

Preliminary Vascular Flora for the Virginia Barrier Islands

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ABSTRACT

Vegetation on 16 barrier and marsh islands located along the southern Delmarva Peninsula was studied in 1975. From north to south, the islands included Metompkin, Cedar, Parramore, Revel, Crescent, Chimney Pole Marsh, Hog, Rogue, Cobb, Little Cobb, Wreck, Ship Shoal, Godwin, Myrtle, Mink, and Smith Islands. Variations in dominant island characteristics included thickets and pine-hardwood forests; xeric to mesic grasslands; salt marsh; and bare, overwashed sand. Representatives of 67 vascular plant families, 151 genera and 217 species or varieties were collected. These included two northern limits, one southern coastal limit, three coastal outliers, and six northern outliers. Several species common on the mainland were uncommon or found on few islands. Five oak species (*Quercus* spp.) occurred only on Smith Island. Red maple (*Acer rubrum*) was found only on Parramore and Smith Islands. Ferns were observed on Parramore, Cobb and Smith Islands. Six planted and 23 naturalized species were observed. The effects of island dynamics, human activities, and plant dispersal mechanisms are evident in the island flora.

Key Words: barrier island, Delmarva Peninsula, plant species, vascular flora

INTRODUCTION

Preliminary plant species lists were compiled in the process of preparing vegetation maps and accompanying community descriptions for 16 of the barrier and marsh islands which lie along the seaward margin of the Delmarva Peninsula (McCaffrey 1975, 1976). Comprehensive species lists and vegetation descriptions have been published for Assateague Island (Higgins *et al.* 1971, Hill 1986), Wallops Island (Klotz 1986), and Fishermans Island (Boulé 1979). Less intensive surveys have been reported for Parramore Island (Harvill 1965) and Smith Island (Clovis 1968). These studies reveal substantial inter-island variation in plant diversity, species composition, and vegetation structure. This study was designed to extend the scope of the previous studies of Parramore and Smith Islands, and to provide an initial inventory of plant species on 14 additional islands. Issues of particular interest included the frequency of unique species occurrences, the distributions of tree, shrub and fern species, the distributions of species at or near the limits of

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their geographic ranges, and the distributions of planted and naturalized species. McCaffrey and Dueser (1990) present vegetation maps and community descriptions for these 16 islands.

STUDY AREA

The study islands extend 75 km north to south along the seaward margin of Accomack and Northampton Counties, Virginia, and are centered approximately on latitude 37° 30' N and longitude 75° 40' W. They include Metompkin, Cedar, Parramore, Revel, Crescent, Chimney Pole Marsh, Hog, Rogue, Cobb, Little Cobb, Wreck, Ship Shoal, Godwin, Myrtle, Mink and Smith Islands (Fig. 1). Crescent Island is an accreting land mass which developed since around 1970 in the lee of the south end of Parramore Island. Most of the acreage on the study islands is owned by The Nature Conservancy, and managed as the Virginia Coast Reserve. Wreck Island is owned by the Commonwealth of Virginia. There are privately-owned tracts on Metompkin, Cedar, Hog and Smith Islands.

The islands lack modern human development, yet all have a history of human influence (Graham 1976). After the mid-1800's, several of the larger islands (Metompkin, Cedar, Parramore, Hog, Cobb, and Smith) supported hotels, sports clubs, summer cottages, and life-saving and Coast Guard stations. Revel Island had a hunting club. The town of Broadwater, Virginia, population 250 at the turn of the century, was located on the southern end of Hog Island until 1935. Probably all of the upland islands have been grazed by sheep, goats and cattle during the past century. All areas of Parramore, Rogue and Smith Islands have burned in the past. Cobb and Wreck Islands were burned regularly prior to the 1930's (Graham 1976). All of the islands are subjected periodically to high winds, flooding and storm overwash resulting from hurricanes and northeasters (Dolan *et al.* 1988). A hurricane in 1933 effectively ended all attempts at permanent human habitation on the islands. The most recent major storm prior to this study was the Ash Wednesday northeaster of March 7, 1962.

METHODS

Field work was performed in 43 days between late March and late July, 1975. In addition, brief reconnaissance visits were made in January and early October, 1975. From one to five days were spent on each island. Preliminary vegetation maps were prepared from low-altitude (1:20000) infrared aerial photography. These maps were ground-truthed, and plant community types identified, from field observations made along multiple transects positioned and oriented to cross all mapping units (≤ 23 total units). Species lists were compiled during this field work. Plant taxa which appeared to be frequent associates in each community type, or which were particularly conspicuous, were emphasized; less apparent taxa were not recorded systematically.

