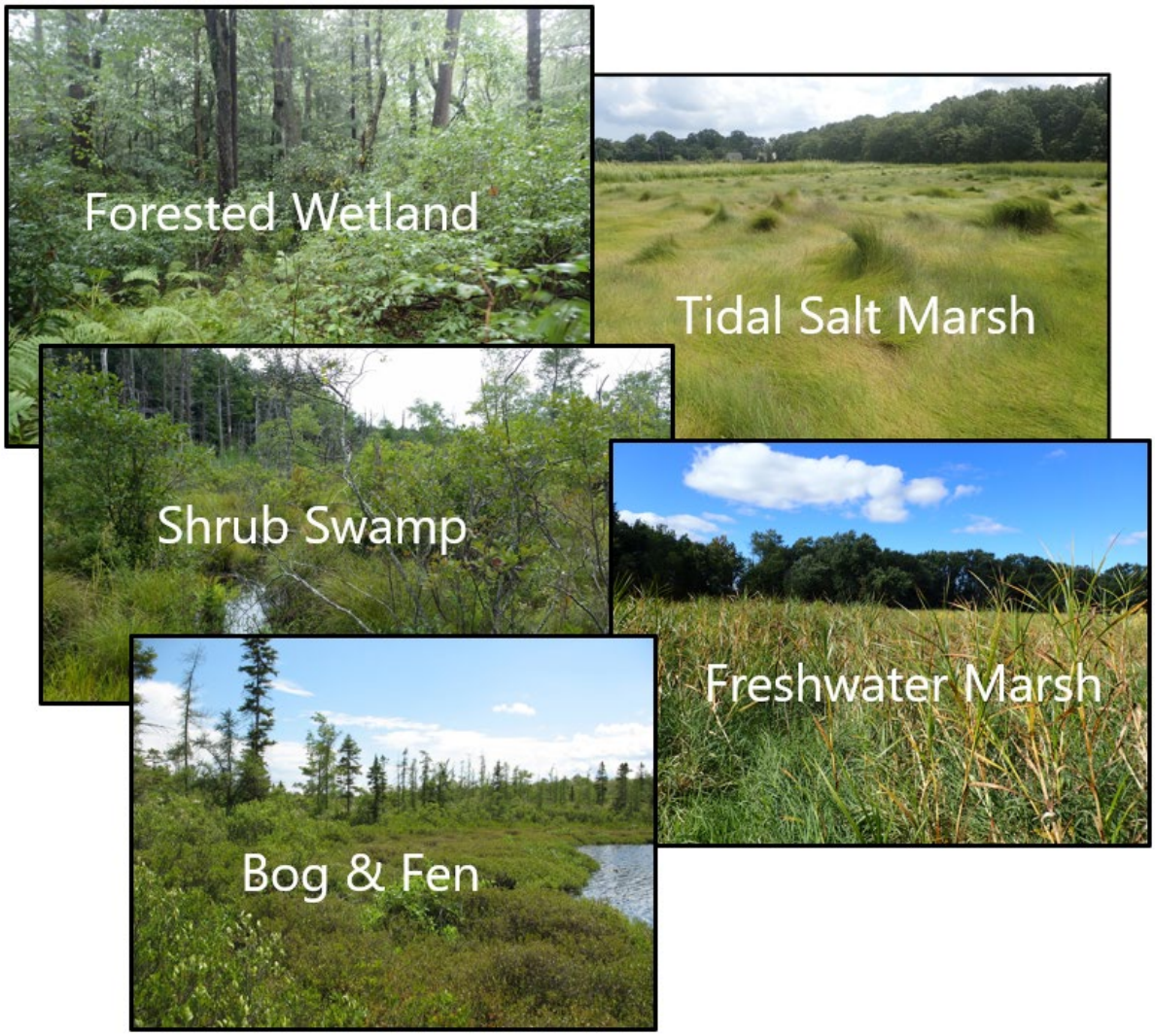
A Guide to Wetland Types in New Jersey with Ecoregional Floristic Quality Assessment Metrics (v1.3)



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v1.3

NatureServe

New Jersey Department of Environmental Protection

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INTRODUCTION

New Jersey supports a remarkable diversity of wetlands across the landscape from acidic bogs and alkaline fens of the Kittatinny Ridge and Valley to tidal wetlands and freshwater swamps on the Atlantic Coastal Plain. The purpose of this report is to provide descriptions of the wetlands and a way to evaluate their condition using an ecoregional floristic quality assessment condition threshold scoring system. The wetland classification presented in this report is based on the U.S. National Vegetation Classification System. This information on wetlands is readily accessible through NatureServe Explorer.

This is a report on the wetland types in New Jersey that focuses on four of New Jersey's major wetland ecosystems -- Floodplain and Swamp Forest; Bog & Fen; Freshwater Marsh, Wet Meadow & Shrub Swamp; and Salt Marsh. Within these major ecosystems, wetland types are based on the U.S. National Vegetation Classification (USNVC) hierarchy ecological Group, a mid-scale regional wetland type with distinct hydrologic and floristic composition, important for identification and mapping, as well as for mitigation and restoration efforts. References to finer detailed floristic Alliances and Associations are included within each Group description. Ecoregional Floristic Quality Assessment (eFQA) metrics and condition thresholds (Excellent-Good-Fair-Poor) are presented by Group for use in monitoring and assessment of wetland sites. A key to wetland types and fact sheets for 30 wetland Groups are included to provide information on wetland classification (Group, Alliance, Association), type description (vegetation, soils, hydrology), plant species list by strata with Coefficient of Conservatism (CoC) values, eFQA metric rating thresholds Excellent-Good-Fair-Poor, ecoregion distribution map, and references. The report includes an introduction to the USNVC classification system, FQA and eFQA concepts, a key to USNVC Wetland Groups in New Jersey, and the 30 Wetland Fact Sheets.

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Wetland Classification

Wetlands are classified primarily by vegetation and hydrology. The National Wetland Inventory (NWI) by Cowardin in 1979 was one of the first national wetland classification systems used by the EPA and other federal agencies. The New Jersey Department of Environmental Protection uses the 1976 Anderson Land Use Land Cover Classification to map wetlands attributed with LULC Codes based on land cover types including vegetation structure. A Hydrogeomorphic Classification of Wetlands (HGM) based on geomorphic setting, water sources, and hydrodynamics was developed by Mark Brinson in 1993 and has been used extensively in wetland monitoring and assessment as well as functional assessments and watershed planning. In 2010 USFWS wetland ecologist Ralph Tiner developed the NWIPlus, a geospatial database for watershed-level functional assessments, based on NWI classification with hydrogeomorphic attributes of landscape position, landform, water flow path, and waterbody type (LLWW). The U.S. National Vegetation Classification (USNVC) "is a comprehensive classification system for all vegetation types in the United States. Much like a flora for plant species, the USNVC offers a

hierarchy of classification levels from coarse to fine, providing a common language for the effective management and conservation of plant communities in the U.S. Furthermore, it is governed by standards for vegetation data collection and analysis, ensuring consistent reporting on the nation's vegetation resources." The USNVC is the wetland classification used in this report.

The following diagram shows the structure of the USNVC hierarchy, from coarse scale Class to finest scale Associations. The classification hierarchy level of Group was used in this wetland guide and the ecoregional floristic quality assessment condition thresholds were developed at this scale using thousands of quantitative wetland plot data from New Jersey, New York, Pennsylvania, Connecticut, Massachusetts, Vermont, New Hampshire, and Maine.

The U.S. National Vegetation Classification hierarchy used in this study focuses on the mid-level Group, with links to finer scale floristic Alliances and Associations within each group.

Class	C01 Forest & Woodland Class
Subclass	S15 Temperate & Boreal Forest & Woodland Subclass
Formation	F026 Temperate Flooded & Swamp Forest Formation
Division	D011 Eastern North American-Great Plains Flooded & Swamp Forest Division
Macrogroup	M503 Pin Oak - Green Ash - Blackgum Swamp Forest Macrogroup
Group	**G918 Quercus bicolor - Fagus grandifolia - Acer rubrum Swamp Forest Group**
Alliance	A4461 *Acer rubrum - Fraxinus pennsylvanica* Northeast Alkaline Swamp Forest Alliance
Association	CEGL006000 Northern Red Oak - Yellow Birch / Cinnamon Fern Forest

The following table shows the inter-relationships among three main wetland classifications: U.S National Vegetation Classification (NVC), National Wetlands Inventory (NWI), and Hydrogeomorphic Classification (HGM). This wetland classification crosswalk was developed for the NatureServe Ecological Integrity Assessment: Protocols for Rapid Field Assessment of Wetlands by Faber-Langendoen et al (2016).

The inter-relationships among three main wetland classifications: U.S National Vegetation Classification (NVC), National Wetlands Inventory (NWI), and Hydrogeomorphic Classification (HGM). Source: Faber-Langendoen et al, 2016.

Vegetation Classification		Hydrogeomorphic*** Classification						
		Riverine	**Depression**	**Slope[1]**	**Mineral Soil Flats**	**Organic Soil Flats**	**Estuarine Fringe[2]**	**Lacustrine Fringe**
NVC* FORMATION[4]	**NWI** CLASS**	**Palustrine:** *Riverine*	**Palustrine**	**Palustrine**	**Palustrine**	**Palustrine**	**Estuarine:** *Intertidal*	**Lacustrine:** *Littoral*
FLOODED & SWAMP FOREST *(Tropical, Temperate, Boreal)*	**Forested (FO)**	PFO	PFO	PFO	PFO	PFO	E2FO	PFO
MANGROVE		-	-	-	-	-	E2FO	-
FRESHWATER MARSH, WET MEADOW & SHRUBLAND *(Tropical, Temperate, Boreal)*	**Scrub-Shrub (SS)**	PSS	PSS	PSS	PSS	PSS	R1SS	PSS
	Emergent (EM)	PEM	PEM	PEM	PEM	PEM	R1EM	PEM
SALT MARSH	**Scrub-Shrub (SS)**	-		-	-	-	E2SS	-
	Emergent (EM)	-	PEM[3]	-	-	-	E2EM	-
BOG & FEN *(Tropical, Temperate, Boreal)*	**Moss-Lichen (ML)**	-	PML, PEM, PSS	PML, PEM, PSS	-	PML, PEM, PSS	-	-
AQUATIC VEGETATION *(Freshwater, Saltwater)*	**Aquatic Bed (AB)**	R1AB	PAB	-	-	-	E2AB	L2AB

*** NVC** = U.S. National Vegetation Classification (FGDC 2008, Faber-Langendoen et al. 2009, Jennings et al. 2009)

**** NWI** = National Wetland Inventory (Cowardin et al. 1979). E2AB = Estuarine Intertidal Aquatic Bed, E2EM = Estuarine Intertidal Emergent, E2SS = Estuarine Intertidal Scrub-Shrub, E2FO – Estuarine Intertidal Forested, L2AB = Lacustrine Littoral Aquatic Bed, PAB = Palustrine Aquatic Bed, PEM = Palustrine Emergent, PML = Palustrine Moss-Lichens, PSS = Palustrine Scrub-Shrub, PFO = Palustrine Forested, R1AB = Riverine Tidal Aquatic Bed, R1EM = Riverine Tidal Emergent

***** HGM** = Hydrogeomorphic Classification (Smith et al. 1995, NRCS 2008)

[1]Includes groundwater slope/riverine or "sliverine" wetlands (e.g., streamside seepage wetlands) and freshwater wetlands on the coast with some tidal influence (e.g., sea level fens)

[2]Includes salt, brackish, oligohaline, and freshwater tidal wetlands

[3]Inland haline marsh

[4] NWI - NVC classification crosswalk details may differ with respect to strata (e.g., NWI tree cover cutoff for PFO is 30% whereas NVC tree cover is 10%; NWI treats sapling stages as Scrub-Shrub whereas in NVC they are treated as part of the Flooded & Swamp Forest)

The wetland classification crosswalk between the USNVC Formation, NWI, and Anderson's LULC is shown in the table below. Note that NWI - NVC classification crosswalk details may differ with respect to strata. For example, NWI tree cover cutoff for PFO is 30% whereas NVC tree cover is 10%; NWI treats sapling stages as Scrub-Shrub whereas in NVC they are treated as part of the Flooded & Swamp Forest.

Wetland Vegetation Classification Systems. The inter-relationships among three main wetland classifications: U.S National Vegetation Classification (NVC), National Wetlands Inventory (NWI), and Anderson Classification used in NJDEP Land Use Land Cover Mapping (NJ LULC).

Wetland Vegetation Classification Systems		
USNVC FORMATION	**NWI CLASS** P – Palustrine, E – Estuarine, R - Riverine	**NJDEP LULC Anderson Level III Classification**
FLOODED & SWAMP FOREST *(Tropical, Temperate, Boreal)*	**Forested (FO)** PFO1 Broad-Leaved Deciduous PFO2 Needle-Leaved Deciduous PFO3 Broad-Leaved Evergreen PFO4 Needle-Leaved Evergreen PFO6 Deciduous PFO7 Evergreen	6210 Deciduous Wooded Wetlands 6220 Coniferous Wooded Wetlands 6221 Atlantic White-cedar Wetlands 6250 Mixed Wooded Wetlands 6251 Mixed Wooded Wetlands with Deciduous Prevalent 6252 Mixed Wooded Wetlands with Coniferous Prevalent
FRESHWATER MARSH, WET MEADOW & SHRUBLAND *(Tropical, Temperate, Boreal)*	**Scrub-Shrub (SS)** PSS1 Broad-Leaved Deciduous PSS2 Needle-Leaved Deciduous PSS3 Broad-Leaved Evergreen PSS4 Needle-Leaved Evergreen PSS6 Deciduous PSS7 Evergreen	6230 Brush-Dominate and Bog Wetlands 6231 Deciduous Brush and Bog Wetlands 6232 Coniferous Brush and Bog Wetlands 6233 Mixed Brush and Bog Wetlands with Deciduous Dominant 6234 Mixed Brush and Bog Wetlands with Coniferous Dominant
	Emergent (EM) PEM1 Persistent PEM2 Nonpersistent PEM5 *Phragmites australis*	6240 Non-Tidal Marshes 6241 Phragmites Dominate Interior Wetlands
	Riverine (R) R1 Tidal R2 Lower Perennial R3 Upper Perennial R4 Intermittent	6120 Freshwater Tidal Marsh
BOG & FEN *(Tropical, Temperate, Boreal)*	**Moss-Lichen (ML)** PML1 Moss PML2 Lichen	6230 Brush-Dominate and Bog Wetlands 6240 Non-Tidal Marshes (herbaceous dominated bogs)
SALT MARSH	**Scrub-Shrub (SS)** E2SS1 Broad-Leaved Deciduous E2SS2 Needle-Leaved Deciduous E2SS3 Broad-Leaved Evergreen E2SS4 Needle-Leaved Evergreen E2SS6 Deciduous E2SS7 Evergreen	Not recognized by Anderson or used in NJDEP LULC Mapping
	Emergent (EM) E2EM1 Persistent E2EM2 Nonpersistent E2EM5 *Phragmites australis*	6110 Saline Marshes (including brackish marsh) 6111 Saline Marsh (Low Marsh) 6112 Saline Marsh (High Marsh)
AQUATIC VEGETATION *(Freshwater, Saltwater)*	**Aquatic Bed (AB)** E1AB Subtidal Aquatic Bed E2AB Intertidal Aquatic Bed R1-5AB Riverine L1-2AB4 Lacustrine PAB Palustrine	5000 Open Water 5110 Streams 5210 Small Lakes 5410 Tidal Rivers, Inland Bays, and Other Tidal waters
REFERENCES:		
LULC: Anderson et al. 1976 classification system and LULC code list for NJDEP GIS mapping ("Brush" means woody plants <20 ft in height)		
USNVC: U.S. National Vegetation Classification (FGDC 2008, Faber-Langendoen et al. 2009, Jennings et al. 2009)		
NWI: National Wetland Inventory (Cowardin et al. 1979 updated in 2013 by FGDC) and NWI classification chart		

Ecoregions in New Jersey

New Jersey has four major Physiographic Provinces: Ridge & Valley, Highlands, Piedmont, and Coastal Plain. EPA Ecoregions are based on the U.S. Geological Survey mapping of the Ecoregions of the Continental United States by J.M. Omernik in 1987; these maps provide a framework for inventory, monitoring and assessment at multiple scales. Level III Ecoregions is the mapping scale used for this wetland report and associated ecoregional Floristic Quality Assessment in New Jersey. The Level III Ecoregions of New Jersey were described and mapped by Woods et al in 2007. The following map shows the Ecoregions of New Jersey that are used in the wetland classification and ecoregional floristic quality assessment in this report.

Level III Ecoregions in New Jersey

67 Ridge and Valley: Diverse, folded, and faulted, partly glaciated ecoregion with northeastwardly trending, forested ridges on sedimentary and metamorphic bedrock and agricultural in the rich limestone/dolomite valleys. Karst landscape features with sinkhole ponds, calcareous fens, and rich swamps in glacial lake basins in the Kittatinny Valley; glacial bogs on the Kittatinny Mountain ridges.

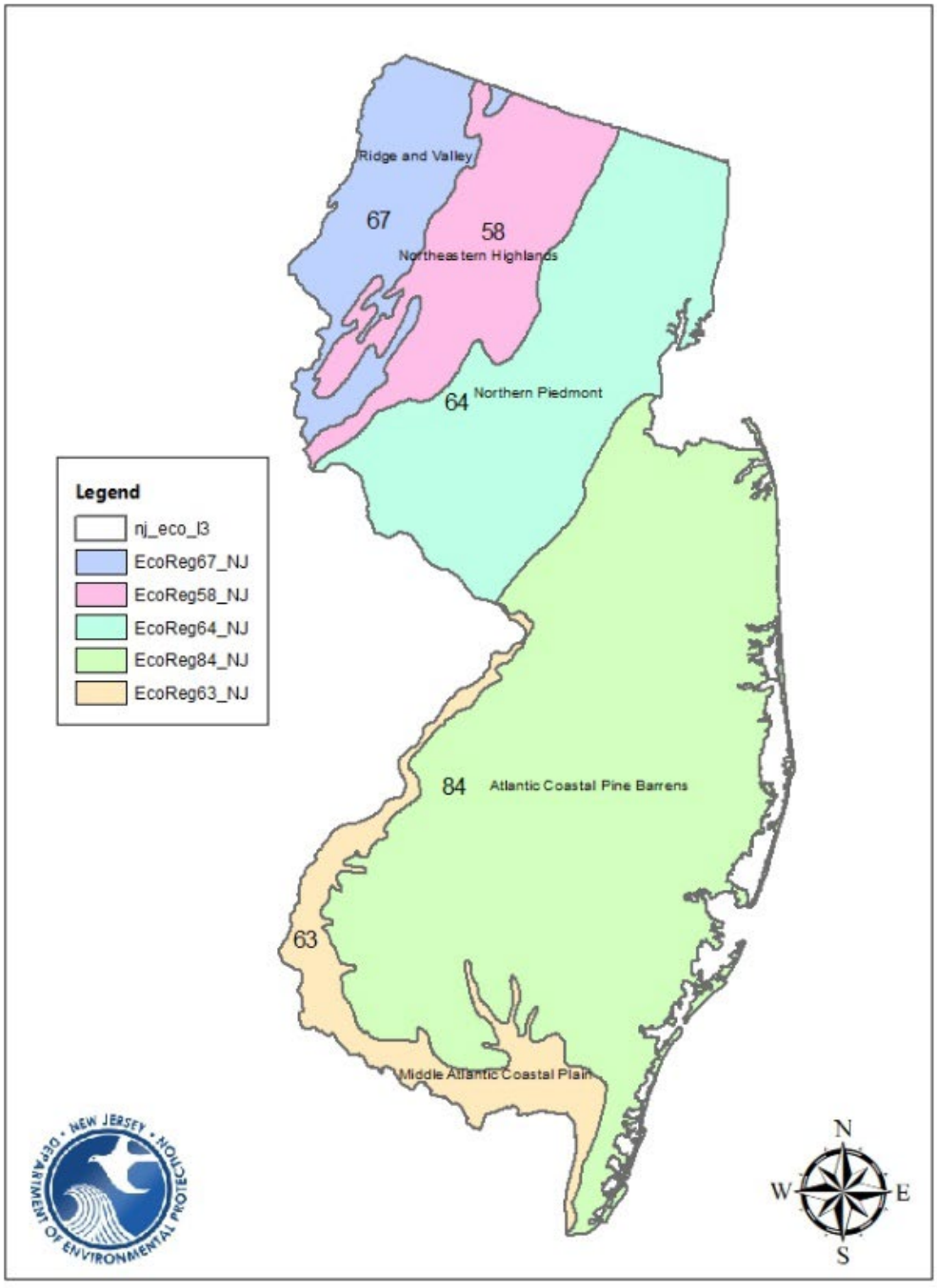
58 Northeastern Highlands: Partially glaciated highlands on metamorphic crystalline bedrock, forested hills, and lakes in glaciated northeastern areas on rugged terrain. Mixed oak forested uplands on Gneiss, valleys on limestone and shale. Steep gradient streams.

64 Northern Piedmont: Partly glaciated, irregular plains and low hills extensively cleared for farms or development; large, old glacial lake beds support extensive wetland complexes; Triassic shale and sandstone support forested rocky ridges and on diabase and basalt of the Watchung Mountains.

84 Atlantic Coastal Pine Barrens: Low, undulating coastal plain underlain by xeric sands supporting extensive pine-oak woodlands and the pine barrens. The Kirkwood-Cohansey Aquifer supports groundwater dominated wetlands such as Atlantic white-cedar swamps along streams and in basins, as well as many coastal plain intermittent ponds. Coastal maritime dunes, beaches and barrier islands occur along the Atlantic coast.

63 Middle Atlantic Coastal Plain: Low, nearly flat coastal plain underlain by gravels, sands, and silts along the Delaware River and Bay. Frequently flooded areas support tidal marshes, swamps, floodplain forests and ponds.

NJ Ecoregion Map for Wetland Groups



Floristic Quality Assessment

Plants can tell a story about site history and environmental stressors. Floristic Quality Assessment (FQA) is a statistical method developed by Gerould Wilhelm in 1977 to discern the floristic integrity of sites. It is a tool used by scientists and land managers to distinguish non-random differences in floristic quality between sites and to track changes in vegetation quality over time at selected sites. FQA has been used extensively in upland and wetland natural area conservation and habitat restoration, for wetland condition assessments in states, and was used by the EPA in the NWCA as part of the national Vegetation Multi-Metric Index. Floristic Quality Assessment can also be used in developing performance standards and establishing mitigation criteria.

Floristic Quality is essentially a weighted average of species richness with the weighting factor called the species' Coefficient of Conservatism (CoC). Coefficients of Conservatism, ranging in value from 0 to 10, represent an estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to be pre-European settlement condition. It is based on two ecological tenets:

1) plant taxa (species, subspecies, varieties, hybrids) differ in their tolerance to disturbance and disturbance type, and

2) plant taxa display varying degrees of fidelity to habitat integrity. For example, taxa assigned a low C value are adapted to severe disturbances, particularly anthropogenic disturbances that occur frequently, whereas taxa assigned a high C value are restricted to high quality natural areas.

Definitions for Coefficients of Conservatism (CoC), or C values

CoC	Criteria
0	Non-native with wide range of ecological tolerances. Often these are opportunistic of intact undisturbed habitats.
1 to 2	Native invasive or widespread native that is not typical of, or only marginally typical of, a particular plant community; tolerant of anthropogenic disturbance. These are primarily weedy species that can flourish in the most highly degraded habitats.
3 to 5	Native with an intermediate range of ecological tolerances and may typify a stable native community but may also persist under some anthropogenic disturbance.
6 to 8	Native with a narrow range of ecological tolerances and typically associated with a stable community. Increases in the intensity or frequency of disturbance may result in reduction of population size.
9 to 10	Native with a narrow range of ecological tolerances, high fidelity to particular habitat conditions, and sensitive to anthropogenic disturbance. They are generally restricted to high-quality natural areas.

Floristic Quality Assessment Index Formulas from DeBerry et al (2015)

FQA Metric	Equation	Coefficients and Constants
Mean Coefficient of Conservatism ($\bar{C}$) (native species only)	$\bar{C} = \frac{\sum_{i=1}^{n} C_i}{N}$	C_i = C-value for i^{th} species N = native species richness
Floristic Quality Index (FQI) (native species only)	$FQI = \bar{C}\ (\sqrt{N})$	
Mean Coefficient of Conservatism ($\bar{C}_{all}$) (all species)	$\bar{C}_{all} = \frac{\sum_{i=1}^{n} C_i}{S}$	S = species richness
Floristic Quality Index (FQI_{all}) (all species)	$FQI_{all} = \bar{C}_{all}\ (\sqrt{S})$	
[1]Abundance-weighted $\bar{C}$ ($\bar{C}_{adj}$)	$\bar{C}_{adj} = \frac{\sum_{i=1}^{n} x_i C_i}{\sum_{i=1}^{n} x_i}$	x_i = abundance value for i^{th} native species
[1]Abundance-weighted FQI (FQI_{adj})	$FQI_{adj} = \bar{C}_{adj}\ (\sqrt{N})$	
[2]Richness-corrected FQI (FQI')	$FQI' = \left(\frac{\bar{C}}{10}\frac{\sqrt{N}}{\sqrt{S}}\right) \times 100$	10 = maximum C-value correction factor

[1]Note that $\bar{C}_{adj}$ and FQI_{adj} may also be calculated for all species (not just natives) by substituting $\sqrt{S}$ and coefficients from $\bar{C}_{all}$ into these equations.
[2]The richness-corrected factor calculates FQI' as a percentage of the maximum attainable FQI (Miller and Wardrop 2006).

The most useful tool for assessing FQA floristic data from wetland monitoring and assessment sites is Universal FQA, a web-based tool that automatically calculates site inventory and transect or plot FQAs. FQA databases published for a number of geographic regions, including New Jersey and the five ecoregions in New Jersey, have already been imported into the website.

Two FQA metrics, Mean C and Cover-weighted Mean C (CwMean C), have been widely used in local and state projects for conducting wetland condition assessments. These metrics have been shown to respond well to associated stressor levels affecting wetlands. The Mean C metric simply requires a comprehensive vascular plant species list within a fixed plot area or a mapped area of a wetland, and the mean C metric score is the mean of the C values across all species. The CwMean C requires an estimate of the percent cover for each species; the C value for each species is then weighted by its cover, thereby providing a CwMean C value. The eFQA formulas used to develop the wetland group scores in this report used native and non-native taxa (all species) to calculate Mean C and CwMean C (Faber-Langendoen et al, 2022).

Of the 30 wetland groups presented only 24 eFQA condition metrics were developed; the additional 6 were not included in the northeast analysis due to lack of plots in the northeast states for those types because the mid-Atlantic disctribution of those wetland types reach their northern limit in New Jersey. Species lists with FQA Coefficient of Conservatism values are provided for those wetland groups without Constancy values or eFQA metric thresholds. The following table summarizes the eFQA condition thresholds of Mean C and Cover-weighted Mean C by wetland group. The Mean C and Cover-weighted Mean C metrics by Wetland Group in this report are summarized in the table below. These data are also included with each wetland group description.

WETLAND ECOSYSTEM		USNVC WETLAND GROUP	eFQA MEAN C	eFQA MEAN C	eFQA MEAN C	eFQA MEAN C	eFQA CW MEAN C	eFQA CW MEAN C	eFQA CW MEAN C	eFQA CW MEAN C
	Code	USNVC Group Name	Excellent	Good	Fair	Poor	Excellent	Good	Fair	Poor
FLOODED & SWAMP FOREST										
	G653	Laurentian-Acadian Floodplain Forest	> 4.6	4.6-4.1	4.1-2.9	< 2.9	> 5.0	5.0-4.2	4.2-2.7	< 2.7
	G673	Southcentral-Appalachian-Northeast Floodplain Forest	> 4.9	4.9-4.2	4.2-2.8	< 2.8	> 5.2	5.2-4.4	4.4-2.3	< 2.3
	G034	Oak-Sweetgum Floodplain Forest	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	G759	Southern Ash - Elm - Willow Floodplain Forest	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	G046	Laurentian-Acadian Alkaline Swamp	> 5.3	5.3-4.7	4.7-3.6	< 3.6	> 5.4	5.4-4.5	4.5-3.3	< 3.3
	G045	Laurentian-Acadian Acidic Swamp	> 6.2	6.2-4.9	< 4.9	[3.4]	> 6.4	6.4-4.6	< 4.6	[3.9]
	G667	Northeastern Forest Vernal Pool	> 5.0	5-4.3	< 4.3	[3.6]	> 5.0	5.0-4.0	< 4.0	[2.8]
	G902	Central Appalachian-Northeast Acidic Swamp	> 5.9	5.9-4.9	4.9-3.8	< 3.8	> 6.1	6.1-4.6	4.6-2	< 2.0
	G918	Central Appalachian-Northeast Alkaline Swamp	> 5.0	5.0-4.3	4.3-3.3	< 3.3	> 5.0	5.0-4.0	4-2.7	< 2.7
	G039	Northern Coastal Plain Swamp	> 5.7	5.7-5.0	5.0-4.0	< 4.0	> 6.0	6.0-4.7	4.7-2.6	< 2.6
FRESHWATER MARSH, WET MEADOW & SHRUBLAND										
	G125	Eastern North American Freshwater Marsh	> 4.8	4.8-3.8	3.8-1.1	< 1.1	> 4.8	4.8-3.4	3.4-1.5	< 1.5
	G903	Appalachian-Northeast Wet Meadow & Shrub Swamp	> 5.1	5.1-4.2	4.2-2.6	< 2.6	> 5.7	5.7-4.1	4.1-2.2	< 2.2
	G904	Laurentian-Acadian Wet Meadow & Shrub Swamp	> 5.1	5.1-4.2	<4.2	[2.2]	> 5.6	5.6-4.3	< 4.3	[2.4]
	G925	Laurentian-Acadian-Northeast Riverscour Vegetation	> 4.4	4.4-3.6	<3.6	[3.2]	> 4.7	4.7-3.7	< 3.7	[1.6]
	G755	Eastern North American Scrub & Herb Riverbed Wetland	> 4.1	4.1-3.1	3.1-2.0	< 2.0	> 5.0	5.0-3.5	3.5-1.6	< 1.6
	G756	Eastern North American Wet Shoreline Vegetation	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	G752	North Atlantic Coastal Interdunal Wetland	> 5.3	<5.3	[4.5]	[4.4]	> 6.1	< 6.1	[5.0]	[3.8]
	G916	North Atlantic Coastal Plain Pondshore	> 7.3	7.3-5.9	5.9-3.3	< 3.3	> 7.8	7.8-6.3	6.3-1.1	< 1.1
	G189	Northcentral & Northeastern Seep	> 5.6	5.6-4.7	4.7-3.5	< 3.5	> 5.9	5.9-4.7	4.7-3.7	< 3.7
	G914	North Atlantic Coastal Tidal Freshwater Marsh	> 5.5	5.5-4.4	<4.4	[4.0]	> 5.8	5.8-4.1	< 4.1	[4.0]
	G114	Eastern North American Freshwater Aquatic Vegetation	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
BOG & FEN										
	G805	Central Appalachian-Northeast Alkaline Fen	> 5.9	5.9-5.0	5.0-3.8	< 3.8	> 6.3	6.3 5.2	5.2-2.0	< 2.0
	G804	Eastern North American Boreal-Subboreal Alkaline Fen	> 6.5	6.5-5.2	< 5.2	[4.2]	> 6.9	6.9-5.9	< 5.9	[4.6]
	G1172	Eastern North American Boreal-Subboreal Bog & Acidic Fen	> 6.9	6.9-5.7	5.7-4.4	< 4.4	> 7.1	7.1-6.2	6.2-4.8	< 4.8
	G1171	North Atlantic Coastal Bog & Fen	> 7.0	7.0-5.3	5.3-4.4	< 4.4	> 7.7	7.7-5.7	5.7-3.9	< 3.9
SALT MARSH										
	G120	Atlantic & Gulf Coastal Brackish Salt Marsh	> 6.2	6.2-4.4	4.4-3.6	< 3.6	> 6.7	6.7-3.6	3.6-2.4	< 1.8
	G121	Atlantic & Gulf Coastal High Salt Marsh	> 7.5	7.5-5.7	5.7-4.2	<4.2	> 7.9	7.9- 6.0	6.0-3.9	< 2.4
	G122	Atlantic & Gulf Coastal Low Salt Marsh	> 7.6	7.6-7.3	<7.3	[4.8]	> 7.5	7.5-7.0	< 7.0	[3.9]
	G123	Atlantic & Gulf Coastal Tidal Flat & Panne	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*

IDENTIFYING WETLANDS: A KEY TO WETLAND TYPES IN NJ

Identifying Wetlands: A Key to Wetland Types/Groups in New Jersey

This key applies to native vegetation that has not been modified substantially by human activity or has recovered from human activity to the extent that disturbance is not obvious to the casual observer. Disturbed vegetation, referred to as "ruderal", is classified very broadly and can be found in the Ruderal key, which also includes agricultural fields and tree plantations. We have retained ruderal types here to cover ambiguous situations, however, if you know at the outset that the vegetation you are dealing with is highly altered, proceed to the Ruderal Key.

In the U.S. National Vegetation Classification (NVC) hierarchy groups are broadly classified vegetation types that generally have broad geographic ranges. Because vegetation is usually a continuum, rather than recognizable discreet categories, we impose a somewhat artificial line between two types, creating two groups that are distinct by their total floristic composition over their entire ranges. However, where the physical location of the classification distinction is made, this judgment is often difficult to make locally, and sometimes results in two similar types ending up in different groups. This is not an error, but rather, reflects the fact that the transition line between the two groups is in New Jersey, or that the type, although disjunct, shares more with a type in a different region than it does with any defined more locally.

Wetland vegetation is flooded periodically by rivers, rainwater or by groundwater; standing water is present through much of the growing season or persists just below the surface. The Key is sorted into Forested Wetlands and Open-Canopy Wetlands (Shrub, Herbaceous dominated); forested wetlands are further sorted by floodplain forest or swamp, and open canopy wetlands are sorted by shrub dominated or herbaceous dominated wetlands. Herbaceous wetlands are further sorted into freshwater and tidal marsh. Freshwater aquatic vegetation is included in this key. Note that this key includes more wetland groups than are in this report on wetlands and ecoregional floristic quality assessment condition threshold metrics.

WETLANDS

Forested wetlands ---------- **1**
Open-canopy wetlands---------- **12**

1a. Wetland forests of river floodplains ---------- **2**
1b. Wetland forests not associated with rivers ---------- **6**

2a. Floodplain forests subjected to anthropogenic disturbance dominated by young native trees characteristic of disturbed wetlands such as red maple, river birch, box-elder, sweet gum, black gum, and usually invasive-dominated understories----------
---------- **Northern & Central Native Ruderal Flooded & Swamp (G552)**
2b. Floodplain forests with more mature native trees, invasives may be present but not dominant -------- **3**

3a. Sweetgum, red maple, green ash, and/or sycamore are common; silver maple is lacking; limited to the Coastal Plain ---------- **4**
3b. Silver maple, river birch, sycamore, green ash, tuliptree are common trees, Piedmont, Highlands, Ridge & Valley ---------- **5**

4a. Wetland oaks (willow oak, pin oak, swamp chestnut oak) are usually dominant trees ---------- **Swamp Chestnut Oak – Laurel Oak – Sweetgum Floodplain Forest (G034)**
4b. Wetland oaks generally absent; green ash, American elm, black willow more characteristic ---------- **Green Ash - American Elm - Black Willow Floodplain Forest (G759)**

5a. River birch is absent; silver maple, American elm, green ash are important trees on floodplains with sugar maple and basswood on mesic terraces, or red maple and green ash dominant on the freshwater reaches of tidal rivers ---------- **Silver Maple – Green Ash – Black Ash Floodplain Forest (G653)**
5b. River birch, sycamore, tuliptree characteristic; green ash may or may not be present; pin oak occurs on small rivers, on freely drained floodplains or on higher terraces where mayapple, other rich herbs also occur ---------- **Silver Maple - American Sycamore - Sweetgum Floodplain Forest Group (G673)**

6a. Swamp forest in basins and along streams of the Coastal plain ---------- **7**
6b. Swamp forests in basins of the Piedmont, Highlands, and Ridge and Valley ---------- **8**

Coastal Plain Swamp Forest Wetlands

7a. Combinations of willow 2oak, red maple, sweetgum, characteristic; loblolly pine may be present in the Cape May region ---------- **Coastal Plain Hardwood Basin Swamp (G038)**
7b. Pitch pine or Atlantic white cedar characteristic, on peat, including freshwater tidal swamps ---------- **Northern Coastal Plain Swamp (G039)**

Piedmont, Highlands, Ridge & Valley Swamp Forest Wetlands

8a. Generally small ephemeral basins in a forested setting; shaded mostly by overhanging upland trees; vegetation very variable, from absent to scattered shrubs, grasses, and forbs ---------- **North and Central Forest Vernal Pool (G667)**
8b. Canopy trees are rooted in the wetland, not confined to upland trees shading the wetland ---------- **9**

9a. Swamp forests of the northwestern region of the state in the Ridge and Valley underlain by carbonate bedrock (dolomite, limestone, marble) ---------- **10**
9b. Swamp forests of northern New Jersey *not* underlain by carbonate bedrock ---------- **11**

10a. Combinations of red maple, black ash, and swamp white oak in swamp forests of poorly drained flats, watercourses, seepage areas, and backswamps of floodplains in areas influenced by alkaline soils and groundwater ---------- **Red Maple - Black Ash - Swamp White Oak Swamp Forest Group (G918)**
10b. Black ash, larch, and rich herb and shrub diversity comprising calcium-loving plants such as yellow ladies' slipper, shrubby cinquefoil, dwarf birch, water avens, and others ---------- **Northern White-cedar - Black Ash - Red Maple Swamp Forest Group (G046)**

11a. Red maple swamp characterized by presence of black gum, eastern hemlock, yellow birch, and spruce; substrate usually deep muck or peat, indicating prolonged inundation, in basins---------- ---------- ---------- **Red Maple - Red Spruce - Eastern Hemlock Swamp (G045)**
11b. Red maple, black gum, green ash, hemlock and yellow birch characteristic; diverse shrub layer, flooding is less prolonged, poorly drained, typically mucky, flats, watercourses, seepage areas, and backswamps of floodplains rather than in defined basins---------- ---------- **Red Maple - Blackgum - Green Ash Swamp Forest Group (G902)**

OPEN CANOPY WETLANDS

12a. Shrubs dominant ---------- **13**
12b. Graminoids and/or forbs dominant; shrubs may be present but not dominant ---------- **18**

13a. Shrub swamps and wet meadows of basins or along the edges of slow-moving rivers or streams; alders, silky dogwood, viburnum species characteristic ---------- **14**
13b. Shrub and herb dominated peatlands (bogs and fens) in basins or depressions, not influenced by riverine flooding ---------- **15**

14a. Shrub swamp and wet meadow dominated by winterberry, highbush blueberry, white meadowsweet, southern arrowwood, hazel alder, buttonbush, with graminoids and forbs such as Canada bluejoint, tussock sedge, sensitive fern, jewelweed, variable, occurs statewide ---------- ---------- **Appalachian-Northeast Wet Meadow & Shrub Swamp (G903)**
14b. Shrub swamp and wet meadow dominated by speckled alder, sweet gale, meadowsweet, and graminoids like Canada bluejoint and tussock sedge, northern NJ in the Highlands---------- ---------- **Laurentian-Acadian Wet Meadow & Shrub Swamp (G904)**

15a. Acidic peatlands (bogs and fens) on Coastal Plain and northern NJ dominated by ericaceous shrubs and graminoids, Sphagnum abundant---------- **16**
15b. Alkaline peatlands (calcareous and marl fens) in the dolomite and limestone areas in the Highlands and Ridge & Valley, dominated by shrubs, graminoids and forbs, non-Sphagnum brown mosses abundant---------- **17**

16a. Acidic bogs and fens of the Coastal Plain dominated by shrubs such as highbush blueberry, leatherleaf, sheep laurel, sweet pepperbush, cranberry, with herbaceous twigrush, white beaked-rush, and spatulate-leaved sundew, characteristic in the NJ Pinelands along streams and on the outer edge of the Coastal Plain where is can also occur at the estuarine interface; sphagnum mosses abundant, substrate deep peat, saturated by groundwater ---------- ---------- **Leatherleaf- Dwarf Huckleberry / Walter's Sedge Bog & Fen (G1171)**
16b. Acidic bogs of the Highlands and Ridge & Valley in northern NJ, freshwater wetland dominated by shrubs such as leatherleaf, sheep laurel, pale laurel, small cranberry, pitcher-plants, and tawny cotton-grass characteristic in ombrotrophic acidic bogs of the Highlands and Ridge & Valley---------- ---------- **Leatherleaf - Few-seed Sedge - Bog Laurel Eastern Boreal Bog & Acidic Fen (G1172)**

17a. Calcareous fens on shallow peat over characterized by shrubby cinquefoil, red-osier dogwood, alder-leaved buckthorn, and a rich diversity of sedges; cold, mineral-rich groundwater springs saturates the peat soil, also on marl lakeshores ---------- **Central Appalachian-Northeast Alkaline Fen (G805)**
17b. Calcareous fens on deep peat characterized by a patchwork of thin-leave graminoids sedges and forbs with shrubs such as shrubby cinquefoil, sweet gale, willow, alder, and dwarf birch, on gentle slopes with alkaline groundwater seepage or in depressions, and along wetland margins ---------- **Shrubby-cinquefoil - Woolly-fruit Sedge Eastern Boreal Alkaline Fen (G804)**

18a. Marsh, wet meadow & shrub swamp vegetation of coastal and maritime isolated basins ---------- **19**
18b. Marshes in basins, ponds, and along rivers, characterized by tall leaf forbs, cattails, tall bulrushes; standing water often deep ---------- **Eastern North American Freshwater Marsh (G125)**

19a. Coastal vegetation of maritime interdunal swales ---------- **North Atlantic Coastal Interdunal Wetland (G752)**
19b. Coastal vegetation of pond depressions and wet flats with seasonal water table fluctuations, often with strong vegetation zonation---------- **20**

20a. Coastal plain ponds dominated by beaked-rush, spikerush, yellow-eyed-grass, umbrella sedge, panic grasses, and *Sphagnum cuspidatum in wettest areas*---------- **Beaksedge - Spikerush - Yellow-eyed-grass species Pondshore & Wet Prairie Group) (G915)**
20b. Coastal plain ponds dominated by grasses and sedges with warty panicgrass, Walter's sedge, twig-rush, pipewort, spatulate-leaved sundew, meadowbeauty, and Sphagnum moss---------- **Beaksedge species - Spikerush species - Meadowbeauty species Pondshore Group) (G916)**

21a. Vegetation not influenced by tides, aquatic, floating and rooted emergent ---------- **22**
22b. Vegetation influenced by tides ---------- **26**

22a. Aquatic submerged and floating rooted vegetation and headwater spring seepage ---------- **23**
22b. Wet shores, riverbed and riverscour wetlands of the Piedmont, Highlands, and Ridge and Valley --- **24**

23a. Submerged vegetation, includes floating-leaved aquatics---------- **American White Water-lily - Sago Pondweed - Pondweed species Freshwater Aquatic Vegetation (G114)**
23b. Headwater seepage wetland dominated by large leafy forbs such as skunk cabbage; or graminoids such as tufted hairgrass, or golden saxifrage mostly occur in forested settings but occasionally found in open wetlands, aquatic mosses can grow in the seeps and floating aquatics in emergent groundwater springs---------- **North-Central & Northeastern Seep (G189)**

24a**.** Low energy shorelines of rivers and ponds, characterized by annual plants, emergent aquatic plants, graminoids, leafy forbs, and scattered shrubs, influenced by seasonal flooding---------- **Eastern North American Wet Shoreline Vegetation (G756)**
24b. High energy riverbed and riverscour vegetation ---------- **25**

25a. Small patch, rare community type of calcareous riverside outcrops with emergent groundwater; tufted hairgrass characteristic---------- **Gray Alder / Prairie Cordgrass - Tufted Hairgrass Riverscour Vegetation (925)**

25b. More common riverbed and wet shoreline riverside vegetation characterized by sedges, water willow, shrubby willows, Indian-hemp--------**Eastern North American Scrub & Herb Riverbed Wetland (G755)**

TIDAL WETLANDS

26a. Substrate sparse to unvegetated; intermittently exposed by tidal flooding---------- ---------- **North American North Atlantic Intertidal Shore (G387)**
26b. Substrate vegetated---------- **27**

27a. Vegetation flooded by fresh to oligohaline waters; occurs on upper reaches of tidal rivers; wild rice, amaranth, estuary pipewort and others, including tidal shrub swamps ---------- ---------- **North Atlantic Coastal Tidal Freshwater Marsh (G914)**
27b. Vegetation flooded by mesohaline to haline waters; salt and brackish marshes characterized by species of Spartina, narrow-leaved cattail, common three-square, sturdy bulrush, glassworts---------- **28**

28a. Marsh vegetation occurring on the mid-reaches of tidal rivers; characteristic species include smooth cordgrass, big cordgrass, narrow-leaved cattail, common three-square, sturdy bulrush ---------- ----------**Atlantic & Gulf Coast Brackish Tidal Marsh (G120)**
28b. Salt marsh vegetation behind barrier beaches or at the mouth of tidal rivers; may be dense to nearly unvegetated ---------- **29**

29a. Tall salt marsh vegetation dominated by smooth cordgrass with few other associates except glassworts---------- **Atlantic & Gulf Coast Low Salt Marsh (G122)**
29b. Salt marsh vegetation of lower stature and borders upland edge---------- **30**

30a. Saltmeadow cordgrass dominant, forming dense "cowlicks"; marsh elder may form a border to uplands or on tidal creek edges ---------- **Atlantic & Gulf Coast High Salt Marsh (G121)**
30b. Vegetation less dense to very sparse; glassworts dominant; short form of smooth cordgrass may be present; mucky substrate where water has ponded --- **Atlantic & Gulf Coast Saline Flat & Panne (G123)**

WETLAND FACT SHEETS

Wetland Fact Sheets

The following 30 USNVC Wetland Group fact sheets are organized by four major wetland ecosystems or USNVC Formations: Flooded & Swamp Forest; Freshwater Marsh, Wet Meadow & Shrub Swamp; Bog & Fen; and Salt Marsh. Descriptions of the USNVC Group vegetation, dynamics, and environment are provided with an ecoregion map of the wetland group distribution in New Jersey. A list of characteristic species by group sorted by constancy (percentage of stands or plots that contain the species) and a table with Ecoregional floristic quality assessment condition threshold metrics (Excellent-Good-Fair-Poor) are provided to help guide identification and assess ecological uplift in wetland restoration.

