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# Flora and Threatened and Endangered Plants of Canaveral National Seashore, Florida

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**ABSTRACT** Canaveral National Seashore (CANA) incorporates ca. 23,335 ha of land, shallow lagoons, and offshore waters in east central Florida. We surveyed the flora in 20 terrestrial sites and one lagoon site between the fall of 2002 and the fall of 2004, made additional collections from 2005 to 2015, and examined existing collections in the CANA and KSC (Kennedy Space Center) herbaria annotating them where necessary. The final floristic list includes 679 taxa. Of this total, 584 are native and 94 are introduced. Only 40 taxa were not represented by new collections. Fifteen taxa considered endangered or threatened by the state of Florida occur; one (*Harrisia fragrans*) is listed as endangered by the United States Fish and Wildlife Service. Those listed as endangered in Florida include *Argusia gnaphalodes*, *Chamaesyce cumulicola*, *Glandularia maritima*, *Harrisia fragrans*, *Lantana depressa* var. *floridana*, *Lechea divaricata*, *Nemastylis floridana*, *Ophioglossum palmatum*, *Tephrosia angustissima* var. *curtissii*, *Tillandsia fasciculata* var. *densispica*, and *Tillandsia utriculata*. Plants listed as threatened in Florida include *Myrcianthes fragrans*, *Opuntia stricta*, *Pteroglossaspis ecristata*, and *Scaevola plumieri*. Five plants are listed in Florida as commercially exploited: *Encyclia tampensis*, *Epidendrum conopseum*, *Osmunda cinnamomea*, *O. regalis*, and *Zamia pumila*. Twenty Category I and 11 Category II invasive exotic plants (Florida Exotic Pest Plant Council) occur. Feral pigs, introduced insects, and plant disease threaten some plants. Fire management, control of exotics, and restoration of disturbed areas are management concerns. The temperate and subtropical plants within CANA are sensitive to climatic changes; its coastal location and low elevation makes it vulnerable to sea level rise.

**Key words:** Canaveral National Seashore, Florida, invasive exotic plants, rare species, vascular flora.

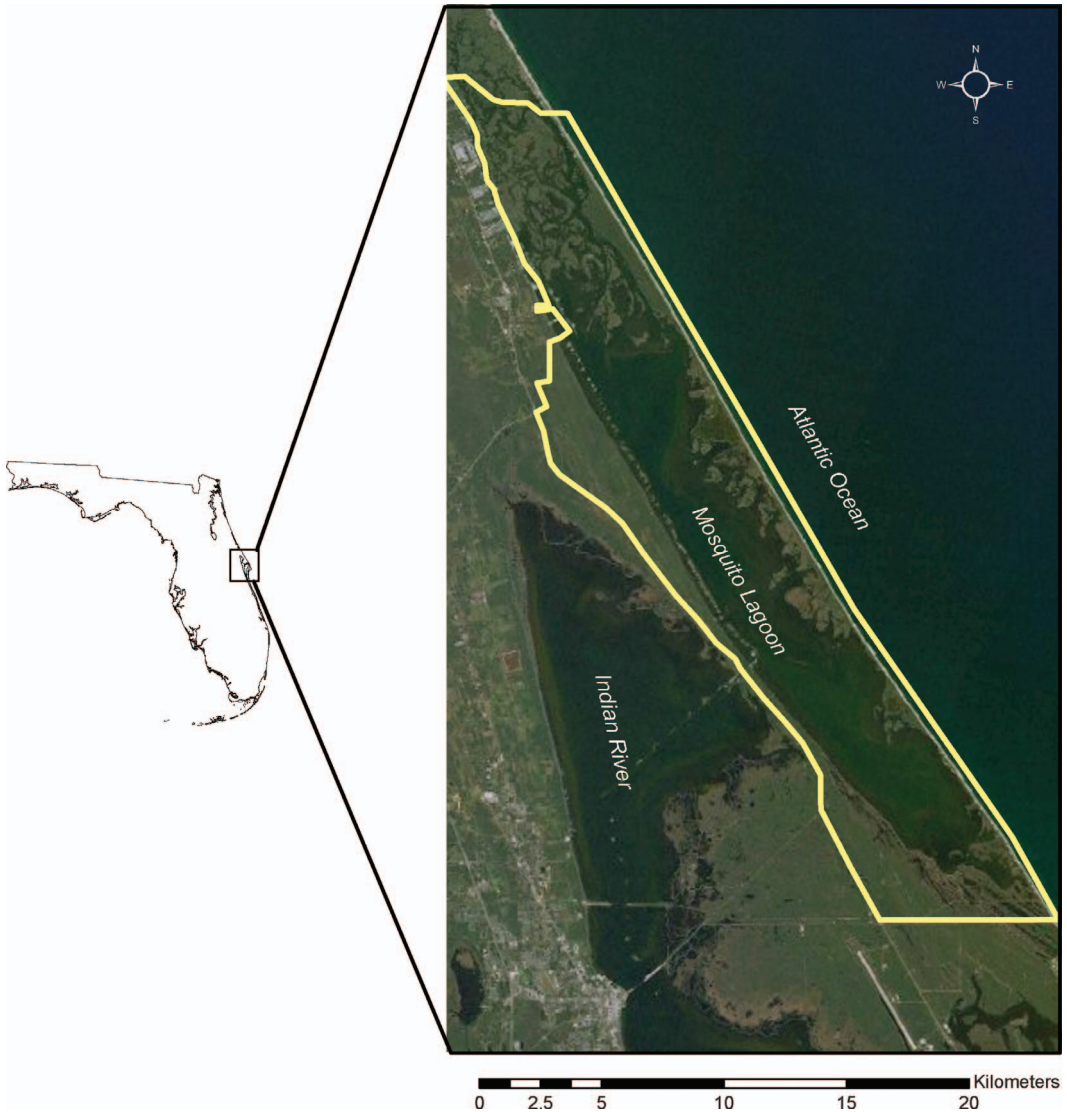
**INTRODUCTION** Canaveral National Seashore (CANA, National Park Service) is located on the east coast of central Florida and extends from approximately 28°40'N to 28°57'N and from 80°37'W to 80°45'W. It includes part of the Merritt Island–Cape Canaveral barrier island complex and is bordered by the Atlantic Ocean and the Mosquito Lagoon (Figure 1). The Seashore was created in 1975 by Public Law 93-626 (United States Department of the Interior, National Parks Service [USDI, NPS 2011]). The Seashore incorporates a total of about 23,335 ha of land and shallow lagoons. Of this area, about 16,188 ha (40,000 ac) are within Kennedy Space Center (KSC, NASA); many of these lands are managed jointly with the United States Fish and

Wildlife Service (USFWS), Merritt Island National Wildlife Refuge (MINWR). The Seashore also includes ca. 7,148 ha (17,662 ac) of lands formerly owned by the State of Florida or formerly privately held lands.

## *Climate*

The climate is warm and humid with mean annual precipitation of 136.6 cm (Mailander 1990). The wet season extends from May to October and the rest of the year is relatively dry. Freezing temperatures may occur in winter but do not persist; severe freezes do damage sensitive biota (Provanca et al. 1986a). Hurricanes are also a periodic disturbance event (Winsberg 2003). Thunderstorms are common in the summer months, and lightning strikes are frequent (Duncan et al. 2010). Long-term precipitation data indicate high year-to-year variability

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**Figure 1.** Location of Canaveral National Seashore in Florida.

and periodic occurrences of drought (Mailander 1990).

### *Geology*

Florida has a complex geologic history (Randazzo 1997, Scott 1997). The geology beneath CANA consists of a limestone plateau of Eocene age overlain by Miocene clays, phosphatic limestone, and phosphorite, and unconsolidated beds of fine sand, shells, and clay of late Miocene or Pliocene age. Surface strata are primarily unconsolidated white to brown quartz sand con-

taining beds of sandy coquina of Pleistocene and Holocene age (Cooke 1945, Brown et al. 1962).

The alternating high and low sea stands of the Pleistocene and Holocene shaped the surface of the region. The outer barrier island and Cape Canaveral formed after sea levels rose when the Wisconsinan glaciers retreated (Davis 1997). It is considered Holocene in age, with its formation beginning about 7,000 yr ago (Brooks 1972, 1981). Cape Canaveral is part of a prograding barrier island complex (White 1958, 1970) with

alternating periods of deposition and erosion (Chaki 1974).

Merritt Island also formed as a prograding barrier island complex, earlier than Cape Canaveral (White 1958, 1970). Multiple dune ridges apparently represent successive stages in this growth. The western portion of Merritt Island is substantially older than the east (Brooks 1972, Clapp 1987).

### *Soils*

The soil pattern of Merritt Island-Cape Canaveral is complex (Huckle et al. 1974, Baldwin et al. 1980) with 58 soil series and land types represented. Topography has a dramatic effect on soil formation. Relatively small elevation changes cause substantial differences in the position of the water table that, in turn, affect leaching, accumulation of organic matter, and formation of soil horizons. In addition, proximity to the lagoon systems influences soil salinity.

The primary source of parent material for these soils is sand of mixed terrestrial and biogenic origin. The terrestrial material originated from southern rivers carrying sediments eroded from highly weathered Coastal Plain and Piedmont soils; these sediments are quartzose with low feldspar content (Milliman 1972). The biogenic carbonate fraction of the sand is primarily of mollusk or barnacle origin (Milliman 1972). Some differences in soil parent material do occur, particularly that between soils formed in deposits over limestone or coquina compared to those formed in sand.

Soils on Cape Canaveral, False Cape, and the barrier island on the east side of Mosquito Lagoon are younger and less weathered than those of Merritt Island. Well drained soils in these areas retain shell fragments in the upper layers, while those inland on Merritt Island do not. The presence of shell fragments influences soil nutrient levels, particularly calcium and magnesium, and pH. The eastern and western sections of Merritt Island differ in age with the eastern section of Merritt Island retaining marked ridge-swale topography from its formation as a barrier island (Brown et al. 1962).

Schmalzer et al. (2001) grouped soil series into ten classes and showed there were significant differences among these classes for many chemical and physical parameters.

### *History*

Native Americans lived in east central Florida for thousands of years before European contact

(Bense 1994). Use of coastal areas and lagoon systems was extensive in some periods as marked by shell mounds and middens; Turtle Mound, Castle Windy, and others are among the shell mounds and middens within the Seashore (USDI, NPS 2011). At the time of European contact in the early 16th century, two groups of Native Americans lived in the area of the seashore, the Timucua to the north and the Ais to the south (USDI, NPS 2011). Both groups depended primarily on hunting, fishing, and gathering with some supplemental agriculture (USDI, NPS 2011). Disturbance to natural vegetation was probably limited to clearing around settlements, construction of shell middens, and perhaps use of fire on the landscape (Davison and Bratton 1986).