Nomenclature follows Radford *et al.* (1968) except for *Bassia hirsuta*, *Juncus gerardii*, *Persea palustris*, *Prunus maritima* and *Puccinellia fasciculata* which follow Fernald (1950). Specimens were identified by the late Harry E. Ahles of the University of Massachusetts or Dr. Wilbur H. Duncan of the University of Georgia. Voucher specimens were deposited with the office of the Virginia Coast Reserve in Nassawadox, Virginia, and with the herbarium of the University of Massachusetts.

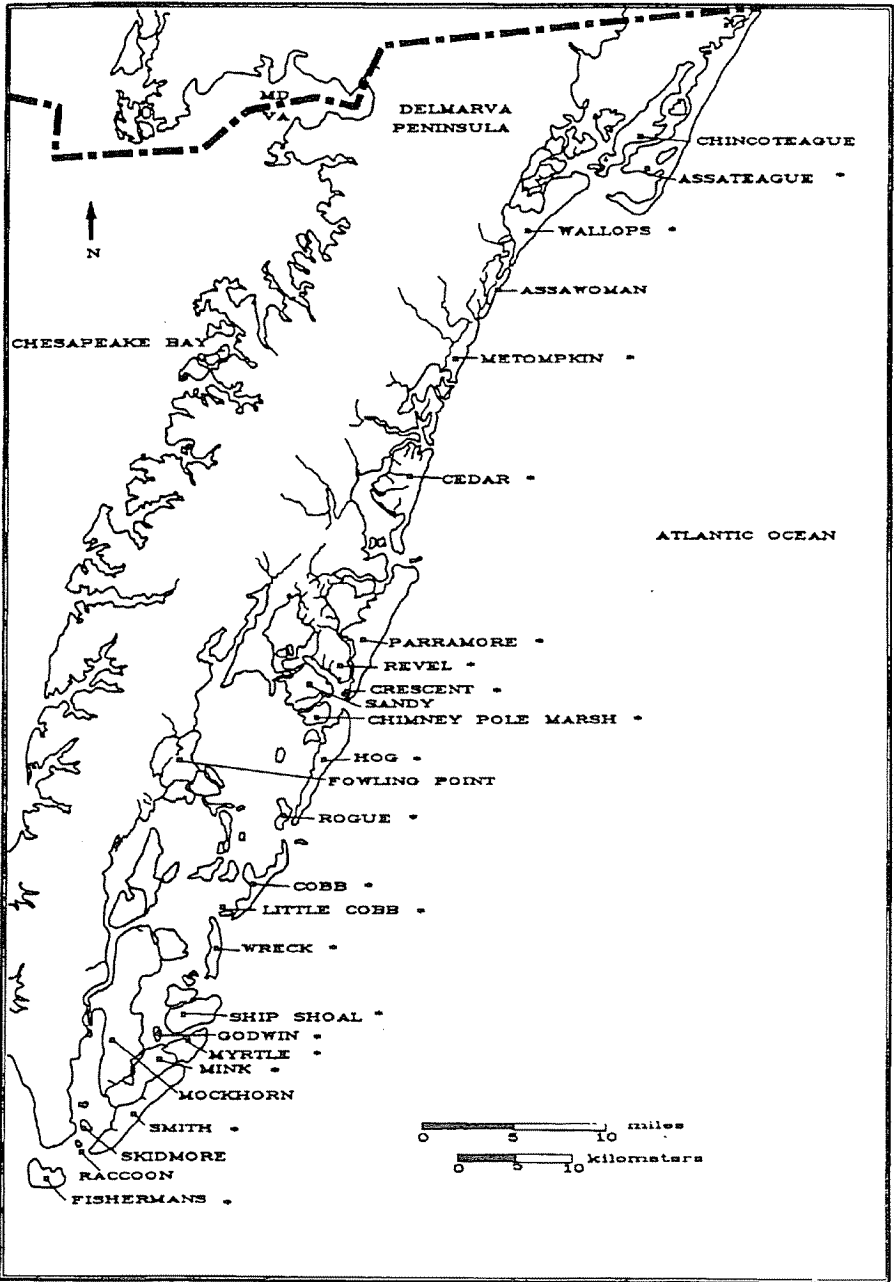


FIGURE 1. The Virginia Barrier islands extend the length of the seaward margin of the southern Delmarva Peninsula. Barrier and marsh islands referred to in this report are marked with an *.