NatureServe. 2022. International Ecological Classification Standard: U.S. National Vegetation Classification. New Jersey Macrogroups, Groups, Alliances, and Associations. NatureServe Central Databases. Arlington, VA. Data current as of 14 October 2022. https://explorer.natureserve.org/

USNVC WETLAND ECOLOGICAL GROUPS IN NEW JERSEY		ECOREGIONS IN NJ				
Wetland Ecosystems and Groups		**67**	**58**	**64**	**84**	**63**
FLOODED & SWAMP FOREST						
Floodplain Forest Groups						
G653	Silver Maple - Green Ash - Black Ash Floodplain Forest	67	58			
G673	Silver Maple American Sycamore Sweetgum Floodplain Forest	67	58			
G034	Swamp Chestnut Oak – Laurel Oak – Sweetgum Floodplain Forest			64	84	63
G759	Green Ash - American Elm - Black Willow Floodplain Forest			64	84	63
Swamp Forest Groups						
G046	Northern White-cedar - Black Ash - Red Maple Swamp Forest Group	67	58			
G045	Red Maple - Red Spruce - Eastern Hemlock Swamp	67	58			
G667	Northeastern Forest Vernal Pool	67	58	64	84	63
G902	Red Maple - Blackgum - Green Ash Swamp Forest	67	58			
G918	Red Maple - Black Ash - Swamp White Oak Swamp Forest	67	58			
G039	Atlantic White-cedar - Pitch Pine Swamp				84	63
FRESHWATER MARSH, WET MEADOW & SHRUB SWAMP						
Marsh, Wet Meadow & Shrub Swamp Groups						
G125	Bulrush species - Cattail species Freshwater Marsh	67	58	64	84	63
G903	Appalachian-Northeast Wet Meadow & Shrub Swamp	67	58	64	84	63
G904	Laurentian-Acadian Wet Meadow & Shrub Swamp		58			
G925	Gray Alder/Prairie Cordgrass-Tufted Hairgrass Riverscour Vegetation	67	58			
G755	Eastern North American Scrub & Herb Riverbed Wetland	67	58	64		
G756	Eastern North American Wet Shoreline Vegetation	67	58	64	84	63
G752	North Atlantic Coastal Interdunal Wetland				84	
G915	Beaksedge - Spikerush - Yellow-eyed-grass Pondshore & Wet Prairie				84	63
G916	Beaksedge species - Spikerush species - Meadowbeauty Pondshore				84	63
Headwater Seep						
G189	Tawny Cottongrass - Jewelweed species - Skunk-cabbage Seep	67	58	64		
Freshwater Tidal Marsh						
G914	Annual Wild Rice - Saltmeadow Cordgrass - Tidal-marsh Amaranth Freshwater Tidal Marsh			64	84	63
Freshwater Aquatic Vegetation						
G114	American White Water-lily - Sago Pondweed - Pondweed species Freshwater Aquatic Vegetation	67	58	64	84	63
BOG & FEN						
G1171	Leatherleaf- Dwarf Huckleberry / Walter's Sedge Bog & Fen				84	63
G1172	Leatherleaf - Few-seed Sedge - Bog Laurel Eastern Boreal Bog & Acidic Fen	67	58			
G805	Central Appalachian-Northeast Alkaline Fen	67	58			
G804	Shrubby-cinquefoil - Woolly-fruit Sedge Eastern Boreal Alkaline Fen	67	58			
SALT MARSH						
G120	Smooth Cordgrass - Big Cordgrass – Common Threesquare Brackish Tidal Marsh *(moved to new G959 North Atlantic Brackish Tidal Marsh)*			64	84	63
G121	Saltmeadow Cordgrass - Jesuit's-bark High Salt Marsh *(moved/merged into new G957 North Atlantic Salt Marsh)*			64	84	63
G122	Smooth Cordgrass Low Salt Marsh *(moved/merged into new G957 North Atlantic Salt Marsh)*			64	84	63
G123	Saltwort species - Swampfire species - Gulf Cordgrass Tidal Flat & Panne *(moved/merged into new G957 North Atlantic Salt Marsh)*			64	84	63

FLOODED and SWAMP FOREST

Floodplain Forest Groups

G653 Silver Maple - Green Ash - Black Ash Floodplain Forest

G653 Laurentian Acadian Floodplain Forest

Silver Maple - Green Ash - Black Ash Floodplain Forest Group

***Acer saccharinum - Fraxinus pennsylvanica - Fraxinus nigra* Floodplain Forest Group**

Type Concept: This group occurs in the northeastern U.S. and temperate regions of eastern Canada, west to the upper Great Lakes region of Minnesota and Ontario. Forest canopy dominants can vary but typically are a combination of *Acer rubrum, Acer saccharinum, Acer saccharum, Fraxinus americana, Fraxinus nigra, Fraxinus pennsylvanica, Prunus serotina, Quercus rubra*, and *Ulmus americana*. Northward stands with *Picea glauca* or *Populus balsamifera* may occur. Shrub layer ranges from dense in patches to sparse. The herbaceous layer is typically diverse. Some common species include *Boehmeria cylindrica, Matteuccia struthiopteris*, and *Onoclea sensibilis*. It occurs along small and large rivers on slightly elevated alluvial terraces and active floodplains, along streams with small watersheds (<2 square miles), high-gradient or submontane portions of major rivers, and beside lakes. Soils range from alluvial sands to sand and alluvial loams to silt loams. Flooding occurs during spring runoff periods and during other peak floods.

Dynamics: Forests are flooded during spring runoff periods and during other peak floods.

Environment: Stands occur along slightly elevated to higher alluvial terraces and active floodplains, streams with small watersheds (<2 square miles), high-gradient or submontane portions of major rivers. It often occurs as a linear band within terraces, backwaters, bars, and islands of minor rivers and smaller tributaries, creeks, and drainages. Soils are typically well-drained to imperfectly drained and range from alluvial sands to sand and alluvial loams to silt loams. Soils can be temporarily inundated during spring floods, although some examples tend to be more mesic and may be considered uplands rather than wetlands.

Silver Maple - Green Ash - Black Ash Floodplain Forest Group (G653)
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

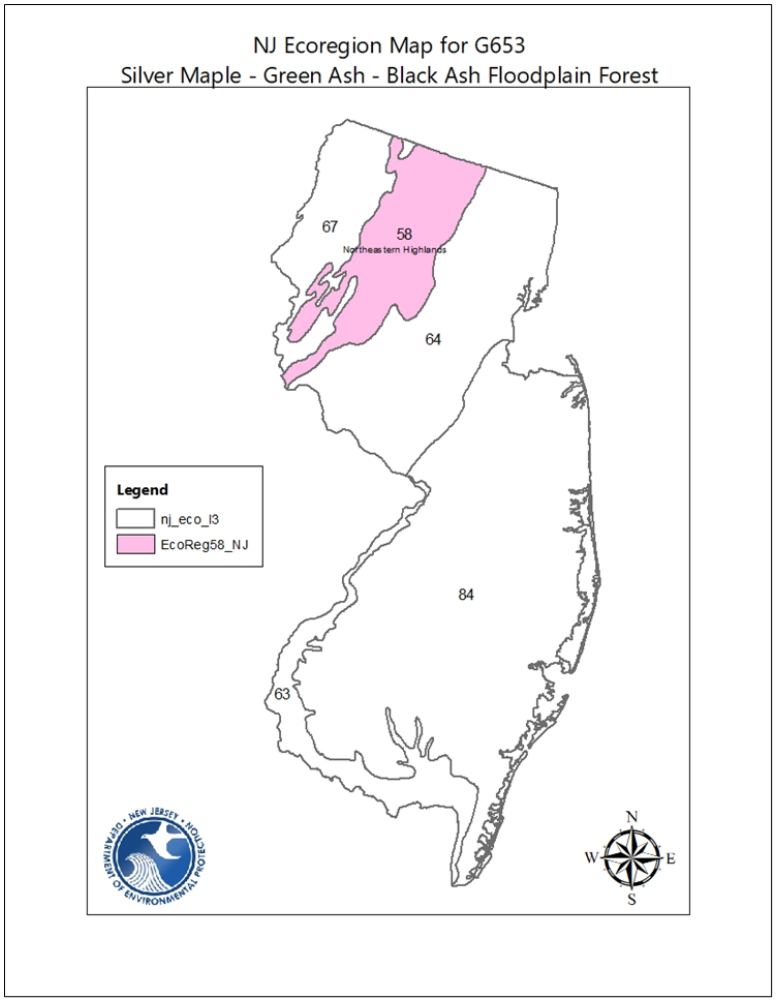
Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
TREES					
Acer saccharinum	Silver maple	ACSA2	**46**	21.5	5
Acer rubrum	Red maple	ACRU	**41**	10.2	3
Acer saccharum	Sugar maple	ACSA3	**40**	18.0	5
Ulmus americana	American elm	ULAM	**36**	1.6	6
Fraxinus pennsylvanica	Green ash	FRPE	**31**	2.6	5

Silver Maple - Green Ash - Black Ash Floodplain Forest Group (G653)

Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
Prunus virginiana	Choke cherry	PRVI	**24**	0.8	4
Quercus rubra	Northern red oak	QURU	**24**	4.0	5
Abies balsamea	Balsam fir	ABBA	**23**	1.9	9
Betula alleghaniensis	Yellow birch	BEAL2	**23**	2.1	8
SHRUBS					
Rubus pubescens	Dwarf blackberry	RUPU	**33**	1.9	7
Alnus incana	Speckled alder	ALIN2	**29**	2.3	6
Spiraea alba	White meadowsweet	SPAL2	**25**	0.7	5
Toxicodendron radicans	Poison ivy	TORA2	**23**	0.8	1
Corylus cornuta	Beaked hazelnut	COCO6	**22**	0.8	7
VINE/LIANA					
Clematis virginiana	Virgin's-bower	CLVI5	**24**	0.8	5
HERBACEOUS					
Onoclea sensibilis	Sensitive fern	ONSE	**67**	13.4	3
Arisaema triphyllum	Jack-in-the-pulpit	ARTR	**51**	0.7	5
Matteuccia struthiopteris	Ostrich fern	MAST	**50**	11.7	7
Thalictrum pubescens	Tall meadow-rue	THPU2	**50**	1.2	5
Athyrium filix-femina	Common lady fern	ATFI	**47**	2.1	6
Carex intumescens	Bladder sedge	CAIN12	**38**	0.5	5
Calamagrostis canadensis	Canada bluejoint	CACA4	**35**	4.8	5
Uvularia sessilifolia	Bellwort	UVSE	**34**	0.4	5
Maianthemum canadense	Canada mayflower	MACA4	**32**	1.0	4
Galium asprellum	Rough bedstraw	GAAS2	**29**	0.5	6
Laportea canadensis	Wood-nettle	LACA3	**28**	2.3	6
Veratrum viride	Green false hellebore	VEVI	**27**	1.6	7
Brachyelytrum aristosum	Northern short-husk	BRAR9	**26**	0.5	10
Osmunda regalis	Royal fern	OSRE	**25**	2.5	7
Carex projecta	Necklace sedge	CAPR9	**24**	0.2	8
Solidago rugosa	Wrinkle-leaf goldenrod	SORU2	**24**	0.4	3
Carex gracillima	Graceful sedge	CAGR2	**22**	0.5	7
Doellingeria umbellata	Parasol whitetop	DOUM2	**22**	0.3	4

FQA Metric Thresholds for Mean C and Cover-Weighted Mean C G653 Laurentian Acadian Floodplain Forest Group Silver Maple - Green Ash - Black Ash Floodplain Forest				
FQA Metric	**Excellent**	**Good**	**Fair**	**Poor**
Mean C	> 4.6	4.6-4.1	4.1-2.9	< 2.9
Cover-Weighted Mean C	> 5.0	5.0-4.2	4.2-2.7	< 2.7



For more information on finer scale floristic Alliances and Associations in **G653 Silver Maple - Green Ash - Black Ash Floodplain Forest Group** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A3715 Silver Maple - Red Maple - American Elm Floodplain Forest
This alliance is dominated by *Acer rubrum, Acer saccharinum, Ulmus americana*, and occasionally *Fraxinus pennsylvanica* and occurs in the northeastern U.S. and temperate regions of eastern Canada, west to the upper Great Lakes region of Minnesota and Ontario, where it occurs along small and large rivers, on higher terraces, and beside lake and larger streams.

Associations within A3715 in New Jersey:
CEGL006176 ***Acer saccharinum / Onoclea sensibilis - Boehmeria cylindrica*** **Floodplain Forest** (Silver Maple Floodplain Bottom Forest (Sensitive Fern Type)
CEGL006147 ***Acer saccharinum - (Populus deltoides) / Matteuccia struthiopteris - Laportea canadensis*** **Floodplain Forest** (Silver Maple Floodplain Levee Forest)

A3714 Sugar Maple - American Basswood Mesic Floodplain Forest
Varying canopy dominants typically include some combination of *Acer saccharum, Tilia americana, Fraxinus* spp., *Fraxinus pennsylvanica, Prunus serotina, Quercus rubra*, and *Ulmus americana*. This alliance ranges across the northeastern United States and the St. Lawrence and Atlantic regions of Canada along slightly elevated alluvial terraces and active floodplains, streams with small watersheds, high-gradient or submontane portions of major rivers.

G673 Silver Maple - American Sycamore - Sweetgum Floodplain Forest

G673 South Central-Appalachian-Northeast Floodplain Forest

Silver Maple - American Sycamore - Sweetgum Floodplain Forest Group

***Acer saccharinum* - *Platanus occidentalis* - *Liquidambar styraciflua* Floodplain Forest Group**

Type Concept: Stands of these floodplain forests are dominated by some combination of *Acer saccharinum, Betula nigra, Celtis laevigata, Fraxinus pennsylvanica, Liquidambar styraciflua, Liriodendron tulipifera, Platanus occidentalis*, and *Ulmus americana*. Other species that may be present include *Acer negundo*. This complex and widespread group is found in a broad band in the northeastern and middle parts of the eastern United States from southern New England and the Ontario lakeplains of New York south and west through the Interior Low Plateau of Ohio, Indiana, Illinois and Kentucky to the Ozarks of Arkansas and Missouri.

Dynamics: Large river floodplains that experience major flood events.

Environment: These forests occur on large river floodplains, where they occupy banks and first bottoms of major rivers with nutrient-rich silt loams, sand loams, and sands that are temporarily inundated, annually or less often, in major flood events.

Silver Maple - American Sycamore - Sweetgum Floodplain Forest Group (G673)
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

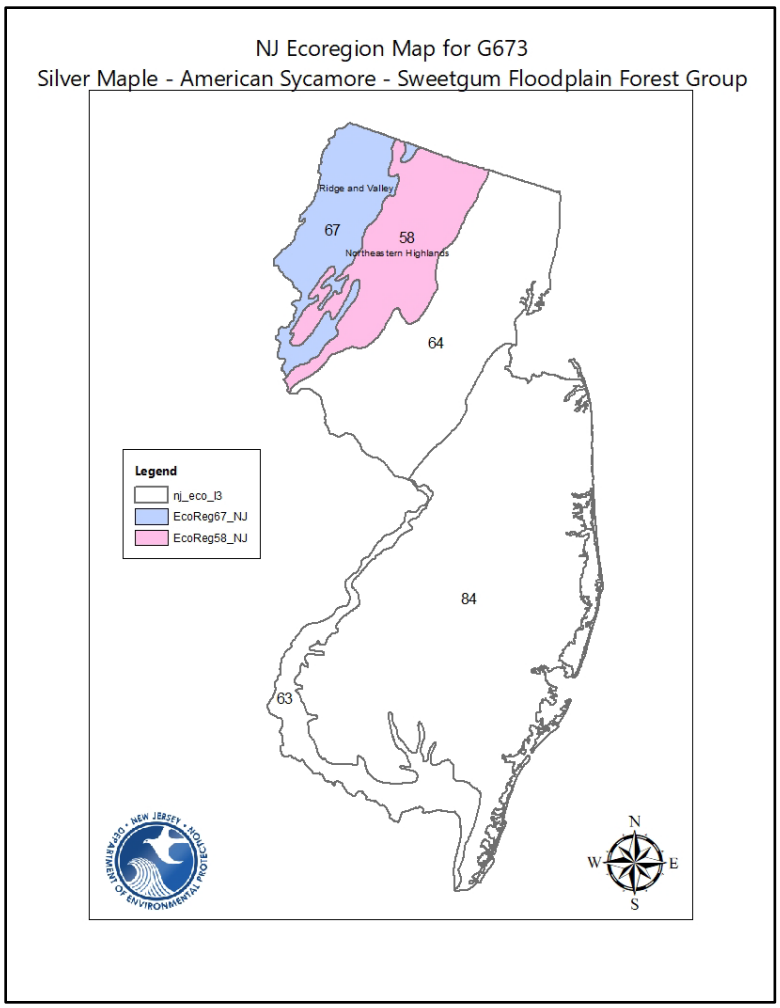
Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
TREES					
Acer rubrum	Red maple	ACRU	**46**	7.2	3
Fraxinus pennsylvanica	Green ash	FRPE	**43**	9.4	5
Acer saccharinum	Silver maple	ACSA2	**40**	14.9	5
Acer saccharum	Sugar maple	ACSA3	**40**	17.4	5
Ulmus americana	American elm	ULAM	**40**	5	6
Carya cordiformis	Bitternut hickory	CACO15	**23**	1.2	6
Fagus grandifolia	American beech	FAGR	**23**	1.9	6
Platanus occidentalis	Sycamore	PLOC	**23**	8.2	4
Quercus rubra	Northern red oak	QURU	**23**	5.5	5
Carpinus caroliniana	American hornbeam	CACA18	**20**	4.1	7
SHRUB					
Lindera benzoin	Spicebush	LIBE3	**49**	9.2	5
Viburnum recognitum	Northern arrow-wood	VIRE7	**29**	0.5	7
Cornus amomum	Silky dogwood	COAM2	**23**	0.3	5
Rosa multiflora	Multiflora rose	ROMU	**20**	0.2	0
Sambucus nigra	Black elderberry	SANI4	**20**	0.3	4
VINE/LIANA					
Toxicodendron radicans	Poison ivy	TORA2	**51**	4	1
Parthenocissus quinquefolia	Virginia-creeper	PAQU2	**29**	0.8	2

Silver Maple - American Sycamore - Sweetgum Floodplain Forest Group (G673)
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
HERBACEOUS					
Onoclea sensibilis	Sensitive fern	ONSE	**54**	15.3	3
Arisaema triphyllum	Jack-in-the-pulpit	ARTR	**51**	0.5	5
Polygonum virginianum	Jumpseed	POVI2	**40**	0.6	4
Laportea canadensis	Wood-nettle	LACA3	**34**	4.2	6
Alliaria petiolata	Garlic-mustard	ALPE4	**31**	0.4	0
Dryopteris intermedia	Evergreen wood fern	DRIN5	**31**	2	6
Symplocarpus foetidus	Skunk cabbage	SYFO	**31**	3.4	5
Boehmeria cylindrica	False nettle	BOCY	**26**	3.1	4
Circaea canadensis	Broad-leaf enchanter's-nightshade	CILU	**26**	0.6	3
Geum canadense	White avens	GECA7	**26**	0.4	5
Impatiens capensis	Jewelweed	IMCA	**26**	2.1	3
Pilea pumila	Clearweed	PIPU2	**26**	1.1	3
Carex bromoides	Brome-like sedge	CABR14	**23**	0.7	7
Dichanthelium clandestinum	Deertongue	DICL	**23**	1.2	2
Polystichum acrostichoides	Christmas fern	POAC4	**23**	0.8	5
Thalictrum pubescens	Tall meadow-rue	THPU2	**23**	0.4	5
Cinna arundinacea	Wood reedgrass	CIAR2	**20**	0.5	5
Eurybia divaricata	White wood aster	EUDI16	**20**	0.1	5
Leersia virginica	White grass	LEVI2	**20**	0.7	3
Podophyllum peltatum	Mayapple	POPE	**20**	0.8	6
Thelypteris noveboracensis	New York fern	THNO	**20**	2.8	4

FQA Metric Thresholds for Mean C and Cover-Weighted Mean C
G673 South Central Appalachian Northeast Floodplain Forest
Silver Maple - American Sycamore - Sweetgum Floodplain Forest Group

FQA Metric	Excellent	Good	Fair	Poor
Mean C	> 4.9	4.9-4.2	4.2-2.8	< 2.8
Cover-Weighted Mean C	> 5.2	5.2-4.4	4.4-2.3	< 2.3



For more information on finer scale floristic Alliances and Associations in **G673 Silver Maple - American Sycamore - Sweetgum Floodplain Forest Group** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A3699 Appalachian-Piedmont River Birch - Sycamore Floodplain Forest Alliance
These riverfront floodplain forests of the Alleghany Plateau, Appalachian, and Piedmont regions are dominated by *Betula nigra* and *Platanus occidentalis* with a variety of other canopy species, including *Acer negundo, Acer saccharinum, Celtis laevigata, Liquidambar styraciflua, Liriodendron tulipifera, Populus deltoides*, and *Salix nigra*.

Associations within A3699 in New Jersey:
CEGL003896 *Platanus occidentalis - Betula nigra - Salix (caroliniana, nigra)* Floodplain Forest (Piedmont-Central Appalachian Sycamore - River Birch Floodplain Forest)
CEGL006184 *Betula nigra - Platanus occidentalis / Impatiens capensis* Floodplain Forest (River Birch Low Floodplain Forest)

A3697 Appalachian-Piedmont Silver Maple Floodplain Forest Alliance
This alliance contains floodplain forests where *Acer saccharinum* is prevalent along major rivers in the Piedmont, Central Appalachians, and Chesapeake Bay regions from Maryland and Virginia north to Pennsylvania and New Jersey.

Associations within A3697 in New Jersey:
CEGL006217 ***Acer saccharinum - Acer negundo / Ageratina altissima - Laportea canadensis - (Elymus virginicus)*** **Floodplain Forest** (Piedmont-Central Appalachian Silver Maple Floodplain Forest)
CEGL006042 ***Acer saccharinum - Ulmus americana / Physocarpus opulifolius*** **Floodplain Forest** (Silver Maple - American Elm / Common Ninebark Floodplain Forest)

A3408 Central Appalachian-Northeast Pin Oak Floodplain Forest Alliance
These floodplain swamp forests are found along smaller rivers in southern New England and the northern Piedmont and are dominated by some combination of *Acer rubrum, Carya cordiformis, Fraxinus americana, Fraxinus pennsylvanica, Nyssa sylvatica, Platanus occidentalis, Quercus bicolor, Quercus palustris*, and *Ulmus americana*.

Associations within A3408 in New Jersey:
CEGL006185 ***Quercus palustris - Acer rubrum / Carex grayi - Geum canadense*** **Wet Forest** (Pin Oak Small River Floodplain Forest)
CEGL006386 ***Quercus bicolor - Acer rubrum / Carpinus caroliniana*** **Wet Forest** (Swamp White Oak Floodplain Forest)

A4473 Central Appalachian-Northeast Silver Maple Floodplain Forest Alliance
These floodplain forests are found throughout the Central Appalachian and northeastern United States primarily on the upper terraces of medium to large, regularly flooded floodplains where flood depth and duration are relatively less than immediately adjacent to the river channel. Strongly dominated by *Acer saccharinum*. *Ulmus rubra, Ulmus americana, Prunus serotina*, and *Fraxinus pennsylvanica.*

Associations within A4473 in New Jersey:
CEGL006001 ***Acer saccharinum - Ulmus americana / Onoclea sensibilis*** **Floodplain Forest** (Northeastern Silver Maple - Elm Floodplain Forest)

A3701 Central Appalachian-Piedmont Sycamore - Green Ash - Tuliptree Floodplain Forest
These are high-energy floodplain forests of rocky streambeds and alluvial deposits, found in the Appalachian and Piedmont regions, typically dominated by *Fraxinus pennsylvanica* and *Platanus occidentalis* with *Liquidambar styraciflua* and/or *Liriodendron tulipifera*.

Associations within A3701 in New Jersey:
CEGL006575 ***Fraxinus pennsylvanica - (Juglans nigra, Platanus occidentalis)*** **Floodplain Forest** (Green Ash - Mixed Hardwood Floodplain Forest)
CEGL006459 ***Acer saccharum - Fraxinus americana / Carpinus caroliniana / Podophyllum peltatum*** **Forest** (Mid-Atlantic High Terrace Hardwood Floodplain Forest)

CEGL006445 ***Carya cordiformis - Prunus serotina / Ageratina altissima*** **Forest** (Mid-Atlantic Terrace Floodplain Forest)
CEGL006036 ***Platanus occidentalis - Fraxinus pennsylvanica*** **Floodplain Forest** (Riverine Floodplain Forest (Early-Successional Type))
CEGL006901 ***Platanus occidentalis - Fraxinus pennsylvanica - Ulmus americana / Cornus sericea*** **Floodplain Forest** (Sinkhole Pond Floodplain Forest)

G034 Swamp Chestnut Oak – Laurel Oak – Sweetgum Floodplain Forest

G034 Oak - Sweetgum Floodplain Forest

Swamp Chestnut Oak – Laurel Oak – Sweetgum Floodplain Forest Group

***Quercus michauxii - Quercus laurifolia - Liquidambar styraciflua* Floodplain Forest Group**

Type Concept: This wetland forest group is a very broad one, in its environmental amplitude, its floristic diversity, and its biogeographic range. It is primarily affiliated with the Atlantic and Gulf coastal plains from Virginia to Texas, and the Mississippi River Alluvial Plain and adjacent Upper East Gulf Coastal Plain from Illinois, Missouri, and Kentucky south to Mississippi and Louisiana, but it also includes wetland, swamp, and riparian forests of the southern Piedmont from Virginia to Alabama. This group primarily encompasses vegetation dominated by members of the genus *Quercus*, along with *Liquidambar styraciflua, Ulmus* spp., and other trees, being generally known as bottomland hardwood forests. It primarily encompasses communities of streams and rivers of all orders and sizes, as well as some forests of isolated wetlands, including depression ponds. This group includes forests known as "blackwater" as well as "brownwater" examples. Some characteristic components of blackwater forests include *Nyssa biflora*, as well as *Quercus laurifolia, Quercus lyrata, Quercus nigra, Pinus taeda*, and *Magnolia virginiana* in higher portions of the floodplain. *Nyssa aquatica* is generally scarce or absent. Brownwater examples are also likely to contain *Platanus occidentalis, Celtis laevigata, Fraxinus pennsylvanica, Acer negundo*, and others. These stands also may include *Quercus michauxii,* and sometimes *Liquidambar styraciflua*. There is also some floristic variation between shorter and longer hydroperiod examples. *Quercus michauxii* is characteristic of shorter hydroperiod examples, and *Quercus lyrata, Quercus phellos*, and *Nyssa biflora* of longer hydroperiod ones.

Except in the very wet examples, understory, shrub, and herb layers are generally well-developed and woody vines are also prominent. *Arundinaria gigantea* is a common understory component in these forests on natural levees and higher point bars and may become dominant after thinning or removal of the overstory. Sandbars dominated by *Salix* spp. and/or *Populus* spp. may have an open-canopy (woodland) structure.

Most vegetation placed here is associated with rivers and streams, but some are referred to as "flatwoods." It includes riverfront vegetation, which is generally temporarily (but rarely seasonally) flooded, on point bars and natural levees adjacent to the river that formed them, as well as high bottomlands, some low bottomlands, as well as levees, ridges, terraces, and some sloughs and abandoned channel segments. These features are large and well-defined in larger river systems, but the forests of smaller floodplains and bottomlands are not differentiated by these depositional landforms, because these features are small and flooding regimes are variable. The hydrologic regime and the hydroperiod are also highly diverse in this group of forests.

Dynamics: Flooding is an important ecological factor in examples of this group and may be the most important factor separating this vegetation from that of adjacent uplands. In addition to disturbance, floods bring moisture and nutrient input, deposit sediment, exclude non-flood-tolerant species and disperse plant seeds. It is unclear how important aquatic fauna are when the system is flooded, but they may be important. The small flows, low gradient, and binding of sediment by vegetation limit channel shifts and sediment movement, but floods may cause local disturbance by scouring. Small rivers and streams, with small watersheds, have shorter and more variable flooding regimes than larger rivers. Floods

tend to be of short duration and unpredictably variable as to season and depth. Flood waters may have significant energy in higher-gradient systems but scouring and reworking of sediment rarely affect more than small patches. They are important in maintaining the small non-forested patches.

Most of these forests exist naturally as multi-aged old-growth forests driven by gap-phase regeneration. Windthrow is probably the most important cause of gaps, as wind disturbance is perhaps more important than in uplands because of frequently wet soils, less dense soils, and more shallow-rooted trees.

Fire does not appear to be a dominant factor, and most floodplain vegetation is not very flammable. Fire is probably more important in small stream examples than in larger river ones, because distances to uplands are short and because stream channels and sloughs are smaller and less effective as firebreaks. However, most of the vegetation is not very flammable and usually will not carry fire. However, historical references to canebrakes dominated by *Arundinaria gigantea* suggest that fire may have once been more possible and more important in at least some portions of stands.

Stands of this group with a shorter hydroperiod are subject to greater disturbance effects than those with longer hydroperiods. A variety of direct and indirect modern human influences have affected all stands. Many larger rivers have been dammed, and power generation and regulation of waterflow create unnatural flood regimes. Extensive erosion of uplands, caused by many years of poor agricultural practices, transported large amounts of sediment into floodplains. River bottoms were the focus of agriculture among Native Americans, so some members of this group have a long history of human clearing. A number of exotic plant species have invaded floodplains as well.

Environment: This group occurs near streams and small rivers, on floodplains and terraces affected by river flooding and on emergent bars and banks within channels. Depositional landforms, including levees, sloughs, ridges, terraces, and abandoned channel segments may be present within stands. The substrate is primarily alluvium. Soils are usually sandy to loamy but include local clayey and gravelly areas. Soils are generally fertile. The presence of alluvial soils may be as important a factor as ongoing flooding in differentiating these systems from adjacent uplands. Emergent and vegetated bars composed of material ranging from gravel to cobbles occur occasionally but are generally not extensive or as distinctive as they are on larger rivers. Floods are generally of short duration, and wetness is a major influence only within channels and where water is ponded in local depressions. The geologic substrate may be of any kind, but areas on Triassic sediments tend to have large floodplain systems even on fairly small streams.

Blackwater examples occur in floodplains of small streams of the coastal plain that carry little mineral sediment. These streams have their headwaters in sandy portions of the coastal plain. The water is usually strongly stained by tannins but has little suspended clay and is not turbid. Depositional landforms may be absent or may be present in limited variety and of small size. Soils are generally sandy in drier portions of the floodplain, mucky in wetter portions, or may be uniform organic soils. Soils are usually strongly acidic, but spring-fed rivers may have calcareous water and non-acidic soils. Flooding ranges from semipermanent in the wettest floodplains to intermittent and short in higher-gradient streams. Some small blackwater streams have most of their flow from sandhill seepage and have limited fluctuation in water levels.

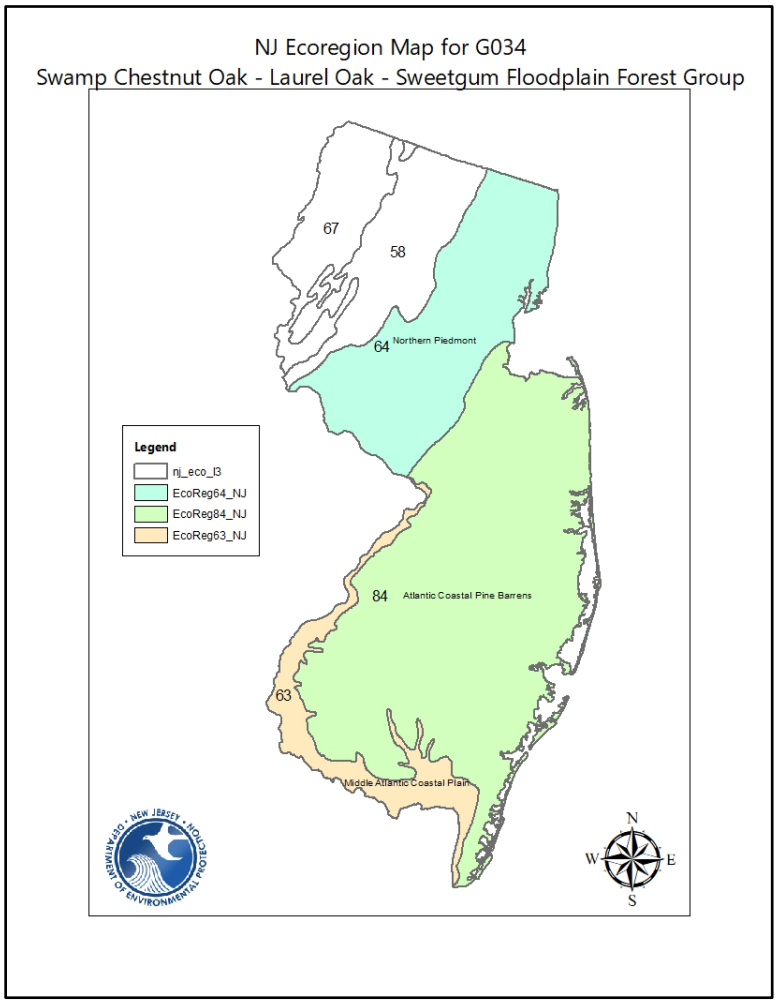
In contrast, brownwater or redwater river examples occur in floodplains of medium to small coastal plain rivers that carry significant mineral sediment. These rivers have their headwaters in the Piedmont, Blue Ridge, Interior Plateaus, or in portions of the coastal plain where fine-textured sediment predominates. The water generally carries substantial amounts of silt, clay, and sometimes sand. Depositional landforms such as point bars, natural levees, backswamps, and ridge-and-swale systems (scrollwork) are well-developed and form patterns of significant variation in flooding duration and nutrient input. Soil texture varies from sandy to clayey. Soils are generally fertile and not strongly acidic. Flooding ranges from semipermanent in the wettest areas to intermittent and short on the higher portions of the floodplain. The highest terraces may no longer flood at all and will be occupied by upland vegetation.

Swamp Chestnut Oak – Laurel Oak – Sweetgum Floodplain Forest (G034)
Floristic Composition: Species listed by Growth Form and Species

Scientific Name	Common Name	USDA Plants Code	NJ State CoC
Tree /Canopy			
Acer rubrum	Red maple	ACRU	3
Betula nigra	River birch	BENI	5
Fagus grandifolia	American beech	FAGR	6
Fraxinus pennsylvanica	Green ash	FRPE	5
Liquidambar styraciflua	Sweetgum	LIST2	3
Liriodendron tulipifera	Tuliptree	LITU	5
Nyssa sylvatica	Sourgum	NYSY	4
Platanus occidentalis	Sycamore	PLOC	4
Quercus lyrata	Over-cup oak	QULY	8
Quercus michauxii	Basket oak	QUMI	8
Quercus palustris	Pin oak	QUPA2	4
Quercus phellos	Willow oak	QUPH	6
Ulmus americana	American elm	ULAM	6
Shrub /Subcanopy			
Asimina triloba	Pawpaw	ASTR	6
Carpinus caroliniana	American hornbeam	CACA18	7
Cornus florida	Flowering dogwood	COFL2	5
Ilex opaca	American holly	ILOP	4
Lindera benzoin	Spicebush	LIBE3	5
Vines			
Campsis radicans	Trumpet creeper	CARA2	2
Parthenocissus quinquefolia	Virginia-creeper	PAQU2	2
Smilax rotundifolia	Roundleaf greenbrier	SMRO	2
Toxicodendron radicans	Poison ivy	TORA2	1
Herbaceous			
Arisaema triphyllum	Jack-in-the-pulpit	ARTR	5
Boehmeria cylindrica	False nettle	BOCY	4
Cardamine concatenata	Cutleaf toothwort	CACO26	7
Carex debilis	White-edged sedge	CADE5	6
Claytonia virginica	Spring-beauty	CLVI3	5
Geum virginianum	Virginia avens	GEVI4	7

Swamp Chestnut Oak – Laurel Oak – Sweetgum Floodplain Forest (G034) Floristic Composition: Species listed by Growth Form and Species			
Scientific Name	**Common Name**	**USDA Plants Code**	**NJ State CoC**
Impatiens capensis	Jewelweed	IMCA	3
Lycopus virginicus	Virginia water horehound	LYVI4	4
Pilea pumila	Clearweed	PIPU2	3
Ranunculus abortivus	Kidney-leaf buttercup	RAAB	2

This Mid-Atlantic Coast wetland type was not included in the NJ and Northeast ecoregional FQA analysis, therefore we do not have FQA Metric Thresholds for Mean C and Cover-Weighted Mean C at this time.



For more information on finer scale floristic Alliances and Associations in **G034 Swamp Chestnut Oak – Laurel Oak – Sweetgum Floodplain Forest Group** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A4439 Mid-Atlantic Coastal Floodplain Forest
This small to medium floodplain forest is found in the Mid-Atlantic Coastal Plain, from New Jersey south to Virginia. The tree canopy is dominated by *Platanus occidentalis, Fagus grandifolia, Quercus michauxii, Betula nigra, Liriodendron tulipifera*, and *Acer rubrum*.

Associations within A4439 in NJ:
CEGL006606 ***Acer rubrum - Fraxinus pennsylvanica / Saururus cernuus*** **Swamp Forest** (Chesapeake-Piedmont Red Maple / Lizard's-tail Swamp Forest)
CEGL006605 ***Quercus (phellos, palustris, michauxii) - Liquidambar styraciflua / Cinna arundinacea*** **Floodplain Forest** (Coastal Plain Oak Floodplain Forest)
CEGL006603 ***Platanus occidentalis - (Liquidambar styraciflua, Liriodendron tulipifera) / Asimina triloba*** **Floodplain Forest** (Coastal Plain Streamside Forest)

A3633 Piedmont Willow Oak Floodplain Forest
These floodplain swamp forests are found in the Piedmont and adjacent Atlantic Coastal Plain and Chesapeake Bay regions from New Jersey to Mississippi; their canopies are typically dominated by one or more of the following species: *Quercus laurifolia* (in the coastal plains) *Quercus palustris* (only from Virginia to New Jersey), and/or *Quercus phellos*.

G759 Green Ash - American Elm - Black Willow Floodplain Forest

G759 Southern Ash - Elm - Willow Floodplain Forest

Green Ash - American Elm - Black Willow Floodplain Forest Group

***Fraxinus pennsylvanica - Ulmus americana - Salix nigra* Floodplain Forest Group**

Type Concept: This group is composed of deciduous floodplain or swamp forests found primarily in the coastal plains of the southeastern United States. These forests are typically dominated by some combination of *Fraxinus pennsylvanica, Populus deltoides, Salix caroliniana, Salix nigra*, and *Ulmus americana*. In addition, some examples contain or are codominated by *Acer negundo, Betula nigra, Liquidambar styraciflua*, and/or *Platanus occidentalis*. The composition and physiognomy of the shrub and herbaceous layers are quite variable due to the broad geographic area in which this group occurs, as well as the dynamics of the frequent disturbances. Common shrubs include *Cornus drummondii, Ilex vomitoria, Lindera benzoin, Smilax* spp., and *Toxicodendron radicans*. Sites are typically on sandbars, riverfronts, and levees of rivers and small streams, though some examples occur on the edges of lakes, and one alliance occurs primarily in the swales of Atlantic coastal dunes.

