A Flora of Fisherman Island, Virginia

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ABSTRACT

Fisherman Island is a 750 ha barrier island located off the southern tip of the Delmarva Peninsula. It is managed by the U.S. Fish and Wildlife Service as Fisherman Island National Wildlife Refuge. A total of 256 plant species and subspecific taxa are reported for the island for the 2005 growing season. These include 14 new Northampton County, Virginia, records and five state-rare taxa. About 30% of the plant species observed are not native to the island, and a few of these are invasive species. The most serious invasive species and the only one that appears to be a current threat to the island's rare species is *Phragmites australis* var. *australis* (Common Reed).

Key words: barrier island, Fisherman Island, Fisherman Island National Wildlife Refuge, flora, invasive species, Northampton County, rare plants.

INTRODUCTION

In 2004, the U.S. Fish and Wildlife Service (USFWS) contracted the Virginia Department of Conservation and Recreation's Division of Natural Heritage (DCR-DNH) to conduct a botanical inventory of Fisherman Island National Wildlife Refuge, Northampton County, Virginia. Specifically, the agreement required DCR-DNH to conduct a survey for rare plant species on Fisherman Island, develop a list of all vascular plant species encountered on the island while conducting rare plant surveys, and develop a list of invasive plant species found on the island. This paper reports on the results of this work.

STUDY AREA

Fisherman Island National Wildlife Refuge (FINWR) is coterminous with Fisherman Island (FI), a barrier island

located about 0.5 km south of the southern tip of the Delmarva Peninsula. Fisherman Island is of recent origin; documented evidence of an island in the area dates back only to 1815. Unlike other barrier islands in Virginia, FI is increasing in size. In 1852, the island consisted of about 10 ha, whereas today it comprises about 750 ha (U.S. Fish and Wildlife Service, 2005).

Fisherman Island has a long history of human use and occupation. Early residents used the island for hunting and fishing. In the 1890s, the island was acquired by the U.S. government and used as a quarantine station for European immigrants sailing up the Chesapeake Bay to Baltimore. The island was used as a defense station by the U.S. Army during both World Wars because of its strategic location at the entrance to the Chesapeake Bay, and remained a military installation until the 1960s. FINWR was established in 1969 and is managed by the Eastern Shore of Virginia National Wildlife Refuge, USFWS (U.S. Fish and Wildlife Service, 2005). In 1964, the Chesapeake Bay Bridge-Tunnel (CBBT) opened; a second span was added in 1999. The CBBT connects Virginia's Eastern Shore with the cities of Norfolk and Virginia Beach via U.S. Route 13. Route 13 crosses the eastern end of the island for a length of about 2.75 km (1.70 mi). To the north, a high-level bridge across Fisherman Inlet connects FI with the Eastern Shore mainland. To the south-southwest, a series of low-level trestle bridges, high-level bridges, and underwater tunnels connect FI with Cape Henry, a distance of about 25 km (16 mi) by road (Chesapeake Bay Bridge and Tunnel Commission, 2006).

We identified the following natural community types (described in Fleming et al., 2006) on the island: Maritime Dune Grasslands, Maritime Dune Scrub, Maritime Dune Woodlands, Maritime Wet Grasslands, Maritime Shrub Swamps, Tidal Mesohaline and Polyhaline Marshes, Salt Flats, Salt Scrub, and Upper Beaches and Overwash Flats.

Ruderal habitats on the island include frequently mowed grassy strips along the edges of Route 13, a small paved parking area, partially shaded areas adjacent to bridge abutments, areas of riprap used to support elevated portions of Route 13, areas around military bunkers, and areas around the foundations of former buildings.

METHODS

Before conducting fieldwork for this project, we gathered information on the study area's landscape. Aerial photographs and topographic maps were examined to delineate the distribution of plant habitats and to identify sites with high potential for rare species occurrences. Harvill et al. (1992) and the DCR-DNH rare species databases were utilized to develop a list of potential rare plants for FI based on rare plants known to occur elsewhere on Virginia's barrier islands and other maritime habitats. We used data compiled on the area's rare plants, along with information on the distribution of plant habitats, to formulate field plans and direct our field investigations.

Fieldwork for the project began 17 May 2005 and ended 13 October 2005. We spent 12 days in the field and focused our surveys on plant communities with a high potential for rare species. In order to develop the flora list, however, all known plant communities on the island were visited; we visited most of these communities at least twice during the growing season to capture species present at different times of the year. Beach and adjacent dune communities around the perimeter of the island could not be accessed until mid-summer due to the presence of nesting American Oystercatchers (*Haematopus palliatus*). We maintained a list of all plant taxa encountered on FI and used Gleason & Cronquist (1991) to key out species whose identities were uncertain. A draft of a flora in progress, Weakley (2004), was consulted for more recent treatments. Harvill et al. (1992) was used to determine if each taxon had previously been collected in Northampton County. We collected voucher specimens of taxa new to the county and kept a separate list of invasive species encountered on the island.

Special emphasis was placed on searching for *Amaranthus pumilus* (Seabeach Amaranth), a potential species for the island that is listed as threatened under the federal Endangered Species Act of 1973, as amended. Seabeach Amaranth is found exclusively on barrier island beaches, where it usually occurs on stable upper beach shelves between the wrackline and foredune crest, on overwash flats, or on the accreting ends of islands. We searched all potential habitat on the island for this species during August and September. A previous search for the species on FI was conducted in 2000 (Belden, 2000). The only known extant population of this species in Virginia is on Assateague Island in Accomack County (Virginia Department of Conservation and Recreation, 2005).

RESULTS

A total of 256 plant species and subspecific taxa was recorded for FI. These are listed in Table 1 and include 3 pteridophytes, 2 gymnosperms, 161 dicot angiosperms, and 90 monocot angiosperms. These 256 taxa represent 65 plant families and 174 genera. The Poaceae (grass family) has by far the largest number of taxa, containing 59 taxa (23.0% of the flora). The Asteraceae (aster family) has 40 taxa (16% of the flora), and the Cyperaceae (sedge family) has 17 taxa (7% of the flora). The 256 taxa compare with 139 taxa reported by Boulé (1979) for the island and 238 reported by Stalter & Lamont (2000).