RESULTS

Vegetation structure and complexity varied among islands (Table 1). The broader and more protected islands supported pine-hardwood forest (Parramore, Revel and Smith Islands) or tall (> 3 m) *Myrica cerifera* shrub thickets (Hog Island). These islands also had brackish marshes, and all but Revel Island had fresh marshes. The especially narrow, low-lying islands and those having a history of repeated fire (Rogue, Cobb, Wreck, Ship Shoal and Myrtle Islands; Graham 1976) supported dense *Spartina patens* grasslands or foredune-grasslands of *Ammophila breviligulata*. Metompkin, Cedar, Crescent, southern Hog, Little Cobb and northern Smith Islands were narrow and sparsely vegetated, and each exhibited evidence of past inlet opening and closure as well as overwash through broken dunes. The bayshore of each island consisted of *S. alterniflora* salt marsh. Chimney Pole Marsh and Mink Island were primarily marsh islands. Godwin Island was all salt marsh. McCaffrey and Dueser (1990) present detailed community descriptions and a 1:2000 vegetation map for each island.

A total of 217 taxa of vascular plants was recorded, including representatives of 67 families, 151 genera, and 217 species or varieties (Appendix 1). *Spartina alterniflora* occurred on all 16 islands, and was the only species observed on Godwin Island. Four species consistently occurred on all of the other 15 islands: *Solidago sempervirens*, *Cakile edentula*, *A. breviligulata*, and *Panicum amarum*. Two additional species, *Spartina patens* and *Salicornia virginica*, were missing only from Godwin and Little Cobb Islands. At the other extreme, 78 species (36%) were recorded on only one of the islands. The number of such unique species was one on Cedar Island and Chimney Pole Marsh, four on Metompkin, seven on Cobb, nine on Hog, 22 on Parramore, and 34 on Smith Island.

A total of 24 tree species were observed on 11 islands. *Juniperus virginiana* occurred on nine islands, *Pinus taeda* and *Prunus serotina* on six, and each of the 21 others on five or fewer islands. One tree species was found only on Cedar Island (*Maclura pomifera*), and one only on Parramore Island (*Celtis laevigata*). Fourteen species were found only on Smith Island (*Aralia spinosa*, *Paulownia tomentosa*, *Diospyros virginiana*, *Robinia pseudo-acacia*, *Quercus falcata*, *Q. laurifolia*, *Q. nigra*, *Q. stellata*, *Q. virginiana*, *Nyssa sylvatica*, *Amelanchier obovalis*, *Crataegus viridis*, *Sorbus arbutifolia* and *Ulmus americana*). Several species abundant in mainland forests were only minor components of forest on Parramore, Revel and Smith Islands. *Acer rubrum* on northern Parramore Island was represented by two small groups of trees totaling fewer than 25 individuals occurring on interior dunes near a fresh marsh. One tree had a 59 cm diameter at breast height. There was a group of 12 *A. rubrum* on a northern ridge on Smith Island. *Liquidambar styraciflua* was observed infrequently in pine and pine-hardwood forest on Parramore Island (7 individuals counted) and occasionally on Smith Island. *Robinia pseudo-acacia* and *Nyssa sylvatica* occurred only on Smith Island. *Quercus* was absent on all but Smith Island which had occasional *Q. falcata*, *Q. laurifolia*, *Q. nigra*, *Q. stellata*, and a few individuals of *Q. virginiana*. Except for a rare occurrence on Revel Island, *Ilex vomitoria* was found only on Smith Island where it was common. Several *I. vomitoria* saplings on Revel Island were in a line under a branch, suggesting avian seed dispersal as the source of this northern limit.

TABLE 1. Dominant physical and botanical attributes of 16 barrier and marsh islands for which preliminary flora are reported.

Island	Features
Metompkin	Foredune-sparse grassland; dissected; overwash-and inlet-influenced
Cedar	North: juniper thicket with poison ivy South: sparse grassland; overwash-influenced
Parramore	Pine and hardwood forest; interior fresh marshes; brackish marshes; interior open dune-shrub thickets
Revel	Pine-hardwood forest
Crescent	Foredune-grassland; overwash-influenced
Chimney Pole	Marsh island with salt pond and grassland
Hog	North: accreting beach, salt flats; tall shrub thickets, dune-grassland, open dune-shrub thickets South: foredune grassland; erosion- and overwash- influenced
Rogue	Salt marsh with salt pond and dense grassland
Cobb	Dense <i>Spartina patens</i> grassland with xeric dunes
Little Cobb	Sparse grassland; erosion- and overwash-influenced
Wreck	Dense <i>Ammophila breviligulata</i> grassland and dunes
Ship Shoal	North: salt marsh; overwash-influenced beach South: dense mesic <i>S. patens</i> grassland; salt marsh
Godwin	Salt marsh
Myrtle	Dense <i>A. breviligulata</i> foredune-grassland
Mink	Salt marsh; dense <i>S. patens</i> grassland
Smith	North: sparse grassland; overwash- and inlet-influenced South: dune ridges with shrub thickets and pine-hardwood forest, alternating with brackish marshes

A total of 19 shrub species were found on 13 islands. *Baccharis halimifolia* and *Iva frutescens* occurred on 13 islands, *Borrchia frutescens* on 12, *Myrica cerifera* and *M. pensylvanica* on 11, and each of the other 14 species on four or fewer islands; nine shrub species were found on only one island. The most commonly encountered shrubs were those associated with upper marsh borders (*Baccharis halimifolia*, *Borrchia frutescens*, and *I. frutescens*) and that found in interior uplands (*M. cerifera*). As indicated below, at least four shrub species were considered to have been planted on one or more islands.