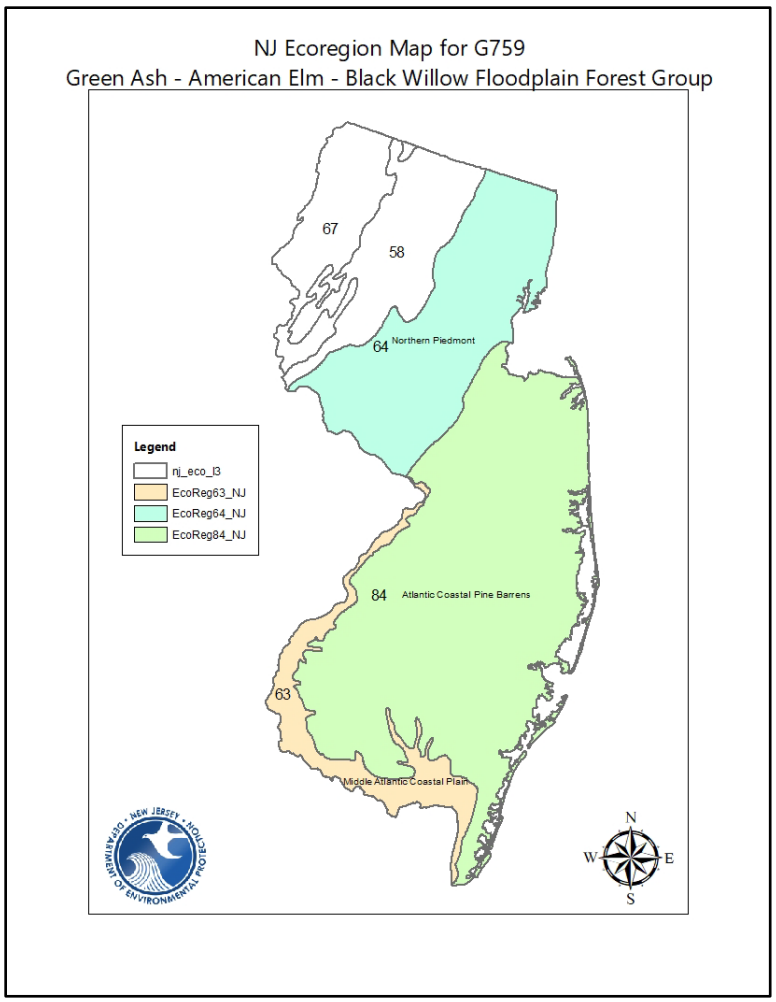
Dynamics: Flooding, seasonal or after heavy rains, is a critical part of the typical dynamics of this group.

Environment: *Soil/substrate/hydrology:* Soils are usually coarse- to medium-textured alluvium (sands to sandy loams). Water levels vary throughout the year with flooding typical at some point during the year.

Southern Ash -Elm - Willow Floodplain Forest Group (G759) **Green Ash - American Elm - Black Willow Floodplain Forest Group** Floristic Composition: Species listed by Growth Form and Species			
Scientific Name	**Common Name**	**USDA Plants Code**	**NJ State CoC**
TREE/CANOPY			
Acer negundo	Box-elder	ACNE2	2
Acer rubrum	Red maple	ACRU	3
Acer saccharinum	Silver maple	ACSA2	5
Betula nigra	River birch	BENI	5
Celtis occidentalis	Hackberry	CEOC	5
Fraxinus pennsylvanica	Green ash	FRPE	5
Juglans cinerea	Butternut	JUCI	6
Juglans nigra	Black walnut	JUNI	3
Liquidambar styraciflua	Sweetgum	LIST2	3
Platanus occidentalis	Sycamore	PLOC	4
Populus deltoides	Eastern cottonwood	PODE3	2
Prunus serotina	Wild black cherry	PRSE2	2
Salix nigra	Black willow	SANI	4
Ulmus americana	American elm	ULAM	6
Ulmus rubra	Slippery Elm	ULRU	7
SHRUB/SUBCANOPY			
Asimina triloba	Pawpaw	ASTR	6
Cornus drummondii	Roughleaf dogwood	CODR	0

Southern Ash -Elm - Willow Floodplain Forest Group (G759) **Green Ash - American Elm - Black Willow Floodplain Forest Group** Floristic Composition: Species listed by Growth Form and Species			
Scientific Name	**Common Name**	**USDA Plants Code**	**NJ State CoC**
Lindera benzoin	Spicebush	LIBE3	5
VINE			
Smilax rotundifolia	Roundleaf greenbrier	SMRO	2
Toxicodendron radicans	Poison ivy	TORA2	1
HERBACEOUS			
Boehmeria cylindrica	False nettle	BOCY	4
Carex grayi	Gray's sedge	CAGR5	6
Carex laevivaginata	Smooth-sheathed sedge	CALA14	7
Carex lupulina	Hop sedge	CALU4	6
Carex retroflexa	Reflexed sedge	CARE9	5
Carex stricta	Tussock sedge	CAST8	5
Chasmanthium latifolium	Indian wood-oats	CHLA5	7
Commelina virginica	Virginia dayflower	COVI3	0
Glyceria septentrionalis	Floating manna grass	GLSE3	6
Symplocarpus foetidus	Skunk cabbage	SYFO	5

This Mid-Atlantic Coast wetland type was not included in the NJ and Northeast ecoregional FQA analysis, therefore we do not have FQA Metric Thresholds for Mean C and Cover-Weighted Mean C at this time.



For more information on finer scale floristic Alliances and Associations in **G759 Green Ash - American Elm - Black Willow Floodplain Forest Group** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A3707 Coastal Plain Sycamore - Green Ash - Elm Floodplain Forest

Stands are dominated by some combination of *Fraxinus pennsylvanica, Platanus occidentalis*, and *Ulmus americana*. Examples may also contain the trees *Acer negundo, Acer rubrum, Acer saccharinum, Acer saccharum, Celtis laevigata, Celtis occidentalis, Juglans cinerea, Juglans nigra, Liquidambar styraciflua, Prunus serotina*, and *Ulmus rubra*, as well as the small trees and shrubs *Asimina triloba, Ilex decidua*, and *Lindera benzoin*, as well as the herbs *Boehmeria cylindrica, Carex grayi, Carex laevivaginata, Carex lupulina, Carex stricta, Carex retroflexa, Carpinus caroliniana, Chasmanthium latifolium, Commelina virginica, Glyceria septentrionalis, Leersia lenticularis*, and *Symplocarpus foetidus*. This alliance is primarily found in the Atlantic Coastal Plain, East Gulf Coastal Plain, and adjacent Piedmont from New Jersey (and possibly Pennsylvania) south and west to Alabama and possibly Mississippi. The associations attributed to this alliance are primarily temporarily flooded, but some have longer hydroperiods and are called seasonally flooded. The temporarily flooded forests of this alliance occur on base-rich alluvial sites in floodplains of large and small alluvial or brownwater rivers. Landforms include low ridges, terrace flats, and sloughs of

first bottoms. Species composition differs somewhat among different geographies and topographic positions. The wetter stands occupy level or nearly level soils that formed in water-deposited clayey or loamy sediments on floodplains of rivers and large perennial streams in the Coastal Plain and adjacent Piedmont. These soils are flooded or saturated for a significant portion of the growing season, and water may be ponded for most of the year in shallow depressions.

Swamp Forest Groups

G046 Northern White-cedar - Black Ash - Red Maple Swamp Forest Group

G046 Laurentian-Acadian Alkaline Swamp
Northern White-cedar - Black Ash - Red Maple Swamp Forest Group
***Thuja occidentalis* - *Fraxinus nigra* - *Acer rubrum* Swamp Forest Group**

Type Concept: These forested wetlands are found across the temperate regions of eastern to south-central Canada, southward from northern New England to the upper Midwest and down to the high plateau of the Allegheny Mountains. They occur in areas where circumneutral to alkaline pH and/or higher nutrient levels are associated with a rich flora. Examples of this group also occur within swales along the dunes of the Great Lakes. The substrate is typically mineral soil, but there may be extensive peat in examples occurring on the margins of peatland complexes. *Thuja occidentalis* is a diagnostic canopy species and may dominate the canopy or be mixed with other conifers or with deciduous trees, most commonly *Acer rubrum* or *Fraxinus nigra*. Some examples are strongly dominated by deciduous hardwoods, such as *Fraxinus nigra* (less often *Fraxinus americana*) and *Acer rubrum*. *Larix laricina*, a deciduous conifer, may dominate some stands within this group. Shrub species commonly occur and range in cover from sparse to dense depending on canopy cover. The herb layer tends to be more diverse than in acidic swamps and some examples may have extensive bryophytes. Examples of this group may occur on seepages, in a basin setting, or alluvial settings. A hummock-and-hollow topography is typical. Logging, especially of *Thuja occidentalis*, has influenced the structure and dominance of many examples of this group.

Dynamics: Tip-up mounds caused by blowdowns are common, in part because the very wet soils permit only shallow rooting by *Thuja occidentalis*. Logging, especially of *Thuja occidentalis*, has influenced the structure and dominance of this group. Acreage of hardwood-conifer swamp has been reduced by conversion of wetlands for agriculture and other human uses.

Environment: Stands occur on level to gently sloping ground with wet, organic or mineral soil. Typical stands occur along the margins of peatlands, in drainage courses, shores of lakes and rivers above flooding level, or in shallow depressions. Some examples occur in swales within dunal areas of the Great Lakes. Stands occur on wet, saturated soils. Substrate is either wet mineral soils or well-decomposed peat, and hummocky topography is present. The groundwater is moderately minerotrophic and has circumneutral to alkaline pH.

Laurentian-Acadian Alkaline Swamp (G046)
Northern White-cedar - Black Ash - Red Maple Swamp Forest Group
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
TREE					
Acer rubrum	Red maple	ACRU	**92**	24.6	3

Laurentian-Acadian Alkaline Swamp (G046)
Northern White-cedar - Black Ash - Red Maple Swamp Forest Group
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
Betula alleghaniensis	Yellow birch	BEAL2	**69**	11.4	8
Fraxinus nigra	Black ash	FRNI	**57**	10	9
Tsuga canadensis	Eastern hemlock	TSCA	**55**	16.9	8
Pinus strobus	Eastern white pine	PIST	**52**	4	5
Abies balsamea	Balsam fir	ABBA	**38**	5.2	9
Thuja occidentalis	Arborvitae	THOC2	**36**	14	10
Quercus rubra	Northern red oak	QURU	**35**	0.4	5
Ulmus americana	American elm	ULAM	**27**	0.8	6
Acer pensylvanicum	Striped maple	ACPE	**24**	0.3	7
Fagus grandifolia	American beech	FAGR	**24**	0.6	6
Acer saccharum	Sugar maple	ACSA3	**23**	1	5
Picea rubens	Red spruce	PIRU	**23**	1.8	8
Acer spicatum	Mountain maple	ACSP2	**20**	0.9	8
Amelanchier sp.	Serviceberry	AMELA	**20**	0.1	7
SHRUB					
Rubus pubescens	Dwarf blackberry	RUPU	**67**	2.9	7
Ilex verticillata	Winterberry	ILVE	**63**	4.9	6
Alnus incana	Speckled alder	ALIN2	**45**	4.2	6
Vaccinium corymbosum	Highbush blueberry	VACO	**39**	2.9	5
Viburnum nudum	Possumhaw	VINU	**32**	0.4	8
Ilex mucronata	Catberry	ILMU	**28**	1	9
Cornus sericea	Red-osier dogwood	COSE16	**23**	0.2	7
Spiraea alba	White meadowsweet	SPAL2	**23**	0.3	5
Rubus hispidus	Bristly dewberry	RUHI	**22**	0.3	5
Lonicera canadensis	American fly honeysuckle	LOCA7	**21**	0.2	9
VINE					
Toxicodendron radicans	Poison ivy	TORA2	**37**	0.5	1
Parthenocissus quinquefolia	Virginia-creeper	PAQU2	**22**	0.2	2
HERBACEOUS					
Osmunda cinnamomea	Cinnamon fern	OSCI	**81**	13.6	5
Coptis trifolia	Goldthread	COTR2	**67**	1.5	10
Onoclea sensibilis	Sensitive fern	ONSE	**63**	5.4	3
Trientalis borealis	Star-flower	TRBO2	**62**	0.4	5
Maianthemum canadense	Canada mayflower	MACA4	**59**	0.5	4
Thelypteris palustris	Eastern marsh fern	THPA	**53**	0.9	4
Aralia nudicaulis	Wild sarsaparilla	ARNU2	**52**	0.6	5
Arisaema triphyllum	Jack-in-the-pulpit	ARTR	**50**	0.3	5
Carex trisperma	threeseeded sedge	CATR10	**42**	1.8	10

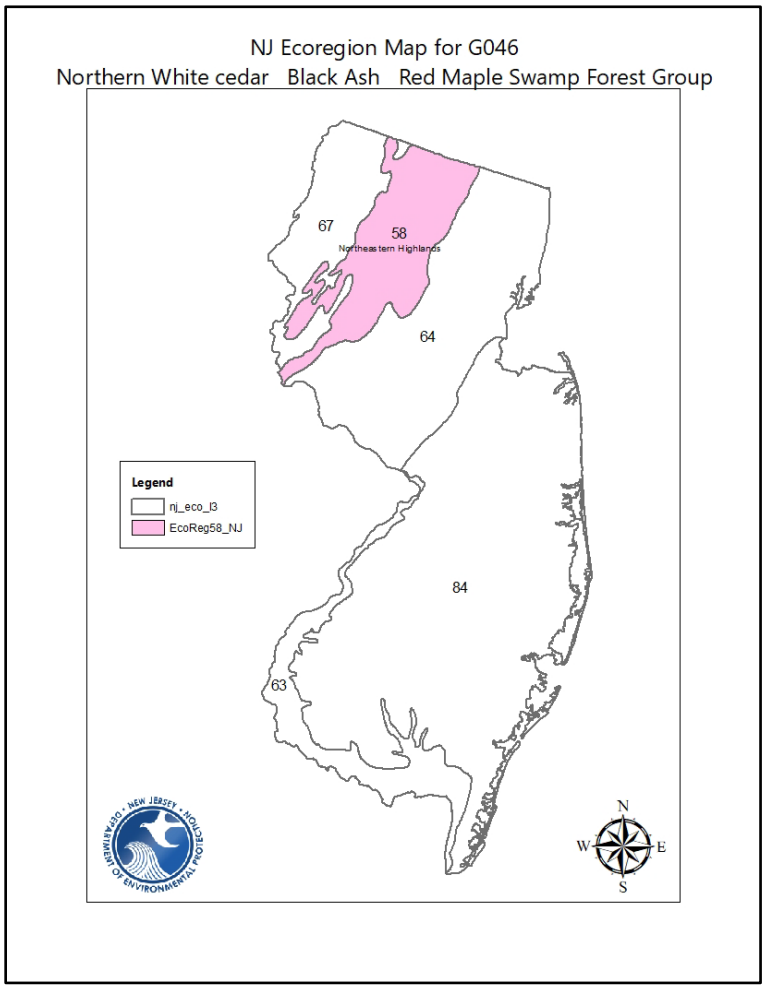
Laurentian-Acadian Alkaline Swamp (G046)
Northern White-cedar - Black Ash - Red Maple Swamp Forest Group
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
Dryopteris cristata	Crested shield fern	DRCR4	**42**	0.2	8
Impatiens capensis	Jewelweed	IMCA	**41**	1.6	3
Lycopus uniflorus	Northern bugleweed	LYUN	**38**	0.4	4
Osmunda regalis	Royal fern	OSRE	**38**	3.4	7
Athyrium filix-femina	Common lady fern	ATFI	**36**	1.3	6
Tiarella cordifolia	Foamflower	TICO	**36**	0.9	8
Glyceria striata	Fowl manna grass	GLST	**34**	0.3	4
Thalictrum pubescens	Tall meadow-rue	THPU2	**33**	0.7	5
Carex intumescens	Bladder sedge	CAIN12	**32**	0.2	5
Chelone glabra	Turtlehead	CHGL2	**32**	0.2	6
Clintonia borealis	Bluebead	CLBO3	**32**	0.2	10
Mitchella repens	Partridge-berry	MIRE	**30**	0.2	5
Carex leptalea	Bristlystalked sedge	CALE10	**28**	0.3	9
Scutellaria lateriflora	Mad-dog skullcap	SCLA2	**24**	0.1	4
Dryopteris intermedia	Evergreen wood fern	DRIN5	**23**	0.5	6
Lysimachia terrestris	Swamp-candles	LYTE2	**23**	0.3	5
Oclemena acuminata	Whorled wood aster	OCAC	**23**	0.2	7
Oxalis montana	Mountain wood-sorrel	OXMO	**23**	0.7	0
Symphyotrichum puniceum	Purplestem aster	SYPU	**23**	0.3	4
Viola sp.	Violet	VIOLA	**23**	0.2	6
Solidago rugosa	Wrinkle-leaf goldenrod	SORU2	**22**	0.1	3
Thelypteris noveboracensis	New York fern	THNO	**22**	0.5	4
Chrysosplenium americanum	Golden saxifrage	CHAM2	**21**	0.6	9
Dryopteris carthusiana	Spinulose wood fern	DRCA11	**21**	0.1	5
Carex disperma	Soft-leaf sedge	CADI6	**20**	0.4	10
Galium triflorum	Fragrant bedstraw	GATR3	**20**	0.1	5
NON-VASCULAR					
Thuidium delicatulum	Delicate Fern Moss	THDE10	**36**	4.6	3
Bazzania trilobata	Threelobed Bazzania	BATR5	**27**	1	5
Sphagnum sp.	Sphagnum	SPHAG2	**27**	8.1	7
Moss	Moss		**21**	2.2	5

FQA Metric Thresholds for Mean C and Cover-Weighted Mean C
G046 Laurentian-Acadian Alkaline Swamp
Northern White-cedar - Black Ash - Red Maple Swamp Forest Group

FQA Metric	Excellent	Good	Fair	Poor
Mean C	> 5.3	5.3-4.7	4.7-3.6	< 3.6

FQA Metric Thresholds for Mean C and Cover-Weighted Mean C G046 Laurentian-Acadian Alkaline Swamp Northern White-cedar - Black Ash - Red Maple Swamp Forest Group				
Cover-Weighted Mean C	> 5.4	5.4-4.5	4.5-3.3	< 3.3



For more information on finer scale floristic Alliances and Associations in **G046 Northern White-cedar - Black Ash - Red Maple Swamp Forest Group** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A4463 Black Ash - Red Maple - Tamarack Acadian-Appalachian Swamp Forest Alliance
This alliance is found in the Northern Appalachian and Acadian regions of the United States and eastern temperate Canada in poorly drained depressions or seepage zones and is typically dominated by *Acer rubrum* and *Fraxinus nigra*.

Associations within A4463 in New Jersey:
CEGL006009 ***Acer rubrum - Fraxinus nigra - (Larix laricina) / Rhamnus alnifolia*** **Swamp Forest** (Red Maple - Black Ash Rich Seepage Swamp Forest)

G045 Red Maple - Red Spruce - Eastern Hemlock Swamp

G045 Appalachian Red Spruce Acidic Swamp

Red Maple - Red Spruce - Eastern Hemlock Swamp Group

***Acer rubrum - Picea rubens - Tsuga canadensis* Swamp Group**

Type Concept: This group includes north-temperate acidic, nutrient-poor swamps of the northeastern U.S. and adjacent Canada, from southeastern Canada and New England to New York through the Central Appalachians south to Virginia and west to Ohio. They occur on mineral soils that are nutrient-poor; there may be an organic epipedon, and the substrate may be shallow to deep peat. Most are basin wetlands that remain saturated for all or nearly all of the growing season and may have standing water seasonally. Some occur on gently sloping seepage lowlands, and even basin settings may have some seepage influence, especially near the periphery. *Acer rubrum* is a nearly constant and often dominant to codominant tree species. It may form a mostly deciduous canopy with *Fraxinus* spp., *Betula alleghaniensis*, or *Nyssa sylvatica*, or it may be mixed with conifers. *Tsuga canadensis* is the most widespread conifer in associations of this group. From central New England and New York north, *Picea rubens* is a characteristic associate (less commonly *Picea mariana*). *Larix laricina, Pinus strobus*, and *Abies balsamea* are occasional and in some places may be locally important. The herbaceous and shrub layers tend to be fairly species-poor. *Ilex mucronata, Viburnum nudum var. cassinoides, Ilex verticillata*, and *Vaccinium corymbosum* are typical shrubs through much of the range of this group, and *Rhododendron maximum* is often important in the central and southern portions of this group's range. Typical herbs include *Osmunda* spp., *Onoclea sensibilis, Dryopteris cristata, Carex folliculata, Carex intumescens, Carex stricta*, and *Carex scabrata*, among others. *Sphagnum* is an important component of the bryoid layer. In many swamps, species richness tends to be higher near the periphery where seepage waters influence the hydrology.

Dynamics: Saturated soils with standing water often present during the growing season.

Environment: These swamps develop in depressions within the landscape where soils are poorly to very poorly drained. The soils remain saturated for most or all of the growing season, and in most of these swamps, standing water is present for at least part of the season. The pH is weakly to moderately acidic. Stands occur on nutrient-poor mineral soils, or on shallow to deep peat.

Red Maple – Red Spruce – Eastern Hemlock Swamp Group (G045)

Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
TREE					
Acer rubrum	Red maple	ACRU	**82**	21.4	3
Picea rubens	Red spruce	PIRU	**68**	29.9	8
Abies balsamea	Balsam fir	ABBA	**65**	14.7	9
Betula alleghaniensis	Yellow birch	BEAL2	**46**	4.8	8
Tsuga canadensis	Eastern hemlock	TSCA	**36**	5.7	8

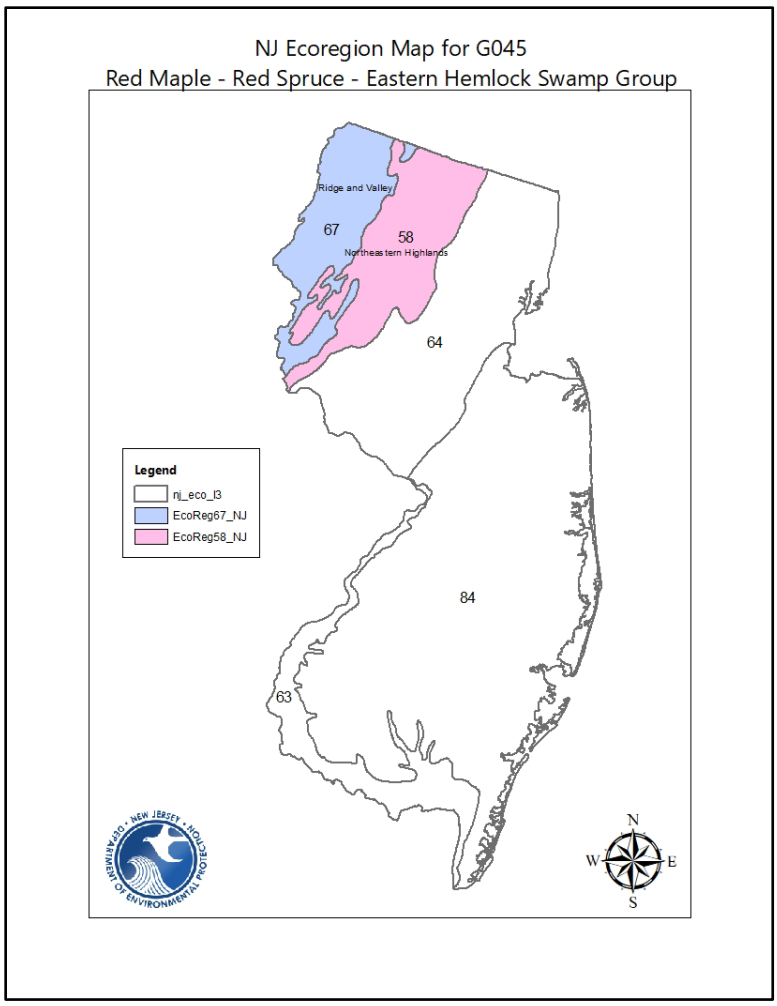
Red Maple – Red Spruce – Eastern Hemlock Swamp Group (G045)

Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
Sorbus americana	American mountain Ash	SOAM3	**29**	0.2	8
Pinus strobus	Eastern white pine	PIST	**27**	1.4	5
Fagus grandifolia	American beech	FAGR	**25**	0.6	6
Quercus rubra	Northern red oak	QURU	**25**	0.4	5
Larix laricina	American larch	LALA	**23**	3	10
Picea mariana	Black spruce	PIMA	**20**	6.9	10
SHRUB					
Ilex mucronata	Catberry	ILMU	**61**	5.3	9
Viburnum nudum	Possumhaw	VINU	**53**	3	8
Gaultheria hispidula	Creeping snowberry	GAHI2	**48**	1.1	10
Ilex verticillata	Winterberry	ILVE	**47**	3.4	6
Vaccinium corymbosum	Highbush blueberry	VACO	**37**	6.9	5
Vaccinium angustifolium	Low sweet blueberry	VAAN	**33**	0.9	7
Kalmia angustifolia	Sheep laurel	KAAN	**31**	0.4	5
Rubus pubescens	Dwarf blackberry	RUPU	**27**	0.8	7
Alnus incana	Speckled alder	ALIN2	**25**	2.4	6
Rubus hispidus	Bristly dewberry	RUHI	**20**	0.2	5
HERBACEOUS					
Coptis trifolia	Goldthread	COTR2	**75**	2.3	10
Carex trisperma	threeseeded sedge	CATR10	**72**	8.2	10
Osmunda cinnamomea	Cinnamon fern	OSCI	**70**	8.7	5
Maianthemum canadense	Canada mayflower	MACA4	**52**	0.5	4
Trientalis borealis	Star-flower	TRBO2	**52**	0.4	5
Aralia nudicaulis	Wild sarsaparilla	ARNU2	**40**	0.3	5
Clintonia borealis	Bluebead	CLBO3	**33**	0.2	10
Oxalis montana	Mountain wood-sorrel	OXMO	**27**	0.9	0
Dryopteris intermedia	Evergreen wood fern	DRIN5	**25**	0.4	6

FQA Metric Thresholds for Mean C and Cover-weighted Mean C
G045 Appalachian Red Spruce Acidic Swamp
Red Maple – Red Spruce – Eastern Hemlock Swamp Group

FQA Metric	Excellent	Good	Fair	Poor
Mean C	>6.2	6.2-4.9	<4.9	[3.4]
Cover-Weighted Mean C	>6.4	6.4-4.6	<4.6	[3.9]



For more information on finer scale floristic Alliances and Associations in **G045 Red Maple – Red Spruce – Eastern Hemlock Swamp Group** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A3418 Acadian-Appalachian Acidic Swamp Forest

This alliance includes swamp forests of the Northern Appalachians and southern Canada dominated by *Picea rubens*, often admixed with *Abies balsamea, Acer rubrum*, and *Betula alleghaniensis*. These swamp forests are generally not "boggy" in nature, and lack significant peat, although deep muck may overlie mineral soil. The shrub layer is characterized by *Ilex 44ucronate, Vaccinium corymbosum, Ilex verticillata*, and *Sorbus americana*. The herbaceous layer is characterized by *Carex trisperma, Clintonia borealis, Gaultheria hispidula*, and others of northern climates. This alliance includes red spruce-fir- or fir-dominated swamps of northern and/or montane regions of the eastern United States and Canada. Canopy associates may include *Acer rubrum, Betula alleghaniensis, Tsuga canadensis*, and *Larix laricina*. Communities of this alliance are "swamps" as opposed to "bog forests" in that they lack significant *Sphagnum* peat accumulation. Soils are saturated mucks over generally acidic outwash materials and other mineral soils in the glaciated and unglaciated portions of the range. Although *Picea rubens* is the predominant spruce, *Picea mariana* or *Picea glauca* are occasionally dominant in the northern portion of

the range. Typical understory species include *Vaccinium corymbosum, Ilex mucronata, Viburnum nudum var. cassinoides*, and, in the southern portion of the range, *Rhododendron maximum* or *Hypericum densiflorum*. Ground flora includes *Carex trisperma, Coptis trifolia, Cornus canadensis, Maianthemum canadense, Osmunda cinnamomea, Oxalis montana*, and *Gaultheria hispidula*. Feathermosses are common and *Sphagnum* is patchy.

G667 Northeastern Forest Vernal Pool

G667 Northeastern Forest Vernal Pool Group

Northeastern Forest Vernal Pool Group

Type Concept: This broadly defined group comprises sparsely vegetated northeastern vernal woodland pools that are important breeding habitats for amphibians and invertebrates; vegetation is widely variable. The association in this group is characterized by seasonally fluctuating water levels; the substrate may dry out completely in the summer. Hydrology may be affected by impermeable soils, seasonally high-water tables, seasonal flooding in nearby streams and drainages, and/or impervious bedrock at or near the surface. The substrate is mineral soil with or without a layer of muck. The species composition is variable among sites, as well as annually and seasonally. Larger examples of this community type may exhibit strong zonation. Many smaller, shaded vernal ponds are unvegetated, their bottoms consisting of dead leaves and algae.

Dynamics: These pools are usually isolated, with rainwater and groundwater the sources of inundation. Water levels decrease through the growing season and are often lacking standing water by late summer.

Environment: This group occurs in small, isolated depressions that flood in the early spring from groundwater or rainwater; some pools also occur on floodplain backswamps. The substrate is variable, ranging from sand to loam to bedrock, with or without a significant organic layer. Stands occur in shallow basins that flood in the spring and draw down later in the season, or in alluvial backswamps that are also dry late in the growing season.

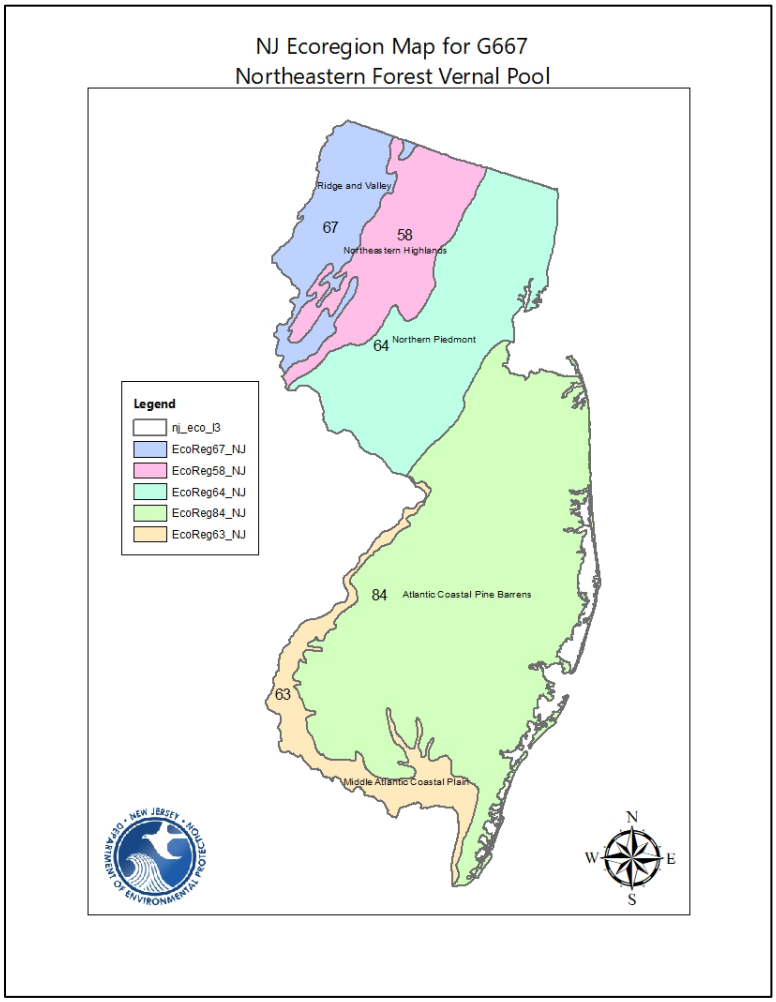
Northeastern Forest Vernal Pool (G667)

Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean% Cover	NJ State CoC
TREE					
Acer rubrum	Red maple	ACRU	**71**	15.8	3
Fagus grandifolia	American beech	FAGR	**33**	3	6
Tsuga canadensis	Eastern hemlock	TSCA	**33**	8.4	8
Acer saccharum	Sugar maple	ACSA3	**31**	4.2	5
Betula alleghaniensis	Yellow birch	BEAL2	**31**	5.6	8
Fraxinus americana	White ash	FRAM2	**25**	1.9	5
SHRUB					
Vaccinium corymbosum	Highbush blueberry	VACO	**25**	3	5
Cephalanthus occidentalis	Buttonbush	CEOC2	**20**	3.9	6
HERBACEOUS					
Onoclea sensibilis	Sensitive fern	ONSE	**40**	4	3
Thelypteris palustris	Eastern marsh fern	THPA	**36**	1.1	4
Osmunda regalis	Royal fern	OSRE	**25**	2	7
Lycopus uniflorus	Northern bugleweed	LYUN	**22**	0.7	4
Boehmeria cylindrica	False nettle	BOCY	**20**	0.7	4

Northeastern Forest Vernal Pool (G667) Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)					
Scientific Name	**Common Name**	**USDA Plants Code**	**Constancy**	**Mean% Cover**	**NJ State CoC**
Osmunda cinnamomea	Cinnamon fern	OSCI	**20**	0.8	5

FQA Metric Thresholds for Mean C and Cover-weighted Mean C G667 Northeastern Forest Vernal Pool				
FQA Metric	**Excellent**	**Good**	**Fair**	**Poor**
Mean C	>5.0	5.0-4.3	<4.3	[3.6]
Cover-Weighted Mean C	>5.0	5.0-4.0	<4.0	[2.8]



For more information on finer scale floristic Alliances and Associations in **G667 Northeastern Vernal Pool Group** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A3686 Eastern North American Vernal Pool
This broadly defined alliance comprises sparsely vegetated northeastern vernal woodland pools that are important breeding habitats for amphibians and invertebrates; vegetation is widely variable.

Associations within G667 in New Jersey:
CEGL006453 Eastern Woodland Vernal Pool (Eastern Woodland Vernal Pool)

G902 Red Maple - Blackgum - Green Ash Swamp Forest

G902 Central Appalachian-Northeast Acidic Swamp

Red Maple - Blackgum - Green Ash Swamp Forest Group

***Acer rubrum - Nyssa sylvatica - Fraxinus pennsylvanica* Swamp Forest Group**

Type Concept: This alliance contains swamp forests in which *Fraxinus pennsylvanica* and *Nyssa sylvatica* are characteristic, and *Acer rubrum* is nearly always present. Canopy composition differs sharply from the surrounding upland and varies with geography. Other canopy species across the range of this alliance include *Betula lenta, Fraxinus americana, Liquidambar styraciflua, Liriodendron tulipifera, Quercus bicolor, Quercus palustris, Ulmus americana*, and *Ulmus rubra*. Understory and shrub species include *Acer pensylvanicum, Alnus serrulata, Carpinus caroliniana, Cornus* spp., *Ilex verticillata, Lindera benzoin, Rhododendron maximum, Vaccinium corymbosum,* and *Viburnum nudum* var. *cassinoides*. Characteristic herbaceous species in hardwood stands are *Boehmeria cylindrica, Carex* spp., *Glyceria* spp., *Impatiens capensis, Juncus* spp., *Laportea canadensis, Leersia* spp., *Osmunda* spp., *Pilea* spp., *Symplocarpus foetidus*, and *Thelypteris palustris*. Hemlock-hardwood stands contain *Coptis trifolia, Cornus canadensis, Glyceria melicaria, Lycopodium obscurum, Maianthemum canadense, Onoclea sensibilis, Osmunda regalis* var. *spectabilis. Vitis* spp. are characteristic vines of stands of this alliance, but *Toxicodendron radicans* and, to the south, *Campsis radicans* are also prominent. *Sphagnum* spp. and other bryophytes are often abundant. Typical habitats include forested seeps on hillsides or along watercourses, edges and backswamps of floodplains that may be saturated by seepage from adjacent slopes, and other poorly drained depressions. Flooding occurs during the winter and spring and often extends into the growing season. Surface water is superficial, but the substrate is saturated to the surface by groundwater for extended periods during the growing season, or water may be ponded for most of the year. Soils supporting this alliance range from moderately acidic to moderately basic. The substrate is generally muck rather than peat, overlying mineral soils.

Dynamics: Floods during winter and spring. Tree-fall and tip-ups are common.

Environment: Poorly drained, typically mucky, flats, watercourses, seepage areas, and backswamps of floodplains.

Red Maple - Blackgum - Green Ash Swamp Forest Group (G902)
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
TREE					
Acer rubrum	Red maple	ACRU	**98**	38.9	3
Tsuga canadensis	Eastern hemlock	TSCA	**80**	33.7	8
Betula alleghaniensis	Yellow birch	BEAL2	**73**	11.3	8
Pinus strobus	Eastern white pine	PIST	**66**	7.5	5
Quercus rubra	Northern red oak	QURU	**57**	1	5
Nyssa sylvatica	Sourgum	NYSY	**46**	6.5	4
Fagus grandifolia	American beech	FAGR	**35**	0.5	6

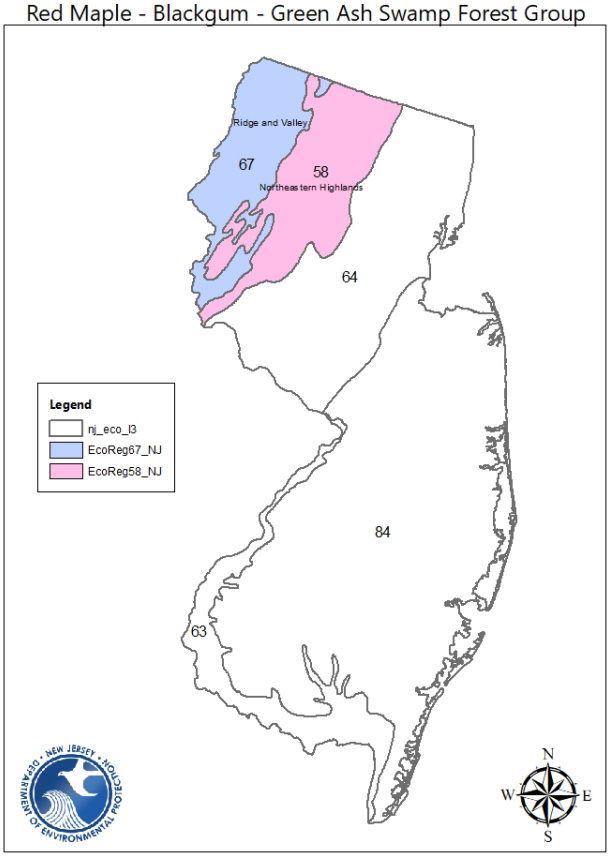
Red Maple - Blackgum - Green Ash Swamp Forest Group (G902)
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
Amelanchier sp.	Serviceberry	AMELA	**32**	0.4	7
Picea rubens	Red spruce	PIRU	**32**	2.8	8
Hamamelis virginiana	Witch-hazel	HAVI4	**25**	1.1	6
SHRUB					
Ilex verticillata	Winterberry	ILVE	**66**	7.9	6
Vaccinium corymbosum	Highbush blueberry	VACO	**64**	10.8	5
Rubus hispidus	Bristly dewberry	RUHI	**45**	1.5	5
Ilex mucronata	Catberry	ILMU	**43**	3.7	9
Viburnum nudum	Possumhaw	VINU	**35**	0.6	8
Kalmia latifolia	Mountain laurel	KALA	**28**	3.5	6
Cornus canadensis	Bunchberry	COCA13	**26**	0.1	10
Gaultheria procumbens	Teaberry	GAPR2	**25**	0.2	5
Vaccinium angustifolium	Low sweet blueberry	VAAN	**25**	1	7
Lyonia ligustrina	Maleberry	LYLI	**24**	0.6	6
Kalmia angustifolia	Sheep laurel	KAAN	**23**	0.3	5
VINES					
Toxicodendron radicans	Poison ivy	TORA2	**25**	0.5	1
HERBACEOUS					
Osmunda cinnamomea	Cinnamon fern	OSCI	**91**	18.2	5
Coptis trifolia	Goldthread	COTR2	**67**	2.2	10
Carex trisperma	threeseeded sedge	CATR10	**57**	2.5	10
Trientalis borealis	Star-flower	TRBO2	**57**	0.2	5
Maianthemum canadense	Canada mayflower	MACA4	**51**	0.8	4
Mitchella repens	Partridge-berry	MIRE	**48**	0.5	5
Aralia nudicaulis	Wild sarsaparilla	ARNU2	**43**	0.3	5
Carex folliculata	Long sedge	CAFO6	**36**	0.7	5
Thelypteris palustris	Eastern marsh fern	THPA	**35**	0.6	4
Arisaema triphyllum	Jack-in-the-pulpit	ARTR	**33**	0.2	5
Onoclea sensibilis	Sensitive fern	ONSE	**33**	0.7	3
Osmunda regalis	Royal fern	OSRE	**28**	1.2	7
Medeola virginiana	Indian cucumber-root	MEVI	**26**	0.1	6
Carex intumescens	Bladder sedge	CAIN12	**25**	0.3	5
Carex sp.	Sedge	CAREX	**24**	0.4	7
Chelone glabra	Turtlehead	CHGL2	**22**	0.1	6
Dryopteris cristata	Crested shield fern	DRCR4	**22**	0.1	8
Symplocarpus foetidus	Skunk cabbage	SYFO	**21**	1	5
Lysimachia terrestris	Swamp-candles	LYTE2	**20**	0.3	5
Viola sp.	Violet	VIOLA	**20**	0.1	6
NON-VASCULAR					
Sphagnum sp.	Sphagnum	SPHAG2	**61**	19.7	7

Red Maple - Blackgum - Green Ash Swamp Forest Group (G902) Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)					
Scientific Name	**Common Name**	**USDA Plants Code**	**Constancy**	**Mean % Cover**	**NJ State CoC**
Moss	Moss		**33**	2.3	
Bazzania trilobata	Threelobed Bazzania	BATR5	**32**	1.5	

FQA Metric Thresholds for Mean C and Cover-Weighted Mean C G902 Central Appalachian-Northeast Acidic Swamp Red Maple - Blackgum - Green Ash Swamp Forest Group				
FQA Metric	**Excellent**	**Good**	**Fair**	**Poor**
Mean C	> 5.9	5.9-4.9	4.9-3.8	<3.8
Cover-Weighted Mean C	> 6.1	6.1-4.6	< 4.6-2.0	<2.0

NJ Ecoregion Map for G902
Red Maple - Blackgum - Green Ash Swamp Forest Group



For more information on finer scale floristic Alliances and Associations in **G902 Red Maple - Blackgum - Green Ash Swamp Forest Group** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A3416 Central Appalachian-Northeast Hemlock - Hardwood Acidic Swamp Forest
This alliance includes swamp forests of the Central Appalachian - Allegheny and New England regions, often dominated by *Tsuga canadensis, Betula alleghaniensis*, and *Acer rubrum*, with closed to open canopies and an open to dense shrub layer, interspersed with small *Sphagnum* - herb-dominated depressions. Forests in this alliance are typically at elevations below 1200 m (4000 feet), in poorly drained bottomlands, generally with visible microtopography of ridges and sloughs or depressions. They often occur near streams and are undoubtedly occasionally flooded.

Associations within A3416 in New Jersey:
CEGL006279 *Tsuga canadensis / Rhododendron maximum / Sphagnum* spp. Swamp Forest (Eastern Hemlock / Great Laurel Swamp Forest)
CEGL006226 *Tsuga canadensis - Betula alleghaniensis / Ilex verticillata / Sphagnum* spp. Swamp Forest (Hemlock - Hardwood Swamp Forest)
CEGL006955 *Betula alleghaniensis - Acer rubrum - Tsuga canadensis / Sphagnum* spp. Forest (Northern Piedmont Birch - Hemlock Swamp Forest)

A4460 Central Appalachian-Northeast Red Maple - Blackgum Acidic Swamp
This alliance contains swamp forests of poorly drained acidic flats, watercourses, seepage areas, and backswamps of floodplains in the Central Appalachian, Allegheny, and Lower New England regions. *Nyssa sylvatica* is characteristic, and *Acer rubrum* is nearly always present. The substrate is generally muck rather than peat, overlying mineral soils.