Sixty-nine of the plant taxa documented during our study were new records for Fisherman Island (Table 1). Fourteen of these taxa also were new records for Northampton County based on Harvill et al. (1992). Voucher specimens for 13 of these taxa were deposited at the herbarium of the Virginia Polytechnic Institute and State University (VPI). A photograph of *Heliotropium curassavicum* was sent to VPI to voucher that species as a county record due to the small size of the population.

Five taxa documented from FI are considered rare in Virginia by DCR-DNH (Townsend, 2005). These are *Chamaesyce bombensis* (Southern Beach Spurge), *Heliotropium curassavicum* var. *curassavicum* (Seaside Heliotrope), *Hydrocotyle bonariensis* (Coastal Waterpennywort), *Physalis walteri* (Dune Ground-cherry), and *Polygonum glaucum* (Sea-beach Knotweed). None of these species are listed under either the federal Endangered Species Act of 1973, as amended, or the Virginia Endangered Plant and Insect Species Act, as amended. Each of these species is discussed below. *Amaranthus pumilus* was not found on the island.

Chamaesyce bombensis

This prostrate annual herb in the Euphorbiaceae is found on dunes and other open, sandy habitats along or near the coast. Its range in the U.S. encompasses all of the Gulf States and southeastern coastal states, and it is also found in tropical America. Virginia is the northern limit of its range (Gleason & Cronquist, 1991). Most of the 11 extant Virginia occurrences are on barrier islands (Virginia Department of Conservation and Recreation, 2005).

We located many hundreds of individuals of *Chamaesyce bombensis* on FI in 2005. The species is widespread on the island and occurs in a variety of open, sandy habitats, including beaches, primary dunes, secondary dunes, and interior dunes. It appears to favor areas with minimal competition from other plant species. The largest known station for the plant is located on the south side of the island in a shallow, sparsely vegetated swale within a dune grassland community, where we observed an estimated 1,000 plants in a 170 x 10 m area.

Heliotropium curassavicum var. curassavicum

This somewhat fleshy, prostrate perennial herb is in the Boraginaceae. Plants in our area are var. *curassavicum*, a plant mostly of saline soil whose range extends north to Maine and south to the New World tropics. Populations north of Delaware are apparently not native, and some authors consider the species to be introduced and naturalized in other areas of the mid-Atlantic as well. Two other varieties are found in the West and Midwest (Gleason & Cronquist, 1991; Kartesz, 1999; McAvoy & Bennett, 2001; Weakley, 2004). The only other known extant population in Virginia is found on Assateague Island, where it was last seen in 1988 (Virginia Department of Conservation and Recreation, 2005).

We located one individual of Seaside Heliotrope on FI in 2005. This sprawling individual measured about 0.3 x 0.3 m and was partially buried in the sand, making it quite difficult to see. The plant was found on the south side of the island on an overwash flat and inland from a small lagoon that parallels the shore.

Hydrocotyle bonariensis

This perennial herb in the Apiaceae is found on dunes and moist, open sand. Its global distribution includes the coastal U.S. from Virginia to Texas, as well as tropical America (Kartesz, 1999; Weakley, 2004). Prior to our study, this species was known in Virginia only from the City of Virginia Beach and Southampton County, and only three exant Virginia Department of Conservation and Recreation, 2005). The FI occurrence represents the northernmost known location for the species (Harvill et al., 1992; Kartesz, 1999) and a new addition to the flora of the Delmarva Peninsula (W.A. McAvoy, The Delaware Natural Heritage Program, pers. comm.).

We found several hundred ramets of *Hydrocotyle bonariensis* within a 25 x 15 m area on the south side of FI. The population is located on the east side and near the toe of a sparsely vegetated low dune ridge and extends eastward into a moist swale dominated by *Morella cerifera* (Southern Bayberry). We observed about 150 ramets in fruit on 13 October 2005.

Physalis walteri

This rhizomatous perennial herb in the Solanaceae is found along the coast in sandy soil from Louisiana to Virginia, where it reaches its northern range limit (Gleason & Cronquist, 1991; Kartesz, 1999). Most of the 11 known extant populations in Virginia are found on barrier islands or on Cape Henry (Virginia Department of Conservation and Recreation, 2005).

We observed thousands of *Physalis walteri* plants on FI, comprising by far the largest known population in Virginia. This species is found in a wide variety of sandy, non-forested habitats, including beaches, dunes, moist swales, and overwash flats. It is a dominant species in many areas of the island and appears to compete quite well with other herbaceous species. It is tolerant of disturbance as evidenced by its prevalence along Route 13. We even found *P. walteri* growing in a stand of *Phragmites australis* var. *australis* (Common Reed).

Polygonum glaucum

This diffusely branched, prostrate annual herb in the Polygonaceae is found on beaches and in dune swales throughout its range (Gleason & Cronquist, 1991). It is known from the eastern seaboard states from Massachusetts south, but is either rare or extirpated in all states except Florida, South Carolina, and Massachusetts (Kartesz, 1999). Most of the nine extant populations in

Virginia occur on barrier islands or beaches along the Chesapeake Bay (Virginia Department of Conservation and Recreation, 2005). Polygonum glaucum is considered to be a globally rare species by NatureServe, an international organization focused on the compilation and management of biological data that operates in all 50 U.S. states, Canada, Latin America, and the Caribbean.

We found about 140 individuals of sea-beach knotweed on FI in five small colonies ranging in size from 2 m^2 to 2,250 m². The plant was in found on sand flats and dune swales that appear to receive occasional short duration inundation during storm events.

In addition to the five rare taxa discussed above, we recorded nine species on FI that are considered to be uncommon in Virginia by DCR-DNH (Townsend, 2005). These are Aristida tuberculosa (Seaside Three-awn), Fimbristylis caroliniana (Carolina Fimbry), Galium hispidulum (Coastal Bedstraw), Ilex vomitoria (Yaupon), Lechea maritima var. virginica (Beach Pinweed), Leptochloa fusca ssp. fascicularis (Bearded Sprangletop), Polygonella articulata (Coastal Jointweed), Uniola paniculata (Sea-oats), and Zanthoxylum clava-herculis (Hercules'-club).

