back to New Castle County Tidal Marsh-](#)  
[-Back to Sussex County Tidal Marsh-](#)

**Successional Broom-sedge Vegetation      GNA      SNA      DNA**

**NVC Alliance:** A.1208-*Andropogon virginicus* Herbaceous Alliance

**NVC Association:** CEGLO04044-*Andropogon virginicus* var. *virginicus* Herbaceous Vegetation

**Delaware Type Locality:** Successional field at the Middleford Preserve northeast of Seaford, De ([38°40'36.25"N, 075°33'56.56"W](#)).

**Description:** This successional grassland community generally occurs in abandoned agricultural fields and pastures that are no longer grazed. Most of the time this community is short lived and succeeds to shrubland and eventually forest.

Herbaceous dominants include broom-sedge ([Andropogon virginicus](#)), purple-top ([Tridens flavus](#)), slender bushclover ([Lespedeza virginica](#)), little bluestem ([Schizachyrium scoparium](#)) and purple lovegrass ([Eragrostis spectabilis](#)).



**Diagnostic Features:** Grassland dominated by broom-sedge is indicative of this community in Delaware.

**Middleford Preserve (TNC)  
Sussex County**

**Geology and Environmental Features:**

**Landscape Position:** variable

**Associated Soil Series:** This community is a relict of past human disturbance and is often not associated with a particular soil series. They are often found on prime farmland soils.

**Species documented from this community**

Animals

Non-Vascular Plants

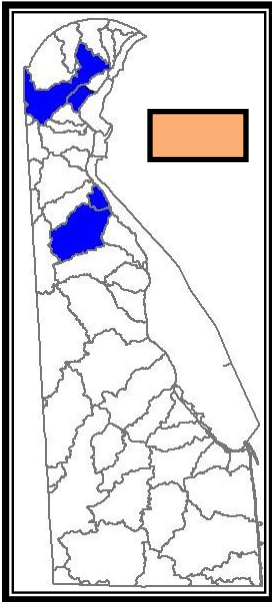
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Green Fringed Orchid ([\*Platanthera lacera\*](#))



Distribution: This community is known from the Piedmont of Delaware and is likely in the Coastal Plain as well.

**Estimated Acres in Delaware = 16.2 (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** ???

**Landfire Classification Code:** unknown

[-Back to New Castle County Modified Community Key-](#)

[-Back to Sussex County Modified Community Key-](#)

[-Back to New Castle County Herbaceous Vegetation Key-](#)  
[-Back to Sussex County Herbaceous Vegetation Key-](#)

## Upland Switchgrass Vegetation

GNA

SNA DNA

NVC Alliance: A.1208-*Andropogon virginicus* Herbaceous Alliance

NVC Association: CEGLO06616-*Panicum virgatum* Herbaceous Vegetation

**Delaware Type Locality:** Successional field at the Middleford Preserve northeast of Seaford, De ([38°40'38.50"N, 075°33'34.53"W](#)).

**Description:** This community occurs in abandoned fields and roadsides where there is high amount of sand and in some cases (especially roadsides) an accumulation of salt. Switchgrass (*Panicum virgatum*) is the dominant species and is closely associated by broom-sedge (*Andropogon virginicus*) sometimes to co-dominance. Other species may include Canada horseweed (*Conyza canadensis*), purple top (*Tridens flavus*), Maryland meadow beauty (*Rhexia mariana*) path rush (*Juncus tenuis*), sneezeweed (*Helenium autumnale*), white snakeroot (*Ageratina altissima*), yellow indian grass (*Sorghastrum nutans*) and deer-tongue grass (*Dichanthelium clandestinum*). Scattered woody plants may occur such as red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*) and loblolly pine (*Pinus taeda*).



**Middleford Preserve (TNC)  
Sussex County**

**Diagnostic Features:** Upland grassland that is dominated by switchgrass (*Panicum virgatum*) and is not associated with a brackish marsh is indicative of this community.

### Geology and Environmental Features:

**Landscape Position:** upland areas

**Associated Soil Series:** Fallsington Loam

### Species documented from this community

Animals

Non-Vascular Plants

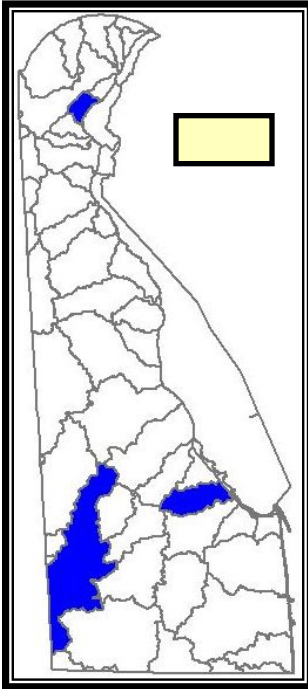
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: These fields are scattered throughout the Coastal Plain of Delaware. Nationally they are found on the eastern seaboard of the United States.

**Estimated Acres in Delaware = 200.5 (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Semi-Natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

[-Back to Kent County Modified Community Key-](#)  
[-Back to New Castle County Modified Community Key-](#)  
[-Back to Sussex County Modified Community Key-](#)  
[-Back to New Castle County Herbaceous Community Key-](#)  
[-Back to Kent County Herbaceous Community Key-](#)  
[-Back to Sussex County Herbaceous Community Key-](#)



## New Castle County Piedmont Herbaceous Wetlands

**Central Appalachian Cutgrass Marsh:** Herbaceous wetland that is dominated by rice cutgrass (*Leersia oryzoides*). ([CEGL006461](#)) **Brandywine Creek**

**Eastern Upright Sedge Meadow:** Herbaceous wetland that is dominated by tussock sedge (*Carex stricta*). (CEGL006412) **Red Clay Creek**

**Golden Saxifrage Forested Seep:** Seepage dominated by golden saxifrage (*Chrysosplenium americanum*) or rarely another species. ([CEGL006193](#)) **Brandywine Creek; Red Clay Creek**

**Rice Cutgrass-Fowl Mannagrass Wet Meadow:** Headwater wetland composed of numerous herbaceous species. The location of the wetland separates this from the Central Appalachian Cutgrass Marsh. ([CEGL005106](#)) **Brandywine Creek**

**Skunk Cabbage-Orange Jewelweed Seep:** Wetland that is dominated by skunk cabbage (*Symplocarpus foetidus*) and/or orange jewelweed (*Impatiens capensis*). ([CEGL006567](#)) **Brandywine Creek; Red Clay Creek**

**Wet Meadow:** Floodplain wetland dominated by sensitive fern (*Onoclea sensibilis*) and associated by deer-tongue grass (*Dichanthelium clandestinum*). ([CEGL006485](#)) **Brandywine Creek**

[-Back to Key to Delaware Vegetation Communities-](#)

## Central Appalachian Cutgrass Marsh

GNR

S1

**NVC Alliance:** A.1399-*Carex stricta* Seasonally Flooded Herbaceous Alliance

**NVC Association:** CEGLO06461-*Leersia oryzoides*-*Sagittaria latifolia* Herbaceous Vegetation

**Delaware Type Locality:** Freshwater Marsh in Brandywine State Park (39°48'7.71"N, 075°34'24.46"W).

**Description:** Central Appalachian Cutgrass Marshes occur on the edges of floodplains and are prominent in the northernmost parts of the Brandywine Creek watershed in Delaware. The most prominent example in Delaware is freshwater marsh which is located in Brandywine Creek State Park.

Dominant species include rice-cut grass (*Leersia oryzoides*), sweet flag (*Acorus calamus*), halbeard-leaf tearthumb (*Polygonum sagittatum*), arrow-leaf tearthumb (*Polygonum arifolium*) and large bur-reed (*Sparganium eurycarpum*). The example at Granoque has tussock sedge (*Carex stricta*) and broadleaf arrowhead (*Sagittaria latifolia*) as dominant species. The example at Smith Bridge includes sensitive fern (*Onoclea sensibilis*) and Japanese stiltgrass (*Microstegium vimineum*) as dominant species. Other associates may include false nettle (*Boehmeria cylindrica*), orange jewelweed (*Impatiens capensis*) and reed canarygrass (*Phalaris arundinacea*).



**Smith Bridge Wetland**  
New Castle County

**Diagnostic Features:** This is the only community in Delaware that is dominated by rice cutgrass.

**Geology and Environmental Features:** This community relies on the constant recharge of groundwater from higher elevation sources. Often the bottoms of the wetlands are covered in muck.

**Landscape Position:** Floodplains of the large streams in the Piedmont

**Associated Soil Series:** Codorus Silt Loam

Species documented from this community

Animals

Non-Vascular Plants

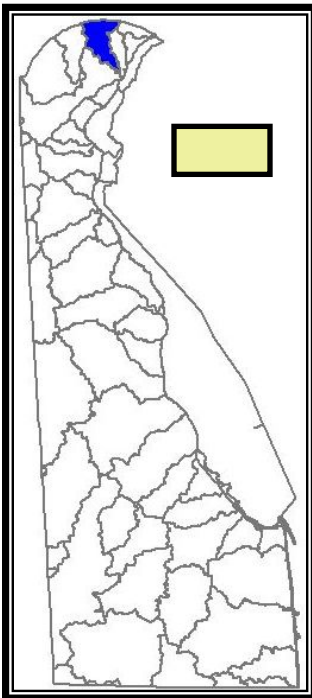
Vascular Plants

Associated Rare Species:

**Animals:** Black Dash (*Euphyes conspicua*), Band-winged Meadowhawk (*Sympetrum semicinctum*), Meadow Fritillary (*Boloria bellona*), Baltimore Checkspot (*Euphydryas phaeton*)

**Non-Vascular Plants:** unknown

**Vascular Plants:** Marsh Bellflower (*Campanula aparinoides*), Hairy-fruit Sedge (*Carex trichocarpa*), Rough Bedstraw (*Galium asprellum*), Canada Lily (*Lilium canadense*), Wild Mint (*Mentha arvensis* var. *canadensis*), Spotted Phlox (*Phlox maculata*), Purple Fringeless Orchid (*Platanthera peramoena*), Hairy Arrowhead (*Sagittaria latifolia* var. *pubescens*), A bulrush (*Scirpus atrovirens*), Red-Stem Bulrush (*Scirpus expansus*), Bulrush (*Scirpus hattorianus*), Nodding Ladies'-tresses (*Spiranthes cernua*), Southern Slender Ladies'-tresses (*Spiranthes lacera* var. *gracilis*), Northern Marsh St. John's Wort (*Triadenum fraseri*)



Distribution: This community is located in the Piedmont of Delaware in the Brandywine Creek watershed and the Coastal Plain in the St. Jones River watershed. Nationally it is found from Pennsylvania south to Virginia and west to West Virginia.

**Estimated Acres in Delaware = 30.4 (February 2012)**

\*This is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** not present

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Piedmont Streamside Seepage Wetland

**Northeast Wildlife Habitat Classification:** Central Appalachian Stream and Riparian

**Landfire Classification Code:** unknown

[-Back to New Castle County Piedmont Herbaceous Wetlands-](#)

## Eastern Upright Sedge Meadow

G4 S1

**NVC Alliance:** A.1397-*Carex stricta* Seasonally Flooded Herbaceous Alliance

**NVC Association:** CEGLO06412-*Carex stricta*-*Carex vesicaria* Herbaceous Vegetation

**Delaware Type Locality:** Seepage north of a bend in Red Clay Creek near Ashland (39°48'9.08"N, 075°39'14.35"W).

**Description:** Eastern Tussock Sedge Meadows are located in seepages dominated by tussock sedge (*Carex stricta*) and are associated by slender spikerush (*Eleocharis tenuis*), skunk cabbage (*Symplocarpus foetidus*), arrow-leaf tearthumb (*Polygonum sagittatum*), and orange-spotted jewelweed (*Impatiens capensis*). Other more minor species present in the wetland include sensitive fern (*Onoclea sensibilis*), duckweed (*Lemna* sp.), American bur-reed (*Sparganium americanum*), spike-rush (*Juncus effusus*), Virginia Mountain-mint (*Pycnanthemum virginianum*), and European sweetflag (*Acorus calamus*).

**Diagnostic Features:** This community is located ground-water seepages just above floodplains of major streams in the Piedmont.

**Geology and Environmental Features:**

**Landscape Position:** Seepages in the Piedmont

**Associated Soil Series:** Codorus Silt Loam

**NWI Classification:**

Species documented from this community

Animals

Non-Vascular Plants

Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:**

**Distribution:** This community is currently only known from the Red Clay Creek watershed. Nationally this community is found on the east coast from Maine south to Maryland.

**Estimated Acres in Delaware = 4.6 (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** Golden-saxifrage Seep (Harrison 2004)

**New Jersey:** not present

**Pennsylvania:** Skunk Cabbage-Golden Saxifrage Seep

**Virginia:** High-Elevation Seep (Fleming et al. 2001)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Streamside Tussock Sedge Meadow

**Northeast Wildlife Habitat Classification:** Laurentian-Acadian Wet Meadow-Shrub Swamp

**Landfire Classification Code:** unknown

[-Back to New Castle County Piedmont Herbaceous Wetlands-](#)

## Golden-saxifrage Forested Seep

G3G5

S1

NVC Alliance: [A.1685-Chrysosplenium americanum Saturated Herbaceous Alliance](#)

NVC Association: [CEGL006193-Chrysosplenium americanum Herbaceous Vegetation](#)

**Delaware Type Locality:** Seepage near the Delaware/Pennsylvania stateline in Stateline Woods of Brandywine Creek State Park ([39°50'3.55"N, 075°36'45.33"W](#)).

**Description:** Golden-saxifrage Seeps have a scattered coverage of golden saxifrage (*Chrysosplenium americanum*) but may be composed of other species as well. These communities are often small and have a canopy of trees or shrubs from the surrounding community, most often a Northern Piedmont Mesic Oak-Beech Forest ([CEGL006921](#)) but larger examples can be open.

Other than the nominal species, other species may include Skunk cabbage (*Symplocarpus foetidus*), spikerush (*Juncus effusus*), rough sedge (*Carex scabrata*), and prairie sedge (*Carex prasina*). Woody plants within the seep may include spicebush (*Lindera benzoin*), tuliptree (*Liriodendron tulipifera*), northern red oak (*Quercus rubra*) and American beech (*Fagus grandifolia*). Occasionally individuals of black ash (*Fraxinus nigra*) may be present.



**Diagnostic Features:** This community is generally a forested seepage that is dominated by golden saxifrage though it can be dominated by other species as well.

**Stateline Woods  
New Castle County**

**Geology and Environmental Features:**

**Landscape Position:** At the headwaters of small streams in the Piedmont.

**Associated Soil Series:** Glenelg and Manor Loams

**NWI Classification:**

**Species documented from this community**

Animals

Non-Vascular Plants

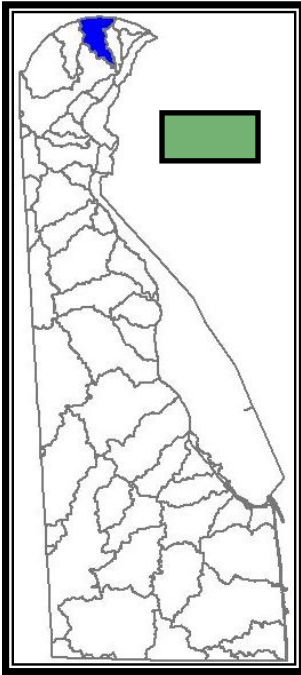
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Rough Sedge (*Carex scabrata*), Smooth White Violet (*Viola blanda*)



Distribution: This community is currently only known from the Brandywine Creek watershed. Nationally this community is found on the east coast from New Hampshire south to Virginia.