Spanish settlement in Florida during the 16th–18th centuries concentrated on the west coast and around St. Augustine (Bense 1994). Cattle, hogs, and citrus were introduced by the Spanish during this period (Davison and Bratton 1986). European diseases devastated Native American populations of Florida by the middle of the 18th century (Bense 1994). Florida became a British territory for a period from 1763–83 (USDI, NPS 2011). Several plantations were established in the area of the seashore during this period, and land was cleared for cultivation of indigo, sugar, and other crops (Davison and Bratton 1986; USDI, NPS 2011). Plantation agriculture required labor, typically from African slaves, to grow cash crops for export (Bense 1994). Florida reverted to Spanish control in 1783; British plantations were abandoned, but some were resettled by Spanish land grants (Davison and Bratton 1986; USDI, NPS 2011). In the same period, Native Americans of Creek and related groups who were displaced from Georgia and Alabama moved into Florida, becoming known as the Seminole (Bense 1994; USDI, NPS 2011). The Seminole founded settlements, conducted agriculture, and herded free-ranging cattle (Davison and Bratton 1986, Bense 1994).

Florida became an American territory in 1821 (USDI, NPS 2011). Increased American settlement led to increased conflicts with the Seminole and the eventual removal of most of the Seminole to western reservations (Bense 1994, USDI, NPS 2011). Logging of live oak for ship building increased in the early to middle 19th century, as did citrus cultivation (Davison and Bratton 1986). Settlement increased after the

American Civil War. Citrus agriculture increased and with it, the establishment of small towns such as Shiloh and Eldora associated with growing or transporting citrus increased as well (Davison and Bratton 1986, USDI, NPS 2011). Haulover Canal connecting the Indian River Lagoon and Mosquito Lagoon was first constructed in 1854 to improve transportation by water. In 1887 a new Haulover Canal was constructed north of the original one. The Florida East Coast Railroad reached the region in the 1880s, and extensive logging of pine occurred to fuel the railroad (Davison and Bratton 1986). Population increased with improved transportation, but citrus agriculture, cattle ranching, and commercial fishing remained major economic activities until the Second World War. Military bases established during the war increased population in the region.

In 1949, Cape Canaveral became the primary site of America's missile testing program. Merritt Island was selected as the site for the National Aeronautics and Space Administration (NASA) manned launch site (now John F. Kennedy Space Center) in 1958, and about 56,656 ha of land and open water lagoons were acquired in the early 1960s (USDI, NPS 2011). Impoundment of salt marshes for mosquito control also increased in the 1960s with a variety of impacts to these wetlands (Schmalzer 1995). Merritt Island National Wildlife Refuge was established in 1963 as an overlay on lands acquired for the space center (U.S. Department of the Interior, Fish and Wildlife Service [USDI, FWS] 2008). Canaveral National Seashore was established by legislation in 1975 (USDI, NPS 2011).

### *Botanical Exploration*

Early botanical exploration of east central Florida included trips by John and William Bartram (Bartram 1791, Taylor and Norman 2002) and Andre Michaux (Taylor and Norman 2002). Later observations were made during the Seminole Wars (Motte 1845). In the early 20th century, Roland Harper described vegetation of the region (Harper 1921), J.K. Small collected plants from various locations (Small 1919, 1921, 1922, 1923, 1927), and Kurz (1942) surveyed scrub on Cape Canaveral.

The first floristic list for the region was compiled in the 1970s by researchers at Florida Technological University (now University of Central Florida; Sweet 1976, Poppleton et al.

1977). This list has been revised twice (Schmalzer and Hinkle 1990, Schmalzer et al. 2002a) with additions and corrections; however, these lists are not specific to the boundaries of Canaveral National Seashore. The flora of Turtle Mound has been studied (Norman 1976), reexamined after 20 years (Norman and Hawley 1995), and also examined by Stalter and Kinkaid (2004). Surveys have been conducted by Poppleton (1981) for some rare plants and by Johnson et al. (1990) of coastal areas. Krakow (1991) conducted a survey for rare plants within the Seashore.

Studies of plant communities (Stout 1980, Schmalzer and Hinkle 1992b, 1996) and fire ecology (Simon 1986, Schmalzer and Hinkle 1992a, Schmalzer 2003) have been conducted. Regional vegetation maps have been prepared by Provanha et al. (1986b) for Kennedy Space Center and by Swain and Larson (1991) for the Indian River Lagoon Basin. Vegetation for part of Canaveral National Seashore was mapped in 1979 by L.K. Kirkman (Kirkman 1979).

### *Vegetation*

The major plant communities occurring within CANA are coastal dunes, coastal strand, coastal scrub, coastal hammock, oak-saw palmetto scrub, pine flatwoods, mesic hammock, hardwood swamp, freshwater marshes, salt marshes, and mangroves. There are also former agricultural areas, primarily citrus, and previously cleared areas in various stages of revegetation.

*Coastal dunes.* This community occurs on the primary dunes. It is dominated by *Uniola paniculata* with other grasses including *Spartina patens* and *Panicum amarum*. Small shrubs such as *Scaevola plumieri*, *Iva imbricata*, and *Croton punctatus* occur along with herbs including *Helianthus debilis*, *Ipomoea pes-caprae*, and *Heterotheca subaxillaris*.

*Coastal strand.* Coastal strand is a shrub community on the barrier island on recent dunes inland from the coastal dunes. *Serenoa repens*, *Coccoloba uvifera*, *Myrica cerifera*, *Myrcianthes fragrans*, *Sideroxylon tenax*, and *Myrsine cubana* are typical shrubs (Schmalzer and Hinkle 1985, Johnson et al. 1990). Shrubs may be dense or sandy openings may be common. If open, herbs such as *Helianthus debilis* and *Heterotheca subaxillaris* often occur. Pruning of shrubs by salt spray is common.

Soils are typically the excessively well-drained Palm Beach sand or the moderately well-drained Canaveral sand (Huckle et al. 1974).

*Coastal scrub.* Coastal scrub is a shrub community on the barrier island inland from coastal strand where oaks become codominant or dominant (Johnson and Barbour 1990). The oak is often a coastal form of *Quercus virginiana* (Kurz 1942, Johnson et al. 1990). Other shrubs include *Serenoa repens*, *Myrica cerifera*, *Sideroxylon tenax*, *Myrsine cubana*, and *Forestiera segregata* (Schmalzer et al. 1999). The soil is typically the moderately well-drained Canaveral sand (Huckle et al. 1974). Unlike soils of inland scrub, this soil is alkaline and still retains shell fragments in the upper horizons. Outside of federal properties, most of this community has been developed but some remnants persist (Johnson et al. 1990). Coastal strand and scrub are habitat for several rare plants including *Glandularia maritima*, *Lantana depressa* var. *floridana*, and *Tephrosia angustissima* var. *curtissii* (Schmalzer et al. 1999).

*Coastal hammock.* Coastal hammock occurs on wider barrier islands inland from the coastal scrub zone where salt spray pruning is reduced and the stature of the vegetation increases. *Quercus virginiana* is the canopy dominant often occurring with *Persea borbonia* and *Sabal palmetto*. Shrubs of tropical affinity including *Myrcianthes fragrans*, *Ocotea coriacea*, *Myrsine cubana*, *Psychotria nervosa*, and *Psychotria sulzneri* may dominate the understory. Coastal hammocks on shell mounds and middens often have a higher proportion of tropical species, as was noted by early botanical explorers such as Andre Michaux (Taylor and Norman 2002) and subsequent work of Small (1923), Norman (1976), and Stalter and Kinkaid (2004).

*Oak-saw palmetto scrub.* Oak-saw palmetto scrub is a shrubland dominated by scrub oaks (*Quercus myrtifolia*, *Q. geminata*, *Q. chapmanii*), *Serenoa repens*, and ericaceous shrubs including *Lyonia ferruginea*, *L. fruticosa*, *L. lucida*, and *Bejaria racemosa*. *Vaccinium myrsinites* is a common small shrub, and *Aristida stricta* a frequent herb. Soils are typically moderately well-drained Pomello or Orsino sands and excessively drained Paola and Astatula sands (Huckle et al. 1974). Oak-

saw palmetto scrub is well represented on Merritt Island (Schmalzer and Hinkle 1992b, Schmalzer et al. 1999).

*Pine flatwoods.* Pine flatwoods occur on moderately to poorly drained sites on Merritt Island. On moderately drained sites, flatwoods have a shrub layer of oak-saw palmetto scrub but an open canopy of pines. On Merritt Island, *Pinus elliottii* var. *densa* is the canopy species (Schmalzer and Hinkle 1985, Breininger et al. 1988). Soils are similar to those of oak-saw palmetto scrub. On mesic to hydric sites, *Serenoa repens* has greater dominance, cover of scrub oaks decreases, and *Ilex glabra* also becomes more important.

*Mesic hammock.* The oak-cabbage palm hammock community has a canopy typically dominated by large *Quercus virginiana* with *Sabal palmetto*, *Quercus laurifolia*, *Ulmus americana*, and *Morus rubra* also in the canopy. Shrubs of tropical affinity including *Myrcianthes fragrans*, *Ocotea coriacea*, *Myrsine cubana*, and *Psychotria* spp. dominate the understory. In some areas near the lagoons, *Juniperus virginiana* becomes important in the hammocks.

*Hardwood swamp.* Locally, hardwood swamps are closed canopy forests dominated by deciduous trees, especially *Acer rubrum* and *Ulmus americana*, but often includes evergreen taxa such as *Quercus laurifolia* and *Sabal palmetto*. In the understory, *Osmunda regalis* and *Woodwardia virginica* occur. On sites with longer hydroperiods and deeper water, willow swamps occur; this community is a swamp of small trees dominated by *Salix caroliniana* with some *Acer rubrum* and *Myrica cerifera*.

*Freshwater marshes.* Swales in scrub and slash pine flatwoods areas contain graminoid communities. Shallow swales or the edges of larger ones are typically dominated by several species of *Andropogon* spp. *Cladium jamaicense* dominates areas with deep water and long hydroperiods. In areas with intermediate hydroperiods, *Spartina bakeri* is often dominant. Other species occurring include *Woodwardia virginica*, *Blechnum serrulatum*, *Sagittaria lancifolia*, and *Panicum hemitomon*. With alterations in hydrology or long exclusion of fire, hardwood species such as *Salix caroli-*

*niana*, *Acer rubrum*, and *Myrica cerifera* may invade these areas (Schmalzer et al. 2012).