Approximately 30% of the taxa that we recorded on FI are non-native plants that have become naturalized on the island. This compares with 29% reported by Stalter & Lamont (2000). The vast majority of these are roadside weeds found only in the frequently mowed grassy strips immediately adjacent to Route 13, but a few are invasive species. An invasive plant is a non-native species that has been intentionally or unintentionally introduced into an area by human activity and threatens to displace native species, alter natural communities, and change ecosystem processes (Heffernan, 1998). Invasive species found on FI include Ailanthus altissima (Tree-of-heaven), Artemisia stelleriana (Dusty Miller), Artemisia vulgaris (Common Wormwood), Bromus tectorum (Cheat Grass), Carex extensa (Long-bract Sedge), Chondrilla juncea (Hogbite), and Lonicera japonica (Japanese Honeysuckle). The most serious invasive species on FI and the only one that appears to be a current threat to the island's rare species is Phragmites australis var. australis. Major stands of Common Reed were aerial sprayed with an herbicide in September 2005 and 2006 (J. Scalf, The Nature Conservancy, pers. comm.).

DISCUSSION

Two floras of Fisherman Island have been previously published (Boulé, 1979; Stalter & Lamont, 2000). Boulé (1979) reported 139 taxa for the island, including Dichromena colorata (L.) A.S. Hitchc. (Whitetopped Sedge). Dichromena colorata is a synonym for Rhynchospora colorata (L.) H. Pfeiffer, a rare species in Virginia (Townsend, 2005). Boulé (1979) reported that his specimens were deposited in the herbarium at the Virginia Institute of Marine Science (VIMS), which is part of The College of William and Mary. Conversations with Holly J. Grubbs, curator of The College of William and Mary herbarium, as well as with individuals on the VIMS staff, failed to locate Boulé's specimens. Stalter & Lamont (2000) also searched for R. colorata on the island without success. Thus, the presence of this species on FI could not be confirmed.

Stalter & Lamont (2000) reported 238 taxa for the island, including Paspalum distichum L. (Joint Paspalum), a rare species in Virginia (Townsend, 2005). They reported that this grass is rare on the island at the upland border of a brackish marsh and stated that a complete set of voucher specimens was deposited with the USFWS at Cape Charles, Virginia. We located voucher specimens for many, but not all, of the species reported in their paper. Among these was a collection labeled Paspalum vaginatum Sw. (Seashore Crown Grass). This species is closely related to P. distichum and, in the past, the latter name has been applied to the taxon now generally referred to as P. vaginatum (Gleason & Cronquist, 1991). This specimen appears to be the basis for the listing of P. distichum by Stalter & Lamont (2000), for they make no reference to P. vaginatum. After examination, the specimen does appear to be P. vaginatum, a species whose status in Virginia is unclear (J. F. Townsend, Virginia Department of Conservation and Recreation, pers. comm.). No specimen of true P. distichum L. was encountered in the collection

ACKNOWLEDGMENTS

This study was made possible through funding provided by the U.S. Fish and Wildlife Service (USFWS). Susan M. Rice, Refuge Manager, Eastern Shore of Virginia National Wildlife Refuge (ESVNWR), administered this funding for USFWS and provided logistical support for the project. Other members of the ESVNWR staff who assisted us with fieldwork logistics are Pamela P. Denmon, Robert J. Leffel, and Irene G. Morris. Assistance with the identification of plant specimens collected in conjunction with this project was provided by DCR-DNH Botanist John F. Townsend, DCR-DNH Vegetation Ecologist Gary P. Fleming, and Thomas F. Wieboldt, Assistant Curator, Herbarium, Virginia Polytechnic Institute and State University. We are grateful to Steven M. Roble and two anonymous reviewers for reviewing a draft copy of this paper.

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Table 1. Flora of Fisherman Island, 2005. The list is arranged taxonomically by Division: Equisetophyta (horsetails), Polypodiophyta (ferns), Pinophyta (gymnosperms), and Magnoliophyta (flowering plants). The Magnoliophyta are further divided into Class Magnoliopsida (dicotyledons) and Class Liliopsida (monocotyledons). Within each major group, families, genera, species, and subtaxa are arranged alphabetically. Scientific and common names follow Kartesz (1999) with the exception of three taxa, *Eupatorium linearifolium* Walter, *Melilotus albus* Medik., and *Setaria pumila* (Poir.) Roemer & J.A. Schultes ssp. *pumila*, which follow Weakley (2004). Synonyms are provided for some taxa where Kartesz (1999) departs sharply from other current sources. Non-native taxa, as determined from a consensus of the standard regional floras, are preceded by an asterisk (*). A few taxa whose status as native or non-native is uncertain are preceded by *?. Rare species, as determined by the Virginia Department of Conservation and Recreation (Townsend, 2006), are highlighted in bold. The third column shows taxa that were previously reported by Boulé (1979) (B) or Stalter & Lamont (2000) (S&L). Taxa not previously reported are indicated as "New." The last column shows the first author's collection number for specimens deposited at VPI to voucher new records from Northampton County.