Smith Island had particularly high diversity of woody species. Twenty-one of the total 24 tree species were observed on Smith Island, including 14 that were observed nowhere else; no other island had more than 11 total (Parramore Island) or one unique (Cedar Island) tree species. Similarly, 13 of the total of 19 shrub species were observed on Smith Island, including six that were observed nowhere

else; no other island had more than 10 total or two unique species of shrubs (Hog Island).

Ferns occurred only on three large islands. A small group of *Asplenium platyneuron* occurred in a pine-hardwood forest on the central-western portion of Parramore Island. *Osmunda regalis* var. *spectabilis* was rare in the low shrub thicket of central Cobb Island, and was found occasionally in tall thickets on Smith Island. *Thelypteris palustris*, *Pteridium aquilinum*, and *Woodwardia areolata* occurred occasionally in wooded communities on Smith Island. *P. aquilinum* also occurred in dense grassland and foredune communities.

The 217 species and varieties observed included two species at or near the northern limit of their geographic ranges (*Crataegus viridis* and *Quercus virginiana* on Smith Island), six northern outliers, three coastal plain outliers, and one species at its southern coastal limit (*Aristida tuberculosa* on Parramore Island, Table 2). *Quercus virginiana* on Smith Island was perhaps the most conspicuous species at its northern limit.

Six planted species were found on Cedar, Revel, Hog, and Smith Islands, and are likely to be remnants of earlier human habitation. *Euonymus japonica*, *Ficus carica*, *Maclura pomifera*, *Prunus maritima*, *Rubus* spp. and *Salix nigra* (growing with *M. pomifera*) are considered to have been planted because of their association with former building sites.

Twenty-three naturalized species (Fernald 1950) were found on 15 islands (Table 3). *Populus alba* and *Paulownia tomentosa* are considered to be naturalized species because their occurrence lacked direct association with habitation. The occurrence of *Bassia hirsuta* in salt marshes and the occurrence of *Xanthium strumarium* and *Salsola kali* on beaches suggest dispersal by tidal water. Most of the other naturalized species are herbs or grasses. Their presence does not necessarily correlate with high grazing use or human occupation. For example, the historical record does not reflect high human or grazing use of Wreck Island, yet Wreck Island had only one fewer naturalized species than Hog Island which received heavy use. Conversely, Revel Island had both grazing and some occupation, yet only one naturalized species was found.

The total number of species observed ranged from one on Godwin Island to 140 on Smith Island. The greatest number of taxa occurred on Smith (140), Parramore (122), and Hog (102) Islands. Taxa unique to that island comprised 24% of the species observed on Smith Island and 18% of those observed on Parramore Island. The average number of species observed was 99 for those islands which support pine-hardwood forest or tall shrub thickets (Parramore, Revel, Hog, and Smith Islands), 54 for the grassland islands (Rogue, Cobb, Wreck, Ship Shoal, and Myrtle Islands), 35 on low-lying islands subject to frequent flooding and overwash (Metompinkin, Cedar, Crescent, and Little Cobb Islands), and 21 on the marsh islands (Chimney Pole Marsh, Godwin Island and Mink Island). There are conspicuous exceptions to the trend in increasing species diversity with increasing structural complexity. For example, only 33 species were recorded on Revel Island (forest), while 84 were recorded on Cobb Island (grassland).

TABLE 2. Vascular plant species observed at the extremes of their geographical ranges on Virginia barrier and marsh islands. Range limits include at or near northern limit (NL), northern outlier (NO), coastal outlier (CO), and at or near southern limit (SL).

Extreme	Species	Island(s)
NL	<i>Crataegus viridis</i>	Smith
NL	<i>Linum virginianum</i>	Hog, Smith
NO	<i>Gnaphalium chilense</i>	Wreck, Smith
NO	<i>Hypericum hypericoides</i>	Parramore, Cobb
NO	<i>Ilex vomitoria</i> var. <i>floridanum</i>	Revel, Smith
NO	<i>Quercus virginiana</i>	Smith
NO	<i>Physalis viscosa</i> ssp. <i>maritima</i>	Rogue, Myrtle, Mink, Smith
NO	<i>Uniola paniculata</i>	Hog, Smith
CO	<i>Veronica serpyllifolia</i>	Parramore
CO	<i>Danthonia compressa</i>	Parramore
CO	<i>Eleocharis erythropoda</i>	Cobb
CO/SL	<i>Aristida tuberculosa</i>	Parramore