**Salt marshes.** Several types of salt marshes occur adjacent to the lagoon systems. The sand cordgrass-black rush community is dominated by *Spartina bakeri* and *Juncus roemerianus* with associated species such as *Acrostichum danaeifolium*. Scattered shrubs of *Myrica cerifera* and *Baccharis* spp. occur. The mixed salt-tolerant grasses marsh is dominated by one or more species of short grasses including *Distichlis spicata*, *Paspalum vaginatum*, and *Sporobolus virginicus* along with herbs such as *Sesuvium portulacastrum*. Patches of the shrub, *Borrchia frutescens*, are distributed in the salt marsh matrix. The saltwort-glasswort community is dominated by *Batis maritima* and *Sarcocornia ambigua*, both low shrubs, and is associated with salt marsh vegetation. *Salicornia bigelovii* and *Spartina alterniflora* occasionally occur.

**Mangroves.** The mangrove community is dominated by monospecific or mixed stands of *Avicennia germinans*, *Languncularia racemosa*, *Rhizophora mangle*, and *Conocarpus erecta* with other species including *Batis maritima*, *Sarcocornia ambigua*, *Paspalum vaginatum*, and *Suaeda linearis*. Mangrove communities fringe some areas of the lagoons and occur in some impounded wetlands.

Many of the salt marshes fringing the lagoon systems were impounded for mosquito control between ca. 1950–70 (Carlson and Carroll 1985, Rey et al. 1991). Later, some of these dikes were removed, and others have been connected via culverts to the lagoon (Virnstein 1992, USDI, NPS 2011). Changes in hydrology and salinity have had varying effects on vegetation and flora (Schmalzer 1995, Brockmeyer et al. 1997).

**Seagrass beds.** Seagrasses and submerged aquatic vegetation are important in the Indian River Lagoon, including Mosquito Lagoon within the Seashore. Four seagrasses occur in the northern Indian River Lagoon: *Halodule wrightii*, *Ruppia maritima*, *Syringodium filiforme*, and *Halophila engelmannii*, with *Halodule*, *Ruppia*, and *Syringodium* most frequently encountered in Mosquito Lagoon (Provancha and Scheidt 1999).

### Plant Distributions

The climate of coastal central Florida including Canaveral National Seashore is transitional

between the warm temperate climate of northern Florida and the subtropical climate of southern Florida with subtropical conditions extending farther north along the coasts (e.g., Winsberg 2003). Greller (1980) showed that distribution of forest zones was related to this climatic gradient with the tropical forest zone/temperate broadleaved forest zone transition extending along the coast through Canaveral National Seashore. The transitional character of the flora is represented by distribution maps that show many northern species at or near the southern limits of their distribution in this region and many subtropical species at or near the northern limits of their distribution (e.g., Little 1978).

### Purpose of This Study

This survey of vascular plants of Canaveral National Seashore was conducted as part of the National Park Service Inventory and Monitoring Program. Under this program, each park within the National Park Service with significant natural resources is charged with developing current species lists for key taxonomic groups (vascular plants and vertebrates) and documenting 90% of those species through literature reviews, museum searches, and targeted field surveys. Canaveral National Seashore is part of the Southeast Coast Network, one of 32 networks that share similar geographic and natural resource characteristics. Results of this and other baseline inventories are intended to serve as a foundation of information to conduct scientifically based natural resource management and design an integrated long-term ecological monitoring program for all parks within the Network.

## METHODS

### Review of Existing Data and Collections

We examined collections in the Kennedy Space Center (KSC) herbarium to determine if they came from within the boundaries of Canaveral National Seashore. We examined specimens in the CANA reference collection, annotated the nomenclature to follow Wunderlin and Hansen (2003), and corrected misidentifications. Collections at the University of Central Florida Herbarium (FTU) and other institutions were not examined.

Information on known occurrence of rare plants was obtained from the Florida Natural Areas Inventory (FNAI). Status was determined

from the Florida Department of Agriculture and Consumer Services list (Coile and Garland 2003, Weaver and Anderson 2010).

### Survey Methods

The size of the Seashore and the logistical constraints on accessing parts of it required a sampling strategy. We selected an initial set of sites (Table 1, Figure 2) that represented different habitats and geographic regions of the seashore, concentrating on the northern barrier island and northern Merritt Island regions that generally had been less examined in previous work. We revisited known locations of threatened and endangered plants to determine if those populations persisted. Later in the study we added sites in the southern portion of the Seashore (Table 1, Figure 2). In addition, we collected plants during other studies being conducted in the region. We did not collect cultivated plants planted at Park Service facilities. We began field surveys in the fall of 2002 and conducted concentrated sampling in the spring, summer, and fall of 2003 and spring of 2004 (Table 1). Less intensive sampling was conducted in the summer and early fall of 2004. Additional collections were made during other studies from 2005 to 2015.

### Plant Identification

We used Wunderlin and Hansen (2003) for most plant identification. Nomenclature here has been updated to follow Wunderlin and Hansen (2011) except where noted. Additional references consulted included Flora of North America (1993–2010), Godfrey and Wooten (1979, 1981), Godfrey (1988), Small (1933), Isley (1990), Cronquist (1980), Lellinger (1985), and Wunderlin and Hansen (2000).

Status of plants as native or introduced was determined using Wunderlin and Hansen (2003, 2011). Status of invasive exotic plants was determined using the most recent (2015) list of the Florida Exotic Pest Plant Council (FLEPPC 2015). Invasive exotic plants are species that are, intentionally or accidentally, introduced to Florida from a natural range outside of Florida that are expanding on their own within the state. Category I invasive exotics are those that are altering native plant communities by displacing native species, changing community structure or ecological function, or hybridizing with native plants. Category II invasive exotics have increased in abundance or frequency but have not

yet altered Florida plant communities to the extent shown by Category I species.

### Comparison to Other Sites

We compared the CANA flora to flora of other sites on the east coast of Florida and southeastern Georgia including Fort Matanzas National Monument (Zomlefer et al. 2004), Castillo de San Marcos National Monument (Zomlefer and Gianasi 2005), Little Talbot Island State Park (Easley and Judd 1993), Timucuan Ecological and Historical Preserve (Zomlefer et al. 2007), and Cumberland Island National Seashore (Zomlefer et al. 2008).

## RESULTS

### Floristic List

We collected 1,200 specimens representing 639 taxa during the course of this study. The KSC herbarium contained 131 taxa from within CANA boundaries before this study began. The CANA herbarium contained 296 specimens representing 241 taxa; these collections were made primarily by C. Seymor and J.M. Kunzer. We annotated 43 of these specimens to reflect nomenclatural changes or to correct misidentifications. In total, there were 317 taxa documented from CANA in the KSC and CANA collections when this study began. The resulting floristic list included 679 taxa (see Annotated Floristic List). Of these, 94 were introduced (14.0%) and 585 were native. Only 40 taxa were not represented by new collections. The flora included 19 pteridophytes, 5 gymnosperms, and 655 angiosperms. The largest families were the Poaceae (100), Asteraceae (78), Fabaceae (53), and Cyperaceae (45). Vouchers are held in the KSC herbarium collection. Duplicates have been deposited at USF and FLAS.

### Threatened and Endangered Plants

We identified one taxa listed as endangered by the USFWS (*Harrisia fragrans*) and 15 taxa considered endangered (FL-E) or threatened (FL-T) by the state of Florida (Weaver and Anderson 2010). Those listed as endangered in Florida include *Argusia gnaphalodes*, *Chamaesyce cumulicola*, *Glandularia maritima*, *Harrisia fragrans*, *Lantana depressa* var. *floridana*, *Lechea divaricata*, *Nemastylis floridana*, *Ophioglossum palmatum*, *Tephrosia angustissima* var. *curtissii*, *Tillandsia fasciculata* var. *densispica*, and *Tillandsia utriculata*. Plants listed as threatened in Florida include *Myr-*



**Table 1. Sites within Canaveral National Seashore sampled for flora.**

Site	Code	Description	County	Agencies <sup>a</sup>	Communities	Dates Sampled
Gomez Grant Line	GG1	Trail along grant line, sand road east of SR 3	Volusia	CANA, KSC, MINWR	Open wet area, hammock, scrub, freshwater marsh	9/26/2002, 3/20/2003, 3/26/2003, 5/14/2003, 6/16/2003, 9/02/2003, 10/04/2003, 10/16/2003, 5/25/2004, 8/25/2004
Northern Kennedy Space Center	KSC1	South of Gomez Grant line, east of SR 3	Volusia	CANA, KSC, MINWR	Scrub, freshwater marsh	10/04/2002, 3/26/2003, 5/14/2003, 6/16/2003, 9/2/2003, 10/16/2003, 5/25/2004, 8/25/2004
Oak Hill 1	OH1	North and south of Gomez Grant line ca. 2.0 km east of SR 3	Volusia	CANA	Hammock, xeric hammock, marsh	9/10/2002, 4/18/2003, 8/25/2003, 5/25/2004
Oak Hill 4	OH4	Ca. 1.7 km east of US 1 along dike road to Mosquito Lagoon	Volusia	CANA	Old field, hammock, salt marsh	9/30/2002, 4/17/2003, 8/26/2003, 6/30/2004
Oak Hill 5	OH5	Unpaved road along Seashore boundary ca. 1.4 km east of US 1	Volusia	CANA	Old field	9/30/2002, 4/17/2003, 8/26/2003, 6/30/2004
Oak Hill 6	OH6	Unpaved road along Seashore boundary ca. 1.5 km east of US 1	Volusia	CANA	Hammock	10/04/2002, 4/17/2003, 8/26/2003, 6/30/2004
Pardon Hammock	PH	Barrier island, east of Pardon Slough	Brevard	CANA, KSC, MINWR	Coastal hammock	10/09/2002, 3/27/2003, 9/4/2003
Dune	DUNE	Barrier island, east of Widgeon Bay	Brevard	CANA, KSC, MINWR	Dune, coastal strand, salt marsh	10/09/2002, 3/27/2003, 9/04/2003
Turtle Mound	TM	Shell mound along edge of Mosquito Lagoon	Volusia	CANA	Shell mound hammock	10/22/2002, 4/21/2003, 4/30/2003, 9/11/2003
Orange Island	OI	Island in Mosquito Lagoon west of Eldora	Volusia	CANA	Coastal hammock, salt marsh	10/10/2002
Shipyard Island	SYIS	Island in Mosquito Lagoon west of Turtle Mound	Volusia	CANA	Coastal hammock, salt marsh	10/07/2003
Eldora 2	ELD2	Barrier island along loop road ca. 3.9 km south of the north entrance to Seashore	Volusia	CANA	Coastal strand, hammock	10/10/2002, 4/21/2003, 9/11/2003, 6/30/2004
Eldora 3	ELD3	Barrier island ca. 4.6 km south of the north entrance to Seashore	Volusia	CANA	Coastal dune, coastal strand, hammock	10/22/2002, 4/29/2003, 9/09/2003, 6/30/2004