DIVISION/FAMILY/ SCIENTIFIC NAME	COMMON NAME	PREVIOUS REPORTS	COUNTY RECORD COLLECTION NO.
EQUISETOPHYTA			
EQUISETACEAE Equisetum hyemale L. var. affine (Engelm.) A.A. Eat.	Tall scouring-rush	New	2110
POLYPODIOPHYTA			
BLECHNACEAE Woodwardia areolata (L.) T. Moore	Netted chain fern	New	
OSMUNDACEAE Osmunda regalis L. var. spectabilis (Willd.) Gray	Royal fern	B, S&L	
PINOPHYTA			
CUPRESSACEAE Juniperus virginiana L.	Eastern red-cedar	B, S&L	
PINACEAE Pinus taeda L.	Loblolly pine	B, S&L	
MAGNOLIOPHYTA: MAGNOLIOPSIDA			
AIZOACEAE Sesuvium maritimum (Walt.) B.S.P.	Slender sea-purslane	B, S&L	
AMARANTHACEAE Froelichia gracilis (Hook.) Moq.	Slender snake-cotton	S&L	
ANACARDIACEAE Rhus copallinum L. Toxicodendron radicans (L.) Kuntze	Winged sumac Eastern poison-ivy	B, S&L B, S&L	2123 2102
APIACEAE *Daucus carota L. *Foeniculum vulgare P. Mill. Hydrocotyle bonariensis Comm. ex Lam. Hydrocotyle sp. (only sterile material was found; reported by S&L as Hydrocotyle verticillata Thunb.) Ptilimnium capillaceum (Michx.) Raf.	Queen Anne's lace Sweet fennel Coastal marsh-pennywort A marsh-pennywort Herbwilliam	B, S&L S&L New S&L B	2108

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DIVISION/FAMILY/ SCIENTIFIC NAME	COMMON NAME	PREVIOUS REPORTS	COUNTY RECORD COLLECTION NO.
AQUIFOLIACEAE <i>Ilex opaca</i> Ait.	American holly	B, S&L	
Ilex vomitoria Ait.	Yaupon	S&L	
	Tuupon	Sal	
ARALIACEAE			
*Hedera helix L.	English-ivy	New	
ASTERACEAE			
*Achillea millefolium L.	Common yarrow	B, S&L	
Ambrosia artemisiifolia L.	Annual ragweed	B, S&L	
*Artemisia stelleriana Bess.	Dusty miller	New	
*Artemisia vulgaris L.	Common wormwood	S&L	
Baccharis halimifolia L. Bidana hinimata L	Groundseltree	B, S&L	
Bidens bipinnata L. Bidens connata Muhl. ex Willd.	Spanish-needles Purple-stem beggarticks	B, S&L S&L	2111
Borrichia frutescens (L.) DC.	Bushy seaside-tansy	B, S&L	2111
*Chondrilla juncea L.	Hogbite	B, S&L S&L	
* <i>Cichorium intybus</i> L.	Chicory	New	
Cirsium horridulum Michx.	Yellow thistle	S&L	
* <i>Cirsium vulgare</i> (Savi) Ten.	Bull thistle	New	
* <i>Conyza bonariensis</i> (L.) Cronq.	Asthmaweed	New	
Conyza canadensis (L.) Cronq. var. canadensis	Canadian horseweed	B, S&L	
= Erigeron canadensis L. var. canadensis		,	
Conyza canadensis (L.) Cronq. var. pusilla	Canadian horseweed	S&L	
= Erigeron canadensis L. var. pusillus (Nutt.) Boivin			
Erechtites hieraciifolia (L.) Raf. ex DC.	American burnweed	S&L	
Eupatorium capillifolium (Lam.) Small	Dog-fennel	B, S&L	
Eupatorium hyssopifolium L.	Hyssop-leaf thoroughwort	B, S&L	
Eupatorium sp. (species has characteristics of		New	
E. linearifolium Walter, but is not a perfect fit)			
Eupatorium serotinum Michx.	Late-flowering thoroughwort	New	
Gamochaeta purpurea (L.) Cabrera	Spoon-leaf purple everlasting	S&L	
= Gnaphalium purpureum L.	X7 . 11	NL	
*Helenium amarum (Raf.) H. Rock	Yellowdicks	New	
Heterotheca subaxillaris (Lam.) Britt. & Rusby	Camphorweed	B, S&L B	
*Hypochaeris radicata L. Iva frutescens L.	Hairy cat's-ear Jesuit's bark	B, S&L	
Krigia virginica (L.) Willd.	Virginia dwarf-dandelion	New	
Lactuca canadensis L.	Florida blue lettuce	S&L	
Mikania scandens (L.) Willd.	Climbing hempvine	B, S&L	
Pityopsis graminifolia (Michx.) Nutt. var.	Narrow-leaf silk-grass	B, S&L	
<i>latifolia</i> (Fern.) Semple & Bowers	8	,	
= Chrysopsis graminifolia (Michx.) Ell.			
var. latifolia Fern.			
Pluchea odorata (L.) Cass var. odorata	Sweetscent	S&L	
Pseudognaphalium obtusifolium (L.) Hilliard & Burtt	Blunt-leaf rabbit-tobacco	B, S&L	
= Gnaphalium obtusifolium L.			
Pyrrhopappus carolinianus (Walt.) DC.	Carolina desert-chicory	S&L	
*Senecio vulgaris L.	Old-man-in-the-spring	New	
Solidago canadensis L.	Tall goldenrod	New	
Solidago sempervirens L.	Seaside goldenrod	B, S&L	
* <i>Sonchus asper</i> (L.) Hill	Spiny-leaf sow-thistle	S&L	