**Estimated Acres in Delaware = 1.0 (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** Golden-saxifrage Seep (Harrison 2004)

**New Jersey:** not present

**Pennsylvania:** Skunk Cabbage-Golden Saxifrage Seep

**Virginia:** High-Elevation Seep (Fleming et al. 2001)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Forested Seepage Slope Wetland

**Northeast Wildlife Habitat Classification:** ???

**Landfire Classification Code:** unknown



[-Back to New Castle County Piedmont Herbaceous Wetlands-](#)

**Rice Cutgrass-Fowl Mannagrass Wet Meadow    GNR    S1**

**NVC Alliance:** [A.1399-Leersia oryzoides-Glyceria striata Seasonally Flooded Herbaceous Alliance](#)

**NVC Association:** [CEGL005106-Leersia oryzoides-Glyceria striata-\(Schoenoplectus spp., Impatiens capensis\) Herbaceous Vegetation](#)

**Delaware Type Locality:** Wetland near the intersection of Ramsey Run Road and Thompson Mill Road (39°49'38.74"N, 075°33'18.18"W).

**Description:** These wetlands are located in the headwaters of streams in the Piedmont of Delaware. Most of these wetlands are entirely herbaceous or may have some scattered woody vegetation. Common species include Canada goldenrod ([Solidago canadensis](#) spp. *rugosa*), sensitive fern ([Onoclea sensibilis](#)), orange-spotted jewelweed ([Impatiens capensis](#)), slender spikerush ([Eleocharis tenuis](#)), spikerush ([Juncus effusus](#)), late goldenrod ([Solidago gigantea](#)), halbeard-leaf tearthumb ([Polygonum arifolium](#)), alternate-leaf seedbox ([Ludwigia alternifolia](#)), sallow sedge ([Carex lurida](#)), rice-cut grass (*Leersia oryzoides*), pointed broom sedge ([Carex scoparia](#)), Virginia mountain-mint ([Pycnanthemum virginianum](#)), purple stem American aster ([Symphyotrichum puniceum](#)) and arrow-leaf tearthumb ([Polygonum sagittatum](#)).



**Woodley Park  
New Castle County**

**Diagnostic Features:** The location of these wetlands at the headwaters of streams can often serve to identify them.

Geology and Environmental Features:

**Landscape Position:** Headwaters of streams in the Piedmont.

**Associated Soil Series:** Codorus Silt Loam

**NWI Classification:**

Species documented from this community

Animals

Non-Vascular Plants

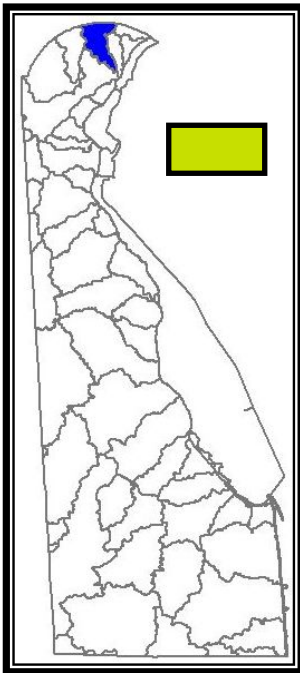
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Marsh Bellflower (*Campanula aparinoides*)



Distribution: This community is located in the headwaters of small tributaries in the Brandywine Creek watershed of Delaware. It is currently only known from the Brandywine Creek watershed but is likely in other Piedmont watersheds. Nationally this community is found in Ontario and New York.

**Estimated Acres in Delaware = 9.0 acres (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** not present

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** not present

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** ???

**Landfire Classification Code:** unknown

[-Back to New Castle County Piedmont Herbaceous Wetlands-](#)

## Skunk Cabbage-Orange Jewelweed Seep

GNR S1

**NVC Alliance:** A.1694-*Symplocarpus foetidus*-*Caltha palustris* Saturated Herbaceous Alliance

**NVC Association:** CEG006567-*Symplocarpus foetidus*-*Impatiens capensis* Herbaceous Vegetation

**Delaware Type Locality:** Tributary to Red Clay Creek near Yorklyn in New Castle County ([39°48'17.64"N, 075°39'48.91"W](#) ).

**Description:** This seepage community is found in low lying areas such as the headwaters of streams and seepages at the base of hillsides.

Typical species in these wetlands include skunk cabbage (*Symplocarpus foetidus*), orange jewelweed (*Impatiens capensis*), Canadian clearweed (*Pilea pumila*), common blue violet (*Viola sororia*), hooked crowfoot (*Ranunculus recurvatus*), log wood fern (*Dryopteris celsa*) and jack-in-the-pulpit (*Arisaema triphyllum*).



**Diagnostic Features:** This is a wooded seepage community that is dominated by skunk cabbage and orange jewelweed.

### Reynolds Heights New Castle County

**Geology and Environmental Features:**

**Landscape Position:** Lower slopes and drainages with seepages

**Associated Soil Series:** Glenelg and Manor Loams

**Species documented from this community**

Animals

Non-Vascular Plants

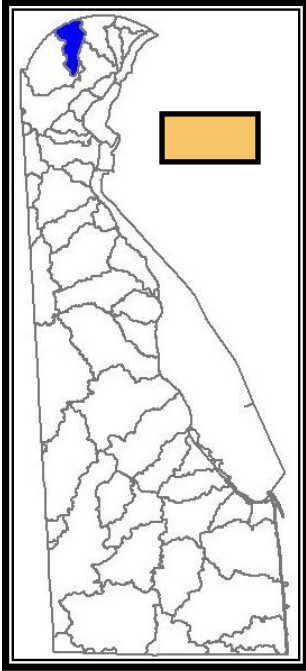
Vascular Plants

**Associated Rare Species:**

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** log wood-fern (*Dryopteris celsa*)



Distribution: This community is known from the Brandywine and Red Clay Creek watersheds, but is also likely in the White Clay Creek watershed. Nationally it is found from Maine south along the east coast to West Virginia.

**Estimated Acres in Delaware = 1.7 acres (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Forested Seepage Slope Wetland

**Northeast Wildlife Habitat Classification:** ???

**Landfire Classification Code:** unknown

[-Back to New Castle County Herbaceous Wetlands-](#)

## Wet Meadow

GNA

S1.1

**NVC Alliance:** No NVC Alliance

**NVC Association:** CEGL006485-*Dichanthelium clandestinum*-*Onclea sensibilis*

Herbaceous Vegetation

**Delaware Type Locality:** Just west of the main entrance to Brandywine Creek State Park in New Castle County (**39°48'8.47"N, 075°35'2.27"W**).

**Description:** This community is almost wholly dominated by sensitive fern (*Onclea sensibilis*) and associated by deer tongue grass (*Dichanthelium clandestinum*) and a few scattered wide-leaved cattail (*Typha latifolia*).



**Diagnostic Features:** Herbaceous community dominated by deer tongue grass and sensitive fern.

**Brandywine Creek State Park  
New Castle County**

**Geology and Environmental Features:**

**Landscape Position:** Lower slopes and open floodplains

**Associated Soil Series:** Johnson Silt Loam

**Species documented from this community**

Animals

Non-Vascular Plants

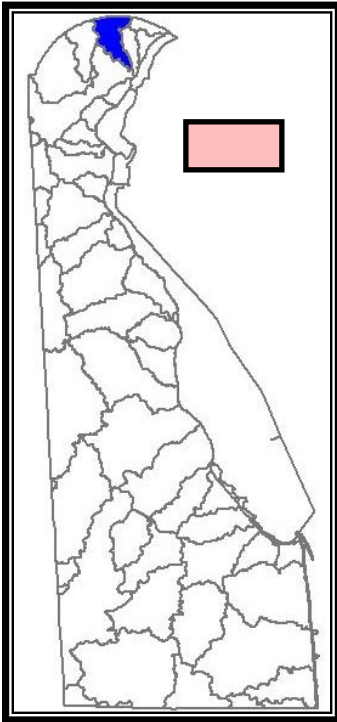
Vascular Plants

**Associated Rare Species:**

**Animals:** Queen Snake (*Regina septemvittata*), Boblink (*Dolichonyx oryzivorus*)

**Non-Vascular Plants:** unknown

**Vascular Plants:** Shrubby St. John's Wort (*Hypericum prolificum*)



Distribution: This community is only known from a small occurrence in Brandywine Creek State Park. Nationally it is known from Maryland and Delaware.

**Estimated Acres in Delaware = 1.4 acres (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** not present

**Virginia:** not present

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** ???

**Landfire Classification Code:** unknown

[-Back to New Castle County Herbaceous Wetlands-](#)



## Interdune Swales

**Atlantic Coast Interdune Swale:** A coastal community that is co-dominated by northern bayberry (*Morella pensylvanica*) and southern bayberry (*Morella cerifera*) and has an understory of salt meadow cordgrass (*Spartina patens*). ([CEGL003839](#)) **Sussex County**

**Barrier Island Bog:** Community that is co-dominated by southern bayberry (*Morella cerifera*) and highbush blueberry ([Vaccinium corymbosum](#)) and located between dunes. ([CEGL003906](#)) **Sussex County**

**Forked Rush Dune Swale:** Interdune swale that is dominated by sedges and rushes with a strong dominance of round head rush (*Juncus scirpoides*) and Olney's three-square (*Schoenoplectus pungens*). ([CEGL004111](#)) **Sussex County**

**Northern Interdunal Cranberry Swale:** Interdune swale dominated by cranberry (*Vaccinium macrocarpon*). ([CEGL006141](#)) **Sussex County**

[-Back to Key to Delaware Vegetation Communities-](#)

**Atlantic Coast Interdune Swale      G3G4      S2      D?**

**NVC Alliance:** [A.1906-Morella cerifera Saturated Shrubland Alliance](#)

**NVC Association:** [CEGL003839-Morella cerifera/Spartina patens Shrubland](#)

**Delaware Type Locality:** Swale south of Broadkill Beach Road in Prime Hook National Wildlife Refuge (38°48'56.71"N, 75°12'44.45"W).

**Description:** This dune swale community occurs on the Atlantic Strand of Delaware. It occurs beyond the reach of storm tides but may be impacted by salt spray. The water table may be less than a half meter below the soil surface. Even though these communities appear as wetlands they are often sandy and dry enough to not be “jurisdictional”. A lot of examples of this community have been eliminated with development.

Dominant woody plants include southern bayberry ([Morella cerifera](#)) intermixed with northern bayberry ([Morella pensylvanica](#)). The herbaceous layer is dominated by salt meadow cordgrass ([Spartina patens](#)) and associated by switchgrass ([Panicum virgatum](#)), broom sedge ([Andropogon virginicus](#)), forked rush ([Juncus dichotomus](#)), seaside goldenrod ([Solidago sempervirens](#)), Virginia creeper ([Parthenocissus quinquefolia](#)) and three-square bulrush ([Schoenoplectus pungens](#)). Smaller wetland openings may have marsh fimbry ([Fimbristylis castanea](#)), common busy broom sedge ([Andropogon glomeratus](#) var. *pumilus*) and mild water pepper ([Polygonum hydropiperoides](#)).

**Diagnostic Features:** A community that is co-dominated by southern bayberry and northern bayberry and has an herbaceous layer of salt meadow cordgrass helps to identify it.

**Geology and Environmental Features:** Sand or loamy sand with a thin layer of organic matter.

**Landscape Position:** Exposed swales on the edges of salt and brackish marshes

**Associated Soil Series:** Acquango-Beaches Complex, 0 to 10 percent slopes

**NWI Classification:** Isolated Terene

Species documented from this community

Animals

Non-Vascular Plants

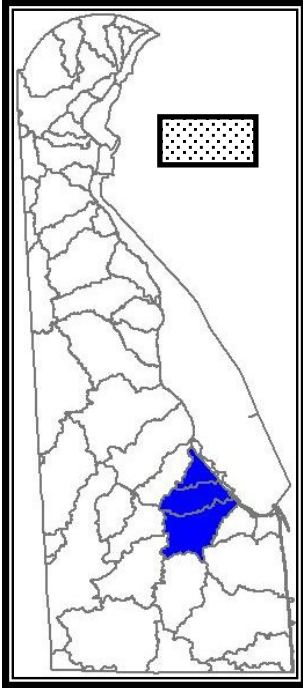
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is found along the coastal areas of the Delaware Bay in Prime Hook National Wildlife Refuge. Nationally this community is found on the east coast from New Jersey south to Florida.

**Estimated Acres in Delaware = 121.8 (February 2012)**

**-Acres with 0.5 m sea level rise = 4.7-3.9 = 0.8**

**-Acres with 1 m sea level rise = 4.7-4.7 = 0**

**-Acres with 1.5 m sea level rise = 4.7-4.7 = 0**

\*This community is projected to be eliminated in its current distribution with 1 meter of sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** *Morella cerifera-Baccharis halimifolia/Spartina patens* Shrubland (Harrison 2004)

**New Jersey:** unknown

**Pennsylvania:** not present

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Wax-myrtle-Groundsel-tree Maritime Shrubland

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Dune and Swale

**Landfire Classification Code:** unknown

[-Back to Sussex County Interdune Swales-](#)

**Barrier Island Bog            G2G4            S1            D?**

**NVC Alliance:** [A.1010-Morella \(cerifera, pennsylvanica\)-Vaccinium formosum Seasonally Flooded Shrubland Alliance](#)

**NVC Association:** [CEGL003906-Morella cerifera-Vaccinium corymbosum Shrubland](#)

**Delaware Type Locality:** Delaware Seashore State Park just south of the 3 R's parking lot in Sussex County ([38°35'28.63"N, 075° 3'39.95"W](#)).

**Description:** Barrier Island Bogs are open shrublands found in depressions between dunes in the barrier islands of Delaware. Shrub species come into the community when a layer of peat and sediment accumulates.

Southern bayberry (*Morella cerifera*) and highbush blueberry (*Vaccinium corymbosum*) dominate the shrub canopy and are associated by swamp rose (*Rosa palustris*) and inkberry (*Ilex glabra*). Characteristic herbs include twisted yellow-eyed grass (*Xyris torta*), royal fern (*Osmunda regalis*) and spoon-leaved sundew (*Drosera intermedia*). Other herbs that may be present are switchgrass (*Panicum virgatum*), common bushy broom sedge (*Andropogon glomeratus*), Canada rush (*Juncus canadensis*) and marsh St. John's wort (*Triadenum virginicum*).



**Delaware Seashore State Park  
Sussex County**

**Diagnostic Features:** The co-dominance of southern bayberry (*Morella cerifera*) and highbush blueberry (*Vaccinium corymbosum*) as well as the location between dunes serves to identify this community from others in Delaware.

**Geology and Environmental Features:** Barrier Island Bogs are found in those dunes that develop a freshwater aquifer. Where this freshwater lens intersects the ground surface is the location of this community. This community is very dynamic due to the fluctuations in water level from precipitation and evapo-transpiration. It often has a thin layer of peat.