Table 1. Continued

Site	Code	Description	County	Agencies <sup>a</sup>	Communities	Dates Sampled
Castle Windy Trail	CWT	Barrier island, ca. 5.2 km south of the north entrance to Seashore	Volusia	CANA	Coastal dune, coastal strand, hammock	4/30/2003, 9/10/2003, 6/30/2004
Parking Lot 5 Peninsula	P5Pen	Barrier island, ca. 8.6 km south of the north entrance to Seashore	Volusia	CANA	Hammock on shell bed	3/19/2004
Wilson Hammock	WH	East of SR 3 north of SR 402	Brevard	CANA, KSC, MINWR	Hammock	3/02/2004, 3/10/2004, 4/26/2004
South Ranger Station Scrub	SRSS	Near South Ranger Station, between SR 402 and railroad	Brevard	CANA, KSC, MINWR	Scrub, recently cut and burned	3/02/2004, 4/26/2004
Biolab Road	Biolab	Dike road along the western shore of Mosquito Lagoon	Brevard	CANA, KSC, MINWR	Hammock, salt marsh, and disturbed sites	5/11/2004
Shiloh	Shiloh	East of SR 3	Brevard	CANA, KSC, MINWR	Scrub, flatwoods, old fields	5/07/2004, 5/19/2004, 6/28/2004, 9/21/2004, 9/22/2004, 11/2/2004
Mosquito Lagoon	ML	Lagoon	Brevard	CANA, KSC, MINWR	Seagrass beds	7/08/2004
Other	Other	Various sites	Brevard, Volusia	CANA, KSC, MINWR	Various	Various

<sup>a</sup>CANA = Canaveral National Seashore, KSC = John F. Kennedy Space Center, MINWR = Merritt Island National Wildlife Refuge.

*cianthes fragrans*, *Opuntia stricta*, *Pteroglossaspis ecristata*, and *Scaevola plumieri*. Coastal strand and scrub are important for *Argusia gnaphalodes*, *Lantana depressa* var. *floridana*, *Glandularia maritima*, *Chamaesyce cumulicola*, *Tephrosia angustissima* var. *curtissii*, *Myrcianthes fragrans*, *Opuntia stricta*, and *Scaevola plumieri*. *Lechea divaricata* and *Pteroglossaspis ecristata* occur in oak scrub, particularly areas recently burned. *Chamaesyce cumulicola* also occurs in sandy openings in a few scrub sites. *Ophioglossum palmatum* is epiphytic on *Sabal palmetto* in a few hammocks. *Tillandsia fasciculata* and *T. utriculata* are also epiphytic in hammocks. One population of *Nemastylis floridana* is known. Plants listed by the state of Florida as commercially exploited (FL-CE) include *Encyclia tampensis*, *Epidendrum conopseum*, *Osmunda cinnamomea*, *O. regalis*, and *Zamia pumila*. *Asclepias curtissii* (FL-E) and *Lechea cernua* (FL-T) previously

occurred within CANA but were not relocated in this survey; both persist in the region.

#### *CANA Plants Listed as Endangered by the State of Florida*

*Argusia gnaphalodes* is a shrub in the Boraginaceae whose historical distribution in Florida was along the east coast from Brevard County south; it is also found in the West Indies and tropical America (Coile and Garland 2003, Wunderlin and Hansen 2008). It is listed as endangered by the State of Florida (Weaver and Anderson 2010). This species was reported from CANA by Poppleton et al. (1977); however, Poppleton (1981) reported that the one individual known had been destroyed by a severe freeze in 1977. Krakow (1991) examined the historic location, and the plant was not present. We examined the historical location and the species was not present there; it was not found elsewhere on the Seashore during the 2002–04



**Figure 2.** Location of floristic survey areas in Canaveral National Seashore. Abbreviations follow Table 1.

survey (Schmalzer and Foster 2005a). Recently, we located one individual on coastal dunes in a remote section of the seashore; whether it persisted there or established from a disjunct population is not known.

*Chamaesyce cumulicola* is a prostrate herb in the Euphorbiaceae (Weaver and Anderson 2010, Wunderlin and Hansen 2011), endemic to Florida (Mueller et al. 1989), that occurs primarily on coastal dunes. Its distribution is primarily in coastal counties but also includes Highlands County (Wunderlin and Hansen 2008). We found this plant in four locations within CANA during this study. Two were on the outer barrier island, and the other two locations were scrub sites on Merritt Island. *Chamaesyce cumulicola* also occurs on Cape Canaveral Air Force Station (Chafin et al. 1996) and on the mainland of Brevard County (Schmalzer and Foster 2005b).

*Glandularia maritima* is a perennial herb in the Verbenaceae primarily found on coastal dunes and in coastal strand (Weaver and Anderson 2010, Wunderlin and Hansen 2011). It is endemic to Florida (Mueller et al. 1989), and its range is primarily along the east coast (Wunderlin and Hansen 2008). *Glandularia maritima* is distributed along most of the barrier island section of CANA occurring on coastal dunes and open areas in coastal strand. This distribution is similar to that reported previously. We also found one site inland. *Glandularia maritima* also occurs on Kennedy Space Center (Schmalzer et al. 2002a), Cape Canaveral Air Force Station (Chafin et al. 1996), and on some remaining coastal habitat in southern Brevard County (Schmalzer and Foster 2005b).

*Harrisia fragrans* is an erect tree cactus (Cactaceae) with slender, cylindrical, spiny stems. It is listed as endangered by the State of Florida (Weaver and Anderson 2010) and by the USFWS (1999) as *Cereus eriophorus* var. *fragrans*. Taxonomic difficulties distinguishing *H. fragrans* from *H. simpsonii* and *H. aboriginum* in Florida have contributed to uncertainties regarding the historic and current ranges of these species (Austin 1984). Norman (1976) reported *H. fragrans* from Turtle Mound in southern Volusia County, as did Poppleton (1981). Poppleton indicated that the population was represented by a single plant. Krakow (1991) examined the site and reported the plant missing. Norman and Hawley (1995) suggested

that the taxon was eliminated from Turtle Mound by freezes since the 1976 study. We did not locate any *Harrisia* during the course of our study (Schmalzer and Foster, 2005a). Subsequently, Woodmansee et al. (2007) identified a population of *H. fragrans* within the Seashore several kilometers south of Turtle Mound, and that identification has been confirmed by A.R. Franck (University of South Florida, pers. comm.). Recent studies of *Harrisia* (Franck 2012; Franck et al. 2013a, 2013b) indicate that the Florida east coast populations of *Harrisia* all should be considered *H. fragrans*, while those on the west coast of Florida are *H. aboriginum*.

*Lantana depressa* var. *floridana* is a shrub in the Verbenaceae. This has been considered one of three varieties within *L. depressa* (Sanders 1987, Wunderlin 1998). Wunderlin and Hansen (2011) place this variety in synonymy with *L. camara*; this treatment is not accepted universally (Chafin 2000, Coile and Garland 2003). Sanders (1987) noted that the introduced *L. camara* hybridizes with *L. depressa* (all varieties). The native populations have declined with increased habitat destruction. Habitat alteration favors the invasion of *L. camara*, which hybridizes with remnant native populations (Sanders 1987). However, the barrier island section of CANA supports populations that are morphologically consistent with *L. depressa* var. *floridana* as described by Sanders (1987), specifically lax or arching shrubs with flowers opening yellow fading to dark yellow or orange and leaves induplicate. The distribution is consistent with that reported previously (Johnson et al. 1990; FNAI records).

*Lantana camara* is also present on CANA, particularly near the north entrance, around facilities, parking lots, other disturbed sites, and on some dike roads; it represents a threat to the persistence of the native species. *L. depressa* var. *floridana* is present on Cape Canaveral Air Force Station (Chafin et al. 1996) as is *L. camara*. Remnant populations also remain in the southern barrier island of Brevard County (Schmalzer and Foster 2005b)

*Lechea divaricata* is a perennial herb in the Cistaceae endemic to Florida that occurs in scrub and scrubby flatwoods (Mueller et al. 1989, Chafin 2000, Weaver and Anderson 2010, Wunderlin and Hansen 2011). It occurs in coastal and inland counties of central and south Florida

(Wunderlin and Hansen 2008). We found one small population of *L. divaricata* within CANA in scrub along the Gomez Grant line that had been cut in preparation for burning. *Lechea divaricata* appears to be a scrub opening species similar to others in the genus (Johnson and Abrahamson 1990, Menges and Kohfeldt 1995, Hawkes and Menges 1996). We have found it in surveys of scrub on Merritt Island and the mainland of Brevard County (Schmalzer and Foster 2005b), often in scrub that has recently been burned. Increased prescribed burning on CANA would probably benefit this species.

*Nemastylis floridana* is a perennial herb in the Iridaceae endemic to Florida, primarily distributed in the eastern part of the state where it occurs in marshes, wet flatwoods, and other open wet areas (Mueller et al. 1989, Chafin 2000, Weaver and Anderson 2010, Wunderlin and Hansen 2011). An unusual characteristic of the plant is that flowers only open in late afternoon, ca. 4:00–6:00 PM during the flowering season (Chafin 2000), making detection of the plant difficult. We found the plant in one location on CANA in a wet open area along the Gomez Grant line.

*Ophioglossum palmatum* is an epiphytic fern in the Ophioglossaceae. In Florida, its range includes the central and southern parts of the state where it occurs primarily on cabbage palms (*Sabal palmetto*) in maritime and hydric hammocks (Chafin 2000, Weaver and Anderson 2010, Wunderlin and Hansen 2011). Florida is at the northern limits of the species' range, which also includes the West Indies, tropical America, and Southeast Asia (Wunderlin and Hansen 2000). Poppleton (1981) reported two locations for the species on CANA, a maritime hammock near Eldora and a mesic hammock east of SR 3. We relocated the Eldora population and documented a second population in a mesic hammock east of SR 3. In a 1990 survey, Krakow (1991) was unable to relocate the plant. This was the year after the hard 1989 freeze, and the population may not have recovered by that time.

*Tephrosia angustissima* var. *curtissii* is a perennial herb in the Fabaceae distributed in a few counties in central and south Florida, primarily in coastal areas (Chafin 2000, Weaver and Anderson 2010, Wunderlin and Hansen 2011). We found the plant in two locations toward the northern end of the Seashore in

openings in coastal strand/coastal scrub vegetation.

*Tillandsia fasciculata* is an epiphytic herb in the Bromeliaceae. Three varieties are present in Florida; those within CANA are var. *densispica* (Wunderlin and Hansen 2011). This species is widely distributed in central and southern Florida (Wunderlin and Hansen 2008) but is considered endangered because of the effects of the introduced weevil *Metamasius callizona* (Chevrolat; Coile and Garland 2003). We observed this taxon at five hammock locations in the Seashore and did not observe any weevil damage to this species within the Seashore in 2002–04 (Schmalzer and Foster 2005a).