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DIVISION/FAMILY/ SCIENTIFIC NAME	COMMON NAME	PREVIOUS REPORTS	COUNTY RECORD COLLECTION NO.
ASTERACEAE (continued) Symphyotrichum pilosum (Willd.) Nesom var. pringlei (Gray) Nesom	White oldfield American-aster	S&L	
 Aster pilosus Willd. var. pringlei (Gray) Blake Symphyotrichum subulatum (Michx.) Nesom Aster subulatus Michx. 	Seaside American-aster	S&L	
Symphyotrichum tenuifolium (L.) Nesom = Aster tenuifolius L.	Perennial saltmarsh American- aster	B, S&L	
* <i>Taraxacum officinale</i> G.H. Weber ex Wiggers	Common dandelion	S&L	
BIGNONIACEAE Campsis radicans (L.) Seem. ex Bureau	Trumpet-creeper	B, S&L	
BORAGINACEAE <i>Heliotropium curassavicum</i> L. var. <i>curassavicum</i>	Seaside heliotrope	New	Photographed
BRASSICACEAE *Arabidopsis thaliana (L.) Heynh. Cakile edentula (Bigelow) Hook. *Cardamine hirsuta L. Lepidium virginicum L.	Thalecress American searocket Hairy bittercress Poorman's-pepperwort	B, S&L B, S&L S&L B, S&L	
CACTACEAE Opuntia humifusa (Raf.) Raf.	Devil's-tongue	B, S&L	
CAPRIFOLIACEAE <i>*Lonicera japonica</i> Thunb.	Japanese honeysuckle	B, S&L	
CARYOPHYLLACEAE	1 5	,	
Sagina decumbens (Ell.) Torr. & Gray	Trailing pearlwort	New	
*Scleranthus annuus L.	Annual knawel	S&L	
Spergularia salina J.& K. Presl	Saltmarsh sandspurry	New	
* <i>Stellaria media</i> (L.) Vill.	Common chickweed	S&L	
CHENOPODIACEAE			
<i>Atriplex cristata</i> Humb. & Bonpl. ex Willd. = <i>Atriplex arenaria</i> Nutt.	Crested saltbush	B, S&L	
Atriplex prostrata Bouchér ex DC. = Atriplex patula L.	Hastate orache	B, S&L	
*?Chenopodium album L.	Lamb's-quarters	B, S&L	
*Chenopodium ambrosioides L.	Mexican-tea	B, S&L	
Salicornia bigelovii Torr.	Dwarf saltwort	B, S&L	
Salicornia virginica L.	Woody saltwort	B, S&L	
*?Salsola kali L. ssp. kali = Salsola caroliniana Walt.	Russian-thistle	B, S&L	
Sarcocornia perennis (P. Mill.) A.J. Scott = Salicornia perennis P. Mill.	Chickenclaws	B, S&L	
Suaeda linearis (Ell.) Moq.	Annual seepweed	B, S&L	
*?Suaeda maritima (L.) Dumort.	Herbaceous seepweed	New	
CISTACEAE	Sand goldon karthar	DCOI	
Hudsonia tomentosa Nutt.	Sand golden-heather	B, S&L S&I	
Lechea maritima Leggett ex B.S.P. var. virginica Hodgdon	Beach pinweed	S&L	

DIVISION/FAMILY/ SCIENTIFIC NAME	COMMON NAME	PREVIOUSCOUNTY RECORDREPORTSCOLLECTION NO.
CLUSIACEAE		
Hypericum hypericoides (L.) Crantz	St. Andrew's-cross	B, S&L
CONVOLVULACEAE		
Calystegia sepium (L.) R. Br.	Hedge false bindweed	В
Dichondra carolinensis Michx.	Carolina pony's-foot	New
*?Ipomoea hederacea Jacq.	Ivy-leaf morning-glory	S&L
Ipomoea lacunosa L. *Ipomoea purpurea (L.) Roth	Whitestar Common morning-glory	S&L B
<i>Ipomoeu purpureu</i> (L.) Koui	Common morning-giory	D
CORNACEAE	0 1	
Nyssa biflora Walt.	Swamp tupelo	S&L
CURCURBITACEAE	~	
<i>Melothria pendula</i> L.	Guadeloupe-cucumber	New
EBENACEAE		
Diospyros virginiana L.	Common persimmon	New
ELAEAGNACEAE		
*Elaeagnus umbellata Thunb. var.	Autumn-olive	S&L
parvifolia (Royle) Schneid.		
EUPHORBIACEAE		
Chamaesyce bombensis (Jacq.) Dugand = Euphorbia ammannioides Kunth	Southern beach spurge	New
Chamaesyce maculata (L.)	Small spotted sandmat	S&L
= Euphorbia maculata L. Chamaesyce polygonifolia (L.)	Small seaside sandmat	B, S&L
= Euphorbia polygonifolia L.	T T (
Croton glandulosus L. var. septentrionalis MuellArg.	Vente-conmigo	New
FABACEAE		
* <i>Kummerowia striata</i> (Thunb.) Schindl. = <i>Lespedeza striata</i> (Thunb.) Hook. & Arn.	Japanese-clover	S&L
*Lespedeza cuneata (DumCours.) G. Don	Chinese bush-clover	S&L
*Melilotus albus Medik.	White sweet-clover	B, S&L
[under Melilotus officinalis (L.) Lam. in Kartesz]		
Robinia pseudoacacia L.	Black locust	B, S&L
Strophostyles helvula (L.) Ell.	Trailing fuzzy-bean	B, S&L
Strophostyles umbellata (Muhl. ex Willd.) Britt. *Trifolium arvense L.	Pink fuzzy-bean Rabbit-foot clover	B, S&L New
*Trijolium arvense L. *Trifolium campestre Schreb.	Lesser hop clover	New
* <i>Trifolium dubium</i> Sibthorp	Suckling clover	New
*Trifolium repens L.	White clover	New
*Vicia hirsuta (L.) S.F. Gray	Tiny vetch	New
*Vicia sativa L. ssp. nigra (L.) Ehrh	Garden vetch	S&L
*Vicia villosa Roth	Winter vetch	New
GENTIANACEAE		
Sabatia stellaris Pursh	Rose-of-Plymouth	B, S&L