**Landscape Position:** Depressions between dunes on the Atlantic Strand

**Associated Soil Series:** Acquango-Beaches Complex, 0 to 10 percent slopes

**NWI Classification:**

Species documented from this community

Animals

Non-Vascular Plants

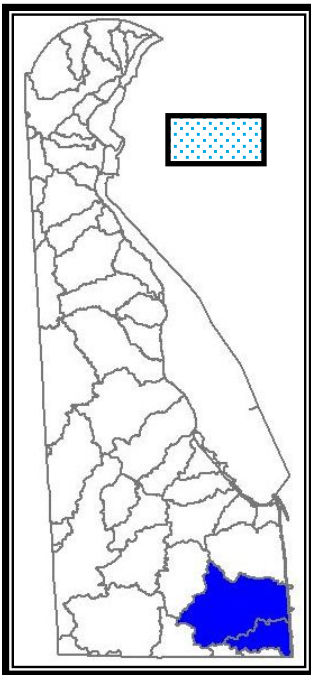
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is restricted to the Atlantic Coastal Strand in Delaware. Nationally it occurs from New Jersey south to Virginia.

**Estimated Acres in Delaware = 16.0 (February 2012)**

**-Acres with 0.5 m sea level rise = 13.9-0 = 13.9**

**-Acres with 1 m sea level rise = 13.9-0.0 = 13.9**

**-Acres with 1.5 m sea level rise = 13.9-13.3 = 0.6**

Equivalent or related communities in nearby states:

**Maryland:** Barrier Island Bog (Harrison 2004)

**New Jersey:** *Morella (cerifera, pensylvanica) - Vaccinium formosum* Shrubland (Breden et al 2001)

**Pennsylvania:** not present

**Virginia:** Maritime Shrub Swamp (Fleming et al. 2001)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Twig-Rush Interdunal Swale

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Dune and Swale

**Landfire Classification Code:** unknown

[-Back to Sussex County Interdunal Swales-](#)

## Forked Rush Dune Swale

G2

S2

D?

NVC Alliance: [A.1427-Juncus dichotomus Seasonally Flooded Herbaceous Alliance](#)

NVC Association: [CEGL004111-Juncus \(dichotomus, scirpoides\)-Drosera intermedia Herbaceous Vegetation](#)

**Delaware Type Locality:** Swale in the Ocean Breezes development north of Bethany Beach, De ([38°33'40.83"N, 75° 3'34.70"W](#)).

**Description:** This dune swale community, like the other interdunal swales, occurs in seasonally flooded depressions between dunes. This community may occur in mosaic with the Barrier Island Bog ([CEGL003906](#)).

Olney's three square bulrush ([Schoenoplectus pungens](#)) is often joined by round head rush ([Juncus scirpoides](#)) as a co-dominant. Other associates include species such as Canada rush ([Juncus canadensis](#)), forked rush ([J. dichotomus](#)), marsh St. John's wort ([Triadenum virginicum](#)), beach panic grass ([Panicum amarum](#)), warty panicgrass (*P. verrucosum*), redtop panicgrass ([P. rigidulum](#)), Eaton's witchgrass ([Dichanthelium spretum](#)), spoon-leaved sundew ([Drosera intermedia](#)), southern bladderwort ([Utricularia juncea](#)), cranberry ([Vaccinium macrocarpon](#)), salt meadow cordgrass ([Spartina patens](#)) and peat moss ([Sphagnum](#) spp.)

**Diagnostic Features:** Unlike the other interdunal swales, this one is strongly dominated by sedges and rushes and serves to identify it. Olney's three square bulrush is often dominant with round head rush co-dominating.

**Geology and Environmental Features:** A shallow organic layer overlies the sand in this community.

**Landscape Position:** Depressions between dunes on the Atlantic Coastal Strand.

**Associated Soil Series:** Acquango-Beaches Complex, 0 to 10 percent slopes

**NWI Classification:** Isolated Terrene

### Species documented from this community

Animals

Non-Vascular Plants

Vascular Plants

### Associated Rare Species:

**Animals:** unknown

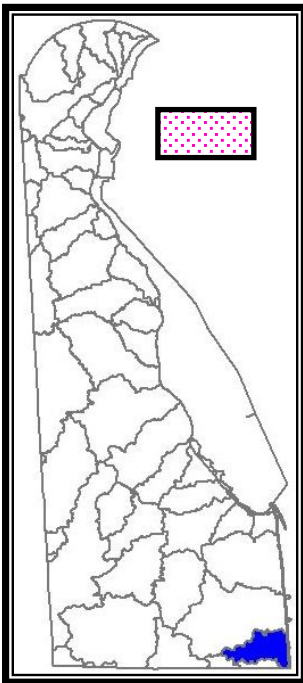
**Non-Vascular Plants:** unknown

**Vascular Plants:** Twining Bartonia (*Bartonia paniculata*), Cross-leaved Milkwort (*Polygala cruciata*), Few-flowered Beak-rush (*Rhynchospora rariflora*), zigzag bladderwort (*Utricularia subulata*), reticulated nutrush (*Scleria reticularis*), large cranberry (*Vaccinium macrocarpon*), Wright's witchgrass (*Dichanthelium wrightianum*), Lance-leaf Orange Milkweed (*Asclepias lanceolata*), Hairy Ludwigia (*Ludwigia hirtella*), Dwarf Umbrella Sedge (*Fuirena pumila*), Tiny-flowered Flat-top Goldenrod (*Euthamia caroliniana*)

### **Ecological Integrity Assessment (EIA)**

A = 0, B = 6, C = 2, D = 0

**Average EIA = 3.81      X=8**



**Distribution:** This interdunal community is known from the Little Assawoman Bay watershed and is likely throughout the entire Atlantic Strand. Nationally this community is found from New Jersey south to Virginia.

**Estimated Acres in Delaware = 14.4 (February 2012)**

### **Equivalent or related communities in nearby states:**

**Maryland:** Forked Rush Dune Swale (Harrison 2004)

**New Jersey:** *Juncus dichotomus* - *Drosera intermedia* Herbaceous Vegetation (Breden et al 2001)

**Pennsylvania:** not present

**Virginia:** Interdune Swale (Mixed Rush Type) (Fleming, G.P., et al 2006)



Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Round-head Rush-Common Threesquare Interdunal Swale

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Dune and Swale

**Landfire Classification Code:** unknown

[-Back to Sussex County Interdunal Swales-](#)

## Northern Interdunal Cranberry Swale

G2G3

S2

D?

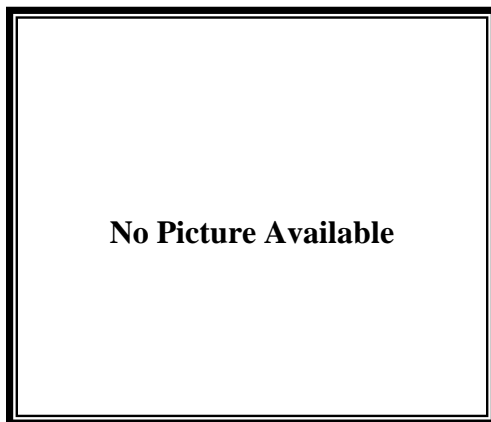
NVC Alliance: [A.1094-Vaccinium macrocarpon Saturated Dwarf Shrubland Alliance](#)

NVC Association: [CEGL006141-Cladium mariscoides/Vaccinium macrocarpon-Morella pensylvanica Dwarf-shrubland](#)

**Delaware Type Locality:** Swale northeast of Gordon's Pond at Cape Henlopen State Park ([38°45'29.40"N, 075° 5'4.75"W](#)).

**Description:** This dune swale community is located behind backdunes on swales that are seasonally flooded. Flooding occurs early in the spring and often the community is dry in the late summer. The species composition can vary due to hydrology, soils or disturbance. Cranberry swales are restricted and exceedingly rare since they require large areas in which they extirpate and then reform. The nominal species is also restricted in range from Massachusetts to Maryland. Most of the occurrences left of this community are threatened by development and recreation on the beach. This is one of Delaware's most rare habitats.

Cranberry ([Vaccinium macrocarpon](#)) is the typical dominant species with northern bayberry ([Morella pensylvanica](#)) and highbush blueberry ([Vaccinium corymbosum](#)) occurring on the edges of the wetland. Associated herbs include [Drosera intermedia](#), appressed bog clubmoss ([Lycopodiella appressa](#)), southern bladderwort ([Utricularia juncea](#)), pink-based yellow-eyed grass ([Xyris difformis](#)) and twisted yellow-eyed grass ([Xyris torta](#)). Other less frequent species include twig-rush ([Cladium mariscoides](#)), three-square bulrush ([Schoenoplectus pungens](#)), Canada rush ([Juncus canadensis](#)), forked rush ([J. dichotomus](#)), slender flat-top goldenrod ([Euthamia tenuifolia](#)), cross-leaf milkwort ([Polygala cruciata](#)), rose pogonia ([Pogonia ophioglossoides](#)), white-fringe orchis ([Platanthera blephariglottis](#)), redtop panicgrass ([Panicum rigidulum](#)), warty panicgrass ([P. verrucosum](#)), brownish beakrush ([Rhynchospora capitellata](#)), long-beaked bulrush ([R. scirpoides](#)) and broom-sedge ([Andropogon virginicus](#)).



**Diagnostic Features:** The presence of cranberry in swales behind backdunes identifies this community.

**Geology and Environmental Features:** A shallow layer of peat overlies deep sand deposits.

**Landscape Position:** dune depressions

**Associated Soil Series:** Salt Pond Mucky Sand, very frequently flooded, tidal

**NWI Classification:**

Species documented from this community

Animals

Non-Vascular Plants

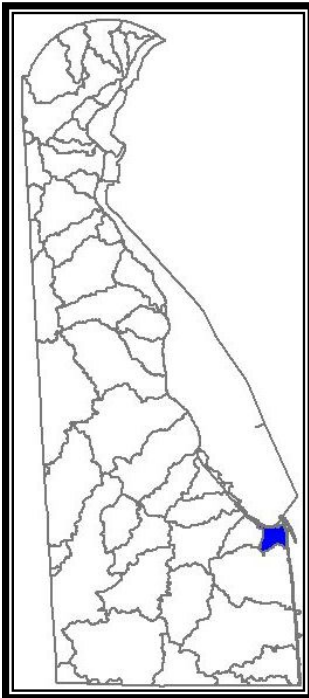
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: Cape Henlopen State Park is the only known location for this community in Delaware. Nationally it is found from Massachusetts south to Maryland.



**Estimated Acres in Delaware = 7.9 (February 2012)**

Equivalent or related communities in nearby states:

**Maryland:** not present

**New Jersey:** *Vaccinium macrocarpon* - *Morella pensylvanica* Dwarf-shrubland (Breden et al 2001)

**Pennsylvania:** not present

**Virginia:** not present

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Cranberry Interdunal Swale

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Dune and Swale

**Landfire Classification Code:** unknown

[-Back to Sussex County Interdunal Swales-](#)

## New Castle County Aquatic Communities

**Central Atlantic Freshwater Subtidal River Bed:** Stream or river bottom that is dominated by sago pondweed (*Stuckenia pectinata*). ([CEGL006027](#)) **Christina River; White Clay Creek**

**Duckweed Vegetation:** Floating community that is dominated by lesser duckweed (*Lemna minor*). ([CEGL003305](#)) **Leipsic River**

**Northern Atlantic Coast Beaked Ditch-grass Bed:** Aquatic community that is dominated by ditch-grass (*Ruppia maritima*). ([CEGL006167](#)) **No known locations in Delaware.**

**Open Water Marsh with Mixed Submergents-Emergents:** Submerged aquatic community that is dominated by Tape-grass (*Vallisneria americana*). ([CEGL006196](#)) **Brandywine Creek**

**Rocky Bar and Shore (Riverweed Type):** Aquatic community that is dominated by or contains only riverweed (*Podostemum ceratophyllum*). ([CEGL004331](#)) **Brandywine Creek; White Clay Creek**

**Water-lily Aquatic Wetland:** A rooted aquatic community that is non-tidal and is co-dominated by spatterdock and waterlily is a hallmark of this community. The related Pond-lily Tidal Marsh ([CEGL004472](#)) is found only in tidal situations. ([CEGL002386](#)) **Smyrna River**

[-Back to Key to Delaware Vegetation Communities-](#)

## Kent Aquatic Communities

**Duckweed Vegetation:** Floating aquatic community that is dominated by lesser duckweed (*Lemna minor*). ([CEGL003305](#)) **Leipsic River**

**Northern Atlantic Coast Beaked Ditch-grass Bed:** Aquatic community that is dominated by ditch-grass (*Ruppia maritima*). ([CEGL006167](#)) **No known locations in Delaware.**

[-Back to Key to Delaware Vegetation Communities-](#)

## Sussex County Aquatic Communities

**Estuary Pipewort Freshwater Intertidal Flat:** Aquatic community that is dominated by Estuary pipewort (*Eriocaulon parkeri*). ([CEGL006352](#)) **Deep Creek**

**Estuary Quillwort Tidal Flat:** Aquatic community that is dominated by estuary quillwort (*Isoetes riparia*) and located within the intertidal zone. ([CEGL006058](#)) **Nanticoke River**

**Duckweed Vegetation:** Floating aquatic community that is dominated by lesser duckweed (*Lemna minor*). ([CEGL003305](#)) **Indian River**

**North Atlantic Coastal Plain River Brackish Intertidal Mudflat:** Aquatic community that is located on a sparsely vegetated mudflat with low-growing rosette-forming herbs. ([CEGL004473](#))

**Northern Atlantic Coast Beaked Ditch-grass Bed:** Aquatic community that is dominated by ditch-grass (*Ruppia maritima*). ([CEGL006167](#)) **No known locations in Delaware.**

[-Back to Key to Delaware Vegetation Communities-](#)

## Central Atlantic Freshwater Subtidal River Bed

**G3G5 S1 D?**

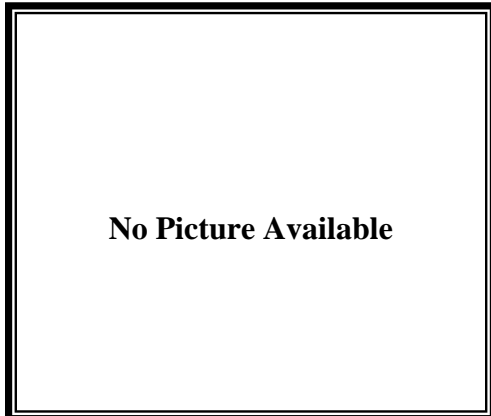
**NVC Alliance:** [A.1768-Stuckenia pectinata-Zannichella palustris Permanently Flooded Tidal Herbaceous Alliance](#)

**NVC Association:** [CEGL006027-Stuckenia pectinata-Potamogeton perfoliatus-Zannichella palustris](#) Tidal Herbaceous Vegetation

**Delaware Type Locality:** TBD

**Description:** This aquatic community consists of sparse to moderately dense vegetated communities on mud or sandy substrates within the intertidal zone of fresh to brackish water. During extreme low tides the sediments of this community may be exposed. Invasive aquatic species such as Eurasian water-milfoil ([Myriophyllum spicatum](#)) and water chestnut ([Trapa natans](#)) are known to inhabit this community.

Common associates may include sago pondweed (*Stuckenia pectinata*), horned pondweed (*Zannichellia palustris*), tapegrass ([Vallisneria americana](#)), Nuttall's waterweed ([Elodea nuttallii](#)) and common hornwort ([Ceratophyllum demersum](#)). Spongy arrowhead ([Sagittaria calycina](#)) is an associate in the intertidal zones of the Christina River.



**Diagnostic Features:** This community is dominated by sago pondweed and horned pondweed and serves to separate it from the *Ruppia maritima* Acadian/Virginian Zone Temperate Vegetation ([CEGL006167](#)) in which ditch-grass (*Ruppia maritima*) is dominant.