Associations within A4460 in New Jersey:
CEGL006220 *Acer rubrum / Ilex mucronata - Vaccinium corymbosum* Swamp Forest (Northeast Red Maple Acidic Swamp Forest)
CEGL006014 *Acer rubrum - Nyssa sylvatica - Betula alleghaniensis / Sphagnum* spp. Swamp Forest (Red Maple - Blackgum Basin Swamp Forest)

G918 Red Maple - Black Ash - Swamp White Oak Swamp Forest

G918 Central Appalachian-Northeast Alkaline Swamp

Red Maple - Black Ash - Swamp White Oak Swamp Forest Group

***Acer rubrum* - *Fraxinus nigra* - *Quercus bicolor* Swamp Forest Group**

Type Concept: This group contains swamp forests of poorly drained flats, watercourses, seepage areas, and backswamps of floodplains in the Central Appalachian and Northeast region of the United States and adjacent Canada. *Acer rubrum* and *Fraxinus nigra* are typical and *Quercus bicolor* is particularly diagnostic. Other canopy species across the range of this alliance include *Betula lenta, Fraxinus americana, Liquidambar styraciflua, Liriodendron tulipifera, Quercus palustris, Ulmus americana*, and *Ulmus rubra*. Understory and shrub species include *Alnus serrulata, Carpinus caroliniana, Cornus* spp., *Ilex verticillata, Lindera benzoin*, and *Vaccinium corymbosum*; *Ilex mucronata* often occurs in the northern portion of the range. Typical habitats include forested seeps on hillsides or along watercourses, edges and backswamps of floodplains that may be saturated by seepage from adjacent slopes, and other poorly drained depressions. Flooding occurs during the winter and spring and often extends into the growing season. Surface water is superficial, but the substrate is saturated to the surface by groundwater for extended periods during the growing season, or water may be ponded for most of the year. The substrate is generally muck rather than peat, overlying mineral soils.

Dynamics: Flooding occurs during the winter and spring and often extends into the growing season.

Environment: Poorly drained flats, watercourses, seepage areas, and backswamps of floodplains, with muck rather than peat, overlying mineral soils.

Red Maple - Black Ash - Swamp White Oak Swamp Forest Group (G918)
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
TREE					
Acer rubrum	Red maple	ACRU	**86**	42.7	3
Pinus strobus	Eastern white pine	PIST	**57**	6	5
Quercus rubra	Northern red oak	QURU	**49**	3.3	5
Betula alleghaniensis	Yellow birch	BEAL2	**48**	11.9	8
Fraxinus americana	White ash	FRAM2	**39**	5.2	5
Tsuga canadensis	Eastern hemlock	TSCA	**39**	3.5	8
Ulmus americana	American elm	ULAM	**30**	1.5	6
Fagus grandifolia	American beech	FAGR	**29**	2.6	6
Amelanchier sp.	Serviceberry	AMELA	**27**	0.4	7
Fraxinus pennsylvanica	Green ash	FRPE	**27**	5.8	5
Prunus serotina	Wild black cherry	PRSE2	**27**	0.6	2
Acer saccharum	Sugar maple	ACSA3	**26**	2.9	5
Fraxinus nigra	Black ash	FRNI	**26**	3.4	9
Betula lenta	Black birch	BELE	**24**	1.8	5

Red Maple - Black Ash - Swamp White Oak Swamp Forest Group (G918)
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

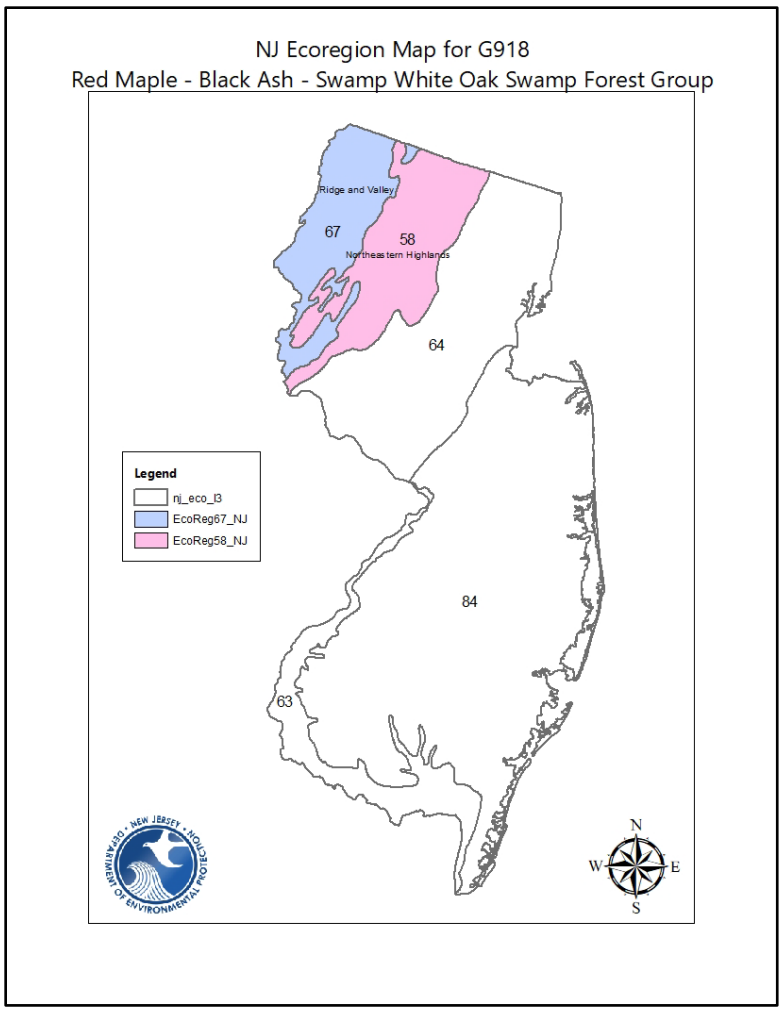
Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
Hamamelis virginiana	Witch-hazel	HAVI4	**23**	1.9	6
SHRUB					
Ilex verticillata	Winterberry	ILVE	**76**	9.2	6
Vaccinium corymbosum	Highbush blueberry	VACO	**58**	2.9	5
Rubus hispidus	Bristly dewberry	RUHI	**50**	0.9	5
Rubus pubescens	Dwarf blackberry	RUPU	**48**	1.3	7
Lindera benzoin	Spicebush	LIBE3	**40**	9.2	5
Spiraea alba	White meadowsweet	SPAL2	**39**	0.6	5
Viburnum recognitum	Northern arrow-wood	VIRE7	**27**	0.7	7
Alnus incana	Speckled alder	ALIN2	**26**	2.3	6
Lyonia ligustrina	Maleberry	LYLI	**26**	0.6	6
Rosa multiflora	Multiflora rose	ROMU	**23**	0.1	0
Berberis thunbergii	Japanese barberry	BETH	**20**	0.1	0
Viburnum dentatum	Southern arrowwood	VIDE	**20**	0.1	5
Viburnum nudum	Possumhaw	VINU	**20**	0.2	8
VINE					
Toxicodendron radicans	Poison ivy	TORA2	**63**	1.4	1
Parthenocissus quinquefolia	Virginia-creeper	PAQU2	**45**	1.1	2
HERBACEOUS					
Onoclea sensibilis	Sensitive fern	ONSE	**85**	6.4	3
Osmunda cinnamomea	Cinnamon fern	OSCI	**76**	11.9	5
Maianthemum canadense	Canada mayflower	MACA4	**65**	1	4
Impatiens capensis	Jewelweed	IMCA	**58**	2.8	3
Arisaema triphyllum	Jack-in-the-pulpit	ARTR	**57**	0.5	5
Thelypteris palustris	Eastern marsh fern	THPA	**54**	0.8	4
Carex sp.	Sedge	CAREX	**46**	1.9	7
Osmunda regalis	Royal fern	OSRE	**44**	3.1	7
Chelone glabra	Turtlehead	CHGL2	**43**	0.2	6
Dryopteris intermedia	Evergreen wood fern	DRIN5	**39**	1.5	6
Thelypteris noveboracensis	New York fern	THNO	**38**	1.9	4
Athyrium filix-femina	Common lady fern	ATFI	**37**	0.5	6
Coptis trifolia	Goldthread	COTR2	**37**	0.8	10
Solidago rugosa	Wrinkle-leaf goldenrod	SORU2	**37**	0.5	3
Trientalis borealis	Star-flower	TRBO2	**36**	0.1	5
Dryopteris cristata	Crested shield fern	DRCR4	**35**	0.2	8
Scutellaria lateriflora	Mad-dog skullcap	SCLA2	**35**	0.2	4
Dryopteris carthusiana	Spinulose wood fern	DRCA11	**33**	0.4	5
Aralia nudicaulis	Wild sarsaparilla	ARNU2	**32**	0.5	5
Viola sp.	Violet	VIOLA	**32**	0.4	6
Symplocarpus foetidus	Skunk cabbage	SYFO	**31**	3.4	5

Red Maple - Black Ash - Swamp White Oak Swamp Forest Group (G918)
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
Mitchella repens	Partridge-berry	MIRE	**30**	0.1	5
Thalictrum pubescens	Tall meadow-rue	THPU2	**30**	0.2	5
Boehmeria cylindrica	False nettle	BOCY	**29**	1.6	4
Carex intumescens	Bladder sedge	CAIN12	**26**	0.2	5
Carex stricta	Tussock sedge	CAST8	**23**	1.9	5
Iris versicolor	Northern blue flag	IRVE2	**23**	0.2	5
Lycopus uniflorus	Northern bugleweed	LYUN	**23**	0.3	4
Polystichum acrostichoides	Christmas fern	POAC4	**23**	0.1	5
Asteraceae	Aster Family	ASTER	**21**	0.1	7
Eutrochium maculatum	Spotted joe-pye-weed	EUMA9	**21**	0.3	5
Osmunda claytoniana	Interrupted fern	OSCL2	**20**	0.4	6
Pilea pumila	Clearweed	PIPU2	**20**	0.1	3
NON-VASCULAR					
Moss	Moss		**48**	3.7	5
Sphagnum sp.	Sphagnum moss	SPHAG2	**42**	2.4	7
Thuidium delicatulum	Delicate thuidium moss	THDE10	**33**	1.5	3

FQA Metric Thresholds for Mean C and Cover-Weighted Mean C
G918 Central Appalachian-Northeast Alkaline Swamp
Red Maple - Black Ash - Swamp White Oak Swamp Forest Group

FQA Metric	Excellent	Good	Fair	Poor
Mean C	> 5.0	5.0-4.3	4.3-3.3	<3.3
Cover-Weighted Mean C	> 5.0	5.0-4.0	4.0-2.7	<2.7



For more information on finer scale floristic Alliances and Associations in **G918 Red Maple – Black Ash – Swamp White Oak Swamp Forest Group** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A4461 Central Appalachian-Northeast Red Maple - Green Ash Alkaline Swamp Alliance

Associations within A4461 in New Jersey:
CEGL008416 ***Acer rubrum - Fraxinus nigra - Betula alleghaniensis / Veratrum viride - Carex bromoides*** **Seep Forest** (Central Appalachian Basic Seepage Swamp Forest)
CEGL006413 ***Acer rubrum - Fraxinus pennsylvanica / Packera aurea - Carex bromoides - Pilea fontana*** **Swamp Forest** (Coastal Plain Calcareous Seepage Swamp Forest)
CEGL006630 ***Acer (rubrum, saccharinum) - Fraxinus pennsylvanica / Ilex verticillata / Osmunda regalis*** **Floodplain Forest** (Northeastern Maple - Ash Swamp Forest)
CEGL006548 ***Acer (rubrum, saccharinum) - Fraxinus pennsylvanica - Ulmus americana / Boehmeria cylindrica*** **Floodplain Forest** (Northern Piedmont-Central Appalachian Maple - Ash Swamp Forest)
CEGL006634 ***Fraxinus pennsylvanica - Acer saccharinum - Quercus bicolor / Boehmeria cylindrica*** **Swamp Forest** (Pond & Lakeside Ash - Maple Swamp)

CEGL006119 ***Acer rubrum / Carex stricta - Onoclea sensibilis*** **Wet Woodland** (Red Maple / Upright Sedge Wet Woodland)
CEGL006406 ***Acer rubrum - Fraxinus (pennsylvanica, americana) / Lindera benzoin / Symplocarpus foetidus*** **Swamp Forest** (Southern New England-Northern Piedmont Red Maple Seepage Swamp Forest)
CEGL006000 ***Quercus rubra - Betula alleghaniensis / Osmunda cinnamomea*** **Forest** (Upland/Wetland Transitional Forest)

A4476 Central Appalachian-Northeast Swamp White Oak Swamp
This alliance contains perched hardwood swamps occurring in the northeastern United States from central New England to Virginia. The canopy is codominated by *Quercus palustris* and/or *Quercus bicolor* and *Acer rubrum*. Common associates include *Nyssa sylvatica*.

Associations within A4476 in New Jersey:
CEGL006072 ***Fagus grandifolia - Acer rubrum / Vaccinium corymbosum*** **Wet Forest** (Beech - Red Maple Subhydric Forest)
CEGL006240 ***Quercus palustris - (Quercus bicolor) - Acer rubrum / Vaccinium corymbosum / Osmunda cinnamomea*** **Wet Forest** (Northeastern Pin Oak - Swamp White Oak Wet Forest)

G039 Atlantic White-cedar - Pitch Pine Swamp

G039 Northern Coastal Plain Swamp

Atlantic White-cedar - Pitch Pine Swamp Group

***Chamaecyparis thyoides - Pinus rigida* Swamp Group**

Type Concept: This group encompasses coniferous to mixed swamp forests and wetland pine barrens on the northern Atlantic Coastal Plain, generally from Massachusetts south to Virginia. They occur on sandy, acidic, and nutrient-poor soils, mostly in settings that remain saturated throughout the growing season, but sometimes in settings that are only seasonally saturated. The characteristic overstory tree is either *Chamaecyparis thyoides* or *Pinus rigida*, generally not together. *Acer rubrum* can be an important associate, especially with *Chamaecyparis*, where cutting or other anthropogenic disturbance has altered the vegetation composition. Associated shrubs and herbs indicative of the coastal plain setting include *Gaylussacia dumosa, Clethra alnifolia, Ilex glabra, Rhododendron viscosum, Eubotrys racemosa*, and *Carex striata*, as well as the more widespread *Vaccinium corymbosum, Gaylussacia baccata*, and *Chamaedaphne calyculata*. Fire has been an important ecological process in the vegetation of this group.

Dynamics: Coastal plain swamps undergo a number of natural disturbances, including windstorms and periodic fire. These processes remove part or all of the tree canopy; an open canopy is necessary for the establishment of the coniferous trees *Chamaecyparis thyoides* and *Pinus rigida*. When periodic disturbance is lacking, the vegetation succeeds to hardwood swamps characterized by *Acer rubrum* and *Nyssa sylvatica*. In pitch pine lowlands, hydrologic regime has the greatest effect on vegetation structure and composition.

Environment: Soils are sands or mucky peat over sand. Most remain saturated throughout the season, but some may be seasonally saturated. The coarse soils are acidic and nutrient-poor.

Atlantic White-cedar - Pitch Pine Swamp Group (G039)
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
TREE					
Acer rubrum	Red maple	ACRU	**94**	33.5	3
Nyssa sylvatica	Sourgum	NYSY	**50**	8.5	4
Chamaecyparis thyoides	Atlantic white-cedar	CHTH2	**37**	17.9	9
Pinus rigida	Pitch pine	PIRI	**34**	6.6	6
Pinus strobus	Eastern white pine	PIST	**34**	2.7	5
Betula alleghaniensis	Yellow birch	BEAL2	**23**	2.7	8
Tsuga canadensis	Eastern hemlock	TSCA	**23**	1.4	8
Quercus rubra	Northern red oak	QURU	**21**	0.2	5
Liquidambar styraciflua	Sweetgum	LIST2	**20**	2.9	3
SHRUB					
Vaccinium corymbosum	Highbush blueberry	VACO	**83**	12.3	5
Clethra alnifolia	Sweet pepperbush	CLAL3	**55**	11.7	5

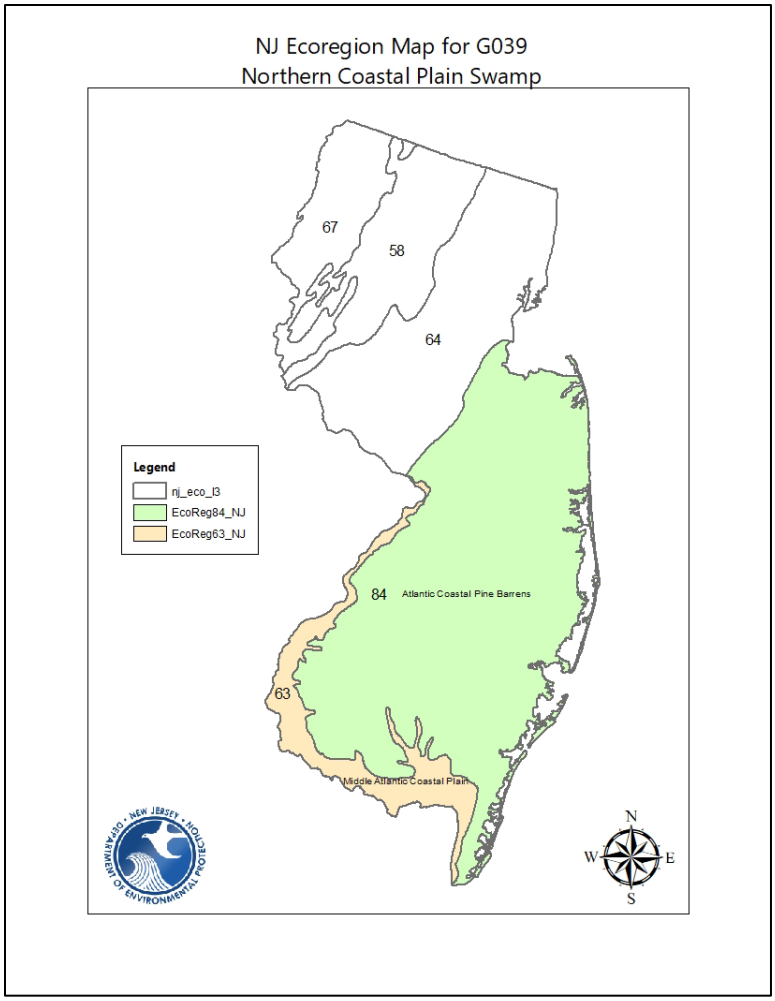
Atlantic White-cedar - Pitch Pine Swamp Group (G039)

Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
Ilex verticillata	Winterberry	ILVE	**39**	4.3	6
Rhododendron viscosum	Swamp azalea	RHVI2	**30**	1.3	6
Ilex mucronata	Catberry	ILMU	**28**	2.6	9
Gaylussacia frondosa	Dangleberry	GAFR2	**26**	2.2	6
Kalmia angustifolia	Sheep laurel	KAAN	**26**	1.5	5
Lyonia ligustrina	Maleberry	LYLI	**20**	0.7	6
VINE					
Smilax rotundifolia	Roundleaf greenbrier	SMRO	**37**	3.2	2
Toxicodendron radicans	Poison ivy	TORA2	**20**	0.2	1
HERBACEOUS					
Osmunda cinnamomea	Cinnamon fern	OSCI	**63**	6.9	5
Maianthemum canadense	Canada mayflower	MACA4	**40**	0.5	4
Trientalis borealis	Star-flower	TRBO2	**29**	0.4	5
Carex trisperma	threeseeded sedge	CATR10	**28**	0.8	10
Mitchella repens	Partridge-berry	MIRE	**28**	0.2	5
Coptis trifolia	Goldthread	COTR2	**26**	1	10
Aralia nudicaulis	Wild sarsaparilla	ARNU2	**22**	0.9	5
Osmunda regalis	Royal fern	OSRE	**21**	1.2	7
NON-VASCULAR					
Sphagnum sp.	Sphagnum	SPHAG2	**42**	12.3	7

FQA Metric Thresholds for Mean C and Cover-weighted Mean C
G039 Northern Coastal Plain Swamp
Atlantic White-cedar - Pitch Pine Swamp Group

FQA Metric	Excellent	Good	Fair	Poor
Mean C	>5.7	5.7-5.0	5.0-4.0	<4.0
Cover-Weighted Mean C	>6.0	6.0-4.7	4.7-2.6	<2.6



For more information on finer scale floristic Alliances and Associations in **G039 Atlantic White-cedar - Pitch Pine Swamp Group (Northern Coastal Plain Swamp Group)** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A3415 Mid-Atlantic Atlantic White-cedar Streamside Swamp Forest
This alliance is characterized by *Chamaecyparis thyoides*, in either pure or mixed stands, with hardwoods such as *Acer rubrum*, occurring along streamsides or coastal plain river terraces, in natural settings, and also colonizing bog mats forming over artificial millponds from the New Jersey coastal plain to Maryland and Delaware.

Associations within A3415 in New Jersey:
CEGL006078 *Chamaecyparis thyoides - Acer rubrum - Magnolia virginiana* Swamp Forest (Coastal Plain Atlantic White-cedar - Red Maple Swamp Forest)

A3637 Mid-Atlantic Coastal Plain Depression Swamp Forest
These are forests dominated by *Liquidambar styraciflua* with *Acer rubrum*. They are found in seasonally flooded depressions and range from North Carolina and Virginia north through the Chesapeake Bay into the northern Atlantic Coast and northern Piedmont of New Jersey, Pennsylvania, and New York.

Associations within A3637 in New Jersey:
CEGL006137 *Pinus taeda / Morella cerifera / Osmunda regalis var. spectabilis* Swamp Forest (Coastal Loblolly Pine Swamp Forest)
CEGL006965 *Acer rubrum - Fraxinus pennsylvanica - Liquidambar styraciflua* Floodplain Forest (Coastal Plain Red Maple / Sedge Swamp Forest)
CEGL006110 *Liquidambar styraciflua - Acer rubrum - Quercus phellos / Eubotrys racemosa* Swamp Forest (Sweetgum - Red Maple Swamp Forest)

A3400 Northern Atlantic White-cedar Peat Swamp Forest
This alliance is characterized by peatlands dominated or codominated by *Chamaecyparis thyoides* occurring in saturated basins and, less commonly, along streamsides and seasonally flooded pondshores, from northern New Jersey north to southern Maine.

Associations within A3400 in New Jersey:
CEGL006355 *Chamaecyparis thyoides / Rhododendron maximum* Swamp Forest (Atlantic White-cedar / Great Laurel Swamp Forest)
CEGL006321 *Chamaecyparis thyoides / Chamaedaphne calyculata* Swamp Woodland (Atlantic White-cedar Bog)
CEGL006188 *Chamaecyparis thyoides / Ilex glabra - Rhododendron viscosum* Swamp Forest (Coastal Plain Atlantic White-cedar Swamp Forest)
CEGL006189 *Chamaecyparis thyoides - (Tsuga canadensis, Betula alleghaniensis) / Clethra alnifolia* Swamp Forest (Inland Atlantic White-cedar Swamp Forest)
A4211 Pitch Pine Scrub Swamp
Hydric pine plains, restricted to the New Jersey pine barrens, are characterized by a dwarf and serotinous form of *Pinus rigida* forming an open to closed-canopy coppice shrubland 1.5 to 4.5 m (5-15 feet) tall.

Associations within A4211 in New Jersey:
CEGL006769 *Pinus rigida / Calamovilfa brevipilis* Wet Scrub (Dwarf Pitch Pine / Reedgrass Hydric Pine Plains)
CEGL006963 *Pinus rigida - Quercus (marilandica, ilicifolia) / Kalmia angustifolia / Calamovilfa brevipilis* Wet Scrub (Hydric Pine Plains (Shrub Type))

A0580 Pitch Pine Swamp Woodland
This alliance comprises acidic wetlands, usually peaty, dominated by *Pinus rigida* usually over an ericaceous understory; it ranges from West Virginia north to Quebec, but is best developed in New Jersey, New York, and Massachusetts where there are extensive pine barrens.

Associations within A0580 in New Jersey:

CEGL006926 ***Pinus rigida - Nyssa sylvatica / Clethra alnifolia - Eubotrys racemosa*** **Forest** (Pine Barrens Pitch Pine - Hardwood Swamp Forest
CEGL006388 ***Pinus rigida / Gaylussacia dumosa / Calamovilfa brevipilis*** **Swamp Woodland** (Pitch Pine / Reedgrass Savanna)
CEGL006768 ***Pinus rigida / Leiophyllum buxifolium*** **Subhydric Swamp Woodland** (Pitch Pine / Sand-myrtle Lowland Subhydric Woodland)
CEGL006194 ***Pinus rigida / Chamaedaphne calyculata / Sphagnum*** **spp. Swamp Woodland** (Pitch Pine Bog)
CEGL006195 ***Pinus rigida / Vaccinium corymbosum - Eubotrys racemosa / Sphagnum*** **spp. Swamp Woodland** (Pitch Pine Lowland Swamp Woodland)
CEGL006387 ***Pinus rigida / Gaylussacia baccata - Kalmia angustifolia*** **Swamp Woodland** (Pitch Pine Subhydric Lowland Swamp Woodland)

A2058 Red Maple - Blackgum Coastal Swamp Forest
This alliance covers nutrient-poor deciduous forested swamps and "basin swamps" characterized by *Nyssa sylvatica*, of the northeastern United States ranging from southern Vermont to the Coastal Plain of Virginia.

Associations within A2058 in New Jersey:
CEGL006013 ***Acer rubrum - Nyssa sylvatica - Liquidambar styraciflua - Populus heterophylla*** Swamp Forest (Cape May Lowland Swamp Forest)
CEGL006165 ***Acer rubrum - Fraxinus pennsylvanica / Polygonum*** **spp. Tidal Woodland** (Freshwater Tidal Woodland)
CEGL006156 ***Acer rubrum / Rhododendron viscosum - Clethra alnifolia*** **Swamp Forest (Lower New England Red Maple Swamp Forest)**
CEGL006238 ***Acer rubrum - Nyssa sylvatica - Magnolia virginiana / Viburnum nudum var. nudum / Osmunda cinnamomea*** **Swamp Forest** (Southern Red Maple - Blackgum Swamp Forest)

FRESHWATER MARSH, WET MEADOW & SHRUB SWAMP

Marsh, Wet Meadow & Shrub Swamp Groups

G125 Bulrush species - Cattail species Freshwater Marsh Group

G125 Eastern North American Freshwater Marsh

Bulrush species - Cattail species Freshwater Marsh Group

***Schoenoplectus* spp. - *Typha* spp. Freshwater Marsh Group**

Type Concept: These freshwater emergent marshes are dominated by herbaceous vegetation, primarily graminoids. *Schoenoplectus* spp., *Typha* spp., and *Zizania* spp. are common dominants though other species can be abundant or even form nearly monotypic stands. They are common throughout the northern half of the eastern United States and adjacent Canadian provinces. Freshwater marshes occur in closed or open basins that are generally flat and shallow and are always or nearly always flooded. Water depths range from a few centimeters to approximately 1 m. They are associated with lakes, ponds, slow-moving streams, and/or impoundments or ditches. These marshes include those along the shores and estuaries of the Great Lakes. Dominant vegetation tends to be 1-2 m tall, and cover varies from moderate to dense. Scattered shrubs may be present but total less than 25% cover. Trees are generally absent and, if present, are scattered. The substrate is typically muck over mineral soil, though where waves or currents are stronger or in some low-nutrient sites, the mineral soil may be exposed.

Dynamics: Wave and current action is typically minor in these marshes. Especially strong storms may create especially strong waves and/or currents that break up marsh vegetation. Prolonged drought or a lowering of the water table may lead to exposure of the soil and invasion by plants more typical of wet meadows. Prolonged increases in the water level will favor submergent or floating-leaved vegetation. These dynamics of flood and drought are more common on the western edge of this group's range, though not as common as in the Great Plains.

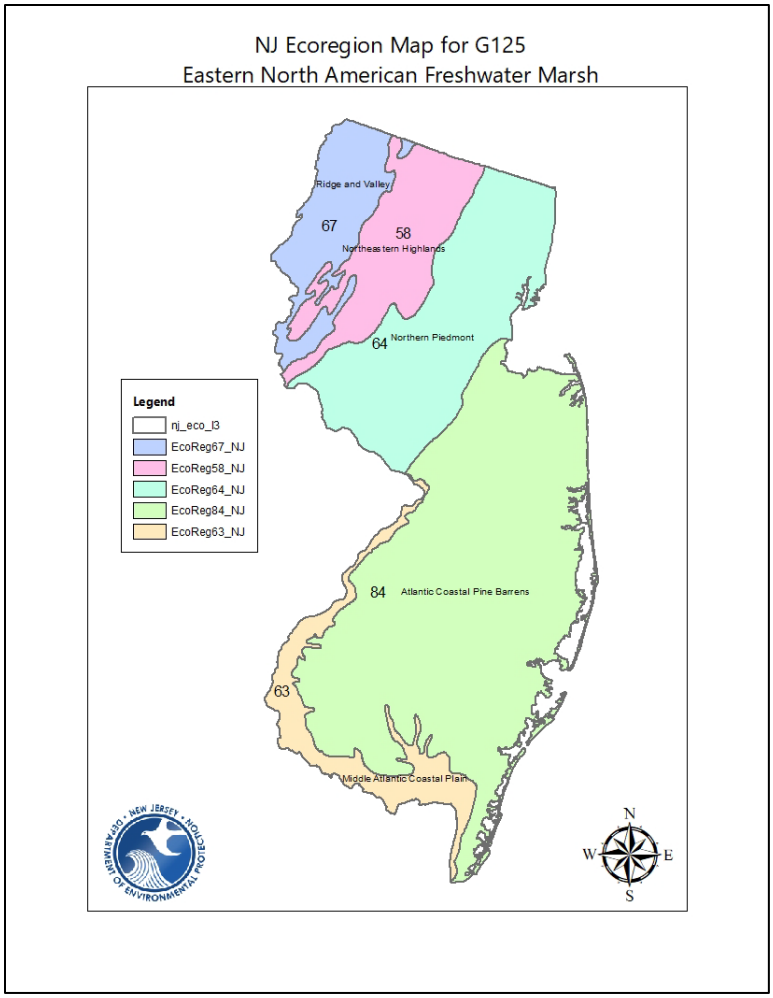
Environment: *Climate:* The climate of these marshes range from cool-temperate to sub-boreal in southern Canada and the northern United States to nearly warm-temperate in the Atlantic Coastal Plain in Virginia and Maryland. *Soil/substrate/hydrology:* Most examples of these marshes are eutrophic with muck over mineral soil as the substrate. Where wave or currents are more active, the mineral soil may be exposed. Some examples of these marshes occur on oligotrophic sites where sand is the substrate. Parts of these marshes can occur on floating root mats which may move with prevailing currents or winds. Marshes are permanently to semipermanently flooded with water depths from a few centimeters to over 1 meter deep except in very dry years.

Eastern North American Freshwater Marsh (G125)
Bulrush species - Cattail species Freshwater Marsh Group
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
SHRUB					
Cephalanthus occidentalis	Buttonbush	CEOC2	**31**	1.8	6
HERBACEOUS					
Carex stricta	Tussock sedge	CAST8	**31**	1.8	5
Impatiens capensis	Jewelweed	IMCA	**31**	1.1	3
Onoclea sensibilis	Sensitive fern	ONSE	**31**	4.4	3
Sagittaria latifolia	Wapato	SALA2	**31**	1	4
Typha angustifolia	Narrowleaf cattail	TYAN	**31**	17	4
Typha latifolia	Broadleaf cattail	TYLA	**31**	9.5	3
Leersia oryzoides	Rice cutgrass	LEOR	**25**	0.7	3
Lycopus americanus	Water-horehound	LYAM	**25**	1.4	4
Pontederia cordata	Pickerel-weed	POCO14	**25**	1	6
Scirpus cyperinus	Wool-grass	SCCY	**25**	0.7	3

FQA Metric Thresholds for Mean C and Cover-weighted Mean C
(G125) Eastern North American Freshwater Marsh
Bulrush species - Cattail species Freshwater Marsh Group

FQA Metric	Excellent	Good	Fair	Poor
Mean C	>4.8	4.8-3.8	3.8-1.1	<1.1
Cover-Weighted Mean C	>4.8	4.8-3.4	3.4-1.5	<1.5



For more information on finer scale floristic Alliances and Associations in **G125 Bulrush species - Cattail species Freshwater Marsh Group (Eastern North American Freshwater Marsh Group)** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A3664 Eastern Bulrush Deep Marsh
This alliance comprises permanently or semipermanently flooded wetlands dominated by *Schoenoplectus acutus, Bolboschoenus fluviatilis*, and *Schoenoplectus tabernaemontani*. It is found in the northeastern United States and Great Lakes area and adjacent southern Canada.

Associations withing A3664 in New Jersey:
CEGL007696 ***Peltandra virginica - Saururus cernuus - Boehmeria cylindrica / Climacium americanum*** **Marsh** (Floodplain Pool)
CEGL006446 ***Bidens cernua - Verbena hastata - Polygonum*** **spp. Marsh** (Mixed Forb Marsh)
CEGL006191 ***Pontederia cordata - Peltandra virginica - Sagittaria latifolia*** **Marsh** (Northeastern Leafy Forb Marsh)

A1436 Eastern Cattail - Bulrush Deep Marsh
This deep marsh alliance, found across the eastern half of the United States and southern Canada, contains stands dominated or codominated by *Typha angustifolia* and/or *Typha latifolia*, either alone or in combination with other tall emergent marsh species.

Associations within A1436 in New Jersey:
CEGL006153 *Typha (angustifolia, latifolia)* - (*Schoenoplectus* spp.) Eastern Marsh (Eastern Cattail Marsh)

A3669 North-Central & Northeast Forb Marsh
This alliance includes very wet or partially submerged forb vegetation the northeastern and midwestern United States and adjacent Canada. Dominants vary greatly and may include *Peltandra virginica, Polygonum amphibium, Polygonum hydropiper, Carex emoryi, Impatiens capensis, Pontederia cordata, Bidens cernua*, and *Verbena hastata*.

Associations within A3669 in New Jersey:
CEGL007696 *Peltandra virginica - Saururus cernuus - Boehmeria cylindrica / Climacium americanum* Marsh (Floodplain Pool)
CEGL006446 *Bidens cernua - Verbena hastata - Polygonum* spp. Marsh (Mixed Forb Marsh)
CEGL006191 *Pontederia cordata - Peltandra virginica - Sagittaria latifolia* Marsh (Northeastern Leafy Forb Marsh)

G903 Appalachian-Northeast Wet Meadow & Shrub Swamp

G903 Appalachian-Northeast Wet Meadow & Shrub Swamp

Appalachian-Northeast Wet Meadow & Shrub Swamp Group

Type Concept: This group is found in the Laurentian region of the Great Lakes and the northeastern United States and adjacent Canada north from West Virginia. It is characterized by wet-mesic to wet sites and can be dominated by a variety of graminoids and forbs. Common abundant species include the graminoids *Calamagrostis canadensis, Carex lacustris, Carex stricta, Carex vesicaria, Carex utriculata, Glyceria striata, Leersia oryzoides*, and *Scirpus cyperinus*. Forbs that may be common or dominant include *Boltonia asteroides var. asteroides, Eutrochium fistulosum, Eupatorium perfoliatum, Impatiens capensis, Impatiens pallida, Mentha arvensis, Sagittaria latifolia, Solidago canadensis, Solidago rugosa, Symphyotrichum racemosum*, and *Verbesina alternifolia*. Sites are found in basins or along slow-moving rivers and streams and are flooded or saturated for at least some of the growing season but rarely more than 0.3 m deep.

Dynamics: Stands are flooded or saturated for at least a few weeks each year and can remain saturated for most of the growing season in some stands. Prolonged changes in hydrologic regime, either wetter or drier, often result in a change to a different group. This group is common behind beaver dams.

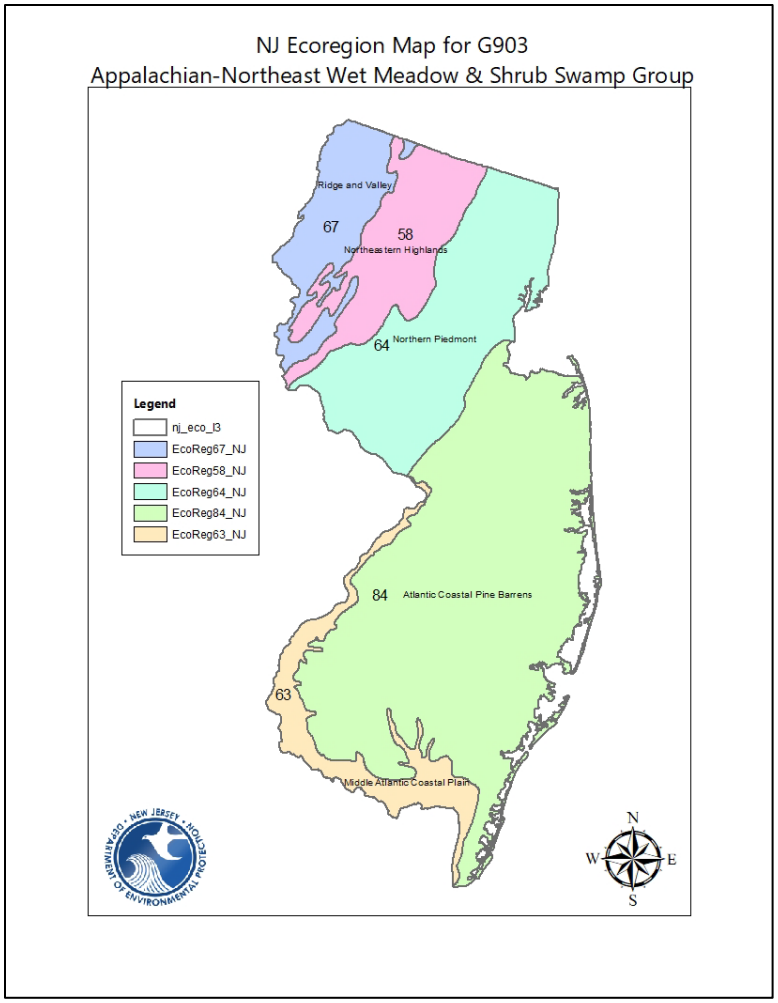
Environment: This group occurs in basins or along the edges of slow-moving rivers or streams. Sites are saturated or flooded by shallow water for at least a few weeks during the growing season. Water is usually less than 0.3 m deep. Soils are alluvial, muck, or sometimes peaty. This group occurs from low elevations near the coast in New England and New Jersey to the high Allegheny Mountains in West Virginia.

Appalachian-Northeast Wet Meadow & Shrub Swamp Group (G903)
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
TREE					
Acer rubrum	Red maple	ACRU	**54**	7	3
SHRUB					
Spiraea alba	White meadowsweet	SPAL2	**49**	7.4	5
Ilex verticillata	Winterberry	ILVE	**40**	5.2	6
Alnus incana	Speckled alder	ALIN2	**36**	9.1	6
Vaccinium corymbosum	Highbush blueberry	VACO	**35**	2.5	5
Rubus hispidus	Bristly dewberry	RUHI	**32**	3.5	5
Viburnum dentatum	Southern arrowwood	VIDE	**29**	1.3	5
Cephalanthus occidentalis	Buttonbush	CEOC2	**20**	7.3	6
HERBACEOUS					
Onoclea sensibilis	Sensitive fern	ONSE	**47**	4.3	3
Impatiens capensis	Jewelweed	IMCA	**42**	3.9	3
Thelypteris palustris	Eastern marsh fern	THPA	**40**	2	4
Osmunda cinnamomea	Cinnamon fern	OSCI	**36**	1.4	5

Appalachian-Northeast Wet Meadow & Shrub Swamp Group (G903) Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)					
Scientific Name	**Common Name**	**USDA Plants Code**	**Constancy**	**Mean % Cover**	**NJ State CoC**
Calamagrostis canadensis	Canada bluejoint	CACA4	**34**	7.2	5
Carex stricta	Tussock sedge	CAST8	**33**	8.9	5
Polygonum sagittatum	Arrow-leaved tearthumb	POSA5	**32**	1.5	3
Carex sp.	Sedge	CAREX	**31**	2	7
Leersia oryzoides	Rice cutgrass	LEOR	**28**	3.8	3
Lysimachia terrestris	Swamp-candles	LYTE2	**28**	0.9	5
Eutrochium maculatum	Spotted joe-pye-weed	EUMA9	**26**	1.4	5
Triadenum virginicum	Marsh St. John's-wort	TRVI2	**26**	0.9	7
Juncus effusus	Common rush	JUEF	**25**	0.4	2
Solidago rugosa	Wrinkle-leaf goldenrod	SORU2	**25**	1.1	3
Symphyotrichum puniceum	Purplestem aster	SYPU	**23**	1.3	4
Lycopus uniflorus	Northern bugleweed	LYUN	**22**	0.2	4
Solidago gigantea	Giant goldenrod	SOGI	**22**	1.1	3
Dulichium arundinaceum	Three-way sedge	DUAR3	**21**	0.8	5
Glyceria canadensis	Rattlesnake manna grass	GLCA	**21**	0.9	6
Iris versicolor	Northern blue flag	IRVE2	**20**	0.1	5
NON-VASCULAR					
Sphagnum sp.	Sphagnum	SPHAG2	**23**	5.2	7

FQA Metric Thresholds for Mean C and Cover-weighted Mean C **G903 Appalachian-Northeast Wet Meadow & Shrub Swamp Group**				
FQA Metric	**Excellent**	**Good**	**Fair**	**Poor**
Mean C	>5.1	5.1-4.2	4.2-2.6	<2.6
Cover-Weighted Mean C	>5.7	5.7-4.1	4.1-2.2	<2.2



For more information on finer scale floristic Alliances and Associations in **G903 Appalachian-Northeast Wet Meadow & Shrub Swamp Group** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A3685 Appalachian-Northeast Alder - Willow - Dogwood Shrub Swamp
This alliance contains tall-shrub swamps in the northeastern and north-central United States and eastern temperate Canada in a variety of non-alluvial topographic depressions, and dominated by *Alnus incana, Alnus serrulata, Salix sericea*, or *Hypericum densiflorum*. Associates may include *Cornus sericea, Rosa palustris, Spiraea alba var. latifolia, Spiraea alba, Viburnum nudum var. cassinoides*, and others.

Associations within A3685 in New Jersey:
CEGL006576 *Cornus (amomum, sericea) - Viburnum dentatum - Rosa multiflora* Shrub Swamp
CEGL005082 *Alnus serrulata / Calamagrostis canadensis* Shrub Swamp (Hazel Alder Shrub Swamp)
CEGL006414 *Cornus amomum - Alnus serrulata* Shrub Swamp (Mid-Atlantic Coastal Plain Alder Swamp)
CEGL006305 *Salix sericea* Shrub Swamp (Silky Willow Shrub Swamp)

A3670 Appalachian-Northeast Buttonbush - Swamp-loosestrife Shrub Swamp
This buttonbush swamp shrubland occurs in wetlands throughout the Central Appalachian region, northeastern United States, and adjacent Canada. *Cephalanthus occidentalis* or *Decodon verticillatus* typically comprises nearly 90% of the shrub layer in waters 1-2 m deep.

Associations within A3670 in New Jersey:
CEGL006242 *Cephalanthus occidentalis / Polygonum hydropiperoides - Panicum verrucosum* Shrub Swamp (Coastal Plain Buttonbush Pond)
CEGL006087 *Decodon verticillatus / Triadenum virginicum* Wet Shrubland (Coastal Plain Swamp-loosestrife Pond)
CEGL006069 *Cephalanthus occidentalis - Decodon verticillatus* Shrub Swamp (Northeastern Buttonbush Shrub Swamp)
CEGL005089 *Decodon verticillatus* Shrub Swamp (Swamp-loosestrife Shrub Swamp)

A4681 Appalachian-Northeast Wet Meadow
This alliance is known from the Central Appalachians-Northeast region and is characterized by wet or wet-mesic sites flooded for part of the growing season, dominated by sedge meadows, forb meadows, and shallow marshes.