DISCUSSION

The species numbers reported here for Parramore (122) and Smith (140) Islands are substantially higher than the 33 and 61 species reported for these same islands by Harvill (1965) and Clovis (1968), respectively. Most species reported by these authors were found also in 1975, although 16 herbaceous species reported by Clovis (1968) were not recorded. By comparison with the numbers of species reported for Assateague (562; Hill 1986), Wallops (488; Klotz 1986), and Fishermans (139; Boulé 1979) Islands, it is apparent that the species lists included here are incomplete and preliminary. It is expected that additional research will expand these lists considerably, particularly for herbaceous species.

There was a notable lack of *Hudsonia tomentosa* which is known from as far south as Nags Head, North Carolina. Klotz (1986) reported this species from two secondary dune sites on Wallops Island, and Higgins et al. (1971) found a small stand on one dune transect on Assateague Island. *Iva imbricata*, a foredune species of the North Carolina barrier islands, apparently does not occur north of the Chesapeake Bay.

The high diversity of woody plant species on Smith Island requires comment. It is impossible to evaluate the effects of human activities or fire history on the composition of this woody flora. It seems likely, however, that the dispersal of plant propagules by birds has had a measurable influence on this flora. Smith Island is at the southern end of the Delmarva Peninsula, an important staging area for migratory birds preparing to cross the mouth of the Chesapeake Bay in their flight

TABLE 3. Naturalized plant species observed (X) on 15 Virginia barrier and marsh islands in 1975. Total number of naturalized species per island is given (Metompkin-ME, Cedar-CE, Parramore-PA, Revel-RE, Crescent-CR, Chimney Pole-CP, Hog-HO, Rogue-RO, Cobb-CO, Little Cob-LC, Wreck-WR, Ship Shoal-SS, Mritite-My, Mink-MI, Smith-SM), along with the number of islands (N) on which each species occurred.

Species	ME CE PA RE CR CP HO RO CO LC WR SS MY MI SM N															
	ME	CE	PA	RE	CR	CP	HO	RO	CO	LC	WR	SS	MY	MI	SM	N
<i>Achillea millefolium</i>	.	X	X	.	.	.	X	.	X	.	X	X	X	X	X	9
<i>Aira elegans</i>	.	.	.	.	.	.	X	.	X	.	.	.	.	.	.	2
<i>Bassia hirsuta</i>	.	X	X	.	.	.	.	.	X	.	X	.	.	.	.	4
<i>Centaurium pulchellum</i>	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Cerastium glomeratum</i>	.	X	.	.	.	.	X	X	X	.	X	.	X	.	X	7
<i>Cynodon dactylon</i>	.	.	X	.	.	.	X	.	.	.	X	.	.	.	.	3
<i>Chenopodium album</i>	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Chenopodium ambrosioides</i>	.	X	.	.	.	.	.	X	X	.	X	X	X	X	X	8
<i>Eragrostis ciliaris</i>	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Paspalum dilatatum</i>	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Paulownia tomentosa</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	1
<i>Phragmites communis</i>	X	X	X	.	.	.	.	.	X	.	X	X	X	.	X	8
<i>Poa annua</i>	.	X	X	.	.	.	X	.	.	.	.	.	.	.	X	3
<i>Polygonum monspeliensis</i>	.	.	X	.	.	.	X	.	.	.	.	.	.	.	X	3
<i>Populus alba</i>	.	.	X	.	.	.	.	.	.	.	.	.	.	X	.	2
<i>Rumex acetosella</i>	.	X	X	X	.	.	X	X	X	.	.	.	.	.	X	7
<i>Rumex crispus</i>	.	.	.	.	.	.	.	.	X	.	X	.	.	X	.	3
<i>Sonchus asper</i>	.	X	.	.	.	.	X	.	X	.	X	.	.	.	X	5
<i>Spergularia marina</i>	X	X	.	.	X	X	X	X	.	.	.	X	.	.	.	7
<i>Verbascum thapsus</i>	.	.	X	.	.	.	X	.	.	.	.	.	.	.	X	3
<i>Veronica serpyllifolia</i>	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Salsola kali</i>	X	X	X	.	.	.	X	.	X	X	X	.	X	X	X	10
<i>Xanthium strumarium</i>	X	X	.	.	.	.	.	.	.	.	.	X	X	X	X	6
Naturalized species	6	11	12	1	1	1	11	4	10	1	9	5	6	6	12	

south along the Atlantic flyway. The islands are an important part of the flyway (J. M. Hill, unpubl.), and Smith Island may be particularly important as a staging point. The flora of Smith Island may, therefore, receive a relatively heavy "seed rain" of bird-dispersed plant propagules.