**Geology and Environmental Features:**

**Landscape Position:** Intertidal areas of streams and rivers

**Associated Soil Series:** water

**NWI Classification:**

Species documented from this community

Animals

Non-Vascular Plants



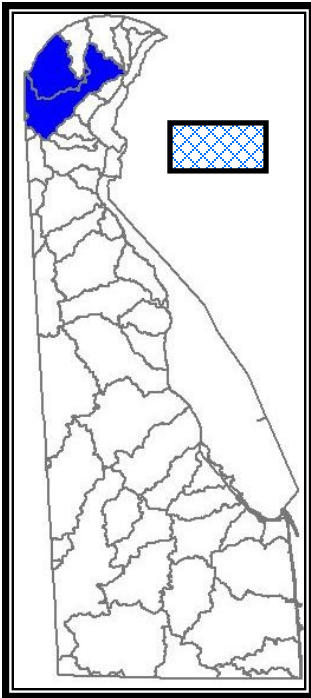
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: In Delaware this community is known from White Clay Creek and the Christina River. Nationally it is known on the east coast from Massachusetts south to Virginia.

**Estimated Acres in Delaware = ? (February 2012)**

Equivalent or related communities in nearby states:

**Maryland:** Central Atlantic Freshwater Subtidal River Bed (Harrison 2004)

**New Jersey:** *Stuckenia pectinata* - *Zannichellia palustris* - (*Ruppia maritima*)  
Permanently Flooded - Tidal Herbaceous Vegetation (Breden et al 2001)

**Pennsylvania:** not present

**Virginia:** Tidal Freshwater and Oligohaline Aquatic Bed (Fleming et al. 2001)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Horned Pondweed Submerged Vegetation

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Subtidal Aquatic Bed

**Landfire Classification Code:** unknown

**[-Back to New Castle County Aquatic Communities-](#)**

## Estuary Pipewort Freshwater Intertidal Flat

G2

S1

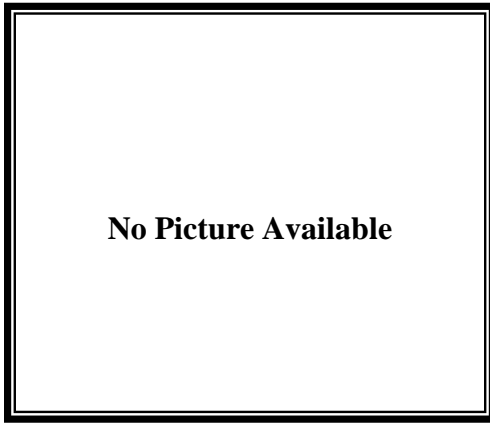
NVC Alliance: A.[1701-Eriocaulon parkeri Tidal Herbaceous Alliance](#)

NVC Association: [CEGL006352-Eriocaulon parkeri-Polygonum punctatum Herbaceous Vegetation](#)

**Delaware Type Locality:** North bank of Deep Creek east of Seaford, De ([38°38'47.12"N, 075°35'2.97"W](#)).

**Description:** This aquatic community is restricted to low marshes where there is a high amount of flood disturbance. The low vegetation is less than 35 cm in height. It is sometimes in association with the Estuary Quillwort Tidal Flat ([CEGL006058](#)). Occurrences are usually small and have a restricted habitat within the intertidal zone. These communities can have up to 95% herbaceous cover.

Estuary pipewort ([Eriocaulon parkeri](#)) is dominant species with lesser amounts of dotted smartweed ([Polygonum punctatum](#)), shore quillwort ([Isoetes riparia](#)), wild rice ([Zizania aquatica](#)), rice-cut grass ([Leersia oryzoides](#)), yellow seed false pimpernel ([Lindernia dubia](#)) and marsh primrose willow ([Ludwigia palustris](#)).



**Diagnostic Features:** The dominance of estuary pipewort serves to identify this community.

**Geology and Environmental Features:** Sandy, gravel or cobble shores of tidal rivers with about 5% gravel. Estuary pipewort communities are exposed during low tides and this allows flushing of fine grained materials.

**Landscape Position:** Mudflats that are inundated by diurnal tides

**Associated Soil Series:** Askecksy Loamy Sand, 0 to 2 percent slopes

**NWI Classification:** Estuarine

Species documented from this community

Animals

Non-Vascular Plants

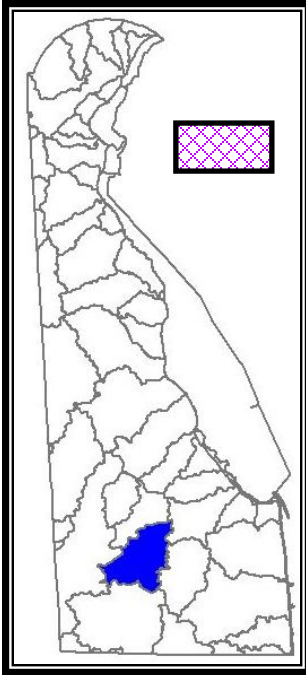
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Parker's pipewort (*Eriocaulon parkeri*)



Distribution: This community is known from Deep Creek in the greater Nanticoke River watershed. Nationally this community is found on the east coast from New Brunswick south to South Carolina.

**Estimated Acres in Delaware = 0.4 (February 2012)**

Equivalent or related communities in nearby states:

**Maryland:** Estuary Pipewort Freshwater Intertidal Flat (Harrison 2004)

**New Jersey:** Estuary Pipewort Freshwater Intertidal Flat (Breden et al. 2001)

**Pennsylvania:** not present

**Virginia:** Tidal Freshwater Marsh (Fleming et al. 2001)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh

**Landfire Classification Code:** unknown

[-Back to Sussex County Aquatic Communities-](#)

## Estuary Quillwort Tidal Flat

GNR

S1

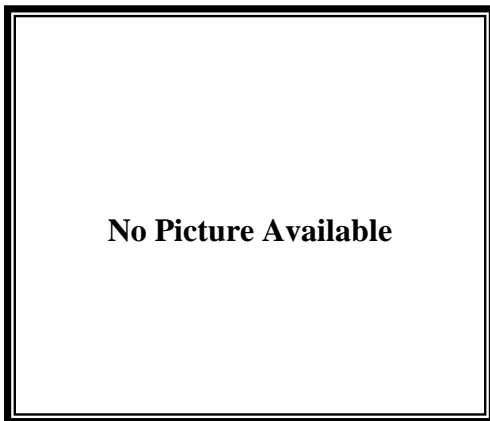
NVC Alliance: [A.1879-Isoetes riparia Tidal Herbaceous Alliance](#)

NVC Association: [CEGL006058-Isoetes riparia Tidal Herbaceous Vegetation](#)

**Delaware Type Locality:** South bank of the Nanticoke River east of Seaford, De ([38°38'55.53"N, 75°34'44.11"W](#)).

**Description:** This aquatic community occurs on intertidal mudflats between mean low tide and mean high tide. Most of the time vegetation is sparse in these zones.

Estuary quillwort ([Isoetes riparia](#)) may be associated by American waterwort ([Elatine americana](#)), Parker's pipewort ([Eriocaulon parkerii](#)), grassleaf arrowhead ([Sagittaria graminea](#)) and strap-leaf arrowhead ([S. subulata](#)) in this community.



**Diagnostic Features:** Estuary quillwort is the diagnostic species for this community. This species along with the location serve to identify the community.

**Geology and Environmental Features:** Muddy, sandy or gravelly banks that are flooded on a diurnal or irregular basis.

**Landscape Position:** Edges of tidal rivers

**Associated Soil Series:** Water

**NWI Classification:** Estuarine

### Species documented from this community

Animals

Non-Vascular Plants

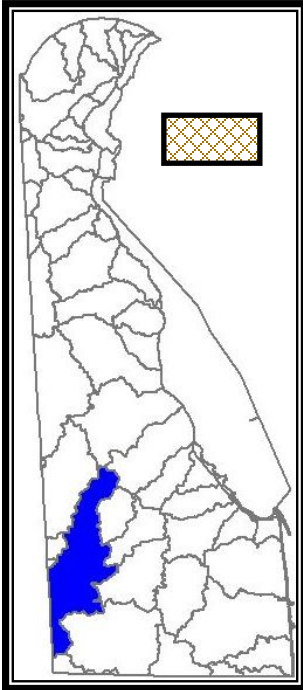
Vascular Plants

### Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** River Bank Quillwort (*Isoetes riparia*)



Distribution: In Delaware this community is found in the Nanticoke and possibly the Choptank watershed. Nationally it is found on the east coast from Massachusetts south to North Carolina.

**Estimated Acres in Delaware = ? (February 2012)**

Equivalent or related communities in nearby states:

**Maryland:** Estuary Quillwort Tidal Flat (Harrison 2004)

**New Jersey:** *Isoetes riparia* Tidal Sparse Vegetation (Breden et al 2001)

South Jersey Freshwater Tidal Marsh (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** *Isoetes riparia* Tidal Herbaceous Vegetation (Fleming, et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Freshwater Intertidal Quillwort Flat

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh

**Landfire Classification Code:** unknown

[-Back to Sussex County Aquatic Communities-](#)

## Duckweed Vegetation

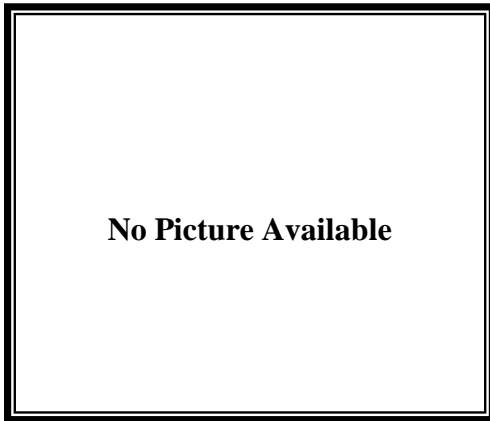
G5 S? D?

**NVC Alliance:** A.1747-*Lemna* spp. Permanently Flooded Herbaceous Vegetation

**NVC Association:** CEGL003305-*Lemna minor* Herbaceous Vegetation

**Delaware Type Locality:** Isolated pond in woods at Bombay Hook National Wildlife Refuge ([39°16'31.86"N, 075°29'22.04"W](#)).

**Description:** This floating aquatic community is found in pools, ponds, lakes, slow moving streams and depressions that collect water in the late winter and spring including Delmarva Bays. Other than the nominal species, other species that may be present include eastern mosquito fern (*Azolla caroliniana*), watermeal (*Wolffia* spp.) and common water flaxseed (*Spirodela polyrrhiza*).



**Diagnostic Features:** This is the only community in Delaware in which lesser duckweed (*Lemna minor*) is dominant.

Geology and Environmental Features:

**Landscape Position:** pools and ponds and slow moving streams

**Associated Soil Series:** water

Species documented from this community

Animals

Non-Vascular Plants

Vascular Plants

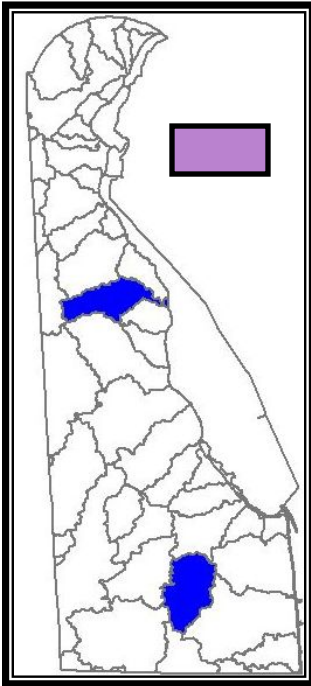
Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown



**Vascular Plants:** unknown



Distribution: This community is known from Bombay Hook National Wildlife Refuge in the Leipsic River watershed. Nationally it is known from on the east coast from Maine to Virginia and is also located in Washington and Oregon in the Pacific Northwest.

**Estimated Acres in Delaware = 0.2 (February 2012)**

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** ???

**Landfire Classification Code:** unknown

[-Back to Kent County Aquatic Communities-](#)  
[-Back to New Castle County Aquatic Communities-](#)  
[-Back to Sussex County Aquatic Communities-](#)

## North Atlantic Coastal Plain River Brackish Intertidal Mudflat S

G2G4

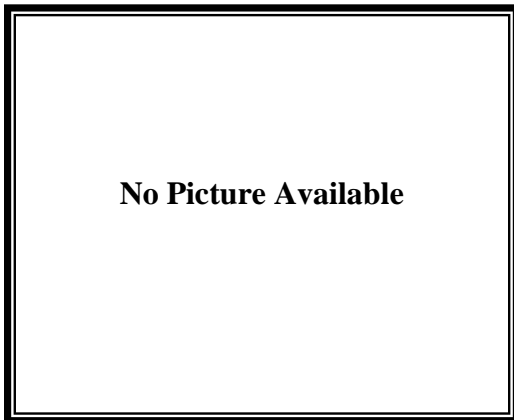
**NVC Alliance:** [A.1710-Sagittaria subulata-Limosella australis Tidal Herbaceous Alliance](#)

**NVC Association:** [CEGL004473-Sagittaria subulata-Limosella australis Tidal Herbaceous Vegetation](#)

**Delaware Type Locality:** This community is known to be in Delaware, but the specific location is currently unknown.

**Description:** This brackish tidal flat community occurs on broad, flat tidal rivershores that are exposed at low tide and submerged at high tide. Vegetation can be sparse and variable.

Typical species include awl-leaf arrowhead ([Sagittaria subulata](#)), hooded arrowhead ([Sagittaria calycina](#) var. *spongiosa*), welsh mudwort ([Limosella australis](#)), eastern grasswort ([Lilaeopsis chinensis](#)), needle sprangletop ([Festuca filiformis](#)), halbeard-leaf tearthumb ([Polygonum arifolium](#)), water smartweed ([Polygonum hydropiperoides](#)), herbwilliam ([Ptilimnium capillaceum](#)), little-head spikerush ([Eleocharis parvula](#)).



**Diagnostic Features:** A brackish mud flat that is sparsely vegetated with low-growing rosette-forming herbs.

**Geology and Environmental Features:** Substrate is usually silty mud with high organic matter content, but can have a greater sand content in places of more wave energy.

**Landscape Position:** Mudflats exposed during low tide

**Associated Soil Series:** No locations in Delaware

**NWI Classification:**

### Species documented from this community

Animals

Non-Vascular Plants

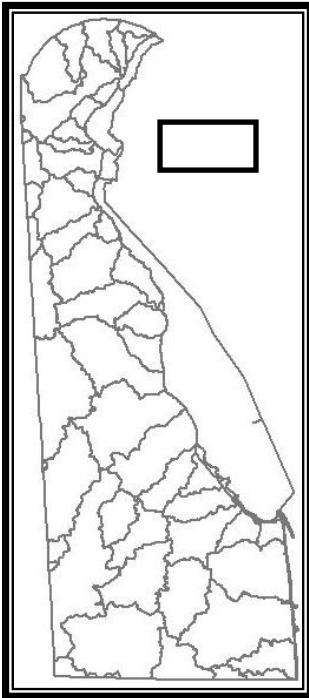
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: There are no confirmed locations for this community in Delaware. Nationally this community is found throughout the Northeastern United States and into Canada.