Associations within A4681 in New Jersey:
CEGL006412 *Carex stricta - Carex vesicaria* Wet Meadow (Eastern Upright Sedge Wet Meadow)
CEGL006447 *Carex trichocarpa* Rivershore Wet Meadow (Hairy-fruit Sedge Wetland)
CEGL006349 *Scirpus cyperinus* Wet Meadow (Northeastern Woolgrass Wet Meadow)
CEGL005106 *Leersia oryzoides - Glyceria striata - (Schoenoplectus* spp.*, Impatiens capensis)* Wet Meadow (Rice Cutgrass - Fowl Mannagrass Wet Meadow)

A4680 Central Appalachian Sinkhole Pond
This sinkhole pond community occurs in mostly seasonally flooded (rarely semipermanently flooded) depression ponds in the Central Appalachian, Ridge and Valley, and Northern Blue Ridge regions.

Associations within A4680 in New Jersey:
CEGL006900 *Boltonia montana - Symphyotrichum racemosum - Mentha arvensis* Wet Meadow (Mountain Doll's-daisy - Smooth White Oldfield Aster - Wild Mint Pond)
CEGL006903 *Leersia oryzoides - Boehmeria cylindrica - Ranunculus flabellaris* Wet Meadow (Rice Cutgrass - Small-spike False Nettle - Yellow Water Buttercup Pond)

G904 Laurentian-Acadian Wet Meadow & Shrub Swamp

G904 Laurentian-Acadian Wet Meadow & Shrub Swamp

Laurentian-Acadian Wet Meadow & Shrub Swamp Group

Type Concept: This group is found in the Laurentian region of the Great Lakes and the northeastern United States and adjacent Canada north from West Virginia. It is characterized by wet-mesic to wet sites and can be dominated by a variety of graminoids and forbs. Common abundant species include the graminoids *Calamagrostis canadensis, Carex lacustris, Carex stricta, Carex vesicaria, Carex utriculata, Glyceria striata, Leersia oryzoides*, and *Scirpus cyperinus*. Forbs that may be common or dominant include *Boltonia asteroides var. asteroides, Eutrochium fistulosum, Eupatorium perfoliatum, Impatiens capensis, Impatiens pallida, Mentha arvensis, Sagittaria latifolia, Solidago canadensis, Solidago rugosa, Symphyotrichum racemosum*, and *Verbesina alternifolia*. Sites are found in basins or along slow-moving rivers and streams and are flooded or saturated for at least some of the growing season but rarely more than 0.3 m deep.

Dynamics: Stands are flooded or saturated for at least a few weeks each year and can remain saturated for most of the growing season in some stands. Prolonged changes in hydrologic regime, either wetter or drier, often result in a change to a different group. This group is common behind beaver dams.

Environment: This group occurs in basins or along the edges of slow-moving rivers or streams. Sites are saturated or flooded by shallow water for at least a few weeks during the growing season. Water is usually less than 0.3 m deep. Soils are alluvial, muck, or sometimes peaty. This group occurs from low elevations near the coast in New England and New Jersey to the high Allegheny Mountains in West Virginia.

Laurentian-Acadian Wet Meadow & Shrub Swamp (G904)
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
TREE					
Acer rubrum	Red maple	ACRU	**46**	1.4	3
Abies balsamea	Balsam fir	ABBA	**20**	1.1	9
SHRUB					
Alnus incana	Speckled alder	ALIN2	**59**	13	6
Spiraea alba	White meadowsweet	SPAL2	**59**	2.9	5
Rubus pubescens	Dwarf blackberry	RUPU	**22**	0.9	7
Myrica gale	Sweet gale	MYGA	**20**	2	9
HERBACEOUS					
Calamagrostis canadensis	Canada bluejoint	CACA4	**59**	10.2	5
Carex stricta	Tussock sedge	CAST8	**46**	9.6	5
Lysimachia terrestris	Swamp-candles	LYTE2	**45**	0.8	5
Onoclea sensibilis	Sensitive fern	ONSE	**39**	1.3	3
Iris versicolor	Northern blue flag	IRVE2	**31**	0.3	5
Thelypteris palustris	Eastern marsh fern	THPA	**31**	0.4	4

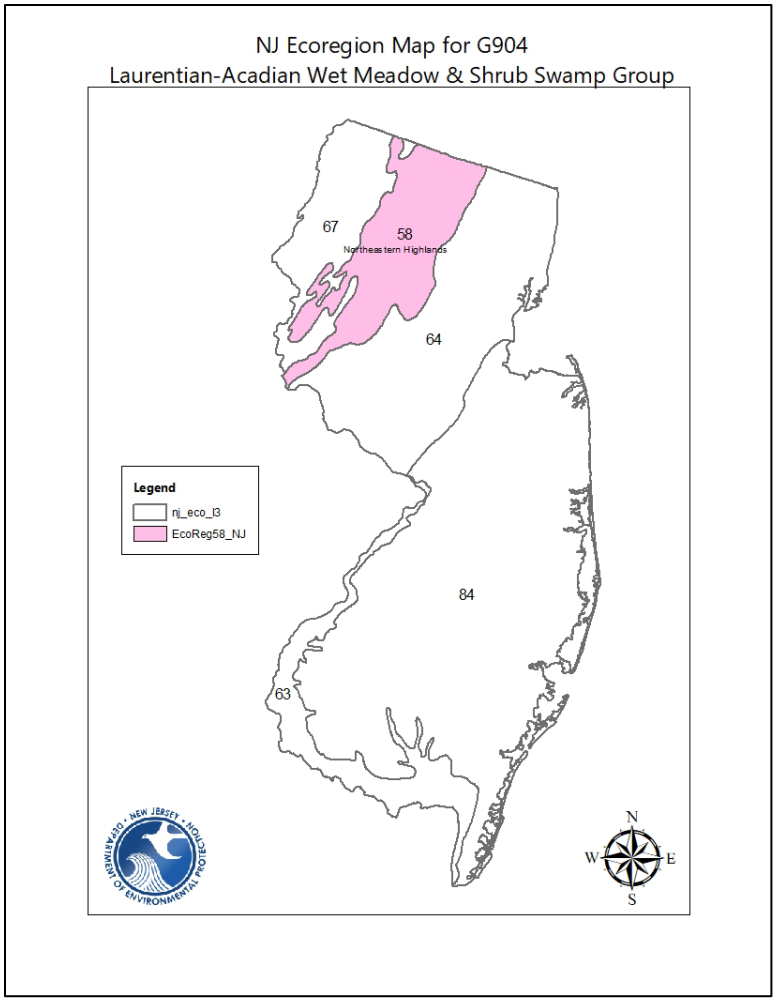
Laurentian-Acadian Wet Meadow & Shrub Swamp (G904)

Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
Osmunda regalis	Royal fern	OSRE	**28**	1.4	7
Dulichium arundinaceum	Three-way sedge	DUAR3	**27**	1.5	5
Glyceria canadensis	Rattlesnake manna grass	GLCA	**25**	0.3	6
Thalictrum pubescens	Tall meadow-rue	THPU2	**25**	1.2	5
Solidago rugosa	Wrinkle-leaf goldenrod	SORU2	**23**	0.8	3
Lycopus uniflorus	Northern bugleweed	LYUN	**22**	0.1	4
Osmunda cinnamomea	Cinnamon fern	OSCI	**21**	1.5	5
Carex lacustris	Lake-bank sedge	CALA16	**20**	2.6	9
Impatiens capensis	Jewelweed	IMCA	**20**	0.5	3
Triadenum virginicum	Marsh St. John's-wort	TRVI2	**20**	0.3	7
NON-VASCULAR					
Sphagnum sp.	Sphagnum	SPHAG2	**40**	15.1	7

FQA Metric Thresholds for Mean C and Cover-weighted Mean C
G904 Laurentian-Acadian Wet Meadow & Shrub Swamp

FQA Metric	Excellent	Good	Fair	Poor
Mean C	>5.6	5.6-4.3	<4.3	[2.4]
Cover-Weighted Mean C	>5.1	5.1-4.2	<4.2	[2.2]



For more information on finer scale floristic Alliances and Associations in **G904 Laurentian-Acadian Wet Meadow & Shrub Swamp Group** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A2172 Laurentian-Acadian Alluvial Thicket
Alnus incana - Cornus sericea - Viburnum nudum Alluvial Shrub Swamp Alliance

A4107 Laurentian-Acadian Graminoid Wet Meadow (*Carex* spp. - *Calamagrostis canadensis* Northern Wet Meadow Alliance)
This bluejoint-sedge wet meadow alliance is found in the Laurentian and Acadian-Northern Appalachian regions of the United States and Canada, extending southward into the Central Appalachian region. It is dominated by *Calamagrostis canadensis* and *Carex* spp. (usually *Carex lacustris, Carex lasiocarpa, Carex stricta, Carex vesicaria*, and *Carex utriculata*). Sites are flooded or saturated for most of the growing season, and soils tend to be fine-textured with muck or sedge peat.

Associations within A4107 in New Jersey:
CEGL005448 *Calamagrostis canadensis* - *Carex* spp. Laurentian-Acadian Wet Meadow
(Laurentian-Acadian Bluejoint Wet Meadow)

G925 Gray Alder / Prairie Cordgrass - Tufted Hairgrass Riverscour Vegetation

G925 Laurentian-Acadian-Northeast Riverscour Vegetation

Gray Alder / Prairie Cordgrass - Tufted Hairgrass Riverscour Vegetation

***Alnus incana / Spartina pectinata - Deschampsia cespitosa* Riverscour Vegetation**

Type Concept: This group consists of sparsely vegetated barren riverscour, both outcrop-pavement and unconsolidated sand, gravel and cobble, in the Great Lakes, Laurentian, and northeastern North America regions, from Pennsylvania to Quebec, Canada and west to Ontario and Wisconsin. Species composition is highly variable because of riverscouring and variable substrates. Characteristic species include *Andropogon gerardii, Calamagrostis canadensis, Campanula rotundifolia, Deschampsia cespitosa, Doellingeria umbellata, Hypericum prolificum, Packera paupercula, Prunus pumila, Solidago simplex, Spartina pectinata*, and/or *Triantha glutinosa*.

Dynamics: Flooding and ice-scour can remove vegetation and rearrange soil/substrate conditions.

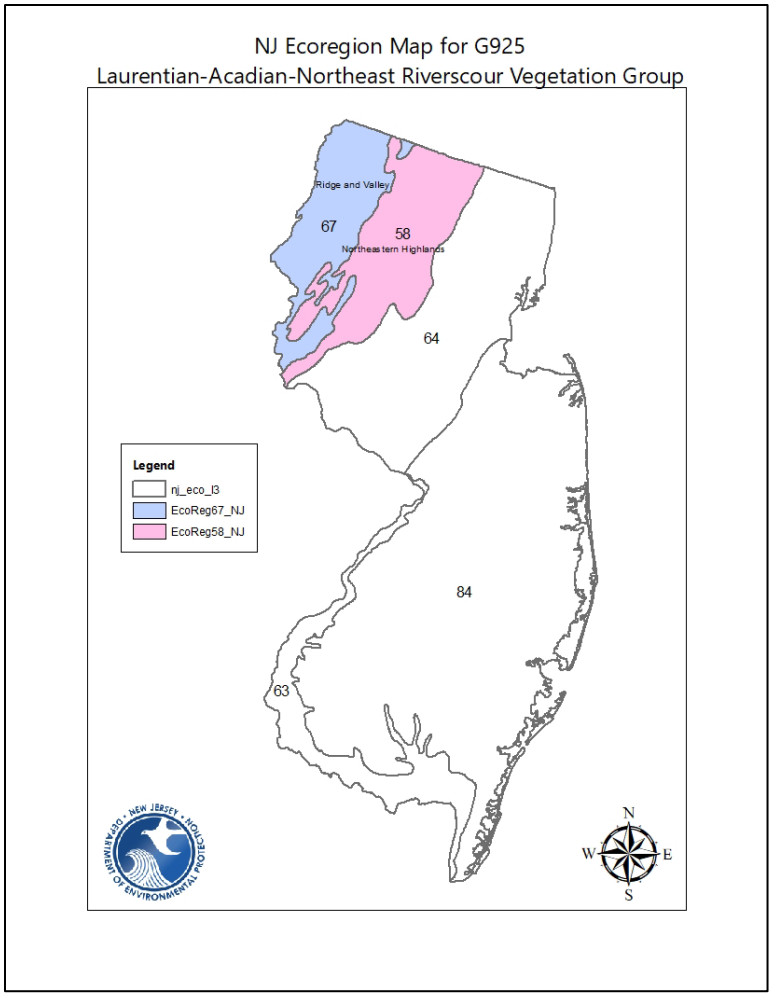
Environment: This group occurs on the shores of rivers where flooding and ice-scour impact the vegetation. Soil is patchy and often poorly developed. The substrate is sand, gravel, cobble, or bedrock. Groundwater seepage occurs in some examples and maintains a more saturated soil condition. Some sites are calcareous due to seepage of calcareous groundwater or occurring on calcareous substrates.

Gray Alder / Prairie Cordgrass - Tufted Hairgrass Riverscour Vegetation (G925)
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
TREE					
Acer rubrum	Red maple	ACRU	**23**	0.3	3
SHRUB					
Spiraea alba	White meadowsweet	SPAL2	**48**	1.2	5
Alnus incana	Speckled alder	ALIN2	**42**	1	6
Cornus amomum	Silky dogwood	COAM2	**23**	0.6	5
Cornus sericea	Red-osier dogwood	COSE16	**21**	0.2	7
HERBACEOUS					
Euthamia graminifolia	Flat-top goldentop	EUGR5	**52**	0.6	2
Calamagrostis canadensis	Canada bluejoint	CACA4	**42**	6.5	5
Doellingeria umbellata	Parasol whitetop	DOUM2	**42**	0.5	4
Thalictrum pubescens	Tall meadow-rue	THPU2	**34**	0.3	5
Solidago rugosa	Wrinkle-leaf goldenrod	SORU2	**32**	2	3
Andropogon gerardii	Big bluestem	ANGE	**31**	9.1	4
Viola cucullata	Blue marsh violet	VICU	**31**	0.2	6
Dichanthelium clandestinum	Deertongue	DICL	**29**	0.4	2
Eutrochium maculatum	Spotted joe-pye-weed	EUMA9	**29**	1.2	5
Onoclea sensibilis	Sensitive fern	ONSE	**27**	1.2	3
Symphyotrichum novi-belgii	New York aster	SYNO3	**27**	0.2	6

Gray Alder / Prairie Cordgrass - Tufted Hairgrass Riverscour Vegetation (G925) Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)					
Scientific Name	**Common Name**	**USDA Plants Code**	**Constancy**	**Mean % Cover**	**NJ State CoC**
Achillea millefolium	Common yarrow	ACMI2	**24**	0.2	0
Solidago gigantea	Giant goldenrod	SOGI	**24**	0.4	3
Lysimachia terrestris	Swamp-candles	LYTE2	**23**	0.3	5
Lycopus uniflorus	Northern bugleweed	LYUN	**21**	0.1	4
Prunella vulgaris	Common selfheal	PRVU	**21**	0.1	1

FQA Metric Thresholds for Mean C and Cover-weighted Mean C **G925 Laurentian-Acadian-Northeast Riverscour Vegetation** **Gray Alder / Prairie Cordgrass - Tufted Hairgrass Riverscour Vegetation**				
FQA Metric	**Excellent**	**Good**	**Fair**	**Poor**
Mean C	>4.4	4.4-3.6	<3.6	[3.2]
Cover-Weighted Mean C	>4.7	4.7-3.7	<3.7	[1.6]



For more information on finer scale floristic Alliances and Associations in **G925 Gray Alder / Prairie Cordgrass - Tufted Hairgrass Riverscour Vegetation (Laurentian-Acadian-Northeast Riverscour Vegetation Group)** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A3826 Great Lakes-Northeast Riverside Outcrop
This alliance comprises vegetation occurring on bedrock outcrops or sandy point bars or receiving flood-scour. The vegetation is highly variable in substrate, cover, and composition, but is characterized by *Andropogon gerardii, Anemone virginiana var. alba, Prunus pumila, Solidago simplex, Arabis lyrata*, and *Solidago simplex*. It ranges from Pennsylvania and New Jersey to northern New England and southern Quebec.

Associations within A3826 in New Jersey:
CEGL006969 *Deschampsia cespitosa - Carex viridula* Riverscour Wet Meadow (MidTufted Hairgrass - Sedge Riverscour Wet Meadow)
CEGL006284 *Andropogon gerardii - Campanula rotundifolia - Solidago simplex* Riverscour Sparse Vegetation (Northern Riverscour Rock Outcrop)

A3827 Northeast Unconsolidated Rivershore Grassland
This alliance comprises riverwash vegetation of northern New England and the Upper Midwest occurring on bedrock ledges, or sandy or cobble beaches receiving alluvial flooding and ice-scour. Physiognomy and species composition are variable but include *Spartina pectinata* and *Apocynum cannabinum*.

Associations within A3827 in New Jersey:
CEGL006518 *Prunus pumila / Andropogon gerardii - Sorghastrum nutans* Riverscour Wet Meadow
(Riverside Prairie Wet Meadow)

G755 Eastern North American Scrub & Herb Riverbed Wetland

G755 Eastern North American Scrub & Herb Riverbed Wetland
Eastern North American Riverine Wetland Vegetation Group

Type Concept: This eastern North American group consists of riverine wetlands. Even with this reduced concept, composition is variable enough that individual character species are somewhat difficult to isolate, but some reasonably constant species might include *Alnus serrulata, Carex torta, Elymus* spp., *Eupatorium* spp., *Panicum virgatum, Salix caroliniana, Salix interior* (more Midwest), *Solidago gigantea*, and others.

Dynamics: Highly dynamic riverside subjected to flood-scour.

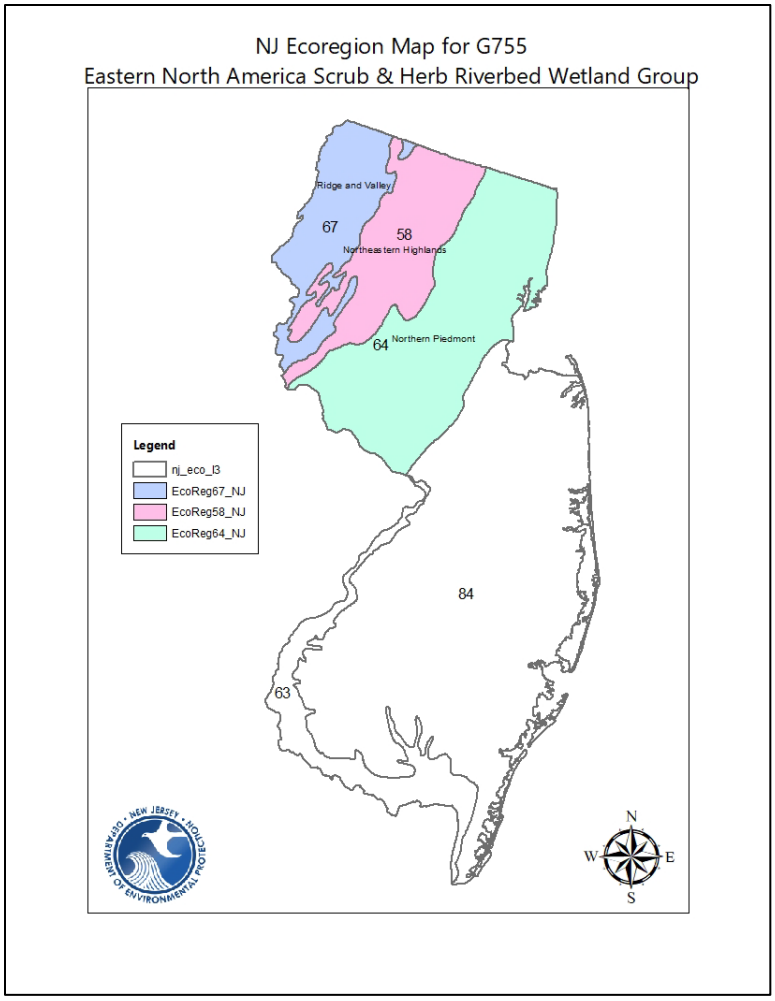
Environment: Rocky river shoals with alluvial herbs and flood-battered scrub on sand or gravel substrate deposited by regular and high-intensity alluvial flooding.

Eastern North American Scrub & Herb Riverbed Wetland (G755)
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
SHRUB					
Salix sericea	Silky willow	SASE	**24**	1.8	6
HERBACEOUS					
Carex torta	Twisted sedge	CATO4	**34**	3.3	10
Onoclea sensibilis	Sensitive fern	ONSE	**31**	0.9	3
Calamagrostis canadensis	Canada bluejoint	CACA4	**29**	0.5	5
Euthamia graminifolia	Flat-top goldentop	EUGR5	**27**	0.2	2
Eutrochium maculatum	Spotted joe-pye-weed	EUMA9	**26**	1.4	5
Oxalis dillenii	Southern yellow wood-sorrel	OXDI2	**26**	0.1	1
Dichanthelium clandestinum	Deertongue	DICL	**25**	0.4	2
Viola cucullata	Blue marsh violet	VICU	**22**	0.1	6
Polygonum sagittatum	Arrow-leaved tearthumb	POSA5	**21**	0.2	3
Eupatorium perfoliatum	Boneset	EUPE3	**20**	0.2	4
Phalaris arundinacea	Reed canary-grass	PHAR3	**20**	0.1	1

FQA Metric Thresholds for Mean C and Cover-weighted Mean C
G755 Eastern North American Scrub & Herb Riverbed Wetland

FQA Metric	Excellent	Good	Fair	Poor
Mean C	>4.1	4.1-3.1	3.1-2.0	<2.0
Cover-Weighted Mean C	>5.0	5.0-3.5	3.5-1.6	<1.6



For more information on finer scale floristic Alliances and Associations in **G755 Eastern North American Scrub & Herb Riverbed Wetland Group** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A0948 Black Willow Sand-Gravel Riverine Scrub
This alliance is composed of vegetation occurring on sand and gravel rivershores receiving high-energy flood-scour throughout the eastern United States and possibly adjacent Canada. The physiognomy is best characterized as scrub, formed by intermittent flood-scour. *Salix nigra* is characteristic, but floristic composition and structure is widely variable.

Associations within A0948 in New Jersey:
CEGL006065 *Salix nigra* - *Salix* spp. / *Carex torta* - *Apocynum cannabinum* Wet Shrubland
(Northeast Willow Riverbar Shrubland)

A1657 Water-willow Riverbed
This riverscour alliance, found in the Interior Low Plateau, Ozarks, Ouachita Mountains, and the Central Appalachians is characterized by *Justicia americana* with *Leersia* spp., *Saururus cernuus*, and others. More

Appalachian examples may contain *Orontium aquaticum* as a codominant. In parts of the Ridge and Valley and Piedmont, *Hymenocallis coronaria* is codominant.

Associations within A1657 in New Jersey:
CEGL006554 ***Lysimachia ciliata - Apocynum cannabinum*** **Sparse Riverbed Vegetation** (Loosestrife - Indian-hemp Scoured Rivershore)
CEGL004286 ***Justicia americana*** **Riverbed Vegetation** (Water-willow Rocky Bar & Shore)

G756 Eastern North American Wet Shoreline Vegetation

G756 Eastern North American Wet Shoreline Vegetation

Eastern North American Wet Shoreline Vegetation Group

Type Concept: This group consists of low-energy shorelines of rivers and ponds, characterized by low annual plants, emergent aquatic plants, graminoids, leafy forbs, and scattered shrubs. Typical taxa include *Boehmeria cylindrica, Carex* spp., *Cyperus* spp., *Eragrostis hypnoides, Hydrocotyle umbellata, Juncus effusus, Leersia oryzoides, Lindernia dubia, Ludwigia palustris, Peltandra virginica, Polygonum* spp., *Saururus cernuus, Schoenoplectus* spp., *Triadenum walteri*, and *Utricularia gibba*. Diminutive annuals include *Eragrostis hypnoides, Lipocarpha micrantha*,and *Fimbristylis autumnalis*. Aquatic species include *Heteranthera* spp., *Nuphar*, and *Nymphaea* spp. *Cephalanthus occidentalis* may occur as scattered individuals. Stands occur in shallow basins, shores of slow-moving rivers, or lake and pond margins that flood in the spring and draw down later in the season. This group ranges broadly in the southeastern, mid-Atlantic, and midwestern U.S.

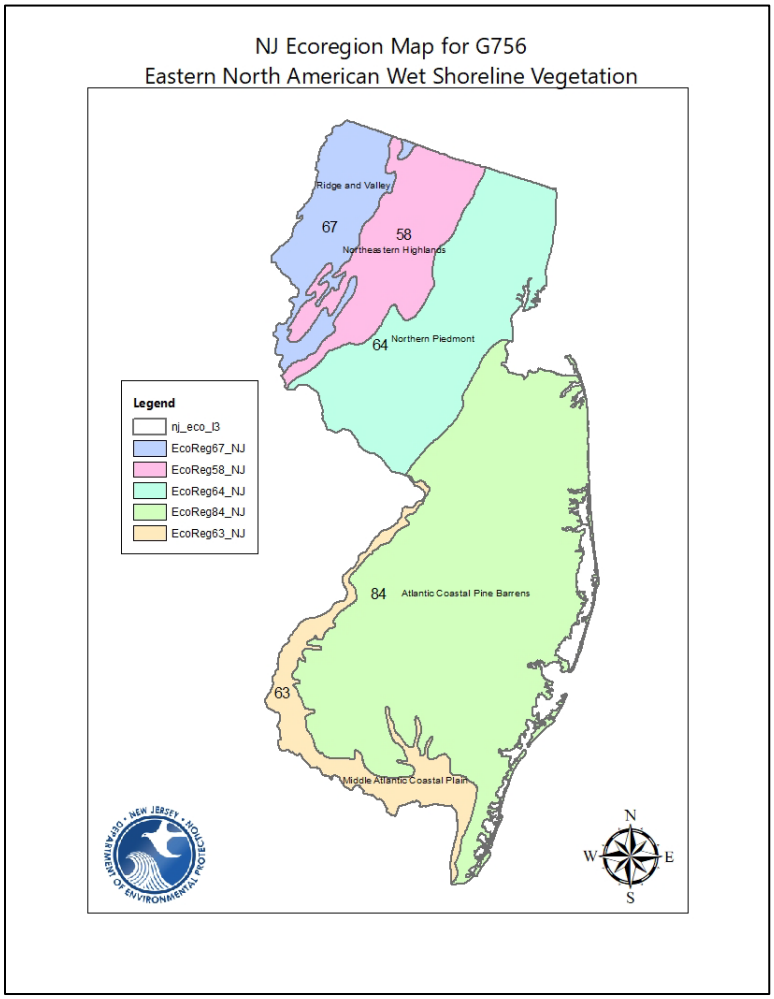
Dynamics: This vegetation is influenced by seasonal flooding in low-energy waterbodies. As the water levels recedes later in the growing season, the mucky substrate is exposed and rapidly colonized by annuals.

Environment: This group occupies the shores of slow-moving rivers, and on lakeshores and pondshores. It also occupies backwater depressions and oxbows of rivers, as well as beaver-influenced wetlands. The substrate is often mucky, or silty on riverbanks. These shores are seasonally flooded, and except for aquatic plants, vegetation may not be evident until late in the growing season when the water level has dropped sufficiently to expose the substrate.

Eastern North American Wet Shoreline Vegetation Group (G756) Floristic Composition: Species listed by Growth Form and Species			
Scientific Name	**Common Name**	**USDA Plants Code**	**NJ State CoC**
SHRUB			
Cephalanthus occidentalis	Buttonbush	CEOC2	6
HERBACEOUS			
Boehmeria cylindrica	False nettle	BOCY	4
Calamagrostis canadensis	Canada bluejoint	CACA4	5
Carex sp.	Sedge	CAREX	7
Cicuta maculata	Spotted water hemlock	CIMA2	5
Cyperus sp.	Flatsedge	CYPER	3
Eragrostis hypnoides	Smooth creeping love-grass	ERHY	5
Fimbristylis autumnalis	Slender fimbry	FIAU2	3
Heteranthera sp.	Mud plantain	HETER	6
Hydrocotyle umbellata	Manyflower marsh pennywort	HYUM	6
Juncus effusus	Common rush	JUEF	2
Leersia oryzoides	Rice cutgrass	LEOR	3
Lindernia dubia	Yellowseed false pimpernel	LIDU	2
Lipocarpha micrantha	Smallflower halfchaff sedge	LIMI12	7

Eastern North American Wet Shoreline Vegetation Group (G756) Floristic Composition: Species listed by Growth Form and Species			
Scientific Name	**Common Name**	**USDA Plants Code**	**NJ State CoC**
Ludwigia palustris	Marsh-purslane	LUPA	2
Nuphar sp.	Pond-Lily	NUPHA	5
Nymphaea sp.	Waterlily	NYMPH	6
Peltandra virginica	Arrow-arum	PEVI	4
Polygonum sp.	Knotweed (native)	_POLYG4-U	3
Saururus cernuus	Lizard's-tail	SACE	8
Schoenoplectus sp.	Bulrush	SCHOE6	8
Spartina pectinata	Prairie cordgrass	SPPE	7
Triadenum walteri	Walter's St. John's-wort	TRWA	10
Utricularia gibba	Humped bladderwort	UTGI	9

This wetland type was not included in the NJ and Northeast ecoregional FQA analysis, therefore we do not have FQA Metric Thresholds for Mean C and Cover-Weighted Mean C at this time.



For more information on finer scale floristic Alliances and Associations in **G756 Eastern North American Wet Shoreline Vegetation Group** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A1881 Eastern Knotweed Shoreline Wet Meadow
This alliance covers various southeastern and mid-Atlantic wet depressions, lakes, and ponds dominated by various *Polygonum* species (section *Persicaria*), singly or in combination, or with other obligate wetland plant species. Associations have been described that are dominated by, or contain, *Polygonum amphibium, Polygonum glabrum, Polygonum hydropiperoides, Polygonum lapathifolium, Polygonum pensylvanicum, Polygonum punctatum*, and/or related *Polygonum* spp. The many associated species vary with geography and habitat.

Associations within A1881 in New Jersey:
CEGL004290 *Polygonum (hydropiperoides, punctatum)* - *Leersia* spp. Shoreline Wet Meadow
(Smartweed - Cutgrass Beaver Pond)

G752 North Atlantic Coastal Interdunal Wetland

G752 North Atlantic Coastal Interdunal Wetland

North Atlantic Coastal Interdunal Wetland Group

Type Concept: This group comprises small-patch non-forested wetlands exclusive of those that are tidally flooded in maritime and coastal areas of the northeast and mid-Atlantic states. It includes small-patch wetlands generally known as "interdunal swales" as well as other non-forested coastal wetlands that are not tidally flooded. Characteristic species include *Fimbristylis castanea, Morella cerifera, Morella pensylvanica, Panicum virgatum, Schoenoplectus pungens, Vaccinium corymbosum, Vaccinium macrocarpon*, and species of *Juncus*.

Dynamics: Groundwater and rainwater are the only sources of inundation, and water levels decrease or standing water may absent later in the growing season. Some interdunal swales are slightly saline as a result of occasional overwash.

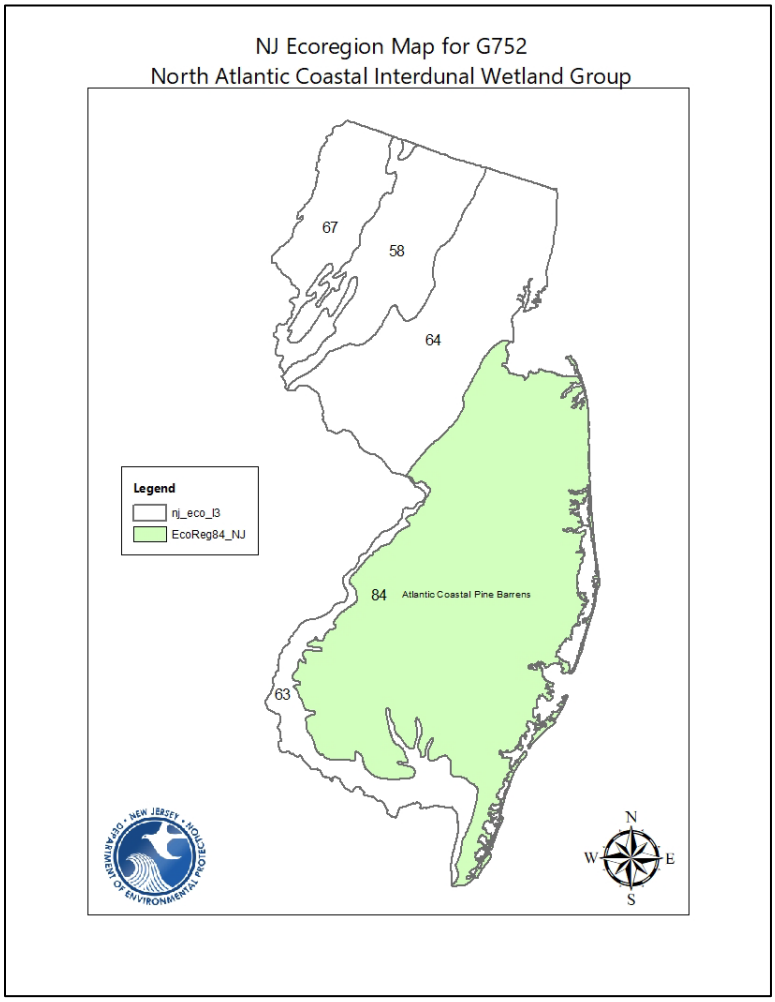
Environment: These small-patch wetlands occur in shallow, seasonally flooded basins occurring in hollows of major dune systems. They also occur on the shores of larger, sometimes deeper ponds that occur on morainal deposits in the glaciated part of the region.

North Atlantic Coastal Interdunal Wetland (G752)

Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
TREE					
Acer rubrum	Red maple	ACRU	**27**	0.7	3
SHRUB					
Toxicodendron radicans	Poison ivy	TORA2	**45**	1	1
Vaccinium corymbosum	Highbush blueberry	VACO	**32**	2.9	5
Vaccinium macrocarpon	Cranberry	VAMA	**32**	15.5	5
Baccharis halimifolia	Groundsel-tree	BAHA	**23**	1.6	4
HERBACEOUS					
Schoenoplectus pungens	Common threesquare	SCPU10	**64**	29.6	3
Hibiscus moscheutos	Rose-mallow	HIMO	**32**	6.5	5
Phragmites australis	Common reed	PHAU7	**32**	0.5	0
Thelypteris palustris	Eastern marsh fern	THPA	**32**	11.2	4
Triadenum virginicum	Marsh St. John's-wort	TRVI2	**27**	2.1	7
Pluchea odorata	Marsh fleabane	PLOD	**23**	0.5	5
NON-VASCULAR					
Sphagnum sp.	Sphagnum	SPHAG2	**45**	19.4	7

FQA Metric Thresholds for Mean C and Cover-weighted Mean C G752 North Atlantic Coastal Interdunal Wetland				
FQA Metric	**Excellent**	**Good**	**Fair**	**Poor**
Mean C	>5.3	<5.3	[4.5]	[4.4]
Cover-Weighted Mean C	>6.1	<6.1	[5.0]	[3.8]



For more information on finer scale floristic Alliances and Associations in **G752 North Atlantic Coastal Interdunal Wetland Group** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A1427 Forked Rush Interdunal Swale
This alliance encompasses rush-dominated vegetation of small, interdunal, very shallow, seasonally flooded basins located along the mid-Atlantic Coast from New Jersey to Virginia. Associates include *Andropogon virginicus, Juncus dichotomus, Juncus canadensis, Juncus biflorus, Juncus scirpoides, Drosera intermedia, Fimbristylis autumnalis, Linum medium, Schoenoplectus pungens*, and *Solidago sempervirens*.

Associations within A1427 in New Jersey:
CEGL004111 ***Juncus (dichotomus, scirpoides) - Drosera intermedia*** **Wet Meadow** (Forked Rush Dune Swale)

A3650 Coastal Northern Bayberry Wet Shrubland
This alliance includes freshwater swales behind primary or secondary dunes or in wetlands of areas underlain by morainal deposits, characterized by, but not necessarily dominated by, *Morella pensylvanica*. Other associates may include *Myrica gale, Vaccinium corymbosum, Clethra alnifolia, Ilex verticillata*, and others. It occurs in the coastal zone in southern New England, New York, and New Jersey.

Associations within A3650 in New Jersey:
CEGL003906 ***Morella (cerifera, pensylvanica) - Vaccinium corymbosum*** **Wet Shrubland** (Barrier Island Shrub Bog)

A3651 Coastal Cranberry Wet Shrubland
This alliance is made up of interdunal swales, as well as peaty basin wetlands underlain by morainal deposits, from New England south to Delaware. The dwarf-shrub *Vaccinium macrocarpon* forms a low thicket, sometimes overtopped and obscured by other shrubs and tall herbs. Scattered *Morella pensylvanica, Vaccinium corymbosum, Clethra alnifolia*, and other shrubs may be prominent.

Associated within A3651 in New Jersey:
CEGL006141 ***Cladium mariscoides / Vaccinium macrocarpon - Morella pensylvanica*** **Wet Dwarf-shrubland** (Northern Interdunal Cranberry Swale)

A3652 Coastal Switchgrass Wet Meadow
This alliance encompasses seasonally flooded basins from coastal Massachusetts south to northern coastal Virginia dominated by *Panicum virgatum*. This vegetation occurs in interdunal wetland depressions, as well as deeper wetland basins in regions underlain by morainal deposits.

Associations within A3652 in New Jersey:
CEGL004129 ***(Morella cerifera) / Panicum virgatum - Spartina patens*** **Wet Meadow** (Interdune Switchgrass Brackish Depression)

A3653 Common Threesquare Interdunal Swale
This alliance contains interdunal swale vegetation characterized by *Spartina patens* and *Schoenoplectus pungens*. It ranges from freshwater to slightly brackish, the latter resulting from occasional overwash or brackish groundwater influence and occurs from southern New England along the coast to Virginia.

Associations within A3653 in New Jersey:
CEGL006935 ***Schoenoplectus pungens var. pungens - Juncus canadensis*** **Marsh** (Coastal Freshwater Marsh)
CEGL006342 ***Spartina patens - Eleocharis parvula*** **Marsh** (Northeastern Atlantic Brackish Interdunal Swale)

G915 Beaksedge - Spikerush - Yellow-eyed-grass species Pondshore & Wet Prairie

G915 South Atlantic & Gulf Coastal Plain Pondshore & Wet Prairie

Beaksedge species - Spikerush species - Yellow-eyed-grass species Pondshore & Wet Prairie Group

***Rhynchospora* spp. - *Eleocharis* spp. - *Xyris* spp. Pondshore & Wet Prairie Group**

Type Concept: This group occurs in coastal plain pond depressions and wet flats, primarily from the South Atlantic Coast of North Carolina to the Gulf Coast states. The vegetation in depressions usually ranges from open water or floating-leaved aquatics in the center of the deepest basins, to emergent marsh zones in semipermanent water, to drawdown zones with diverse small graminoid and forb vegetation, to dense shrub or woodland edges. Wet prairie vegetation is found on extensive wet flats and consists of primarily herbaceous wetland vegetation with relatively thick cover of grasses and sedge species. Examples occupy low, flat plains on poorly drained soils, often saturated for 50-100 days per year. Occasional to frequent fires, including growing-season burns, are essential for maintenance of this vegetation. Some examples have a sparse tree component of *Pinus elliottii* or *Pinus palustris* and scattered shrubs, such as *Morella cerifera*. Common taxa include *Rhynchospora* spp., *Eleocharis* spp., and *Xyris* spp. These often occur with other graminoids such as species of *Andropogon, Aristida, Carex, Eriocaulon*, and *Panicum*.

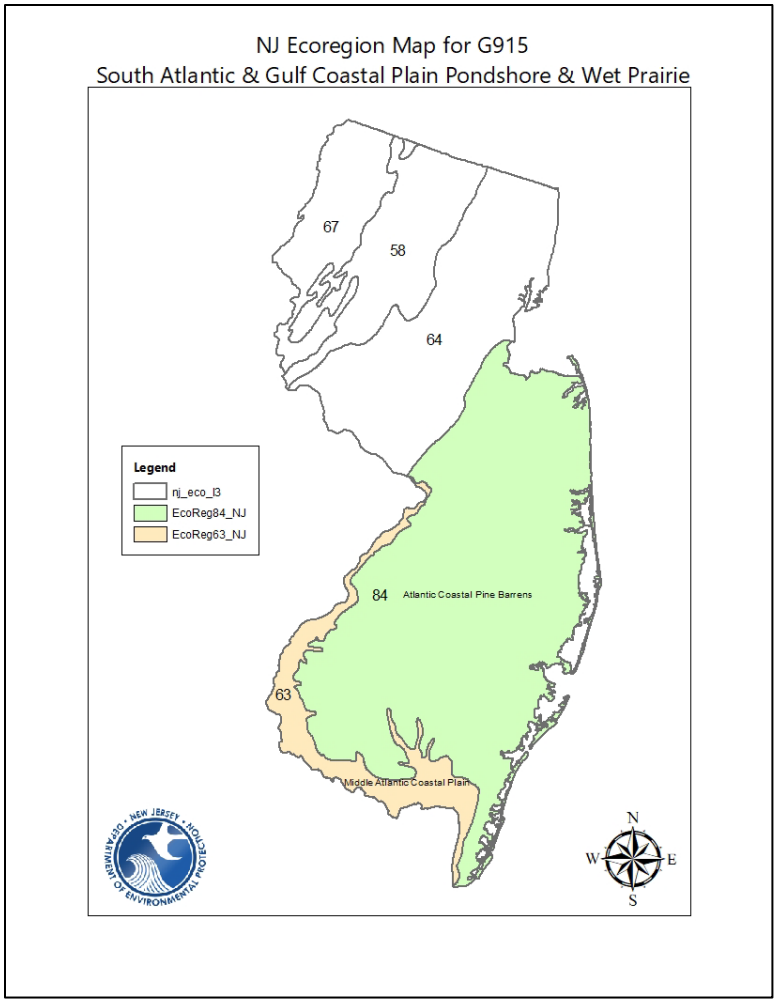
Dynamics: Water table fluctuations are probably the most important factor affecting examples of this vegetation (Bridges and Orzell 1989a). In depressions, hydroperiod can vary substantially from year to year, and vegetation can similarly vary significantly in aspect and dominants. Fire is also an important natural dynamic process, especially when sites are saturated, without standing water at the surface. On barrier islands, ponds usually occur in stable portions of the islands, where they may last for decades.

Environment: *Climate:* The climate is humid, warm temperate. *Soil/substrate/hydrology:* This vegetation occupies low, flat plains on poorly drained Ultisols. Other soil orders may include Spodosols, Inceptisols, and Entisols (Collins et al. 2001); some of these soils have an argillic horizon which impedes drainage and contributes to high water tables. On Eglin Air Force Base, this group is found on the Rutledge series (Kindell et al. 1997). The low areas where this vegetation occurs on barrier islands and similar immediate coastal areas are dune swales or other basins. The ponds have standing water well into the growing season, and most are permanently saturated. The vegetation also occurs in small basins, primarily in sandy terrain of the Atlantic Coastal Plain, from southeastern Virginia to Florida, including the Lake Wales Ridge area of central Florida. Most southeast basins are formed by subsidence of surface sediments caused by solution in underlying limestone, but origins may be different from Delaware northward.