*Tillandsia utriculata* is another epiphytic herb in the Bromeliaceae (Wunderlin and Hansen 2011) and is widely distributed in central and southern Florida (Wunderlin and Hansen 2008) but is affected by the introduced *Metamasius* weevil (Coile and Garland 2003). We observed this taxon at three hammock locations within the Seashore and did not observe any weevil damage to this species within the Seashore in 2002–04 (Schmalzer and Foster 2005a). Damage to *Tillandsia utriculata* populations on the mainland of Brevard County has been documented (Cooper et al. 2014) with the loss of 97% of one population between 2007 and 2009.

#### *CANA Plants Listed as Threatened by the State of Florida*

*Myrcianthes fragrans* is a shrub to small tree in the Myrtaceae that occurs in central and southern Florida primarily in coastal counties (Coile and Garland 2003; Wunderlin and Hansen 2008, 2011); it also occurs in the West Indies and tropical America. *Myrcianthes* is abundant within CANA occurring in 12 of 20 survey areas (Schmalzer and Foster 2005b). It occurs primarily in coastal strand scrub and hammocks and in the understory of some inland hammocks.

*Opuntia stricta* is a large cactus (Cactaceae) that occurs primarily on coastal dunes, shell mounds, and coastal hammocks distributed in coastal counties throughout Florida (Weaver and Anderson 2010, Wunderlin and Hansen 2008). It is relatively common in coastal habitats of CANA occurring in 8 of 20 survey areas (Schmalzer and Foster 2005a). An introduced cactus moth, *Cactoblastis cactorum* (Berg) (Phycitidae), may be a threat to native *Opuntia* species including *Opuntia stricta* (Zimmermann et al. 2001).

**Table 2. Invasive exotic plants occurring within Canaveral National Seashore. Data are frequency of occurrence within 20 survey areas. Categories follow Florida Exotic Pest Plant Council (2015).**

Taxa	Number of Survey Areas
<b>Category I</b>	
<i>Abrus precatorius</i> <sup>a</sup>	1
<i>Albizia julibrissin</i>	1
<i>Asparagus aethiopicus</i>	1
<i>Bauhinia variegata</i>	KSC herbarium
<i>Casuarina equisetifolia</i> <sup>ab</sup>	2
<i>Casuarina glauca</i> <sup>ab</sup>	KSC herbarium
<i>Colubrina asiatica</i> <sup>a</sup>	1
<i>Dioscorea bulbifera</i> <sup>a</sup>	1
<i>Eugenia uniflora</i>	CANA herbarium
<i>Hydrilla verticillata</i> <sup>bc</sup>	1
<i>Imperata cylindrica</i> <sup>ac</sup>	1
<i>Lantana camara</i>	8
<i>Ludwigia peruviana</i>	3
<i>Melinis repens</i>	8
<i>Pennisetum purpureum</i>	2
<i>Psidium guajava</i>	1
<i>Pueraria montana</i> var. <i>lobata</i> <sup>a</sup>	1
<i>Scaevola taccada</i> var. <i>sericea</i> <sup>a</sup>	1
<i>Schinus terebinthifolia</i> <sup>ab</sup>	11
<i>Urena lobata</i>	1
<b>Category II</b>	
<i>Broussonetia papyrifera</i>	KSC herbarium
<i>Dactyloctenium aegyptium</i>	10
<i>Kalonchoe pinnata</i>	1
<i>Landoltia punctata</i>	2
<i>Leucaena leucocephala</i> <sup>a</sup>	2
<i>Momordica charantia</i>	2
<i>Panicum maximum</i>	5
<i>Ricinus communis</i>	1
<i>Sanseveria hyacinthoides</i>	1
<i>Sesbania punicea</i>	1
<i>Sphagneticola trilobata</i>	1

<sup>a</sup>Noxious weed listed by Florida Department of Agriculture and Consumer Services.

<sup>b</sup>Prohibited aquatic plant listed by Florida Department of Agriculture and Consumer Services.

<sup>c</sup>Noxious weed listed by U.S. Department of Agriculture.

*Pteroglossaspis ecristata* is a large terrestrial orchid (Orchidaceae). It is relatively widespread in Florida occurring in scrub, sandhills, oak hammocks, and pine flatwoods (Chafin 2000, Wunderlin and Hansen 2011); however, Chafin (2000) noted that it was now apparently absent from many areas of historical occurrence. We found this orchid in one location within CANA in scrub that has been managed by prescribed burning, which benefits this plant (Chafin 2000). We have found populations of *Pteroglossaspis* in surveys of scrub on the mainland of Brevard County that have been restored by prescribed

burning or wildfire (Schmalzer and Foster 2005b).

*Scaevola plumieri* is an herb or small shrub in the Goodeniaceae that occurs in coastal counties of central and southern Florida on coastal dunes and coastal strand (Wunderlin and Hansen 2008, Weaver and Anderson 2010). Brevard County is the northern limit of its reported range. We found the plant along the southern barrier island section of CANA in Brevard County. *Scaevola* also occurs on Cape Canaveral Air Force Station (Schmalzer and Oddy 1995).

#### *Plants Considered Commercially Exploited by the State of Florida*

*Encyclia tampensis* is an epiphytic orchid (Orchidaceae) occurring in hammocks and swamps of central and southern Florida (Coile and Garland 2003, Wunderlin and Hansen 2008). One occurrence of this species within CANA has been documented (Schmalzer and Foster 2005a).

*Epidendrum conopseum* is an epiphytic orchid (Orchidaceae) occurring in hammocks and swamps of northern and central Florida (Coile and Garland 2003, Wunderlin and Hansen 2008). We documented two occurrences within CANA in hammocks of the Eldora area (Schmalzer and Foster 2005a).

*Osmunda cinnamomea* and *Osmunda regalis* var. *spectabilis* are both terrestrial ferns in the Osmundaceae and are common ferns of wetlands in Florida (Wunderlin and Hansen 2011). We recorded *O. cinnamomea* in 6 of 20 survey areas and *O. regalis* in 3 of 20 survey areas within CANA (Schmalzer and Foster 2005a).

*Zamia pumila* is a cycad in the Zamiaceae found in the Florida peninsula, two counties in Georgia, and the West Indies (Coile and Garland 2003, Wunderlin and Hansen 2011). We found the plant in 3 of 20 survey areas within CANA, all near the northern end of the Seashore (Schmalzer and Foster 2005a).

#### *Listed Plants of Uncertain Status on CANA*

*Asclepias curtissii* is an herb in the Apocynaceae listed as endangered by the State of Florida (Weaver and Anderson 2010). It occurs in scrub, flatwoods, and dry hammocks in central and southern Florida (Coile and Garland 2003, Wunderlin and Hansen 2011). Poppleton (1981) located one small population within CANA. Krakow (1991) was unable to relocate it during his survey. We have not seen it within CANA

**Table 3. Comparison of the Canaveral National Seashore vascular flora with that of other sites on the east coast of Florida and southeastern Georgia.**

Study Site	Reference	Location
Canaveral National Seashore (CANA)	This study	Brevard & Volusia Counties, Florida
Fort Matanzas National Monument	Zomlefer et al. (2004)	St. Johns County, Florida
Castillo de San Marcos National Monument	Zomlefer and Giannasi (2005)	St. Augustine, Florida
Little Talbot Island State Park	Easley and Judd (1993)	Duval County, Florida
Timucuan Ecological and Historical Preserve	Zomlefer et al. (2007)	Duval County, Florida
Cumberland Island National Seashore	Zomlefer et al. (2008)	Camden County, Georgia

<sup>a</sup>IS<sub>J</sub> = c/A + B - c where c = number of taxa in common, A = number of taxa in area 1, and B = number of taxa in area 2.

<sup>b</sup>IS<sub>S</sub> = 2c/A + B (Mueller-Dombois and Ellenberg 1974).

during this survey. However, it does persist in the region. We have found *A. curtissii* in scrubby flatwoods on Merritt Island and on the mainland of Brevard County (Schmalzer and Foster 2005b). It may persist within CANA. It is generally found in small numbers and is not readily detected when not in flower (P. Schmalzer, pers. obs.).

*Lechea cernua* is an herb in the Cistaceae listed as threatened by the State of Florida (Weaver and Anderson 2010) that occurs in scrub in central and southern Florida (Coile and Garland 2003, Wunderlin and Hansen 2011). Poppleton (1981) found a population in scrub within CANA. Krakow (1991) was unable to relocate the population, and we have not seen it within CANA in this survey. It does persist in the region (Schmalzer and Foster 2005b) and may still occur within CANA.

#### *Invasive Exotic Plants*

Twenty Category I and 11 Category II invasive exotic plants are now known to occur within the Seashore (Table 2). Most of these do not appear to be widespread occurring at only one (of 20) survey areas (Table 2). A few of these are widespread. *Schinus terebinthifolia* was the invasive exotic encountered most frequently in this survey. Canaveral National Seashore has been conducting invasive exotic plant treatment for several years (John Stiner, CANA, pers. comm.), and this has reduced the abundance of *Schinus* in many areas, but it remains present throughout the Seashore (USDI, NPS 2011). *Casuarina* spp. have also been targeted for treatment by the Seashore (USDI, NPS 2011) and by Merritt Island National Wildlife Refuge, in the joint management area (M. Legare, MINWR, pers. comm.), and their abundance has been reduced but not eliminated (USDI 2011).

Several of the invasive exotic species have the potential to cause substantial harm to CANA ecosystems or populations of rare plants. *Lantana camara* threatens the native *Lantana depressa* var. *floridana* populations through hybridization. *Imperata cylindrica* has been present in the region for some time (Poppleton et al. 1977), but it has been spreading in recent years (P. Schmalzer, pers. obs.). *Imperata* has the capability to invade upland ecosystems (e.g., scrub), displace native plants, and change the fire regime (Lippincott 2000). *Pueraria montana* var. *lobata* was documented from the Seashore for the first time. At about the same time, *Pueraria* was found in several localities in Brevard County where it had not been reported previously (S. Kennedy, pers. comm.). On CANA, *Pueraria* was found in an abandoned citrus grove; these groves are often dominated by invasive exotic plants and weedy native species. Two grasses, *Panicum maximum* (Category II) and *Melinis repens* (Category I), are also common in abandoned groves and other disturbed sites. These and other exotic species in old groves may limit the establishment of native plant taxa (Schmalzer et al. 2002b). *Scaevola taccada* var. *sericea* and *Colubrina asiatica* were recently documented (2014) in CANA. These plants were not found in the 2002–04 survey but have established and may be spreading.