**Estimated Acres in Delaware = 0+ (February 2012)**

Equivalent or related communities in nearby states:

**Maryland:** North Atlantic Coast Intertidal Mudflat (Harrison 2004)

**New Jersey:** North Atlantic Coast Intertidal Mudflat (Breden et al. 2001)

**Pennsylvania:** not present

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Brackish Tidal Marsh

**Landfire Classification Code:** unknown

[-Back to Sussex County Aquatic Communities-](#)

**Northern Atlantic Coast Beaked Ditch-grass Bed GNR S**

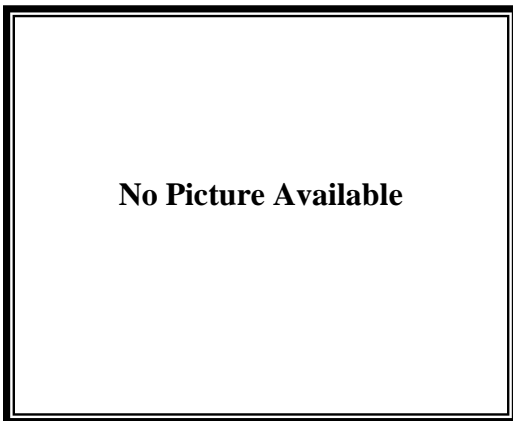
**NVC Alliance:** [A.1769-Ruppia maritima Permanently Flooded Tidal Temperate Herbaceous Alliance](#)

**NVC Association:** [CEGL006167-Ruppia maritima Acadian/Virginian Zone Temperate Herbaceous Vegetation](#)

**Delaware Type Locality:** No confirmed locations in Delaware

Description: This aquatic community is often found in sheltered tidal creeks and in pools or ponds on the surface of the salt marsh. Various species of macro-algae may be present. Ditch-grass (*Ruppia maritima*) usually becomes less prominent as salinity decreases and grades into eelgrass beds as salinity increases. Ditch-grass is the only marine seagrass that can grow in freshwater and therefore has a wide distribution. Ditch-grass often behaves as an annual and the distribution of this plant within the community is changeable.

Besides ditch-grass, other associates may include pondweed (*Potamogeton* spp.) and tapegrass (*Vallisneria americana*).



Diagnostic Features: Ditch-grass is the dominant species in this community and serves to distinguish it from other communities in Delaware.

Geology and Environmental Features: This community is located in slightly to highly brackish habitats on muddy or sandy substrates.

**Landscape Position:** pools and ponds

**Associated Soil Series:** No current locations in Delaware

**NWI Classification:**

Species documented from this community

Animals

Non-Vascular Plants

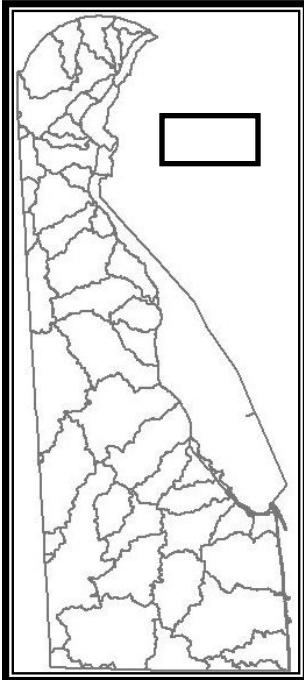
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: These communities are thought to be distributed throughout the Delaware Bay from southeastern New Castle County to Lewes and in tidal creeks of the Inland Bays. No specific locations are known. Nationally this community is found on the east coast from Maine south to North Carolina.

**Estimated Acres in Delaware = 0+ (February 2012)**

Equivalent or related communities in nearby states:

**Maryland:** Northern Atlantic Coast Beaked Ditch-grass Bed (Harrison 2004)

**New Jersey:** *Ruppia maritima* Acadian/Virginian Zone Temperate Herbaceous Vegetation (Breden et al 2001)

**Pennsylvania:** not present

**Virginia:** North Atlantic Beaked Ditch-Grass Bed (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Submerged Widgeon Grass Community

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Seagrass Bed

**Landfire Classification Code:** unknown

[-Back to Kent County Aquatic Communities-](#)  
[-Back to New Castle County Aquatic Communities-](#)  
[-Back to Sussex County Aquatic Communities-](#)

**Open Water Marsh with Mixed Submergents/Emergents G5 S1**

**NVC Alliance:** [A.1757-Vallisneria americana Permanently Flooded Temperate Herbaceous Alliance](#)

**NVC Association:** [CEGL006196-Vallisneria americana-Potamogeton perfoliatus Herbaceous Vegetation](#)

**Delaware Type Locality:** Brandywine Creek upstream of Rockland Bridge in New Castle County (39°47'59.76"N, 075°34'26.16"W).

**Description:** This aquatic community is dominated by submergent or emergent plants and only a few floating leaved plants. This community is generally found at or above the tidal limit on rivers in places where it is not highly disturbed by wave action.

Tape-grass ([Vallisneria americana](#)), clasping-leaf pondweed ([Potamogeton perfoliatus](#)), Nuttall's pondweed ([Potamogeton epihydrus](#)), longleaf pondweed ([Potamogeton nodosus](#)), grass-leaf mud plantain ([Heteranthera dubia](#)), kidneyleaf mud-plantain ([Heteranthera reniformis](#)), water-milfoil ([Myriophyllum](#) spp.), broad-leaved waterweed ([Elodea canadensis](#)), bladderwort ([Utricularia](#) spp.) and seven-angled pipewort ([Eriocaulon aquaticum](#)) are characteristic species for this community.



**Diagnostic Features:** Submerged community that is dominated by tape-grass.

**Brandywine Creek State Park  
New Castle County**

**Geology and Environmental Features:** The plants in this community are often attached to rocky or woody substrate in and at the bottom of the streams.

**Landscape Position:** This community is found in slow moving streams and pooled water.

**Associated Soil Series:** Water, submerged substrate of streams

**NWI Classification:**



Species documented from this community

Animals

Non-Vascular Plants

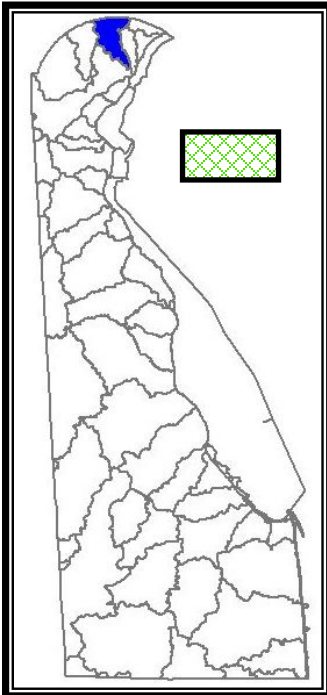
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Nuttall's Waterweed (*Elodea nuttallii*), Leafy Pondweed (*Potamogeton foliosus*), Tape-grass (*Vallisneria americana*)



Distribution: This community is known on Brandywine Creek but may be found in other Piedmont streams. This community could theoretically be found in the Coastal Plain of Delaware. Nationally it is found on the east coast from Maine south to Maryland.

**Estimated Acres in Delaware = ~ 1 (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** Open Water Marsh with Mixed Submergents/Emergents (Harrison 2004)

**New Jersey:** *Vallisneria americana* - *Potamogeton perfoliatus* Herbaceous Vegetation (Breden et al 2001)

**Pennsylvania:** unknown

**Virginia:** not present

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Submerged Tapegrass Community

**Northeast Wildlife Habitat Classification:** Laurentian-Acadian Freshwater Marsh

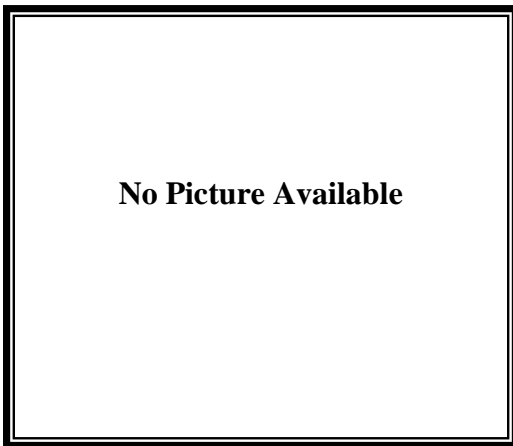
**Landfire Classification Code:** unknown

[-Back to New Castle County Aquatic Communities-](#)

**Rocky Bar and Shore (Riverweed Type)      G3G5      S1      D**  
**NVC Alliance:** [A.1752-Podostemum ceratophyllum Permanently Flooded Herbaceous Alliance](#)  
**NVC Association:** [CEGL004331-Podostemum ceratophyllum Herbaceous Vegetation](#)

**Delaware Type Locality:** Just downstream of the Rockland Road bridge across Brandywine Creek in New Castle County ([39°47'48.36"N, 075°34'30.54"W](#)).

**Description:** Rocky bars and shores are found in rocky streambeds and riverbeds in mature drainage systems or in dams in moderately fast to fast-flowing water. Riverweed (*Podostemum ceratophyllum*) which is the only plant growing here is attached to rocks in outcrops and stream rubble. This is a generally a monospecific community with no other vascular plants present. Riverweed can be affected by increased nutrient inputs allowing algae to outcompete it.



**Diagnostic Features:** An aquatic community dominated by or containing only riverweed identifies this community.

**Geology and Environmental Features:** This community tends to be associated with higher pH streams.

**Landscape Position:** Submerged in rocky streams

**Associated Soil Series:** Water, submerged substrate in streams

**NWI Classification:**

Species documented from this community

Animals

Non-Vascular Plants

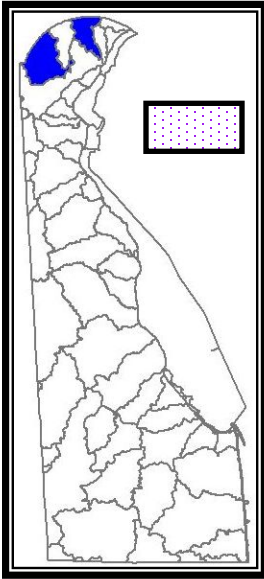
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: A dam on White Clay Creek and one location on Brandywine Creek are the only known locations for this community in Delaware. Historically it has been known on Red Clay Creek as well. Nationally it is found on the East and Gulf Coasts from Maine south to Louisiana and in the Mid-west in Oklahoma and Arkansas.

**Estimated Acres in Delaware = 0.4 acres (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** Rocky Bar and Shore (Riverweed Type) (Harrison 2004)

**New Jersey:** *Podostemum ceratophyllum* Herbaceous Vegetation (Breden et al 2001)

**Pennsylvania:**

**Virginia:** Riverine Aquatic Bed (Horn-leaf Riverweed Type) (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Riverweed Rocky Bar and Shore

**Northeast Wildlife Habitat Classification:** Central Appalachian Stream and Riparian

**Landfire Classification Code:** unknown

[-Back to New Castle County Aquatic Communities-](#)

## Water-lily Aquatic Wetland

G4G5

S3?

D?

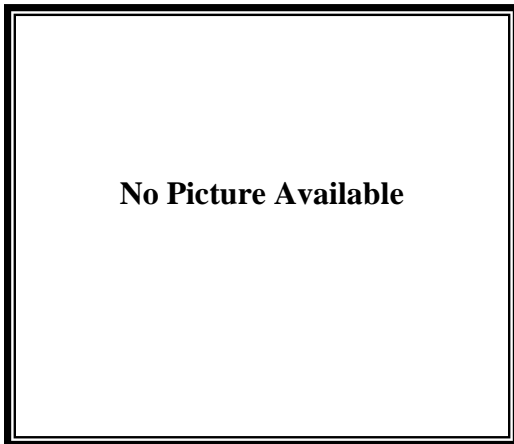
**NVC Alliance:** [A.1984-Nymphaea odorata-Nuphar spp. Permanently Flooded Temperate Herbaceous Alliance](#)

**NVC Association:** [CEGL002386- Nuphar lutea ssp. advena - Nymphaea odorata Herbaceous Vegetation](#)

### Delaware Type Locality:

Description: This aquatic community is found in backwater sloughs of river floodplains, slow-moving streams, ponds and small lakes. The vegetation rooted on the bottom or in an open marsh. Floating leaved aquatic plants as well submergent and emergent plants are present. Water-lily communities can occur in both natural and artificial habitats such as impoundments and borrow pits.

Spatterdock (*Nuphar lutea* spp. *advena*) and waterlily (*Nymphaea odorata*) often dominated the community with associates of watershield (*Brasenia schreberi*), pondweed (*Potamogeton* spp.), Robbin's spikerush (*Eleocharis robbinsii*) and other spikerush (*Eleocharis* spp.) and water smartweed (*Polygonum amphibian* var. *emersum*).



Diagnostic Features: A rooted aquatic community that is non-tidal and is co-dominated by spatterdock and waterlily is a hallmark of this community. The related Pond-lily Tidal Marsh ([CEGL004472](#)) is found only in tidal situations.

Geology and Environmental Features: The plants in this community are rooted in the bottoms of ponds.

**Landscape Position:** Places where there is ponded or slow moving water

**Associated Soil Series:** Water, rooted in submerged substrate

**NWI Classification:**

### Species documented from this community

Animals

Non-Vascular Plants

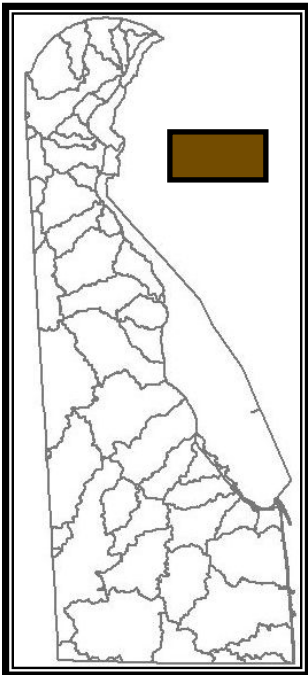
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: No specific locations are known for this community in Delaware, but it is likely throughout the state. Nationally it can be found from Minnesota to Maine and south to Florida and Texas.

**Estimated Acres in Delaware = 508.7 (February 2012)**

**-Acres with 0.5 m sea level rise = 529.4-332.6 = 196.8**

**-Acres with 1 m sea level rise = 529.4-378.2 = 151.2**

**-Acres with 1.5 m sea level rise = 529.4-422.7 = 106.7**

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Water-lily Aquatic Wetland

**Northeast Wildlife Habitat Classification:** Laurentian-Acadian Freshwater Marsh

**Landfire Classification Code:** unknown

[-Back to New Castle County Aquatic Communities-](#)

## New Castle County Vinelands

**Wisteria Vineland:** A vineland dominated by wisteria (*Wisteria sinensis*) and may be located in scour areas along side streams. ([CEGL008568](#)) **Brandywine Creek**

[-Back to Key to Delaware Vegetation Communities-](#)



## Kent County Vinelands

**Kudzu Vineland:** A vineland dominated by kudzu (*Pueraria montana*). ([CEGL003882](#)) **Murderkill River**

[-Back to Key to Delaware Vegetation Communities-](#)

## Sussex County Vinelands

**North Atlantic Coastal Plain Vine Dune:** A vineland with a dense coverage of whiteleaf greenbrier (*Smilax glauca*), common greenbrier (*Smilax rotundifolia*), poison ivy (*Toxicodendron radicans*) and Virginia creeper (*Parthenocissus quinquefolia*). ([CEGL003886](#)) **Lewes-Rehoboth Canal**

[-Back to Key to Delaware Vegetation Communities-](#)

## Kudzu Vineland

GNA

SNA

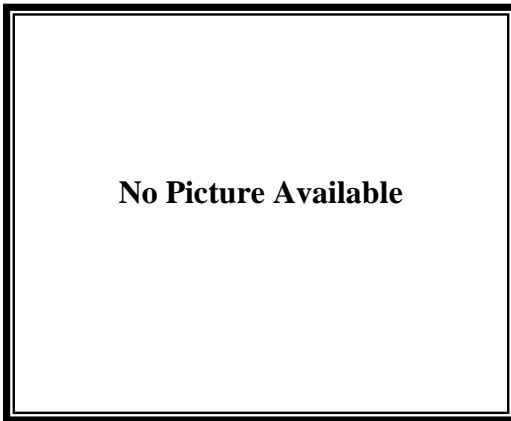
DNA

NVC Alliance: [A.904-Pueraria montana Vine-Shrubland Alliance](#)

NVC Association: [CEGL003882-Pueraria montana var. lobata Vine-Shrubland](#)

**Delaware Type Locality:** Spring Creek just below the dam of Andrews Lake in the Murderkill River watershed in Kent County (39° 1'25.73"N, 075°30'24.02"W).