Future floristic surveys of these islands should provide interesting information on species richness, similarities and differences among islands of similar physical characteristics and human activity. Such surveys should be designed to reveal patterns of change in species composition through disturbance and succession in a mild storm climate (McCaffrey and Dueser, 1990).

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APPENDIX 1. Vascular plant species observed (X) on 15 Virginia barrier and marsh islands (Metomkin-ME, Cedar-CE, Parramore-PA, Revel-RE, Crescent-CR, Chimney Pole-CP, Hog-HO, Rogue-RO, Cobb-CO, Little Cob-LC, Wreck-WR, Ship Shoal-SS, Mrttle-MI, Smith-SM) in 1975. Only *Spartina alterniflora* was observed on a sixteenth island, Godwin Island. Number of species per island is given, along with the number of islands (N) on which each species occurred.

Species	ME	CE	PA	RE	CR	CP	HO	RO	CO	LC	WR	SS	MI	SM	N
PTERIDOPHYTES															
ASPIDIACEAE															
<i>Thelypteris palustris</i> Schott	.	.	.	.	.	.	.	.	.	.	.	.	.	X	1
ASPLENACEAE															
<i>Asplenium platyneuron</i> (L.)	.	.	X	.	.	.	.	.	.	.	.	.	.	.	1
Oakes															
BLECHNACEAE															
<i>Woodwardia areolata</i> (L.)	.	.	.	.	.	.	.	.	.	.	.	.	.	X	1
Moore															
OSMUNDACEAE															
<i>Osmunda regalis</i>	.	.	.	.	.	.	.	.	X	.	.	.	.	X	2
var. <i>spectabilis</i> (Willd.) Gray															
PTERIDACEAE															
<i>Pteridium aquilinum</i> (L.) Kuhn	.	.	.	.	.	.	.	.	.	.	.	.	.	X	1
GYMNOSPERMS															
CUPRESSACEAE															
<i>Juniperus virginiana</i> L.	.	X	X	X	.	X	X	X	.	.	X	X	.	X	10
PINACEAE															
<i>Pinus taeda</i> L.	.	X	X	X	.	.	X	.	X	.	.	.	.	X	6
ANGIOSPERMS															
ACERACEAE															
<i>Acer rubrum</i> L.	.	.	X	.	.	.	.	.	.	.	.	.	.	X	2
AIZOACEAE															
<i>Mollugo verticillata</i> L.	X	.	.	.	.	.	.	.	X	.	.	.	.	.	2

Species	ME	CE	PA	RE	CR	CP	HO	RO	CO	LC	WR	SS	MY	MI	SM	N
<i>Chenopodium ambrosioides</i> L.	.	X	.	.	.	.	.	X	X	.	X	X	X	X	X	8
<i>Salicornia bigelovii</i> Torrey	X	X	X	.	.	.	X	.	X	.	X	.	X	X	X	9
<i>Salicornia europaea</i> L.	X	X	X	.	.	.	.	.	X	.	X	X	.	X	X	8
<i>Salicornia virginica</i> L.	X	X	X	X	X	X	X	X	X	.	X	X	X	X	X	14
<i>Salsola kali</i> L.	X	X	X	.	.	.	X	.	X	X	X	.	X	X	X	10
<i>Suaeda linearis</i> (Elli.) Moq.	X	X	.	.	.	X	.	.	.	.	X	X	X	.	X	7
CISTACEAE																
<i>Helianthemum canadense</i> (L.) Michx.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	1
CONVOLVULACEAE																
<i>Catystegia sepium</i> (L.) R. Br.	X	X	X	.	.	X	X	X	X	.	X	X	X	X	X	12
CYPERACEAE																
<i>Bulbosylis capillaris</i> (L.) C.B. Clarke	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Carex festucacea</i> Schkuhr	.	X	X	.	.	.	X	.	X	.	X	.	.	.	X	6
<i>Carex pennsylvanica</i> Lam.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Carex vulpinoidea</i> Michx.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Cyperus esculentus</i> L.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Cyperus grayi</i> Torrey	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Cyperus odoratus</i> L.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Eleocharis acicularis</i> (L.) R. & S.	.	.	X	.	.	.	.	.	X	.	.	.	.	.	X	3
<i>Eleocharis erythropoda</i> Steudel	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	1
<i>Eleocharis palustris</i> (L.) R. & S.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Eleocharis parvula</i> (R. & S.) Link	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	1
<i>Eleocharis tenuis</i> (Willd.) Schultes	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Fimbristylis spadiacea</i> (L.) Vahl	X	X	X	X	.	.	X	.	X	.	X	X	X	X	X	11