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DIVISION/FAMILY/ SCIENTIFIC NAME	COMMON NAME	PREVIOUS REPORTS	COUNTY RECORD COLLECTION NO.
GERANIACEAE Geranium carolinianum L.	Carolina cranes's-bill	B, S&L	
LAMIACEAE Monarda punctata L. Teucrium canadense L.	Spotted beebalm American germander	B, S&L B, S&L	
LAURACEAE Persea palustris (Raf.) Sarg. Sassafras albidum (Nutt.) Nees	Swamp bay Sassafras	S&L B, S&L	
LINACEAE Linum medium (Planch.) Britt. var. texanum (Planch.) Fern.	Stiff yellow flax	New	
MALVACEAE Hibiscus moscheutos L.	Crimson-eyed rose-mallow	B, S&L	
MOLLUGINACEAE * <i>Mollugo verticillata</i> L.	Green carpetweed	S&L	
MYRICACEAE Morella cerifera (L.) Small = Myrica cerifera L. Morella pensylvanica (Mirbel) Kartesz = Myrica pensylvanica Mirbel	Southern bayberry Northern bayberry	B, S&L B, S&L	
ONAGRACEAE Ludwigia palustris (L.) Ell. Oenothera humifusa Nutt. Oenothera laciniata Hill	Marsh primrose-willow Seaside evening-primrose Cut-leaf evening-primrose	S&L S&L B, S&L	
OXALIDACEAE Oxalis corniculata L.	Creeping yellow wood-sorrel	New	
PASSIFLORACEAE Passiflora incarnata L.	Purple passion-flower	New	
PHYTOLACCACEAE Phytolacca americana L.	American pokeweed	B, S&L	
PLANTAGINACEAE *Plantago aristata Michx. *Plantago lanceolata L. Plantago virginica L.	Large-bract plantain English plantain Pale-seed plantain	B, S&L B, S&L B, S&L	
PLUMBAGINACEAE Limonium carolinianum (Walt.) Britt.	Carolina sea-lavender	B, S&L	
POLYGONACEAE Polygonella articulata (L.) Meisn. *Polygonum caespitosum Blume var. longisetum (de Bruyn) A.N. Steward	Coastal jointweed Oriental lady's-thumb	B, S&L New	
Polygonum glaucum Nutt.	Sea-beach knotweed	New	

DIVISION/FAMILY/ SCIENTIFIC NAME	COMMON NAME	PREVIOUS REPORTS	COUNTY RECORD COLLECTION NO.
DOI VCONACEAE (continued)			
POLYGONACEAE (continued) Polygonum punctatum Ell.	Dotted smartweed	B, S&L	
Polygonum setaceum Baldw.	Bog smartweed	New	
*Rumex acetosella L.	Common sheep sorrel	B, S&L	
*Rumex crispus L.	Curly dock	S&L	
RANUNCULACEAE			
*Ranunculus bulbosus L.	St. Anthony's-turnip	New	
RHAMNACEAE			
Berchemia scandens (Hill) K. Koch	Alabama supplejack	S&L	
ROSACEAE			
Prunus serotina Ehrh.	Black cherry	B, S&L	
*Rosa multiflora Thunb. ex Murr.	Multiflora rose	New	
Rubus argutus Link	Saw-tooth blackberry	S&L	
Rubus cuneifolius Pursh	Sand blackberry	New	
Rubus flagellaris Willd.	Whiplash dewberry	S&L	
RUBIACEAE			
Diodia teres Walt.	Poorjoe	B, S&L	
Diodia virginiana L.	Virginia buttonweed	S&L	
Galium aparine L.	Sticky-Willy	New	
Galium hispidulum Michx.	Coastal bedstraw	S&L	
Galium tinctorium (L.) Scop.	Stiff marsh bedstraw	New	
Mitchella repens L.	Partridge-berry	S&L	
RUTACEAE			
Zanthoxylum clava-herculis L.	Hercules'-club	B, S&L	
SALICACEAE			
Populus deltoides Bartr. ex Marsh.	Eastern cottonwood	B, S&L	
Salix caroliniana Michx.	Carolina willow	S&L	
SCROPHULARIACEAE			
Agalinis purpurea (L.) Pennell	Purple false foxglove	New	
<i>Nuttallanthus canadensis</i> (L.) D.A. Sutton = <i>Linaria canadensis</i> (L.) Chaz.	Oldfield-toadflax	B, S&L	
*Veronica arvensis L.	Corn speedwell	S&L	
SIMARUBACEAE			
*Ailanthus altissima (P. Mill.) Swingle	Tree-of-heaven	S&L	
SOLANACEAE			
*Datura stramonium L.	Jimsonweed	S&L	
<i>Physalis walteri</i> Nutt.	Dune ground-cherry	New	
= <i>Physalis viscosa</i> L. var.			
maritima (M.A. Curtis) Rydb.		_	
Solanum carolinense L.	Carolina horse-nettle	B, S&L	
Solanum ptychanthum Dunal	Eastern black nightshade	B, S&L	
= Solanum americanum auct. Non P. Mill. = Solanum nigrum auct. Non L.			

= Solanum nigrum auct. Non L.

DIVISION/FAMILY/ SCIENTIFIC NAME	COMMON NAME	PREVIOUS REPORTS	COUNTY RECORD COLLECTION NO.
TYPHACEAE Typha angustifolia L.	Narrow-leaf cat-tail	New	
ULMACEAE Celtis occidentalis L.	Common hackberry	B, S&L	
URTICACEAE Boehmeria cylindrica (L.) Sw.	Small-spike false nettle	New	
VALERIANACEAE *Valerianella locusta (L.) Lat.	Lamb's-lettuce	New	
VERBENACEAE Callicarpa americana L.	American beauty-berry	S&L	
VITACEAE Parthenocissus quinquefolia (L.) Planch.	Virginia-creeper	B, S&L	
MAGNOLIOPHYTA: LILIOPSIDA			
AGAVACEAE Yucca filamentosa L.	Adam's-needle	B, S&L	
COMMELINACEAE *Commelina communis L.	Asiatic dayflower	New	
CYPERACEAE Carex albicans Willd. ex Spreng. var. albicans *Carex extensa Goodenough *Carex gravida Bailey var. lunelliana (Mackenzie) F.J. Herm. Carex hirsutella Mackenzie = Carex complanata Torr. & Hook. var.	White-tinge sedge Long-bract sedge Heavy sedge Fuzzy-wuzzy sedge	New New New	2101 2113 2103
hirsuta (Willd.) Gleason *Carex kobomugi Ohwi Carex longii Mackenzie Cyperus esculentus L. Cyperus filicinus Vahl Cyperus grayi Torr. Cyperus odoratus L. Cyperus retrorsus Chapman Eleocharis obtusa (Willd.) J.A. Schultes	Asiatic sand sedge Long's sedge Chufa Fern flat sedge Eastern Gray's flat sedge Rusty flat sedge Pine-barren flat sedge Blunt spike-rush	B, S&L S&L B, S&L B, S&L B, S&L S&L B, S&L S&L S&L	2106
 = Eleocharis ovata (Roth) Roemer & J. A. Schultes var. obtusa (Willd.) Kükenth. Fimbristylis caroliniana (Lam.) Fern. Fimbristylis castanea (Michx.) Vahl Schoenoplectus americanus (Pers.) Volk. ex Schinz & R. Keller = Scirpus olneyi Gray 	Carolina fimbry Marsh fimbry Chairmaker's club-rush	S&L B?, S&L New	
Schoenoplectus pungens (Vahl) Palla = Scirpus americanus auct. Non Pers. Scirpus cyperinus (L.) Kunth	Three-Square Cottongrass bulrush	B, S&L S&L	