**Description:** This vineland community is on a roadside below the dam of Andrews Lake in Kent County. The canopy here is composed of black walnut ([Juglans nigra](#)), sweetgum ([Liquidambar styraciflua](#)) and black locust ([Robinia pseudoacacia](#)). The understory is composed of tree-of-heaven ([Ailanthus altissima](#)). The shrub and vine layer is dominated by a thick coverage of kudzu ([Pueraria lobata](#) var. *lobata*) and associated by Japanese honeysuckle ([Lonicera japonica](#)), blackberry (*Rubus* sp.) and multiflora rose ([Rosa multiflora](#)). The few herbs are composed of pokeweed ([Phytolacca americana](#)), white goosefoot ([Chenopodium album](#)), lesser periwinkle ([Vinca minor](#)) and goldenrod (*Solidago* sp.)



**Diagnostic Features:** A vineland that is dominated by kudzu serves to identify this community.

**Geology and Environmental Features:** This community exists in a place of disturbance to the canopy and understory where there is plenty of light. It does not favor a particular geological formation.

**Landscape Position:** Anyplace where there is an infestation of kudzu.

**Associated Soil Series:** variable, exotic invasive species

### Species documented from this community

Animals

Non-Vascular Plants

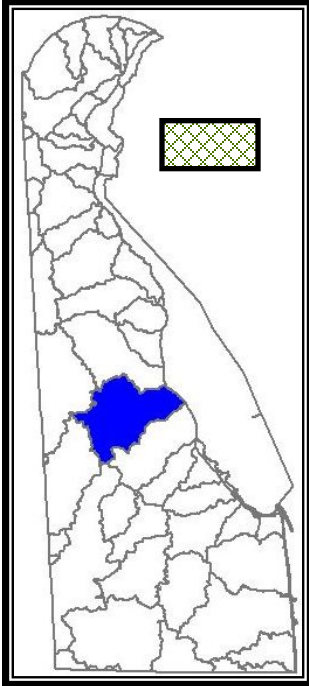
Vascular Plants

### Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: One site of this community is known in Delaware below the spillway of Andrews Lake in the Murderkill River watershed. It is likely in other places in the state as well.

**Estimated Acres in Delaware = ~ 1 (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** unknown

**Pennsylvania:** unknown

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** ???

**Landfire Classification Code:** unknown

[-Back to Kent County Vinelands-](#)

**North Atlantic Coastal Plain Vine Dune      G1G2      S?      D?**

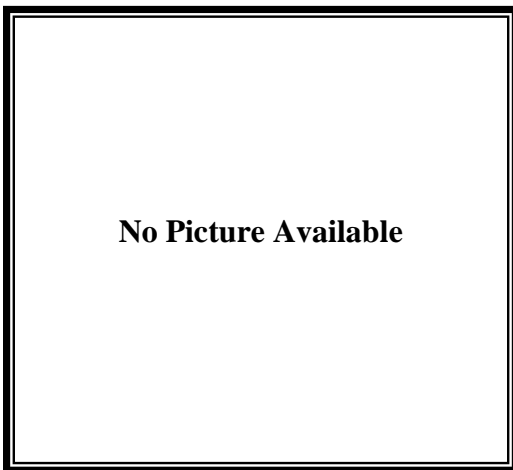
**NVC Alliance:** [A.909-Smilax glauca – Toxicodendron radicans Vine-Shrubland Alliance](#)

**NVC Association:** [CEGL003886-Smilax glauca-Toxicodendron radicans Vine-Shrubland](#)

**Delaware Type Locality:** This community is known from Cape Henlopen State Park but the specific locality is currently unknown.

**Description:** As the name implies this community is a maritime sand dune that is covered by vines. Height of the vines can vary from being low growing on the sand surface to 1 m or more climbing on older stems of the same species. Vegetation can cover 70 to 80 percent of the surface of the ground.

Typical vines can include whiteleaf greenbrier (*Smilax glauca*), common greenbrier (*Smilax rotundifolia*), muscadine grape (*Vitis rotundifolia*), Virginia creeper (*Parthenocissus quinquefolia*) or poison ivy (*Toxicodendron radicans*). Other woody plants can include on which the vines can climb include northern bayberry (*Morella pensylvanica*), winged sumac (*Rhus copallina*) or beach plum (*Prunus maritima*).



**Diagnostic Features:** A vineland with a dense coverage of whiteleaf greenbrier, common greenbrier, poison ivy and Virginia creeper typifies this community.

**Geology and Environmental Features:** This community is found on dunes that are exposed to wind, salt spray and storm tide overwash. The water table is more than 1 m below the surface making it dry.

**Landscape Position:** dunes at the coast

**Associated Soil Series:** Acquango-Beaches Complex, 0 to 10 percent slopes

Species documented from this community

Animals

Non-Vascular Plants

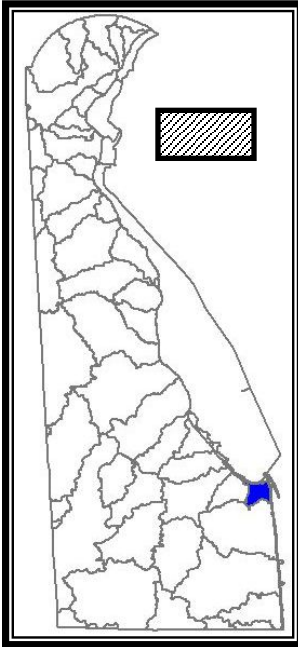
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is found in Cape Henlopen State and may be in other places in the Coastal Strand. Nationally this community ranges along the Atlantic Coast from Massachusetts to Maryland and maybe into Virginia.

**Estimated Acres in Delaware = ? (February 2012)**

Equivalent and related Communities in nearby states:

**Maryland:** North Atlantic Coastal Plain Vine Dune (Harrison 2004)

**New Jersey:** Coastal Shrub Thicket (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Greenbrier-Poison Ivy Dune Shrubland

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Dune and Swale

**Landfire Classification Code:** unknown

[-Back to Sussex County Vinelands-](#)

**Wisteria Vineland**

**GNA**

**SNA**

**DNA**

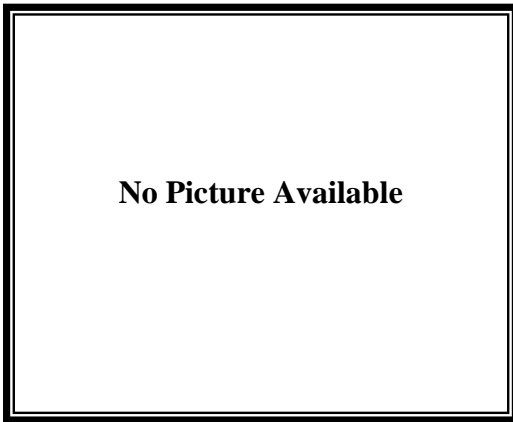
**NVC Alliance:** A.2013-*Wisteria (sinensis, floribunda)* Vine-Shrubland Alliance

**NVC Association:** CEGL008568-*Wisteria sinensis* Vine-Shrubland

**Delaware Type Locality:** Scoured floodplain on Brandywine Creek in Alapocas Run State Park across from Bancroft Mills in New Castle County.

[\(39°46'9.51"N, 75°33'54.30"W\)](#)

**Description:** This community is a vineland that is dominated almost exclusively by wisteria (*Wisteria sinensis*). In Delaware it occurs in one location on a scour bar on Brandywine Creek.



**Diagnostic Features:** An area that is dominated by wisteria is diagnostic of this community.

**Geology and Environmental Features:** Scoured areas and places of disturbance.

**Landscape Position:** Low floodplains

**Associated Soil Series:** Othello-Fallsington Urban Land Complex

Species documented from this community

Animals

Non-Vascular Plants

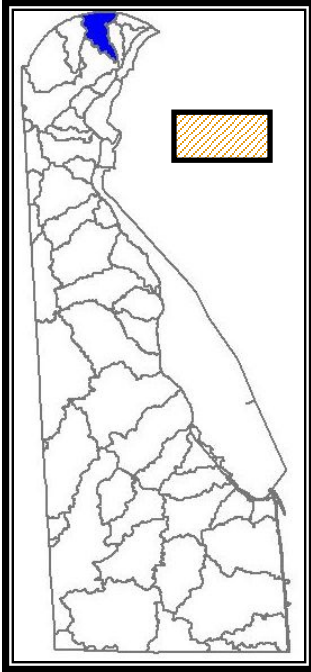
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



**Distribution:** This community is only known from a scour bar on Brandywine Creek across from the Bancroft Mills development. Other sites may be present in the state. This community is generally found in the southeastern United States.

**Estimated Acres in Delaware = 1.9 (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** not present

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Semi-natural/Altered Vegetation and Conifer Plantations

**Landfire Classification Code:** unknown

[-Back to New Castle County Vinelands-](#)



## New Castle County Herbaceous Vegetation

**Little Bluestem Old Field:** Grassland that is dominated by little bluestem (*Schizachyrium scoparium*) and has an abundance of other warm-season grasses. ([CEGL006333](#)) **Brandywine Creek; Red Clay Creek**

**Northeastern Temperate Cobble Scour Rivershore:** Herbaceous community dominated by twisted sedge (*Carex torta*) on cobble scour and contains a combination white vervain (*Verbena hastata*), water smartweed (*Polygonum amphibian*), Canada goldenrod (*Solidago canadensis*) and lamp rush (*Scirpus cyperinus*) as well as others. ([CEGL006536](#)) **New Castle County**

**Rocky Bar and Shore (Twisted Sedge Type):** Herbaceous community that is dominated by twisted sedge (*Carex torta*) and does not have the species combination in ([CEGL006536](#)). ([CEGL004103](#)) **Brandywine Creek**

**Successional Broom-sedge Vegetation:** Successional grassland that is dominated by broom-sedge (*Andropogon virginicus*). ([CEGL004044](#)) **C and D Canal**

**Upland Switchgrass Vegetation:** Upland grassland that is dominated by switchgrass (*Panicum virgatum*). ([CEGL006616](#)) **Appoquinimink River; Army Creek**

[-Back to Key to Delaware Vegetation Communities-](#)

## Kent County Herbaceous Vegetation

**Eastern Cattail Marsh:** Marsh dominated by cattail (*Typha* sp.). ([CEGL006153](#)) **Fresh Leipsic River**

**Upland Switchgrass Vegetation:** Upland grassland that is dominated by switchgrass (*Panicum virgatum*). ([CEGL006616](#)) **Chester River; Simons River**

[-Back to Key to Delaware Vegetation Communities-](#)

## Sussex County Herbaceous Vegetation

**Chainfern Small Depression Pond:** Small acidic depression pond that is dominated by Virginia chainfern (*Woodwardia virginica*). ([CEGL004475](#)) **Pocomoke River**

**Coastal Bay Shore-Succulent Beach:** Herbaceous community that is dominated and composed mostly of sea purslane (*Sesuvium maritimum*). ([CEGL004406](#)) **Prime Hook Creek**

**North Atlantic Upper Ocean Beach:** Sparsely vegetated community that is located between the dunes and the ocean or bay and contains American sea rocket (*Cakile edentula* ssp. *edentula*), seaside sandmat (*Chamaecysce polygonifolia*) and sand dune sandburr (*Cenchrus tribuloides*). ([CEGL004400](#)) **Broadkill River; Lewes-Rehoboth Canal; Lower Delaware Bayshore; Mispillion River**

**Salt Panne (*Salicornia* type):** Small pools within the North Atlantic Low Salt Marsh and the Mid-Atlantic Low Salt Marsh that are dominated by sea saltwort (*Salicornia maritima*). ([CEGL004308](#)) **Broadkill River; Indian River Bay; Lewes-Rehoboth Canal; Little Assawoman Bay; Red Mill Creek; Rehoboth Bay**

**Sea Level Fen:** Vigorous acidic seepage that is dominated by Beaked spikerush (*Eleocharis rostellata*) and co-dominated by ten-angle pipewort (*Eriocaulon decangulare*) and twig rush (*Cladium mariscoides*). ([CEGL006310](#)) **Rehoboth Bay**

**Successional Broom-sedge Vegetation:** Successional grassland that is dominated by broom-sedge (*Andropogon virginicus*). ([CEGL004044](#)) **Nanticoke River**

**Twig Rush Peat Mat:** A floating peat mat that is dominated by twig rush (*Cladium mariscoides*). ([CEGL006467](#)) **Indian River; Prime Hook Creek**

**Upland Switchgrass Vegetation:** Upland grassland that is dominated by switchgrass (*Panicum virgatum*). ([CEGL006616](#)) **Nanticoke River**

[-Back to Key to Delaware Vegetation Communities-](#)

## Chainfern Small Depression Pond

G2?

S?

D?

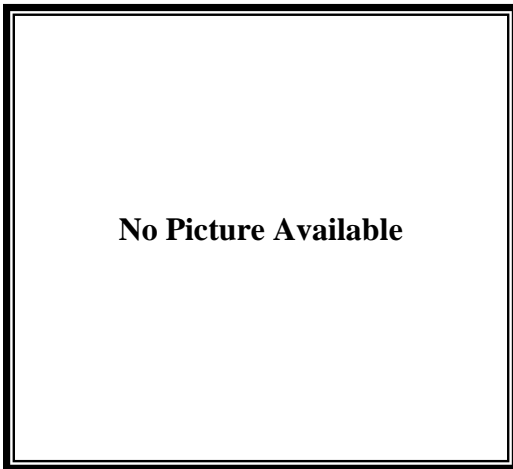
NVC Alliance: [A.1713-Woodwardia virginica Seasonally Flooded Herbaceous Alliance](#)

NVC Association: [CEGL004475-Woodwardia virginica/Sphagnum cuspidatum Herbaceous Vegetation](#)

**Delaware Type Locality:** This community is known to be in Delaware but the specific location is currently unknown.

**Description:** Chainfern Depression Ponds occur in the acid sands of the Coastal Plain. Vegetation is tall and up to 1.5 m in height.

Virginia chainfern ([Woodwardia virginica](#)) is the dominant species and can be joined by marsh St. John's wort ([Triadenum virginicum](#)), Walter's sedge ([Carex striata](#)), slender St. John's wort ([Hypericum mutilum](#)) and water willow ([Decodon verticillatus](#)). [Sphagnum](#) spp. may be abundant with high cover in the layer below the [Woodwardia](#). A woody canopy of red maple ([Acer rubrum](#)), loblolly pine ([Pinus taeda](#)) and sweetgum ([Liquidambar styraciflua](#)) with an understory of sweet pepperbush ([Clethra alnifolia](#)), swamp azalea ([Rhododendron viscosum](#)) and highbush blueberry ([Vaccinium corymbosum](#)) may be present on the edges.