#### *Comparison to Other Sites*

The CANA flora is the largest of the sites compared (Table 3). Canaveral National Seashore is also the largest site by area, but only about 35% of that area is land, the rest being Mosquito Lagoon and offshore waters that support only a few vascular plants. Less than half of the CANA flora occurs at any one of the



Table 3. Extended

Area (ha)	Total Flora	Native Flora (#/%)	Taxa in Common with CANA (#/%)	Jaccard Similarity Index <sup>a</sup>	Sorensen Similarity Index <sup>b</sup>
23,335; 8,154 of land	679	585 (86.2)	—	—	—
1,127	237	180 (75.9)	185 (27.3)	25.3	40.4
8.5	152	94 (61.8)	92 (13.6)	12.5	22.1
951	289	262 (90.7)	215 (31.7)	28.6	44.4
3,723	480	398 (82.9)	296 (43.7)	34.3	51.1
7,880	583	471 (80.2)	313 (46.2)	33.0	49.6

other sites (Table 3). This is a reflection of the variety of habitats represented within CANA and the subtropical element in the CANA flora; many of those species do not extend to north Florida or southeastern Georgia. A high proportion of the CANA flora is native (86.1%). Among these sites, CANA is most similar to Timucuan Ecological and Historical Preserve and Cumberland Island National Seashore (Table 3); however, the similarity indices are modest on an absolute basis.

**DISCUSSION** The flora of Canaveral National Seashore is predominantly native and representative of the flora of coastal central Florida. Good examples of coastal dunes, coastal strand, coastal hammocks, oak-saw palmetto scrub, pine flatwoods, mesic hammocks, hardwood swamps, freshwater marshes, and salt marshes are included with the Seashore, as are extensive seagrass beds.

Hammocks of subtropical character, especially those on shell mounds and shell beds, are an additional source of plant diversity. The occurrence of more tropical species on shell mounds and beds north of their typical range was noted by early botanical explorers such as Andre Michaux, who visited Turtle Mound in 1788 (Taylor and Norman 2002). Later, J.K. Small (1923) noted the tropical character of the vegetation of Turtle Mound and other shell mounds. Stalter and Kincaid (2004) examined five middens from north to central Florida on the east coast and found that the more southern of these (including Turtle Mound) supported tropical species. The P5 Peninsula site examined in this survey was on a flat shell bed rather than a mound; it had areas where *Bursera simaruba* and *Sideroxylon foetidissimum* were the dominant trees and other subtropical species were common (Schmalzer and Foster 2005a). The

transitional character of the CANA flora is indicated by the modest level of similarity to coastal sites in north Florida and southeast Georgia.

Abandoned citrus groves and other former agricultural sites or cleared areas support a mix of native and introduced plants including many invasive exotic plants. Our observations are that these sites do not return to natural communities by successional processes. Restoration of these sites is not simple (Schmalzer et al. 2002b) and requires additional work to develop effective techniques. The prevalence of invasive exotic plants in these sites provides a source for spread into intact native vegetation.

#### *Threatened and Endangered Plants*

Canaveral National Seashore provides habitat for populations of 1 federally listed endangered plant, 15 plants listed as threatened or endangered by the state of Florida, and 5 that are considered commercially exploited. Canaveral National Seashore is clearly important for some of these. The Seashore supports the northernmost population of *Harrisia fragrans*. The large, contiguous area of coastal dunes, strand, and coastal scrub are important for *Glandularia maritima*, *Lantana depressa* var. *floridana*, *Scaevola plumieri*, *Myrcianthes fragrans*, and *Opuntia stricta*; these coastal habitats also support the only sites for *Argusia gnaphalodes*, *S. plumieri*, and *Tephrosia angustissima* var. *curtissii* known on the Seashore. *Glandularia*, *Chamaesyce*, *Tephrosia*, and, to some extent, *Lantana* require openings in the coastal strand-coastal scrub matrix. We have observed increases in *Glandularia* in coastal scrub that was cut and burned for restoration.

An introduced cactus moth, *Cactoblastis cactorum* (Berg) (Phycitidae) may be a threat to native *Opuntia* species including *Opuntia*



*stricta* (Zimmermann et al. 2001). The range of this moth now includes CANA and extends to South Carolina (Hight et al. 2002), but occurrence is not uniform within this range. Extensive damage to *O. stricta* within CANA has not been observed.

The survival of *Lantana depressa* var. *floridana* is threatened by the introduced *Lantana camara* through hybridization and genetic swamping (Sanders 1987). Removal of *L. camara* from coastal areas, particularly around entrances to the Seashore, facilities, and other disturbed sites, would help protect the native *Lantana*.

*Lechea divaricata* and *Pteroglossaspis ecris-tata* both occur in oak-saw palmetto scrub on leached, acidic soils. As with many rare scrub plants (Menges and Kohfeldt 1995, Hawkes and Menges 1996), *Lechea* and *Pteroglossaspis* require openings in the dense shrub matrix. The site for *Pteroglossaspis* was in the joint management area and has been burned several times. The site for *Lechea* was along a sand road; it has been cut by roller-chopper in preparation for burning but not yet burned. Most of the scrub in the joint management area of CANA has been burned by the U.S. Fish and Wildlife Service (MINWR), and some of the long-unburned scrub has been restored by cutting and burning (Schmalzer et al. 2003). Most of the scrub solely within Park Service management requires prescribed burning. Pine flatwoods, freshwater marshes, and some salt marshes within CANA are also fire dependent systems requiring periodic burning, and CANA has instituted a prescribed burning program (USDI, NPS 2011).

*Tillandsia fasciculata* var. *densispica*, *Tillandsia utriculata*, and *Ophioglossum palmatum* are all epiphytes of coastal or mesic hammocks. *Ophioglossum* is the most host specific, occurring only on *Sabal palmetto*; it is also near the northern limits of its range and may be damaged by hard freezes. Both species of *Tillandsia* are threatened by an introduced insect, *Metamasius callizona*. No damage to *Tillandsia* by this weevil was seen in this study, but the insect is expected to reach CANA as it caused a major reduction to the population of *T. utriculata* at the Enchanted Forest Sanctuary in Titusville between 2007 and 2009 (Cooper et al. 2014). Periodic monitoring in areas where *Tillandsia* is frequent should be conducted to determine if weevil damage is occurring. Unlike

the rare scrub plants, epiphytes are sensitive to fire. However, prescribed burns are usually conducted under moderate conditions such that fire does not spread into mesic hammocks. Reductions of fuel loads in scrub and flatwoods should reduce the risk or intensity of wild fires under more extreme conditions where they might represent a risk to coastal or mesic hammocks.

#### *Invasive Exotic Plants*

Treatment of invasive exotic plants within CANA in recent years has reduced but not eliminated populations of *Schinus* and *Casuarina*. The threat posed by *Lantana camara* to the native *Lantana depressa* var. *floridana* has been discussed. *Panicum maximum* and *Imperata cylindrica* are also threats to native communities and species. Their current populations are primarily in disturbed sites including abandoned groves and roadsides, but they have the potential to spread into undisturbed vegetation. Effective techniques for restoration of abandoned agricultural lands and other disturbed areas need to be developed.

#### *Invasive Exotic Animals*

Laurel wilt disease is now affecting susceptible species within CANA. Laurel wilt disease is a fungal disease causing mortality to trees and shrubs in the Lauraceae (laurel family). The disease results from an introduced fungus (*Raffaelea lauricola*; Harrington et al. 2008) spread by the introduced red bay ambrosia beetle (*Xyleborus glabratus*; Fraedrich et al. 2008). First noted in 2003, it has spread rapidly and caused extensive mortality to *Persea borbonia* (Gramling 2010). Within the CANA flora, *Persea palustris* and *Persea borbonia* var. *humilis* are also vulnerable. Periodic monitoring would be useful in detecting and documenting impacts.

Feral pigs (*Sus scrofa*) cause damage to wetlands and hammocks within CANA; localized damage can be extensive (P. Schmalzer, pers. obs.). Feral pigs have the most destructive impact to native habitats of any exotic mammal in Florida (Layne 1997). Current control efforts do not appear adequate.

#### *Climatic Fluctuations and Changes*

The Canaveral National Seashore occupies a zone of climatic transition and supports many species that are near the northern or southern limits of their ranges. Climatic events such as

hard freezes or extended droughts have the potential to affect the flora. Several species that occurred historically on CANA in small numbers (e.g., *Argusia gnaphalodes*, *Harrisia fragrans*) that appeared to be eliminated by freezes in the 1970s and 1980s have only recently been relocated. Other species (e.g., *Ophioglossum palmatum*, *Amyris elemifera*, *Ocotea coriacea*) were damaged by these freezes, and populations could not be relocated soon after the last freeze (Krakow 1991). We found one or more populations of these plants indicating recovery since then.

Future climatic change has the potential to affect plant species distributions, and transitional areas may be particularly sensitive (Crumpacker et al. 2001). Monitoring could provide an early indication of climatic change (Crumpacker et al. 2002). Coastal Florida is highly vulnerable to effects of sea level rise from overwash, inundation, and saltwater intrusion (Noss 2011), and CANA clearly shares that vulnerability. Negative effects have already been demonstrated to wetlands and forests on Florida's Gulf Coast (e.g., Williams et al. 1999, DeSantis et al. 2007), in the Everglades (e.g., Saha et al. 2011), and the Florida Keys (Maschinski et al. 2011). Projected increases in sea level over the next century would increase greatly the impacts to coastal Florida (e.g., Donoghue 2011, Geselbracht et al. 2011).

**ANNOTATED FLORISTIC LIST** The floristic list given below is arranged by pteridophytes, gymnosperms, and angiosperms with families given alphabetically within those groups. Families follow Wunderlin and Hansen (2011). Nonnative taxa are indicated by "Introd." and categories of invasive exotic plants are those of the Florida Exotic Pest Plant Council (2015): Category I as EPPC-CI, and Category II as EPPC-CII. Plants that are considered rare by the state of Florida (Weaver and Anderson 2010) are indicated as FL-E (Florida Endangered), FL-T (Florida Threatened), and FL-CE (Florida Commercially Exploited). Taxa collected during this study are indicated by "C"; taxa previously represented in either the KSC herbarium or the CANA herbarium are indicated by "E" followed by the collection where the specimen was located. Collectors are indicated by "S" Paul Schmalzer, "F" Tammy Foster, and "K" Timothy Kozusko. Specimens at KSC collected by Florida Technological University (now University of

Central Florida) in the 1970s did not identify collectors; these have been assigned numbers starting with FTU. Park Service catalog numbers are given for specimens in the CANA collection. Habitats are indicated as CD = coastal dunes, CST = coastal strand, CSC = coastal scrub, CH = coastal hammock, OSP = oak-saw palmetto scrub, FW = pine flatwoods, MH = mesic hammock, HS = hardwood swamp, FM = freshwater marsh, SM = salt marsh, M = mangrove, SG = seagrass bed, and DIS = disturbed. Abundance is based on frequency of occurrence within sample sites supplemented by collection data with R = rare (1 site), UN = uncommon (2–4 sites), CM = common (5–9 sites), and AB = abundant (>10 sites).