South Atlantic & Gulf Coastal Plain Pondshore & Wet Prairie Group (G915) **Beaksedge species - Spikerush species - Yellow-eyed-grass species Pondshore & Wet Prairie** Floristic Composition: Species listed by Growth Form and Species			
Scientific Name	**Common Name**	**USDA Plants Code**	**NJ State CoC**
TREE			
Acer rubrum	Red maple	ACRU	3
Magnolia virginiana	Sweet-bay magnolia	MAVI2	7
Nyssa biflora	Swamp tupelo	NYBI	6

South Atlantic & Gulf Coastal Plain Pondshore & Wet Prairie Group (G915) **Beaksedge species - Spikerush species - Yellow-eyed-grass species Pondshore & Wet Prairie** Floristic Composition: Species listed by Growth Form and Species			
Scientific Name	**Common Name**	**USDA Plants Code**	**NJ State CoC**
Nyssa sylvatica	Sourgum	NYSY	4
Pinus rigida	Pitch pine	PIRI	6
SHRUB			
Cephalanthus occidentalis	Buttonbush	CEOC2	6
Clethra alnifolia	Sweet pepperbush	CLAL3	5
Morella cerifera	Wax myrtle	MOCE2	7
HERBACEOUS			
Carex striata	Walter's sedge	CAST41	8
Centella erecta (rare)	Erect coinleaf	CEER2	9
Ctenium aromaticum	Toothache grass	CTAR	8
Dichanthelium wrightianum (rare)	Wright's panic grass	DIWR3	8
Eleocharis equisetoides (rare)	Knotted spike-rush	ELEQ	9
Eleocharis microcarpa	Small-fruit spike-rush	ELMI2	6
Eleocharis quadrangulata	Angled spike-rush	ELQU	8
Eleocharis sp.	Spikerush	ELEOC	8
Fuirena squarrosa (rare)	Hairy umbrella-sedge	FUSQ	7
Juncus effusus	Common rush	JUEF	2
Lachnanthes caroliana	Redroot	LACA5	6
Ludwigia linearis (rare)	Narrow-leaf primrose-willow	LULI	8
Ludwigia sp.	Primrose-Willow	LUDWI	7
Panicum hemitomon (rare)	Maiden-cane	PAHE2	10
Panicum rigidulum (rare varieties)	Redtop panicgrass	PARI4	4
Panicum verrucosum	Warty panicgrass	PAVE2	6
Panicum virgatum	Switchgrass	PAVI2	2
Proserpinaca sp.	Mermaidweed	PROSE	7
Rhexia sp.	Meadowbeauty	RHEXI	9
Rhynchospora filifolia (rare)	Thread-leaved beaked-rush	RHFI	10
Rhynchospora inundata (rare)	Slender horned-rush	RHIN7	8
Rhynchospora sp.	Beaksedge	RHYNC3	8
Sabatia angularis	Common marsh-pink	SAAN	4
Saccharum sp.	Sugarcane	SACCH	8
Symphyotrichum subulatum	Annual salt marsh aster	SYSU5	7
Xyris jupicai (rare)	Richard's yellow-eyed grass	XYJU	4
Xyris sp.	Yelloweyed Grass	XYRIS	9

This Mid-Atlantic Coast wetland type was not included in the NJ and Northeast ecoregional FQA analysis, therefore we do not have FQA Metric Thresholds for Mean C and Cover-Weighted Mean C at this time.



For more information on finer scale floristic Alliances and Associations in **G915 Beaksedge species - Spikerush species - Yellow-eyed-grass species Pondshore & Wet Prairie Group (South Atlantic & Gulf Coastal Plain Pondshore & Wet Prairie Group)** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A1379 Maidencane Pondshore Marsh
This alliance encompasses a variety of temperate wetland communities dominated by *Panicum hemitomon*, found in the eastern and southeastern Atlantic Coastal Plain of the United States, occurring in various ponds, lakes, depression meadows, flatwoods ponds, pineland ponds, and Carolina bays.

Associations within A1379 in New Jersey:
CEGL006338 *Panicum hemitomon - Panicum verrucosum* Marsh (Maidencane Pondshore)

A1383 Southeastern Coastal Plain Pondshore Marsh
These are seasonally flooded depression marshes of the Southeastern Coastal Plain dominated by graminoid plants such as *Rhynchospora inundata* and *Rhynchospora careyana*.

Associations within A1383 in New Jersey:
CEGL004475 ***Woodwardia virginica / Sphagnum cuspidatum*** **Marsh** (Chainfern Small Depression Pond)
CEGL004384 ***Sphagnum cuspidatum*** **Peat Marsh** (Vernal Pool (Sphagnum Type))

G916 Beaksedge species - Spikerush species - Meadowbeauty species Pondshore

G916 North Atlantic Coastal Plain Pondshore

Beaksedge species - Spikerush species - Meadowbeauty species Pondshore Group

***Rhynchospora* spp. - *Eleocharis* spp. - *Rhexia* spp. Pondshore Group**

Type Concept: These eastern coastal plain depression wetlands occur in the North Atlantic coastal plain, from Virginia north to Nova Scotia, and inland to Michigan and Wisconsin. The vegetation in depressions usually ranges from open water or floating-leaved aquatics in the center of the deepest basins, to emergent marsh zones in semipermanent water, to drawdown zones with diverse small graminoid and forb vegetation, to dense shrub or woodland edges. Wet prairie vegetation is found on extensive wet flats and consists of primarily herbaceous wetland vegetation with relatively thick cover of grasses and sedge species. Examples occupy low, flat plains on poorly drained soils, often saturated for 50-100 days per year. Occasional to frequent fires, including growing-season burns, are essential for maintenance of this vegetation. Some examples have a sparse tree or shrub component, such as *Pinus rigida* and *Morella pensylvanica* to the north. Common taxa include *Rhynchospora* spp., *Eleocharis* spp., and *Xyris* spp. These often occur with other graminoids such as species of *Andropogon, Aristida, Carex, Eriocaulon*, and *Panicum*.

Dynamics: Water table fluctuations are probably the most important factor affecting examples of this vegetation (Bridges and Orzell 1989a). In depressions, hydroperiod can vary substantially from year to year, and vegetation can similarly vary significantly in aspect and dominants. Fire is also an important natural dynamic process, especially when sites are saturated, without standing water at the surface. On barrier islands, ponds usually occur in stable portions of the islands, where they may last for decades.

Environment: *Climate:* From eastern Virginia northward to the Maritimes, the climate is humid, cool temperate. *Soil/substrate/hydrology:* This vegetation occupies low, flat plains on poorly drained soils (Collins et al. 2001); some of these soils have an argillic horizon which impedes drainage and contributes to high water tables. The vegetation also occurs in small basins, primarily in sandy terrain of the Atlantic Coastal Plain.

North Atlantic Coastal Plain Pondshore (G916)
Beaksedge species - Spikerush species - Meadowbeauty species Pondshore
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

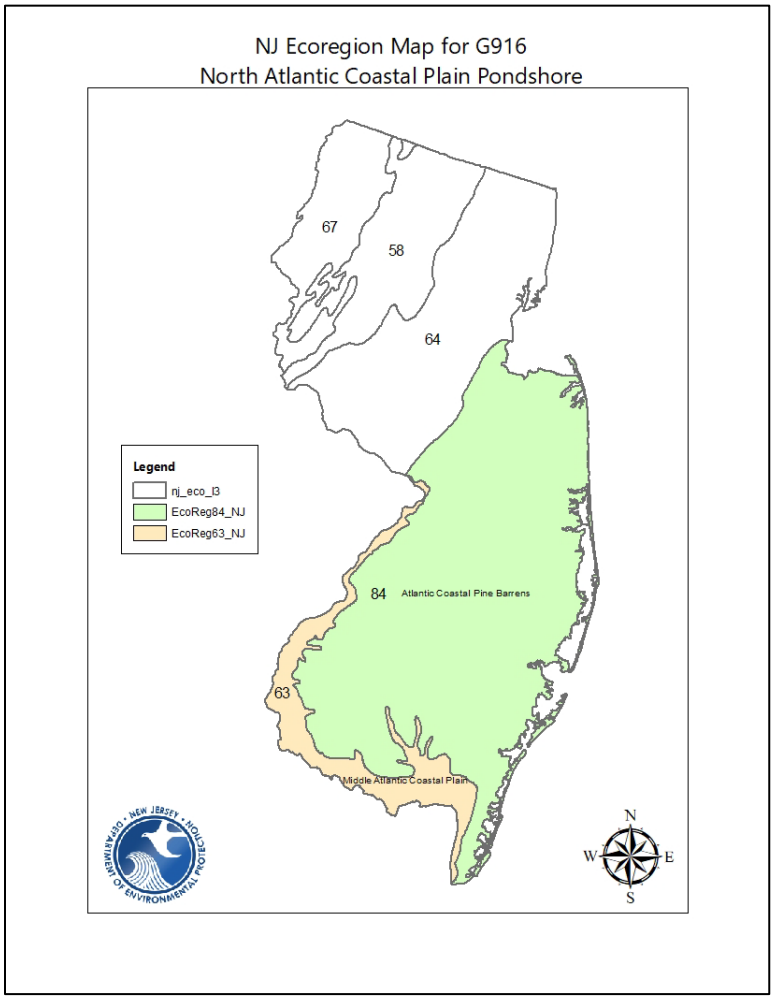
Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
HERBACEOUS					
Panicum verrucosum	Warty panicgrass	PAVE2	**41**	7	6
Carex striata	Walter's sedge	CAST41	**40**	10.4	8
Eleocharis olivacea	Bright green spike-rush	ELOL	**30**	1.8	5
Juncus pelocarpus	Brown-fruited rush	JUPE	**28**	0.8	5
Panicum rigidulum	Redtop panicgrass	PARI4	**27**	2.8	4
Drosera intermedia	Spatulate-leaved sundew	DRIN3	**26**	0.1	6
Cladium mariscoides	Twig-rush	CLMA	**23**	1.7	5

North Atlantic Coastal Plain Pondshore (G916)
Beaksedge species - Spikerush species - Meadowbeauty species Pondshore
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
Eriocaulon aquaticum	Seven-angled pipewort	ERAQ2	**21**	0.9	9
NON-VASCULAR					
Sphagnum sp.	Sphagnum	SPHAG2	**38**	8.4	7

FQA Metric Thresholds for Mean C and Cover-weighted Mean C
G916 North Atlantic Coastal Plain Pondshore
Beaksedge species - Spikerush species - Meadowbeauty species Pondshore

FQA Metric	Excellent	Good	Fair	Poor
Mean C	>7.3	7.3-5.9	5.9-3.3	<3.3
Cover-Weighted Mean C	>7.8	7.8-6.3	6.3-1.1	<1.1



For more information on finer scale floristic Alliances and Associations in **G916 Beaksedge species - Spikerush species - Meadowbeauty species Pondshore (North Atlantic Coastal Plain Pondshore Group)** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A1429 Northern Coastal & Inland Sandy Lakeshore Marsh
This alliance includes short graminoid vegetation of semipermanently flooded zones of northern Atlantic Coastal Plain pondshores dominated or codominated by *Eleocharis* spp., *Eriocaulon aquaticum*, or *Xyris difformis*.

Associations within A1429 in New Jersey:
CEGL006345 ***Juncus militaris - Eriocaulon aquaticum*** **Marsh** (Bayonet Rush Pondshore)

A1384 Northern Coastal Sandplain Pondshore Marsh
These herbaceous graminoid depression ponds are dominated by *Panicum rigidulum, Panicum verrucosum, Rhexia virginica, Rhynchospora* spp., and *Saccharum giganteum*, occurring on the Atlantic Coastal Plain from Nova Scotia south to Virginia, and disjunct in the Great Lakes area, the Great Valley of Virginia, northern Alabama, and central Tennessee.

Associations within A1384 in New Jersey:
CEGL006264 ***Rhexia virginica - Panicum verrucosum*** **Marsh** (Coastal Plain Muck Pondshore)
CEGL006086 ***Nymphaea odorata - Eleocharis robbinsii*** **Aquatic Vegetation** (Coastal Plain Pond)
CEGL006210 ***Rhynchospora capitellata - Cyperus dentatus - Rhexia virginica - Xyris difformis*** **Marsh** (Coastal Plain Toothed Flatsedge Sandy Pondshore)

A3397 Mid-Atlantic Coastal Pondshore Marsh
Depression ponds with herbaceous graminoid wetland vegetation on the Northern Atlantic Coastal Plain, not including the wetland vegetation of coastal interdunal swales.

Associations within A3397 in New Jersey:
CEGL006332 ***Cladium mariscoides - Coelorachis rugosa*** **Marsh** (Cape May-Delmarva Depression Marsh)
CEGL006400 ***Eleocharis flavescens - Xyris difformis*** **Marsh** (Coastal Plain Deep Muck Pond)
CEGL006853 ***Juncus pelocarpus - Rhynchospora alba - (Nymphaea odorata ssp. odorata)*** **Marsh** (Coastal Plain Emergent Millpond Bog)
CEGL006016 ***Cladium mariscoides - Eleocharis equisetoides*** **Marsh** (Coastal Plain Horsetail Spikerush Peatland)
CEGL006764 ***Polygonum (hydropiper, punctatum, lapathifolium) - Bidens connata - Leersia oryzoides*** **Marsh** (Coastal Plain Knotweed Pondshore)
CEGL006415 ***Dulichium arundinaceum - Juncus canadensis - Juncus pelocarpus*** **Marsh** (Coastal Plain Pondshore)
CEGL006763 ***Dichanthelium spretum - Dichanthelium dichotomum var. dichotomum - Panicum verrucosum - Panicum rigidulum var. pubescens*** **Marsh** (Coastal Plain Rosette Grass Pondshore)
CEGL006762 ***Cladium mariscoides - Juncus canadensis*** **Marsh** (Coastal Plain Smooth Sawgrass

Pondshore)
CEGL006761 ***Panicum virgatum / Sphagnum*** **spp. Wet Meadow** (Coastal Plain Switchgrass Pondshore)
CEGL006608 ***Eragrostis hypnoides - Ludwigia sphaerocarpa - Polygonum hydropiperoides*** **Marsh** (Coastal Plain Teal Lovegrass Pond)
CEGL006609 ***Saccharum giganteum - (Dichanthelium spretum, Panicum verrucosum)*** **Marsh** (Delmarva Bay Tall Marsh)
CEGL004120 ***Carex striata var. brevis*** **Marsh** (Northern Peatland Sedge Coastal Plain Pond)
CEGL006760 ***Muhlenbergia torreyana - Rhynchospora fusca*** **Marsh** (Pine Barrens Coastal Plain Muhly Pondshore)

Headwater Seep

G189 Tawny Cottongrass - Jewelweed species - Skunk-cabbage Seep

G189 North-Central & Northeastern Seep Group

Tawny Cottongrass - Jewelweed species - Skunk-cabbage Seep Group

***Eriophorum virginicum* - *Impatiens* spp. - *Symplocarpus foetidus* Seep Group**

Type Concept: This group contains primarily herbaceous-dominated seep vegetation of the north-central and northeastern United States from Maryland and Pennsylvania north to Maine, Vermont, Wisconsin, and into adjacent Canada. This vegetation is primarily dominated by tall and short forbs, as well as by graminoids and *Sphagnum* mosses in some associations. These seepage-fed wetlands are found on gentle slopes. Examples are linear, non-peaty, non-sphagnous, often rocky, groundwater slope wetlands that are embedded in an upland forest setting. Some smaller examples may be nearly or fully shaded by overhanging trees rooted in the adjacent forest, but others are open. Stands of this group are dominated by a wetland flora, but with a lack of species characteristic of floodplains and true bogs (some bog-related species may occasionally be present). Trees may be present on the edges of stands, or often overhanging, but are not characteristic. Shrub species are typically sparse and most typically mesophytic, rather than obligate wetland species. They may form dense zones around the edge but are not characteristic. The herb layer is generally well-developed and is usually dominated either by characteristic forbs such as *Chelone* spp., *Impatiens capensis, Impatiens pallida, Rudbeckia laciniata*, and *Symplocarpus foetidus*, and/or with presence of *Carex* spp. and other graminoids, including *Eriophorum virginicum* and *Glyceria striata*. In addition, *Sphagnum* spp. may occur in a minority of examples, but it is more characteristic of vegetation in the other groups within this macrogroup.

Dynamics: The presence of seepage is the primary environmental characteristic of stands of this group. Long-term droughts that would affect seepage flow are presumed to have an effect on the vegetation, but this has not been documented. Soil wetness may limit recruitment of most tree and shrub seedlings to drier embedded microsites, making canopy gaps persist longer than in adjacent forests and creating and sustaining the openings where this vegetation occurs. Fires may penetrate from adjacent forests, but only in the driest conditions are they likely to be intense enough to have much effect. Seeps are fairly permanent features of the landscape, but may potentially be created, destroyed, or altered in extent because of changes in groundwater flow, stream entrenchment or headward erosion, mass movement on slopes, or long-term climatic cycles. Examples are often left undisturbed when surrounding forests are logged. Effects of logging on water infiltration or surface flow may have significant indirect effects.

Environment: This vegetation occurs in small patches where seepage creates permanent or seasonally saturated soil conditions. Wetness may vary substantially over short distances in response to amounts of seepage, flow, and pooling by topography or the presence of an impermeable substrate. Stands of the group occur over a wide elevational range, from low and moderate elevations northward nearly to the highest peaks of the Southern Appalachians. Landforms are usually concave slopes but may be convex slopes or even (rarely) ridgetop gaps. This vegetation is almost never found on flat valley bottoms, though it may be found on their edges. Soils are usually saturated mineral soils, rather than peats or mucks, and may be residual or colluvial, and shallow to deep.

Climate: This vegetation is favored by a cool-temperate climate, in which cool temperatures and high rainfall make more water available, thereby making seepage flow more reliable. *Soil/substrate/hydrology:* This vegetation occurs in small patches where seepage creates permanent or seasonal saturated soil conditions. Soils are usually saturated mineral soils, rather than peats or mucks. Soil wetness may limit recruitment of most tree and shrub seedlings to drier microsites, making canopy gaps persist longer than in adjacent forests and creating and sustaining the openings where this vegetation is found. Wetness may vary substantially over short distances in response to amounts of seepage, flow, and pooling by topography or impermeable substrate.

North-Central & Northeastern Seep (G189)
Tawny Cottongrass - Jewelweed species - Skunk-cabbage Seep
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

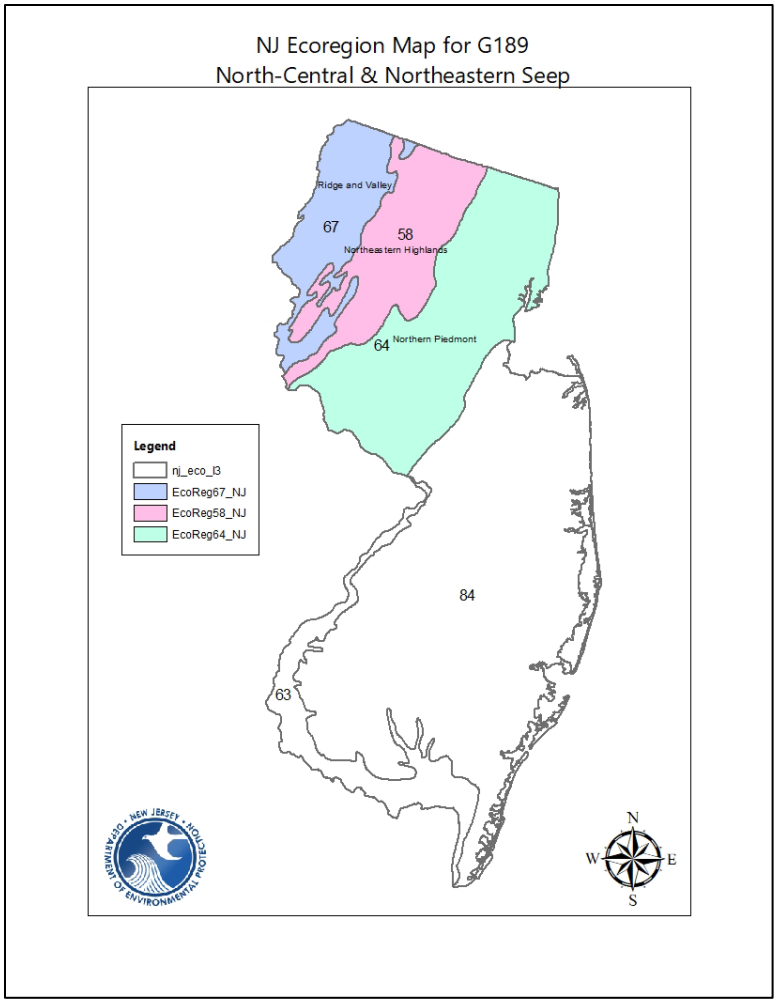
Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
TREE					
Acer rubrum	Red maple	ACRU	**52**	10.8	3
Betula alleghaniensis	Yellow birch	BEAL2	**50**	11.1	8
Fagus grandifolia	American beech	FAGR	**38**	4.3	6
Acer saccharum	Sugar maple	ACSA3	**35**	8.6	5
Fraxinus americana	White ash	FRAM2	**25**	1.1	5
Fraxinus nigra	Black ash	FRNI	**22**	2.1	9
Tsuga canadensis	Eastern hemlock	TSCA	**22**	5.5	8
SHRUB					
Lindera benzoin	Spicebush	LIBE3	**30**	4.4	5
Rubus pubescens	Dwarf blackberry	RUPU	**25**	1.1	7
HERBACEOUS					
Impatiens capensis	Jewelweed	IMCA	**75**	18.3	3
Arisaema triphyllum	Jack-in-the-pulpit	ARTR	**70**	1.4	5
Chelone glabra	Turtlehead	CHGL2	**55**	0.8	6
Chrysosplenium americanum	Golden saxifrage	CHAM2	**52**	4.3	9
Glyceria striata	Fowl manna grass	GLST	**50**	1	4
Onoclea sensibilis	Sensitive fern	ONSE	**48**	1.2	3
Osmunda cinnamomea	Cinnamon fern	OSCI	**48**	3.9	5
Viola cucullata	Blue marsh violet	VICU	**48**	1.4	6
Symplocarpus foetidus	Skunk cabbage	SYFO	**45**	18.4	5
Tiarella cordifolia	Foamflower	TICO	**42**	2.7	8
Carex scabrata	Rough sedge	CASC13	**40**	5.6	9
Dryopteris intermedia	Evergreen wood fern	DRIN5	**40**	1.2	6
Galium triflorum	Fragrant bedstraw	GATR3	**40**	1	5
Glyceria melicaria	Long manna grass	GLME2	**40**	4.2	5
Thelypteris noveboracensis	New York fern	THNO	**38**	0.6	4
Circaea alpina	Small enchanter's-nightshade	CIAL	**35**	0.5	9
Athyrium filix-femina	Common lady fern	ATFI	**32**	0.8	6

North-Central & Northeastern Seep (G189)
Tawny Cottongrass - Jewelweed species - Skunk-cabbage Seep
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
Carex prasina	Drooping sedge	CAPR12	**32**	4.6	6
Cardamine pensylvanica	Pennsylvania bittercress	CAPE3	**28**	0.3	4
Pilea pumila	Clearweed	PIPU2	**28**	0.8	3
Deparia acrostichoides	Silvery glade fern	DEAC4	**25**	0.6	7
Dryopteris carthusiana	Spinulose wood fern	DRCA11	**25**	0.4	5
Polygonum sagittatum	Arrow-leaved tearthumb	POSA5	**25**	0.2	3
Symphyotrichum prenanthoides	Crooked-stem aster	SYPR6	**25**	1.5	7
Symphyotrichum puniceum	Purplestem aster	SYPU	**25**	0.8	4
Carex stipata	Awl-fruited sedge	CAST5	**22**	0.8	2
Hydrocotyle americana	Marsh pennywort	HYAM	**22**	0.3	5
Scutellaria lateriflora	Mad-dog skullcap	SCLA2	**22**	0.3	4
Laportea canadensis	Wood-nettle	LACA3	**20**	4	6
Maianthemum canadense	Canada mayflower	MACA4	**20**	0.2	4
Oxalis montana	Mountain wood-sorrel	OXMO	**20**	0.7	0
Ranunculus recurvatus	Blisterwort	RARE2	**20**	0.2	5
Solidago rugosa	Wrinkle-leaf goldenrod	SORU2	**20**	0.3	3
Thalictrum pubescens	Tall meadow-rue	THPU2	**20**	0.2	5
NON-VASCULAR					
Thuidium delicatulum	Delicate Fern Moss	THDE10	**38**	4.1	7
Rhizomnium punctatum	Dotted Thyme Moss	RHPU7	**22**	1	6
Moss	Moss		**20**	1.7	5

FQA Metric Thresholds for Mean C and Cover-weighted Mean C
G189 North-Central & Northeastern Seep Group
Tawny Cottongrass - Jewelweed species - Skunk-cabbage Seep

FQA Metric	Excellent	Good	Fair	Poor
Mean C	>5.6	5.6-4.7	4.7-3.5	<3.5
Cover-Weighted Mean C	>5.9	5.9-4.7	4.7-3.7	<3.7



For more information on finer scale floristic Alliances and Associations in **G189 Tawny Cottongrass - Jewelweed species - Skunk-cabbage Seep (North-Central & Northeastern Seep Group)** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A1685 Central Appalachian-Northeast Circumneutral Seep
This alliance accommodates small seepages with scattered cover of *Carex scabrata* and small forbs, including *Chrysosplenium americanum, Cardamine clematitis, Circaea alpina*, and usually also with the moss *Rhizomnium appalachianum*. Vegetation in this alliance is normally over-shaded by trees rooted in adjacent (non-wetland) communities. The alliance is distributed primarily in the Appalachian Mountains from New Hampshire and Vermont south to West Virginia, and possibly in adjacent Canada.

Associations within A1685 in New Jersey:
CEGL006193 ***Chrysosplenium americanum*** **Seepage Meadow** (Golden-saxifrage Forested Seep)
CEGL006567 ***Symplocarpus foetidus - Impatiens capensis*** **Seepage Meadow** (Skunk-cabbage - Orange Jewelweed Seep)

A3373 Central Appalachian-Northeast Acidic Seep
This alliance accommodates acidic herbaceous fen or "bog" vegetation from the Allegheny Mountains region of Virginia, West Virginia, and Maryland as well as related areas of New York and Pennsylvania. This vegetation is found on flat to gently sloping topography of terraces, toeslopes, shallow headwater basins, swales, moats of bog mats, and pondshores.

Associations within A3373 in New Jersey:
CEGL006101 *Deschampsia cespitosa - Claytonia virginica var. hammondiae* Seepage Meadow (Kittatinny Acidic Seep)

A3374 Central Appalachian-Northeast Calcareous Seep
These are circumneutral or slightly calcareous groundwater seeps typically dominated by forbs, including *Angelica atropurpurea, Caltha palustris, Impatiens capensis*, and *Symplocarpus foetidus*, and found throughout the Central Appalachian, northeastern and north-central United States and eastern temperate Canada.

Associations within A3374 in New Jersey:
CEGL006448 *Vernonia noveboracensis - Thelypteris palustris - Symplocarpus foetidus* Seepage Meadow (Mid-Atlantic Rich Seep)
CEGL002385 *Symplocarpus foetidus* - Mixed Forbs Seep (Skunk-cabbage Seepage Meadow)

Freshwater Tidal Marsh

G914 Annual Wild Rice - Saltmeadow Cordgrass - Tidal-marsh Amaranth Freshwater Tidal Marsh Group

G914 North Atlantic Coastal Tidal Freshwater Marsh

Annual Wild Rice - Saltmeadow Cordgrass - Tidal-marsh Amaranth Freshwater Tidal Marsh Group

***Zizania aquatica* - *Spartina patens* - *Amaranthus cannabinus* Freshwater Tidal Marsh Group**

Type Concept: Vegetation of this fresh and oligohaline marsh group constitutes the primary vegetation between oceanward salt and brackish marshes and inland, non-tidally influenced vegetation from Newfoundland south to North Carolina along the Atlantic and coast. These freshwater marshes are characterized by fresh to oligohaline waters which are driven by lunar and wind tides. The environment includes areas well inside the mouths of tidal creeks and rivers, where there is adequate riverflow and discharge to maintain fresh to oligohaline conditions, while still within tidal range. This group typically occurs as complexes of several associations characterized by a mixture of annual and perennial grasses, forbs, sedges, rushes, other grass-like plants, floating or submerged aquatics, shrubs, and scattered tree saplings. Dominance patterns change seasonally, yearly, and geographically. In addition to regional variability, freshwater tidal marshes may also exhibit floristic zonation based on age, water depth, tidal regime, and other factors, into a low and high marsh. This vegetation supports broad-leaved emergent plants such as *Nuphar advena, Nuphar orbiculata, Nuphar sagittifolia, Peltandra virginica, Pontederia cordata*, and *Sagittaria* spp.; annual and perennial grasses such as *Calamagrostis canadensis, Leersia oryzoides, Panicum hemitomon, Spartina cynosuroides, Spartina patens, Zizania aquatica,* sedges and rushes such as *Carex* spp., *Eleocharis* spp., *Fuirena* spp., *Schoenoplectus pungens,* and *Schoenoplectus tabernaemontani*; other grass-like plants and annual and perennial forbs such as *Acorus calamus, Amaranthus cannabinus, Ambrosia trifida, Bidens* spp., *Impatiens capensis, Hibiscus moscheutos, Polygonum* spp., *Sium suave,* and *Typha* spp.; and scattered shrubs such as *Cephalanthus occidentalis* and *Morella cerifera*. Some dominants are tolerant of brackish water, but they are associated with plants restricted to oligohaline or freshwater. Irregular flooding and fire are both important forces in this group, and rising sea level is a particularly important driver of long-term trends.

Dynamics: Hydrology is the most important driving process, with the constant saturation determining the potential vegetation, and the variable flooding and variations in salinity in the fresh to brackish range a primary disturbance. Variations in flooding, sedimentation rates, erosion, scouring, wrack deposition and salinity are regular disturbances (Tiner 2013). Seed bank dynamics also drive the temporal and spatial diversity (Leck et al. 2009). Herbivory and competition also play an important role in vegetation patterns and some components (e.g., *Typha* and *Peltandra virginica*) are reported to be allelopathic (Bonasera et al. 1979). Rising sea level is an important driver of longer-term vegetation trends, including expansion into adjacent swamp areas. Fire is also an important natural process in all but the smallest and most isolated patches. Marshes often show evidence of transition to or from treed communities, in the form of young invading trees and shrubs or standing dead older trees (Odum et al. 1984, Tiner 2013). Lack of fire appears to be allowing sufficient tree invasion to eventually produce a swamp forest in some upstream examples, but the trend in most places is toward development of marshes in former swamp areas. More research is needed to interpret the complex interactions between temporal and spatial disturbance patterns (e.g., hydrology, salinity, sedimentation, erosion, herbivory, hurricanes, etc.), geomorphology, species life

histories, and other factors to better elucidate the range-wide and local patterns in vascular plant communities of freshwater tidal marshes. It is unclear how subsidence, freshwater withdrawal, sea level rise, and climate change will impact this ecosystem, but changes are expected.

Environment: Tidal fresh marshes exist along low-relief coastlines and upper reaches of tidal rivers and creeks where there is sufficient freshwater input from rain and rivers, and enough tidal amplitude to reach upstream into marshes along bays and rivers (e.g., Hudson River, Delaware River, Cape Fear River). Both lunar and wind tides are important. Along the Atlantic Coast this vegetation is often found on rivers where there is a geomorphological constriction that increases tidal amplitude (Odum et al. 1984). Within any specific region tidal marshes occur along elevational gradients that result in varying water depths. Tidal freshwater marshes tend to be common along the coastal edge of river systems with large watersheds and no dams (Tiner 2013). Most of the Atlantic Coast freshwater tidal marshes are riverine (Odum et al. 1984). They formed as sea level rose after the last glaciation. Sediment carried by streams and rivers filled drowned river valleys that were downcut during the Pleistocene glaciations. Marshes built up and expanded as streams and rivers deposited their sediment load and the tides helped to extend the area of available habitat. Hydrology and salinity are the most important driving processes determining the range of potential vegetation in this group. Variations in flooding, sedimentation rates, erosion, scouring, wrack deposition and salinity are regular disturbances (Tiner 2013).

Tidal freshwater marshes occur in a variety of settings, including "mature marshes," marshes that may be more than 500 years old with a well-developed peat substrate, and "new marshes" in areas where sedimentation by rivers is exceeding erosion and subsidence such as prograding deltas (found throughout the range) (Odum et al. 1984, Mitsch and Gosselink 1986c, 2000, Mitsch et al. 2009, Tiner 2013). In some areas, marshes have expanded in the recent past because of streams and rivers carrying and depositing higher sediment loads because of inland erosion (Odum et al. 1984). Soils in older marshes tend to be high in organic matter and those in younger marshes high in clays and silts (Odum et al. 1984).

Common characteristics of tidal freshwater marshes include variable rates of sedimentation and vertical accretion of sediments and organic matter (Perry et al. 2009). In many places, this is often offset by subsidence, reduced sedimentation due to water diversion, and a rising sea level. The substrate of tidal wetlands varies from primarily black, fibrous organic muck over sandy or silt clay loam occasionally mixed with woody peat, underlain by deep coastal plain quartzite sand deposits in New Jersey (Tedrow 1986), to thin or thick mats of floating roots and peat over muck and clay in Louisiana (Sasser et al. 2009). The New Jersey Geological Survey publication by Waksman et al. (1943) entitled "The Peats of New Jersey and Their Utilization" distinguishes marine salt marsh peats found along the coast and in bays that have fine mud rich in organic matter derived of decomposed grasses from the freshwater tidal marshes of drowned estuarine streams with freshwater alluvial peat and sedge-and-reed-peat characterized by coarse fibrous organic material often with wood particles and large amounts of mineral sediment (Walz et al. 2007). Odum et al. (1984) described the substrate underlying most tidal freshwater marshes in the eastern U.S. as "a dark, mucky soil" with high levels of silts and clays in the low marsh and higher levels of organic matter in the high marsh.

Tidal freshwater and oligohaline marshes are complex entities that are affected by movement of the salt line resulting from seasonal fluctuations in precipitation as well as changes in the periodicity and amplitude of tidal inundation (lunar and wind). Sea level rise due to global warming, and the resulting

change in salt intrusion, vegetation composition, marsh acreage, and function, are serious concerns for the future of these critically important estuarine wetlands (Walz et al. 2007).

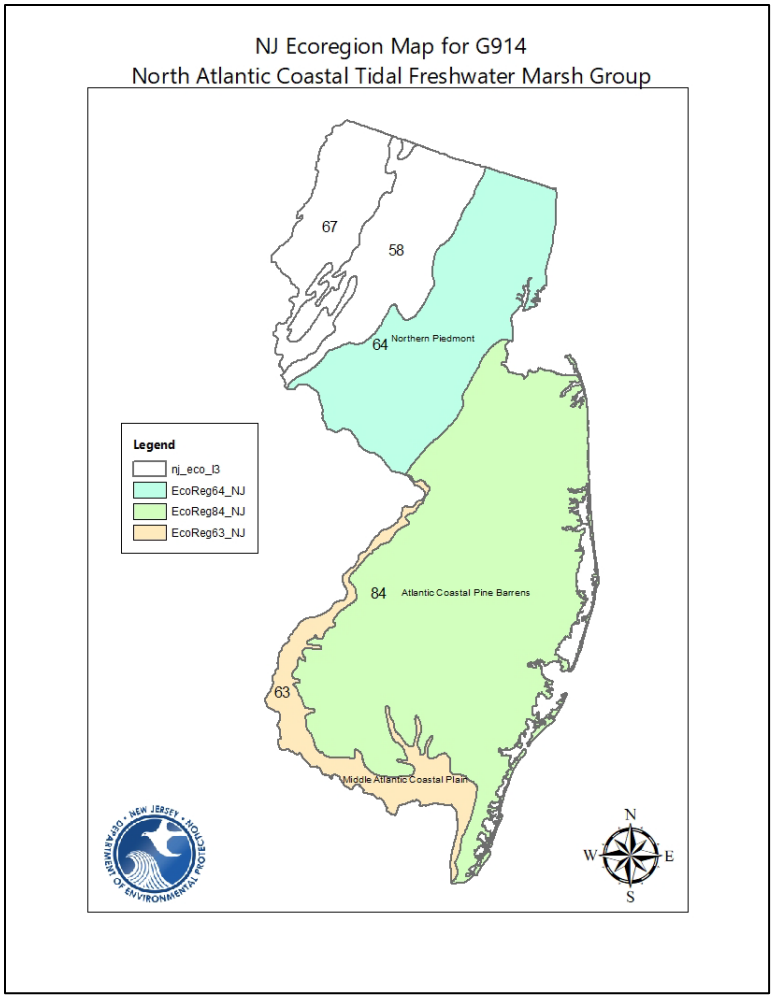
More research is needed to interpret the complex interactions between temporal and spatial disturbance patterns (e.g., hydrology, salinity, sedimentation, erosion, herbivory, hurricanes, etc.), geomorphology, species life histories, and other factors to better elucidate the rangewide and local patterns in vascular plant communities of freshwater tidal marshes. It is unclear how subsidence, freshwater withdrawal, sea level rise, and climate change will impact this ecosystem, but changes are expected. Though causation is unclear, vegetation changes have already been documented in New Jersey (Leck et al. 2009).

North Atlantic Coastal Tidal Freshwater Marsh (G914)
Annual Wild Rice - Saltmeadow Cordgrass - Tidal-marsh Amaranth Freshwater Tidal Marsh Group
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plant Code	Constancy	Mean % Cover	NJ State CoC
HERBACEOUS					
Zizania aquatica	Wild-rice	ZIAQ	**63**	15.4	8
Nuphar lutea	Yellow pond lily	NULU	**56**	18.2	4
Pontederia cordata	Pickerel-weed	POCO14	**33**	6.2	6
Peltandra virginica	Arrow-arum	PEVI	**30**	1.7	4
Polygonum punctatum	Dotted smartweed	POPU5	**30**	0.4	5
Sagittaria latifolia	Wapato	SALA2	**30**	1.8	4
Polygonum arifolium	Halberd-leaf tearthumb	POAR6	**22**	0.9	5
Schoenoplectus pungens	Common threesquare	SCPU10	**22**	1.3	3

FQA Metric Thresholds for Mean C and Cover-weighted Mean C
G914 North Atlantic Coastal Tidal Freshwater Marsh Group
Annual Wild Rice - Saltmeadow Cordgrass - Tidal-marsh Amaranth Freshwater Tidal Marsh

FQA Metric	Excellent	Good	Fair	Poor
Mean C	>5.5	5.5-4.4	<4.4	[4.0]
Cover-Weighted Mean C	>5.8	5.8-4.1	<4.1	[4.0]



For more information on finer scale floristic Alliances and Associations in **G914 Annual Wild Rice - Saltmeadow Cordgrass - Tidal-marsh Amaranth Freshwater Tidal Marsh (North Atlantic Coastal Tidal Freshwater Marsh Group)** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A3579 Riverbank Quillwort - Estuary Pipewort Intertidal Freshwater Marsh
This freshwater tidal vegetation of the eastern U.S. and possibly Canada occurs on sandy or gravelly shores that are exposed only at low tide, such as on the upper limits of freshwater intertidal shores; stands are dominated by *Isoetes riparia* and *Eriocaulon parkeri*.

Associations within A3579 in New Jersey:
CEGL006352 *Eriocaulon parkeri* - *Polygonum punctatum* Tidal Marsh (Estuary Pipewort Freshwater Intertidal Flat)
CEGL006058 *Isoetes riparia* Tidal Marsh (Shore Quillwort Tidal Flat)

A1708 Pond-lily Tidal Freshwater Marsh
This is tidal mudflat vegetation of freshwater tidal rivers of the eastern United States dominated by species of *Nuphar*, including *Nuphar advena* or *Nuphar sagittifolia*.

Associations within A1708 in New Jersey:
CEGL004472 *Nuphar advena* Tidal Marsh (Broadleaf Pond-lily Tidal Marsh)

A3020 American Lotus Tidal Freshwater Marsh
This tidal vegetation occurs as a distinct zone along fresh reaches of tidal rivers in the Mid-Atlantic Coastal Plain, and is dominated by *Nelumbo lutea*, which forms a thin band of vegetation along the river.

Associations within A3020 in New Jersey:
CEGL006913 *Nelumbo lutea* Tidal Marsh (American Lotus Tidal Marsh)

A4017 Mixed Forb Oligohaline Tidal Marsh
This alliance comprises vegetation of oligohaline marshes occurring on tidal rivers beyond significant influence by saline waters. The vegetation is widely variable and characterized by small to large leafy forbs and graminoids, including *Acorus calamus, Amaranthus cannabinus, Peltandra virginica, Pontederia cordata, Hibiscus moscheutos, Impatiens capensis*, and *Thelypteris palustris*. This alliance occurs in coastal areas from Maine to Virginia and may occur in Quebec and maritime Canada.

Associations within A4017 in New Jersey:
CEGL006080 *Amaranthus cannabinus* Tidal Marsh (Amaranth Tidal Marsh)
CEGL006325 *Impatiens capensis - Peltandra virginica - Polygonum arifolium - Bolboschoenus fluviatilis - Typha angustifolia* Tidal Marsh (Freshwater Tidal Mixed High Marsh)
CEGL004706 *Peltandra virginica - Pontederia cordata* Tidal Marsh (Green Arrow-arum - Pickerelweed Tidal Marsh)
CEGL006181 *Hibiscus moscheutos - Polygonum punctatum - Peltandra virginica* Tidal Marsh (Oligohaline Mixed Forbs Tidal Marsh)
CEGL006833 *Acorus calamus* Tidal Marsh (Sweetflag Tidal Marsh)
CEGL006579 *Justicia americana - Peltandra virginica* Tidal Marsh (Water-willow Tidal Marsh)

A4484 Northern Wild Rice Tidal Freshwater Marsh
This wild rice freshwater tidal marsh is characterized by *Zizania aquatica*, which occurs in freshwater to minimally saline zones of tidal rivers along the north and mid-Atlantic coast of North America.

Associations within A4484 in New Jersey:
CEGL004202 *Zizania aquatica* Tidal Marsh (Atlantic Coast Wild Rice Tidal Marsh)

A4376 Tidal Alder - Dogwood Shrub Swamp
This alliance comprises tall alluvial and freshwater tidal shrublands dominated or characterized by *Alnus* spp. and *Cornus* spp. in the northeastern United States and temperate regions of eastern Canada.

Associations within A4376 in New Jersey:

CEGL006337 ***Alnus (incana ssp. rugosa, serrulata) - Cornus amomum*** **Tidal Shrub Swamp** (North Atlantic Fresh Tidal Shrub

A4483 Northern Wax-myrtle Tidal Freshwater Shrubland
These are tidally flooded shrublands of the mid-Atlantic Coastal Plain, occurring in association with freshwater tidal marshes and tidally flooded forests, dominated by *Morella cerifera* with *Rosa palustris* and *Toxicodendron radicans* ssp. *radicans*.

Associations within A4483 in New Jersey:
CEGL006846 ***Morella cerifera - Baccharis halimifolia / Eleocharis fallax*** **Tidal Shrubland** (Brackish Tidal Creek Shrubland)

Freshwater Aquatic Vegetation

G114 American White Water-lily - Sago Pondweed - Pondweed species Freshwater Aquatic Vegetation Group

G114 Eastern North American Freshwater Aquatic Vegetation Group

American White Water-lily - Sago Pondweed - Pondweed species Freshwater Aquatic Vegetation Group

***Nymphaea odorata - Stuckenia pectinata - Potamogeton* spp. Freshwater Aquatic Vegetation Group**

Note: This USNVC Freshwater Aquatic Vegetation group is included in this section; while rooted vascular wetland plants are not dominant, this submerged or floating rooted aquatic vegetation is often found in the wettest, permanently, or semi-permanently flooded areas within ponds, rivers, marshes, and shrub swamps as part of a mosaic or zone in associated wetlands.