**Diagnostic Features:** This is the only community in Delaware where Virginia chainfern is dominant.

### Geology and Environmental Features:

**Landscape Position:** Places of low elevation

**Associated Soil Series:** unknown

**NWI Classification:**

### Species documented from this community

Animals

Non-Vascular Plants

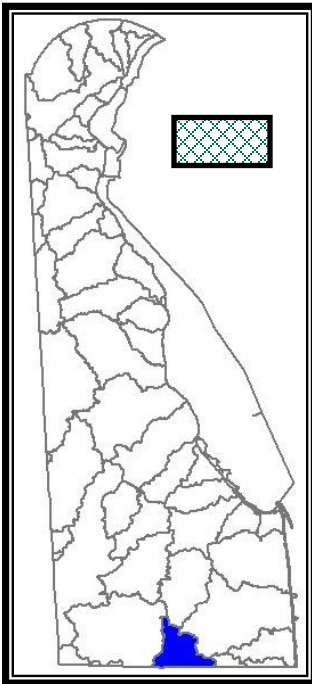
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** unknown



Distribution: This community is known only from the Great Cypress Swamp in Sussex County in Delaware. Nationally this community is found on the East Coast from Delaware south to Florida.

**Estimated Acres in Delaware = 20.8 (February 2012)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** Chainfern Small Depression Pond (Harrison 2004)

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** unknown

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Virginia Chainfern Swale

**Northeast Wildlife Habitat Classification:** Southern Atlantic Coastal Plain Depression Pondshore

**Landfire Classification Code:** unknown

[-Back to Sussex County Herbaceous Vegetation-](#)

## Coastal Bay Shore/Succulent Beach

G3

SX

D1?

**NVC Alliance:** [A.1868-Sesuvium spp.-Atriplex spp.-Suaeda spp. Tidal Sparsely Vegetated Alliance](#)

**NVC Association:** [CEGL004406-Sesuvium portulacastrum-Atriplex spp.-Suaeda spp. Sparse Vegetation](#)

**Delaware Type Locality:** marsh area just to the west of Broadkill Beach in Prime Hook National Wildlife Refuge. It is located in the Broadkill River watershed in Sussex County. (38 49' 22" N, 075 12' 56" W)

**Description:** This community comprises irregularly flooded vegetation on the Atlantic Coast. Most often in Delaware this community is dry in the late summer and fall and inundated during the winter and spring. It tends to occur behind the dunes and have less salt than other communities in the same areas. The vegetation often forms mound-like clumps.

Slender sea purslane (*Sesuvium maritimum*) is the dominant species and may be joined by halbeard-leaf orache (*Atriplex patula*), salt-meadow cordgrass (*Spartina patens*), bitter panic grass (*Panicum amarum*) and annual seepweed (*Suaeda linearis*).



**Prime Hook National Wildlife  
Refuge  
Sussex County**

**Diagnostic Features:** This community is dominated by sea purslane and is the only one in Delaware that has this species as a dominant.

**Geology and Environmental Features:** This community occurs on beaches that are irregularly flooded and accumulate less salt.

**Landscape Position:** Topographic depressions in marshes which accumulate water in the fall and winter and dry in the summer.

**Associated Soil Series:** Broadkill-Appoquinimink Complex, very frequently flooded, tidal

**NWI Classification:** Estuarine

Species documented from this community

Animals

Non-Vascular Plants

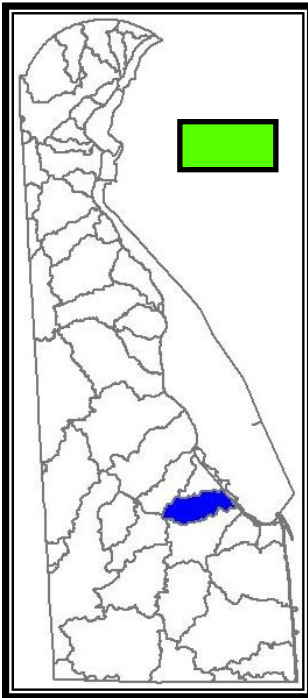
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Slender Sea Purslane (*Sesuvium maritimum*)



Distribution: The only known location for this community is at Prime Hook National Wildlife Refuge in the Broadkill River Watershed. Nationally it is found on the east coast from Delaware to Mississippi.

**Estimated Acres in Delaware = 90.7 acres (October 2008)**

**Note:** This community has been reduced from its previous extent from saltwater intrusion from Prime Hook NWR Unit 2 (October 2008).

Equivalent or related communities in nearby states:

**Maryland:** Coastal Bay Shore/Succulent Beach (Harrison 2004)

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** Upper Beach/Overwash Flat (Fleming et al. 2001)



Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Central Atlantic Coastal Plain Sandy Beach

**Landfire Classification Code:** unknown

[-Back to Sussex County Herbaceous Vegetation-](#)

## North Atlantic Upper Ocean Beach

G4G5

S3

NVC Alliance: [A.1861-Cakile edentula Sparsely Vegetated Alliance](#)

NVC Association: [CEGL004400- Cakile edentula ssp. edentula - Chamaesyce polygonifolia Sparse Vegetation](#)

**Delaware Type Locality:** Delaware Seashore State Park

**Description:** This beach community, as the name suggests, occurs on the unstable sands and gravels just above the mean high tide on maritime beaches and foredunes. Wrack-lines of floatsam are a common occurrence within this community. Some flooding occurs with spring tides and storm tides. Vegetation amounts are variable depending on exposure to wind and wave action. Annual and biennial species common to beaches predominate in this community. A high amount (90%-99%) of the substrate in this community is unvegetated.

Typical species include American sea rocket (*Cakile edentula ssp. edentula*), seaside sandmat (*Chamaecysce polygonifolia*), sand dune sandburr (*Cenchrus tribuloides*), purple sand grass (*Triplasis purpurea*), crested saltbush (*Atriplex cristata*) and a few others. Sparse individuals of American beachgrass (*Ammophila breviligulata*) may occur with the other herbs.



**Diagnostic Features:** The location of this community between the dunes and the ocean and the sparse vegetation present can readily differentiate this community from others.

**Prime Hook  
National Wildlife Refuge  
Sussex County**

**Geology and Environmental Features:** This community is common on maritime dunes but is vulnerable to development and wave action due to jetties. It is found on unstable sands and gravels just above mean high tide.

**Landscape Position:** This community as the name implies is located right at the front of the dunes on the Atlantic Ocean and Delaware Bay.

**Associated Soil Series:** Acquango-Beaches Complex, 0 to 10 percent slopes

**NWI Classification:** Marine

Species documented from this community

Animals

Non-Vascular Plants

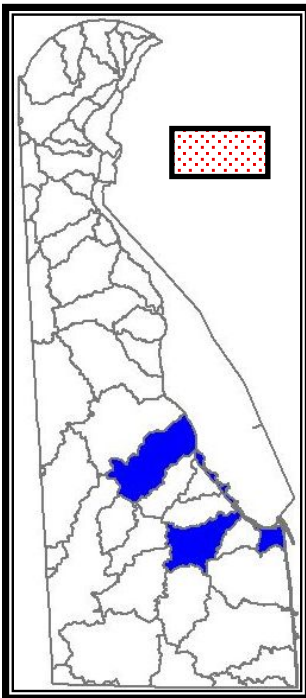
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Seabeach Amaranth (*Amaranthus pumilis*)



Distribution: This community can be found in Delaware from Bowers Beach south along the coast to Fenwick Island. Nationally it occurs on the coast from Maine south to North Carolina.

**Estimated Acres in Delaware = 1,590.0 (February 2012)**

**-Acres with 0.5 m sea level rise = 1,611.2-800.0 = 811.2**

**-Acres with 1 m sea level rise = 1,611.2-1,043.1 = 568.1**

**-Acres with 1.5 m sea level rise = 1,611.2-1,234.8 = 376.4**

Equivalent or related communities in nearby states:

**Maryland:** North Atlantic Upper Ocean Beach (Harrison 2004)

**New Jersey:** North Atlantic Upper Ocean Beach (Breden et al. 2001)

**Pennsylvania:** not present

**Virginia:** North Atlantic Upper Ocean Beach/Overwash Flat (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Beach Foredune

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Sandy Beach

**Landfire Classification Code:** unknown

[-Back to Sussex County Herbaceous Vegetation-](#)

## Salt Panne (*Salicornia* Type)

G5

S3

**NVC Alliance:** [A.1704-Sarcocornia perennis-\(Distichlis spicata, Salicornia spp.\) Tidal Herbaceous Alliance](#)

**NVC Association:** [CEGL004308-Salicornia \(virginica, bigelovii, maritima\)-Spartina alterniflora Herbaceous Vegetation](#)

**Delaware Type Locality:** Salt Pannes in the Mid and Southern Atlantic High Salt Marsh on the east side of Little Assawoman Bay ([38°28'29.10"N, 075° 3'12.13"W](#)).

**Description:** This saline community is found in low, poorly drained depressions of North Atlantic Low Salt Marshes. Some “salt panne” examples may be completely devoid of plants. During low tides, the water forms pools and then evaporates, increasing the salinity level and forming a panne. The resulting habitat is extremely saline and few vascular plant species are able to occupy it.

Glasswort (*Salicornia virginica*) and dwarf glasswort (*Salicornia bigelovii*) may form dense colonies or may be composed of a few other plants. Other associates may include sea lavender (*Limonium carolinianum*) and halbeard-leaf orache (*Atriplex patula*).



**Diagnostic Features:** Small pools within a North Atlantic Low Salt Marsh ([CEGL004192](#)) that are dominated by sea saltwort can distinguish this community from others in Delaware.

### Fenwick Island State Park Sussex County

**Geology and Environmental Features:** Salt Pannes are found in places where tidal salt water has been trapped and has formed a mini-impoundment.

**Landscape Position:** These communities are found in isolated depressions within North Atlantic Low Salt Marshes. Often they have a more saline environment because of evaporation.

**Associated Soil Series:** Broadkill-Appoquinimink Complex, very frequently flooded, tidal

**NWI Classification:** Marine

Species documented from this community

Animals

Non-Vascular Plants

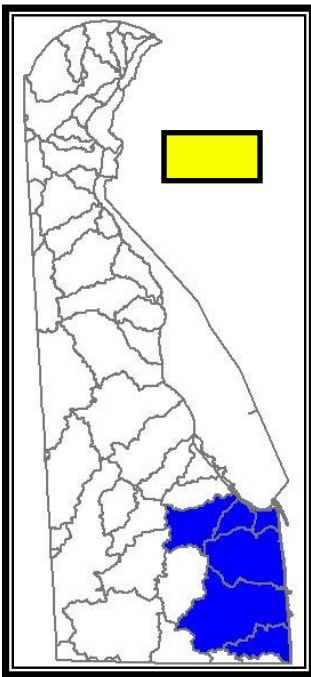
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Woody Glasswort (*Sarcocornia perennis*), Dwarf Glasswort (*Salicornia bigelovii*), Virginia Glasswort (*Salicornia virginica*)



Distribution: This community is present in the salt marshes of the Delaware Bay and in the Inland Bays. Great Marsh and Lewes Creek marshes in Sussex County are common places for this community. Nationally it is found on the east coast from Nova Scotia south to South Carolina.

**Estimated Acres in Delaware = 48.0 (February 2012)**

**-Acres with 0.5 m sea level rise = 7.2-7.2 = 0**

**-Acres with 1 m sea level rise = 7.2-7.2 = 0**

**-Acres with 1.5 m sea level rise = 7.2-7.2 = 0**

\*This community is projected to be eliminated in its current distribution with 0.5 meters of sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** Salt Panne (Harrison 2004)

**New Jersey:** *Sarcocornia perennis* - *Salicornia* spp. - *Spartina alterniflora* Dwarf-shrubland (Breden et al 2001)

Coastal Salt Marsh (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** Glasswort Salt Flat (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Salt Panne

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Tidal Salt Marsh

**Landfire Classification Code:** unknown

[-Back to Sussex County Herbaceous Vegetation-](#)

## Sea Level Fen

G1

S1.1

D1

NVC Alliance: [A.1447-\*Cladium mariscoides\* Saturated Herbaceous Alliance](#)

NVC Association: [CEGL006310-\*Cladium mariscoides\*-\*Drosera intermedia\*-\*Eleocharis rostellata\* Herbaceous Vegetation](#)

**Delaware Type Locality:** Rehoboth Bay watershed in Sussex County. (No location is given because of the sensitivity of this site)

Description: Sea level fens occur on the edges of salt marshes where there is enough acidic groundwater seepage to “push back” brackish water creating a freshwater environment. It may infrequently be affected by salt or brackish water during unusually high tides. It is mostly dominated by herbs. There may be only twenty or less examples of this community known in the world.

Beaked spikerush (*Eleocharis rostellata*) is the dominant species and co-dominant with ten-angle pipewort (*Eriocaulon decangulare*) and twig rush (*Cladium mariscoides*). Other species that may be encountered include spoon-leaved sundew (*Drosera intermedia*), marsh St. John’s wort (*Triadenum virginicum*), bladderwort (*Utricularia* spp.), Olney’s three square bulrush (*Schoenoplectus americanus*), horsetail spikerush (*Eleocharis equisetoides*) and hairy umbrella sedge (*Fuirena squarrosa*).



Diagnostic Features: Vigorous acidic freshwater seepage adjacent to a salt marsh.

### Inland Bays Area Sussex County

Geology and Environmental Features: Sedgy peat over sand or gravel.

**Landscape Position:** Sea Level Fens are confined to places that are at sea level and have a vigorous input of freshwater to keep the influx of salt water at bay.

**Associated Soil Series:** Broadkill-Appoquinimink Complex, very frequently flooded, tidal

**NWI Classification:** Estuarine



Species documented from this community

Animals

Non-Vascular Plants

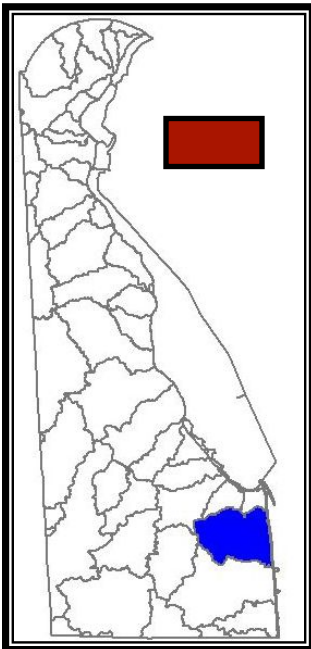
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** twining bartonia (*Bartonia paniculata*), sessile-leaved bugleweed (*Lycopus amplexans*), humped bladderwort (*Utricularia gibba*), *Utricularia fibrosa*, southern bladderwort (*Utricularia juncea*), *Polygala virginicum*, brown beakrush (*Rhynchospora fusca*), slender beakrush (*R. gracilentia*), Muhlenberg's nutrush (*Scleria muhlenbergii*), flattened pipewort (*Eriocaulon compressum*), slender blue flag iris (*Iris prismatica*), brown-fruited rush (*Juncus pelocarpus*), grass-pink orchid (*Calopogon tuberosus*), rose pogonia (*Pogonia ophioglossoides*), fringed yellow-eyed grass (*Xyris fimbriata*) and Small's yellow-eyed grass (*X. smalliana*).



Distribution: This community is only known from one location in Delaware in the Rehoboth Bay watershed. Other examples may have been present at one time but sea level rise has likely eliminated them. Nationally this community is known from New Hampshire south to Virginia.