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JUNCACEAEJuncus biflorus Ell.Bog rushS&L= Juncus marginatus Rostk. var. biflorus WoodNewJuncus coriaceus MackenzieLeathery rushB, S&LJuncus dichotomus Ell.Forked rushS&LJuncus effusus L.Lamp rushS&LJuncus gerardii Loisel.Saltmarsh rushB, S&LJuncus roemerianus ScheeleRoemer's rushB, S&LLILIACEAE*Allium vineale LCrow garlicS&L	DIVISION/FAMILY/ SCIENTIFIC NAME	COMMON NAME	PREVIOUS REPORTS	COUNTY RECORD COLLECTION NO.
Juncus biflorus Ell.Bog rushS&L= Juncus marginatus Rostk. var. biflorus WoodNewJuncus coriaceus MackenzieLeathery rushB, S&LJuncus dichotomus Ell.Forked rushS&LJuncus effusus L.Lamp rushS&LJuncus gerardii Loisel.Saltmarsh rushB, S&LJuncus roemerianus ScheeleRoemer's rushB, S&LLILIACEAELittaceaeLittaceae				
= Juncus marginatus Rostk. var. biflorus WoodNewJuncus coriaceus MackenzieLeathery rushB, S&LJuncus dichotomus Ell.Forked rushS&LJuncus effusus L.Lamp rushS&LJuncus gerardii Loisel.Saltmarsh rushB, S&LJuncus roemerianus ScheeleRoemer's rushB, S&LLILIACEAELittaceaeLittaceae		Bog rush	S&L	
Juncus coriaceus MackenzieLeathery rushB, S&LJuncus dichotomus Ell.Forked rushS&LJuncus effusus L.Lamp rushS&LJuncus gerardii Loisel.Saltmarsh rushB, S&LJuncus roemerianus ScheeleRoemer's rushB, S&LLILIACEAELittaceaeLittaceae		2081451		
Juncus dichotomus Ell.Forked rushS&LJuncus effusus L.Lamp rushS&LJuncus gerardii Loisel.Saltmarsh rushB, S&LJuncus roemerianus ScheeleRoemer's rushB, S&LLILIACEAELL		Leathery rush	B, S&L	
Juncus gerardii Loisel.Saltmarsh rushB, S&LJuncus roemerianus ScheeleRoemer's rushB, S&LLILIACEAELILIACEAELILIACEAE	Juncus dichotomus Ell.	Forked rush	S&L	
Juncus roemerianus ScheeleRoemer's rushB, S&LLILIACEAE	Juncus effusus L.	Lamp rush	S&L	
LILIACEAE	Juncus gerardii Loisel.		B, S&L	
	Juncus roemerianus Scheele	Roemer's rush	B, S&L	
*Allium vineale I Crow garlie S&I	LILIACEAE			
	*Allium vineale L.	Crow garlic	S&L	
*Asparagus officinalis L. Asparagus B, S&L	*Asparagus officinalis L.	-	B, S&L	
POACEAE	POACEAE			
* <i>Aira caryophyllea</i> L. Common silver-hair grass New		Common silver-hair grass	New	
Ammophila breviligulata Fern. American beach grass B, S&L			B, S&L	
Andropogon glomeratus (Walt.) B.S.P. Bushy bluestem S&L		Bushy bluestem	S&L	
Andropogon virginicus L. Broom-sedge B, S&L 2112		Broom-sedge	B, S&L	2112
*Anthoxanthum odoratum L. Large sweet vernal grass New	*Anthoxanthum odoratum L.		New	
Aristida tuberculosa Nutt. Seaside three-awn B		Seaside three-awn	В	
Axonopus furcatus (Flueggé) A.S. Hitchc. Big carpet grass New	Axonopus furcatus (Flueggé) A.S. Hitchc.		New	
*Bromus hordeaceus L. Soft brome New	*Bromus hordeaceus L.	Soft brome	New	
*Bromus racemosus L. Bald brome S&L	*Bromus racemosus L.	Bald brome		
*Bromus tectorum L. Cheat grass B, S&L			,	
Cenchrus tribuloides L. Sand-dune sandburr B, S&L				
Chasmanthium laxum (L.) Yates Slender wood-oats S&L				
* <i>Cynodon dactylon</i> (L.) Pers Bermuda grass B, S&L				
*Dactylis glomerata L. Orchard grass New				
Dichanthelium meridionale (Ashe) Freekmann Matting rosette grass S&L		Matting rosette grass	S&L	
= Panicum acuminatum Sw.				
var. unciphyllum (Trin.) Lelong		East leaf months among	Name	
Dichathelium ovale (Ell.) Gould & C.A. Egg-leaf rosette grass New		Egg-leaf rosette grass	new	
Clark var. <i>addisonii</i> (Nash) Gould & C.A. Clark = Panicum addisonii Nash				
Dichanthelium scoparium (Lam.) Gould Broom rosette grass B, S&L		Broom rosette grass	P S&I	
= Panicum scoparium Lam.		Broom rosette grass	D, S&L	
Dichanthelium sphaerocarpon (Ell.) Round-seed rosette grass New		Round-seed rosette grass	New	
Gould var. sphaerocarpon		itouna seca iosette grass	1.000	
= Panicum sphaerocarpon Ell.				
Digitaria ciliaris (Retz.) Koel. Southern crab grass S&L		Southern crab grass	S&L	
= Digitaria sanguinalis (L.) Scop.	-	e		
var. ciliaris (Retz.) Parl.				
*Digitaria ischaemum (Schreb.) Schreb. ex Muhl. Smooth crab grass S&L		Smooth crab grass	S&L	
Distichlis spicata (L.) Greene Coastal salt grass B, S&L			B, S&L	
*Echinochloa crus-galli (L.) Beauv. Large barnyard grass S&L		Large barnyard grass	S&L	
Echinochloa walteri (Pursh) Heller Long-awn cock's-spur grass New	Echinochloa walteri (Pursh) Heller	Long-awn cock's-spur grass	New	
* <i>Eleusine indica</i> (L.) Gaertn. Indian goose grass S&L	*Eleusine indica (L.) Gaertn.	Indian goose grass	S&L	
<i>Elymus virginicus</i> L. var. <i>halophilus</i> (Bickn.) Wieg. Virginia wild rye B, S&L 2104	Elymus virginicus L. var. halophilus (Bickn.) Wieg.	Virginia wild rye	B, S&L	2104
* <i>Eragrostis curvula</i> (Schrad.) Nees Weeping love grass S&L	*Eragrostis curvula (Schrad.) Nees	Weeping love grass	S&L	
Eragrostis hirsuta (Michx.) Nees Big-top love grass New	Eragrostis hirsuta (Michx.) Nees	Big-top love grass	New	
<i>Eragrostis spectabilis</i> (Pursh) Steud. Petticoat-climber B, S&L			B, S&L	
<i>Festuca rubra</i> L. Red fescue New	Festuca rubra L.	Red fescue	New	