Species	ME	CE	PA	RE	CR	CP	HO	RO	CO	LC	WR	SS	MY	MI	SM	N
<i>Scirpus americanus</i> Persoon	X	X	X	.	X	.	X	X	X	.	X	X	X	X	X	12
<i>Scirpus cyperinus</i> (L.) Kunth	.	.	X	.	.	.	.	.	X	.	.	.	.	.	.	2
<i>Scirpus robustus</i> Pursh	.	X	X	X	.	.	.	.	.	.	X	.	.	.	X	5
EBENACEAE																
<i>Diospyros virginiana</i> L.	X	1
ERICACEAE																
<i>Vaccinium atrococcum</i> (Gray)	X	1
Porter																
<i>Vaccinium corymbosum</i>	X	1
<i>x atrococcum</i> (?)	X	1
EUPHORBIACEAE																
<i>Euphorbia polygonifolia</i> L.	X	X	X	.	.	.	.	.	X	.	X	.	X	.	X	7
FABACEAE (LEGUMINOSAE)																
<i>Cassia fasciculata</i> Mich.	X	.	.	.	.	.	.	1
<i>Centrosema virginianum</i> (L.) Bentham	X	1
<i>Robinia pseudo-acacia</i> L.	X	1
<i>Strophostyles helvola</i> (L.) Ell.	X	X	.	.	X	X	.	X	X	.	X	X	X	X	X	11
<i>Strophostyles umbellata</i> (Muhl. ex Willd.) Britton	X	.	.	.	.	.	.	1
FAGACEAE																
<i>Quercus falcata</i> Michx.	X	1
<i>Quercus laurifolia</i> Michx.	X	1
<i>Quercus nigra</i> L.	X	1
<i>Quercus stellata</i> Wang.	X	1
<i>Quercus virginiana</i> Miller	X	1
GENTIANACEAE																

Species	ME	CE	PA	RE	CR	CP	HO	RO	CO	LC	WR	SS	MY	MI	SM	N
<i>Sabatia stellaris</i> Pursh	.	.	.	X	.	.	X	.	.	.	.	.	.	.	X	3
<i>Centaurium pulchellum</i> (Swartz)	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	1
Druce																
GERANIACEAE																
<i>Geranium carolinianum</i> L.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	1
HAMAMELIDACEAE																
<i>Liquidambar styraciflua</i> L.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	X	2
HYPERICACEAE (GUTTIFERAE)																
<i>Hypericum gentianoides</i> (L.) BSP.	.	.	X	.	.	.	X	.	X	.	.	.	.	.	.	3
<i>Hypericum hypericoides</i> (L.) Crantz	.	.	X	.	.	.	.	.	X	.	.	.	.	.	.	2
IRIDACEAE																
<i>Sisyrinchium angustifolium</i> Miller	.	.	X	.	.	.	.	.	X	.	.	.	.	.	.	2
JUNCACEAE																
<i>Juncus acuminatus</i> Michx.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Juncus biflorus</i> Ell.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	1
<i>Juncus bufonius</i> L.	.	X	X	.	.	.	X	.	.	.	.	.	.	.	.	3
<i>Juncus coriataeus</i> Mackenzie	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Juncus debilis</i> Gray	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	1
<i>Juncus dichotomus</i> Ell.	.	X	X	.	.	.	X	.	X	.	X	.	.	.	X	6
<i>Juncus gerardi</i> Loisel.	X	X	X	.	.	.	.	.	.	.	.	.	.	.	.	2
<i>Juncus roemerianus</i> Scheele	X	X	X	X	.	.	.	X	.	.	.	.	.	X	X	6
<i>Juncus scirpoides</i> Lam.	.	.	X	X	.	.	X	.	X	.	X	.	.	.	.	4
<i>Juncus tenuis</i> Willd.	X	X	X	.	.	.	X	.	.	.	X	.	.	.	.	5
LAMIACEAE (LABIATAE)																
<i>Monarda punctata</i> L.	.	.	.	.	.	.	.	X	X	.	X	X	.	.	X	5