Type Concept: Submergent marshes can be found across a large part of North America, ranging from boreal, interior Canada (Saskatchewan, Manitoba, Ontario) south through the Great Plains to the Gulf Coastal Plain in Texas and east to the Atlantic from Virginia to Maine. Stands in this group have rooted aquatic herbaceous vegetation, are permanently flooded with water generally less than 2 m deep and are subject to low to moderate waves and currents. Water salinity varies from fresh to saline, with the saline and brackish sites tending to occur in the Great Plains. Submergent and floating-leaved aquatics dominate submergent marshes. Emergent vegetation has <10% total cover. Total vegetation cover ranges from sparse to dense.

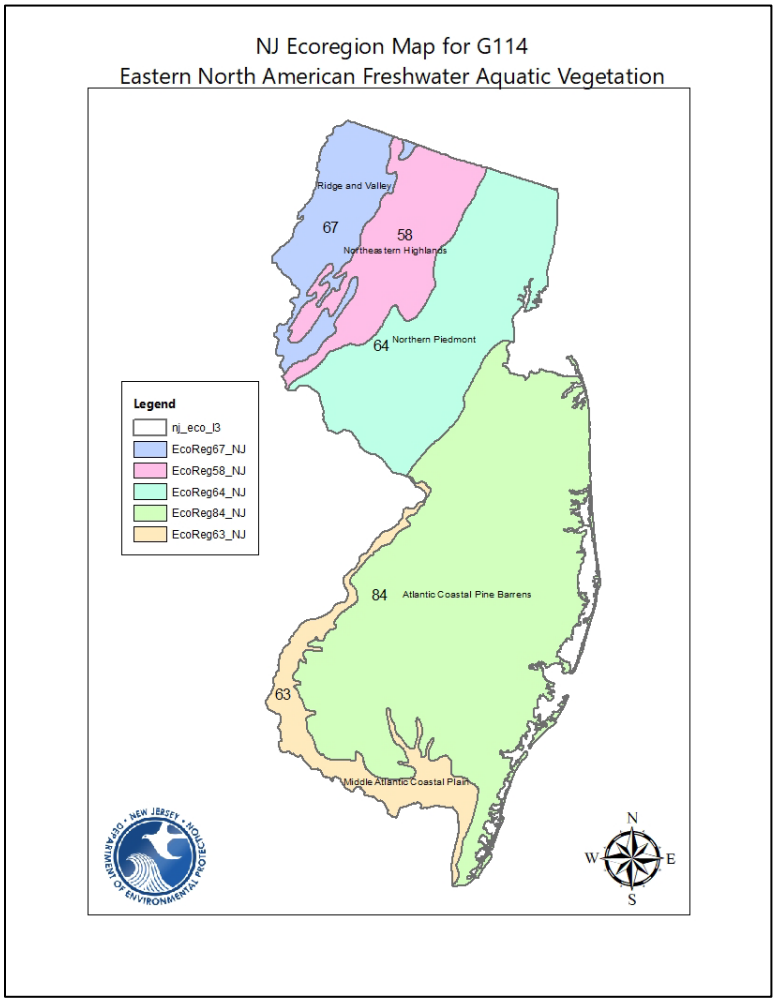
Dynamics: These submergent marshes are typically part of a complex of wetland communities. They tend to be stable if hydrologic conditions remain stable. Emergent marsh, shrub wetlands, and/or wet meadows are typically on the upland side of these communities. Submergent marshes may form the center (deepest part) of wetlands. Other communities not typically part of terrestrial vegetation classifications tend to occur in deeper or higher energy settings.

Environment: *Climate:* This aquatic vegetation can be found from boreal, through cool temperate, to warm temperate climates. *Soil/substrate/hydrology:* Submergent marshes can be found in lakes, ponds, low-gradient river channels, and oxbows and backwaters on rivers or streams. This includes the shoreline and estuaries along the Great Lakes. Surface soils are typically muck in richer sites, but there is substantial variance across the range of this group. Muck can be over nearly any material, including bedrock. Submergent vegetation can also root in mineral soils. Most sites have freshwater, but in closed basins in the Great Plains where evaporation is high, the water can be brackish or even saline. Stands of submergent marshes are flooded in all but the driest years. Water depth varies from several centimeters to 2 m. A few stands in the Great Plains dry out for part of most years, but water is present long enough to support the characteristic species. Submergent marsh vegetation occurs where wave and current action is minor to moderate. Frequent fast water or heavy waves prevent these vegetation communities from persisting.

Eastern North American Freshwater Aquatic Vegetation Group (G114)
American White Water-lily - Sago Pondweed - Pondweed species Freshwater Aquatic Vegetation
Floristic Composition: Species listed by Growth Form and Species

Scientific Name	Common Name	USDA Plants Code	NJ State CoC
HERBACEOUS			
Azolla caroliniana (rare)	Eastern mosquito-fern	AZCA	2
Bidens beckii (rare)	Water-marigold	BIBE2	10
Brasenia schreberi	Water shield	BRSC	5
Ceratophyllum demersum	Coontail	CEDE4	4
Eleocharis robbinsii	Robbins' spike rush	ELRO	8
Elodea canadensis	Ditch-moss	ELCA7	4
Eriocaulon aquaticum	Seven-angled pipewort	ERAQ2	9
Heteranthera dubia	Grassleaf mudplantain	HEDU2	6
Heteranthera reniformis	Mud-plantain	HERE	7
Lemna sp.	Duckweed	LEMNA	7
Ludwigia sp.	Primrose-Willow	LUDWI	7
Myriophyllum sp.	Watermilfoil	MYRIO	5
Najas flexilis	Northern water nymph	NAFL	3
Nelumbo lutea (rare)	American lotus	NELU	8
Nuphar advena	Spatterdock	NUAD2	4
Nuphar microphylla (rare)	Small yellow pond-lily	NUMI4	5
Nuphar variegata	Variegated yellow pond-lily	NUVA2	4
Nymphaea odorata	Fragrant water-lily	NYOD	6
Nymphoides cordata (rare)	Floating heart	NYCO	7
Peltandra virginica	Arrow-arum	PEVI	4
Potamogeton amplifolius	Large-leaved pondweed	POAM5	10
Potamogeton epihydrus	Ribbonleaf pondweed	POEP2	6
Potamogeton gramineus	Grass-like pondweed	POGR8	8
Potamogeton natans	Floating pondweed	PONA4	8
Potamogeton nodosus	Longleaf pondweed	PONO2	6
Potamogeton perfoliatus	Perfoliate pondweed	POPE7	3
Potamogeton zosteriformis (rare)	Flatstem pondweed	POZO	10
Ruppia maritima	Ditch-grass	RUMA5	8
Spirodela sp.	Duckmeat	SPIRO	3
Stuckenia pectinata	Sago pondweed	STPE15	7
Utricularia sp.	Bladderwort	UTRIC	9
Vallisneria americana	Tape-grass	VAAM3	8
Zannichellia palustris	Horned pondweed	ZAPA	8
ALGAE			
Chara sp.	Stonewort (Green Algae)		

This aquatic wetland type was not included in the NJ and Northeast ecoregional FQA analysis, therefore we do not have FQA Metric Thresholds for Mean C and Cover-Weighted Mean C at this time.



For more information on finer scale floristic Alliances and Associations in **G114 Eastern North American Freshwater Aquatic Vegetation Group** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A4147 Duckweed Aquatic Vegetation
This alliance is widespread across temperate eastern North America where floating, non-rooted species, typically *Lemna* spp., *Spirodela polyrrhiza*, and *Wolffia* spp., dominate flooded areas with little emergent or submergent vegetation.

Associations within A4147 in New Jersey:
CEGL005451 *Lemna* spp. Eastern North American Aquatic Vegetation (Eastern North America Duckweed Pond)

A4064 Water-lily - Pond-lily Aquatic Vegetation
This submerged aquatic alliance, common throughout most of the eastern and central United States and

adjacent Canadian provinces, is dominated by hydromorphic-rooted aquatic plants, typically *Brasenia schreberi, Nuphar* spp., *Nymphaea odorata*, and *Nymphoides aquatica*. It may occur in a variety of slow-moving waterbodies, including rivers, millponds, streams, shallow ponds or lakes, or on shores of deeper waterbodies including freshwater tidal areas.

Associations within A4064 in New Jersey:
CEGL002386 ***Nuphar advena - Nymphaea odorata*** **Aquatic Vegetation** (Water-lily Aquatic Wetland)

A1752 Eastern Hornleaf Riverweed Aquatic Vegetation
This alliance is widely scattered in the eastern United States where *Podostemum ceratophyllum* forms monotypic or near-monotypic stands on rocks in moderate- to fast-flowing streams.

Associations within A1752 in New Jersey:
CEGL004331 ***Podostemum ceratophyllum*** **Aquatic Vegetation** (Rocky Bar & Shore (Riverweed Type))

A4066 Pondweed - Hornwort - Waterweed Aquatic Vegetation
This submergent marsh alliance is widespread in the eastern United States and adjacent Canada where a variety of submergent species, typically including *Ceratophyllum* spp., *Elodea* spp., *Potamogeton* spp., and *Utricularia macrorhiza*, can be dominant.

Associations within A4066 in New Jersey:
CEGL006770 ***Chara*** **sp. /** ***Potamogeton*** **spp. Nonvascular Aquatic Vegetation** (Stonewort / Pondweed Calcareous Sinkhole Pond)

A4068 American Eel-grass Aquatic Vegetation
This alliance consists of aquatic vegetation in rivers and springs dominated by *Vallisneria americana* in the eastern United States.

Associations within A4068 in New Jersey:
CEGL006196 ***Vallisneria americana - Potamogeton perfoliatus*** **Aquatic Vegetation** (Open Water Marsh with Mixed Submergents/Emergents)

BOG & FEN

Acidic Bog & Fen

G1171 Leatherleaf- Dwarf Huckleberry / Walter's Sedge Bog & Fen

G1171 North Atlantic Coastal Bog & Fen

Leatherleaf- Dwarf Huckleberry / Walter's Sedge Bog & Fen Group

***Chamaedaphne calyculata* - *Gaylussacia dumosa* / *Carex striata* Bog & Fen Group**

Type Concept: These bogs and fens occur in the North Atlantic coastal region, from Maryland north to Massachusetts. They range in condition from coastal acid peatlands characterized by acidic, tannic water supporting a floating or grounded *Sphagnum* mat over which *Chamaedaphne calyculata, Gaylussacia dumosa*, and other dwarf-shrubs have rooted, to sea-level fens in mid-Atlantic coastal areas, and the Pine Barrens, where the open peatlands (streamside savannas) are characterized by the graminoid herbs *Cladium mariscoides* and *Rhynchospora alba* growing in saturated wetland conditions.

Dynamics: Groundwater-fed, acidic, nutrient-poor peatlands in unique settings on the coastal plain.

Environment: Coastal Plain acidic seepage peatlands along streams and rivers in the NJ pinelands and coastal sea-level fens with fresh groundwater discharge at the salt marsh interface with tidal flooding on high tides during full moon and spring neap lunar cycles.

North Atlantic Coastal Bog & Fen (G1171)
Leatherleaf- Dwarf Huckleberry / Walter's Sedge Bog & Fen
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

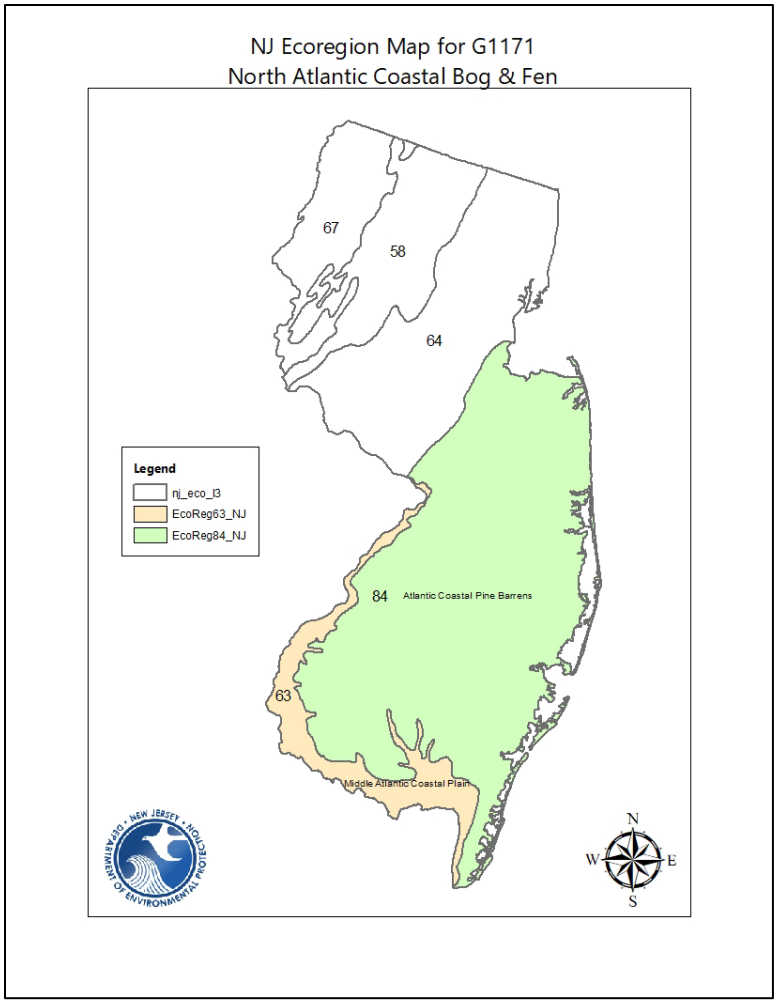
Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
TREES					
Acer rubrum	Red maple	ACRU	**56**	3.3	3
Pinus rigida	Pitch pine	PIRI	**29**	1.4	6
Chamaecyparis thyoides	Atlantic white-cedar	CHTH2	**28**	3	9
SHRUBS					
Vaccinium corymbosum	Highbush blueberry	VACO	**47**	14.6	5
Chamaedaphne calyculata	Leatherleaf	CHCA2	**37**	9.7	7
Vaccinium macrocarpon	Cranberry	VAMA	**27**	0.8	5
Kalmia angustifolia	Sheep laurel	KAAN	**25**	0.7	5
Clethra alnifolia	Sweet pepperbush	CLAL3	**23**	1.6	5
HERBACEOUS					
Cladium mariscoides	Twig-rush	CLMA	**47**	7.3	5
Drosera intermedia	Spatulate-leaved sundew	DRIN3	**34**	0.7	6
Rhynchospora alba	White beak-rush	RHAL3	**33**	2.3	6
Andropogon glomeratus	Bushy bluestem	ANGL2	**28**	0.8	6
Panicum virgatum	Switchgrass	PAVI2	**24**	2.8	2

North Atlantic Coastal Bog & Fen (G1171)
Leatherleaf- Dwarf Huckleberry / Walter's Sedge Bog & Fen
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
Eriocaulon aquaticum	Seven-angled pipewort	ERAQ2	**23**	0.8	9
Lophiola aurea	Goldencrest	LOAU	**21**	0.7	10
Thelypteris palustris	Eastern marsh fern	THPA	**21**	0.6	4
Triadenum virginicum	Marsh St. John's-wort	TRVI2	**21**	0.2	7
NON-VASCULAR					
Sphagnum sp.	Sphagnum	SPHAG2	**37**	10	7

FQA Metric Thresholds for Mean C and Cover-weighted Mean C
G1171 North Atlantic Coastal Bog & Fen
Leatherleaf- Dwarf Huckleberry / Walter's Sedge Bog & Fen

FQA Metric	Excellent	Good	Fair	Poor
Mean C	>7.0	7.0-5.3	5.3-4.4	<4.4
Cover-Weighted Mean C	>7.7	7.7-5.7	5.7-3.9	<3.9



For more information on finer scale floristic Alliances and Associations in **G1171 Leatherleaf- Dwarf Huckleberry / Walter's Sedge Bog & Fen (North Atlantic Coastal Bog & Fen Group)** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A4478 North Atlantic Coastal Bog
This alliance comprises dwarf-shrub sphagnum bogs dominated by *Chamaedaphne calyculata* occurring on Cape Cod (Massachusetts), Long Island (New York), and the Coastal Plain and near-coastal areas of northern New Jersey.

Associations within A4478 in New Jersey:
CEGL006392 ***Myrica gale - Chamaedaphne calyculata / Carex exilis*** **Fen** (Coastal Plain Sedge Fen)
CEGL006371 ***Vaccinium corymbosum - Rhododendron viscosum - Clethra alnifolia*** **Acidic Peatland** (Highbush Blueberry - Winterberry Shrub Thicket)
CEGL006208 ***Chamaedaphne calyculata / Carex striata*** **Acidic Peatland** (Pine Barrens Bog)
CEGL006397 ***Gaylussacia dumosa / Calamovilfa brevipilis*** **Shrubby Graminoid Acidic Peatland** (Pine Barrens Sandreed Shrubby Graminoid Acidic Peatland)

CEGL006467 ***Cladium mariscoides - Eriocaulon decangulare - Eriophorum virginicum*** **Fen** (Smooth Sawgrass Peat Mat)

A3406 Pine Barrens Streamside Savanna

These savannas are characterized by the graminoid herbs *Cladium mariscoides* and *Rhynchospora alba* growing in saturated wetland conditions, including riverside savanna, limited to the New Jersey Pine Barrens and sea-level fens in mid-Atlantic coastal areas.

Associations within A3406 in New Jersey:

CEGL006263 ***Chamaecyparis thyoides / Narthecium americanum - Sarracenia purpurea - Drosera filiformis / Sphagnum pulchrum*** **Fen** (Pine Barrens Streamside Bog Asphodel Savanna)

CEGL006265 ***Eriocaulon aquaticum - Juncus pelocarpus - Drosera intermedia*** **Fen** (Pine Barrens Streamside Bog Iron Seepage Savanna)

CEGL006291 ***Muhlenbergia torreyana - Lobelia canbyi - Rhynchospora alba*** **Fen** (Pine Barrens Streamside Muhly Savanna)

CEGL006285 ***Rhynchospora (alba, cephalantha) - Muhlenbergia uniflora - Lophiola aurea*** **Fen** (Pine Barrens Streamside Sedge Savanna)

CEGL006262 ***Chamaecyparis thyoides / Gaylussacia dumosa / Andropogon glomeratus var. glomeratus*** **Fen** (Pine Barrens Streamside Shrub Savanna)

CEGL006270 ***Cladium mariscoides - Panicum rigidulum var. pubescens*** **Fen** (Pine Barrens Streamside Twigrush Savanna)

A4481 Atlantic Sea Level Fen

This alliance comprises two closely related associations - sea-level fens and a spikerush salt marsh that occur discontinuously along the coast from Massachusetts to Virginia. The sea-level fen is a small-patch community occurring at the edge of salt marshes adjacent to sandy or gravelly slopes where there is acidic, oligotrophic groundwater seepage. Although its association with salt marshes is diagnostic, it is only infrequently influenced by salt or brackish overwash during unusually high tides.

Associations within A4481 in New Jersey:

CEGL006310 ***Cladium mariscoides - Drosera intermedia - Eleocharis rostellata*** **Coastal Fen** (Atlantic Sea Level Fen)

CEGL006611 ***Eleocharis rostellata - Spartina patens*** **Salt Marsh** (Spikerush Lawn Salt Marsh)

G1172 Leatherleaf - Few-seed Sedge - Bog Laurel Eastern Boreal Bog & Acidic Fen

G1172 Eastern North American Boreal-Subboreal Bog & Acidic Fen

Leatherleaf - Few-seed Sedge - Bog Laurel Eastern Boreal Bog & Acidic Fen Group

***Chamaedaphne calyculata* - *Carex oligosperma* - *Kalmia polifolia* Eastern Boreal Bog & Acidic Fen**

Type Concept: These acidic peatlands are found in eastern boreal regions of central and eastern Canada and southward into adjacent subboreal regions of northeast and north-central United States. Climates are cold enough to allow the rate of peat accumulation to exceed its decomposition. They contain a continuous (>80% cover) layer of *Sphagnum* mosses (sometimes submerged in bog pools), to depths exceeding 40 cm, with ericaceous dwarf-shrubs and thin-leaved graminoids >25% cover. Scrub trees <2 m may be common, but trees >5 m are <10% cover. Acidic peatlands range from strictly ombrotrophic bog (isolated from groundwater, precipitation fed) to weakly minerotrophic poor fen. They occur in extensive areas of low flats, or develop in open or closed, relatively shallow basins with nutrient-poor and acidic conditions. Many occur in association with larger lakes or streams. Some occur as kettlehole fens (usually called kettlehole "bogs") associated with eskers or other glacial deposits. Poor fens often develop adjacent to open water and may form a floating mat over water. The surface morphology of a bog may be more-or-less level, domed, or eccentric, but typically is above the water table. As peat accumulates, ridges may form, which can be relatively dry compared to the flat areas. Secondary bog pools (schlenke) may be present in the raised portions of the peatlands. *Sphagnum* mosses play a key role in these systems because they trap base cations, causing the organic soils to acidify, and they retain moisture, thus slowing the decomposition rate and promoting peat accumulation. Species diversity is low. Dwarf-shrubs include *Chamaedaphne calyculata, Ledum groenlandicum, Kalmia polifolia, Andromeda polifolia, Vaccinium oxycoccos, Vaccinium macrocarpon*, occasionally *Gaultheria hispidula* or *Betula pumila*. Rarely, tall ericaceous shrubs such as *Vaccinium corymbosum* are dominant. Common sedges include *Carex oligosperma, Carex chordorrhiza, Carex magellanica* ssp. *irrigua, Carex limosa*, and *Carex lasiocarpa*. Other herbs include *Eriophorum vaginatum, Eriophorum virginicum, Drosera rotundifolia, Menyanthes trifoliata, Sarracenia purpurea*, and *Scheuchzeria palustris*. When present, stunted *Picea mariana* and *Larix laricina* are the dominant trees. Dominant mosses include *Sphagnum fuscum* and *Sphagnum magellanicum*, and less commonly *Sphagnum angustifolium. Pleurozium schreberi* can be common on raised mats.

In the Atlantic region, from Labrador to Downeast Maine, acidic peatlands take on somewhat different characteristics. In basins, they develop raised plateaus with undulating sedge and dwarf-shrub vegetation. *Trichophorum cespitosum* may form sedge lawns on the raised plateau. The system may also occur as "blanket bogs" over a sloping rocky substrate in extreme maritime settings; here, dwarf-shrubs and *Sphagnum* are the dominant cover. Species characteristic of this maritime setting include *Empetrum nigrum* and *Rubus chamaemorus*. Typical bog heaths such as *Kalmia angustifolia, Kalmia polifolia, Gaylussacia baccata, Ledum groenlandicum*, and *Gaylussacia dumosa* are also present. Morphological characteristics and certain coastal species distinguish these from more inland acidic peatlands.

Dynamics: Acidic peatlands range from strictly ombrotrophic bog (isolated from groundwater, precipitation fed) to weakly minerotrophic poor fen.

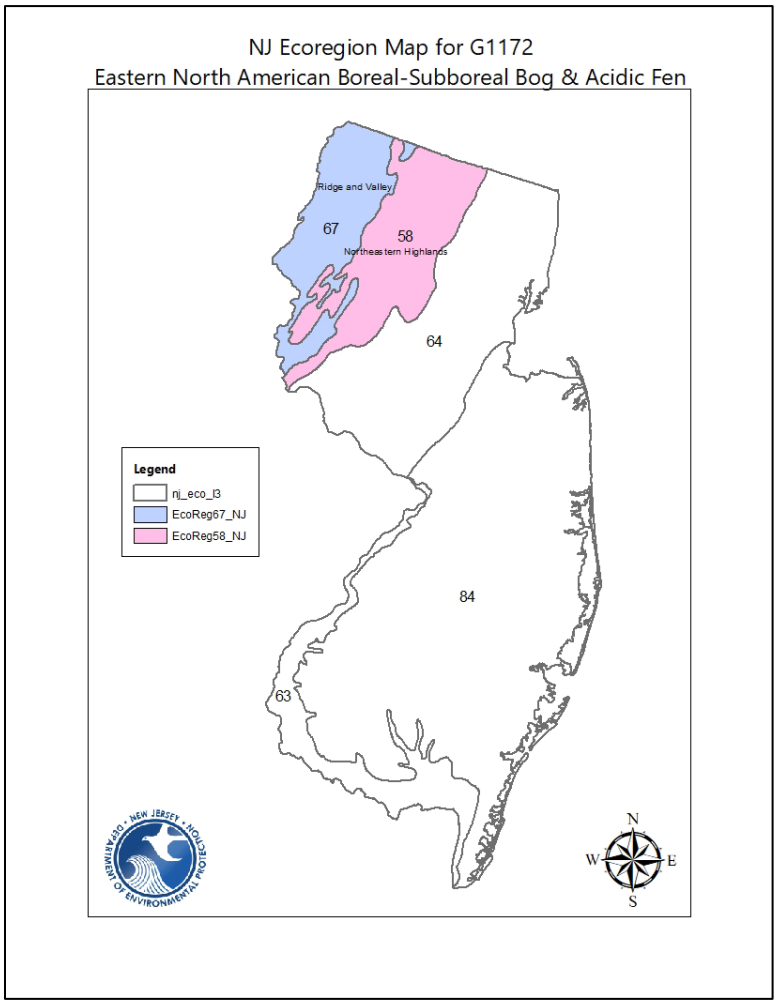
Environment: Bogs occur in both continental and maritime climates. In the northeastern United States, true bogs may reach their core southern limit in Maine and extreme northern New Hampshire and Vermont (Damman and French 1987, figure 3), though isolated occurrences are possible elsewhere.

Soil/substrate/hydrology: Sites are found in depressions, on acidic seepage slopes, with either ombrotrophic or weakly minerotrophic groundwater. They occur in a variety of landforms, including peat bog-lake systems (lake-fill bogs, moat bogs, and pond border bogs), perched water peatland systems in valleys and depressions, peat bog-stream systems, and ombrogenous peatland systems, including raised bogs (Damman and French 1987). Sub-boreal bogs are often limited to specific geological and microclimate settings. They are found in colder regions, mostly in areas where glacial stagnation left coarse deposits and glacial depressions (many are "kettleholes"). The basins are generally closed, i.e., without inlets or outlets of surface water, and typically small in area. The nutrient-poor substrate and the reduced throughflow of water create oligotrophic conditions fostering the development of *Sphagnum* peat and the growth of peatland vegetation. These acidic peatlands occur in a variety of landforms, including peat bog-lake systems (lake-fill bogs, moat bogs, and pond border bogs), perched water-peatland systems in valleys and depressions, and more rarely, peat bog-stream systems.

Eastern North American Boreal-Subboreal Bog & Acidic Fen Group (G1172)
Leatherleaf - Few-seed Sedge - Bog Laurel Eastern Boreal Bog & Acidic Fen
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
TREE					
Acer rubrum	Red maple	ACRU	**46**	2.4	3
Larix laricina	American larch	LALA	**39**	1.9	10
Picea mariana	Black spruce	PIMA	**38**	6.3	10
Pinus strobus	Eastern white pine	PIST	**25**	0.8	5
SHRUB					
Chamaedaphne calyculata	Leatherleaf	CHCA2	**72**	20.5	7
Kalmia angustifolia	Sheep laurel	KAAN	**52**	4.3	5
Vaccinium oxycoccos	Small cranberry	VAOX	**44**	1.8	9
Vaccinium corymbosum	Highbush blueberry	VACO	**42**	9	5
Kalmia polifolia	Pale laurel	KAPO	**37**	0.9	10
Ilex mucronata	Catberry	ILMU	**32**	3.2	9
Aronia melanocarpa	Black chokeberry	ARME6	**29**	1.2	6
Ledum groenlandicum	Labrador tea	LEGR	**29**	2.1	10
Andromeda polifolia	Bog rosemary	ANPO	**24**	1	10
Viburnum nudum	Possumhaw	VINU	**24**	0.6	8
HERBACEOUS					
Eriophorum virginicum	Tawny cotton-grass	ERVI8	**50**	3.1	7
Sarracenia purpurea	Pitcher-plant	SAPU4	**44**	0.9	10
Drosera rotundifolia	Round-leaved sundew	DRRO	**34**	0.4	6
Carex trisperma	threeseeded sedge	CATR10	**32**	2.4	10
Rhynchospora alba	White beak-rush	RHAL3	**30**	3.5	6
Osmunda cinnamomea	Cinnamon fern	OSCI	**26**	1.7	5
NON-VASCULAR					
Sphagnum sp.	Sphagnum	SPHAG2	**51**	35.8	7

FQA Metric Thresholds for Mean C and Cover-weighted Mean C G1172 Eastern North American Boreal-Subboreal Bog & Acidic Fen Leatherleaf - Few-seed Sedge - Bog Laurel Eastern Boreal Bog & Acidic Fen Group				
FQA Metric	**Excellent**	**Good**	**Fair**	**Poor**
Mean C	>6.9	6.9-5.7	5.7-4.4	<4.4
Cover-Weighted Mean C	>7.1	7.1-6.2	6.2-4.8	<4.8



For more information on finer scale floristic Alliances and Associations in **G1172 Eastern North American Boreal-Subboreal Bog & Acidic Fen Group** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A4398 Eastern Boreal-Subboreal Poor Fen

This poor fen alliance is found in the boreal and subboreal regions of eastern Canada and the midwestern and northeastern United States. The ground layer is dominated by ericaceous dwarf-shrubs (>25% cover), including *Chamaedaphne calyculata, Kalmia polifolia*, and *Andromeda polifolia* var. *glaucophylla,* with tree cover < 10%. *Carex lasiocarpa* and *Carex oligosperma* are typically dominant.

Associations within A4398 in New Jersey:
CEGL006008 ***Chamaedaphne calyculata - (Gaylussacia dumosa) - Decodon verticillatus / Woodwardia virginica*** **Acidic Peatland** (Southern New England Poor Fen)
CEGL006077 ***Dulichium arundinaceum - Triadenum virginicum / Sphagnum fallax*** **Fen** (Threeway Sedge Poor Fen)

A3836 Eastern Boreal-Subboreal Black Spruce Treed Bog
This acidic bog forest alliance is found in the Great Lakes and northeastern parts of the United States and the Ontario and Quebec boreal region in Canada (excluding Atlantic Boreal region). Tree canopy cover is variable but generally exceeds 10%. Stunted *Picea mariana* trees (<10 m tall) dominate the canopy, which may also include scattered *Larix laricina*. The dwarf-shrub layer is dominated by ericaceous species.

Associations within A3836 in New Jersey:
CEGL006098 ***Picea mariana / (Vaccinium corymbosum, Gaylussacia baccata) / Sphagnum*** **spp. Swamp Woodland** (Subboreal Black Spruce Semi-treed Bog)

A1018 Highbush Blueberry Peat Shrubland
This alliance, found in the eastern midwestern and northeastern United States and probably many of the eastern Canadian provinces, contains tall-shrub peat swamps dominated by *Vaccinium corymbosum* with ericaceous shrubs and peatmosses, little or no groundwater influence, and usually nutrient-poor and acidic water.

Associations within A1018 in New Jersey:
CEGL006190 ***Vaccinium corymbosum / Sphagnum*** **spp. Acidic Peatland** (Highbush Blueberry Wooded Fen)

Alkaline Fen

G805 Central Appalachian-Northeast Alkaline Fen

G805 Central Appalachian-Northeast Alkaline Fen

North-Central Interior & Appalachian Alkaline Fen Group

OVERVIEW

Type Concept: This group encompasses shrub and herbaceous fen vegetation in the northeastern temperate region, including Allegheny Plateau and much of New York and New England, as well as the tallgrass prairie and southern Great Lakes regions of the north-central Midwest. Associations may be shrub-dominated, a mixture of shrubs and herbs, or herb-dominated. Characteristic species include the shrubs *Dasiphora fruticosa ssp. floribunda, Cornus amomum, Cornus racemosa, Cornus sericea*, prairie grasses such as *Andropogon gerardii* and *Spartina pectinata*, sedges, including *Carex flava, Carex sterilis, Carex prairea, Carex stricta*, and other graminoids such as *Trichophorum alpinum*, and forbs such as *Lobelia kalmii, Packera aurea, Symplocarpus foetidus, Rhynchospora* spp., and *Triantha glutinosa*. Less commonly, *Cladium mariscoides* may be a dominant. Vegetation develops on shallow to deep peat over a gently sloping or level substrate, where the groundwater, typically minerotrophic and slightly alkaline, provides nutrients. In glaciated areas, they are characteristically in pitted outwash or in kettle lakes associated with kettle-kame-moraine topography.

Dynamics: The presence of cold, mineral-rich groundwater which promotes the formation of peat and marl is key to the formation and maintenance of this group. Where cold, mineral-rich groundwater emerges as seeps and diffuse springs, decomposition of plant matter is slowed, and peat can accumulate. Marl forms under sustained flow of calcium- and magnesium-rich water. The marl occurs where the groundwater emerges and in "spring runs" where water has cut a channel through the peat. Peat accumulation tends to be thickest in the center of the fens and can form raised mounds over time. Some of these areas are kept open by grazing, and succession to heavier shrub cover may occur in the absence of disturbance. Fire can spread from surrounding upland grasslands in the prairie landscape and can help limit the spread of trees and shrubs in those areas.

Environment: *Climate:* North-temperate. *Soil/substrate/hydrology:* Sedge or moss peat forms the vegetation substrate. Moisture is supplied by moving groundwater which is typically alkaline and cold throughout the summer. These fens typically remain saturated throughout the growing season.

North-Central Interior & Appalachian Alkaline Fen Group (G805)

Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

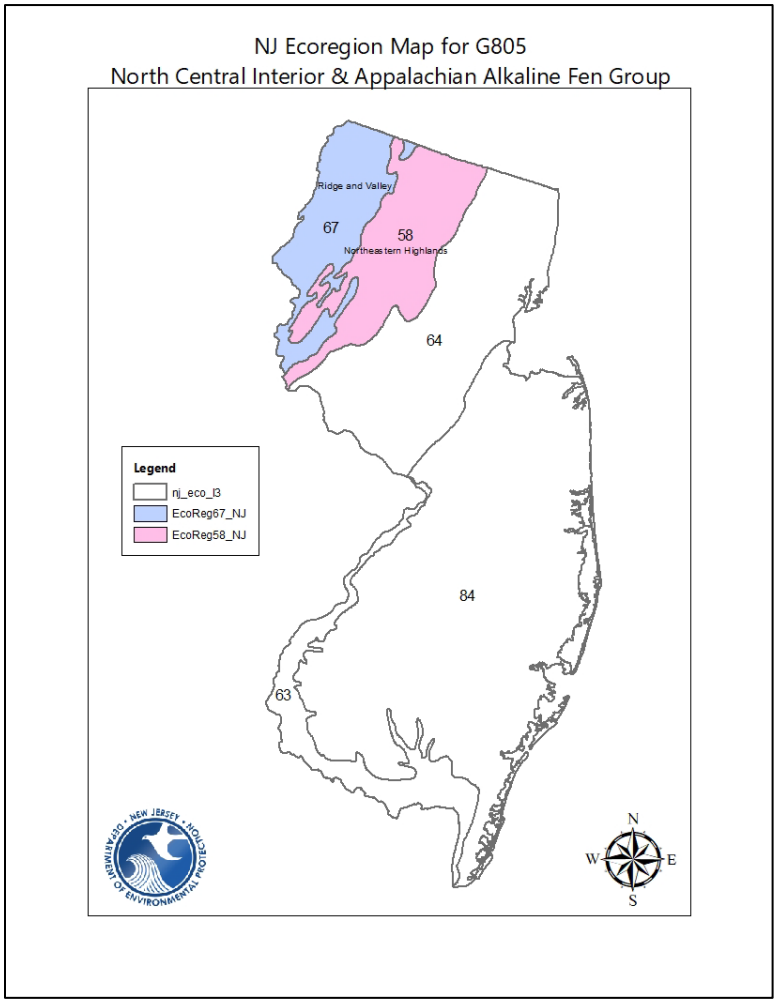
Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
TREE					
Acer rubrum	Red maple	ACRU	**46**	1.6	3
Salix discolor	Pussy willow	SADI	**28**	0.8	4
Toxicodendron vernix	Poison sumac	TOVE	**26**	1.9	7

North-Central Interior & Appalachian Alkaline Fen Group (G805)
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
SHRUB					
Cornus sericea	Red-osier dogwood	COSE16	**38**	1.9	7
Dasiphora fruticosa	Shrubby Cinquefoil	DAFR6	**38**	9.2	9
Spiraea alba	White meadowsweet	SPAL2	**36**	1.6	5
Viburnum recognitum	Northern arrow-wood	VIRE7	**31**	1.6	7
Alnus incana	Speckled alder	ALIN2	**28**	1.9	6
Rubus pubescens	Dwarf blackberry	RUPU	**26**	0.5	7
Cornus racemosa	Grey dogwood	CORA6	**23**	2.6	5
Vaccinium corymbosum	Highbush blueberry	VACO	**23**	0.8	5
Rhamnus alnifolia	Alder-leaved buckthorn	RHAL	**21**	4	8
HERBACEOUS					
Thelypteris palustris	Eastern marsh fern	THPA	**72**	8.9	4
Typha latifolia	Broadleaf cattail	TYLA	**59**	2.5	3
Carex interior	Inland sedge	CAIN11	**54**	3.2	10
Eupatorium perfoliatum	Boneset	EUPE3	**51**	0.6	4
Eutrochium maculatum	Spotted joe-pye-weed	EUMA9	**49**	2	5
Symplocarpus foetidus	Skunk cabbage	SYFO	**49**	7.3	5
Lycopus uniflorus	Northern bugleweed	LYUN	**46**	0.3	4
Carex stricta	Tussock sedge	CAST8	**44**	12.8	5
Glyceria striata	Fowl manna grass	GLST	**38**	0.4	4
Solidago patula	Spreading goldenrod	SOPA2	**38**	1.3	7
Solidago rugosa	Wrinkle-leaf goldenrod	SORU2	**36**	0.8	3
Symphyotrichum puniceum	Purplestem aster	SYPU	**36**	0.3	4
Carex leptalea	Bristlystalked sedge	CALE10	**33**	2.3	9
Carex lacustris	Lake-bank sedge	CALA16	**31**	7.6	9
Osmunda cinnamomea	Cinnamon fern	OSCI	**31**	2.3	5
Solidago uliginosa	Bog goldenrod	SOUL	**31**	1.1	9
Packera aurea	Golden ragwort	PAAU3	**28**	2.2	5
Calamagrostis canadensis	Canada bluejoint	CACA4	**26**	0.9	5
Carex flava	Yellow sedge	CAFL4	**26**	1.5	8
Carex prairea	Prairie sedge	CAPR6	**26**	1.1	9
Carex sp.	Sedge	CAREX	**26**	2.8	7
Chelone glabra	Turtlehead	CHGL2	**26**	0.4	6
Drosera rotundifolia	Round-leaved sundew	DRRO	**23**	0.2	6
Equisetum fluviatile	Water horsetail	EQFL	**23**	0.8	8
Euthamia graminifolia	Flat-top goldentop	EUGR5	**23**	0.1	2
Galium obtusum	Bluntleaf bedstraw	GAOB	**23**	0.2	5
Iris versicolor	Northern blue flag	IRVE2	**23**	0.3	5
Thalictrum pubescens	Tall meadow-rue	THPU2	**23**	0.4	5
Lycopus americanus	Water-horehound	LYAM	**21**	0.3	4

North-Central Interior & Appalachian Alkaline Fen Group (G805) Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)					
Scientific Name	**Common Name**	**USDA Plants Code**	**Constancy**	**Mean % Cover**	**NJ State CoC**
Viola cucullata	Blue marsh violet	VICU	**21**	0.4	6

FQA Metric Thresholds for Mean C and Cover-weighted Mean C G805 North-Central Interior & Appalachian Alkaline Fen Group				
FQA Metric	**Excellent**	**Good**	**Fair**	**Poor**
Mean C	>5.9	5.9-5.0	5.0-3.8	<3.8
Cover-Weighted Mean C	>6.3	6.3-5.2	5.2-2.0	<2.0



For more information on finer scale floristic Alliances and Associations in **G805 Central Appalachian-Northeast Alkaline Fen Group** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A4479 Central Appalachian-Northeast Rich Fen
This rich fen alliance is found in the temperate regions of the northeastern United States and in southern Ontario, Canada. Stands are a variable combination of tall shrubs, low shrubs, and herbs on minerotrophically rich mucks, often called marl fens. Patterning within large fens may occur, leading to recognizable zones, such as sedge flats, which occur around the spring discharge; fen meadows, which occur in the adjacent saturated zone as a variable combination of shrubs and herbs; and tall-shrub fens, which occur on more elevated portions or edges of the fen.

Associations in A4479 in New Jersey:
CEGL006359 ***Cornus amomum - Salix candida / Dasiphora fruticosa / Carex stricta*** **Fen** (Calcareous Shrub Fen)
CEGL006356 ***Dasiphora fruticosa / Rhynchospora capillacea - Scleria verticillata*** **Fen** (Lakeshore Marl Fen)
CEGL006103 ***Morella pensylvanica - Dasiphora fruticosa / Carex sterilis - Carex flava*** **Fen** (Northern Piedmont Rich Fen)
CEGL006357 ***Juniperus virginiana / Dasiphora fruticosa / Carex flava - Carex tetanica*** **Fen** (Pasture Fen)
CEGL006360 ***Betula pumila - Toxicodendron vernix - Dasiphora fruticosa*** **Fen** (Rich Shrub Carr)

G804 Shrubby-cinquefoil - Woolly-fruit Sedge Eastern Boreal Alkaline Fen Group

G804 Eastern North American Boreal-Subboreal Alkaline Fen

Shrubby-cinquefoil - Woolly-fruit Sedge Eastern Boreal Alkaline Fen Group

***Dasiphora fruticosa* - *Carex lasiocarpa* Eastern Boreal Alkaline Fen Group**

Type Concept: These fens, distributed across eastern boreal regions of North America, develop in open basins where lateral groundwater flow through circumneutral to calcareous parent materials creates moderately to strongly alkaline conditions. They are found on level to gently sloping surfaces, or in closed wet depressions (sometimes as floating mats), and along wetland margins and lakeshores and rivershores. The shore fens are occasionally flooded, and so are included here because flooding tends to create moderately alkaline conditions. The vegetation may be graminoid-dominated, shrub-dominated, or a patchwork of the two, with broad-leaved non-ericaceous shrubs typically dominant. There is a discontinuous to absent layer of *Sphagnum* peatmoss (<80% cover), with brown mosses (*Calliergon, Campylium, Drepanocladus, Tomentypnum*) present to dominant. Broad-leaved non-ericaceous shrubs (*Alnus incana, Betula glandulosa, Betula pumila, Dasiphora fruticosa ssp. floribunda, Myrica gale, Salix* spp.) exceed cover of ericaceous shrubs, although some shore fens may be dominated by *Chamaedaphne calyculata*. Thin-leaved graminoids include *Carex interior, Carex lasiocarpa, Carex limosa, Carex livida, Eriophorum viridicarinatum, Muhlenbergia glomerata*, and *Trichophorum alpinum*. In the tree layer, *Picea mariana* is rare to absent and *Larix laricina* is variable. Minerotrophic *Sphagnum* dominates the substrate among medium fens, but brown mosses become increasingly common under richer conditions. *Campylium stellatum* is an indicator brown moss bryophyte.