BANISTERIA

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DIVISION/FAMILY/ SCIENTIFIC NAME	COMMON NAME	PREVIOUS REPORTS	COUNTY RECORD COLLECTION NO.
DOACEAE (continued)			
POACEAE (continued) <i>Leptochloa fusca</i> (L.) Kunth ssp.	Bearded sprangletop	S&L	2109
fascicularis (Lam.) N. Snow	Bearded sprangietop	Sal	2109
= Leptochloa fascicularis (Lam.) Gray var.			
<i>maritima</i> (Bickn.) Gleason			
*Lolium arundinaceum (Schreb.) S.J. Darbyshire	Tall rye grass	S&L	
= Festuca arundinacea Schreb.	Tall Tyc glass	SæL	
= Festuca elatior L. ssp. arundinacea (Schreb.) Hack.			
*Lolium perenne L. ssp. multiflorum (Lam.) Husnot	Perennial rye grass	B, S&L	
= Lolium multiflorum Lam.	r cremmar rye grass	D, S&L	
* <i>Microstegium vimineum</i> (Trin.) A.	Japanese stilt grass	New	
Mucrossegium vinneum (TTIII.) A. Muhlenbergia capillaris (Lam.) Trin.	Hair-awn muhly	B	
Panicum amarum Ell. var. amarulum	Bitter panic grass	B, S&L	
(A.S. Hitchc. & Chase) P.G. Palmer	Bitter panie grass	D, S&L	
Panicum amarum Ell. var. amarum	Bitter panic grass	B, S&L	
Panicum dichotomiflorum Michx.	Fall panic grass	S&L	
	Wand panic grass	S&L S&L	
Panicum virgatum L. *Paspalum dilatatum Poir.	Golden crown grass	New	
Paspalum floridanum Michx.	Florida crown grass	S&L	
Paspalum laeve Michx.	Field crown grass	New	
Paspalum setaceum Michx.	Slender crown grass	S&L	
*Phragmites australis (Cav.) Trin. ex Steud. var. australis *Poa annua L.	Annual blue grass	B, S&L S&L	
*Poa pratensis L.	Kentucky blue grass	S&L S&L	
Schizachyrium littorale (Nash) Bickn.	Dune false bluestem	B, S&L	
= Andropogon scoparius Michx. var.	Dune faise bluesteni	D, S&L	
<i>littoralis</i> (Nash) A.S. Hitchc.			
Setaria magna Griseb.	Giant bristle grass	New	
Setaria parviflora (Poir.) Kerguélen	Marsh bristle grass	New	
= Setaria geniculata auct. non (Wild.) Beauv.	Marsh bristle grass	INCW	
* <i>Setaria pumila</i> (Poir.) Roemer & J.A.	Pearl-millet	S&L	
Schultes ssp. <i>pumila</i>	I cari-innici	SæL	
= <i>Setaria glauca</i> (L.) Beauv.			
[under <i>Pennisetum glaucum</i> (L.) R. Br. in Kartesz]			
Sorghastrum nutans (L.) Nash	Yellow Indian grass	New	2105
*Sorghum halepense (L.) Pers.	Johnson grass	S&L	2103
Spartina alterniflora Loisel.	Saltwater cord grass	B, S&L	
Spartina patens (Ait.) Muhl.	Salt-meadow cord grass	B, S&L B, S&L	
*Sporobolus indicus (L.) R. Br.	Smut grass	S&L	
Tridens flavus (L.) A.S. Hitchc.	Tall redtop	S&L	
Triplasis purpurea (Walt.) Chapman	Purple sand grass	B, S&L	
Uniola paniculata L.	Sea-oats	B, S&L B, S&L	
Vulpia elliotea (Raf.) Fern.	Squirrel-tail six-weeks grass	B, S&L	
= Festuca sciurea Nutt.	Squitter-tail Six-weeks glass	D	
* <i>Vulpia myuros</i> (L.) K.C. Gmel.	Rat-tail six-weeks grass	S&L	
= Festuca myuros L.	Rat-all SIX-weeks grass	Bæl	
SMILACACEAE			
Smilax bona-nox L.	Fringed greenbrier	S&L	
Smilax glauca Walt.	Sawbrier	S&L	
Smilax pseudochina L.	Bamboovine	New	
Smilax rotundifolia L.	Horsebrier	S&L	
		Sal	

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