**Estimated Acres in Delaware = 3 (February 2012)**

**-Acres with 0.5 m sea level rise = 4.5-4.5 = 0**

**-Acres with 1 m sea level rise = 4.5-4.5 = 0**

**-Acres with 1.5 m sea level rise = 4.5-4.5 = 0**

\*This community is projected to be eliminated in its current distribution with 0.5 meters of sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** Sea Level Fen (Harrison 2004)

**New Jersey:** *Cladium mariscoides* - *Drosera intermedia* - *Eleocharis rostellata*  
Herbaceous Vegetation (Breden et al 2001)

Coastal Salt Marsh (Collins and Anderson 1994)

**Pennsylvania:** not present

**Virginia:** Sea Level Fen (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Sea-level Fen

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Tidal Salt Marsh

**Landfire Classification Code:** unknown

[-Back to Sussex County Herbaceous Vegetation-](#)

## Twig Rush Peat Mat

G?

S1

D1

**NVC Alliance:** A.1447-*Cladium mariscoides* Saturated Herbaceous Alliance

**NVC Association:** CEGLO06467-*Cladium mariscoides*-*Eriocaulon decangulare*-*Eriophorum virginicum* Herbaceous Vegetation

**Delaware Type Locality:** Prime Hook National Wildlife Refuge (Exact location is not disclosed due to sensitivity of this community to visitation).

**Description:** This peat mat community is dominated by twig rush (*Cladium mariscoides*) and is associated by numerous rare plant species at the global and state level. This community is one of the rarest in Delaware and on the Delmarva Peninsula along with the Sea Level Fen. Other associated species include purple pitcher plant (*Sarracenia purpurea*), round-leaf sundew (*Drosera rotundifolia*), spoon-leaf sundew (*Drosera intermedia*), fibrous bladderwort (*Utricularia fibrosa*) and southern bladderwort (*Utricularia juncea*).



**Diagnostic Features:** A floating peat mat that is dominated by twig rush is diagnostic of this community.

**Doe Bridge Nature Preserve  
Sussex County**

### Geology and Environmental Features:

**Landscape Position:** Depressions and edges of impoundments

**Associated Soil Series:** Water, this community floats on the water

### Species documented from this community

Animals

Non-Vascular Plants

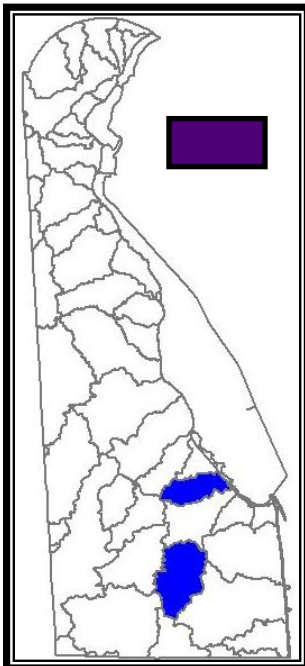
Vascular Plants

Associated Rare Species:

**Animals:** Sphagnum sprite (*Nehalennia gracilis*), Pennsylvania Firefly (*Photuris pensylvanica*), a firefly (*Photuris tremulans*), owlet moth (*Xestia youngii*), a moth (*Exyra fax*), plant hopper (*Megamelus* sp.), elfin skimmer (*Nannothemis bella*)

**Non-Vascular Plants:** unknown

**Vascular Plants:** Seaside alder (*Alnus maritima*), bushy bluestem (*Andropogon glomeratus* var. *hirsutior*), twining bartonia (*Bartonia paniculata*), tickseed sunflower (*Bidens coronata*), small-fruit beggar-ticks (*Bidens mitis*), umbrella flatsedge (*Cyperus diandrus*), round-leaf sundew (*Drosera rotundifolia*), Robbin's spike-rush (*Eleocharis robbinsii*), ten-angle pipewort (*Eriocaulon decangulare*), Parker's pipewort (*Eriocaulon parkeri*), tawny cotton-grass sedge (*Eriophorum virginicum*), hairy umbrella sedge (*Fuirena squarrosa*), dwarf umbrella sedge (*Fuirena pumila*), brown-fruited rush (*Juncus pelocarpus*), sessile-leaved bugleweed (*Lycopus amplexans*), rose pogonia (*Pogonia ophioglossoides*), white beakrush (*Rhynchospora alba*), long-beaked beakrush (*Rhynchospora scirpoides*), Englemann's arrowhead (*Sagittaria engelmanniana*), grass-leaf arrowhead (*Sagittaria graminea*), purple pitcher-plant (*Sarracenia purpurea*), nodding ladies'-tresses (*Spiranthes cernua*), fibrous bladderwort (*Utricularia fibrosa*), southern bladderwort (*Utricularia juncea*)



Distribution: This community is known only from the Prime Hook Creek and Indian River watersheds. The distribution throughout the rest of the country is unknown but it may be found in Maryland.

**Estimated Acres in Delaware = 8.0 (February 2012)**

**-Acres with 0.5 m sea level rise = 8.0-0.0 = 8.0**

**-Acres with 1 m sea level rise = 8.0-8.0 = 8.0**

**-Acres with 1.5 m sea level rise = 8.0-4.4 = 3.6**

Equivalent or related communities in nearby states:

**Maryland:** not present

**New Jersey:** not present

**Pennsylvania:** not present

**Virginia:** not present

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Atlantic White Cedar-Millpond Headwater Hummock and Peat Mat Woodland

**Northeast Wildlife Habitat Classification:** Northern Atlantic Coastal Plain Basin Peat Swamp

**Landfire Classification Code:** unknown

[-Back to Sussex County Herbaceous Vegetation-](#)

**Northeastern Temperate Cobble Scour Rivershore**      **G4G5**      **S**

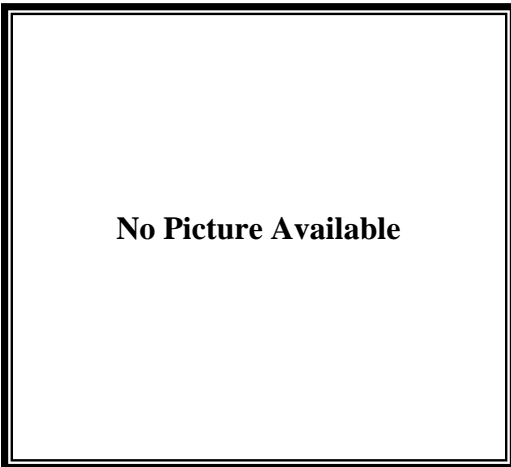
**NVC Alliance:** [A.1340-Carex torta Temporarily Flooded Herbaceous Alliance](#)

**NVC Association:** [CEGL006536-Carex torta-Apocynum cannabinum-Cyperus spp. Herbaceous Vegetation](#)

**Delaware Type Locality:** TBD

Description: This riverine community occurs on the shores of large to medium sized watercourses which receive seasonal flooding and/or ice-scour. Vegetation can range from sparse in those places that are frequently inundated to dense in places where there is often exposed substrate. Seasonal flooding and ice-scour maintain the open nature of these communities.

Twisted sedge (*Carex torta*) and willow (*Salix* spp.) are frequent associates of those places that have the most inundation and ice-scour. Associates can be variable depending on the particular conditions of the site and can include: blue vervain (*Verbena hastata*), dogbane (*Apocynum cannabinum*), *Symphytotrichum puniceum*, rugose goldenrod (*Solidago rugosa*), Canada goldenrod (*Solidago canadensis*), reed grass (*Phalaris arundinacea*), deer-tongue grass (*Dichanthelium clandestinum*), perfoliate boneset (*Eupatorium perfoliatum*) and straw-color flat sedge (*Cyperus strigosus*). Some stunted shrubs such as silky dogwood (*Cornus amomum*), river birch (*Betula nigra*), eastern cottonwood (*Populus deltoides*) and sycamore (*Platanus occidentalis*) can occur on the edge of the shore. Eastern reed grass (*Phragmites australis*) can often be a persistent invasive species in these habitats.



Diagnostic Features: The dominance of twisted sedge on a sandbar is diagnostic of this community.

Geology and Environmental Features: These communities can be found on cobble, gravel, sand bar and banks of streams with medium to high gradients. These communities are kept open by frequent flooding and ice. These communities receive a lot of disturbance and as a result can be quite variable from year to year.

Species documented from this community

Animals

Non-Vascular Plants

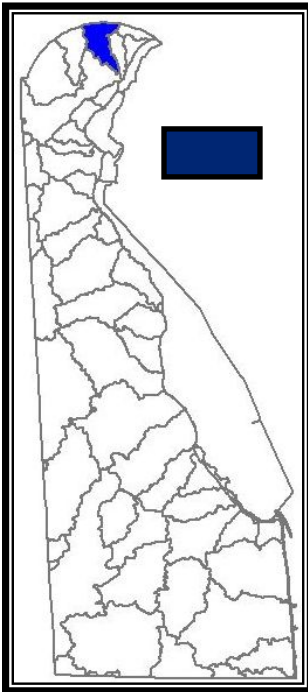
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Twisted Sedge (*Carex torta*)



Distribution: Upper reaches of the Delaware River and larger rivers in the Piedmont such as the Christina River and Brandywine Creek where ample rocks can be found. Nationally this community is found from Maine south to Maryland.

**Estimated Acres in Delaware = ? (February 2012)**

Equivalent or related communities in nearby states:

**Maryland:** not present

**New Jersey:** not present

**Pennsylvania:** unknown

**Virginia:** not present

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** No equivalent community

**Northeast Wildlife Habitat Classification:** Central Appalachian Stream and Riparian

**Landfire Classification Code:** unknown

[-Back to New Castle County Herbaceous Vegetation-](#)



## Rocky Bar and Shore (Twisted Sedge Type) G3G4 S1

NVC Alliance: [A.1340-Carex torta Temporarily Flooded Herbaceous Alliance](#)

NVC Association: [CEGL004103-Carex torta Herbaceous Vegetation](#)

**Delaware Type Locality:** Rocky Run just above its confluence with Brandywine Creek in Brandywine Creek State Park in New Castle County (**39°48'44.16"N, 075°33'57.85"W**).

**Description:** Sparse to densely vegetated riverine community on sand and gravel bars in Piedmont streams. Twisted sedge (*Carex torta*) is the diagnostic species, which is adapted to frequent flooding and scouring. This plant is also shade intolerant. The vegetation may be composed of only a few caespitose individuals or in rare cases, dense colonies. Infrequent associates are generally herbaceous and may include spikerush (*Juncus effusus*), orange spotted jewelweed (*Impatiens capensis*), reed canary grass (*Phalaris arundinacea*), rice-cut grass (*Leersia oryzoides*), deer tongue grass (*Dichanthelium clandestinum*), Canadian clearweed (*Pilea pumila*) and wild parsley (*Cryptotaenia canadensis*). Due to natural disturbance, invasive species such as rough-stalk bluegrass (*Poa trivialis*), true forget-me-not (*Myosotis scorpioides*), daylily (*Hemerocallis fulva*), Japanese stiltgrass (*Microstegium vimineum*) can gain a foothold. Small seedlings of boxelder (*Acer negundo*), black willow (*Salix nigra*), sycamore (*Platanus occidentalis*) and green ash (*Fraxinus pennsylvanica*) can be found growing with the twisted sedge.



**Brandywine Creek State Park  
New Castle County**

**Diagnostic Features:** The presence of twisted sedge on sand and gravel bars in high-gradient streams is indicative of this community.

**Geology and Environmental Features:** This community is found on sandbars and rocky islands in rivers and streams and often occurs as a linear occurrence. Regular flood scouring is common making it a target for invasive species such as daylily and Japanese stiltgrass. The roots of the plants serve to stabilize and serve to “build” the islands that they are on.

**Landscape Position:** This community is located on sandbars with large cobbles in the larger creeks of the Piedmont.

**Associated Soil Series:** Hatboro Silt Loam

Species documented from this community

Animals

Non-Vascular Plants

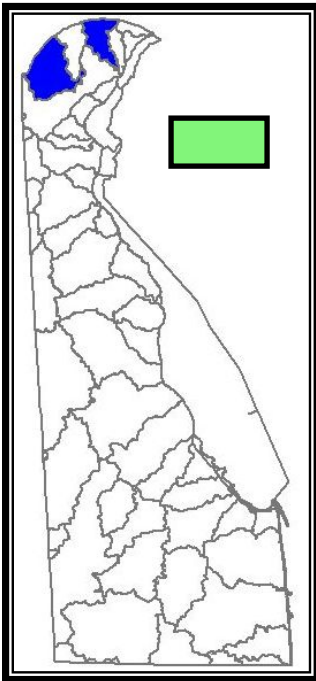
Vascular Plants

Associated Rare Species:

**Animals:** unknown

**Non-Vascular Plants:** unknown

**Vascular Plants:** Twisted Sedge (*Carex torta*)



Distribution: This community, with the exception of one example, is known wholly from Piedmont streams in Delaware. Nationally this community is known from Pennsylvania, south to Georgia and west to Alabama and Tennessee.

**Estimated Acres in Delaware = 0.4 (April 2009)**

\*This community is not projected to be affected by sea level rise.

Equivalent or related communities in nearby states:

**Maryland:** unknown

**New Jersey:** not present

**Pennsylvania:** unknown

**Virginia:** Rocky Bar and Shore (Twisted Sedge Type) (Fleming, G.P., et al 2006)

Names in other classifications:

**Delaware Wildlife Action Plan (DEWAP):** Twisted Sedge Sand Bar

**Northeast Wildlife Habitat Classification:** Central Appalachian Stream and Riparian

**Landfire Classification Code:** unknown

[-Back to New Castle County Herbaceous Vegetation-](#)

## Literature Cited

Fleming, G.P., P.P. Coulling, K.D. Patterson, and K. Taverna. 2006. The natural communities of Virginia: classification of ecological community groups. Second approximation. Version 2.2. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, VA.  
[http://www.dcr.virginia.gov/natural\\_heritage/ncintro.shtml](http://www.dcr.virginia.gov/natural_heritage/ncintro.shtml).

Fike, Jean. 1999. Terrestrial and Palustrine Plant Communities of Pennsylvania. (DCNR: State of Pennsylvania).

## **APPENDIX I: STATE-RARE COMMUNITIES RANKING CRITERIA**

Ranks are based on a system developed by The Nature Conservancy and NatureServe to measure the relative rarity of a species within a given state. State rarity ranks are used to prioritize conservation and protection efforts so that the rarest of species receive immediate attention. The primary criteria for ranking species are the total number of documented occurrences or populations with consideration given to the total number of individuals within each population. Ranks for individual species are updated annually and are based on current knowledge of taxonomic experts.

### **STATE RANK**

**S1** Extremely rare and of conservation concern; typically 5 or fewer extant occurrences and/or populations in the state or less than 500 acres of a community known; or only a few remaining occurrences; may be especially vulnerable to extirpation.

-some communities like Coastal Plain Ponds may have a lot of occurrences but may be vulnerable because of small size.

**S2** Very rare and of conservation concern; typically between 6 and 20 known occurrences and/or between 500 and 1,500 acres of a community known; may be susceptible to becoming extirpated.

**S3** Rare to uncommon not of conservation concern; typically 21 to 50 known occurrences and/or less than 4,000 acres known; S3 ranked communities are not yet susceptible to becoming extirpated in the state but may be if additional populations are destroyed.

**S4** , typically 50 to 100 occurrences and/or 4,001 and 6,000 acres known.

**S5** Very common community that has greater than 100 occurrences and/or more than 6,000 acres.