## PTERIDOPHYTES

### ASPLENIACEAE

*Asplenium platyneuron* (L.) Britton et al. C: S&F 04-457, E (KSC: S 83-152); MH; R

### AZOLLACEAE

*Azolla filiculoides* Lam. C: S&F 04-485; FM; R

### BLECHNACEAE

*Blechnum serrulatum* Rich. C: S&F 06-107; HS; UN

*Woodwardia areolata* (L.) T. Moore C: S&F 03-505, 04-30; MH; UN

*Woodwardia virginica* (L.) Smith C: S&F 04-381; FM; UN

### DENNSTAEDTIACEAE

*Pteridium aquilinum* (L.) Kuhn var. *pseudocaudatum* (Clute) Clute ex A. Heller C: S&F 04-341, 06-81, E (CANA: 7408); OSP, FW, CH, DIS; CM

### OPHIOGLOSSACEAE

*Ophioglossum palmatum* L. FL-E; C: S&F 03-377, 04-28; CH, MH; UN

### OSMUNDACEAE

*Osmunda cinnamomea* L. FL-CE; C: S&F 15-7, E (KSC: FTU-3); MH, HS; CM

*Osmunda regalis* L. var. *spectabilis* (Willd.) A. Gray FL-CE; C: S&F 04-31; MH, HS; UN

### POLYPODIACEAE

*Phlebodium aureum* (L.) Small C: S&F 04-36; CH, MH, HS; AB

*Pleopeltis polypodioides* (L.) E. G. Andrews & Windham var. *michauxiana* (Weatherby) E. G. Andrews & Windham C: S&F 02-021, E (CANA: 7406); CH, MH; AB

## PSILOACEAE

*Psilotum nudum* (L.) P. Beauv. C: S&F 03-701; CH; R

## PTERIDACEAE

*Acrostichum danaeifolium* Langsd. & Fisch. C: S&F 04-348; SM, M, FM; CM

## THELYPTERIDACEAE

*Macrothelypteris torresiana* (Gaudich.) Ching Introd.; C: S&F 04-12; MH; R

*Thelypteris dentata* (Forssk.) E. P. St. John Introd.; C: S&F 04-13; MH; R

*Thelypteris kunthii* (Desv.) C. V. Morton C: S&F 04-456, 06-108; MH; R

*Thelypteris ovata* R. P. St. John C: S&F 03-504; MH; R

*Thelypteris palustris* Schott var. *pubescens* (G. Lawson) Fernald C: S&F 04-48, 04-395; MH, DIS; UN

## VITTARIACEAE

*Vittaria lineata* (L.) Sm. C: S&F 04-35; CH, MH; CM

**GYMNOSPERMS**

## CUPRESSACEAE

*Juniperus virginiana* L. C: S&F 04-226, 04-331, E (CANA: 7293); MH, CH, DIS; AB

## PINACEAE

*Pinus clausa* (Chapm. ex Engelm.) Vasey ex Sarg. C: S&F 04-376, 04-377; OSP; R

*Pinus elliottii* Engelm. var. *densa* Little & K. W. Dorman C: S&F 04-400; FW, OSP; AB

*Pinus serotina* Michx. C: S&F 06-103; FW; R

## ZAMIACEAE

*Zamia pumila* L. FL-CE; E (CANA: 7294); CH; UN

**ANGIOSPERMS**

## ACANTHACEAE

*Dicliptera sexangularis* (L.) Juss. C: S&F 03-381, E (CANA: 7999); MH; R

*Ruellia caroliniensis* (J. F. Gmel.) Steud. C: S&F 04-265, 04-332, 04-458, E (CANA: 7466, 7477, KSC: S 84-171); MH, DIS; UN

## ADOXACEAE

*Sambucus nigra* L. subsp. *canadensis* (L.) R. Bolli. C: S&F 04-235, E (CANA: 7267-7269); FM, HS, DIS; CM

## AGAVACEAE

*Agave decipiens* Baker C: S&F 04-493; CD, CST; UN

*Yucca aloifolia* L. C: S&F 04-359, E (CANA: 7469); CD, CSC, CH, DIS; CM

*Yucca filamentosa* L. C: S&F 04-474; OSP; UN

## AIZOACEAE

*Sesuvium maritimum* (Walter) Britton et al. C: S&F 04-490; SM; UN

*Sesuvium portulacastrum* (L.) L. C: S&F 04-353, E (CANA: 7459, 7460); SM; CM

## ALISMACEAE

*Sagittaria filiformis* J. G. Sm. C: S&F 03-399, 03-523, 15-58; FM; UN

*Sagittaria lancifolia* L. subsp. *lancifolia* C: S&F 04-398, 06-110, E (CANA: 7461); FM; UN

## ALTINGIACEAE

*Liquidambar styraciflua* L. C: S&F 04-680; MH; R

## AMARANTHACEAE

*Amaranthus australis* (A. Gray) J. D. Sauer C: S&F 06-83, E (CANA: 7463, KSC: FTU-09); FM, SM; UN

*Atriplex pentandra* (Jacq.) Standl. C: S&F 03-583, 04-453, S&K 15-63; CD, SM; UN

*Blutaparon vermiculare* (L.) Mears C: S&F 04-392; DIS; R  
*Chenopodium ambrosioides* L. Introd.; C: S&F 14-16, E (KSC: S 93-35, 93-36); DIS; UN

*Chenopodium berlandieri* Moq. E (KSC: FTU-73); DIS; R

*Froelichia floridana* (Nutt.) Moq. C: S&F 14-24, E (KSC: S 85-22); OSP, DIS; UN

*Gomphrena serrata* L. Introd.; C: S&F 03-631; DIS; R

*Iresine diffusa* Humb. & Bonpl. ex Willd. C: S&F 02-122, 03-295, E (CANA: 7464, 7465, KSC: FTU-10, 11); CST, DIS; UN

*Salicornia bigelovii* Torr. C: S&F 04-408, E (CANA: 7270); SM; UN

*Sarcocornia ambigua* (Michx.) M. A. Alonso & M. B. Crespo C: S&F 04-354, E (CANA: 7271, 7272); SM; CM

*Suaeda linearis* (Elliott) Moq. C: S&F 02-136, E (CANA: 7273, 7274); SM; CM

## AMARYLLIDACEAE

*Hymenocallis latifolia* (Mill.) M. Roem. C: S&F 04-446, 15-22; CD, CST; CM

## ANACARDIACEAE

*Rhus copallinum* L. C: S&F 04-312, 04-551, E (CANA: 7471); OSP, FW, CSC, DIS; AB

*Schinus terebinthifolia* Raddi Introd.; EPPC-CI; C: S&F 04-329, E (CANA: 7472); DIS, MH; AB

*Toxicodendron radicans* (L.) Kuntze C: S&F 04-38, E (CANA: 7473); MH, CH, HS; CM

## ANNONACEAE

*Asimina obovata* (Willd.) Nash C: S&F 03-06, E (KSC: S 94-11); OSP; UN

*Asimina parviflora* (Michx.) Dunal C: S&F 02-008, 04-333; MH; UN

*Asimina reticulata* Shuttlew. ex Chapm. C: S&F 04-39, 04-379; FW, OSP; UN

## APIACEAE

- Cicuta maculata* L. C: S&F 03-519, 03-726; MH, FM; UN  
*Cyclospermum leptophyllum* (Pers.) Sprague ex Britton & P. Wilson Introd.; C: S&F 04-340, 04-421; HS, FM; UN  
*Eryngium aromaticum* Baldwin C: S&F 02-067, E (KSC: S 85-23); OSP; UN  
*Eryngium baldwinii* Spreng. C: S&F 03-425; FM; R  
*Eryngium yuccifolium* Michx. E (CAN: 7474); FM; R  
*Oxypolis filiformis* (Walter) Britton subsp. *filiformis* C: S&F 04-559, 04-569; FM; UN  
*Ptilimnium capillaceum* (Michx.) Raf. C: S&F 03-416; FM; R  
*Spermolepis echinata* (Nutt. ex DC.) A. Heller C: S&F 03-326, 04-195; DIS; UN

## APOCYNACEAE

- Asclepias lanceolata* Walter C: S&F 06-85; FW, DIS; R  
*Asclepias pedicellata* Walter C: S&F 04-552; OSP; R  
*Asclepias tomentosa* Elliott E (KSC: S 83-275); OSP; R  
*Asclepias tuberosa* L. C: S&F 06-84, 15-21, E (CAN: 7456); DIS; UN  
*Catharanthus roseus* (L.) G. Don Introd.; C: S&F 04-490, E (CAN: 7478); DIS; UN  
*Cynanchum angustifolium* Pers. C: S&F 03-636; CH; R  
*Cynanchum scoparium* Nutt. C: S&F 02-191, 02-237, 03-588, 03-656, E (CAN: 7457); CH, MH; UN  
*Gonolobus suberosus* (L.) R. Br. C: S&F 04-81; CH; R  
*Morrenia odorata* (Hook. & Arn.) Lindl. Introd.; E (CAN: 7477); R

## AQUIFOLIACEAE

- Ilex ambigua* (Michx.) Torr. var. *ambigua* C: S&F 04-469; OSP; UN  
*Ilex cassine* L. var. *cassine* C: S&F 02-064, 03-375, E (KSC: FTU-16); FW, MH, CH; CM  
*Ilex glabra* (L.) A. Gray C: S&F 04-221, E (CAN: 7454); FW; CM  
*Ilex vomitoria* Aiton C: S&F 04-322, 05-114, E (CAN: 7455); FW, MH, CH; AB

## ARACEAE

- Landoltia punctata* (G. Mey.) Les & D. J. Crawford Introd.; EPPC-CII; C: S&F 04-455, 04-486; FM; UN

## ARALIACEAE

- Centella asiatica* (L.) Urban E (KSC: FTU-14); FM, DIS; R  
*Hydrocotyle bonariensis* Comm. ex Lam. C: S&F 03-384, E (CAN: 7475, KSC: S 94-26); CD; UN  
*Hydrocotyle umbellata* L. C: S&F 03-328, 03-454, E (CAN: 7476); MH, FM; UN

## ARECACEAE

- Sabal palmetto* (Walter) Lodd. ex Schult. & Schult. f. C: S&F 04-441; CH, MH, HS, DIS; AB  
*Serenoa repens* (W. Bartram) Small C: S&F 04-208, E (CAN: 8000); OSP, CST, CSC, FW; AB