Dynamics: Lateral groundwater flow through calcareous parent material.

Environment: *Soil/substrate/hydrology:* These fens develop in open basins where lateral groundwater flow through circumneutral to calcareous parent materials creates moderately to strongly alkaline conditions. They are found on level to gently sloping surfaces, or in closed wet depressions (sometimes as floating mats), and along wetland margins, lake shores and rivershores. The shore fens are occasionally flooded, and so are included here because flooding tends to create moderately alkaline conditions.

Eastern North America Boreal-Subboreal Alkaline Fen Group (G804)
Shrubby-cinquefoil - Woolly-fruit Sedge Eastern Boreal Alkaline Fen Group
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

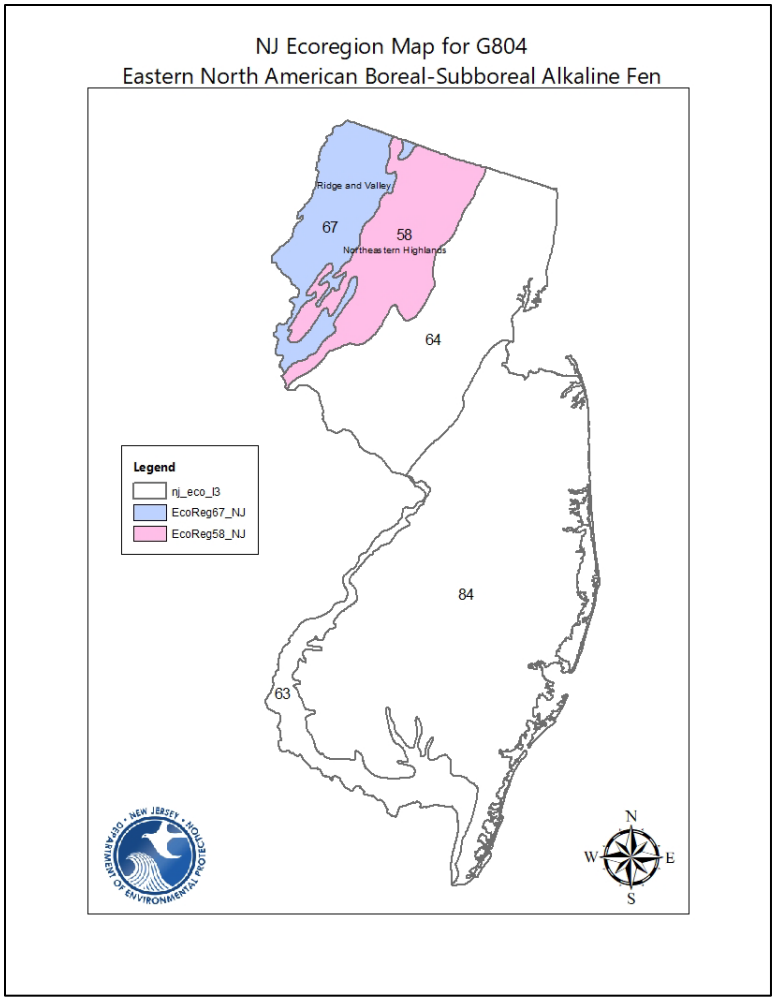
Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
TREE					
Acer rubrum	Red maple	ACRU	**37**	1.9	3
Larix laricina	American larch	LALA	**23**	0.9	10
SHRUB					
Myrica gale	Sweet gale	MYGA	**56**	13.7	9
Chamaedaphne calyculata	Leatherleaf	CHCA2	**55**	11.6	7
Spiraea alba	White meadowsweet	SPAL2	**45**	1.8	5
Alnus incana	Speckled alder	ALIN2	**29**	1	6

Eastern North America Boreal-Subboreal Alkaline Fen Group (G804)
Shrubby-cinquefoil - Woolly-fruit Sedge Eastern Boreal Alkaline Fen Group
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
Dasiphora fruticosa	Shrubby Cinquefoil	DAFR6	**23**	5.3	9
Vaccinium macrocarpon	Cranberry	VAMA	**23**	1.3	5
HERBACEOUS					
Carex lasiocarpa	Wooly fruit sedge	CALA11	**48**	12.7	9
Thelypteris palustris	Eastern marsh fern	THPA	**34**	1.6	4
Triadenum virginicum	Marsh St. John's-wort	TRVI2	**34**	0.4	7
Drosera rotundifolia	Round-leaved sundew	DRRO	**32**	0.3	6
Carex stricta	Tussock sedge	CAST8	**26**	4.3	5
Lysimachia terrestris	Swamp-candles	LYTE2	**26**	0.4	5
Sarracenia purpurea	Pitcher-plant	SAPU4	**25**	0.6	10
Calamagrostis canadensis	Canada bluejoint	CACA4	**23**	0.8	5
Menyanthes trifoliata	Bogbean	METR3	**23**	1.7	10
Dulichium arundinaceum	Three-way sedge	DUAR3	**22**	0.5	5
NON-VASCULAR					
Sphagnum sp.	Sphagnum	SPHAG2	**42**	20.8	7

FQA Metric Thresholds for Mean C and Cover-weighted Mean C
G804 Eastern North America Boreal-Subboreal Alkaline Fen Group
Shrubby-cinquefoil - Woolly-fruit Sedge Eastern Boreal Alkaline Fen Group

FQA Metric	Excellent	Good	Fair	Poor
Mean C	>6.5	6.5-5.2	<5.2	[4.2]
Cover-Weighted Mean C	>6.9	6.9-5.9	<5.9	[4.6]



For more information on finer scale floristic Alliances and Associations in **G804 Shrubby-cinquefoil - Woolly-fruit Sedge Eastern Boreal Alkaline Fen Group (Central Appalachian-Northeast Alkaline Fen Group)** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A4401 Eastern Boreal-Subboreal Medium Fen
This alliance is an intermediate fen overlying deep peat accumulations of lakes and other depressions in the Great Lakes region east to the northeastern United States. It is characterized by rhizomatous sedges that form a mat, with variable shrub cover. Characteristic mosses are non-Sphagnum mosses.

Associations within A4401 in New Jersey:
CEGL006068 ***Myrica gale - Dasiphora fruticosa / Carex lasiocarpa - Cladium mariscoides*** **Fen**
(Medium Graminoid Fen)

SALT MARSH

USNVC Changes in Salt Marsh Classification

The ecoregional Floristic Quality Assessment (eFQA) analysis of wetland groups in the northeast included four USNVC salt marsh types that occur in New Jersey. That data is presented in this report. However, the USNVC will soon be making two substantial changes in the classification to separate Brackish Marsh and Salt Marsh at the Group level of the hierarchy.

1) The USNVC will be moving the Atlantic & Gulf Coastal Brackish Salt Marsh Group (G120) into a new Group, North Atlantic Brackish Tidal Marsh (G959). This is due in part to differences in plant species distribution and the need to sort the ecological group classification of brackish tidal marshes by northern and southern regional types. The original Group G120 will be split into the new northern G959 and the new southern G960 coastal brackish tidal marsh groups. Once this revision is finalized the classification links in NatureServe Explorer will be updated. The updated classification for brackish tidal marsh types will be as follows:

The new Northern Atlantic Brackish Tidal Marsh Group (G959) will include one Alliance, A4493 Northern Atlantic Cordgrass Brackish Tidal Marsh, that occurs in New Jersey. That new Alliance will have nine finer floristic Associations in New Jersey, including:

CEGL004195 *Spartina cynosuroides* Salt Marsh (Atlantic Big Cordgrass Salt Marsh)
CEGL004188 *Schoenoplectus pungens* Tidal Salt Marsh (Atlantic Coast Brackish Tidal Marsh)
CEGL004193 *Spartina alterniflora - Lilaeopsis chinensis* Salt Marsh (Brackish Low Tidal Salt Marsh)
CEGL006150 *Panicum virgatum - Spartina patens - Carex silicea* Salt Marsh (Brackish Meadow)
CEGL006416 *Bolboschoenus robustus - Spartina alterniflora* Salt Marsh (Bulrush Brackish Marsh)
CEGL004201 *Typha angustifolia - Hibiscus moscheutos* Salt Marsh (Cattail Brackish Tidal Salt Marsh)
CEGL006418 *Spartina alterniflora - Polygonum punctatum - Amaranthus cannabinus* Salt Marsh (Mesohaline Seepage Salt Marsh)
CEGL004473 *Sagittaria subulata - Limosella australis* Tidal Marsh (North Atlantic Coastal Plain River Brackish Intertidal Mudflat)
CEGL006365 *Spartina patens - Agrostis stolonifera* Salt Marsh (Tidal River Brackish Meadow)

2) The USNVC will be moving the Atlantic & Gulf Coastal High Salt Marsh (G121), Atlantic & Gulf Coastal Low Salt Marsh (G122), and Atlantic & Gulf Coastal Tidal Flat & Panne (G123) into a new Group, North Atlantic Salt Marsh (G957). The original Groups (G121, G122, G123) will be included as four new Alliances within the new Group (G957). Once this revision is finalized the classification links in NatureServe Explorer will be updated. The updated classification for salt marsh types is as follows:

The new North Atlantic Salt Marsh Group (G957) will include four Alliances and eight Associations:

A4491 Northern Atlantic Saltmeadow Cordgrass High Salt Marsh
A4498 North Atlantic Smooth Cordgrass Low Salt Marsh
A4487 North Atlantic Intertidal Salt Flat & Panne
A4489 Northern Atlantic Shrub Salt Marsh

The new Northern Atlantic Saltmeadow Cordgrass High Salt Marsh Alliance (A4491) will have three finer floristic Associations in New Jersey, including:

CEGL006006 *Spartina patens - Distichlis spicata - (Juncus gerardii)* Salt Marsh (North Atlantic High Salt Marsh)

CEGL006586 *Spartina alterniflora - Distichlis spicata* Tidal Salt Marsh (North Atlantic Short-form Salt Marsh)

CEGL006612 *Schoenoplectus americanus - Spartina patens* Salt Marsh (Transitional Tidal Marsh)

The new North Atlantic Smooth Cordgrass Low Salt Marsh Alliance (A4498) will have one finer floristic Association in New Jersey, including:

CEGL004192 *Spartina alterniflora* North Atlantic Salt Marsh (North Atlantic Low Salt Marsh)

The new North Atlantic Intertidal Salt Flat & Panne Alliance (A4487) will have two finer floristic Associations in New Jersey, including:

CEGL004308 *Salicornia (depressa, bigelovii, maritima) - Spartina alterniflora* Salt Marsh (Salt Panne (Salicornia Type))

CEGL006370 *Ruppia maritima - Stuckenia pectinata* Aquatic Vegetation (Salt Panne Pool)

The new Northern Atlantic Shrub Salt Marsh Alliance (A4489) will have two finer floristic Associations in New Jersey, including:

CEGL006848 *Iva frutescens / Spartina patens* Saline Shrubland (Eastern Tidal Salt Shrubland)

CEGL003921 *Baccharis halimifolia - Iva frutescens / Panicum virgatum* Saline Shrubland (Irregularly Flooded Eastern Tidal Salt Shrub)

Brackish Marsh

G120 Smooth Cordgrass - Big Cordgrass – Common Threesquare Brackish Tidal Marsh

G120 Atlantic & Gulf Coastal Brackish Marsh (= new G959 North Atlantic Brackish Tidal Marsh)
Smooth Cordgrass - Big Cordgrass – Common Threesquare Brackish Tidal Marsh Group
***Spartina alterniflora* - *Spartina cynosuroides* - *Schoenoplectus pungens* Brackish Marsh Group**

Type Concept: Brackish tidal marshes of the Atlantic coast, generally occurring on tidal rivers. Typical dominants include *Spartina alterniflora* and/or *Spartina cynosuroides*. Associates include *Typha angustifolia*. In addition to the nominals, additional halophytic species such as *Spartina patens* and *Iva frutescens* indicate brackish (mesohaline) conditions. Characteristic species of these environments are *Amaranthus cannabinus, Baccharis halimifolia, Crassula aquatica (= Tillaea aquatica), Echinochloa walteri, Eleocharis halophila, Eleocharis parvula, Hibiscus moscheutos, Kosteletzkya virginica, Lilaeopsis chinensis, Pluchea odorata, Sagittaria calycina, Samolus valerandi* ssp. *parviflorus (= Samolus parviflorus), Schoenoplectus americanus, Bolboschoenus maritimus (= Schoenoplectus maritimus),* and *Bolboschoenus robustus (= Schoenoplectus robustus). Carex paleacea* is characteristic in northern New England and the Canadian maritime provinces.

Dynamics: Vegetation of environmental settings that experience a wide fluctuation in salinity. This includes the mesohaline (5-18 ppt salinity) reaches of tidal rivers where saltwater from the ocean intermixes with freshwater input from inland, or at the upland interface of tidal marshes that receives significant freshwater input (oligohaline 0.5-5ppt). Flooding regime varies with respect to height from river channel, with more regular flooding occurring adjacent to the river, and irregular flooding on terraces.

Environment: This type generally occurs on tidal rivers as opposed to regularly flooded salt marshes forming behind barrier beaches. Substrates vary from sand or gravel on tidal rivershores, poorly drained peat overlying sand and mucky sand, to silty mud along meanders in tidal rivers and guts in the interiors of extensive marshes where there is significant freshwater input. Tidal flow also varies from regularly flooded low marsh to intermittently flooded high marsh on terraces and levees. Microtopography is relatively flat, and lacks pronounced hummocks and hollows.

Atlantic & Gulf Coastal Brackish Salt Marsh (G120)
Smooth Cordgrass - Big Cordgrass – Common Threesquare Brackish Tidal Marsh Group
(= new G959 Northern Coastal Brackish Tidal Marsh)
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

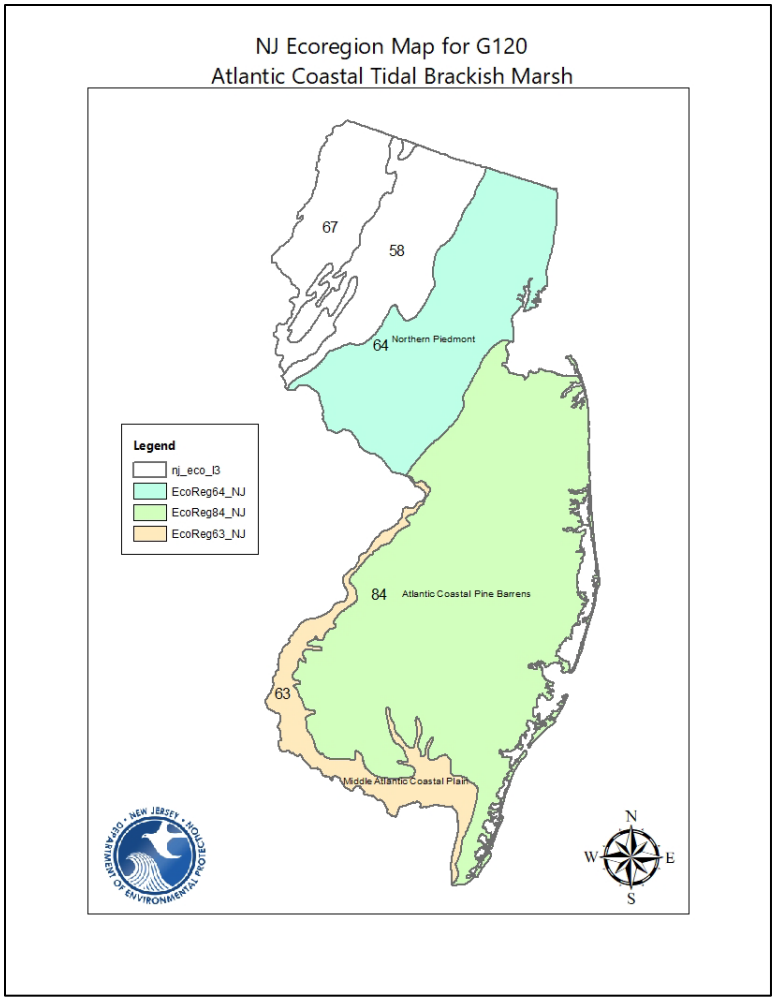
Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
SHRUB					
Toxicodendron radicans	Poison ivy	TORA2	**33**	6.8	1
Baccharis halimifolia	Groundsel-tree	BAHA	**20**	1.4	4

Atlantic & Gulf Coastal Brackish Salt Marsh (G120)
Smooth Cordgrass - Big Cordgrass – Common Threesquare Brackish Tidal Marsh Group
(= new G959 Northern Coastal Brackish Tidal Marsh)
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
HERBACEOUS					
Spartina patens	Salt marsh cordgrass	SPPA	**42**	10.1	5
Panicum virgatum	Switchgrass	PAVI2	**40**	9	2
Solidago sempervirens	Seaside goldenrod	SOSE	**38**	0.9	2
Schoenoplectus pungens	Common threesquare	SCPU10	**33**	4.3	3
Distichlis spicata	Marsh spike-grass	DISP	**31**	8.1	7
Typha angustifolia	Narrowleaf cattail	TYAN	**29**	15.5	4
Euthamia graminifolia	Flat-top goldentop	EUGR5	**27**	0.5	2
Hibiscus moscheutos	Rose-mallow	HIMO	**27**	1	5
Cladium mariscoides	Twig-rush	CLMA	**22**	4.3	5
Phragmites australis	Common reed	PHAU7	**22**	0.3	0
Spartina alterniflora	Smooth cordgrass	SPAL	**22**	8.7	6
Thelypteris palustris	Eastern marsh fern	THPA	**22**	1.7	4
Amaranthus cannabinus	Water hemp	AMCA2	**20**	1.1	7
Symphyotrichum subulatum	Annual salt marsh aster	SYSU5	**20**	0.5	7

FQA Metric Thresholds for Mean C and Cover-weighted Mean C
G120 Coastal Brackish Salt Marsh (=G959 North Atlantic Brackish Tidal Marsh)
Smooth Cordgrass - Big Cordgrass – Common Threesquare Brackish Tidal Marsh Group

FQA Metric	Excellent	Good	Fair	Poor
Mean C	>6.2	6.2-4.4	4.4-3.6	<3.6
Cover-Weighted Mean C	>6.7	6.7-3.6	3.6-2.4	<2.4



For more information on finer scale floristic Alliances and Associations in **G120 Smooth Cordgrass - Big Cordgrass – Common Threesquare Brackish Tidal Marsh Group (Coastal Brackish Salt Marsh) (= new G959 Northern Coastal Brackish Tidal Marsh Group)** in New Jersey, see the following U.S. National Vegetation Classification descriptions:

A4493 Northern Atlantic Cordgrass Brackish Tidal Marsh
This alliance comprises brackish tidal marshes of the North Atlantic coast and characterized by *Spartina alterniflora* and/or *Spartina cynosuroides*, generally occurring on tidal rivers.

Associations within A4493 in New Jersey:
CEGL004195 ***Spartina cynosuroides*** **Salt Marsh** (Atlantic Big Cordgrass Salt Marsh)
CEGL004188 ***Schoenoplectus pungens*** **Tidal Salt Marsh** (Atlantic Coast Brackish Tidal Marsh)
CEGL004193 ***Spartina alterniflora - Lilaeopsis chinensis*** **Salt Marsh** (Brackish Low Tidal Salt Marsh)
CEGL006150 ***Panicum virgatum - Spartina patens - Carex silicea*** **Salt Marsh** (Brackish Meadow)
CEGL006416 ***Bolboschoenus robustus - Spartina alterniflora*** **Salt Marsh** (Bulrush Brackish Marsh)
CEGL004201 ***Typha angustifolia - Hibiscus moscheutos*** **Salt Marsh** (Cattail Brackish Tidal Salt Marsh)
CEGL006418 ***Spartina alterniflora - Polygonum punctatum - Amaranthus cannabinus*** **Salt Marsh**

(Mesohaline Seepage Salt Marsh)
CEGL004473 ***Sagittaria subulata - Limosella australis*** **Tidal Marsh** (North Atlantic Coastal Plain River Brackish Intertidal Mudflat)
CEGL006365 ***Spartina patens - Agrostis stolonifera*** **Salt Marsh** (Tidal River Brackish Meadow)

Salt Marsh

G121 Saltmeadow Cordgrass - Jesuit's-bark High Salt Marsh Group

G121 Atlantic & Gulf Coastal High Salt Marsh
(moved/merged into new G957 North Atlantic Salt Marsh)
Saltmeadow Cordgrass - Jesuit's-bark High Salt Marsh Group
***Spartina patens* - *Iva frutescens* High Salt Marsh Group**

Type Concept: This group encompasses vegetation in the regularly flooded, upper herbaceous or herb-shrub zones of salt marshes of the Atlantic Coast of temperate North America subject to polyhaline tidal waters. Dominance is most often by graminoids, with *Spartina patens* usually present and often dominant. Other characteristic species include *Distichlis spicata* and *Salicornia* spp. A fringe of shrub-herb vegetation, or sometimes more extensive areas of salt-tolerant shrubs, is common at the upper edges of the high marsh zone. High marsh vegetation generally develops between the levels of an area's mean daily high tides and spring tides. Wind tides may be important in marshes associated with barrier island systems. Associated species vary across the north-to-south expanse of this group. Towards the north, in the Gulf of Maine, common associates include *Juncus gerardii, Solidago sempervirens, Symphyotrichum novi-belgii*, and *Limonium carolinianum*; from the Chesapeake south, *Juncus roemerianus* is common and other associates such as *Baccharis halimifolia* are characteristic.

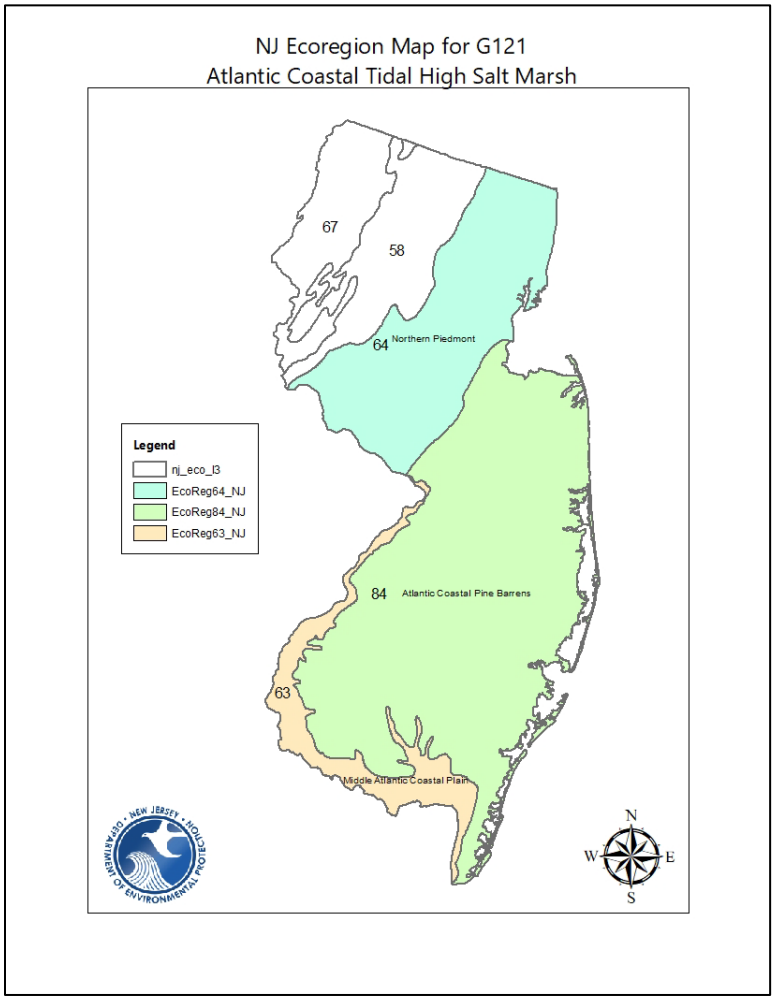
Dynamics: High marshes develop in areas above mean high water that still receive tidal influence from lunar spring tides, wind tides, or other events. For marshes on the back of barrier islands, overwash in storms may deposit sand in the marsh.

Environment: ***Climate:*** Cool-temperate to warm-temperate maritime climate. *Soil/substrate/hydrology:* Tides bring nutrients, making the regularly flooded marshes fertile. Salt marshes generally develop on fine-grained sediments but can develop over sands as well. Production exceeds decomposition, leading to the buildup of marsh peat. High marsh, above mean high tide, is regularly to irregularly flooded by shallow polyhaline waters as a result of lunar, wind, and storm tides.

Atlantic Coastal High Salt Marsh (G121) = G957 North Atlantic Salt Marsh
Saltmeadow Cordgrass - Jesuit's-bark High Salt Marsh Group
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean % Cover	NJ State CoC
Spartina patens	Salt marsh cordgrass	SPPA	**88**	31.4	5
Spartina alterniflora	Smooth cordgrass	SPAL	**66**	22.5	6
Distichlis spicata	Marsh spike-grass	DISP	**47**	10.8	7
Salicornia depressa	Virginia glasswort	SADE10	**39**	0.4	7
Juncus gerardii	Blackfoot rush	JUGE	**35**	6.7	6
Limonium carolinianum	Sea lavender	LICA17	**33**	0.7	8
Solidago sempervirens	Seaside goldenrod	SOSE	**33**	0.7	2

FQA Metric Thresholds for Mean C and Cover-weighted Mean C G121 Atlantic Coastal High Salt Marsh (=G957 North Atlantic Salt Marsh) Saltmeadow Cordgrass - Jesuit's-bark High Salt Marsh Group				
FQA Metric	**Excellent**	**Good**	**Fair**	**Poor**
Mean C	>7.5	7.5-5.7	5.7-4.2	<4.2
Cover-Weighted Mean C	>7.9	7.9-6.0	6.0-3.9	<3.9



For more information on finer scale floristic Alliances and Associations in **G121 Saltmeadow Cordgrass - Jesuit's-bark High Salt Marsh Group (Atlantic Coastal High Salt Marsh Group)** in New Jersey, see the following U.S. National Vegetation Classification descriptions. Note that the USNVC new **G957 North Atlantic Salt Marsh Group** will include High Salt Marsh, Low Salt Marsh, Salt Flat & Panne, and Shrub Salt Marsh.

A4491 Northern Atlantic Saltmeadow Cordgrass High Salt Marsh
This alliance comprises "high salt marsh" vegetation dominated or codominated by *Spartina patens* along the North and Mid-Atlantic coasts from Maine to the Carolinas.

Associations within A4491 in New Jersey:
CEGL006006 ***Spartina patens - Distichlis spicata - (Juncus gerardii)*** **Salt Marsh** (North Atlantic High Salt Marsh)
CEGL006398 ***Schoenoplectus pungens - Eleocharis parvula*** **Salt Marsh** (Coastal Salt Pond Marsh)
CEGL006612 ***Schoenoplectus americanus - Spartina patens*** **Salt Marsh** (Transitional Tidal Marsh)

In the new G957 Northern Coastal High Salt Marsh Group the Northern Atlantic Saltmeadow Cordgrass High Salt Marsh Alliance (A4491) will have three floristic Associations in New Jersey. Two are same – GEGL006066 and CEGL006612; but CEGL006398 will be moved to a different Alliance and CELG6583 will be added as follows:
CEGL006006 ***Spartina patens - Distichlis spicata - (Juncus gerardii)*** **Salt Marsh** (North Atlantic High Salt Marsh)
CEGL006586 ***Spartina alterniflora - Distichlis spicata*** **Tidal Salt Marsh** (North Atlantic Short-form Salt Marsh)
CEGL006612 ***Schoenoplectus americanus - Spartina patens*** **Salt Marsh** (Transitional Tidal Marsh)

A4489 Northern Atlantic Shrub Salt Marsh
These tidal shrub salt marshes are found on the Mid-Atlantic coast from Massachusetts to the Carolinas. They are characterized by *Iva frutescens* and *Baccharis halimifolia,* and occur primarily in estuarine margin situations, as an ecotone between salt marsh and uplands, especially on the sound sides of barrier islands.

Associations within A4489 in New Jersey:
CEGL006848 ***Iva frutescens / Spartina patens*** **Saline Shrubland** (Eastern Tidal Salt Shrubland)
CEGL003921 ***Baccharis halimifolia - Iva frutescens / Panicum virgatum*** **Saline Shrubland** (Irregularly Flooded Eastern Tidal Salt Shrub)

G122 Smooth Cordgrass Low Salt Marsh

G122 Atlantic & Gulf Coastal Low Salt Marsh
(moved/merged into the new G957 North Atlantic Salt Marsh)
Smooth Cordgrass Low Salt Marsh Group
***Spartina alterniflora* Low Salt Marsh Group**

Type Concept: This group encompasses salt marsh vegetation that is flooded twice daily by polyhaline waters and dominated by *Spartina alterniflora*. *Spartina alterniflora* is constant, dominant, and sometimes monospecific. Halophytic forbs (or forblike woody plants in the case of *Sarcocornia*) such as *Sarcocornia perennis* may be present though not abundant, and individuals of species more common in the high marsh, such as *Limonium carolinianum, Juncus roemerianus*, and *Distichlis spicata*, may also occur. Other species include *Limonium carolinianum, Plantago maritima, Salicornia* spp., *Spartina patens*, and *Spergularia canadensis*. Macroalgae such as *Ascophyllum nodosum* may be present (though sparse) particularly in the northern part of the group's range. It is often found fringing tidal creeks, and in places forms extensive flats of low marsh vegetation.

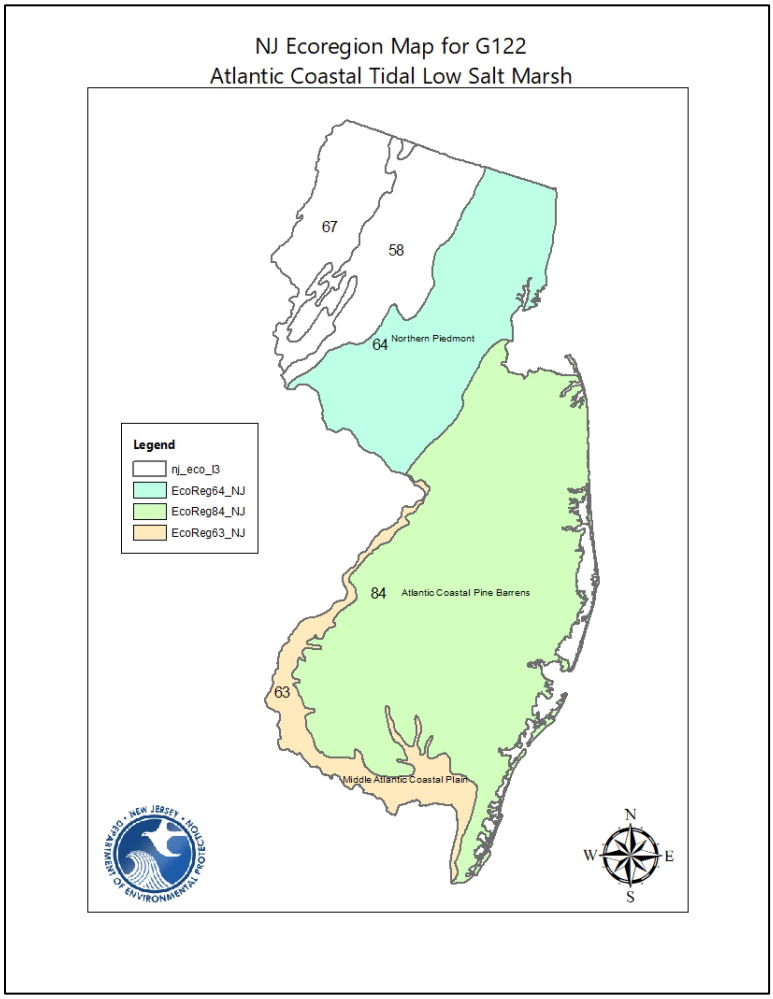
Dynamics: Storm tides often deposit sand on salt marsh surfaces where overwash breaches the barrier dune. Flood-deposited wrack can smother the underlying marsh, converting it to an unvegetated flat. Decline of low salt marsh has been documented on the Atlantic and Gulf coasts in recent decades; loss is attributed to intense grazing by a nocturnal crab, which is most pronounced at tidal creek edges (Smith 2009).

Environment: *Climate:* Cool-temperate to warm-temperate maritime climate. *Soil/substrate/hydrology:* Tides bring nutrients, making the regularly flooded marshes fertile. Salt marshes generally develop on fine-grained sediments but can develop over sands as well. Production exceeds decomposition, leading to the buildup of marsh peat. Low marsh is flooded twice daily by polyhaline waters as a result of lunar, wind and storm tides.

Atlantic Coastal Low Salt Marsh (G122) (moved to new G957 North Atlantic Salt Marsh)
Smooth Cordgrass Low Salt Marsh Group
Floristic Composition: Species listed by Growth Form and Constancy (percentage of stands that contain the species)

Scientific Name	Common Name	USDA Plants Code	Constancy	Mean% Cover	NJ State CoC
Spartina alterniflora	Smooth cordgrass	SPAL	**100**	57.5	6
Spartina patens	Salt marsh cordgrass	SPPA	**75**	17.3	5
Salicornia depressa	Virginia glasswort	SADE10	**71**	1	7
Distichlis spicata	Marsh spike-grass	DISP	**48**	4.2	7
Limonium carolinianum	Sea lavender	LICA17	**48**	1	8
Symphyotrichum tenuifolium	Perennial salt marsh aster	SYTE6	**22**	0.1	8

FQA Metric Thresholds for Mean C and Cover-weighted Mean C G122 Atlantic Coastal Low Salt Marsh Group (=G957 North Atlantic Salt Marsh) Smooth Cordgrass Low Salt Marsh				
FQA Metric	**Excellent**	**Good**	**Fair**	**Poor**
Mean C	>7.6	7.6-7.3	<7.3	[4.8]
Cover-Weighted Mean C	>7.5	7.5-7.0	<7.0	[3.9]



For more information on finer scale floristic Alliances and Associations in **G122 Smooth Cordgrass Low Salt Marsh (Atlantic Coastal Tidal Low Salt Marsh Group)** in New Jersey, see the following U.S. National Vegetation Classification descriptions. Note that the USNVC new **G957 North Atlantic Salt Marsh Group** will include High Salt Marsh, Low Salt Marsh, Salt Flat & Panne, and Shrub Salt Marsh.

A4498 North Atlantic Smooth Cordgrass Low Salt Marsh
This alliance includes low, regularly flooded tidal salt marshes of the north Atlantic coast, from Virginia to Labrador, and is dominated by *Spartina alterniflora*.

Associations within A4498 in New Jersey:
CEGL004192 ***Spartina alterniflora*** **North Atlantic Salt Marsh** (North Atlantic Low Salt Marsh)
CEGL006586 ***Spartina alterniflora - Distichlis spicata*** **Tidal Salt Marsh** (North Atlantic Short-form Salt Marsh)

In the new G957 Northern Coastal Salt Marsh Group the North Atlantic Smooth Cordgrass Low Salt Marsh Alliance (A4498) will have only one floristic Association in New Jersey: CEGL004192. The short form *Spartina alterniflora* marsh CEGL006586 is moved into the Northern Atlantic Saltmeadow Cordgrass High Salt Marsh Alliance (A4491).

G123 Saltwort species - Swampfire species - Gulf Cordgrass Tidal Flat & Panne Group

G123 Atlantic & Gulf Coastal Tidal Flat & Panne
(moved/merged into the new G957 North Atlantic Salt Marsh)
Saltwort species - Swampfire species - Gulf Cordgrass Tidal Flat & Panne Group
Salicornia spp. - Sarcocornia spp. - Spartina spartinae Tidal Flat & Panne Group

Type Concept: Vegetation of this group occupies tidally-influenced hypersaline areas along the Atlantic Coast and Gulf of Mexico region from the New England states and the Canadian Maritime Provinces, along the southeastern coast and south to northern Mexico. Examples of this vegetation may occur in patches throughout this relatively large range. The southern limit depends on where the temperate-tropical line is set in relation to this division. These irregularly tidally-flooded marshes are generally somewhat hypersaline from evaporation of seawater after storm surges or exceptionally high tides. They vary somewhat locally in expression, but all tend to exhibit low vascular plant diversity, dominated by halophytic species. There are relatively few plant species which are able to occupy these environments. These include various species of the succulent genera *Salicornia* spp. and *Sarcocornia* spp., as well as several grasses (which may be stunted), including *Distichlis spicata, Spartina alterniflora, Spartina spartinae* (not in NJ), and/or *Sporobolus virginicus*. Some more southerly associations may contain or be dominated by *Batis maritima*. Common associates include *Atriplex* spp., *Limonium carolinianum, Monanthochloe littoralis, Plantago maritima var. juncoides, Suaeda maritima*, and *Triglochin maritima*. Total vegetative cover is quite variable, from near total absence of vascular plants to a dense cover of vascular and nonvascular plants; however, unlike high marsh *Spartina* vegetation, pannes do not feature dense *Spartina* cover. Algal mats are characteristically present, visible even in densely vegetated pannes. In some cases, blue-green algae may contribute significantly more biomass than vascular species.

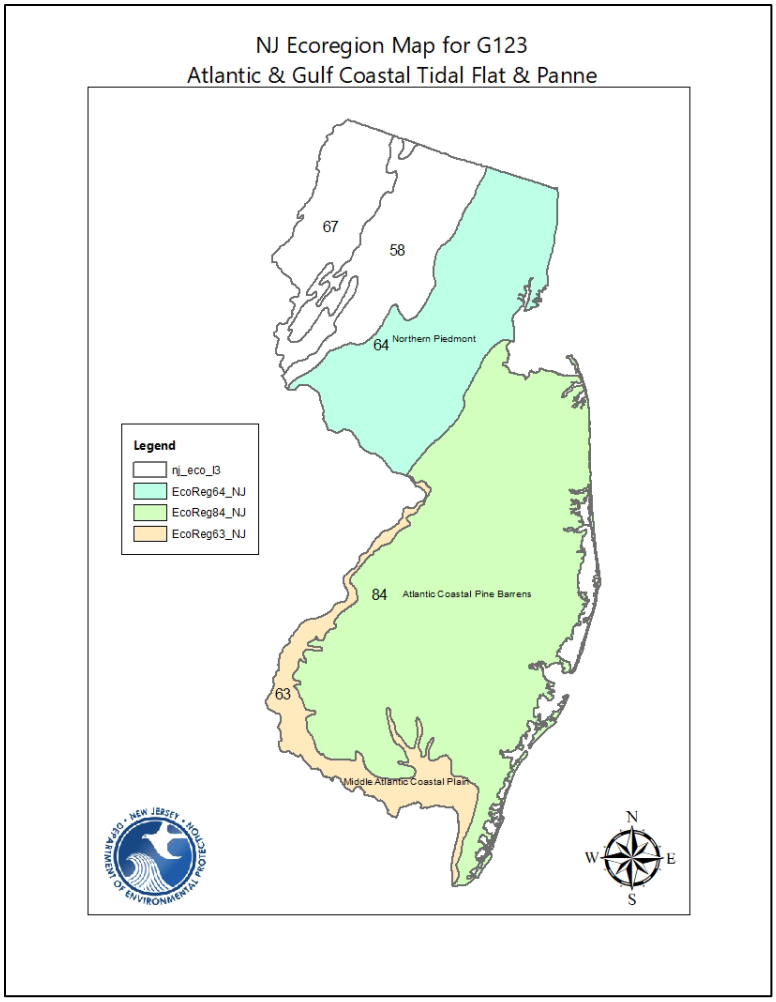
Dynamics: Salt pannes are part of the shifting mosaic of plant communities of the salt marsh complex. They tend to occur more frequently on the high marsh but are present in the low marsh as well. Pannes are variable in shape and likely variable in origin. Formation can result from ice-scouring or rafting flotsam that scrapes away or smothers existing vegetation, or from peat compaction, mosquito ditch levees, or tidal creekbank erosion that blocks or impedes drainage. Lack of vegetation decreases local sedimentation, which also maintains lower micro-relief (Redfield 1972). Evaporation from these poorly drained shallow depressions leads to hypersaline conditions (Niering and Warren 1980, Bertness et al. 1992). Gradients of salinity and standing water depth and duration correlate to vegetative cover and composition. The lowest portions of pannes tend to be wetter and more saline and can have little or no vegetation. As duration of wetness and salinity decrease across the micro-relief, forb-dominated species assemblages tend to dominate followed by mixed graminoid-forb assemblages at the outer, higher edges (Redfield 1972). Pannes can be ephemeral features on the marsh, and vegetation cover and composition can vary from year to year. Unvegetated, soft-bottomed pannes generally have plentiful worm and crab burrows (Godfrey et al. 1978).

Environment: Vegetation of this association tends to develop in shallow depressions in salt marshes where drainage is poor. They tend to occur more frequently on the high marsh but occur within low marsh as well. Pannes form in depressions that range from 2-30 cm lower than the elevation of the marsh. The depressions are regularly to irregularly flooded by tides, and as the water evaporates during low tide, the salinity concentration increases, forming "salt pannes." Substrate is soft, silty muck or peat of variable density.

Atlantic & Gulf Coastal Tidal Flat & Panne (G123)
(moved to G957 North Atlantic Salt Marsh)
Saltwort species - Swampfire species - Gulf Cordgrass Tidal Flat & Panne Group
Floristic Composition: Species listed by Growth Form and Species

Scientific Name	Common Name	USDA Plants Code	NJ State CoC
HERBACEOUS			
Agalinis maritima	Seaside gerardia	AGMA3	7
Atriplex prostrata	Halberd-leaved orach	ATRIP	5
Distichlis spicata	Marsh spike-grass	DISP	7
Limonium carolinianum	Sea lavender	LICA17	8
Plantago maritima var. juncoides	Seaside plantain	PLMAJ	8
Salicornia bigelovii	Dwarf glasswort	SABI	8
Salicornia depressa	Virginia glasswort	SADE10	7
Salicornia maritima	Virginia glasswort	SAMA26	7
Spartina alterniflora	Smooth cordgrass	SPAL	6
Suaeda maritima ssp. maritima	Low sea-blite	SUMA	0
Symphyotrichum tenuifolium	Perennial salt marsh aster	SYTE6	8
Triglochin maritima	Seaside arrow-grass	TRMA20	10

This wetland type was not included in the NJ and Northeast ecoregional FQA analysis, therefore we do not have FQA Metric Thresholds for Mean C and Cover-Weighted Mean C at this time.



For more information on finer scale floristic Alliances and Associations in **G123 Saltwort species - Swampfire species - Gulf Cordgrass Tidal Flat & Panne Group (Atlantic Coastal Tidal Flat & Panne Group)** in New Jersey, see the following U.S. National Vegetation Classification descriptions. Note that the USNVC **new G957 North Atlantic Salt Marsh Group** will include High Salt Marsh, Low Salt Marsh, Salt Flat & Panne, and Shrub Salt Marsh.

A4487 North Atlantic Intertidal Salt Flat & Panne
These salt marshes are hypersaline flats or very shallow depressions (pannes) dominated by succulents and other halophytic herbs, including *Salicornia depressa, Salicornia bigelovii, Salicornia maritima*, and stunted *Spartina alterniflora*, that occur in salt marshes of the North American Atlantic coast.

Associations within A4487 in New Jersey:
CEGL004308 ***Salicornia (depressa, bigelovii, maritima) - Spartina alterniflora*** **Salt Marsh** (Salt Panne (Salicornia Type))
CEGL006370 ***Ruppia maritima - Stuckenia pectinata*** **Aquatic Vegetation** (Salt Panne Pool)

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