Species	ME	CE	PA	RE	CR	CP	HO	RO	CO	LC	WR	SS	MY	MI	SM	N
<i>Eragrostis ciliaris</i> (All.) Lutati	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Festuca rubra</i> L.	X	X	X	.	.	.	X	.	X	.	X	X	X	X	X	10
<i>Festuca sciurea</i> Nuttall	.	X	.	.	.	.	X	.	.	.	.	.	.	.	X	3
<i>Muhlenbergia capillaris</i> (Lam.) Trinius	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	1
<i>Panicum amanulum</i> Hitchc. & Chase	.	.	X	.	.	X	.	.	.	.	X	X	X	.	X	6
<i>Panicum amanum</i> Ell.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
<i>Panicum dichotomiflorum</i> Michx.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Panicum lanuginosum</i> Ell.	.	.	X	X	.	.	.	.	X	.	.	.	.	.	.	3
<i>Panicum scoparium</i> Lam.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	1
<i>Panicum sphaerocarpon</i> Ell.	.	.	.	.	.	.	.	.	X	.	.	.	.	.	.	1
<i>Panicum virgatum</i> L.	X	.	X	.	.	.	X	.	X	.	.	.	.	.	X	5
<i>Paspalum dilatatum</i> Poiret	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Paspalum floridanum</i> Michx.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Phragmites communis</i> Trinius	X	X	X	.	.	.	.	.	X	.	X	X	X	X	X	8
<i>Poa annua</i> L.	.	.	.	.	.	.	X	.	.	.	.	.	.	.	X	3
<i>Polygonum monspeliensis</i> (L.) Desf.	.	.	X	.	.	.	X	.	.	.	.	.	.	.	X	3
<i>Puccinellia fasciculata</i> (Torr.) Bicknell	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Setaria geniculata</i> (Lam.) Beauvois	.	.	X	X	.	.	X	X	X	.	X	X	X	X	X	10
<i>Setaria magna</i> Griesbach	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	1
<i>Spartina alterniflora</i> Loisel.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	16
<i>Spartina patens</i> (Ait.) Muhl.	X	X	X	X	X	X	X	X	X	.	X	X	X	X	X	14
<i>Sphenopholis obtusata</i> (Michx.) Scribner	.	.	.	.	.	.	.	.	X	.	X	.	.	.	.	2

Species	ME	CE	PA	RE	CR	CP	HO	RO	CO	LC	WR	SS	MY	MI	SM	N
<i>Triplaris purpurea</i> (Walt.) Chapman	X	X	X	.	.	.	X	.	X	.	X	.	.	.	X	7
<i>Uniola laxa</i> (L.) BSP.	.	.	X	.	.	.	X	.	.	.	.	.	.	.	X	3
<i>Uniola paniculata</i> L.	X	1
POLYGONACEAE																
<i>Polygonum glaucum</i> Nuttall	X	.	X	.	.	.	.	.	.	2
<i>Polygonum hydropiperoides</i> Michx.	.	.	X	.	.	.	X	.	.	.	.	.	.	.	.	2
<i>Rumex acetosella</i> L.	.	X	X	X	.	.	X	X	X	.	.	.	.	.	X	7
<i>Rumex crispus</i> L.	X	.	X	.	.	X	.	3
PRIMULACEAE																
<i>Samolus parviflorus</i> Raf.	X	X	X	.	.	.	X	.	X	.	.	.	.	.	X	6
RHAMNACEAE																
<i>Berchemia scandens</i> (Hill) Koch	.	.	X	.	.	.	.	.	.	.	.	.	.	.	X	2
ROSACEAE																
<i>Amelanchier obovatis</i> (Michx.) Ashe	X	1
Crataegus viridis L.																
<i>Prunus maritima</i> Marshall	X	.	.	.	.	.	.	X	1
<i>Prunus serotina</i> Ehrh.	.	X	X	.	.	.	X	X	.	.	X	.	.	.	.	2
<i>Rubus argutus</i> Link	.	X	X	.	.	.	X	.	X	.	.	.	.	.	X	6
<i>Sorbus arbutifolia</i> (L.) Heyn.	4
RUBIACEAE																
<i>Diodea virginiana</i> L.	.	.	X	.	.	.	X	.	.	.	.	.	.	.	.	2
<i>Galium hispidulum</i> Michx.	X	.	.	.	.	.	.	.	X	2
<i>Galium pilosum</i> Aiton	X	.	.	.	.	.	.	.	.	1
<i>Galium tinctorium</i> L.	.	.	X	.	.	.	X	.	X	.	.	.	.	.	.	3

Species	ME	CE	PA	RE	CR	CP	HO	RO	CO	LC	WR	SS	MY	MI	SM	N
<i>Boehmeria cylindrica</i> (L.) Swartz	.	.	X	.	.	.	X	.	.	.	.	.	.	.	X	3
VERBENACEAE																
<i>Callicarpa americana</i> L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	1
<i>Lippia lanceolata</i> Michx.	.	.	X	.	.	.	X	.	.	.	.	.	.	.	.	2
VITACEAE																
<i>Parthenocissus quinquefolia</i> (L.) Planchon	X	X	X	.	.	.	X	.	.	.	.	.	.	.	X	5
<i>Vitis aestivalis</i> Michx.	.	X	X	.	.	.	X	.	.	.	.	.	.	.	X	4
<i>Vitis rotundifolia</i> Michx.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	1
ZOSTERACEAE																
<i>Zostera marina</i> L.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X	1
Species per island	43	77	120	33	12	22	102	38	84	6	68	39	42	38	138	