## ASPARAGACEAE

- Asparagus aethiopicus* L. Introd.; EPPC-CI; C: S&F 03-602; CH, DIS; R

## ASTERACEAE

- Acmella oppositifolia* (Lam.) R. K. Jansen var. *repens* (Walter) R. K. Jansen C: S&F 02-044, 04-272; FM; UN  
*Ambrosia artemisiifolia* L. C: S&F 14-14, E (CAN: 7218, KSC: S 94-23); DIS; CM  
*Arnoglossum floridana* (A. Gray) H. Rob. C: S&F 04-405; OSP; UN  
*Baccharis angustifolia* Michx. C: S&F 15-53; SM; R  
*Baccharis glomeruliflora* Pers. C: S&F 04-629, 04-679; MH, FM, DIS; UN  
*Baccharis halimifolia* L. C: S&F 04-632, E (CAN: 7219, 7220); OSP, FM, DIS; AB  
*Berlandiera subcaulis* (Nutt.) Nutt. C: S&F 02-041; OSP; UN  
*Bidens alba* (L.) DC. var. *radiata* (Sch. Bip.) R. E. Ballard ex Melchert C: S&F 04-212, E (CAN: 7221); DIS; AB  
*Borrchia frutescens* (L.) DC. C: S&F 04-326, E (CAN: 7222); SM; AB  
*Brickellia eupatorioides* (L.) Shimmers C: S&F 06-144; FW; R  
*Calyptocarpus vialis* Less. Introd.; C: S&F 02-193, 03-657; CH, DIS; R  
*Carpophorus corymbosus* (Nutt.) Torr. & A. Gray C: S&F 02-058, 02-070; FW, OSP; UN  
*Carpophorus odoratissimus* (J. F. Gmel.) H. Hebert var. *subtropicanus* (Delaney et al.) Wunderlin and B. F. Hansen C: S&F 02-057, 02-071, E (CAN: 7223, KSC: S 83-117); FW; UN  
*Chrysopsis linearifolia* Semple subsp. *dressii* Semple C: S&F 02-054, 02-139, 03-438, 06-135; OSP; UN  
*Chrysopsis scabrella* Torr. & A. Gray C: S&F 03-165; OSP; R  
*Chrysopsis subulata* Small E (KSC: Simon 83-106); CST; R  
*Cirsium horridulum* Michx. C: S&F 03-414; FM, DIS; R  
*Conoclinium coelestinum* (L.) DC. C: S&F 03-530, 03-703; FM; R  
*Conyza canadensis* (L.) Cronq. var. *pusilla* (Nutt.) Cronq. C: S&F 14-15, E (CAN: 7224, KSC: S 93-37); DIS; AB  
*Coreopsis floridana* E. B. Sm. C: S&F 05-113; FW; R  
*Coreopsis leavenworthii* Torr. & A. Gray C: S&F 03-458, 04-16, E (CAN: 7225); FM, DIS; UN  
*Eclipta prostrata* (L.) L. C: S&F 02-048, 03-426; FM, DIS; R  
*Elephantopus elatus* Bertol. C: S&F 02-010, 03-653, E (CAN: 7226); OSP, DIS; UN  
*Emilia fosbergii* Nicolson Introd.; C: S&F 04-25; DIS; R  
*Erechtites hieracifolius* (L.) Raf. ex DC. C: S&F 03-309, 03-427, E (CAN: 8002, KSC: S 94-13); FM, DIS; CM  
*Erigeron quercifolius* Poir. C: S&F 04-222; OSP, DIS; CM  
*Erigeron vernus* (L.) Torr. & A. Gray C: S&F 03-286; FM; R  
*Eupatorium album* L. E (CAN: 7231); R  
*Eupatorium capillifolium* (Lam.) Small ex Porter & Britton C: S&F 04-626; DIS; CM

- Eupatorium compositifolium* Walter C: S&F 04-627, 06-134; DIS; UN
- Eupatorium leucolepis* (DC.) Torr. & A. Gray C: S&F 03-531; DIS; R
- Eupatorium mikanioides* Chapm. C: S&F 03-582, 04-557, E (CANADA: 7227-7229); FM, SM, DIS; UN
- Eupatorium mohrii* Greene C: S&F 03-439, E (CANADA: 7230, 7232); FW, FM; UN
- Eupatorium rotundifolium* L. C: S&F 04-459, 14-51; OSP; UN
- Eupatorium serotinum* Michx. C: S&F 03-654, E (CANADA: 7233, 7234); FM, DIS; CM
- Euthamia caroliniana* (L.) Green ex Porter & Britton C: S&F 04-630; OSP, DIS; CM
- Flaveria linearis* Lag. C: S&F 03-652, E (CANADA: 7235); FM, DIS; CM
- Gaillardia pulchella* Foug. C: S&F 04-325, E (CANADA: 7236, 7237); CD, CST, DIS; UN
- Gamochaeta antillana* (Urban) Anderberg C: S&F 03-273, 03-360, 04-308, E (KSC: S 95-69); OSP, DIS; UN
- Gamochaeta pensylvanica* (Willd.) Cabrera E (CANADA: 8003); DIS; R
- Helianthus angustifolius* L. E (KSC: FTU-37); DIS; R
- Helianthus debilis* Nutt. subsp. *debilis* C: S&F 14-45, E (CANADA: 7238, KSC: FTU-38); CD, CST; CM
- Helianthus floridanus* A. Gray ex Chapm. C: S&F 03-166; FW, DIS; R
- Heterotheca subaxillaris* (Lam.) Britton & Rusby C: S&F 14-20, E (CANADA: 7239, KSC: S 82-30); CD, CST, CSC, DIS; AB
- Hieracium megacephalon* Nash C: S&F 04-416; FW; R
- Iva frutescens* L. C: S&F 14-35, E (CANADA: 7240, KSC: FTU-41); FM, SM, DIS; AB
- Iva imbricata* Walter C: S&F 04-451, E (CANADA: 7241); CD; UN
- Krigia virginica* (L.) Willd. C: S&F 03-300, 04-201; OSP, CH; UN
- Lactuca canadensis* L. C: S&F 03-338; MH, DIS; R
- Lactuca graminifolia* Michx. C: S&F 03-323, 04-309, 04-345, E (KSC: FTU-42); DIS; UN
- Liatris tenuifolia* Nutt. var. *quadriflora* Chapm. C: S&F 02-069, 03-167, 03-722; OSP; UN
- Melanthera nivea* (L.) Small C: S&F 03-316, 03-603, 03-721, E (CANADA: 7243, 7244); CH, DIS; UN
- Mikania cordifolia* (L.f.) Willd. C: S&F 02-224, 02-241; CST, CH; UN
- Mikania scandens* (L.) Willd. C: S&F 02-036; MH, OSP, DIS; UN
- Pachera glabella* (Poir.) C. Jeffrey C: S&F 03-350; FM; R
- Palafoxia integrifolia* (Nutt.) Torr. & A. Gray C: S&F 02-167; OSP; R
- Pityopsis graminifolia* (Michx.) Nutt. C: S&F 04-219; OSP, FW, DIS; UN
- Pluchea baccharis* (Mill.) Pruski C: S&F 02-068, 03-518, E (CANADA: 7247, KSC: FTU-50); MH, FM, SM, DIS; UN
- Pluchea foetida* (L.) DC. C: S&F 02-065, 04-556, 15-54; MH; UN
- Pluchea longifolia* Nash C: S&F 15-31; FM; UN
- Pluchea odorata* (L.) Cass. C: S&F 15-55, E (CANADA: 7246, KSC: S 94-27); FM, SM; UN
- Pterocaulon pycnostachyum* (Michx.) Elliott C: S&F 04-205, E (CANADA: 7248); OSP; UN
- Pyrrhopappus carolinianus* (Walter) DC. C: S&F 03-605, 04-197, 04-344, E (CANADA: 7249, 7250, KSC: S 83-241); OSP, DIS; UN
- Rudbeckia hirta* L. E (CANADA: 7251); R
- Seriocarpus tortifolius* (Michx.) Nees C: S&F 02-050, 03-720; OSP; R
- Solidago fistulosa* Mill. C: S&F 02-156, 03-702, E (CANADA: 7252, KSC: FTU-52); FM; UN
- Solidago odora* Aiton var. *chapmanii* (A. Gray) Cronq. C: S&F 14-19, E (KSC: S 94-15); OSP; CM
- Solidago sempervirens* L. C: S&F 02-226, 02-227, 02-228, 04-389; CST, CH; UN
- Solidago stricta* Aiton E (KSC: Simon 84-38, FTU-54); CST; R
- Sonchus asper* (L.) Hill Introd.; C: S&F 04-273; DIS; R
- Sonchus oleraceus* L. Introd.; C: S&F 03-362, E (CANADA: 8001, KSC: FTU-56); DIS; UN
- Sphagneticola trilobata* (L.) Pruski Introd.; EPPC-CII; C: S&F 04-378; DIS; R
- Symphiotrichum bahamense* (Britton) Nesom C: S&K 12-7; FM; R
- Symphiotrichum dumosum* (L.) G. L. Nesom C: S&F 03-680, 04-681; MH; UN
- Symphiotrichum simmondsii* (Small) G. L. Nesom C: S&F 04-391, 04-570, 05-112; SM; R
- Verbesina virginica* L. C: S&F 02-112, E (CANADA: 7253); CH, MH; AB
- Vernonia gigantea* (Walter) Trel. ex Branner & Coville C: S&F 03-507, 03-590, 03-591, 03-619, E (CANADA: 7254); CST, CH, MH; UN
- Youngia japonica* (L.) DC. Introd.; C: S&F 02-211, 03-313, 03-352, 03-696; CH, DIS; CM

## AVICENNIACEAE

- Avicennia germinans* (L.) L. C: S&F 04-327, 04-430, E (CANADA: 7255, 7256); M, SM; AB

## BATACEAE

- Batis maritima* L. C: S&F 03-580, E (CANADA: 7413); M, SM; CM

## BIGNONIACEAE

- Tecoma capensis* (Thunb.) Lindl. Introd.; E (CANADA: 8004); DIS; R

## BORAGINACEAE

- Argusia gnaphalodes* (L.) Heine FL-E; C: S, F&K: 14-12; CD; R
- Heliotropium angiospermum* Murray C: S&F 02-243, 03-570, 04-74, E (CANADA: 7257, KSC: FTU-60, 61, 62); CH; CM

- Heliotropium curassavicum* L. C: S&F 04-73, E (CANA: 8005, KSC: S 84-05); M, SM; R
- BRASSICACEAE**  
*Cakile lanceolata* (Willd.) O. E. Schulz C: S&F 03-307, F 09-13, E (CANA: 8006); CD; UN  
*Capparis flexuosa* (L.) L. C: S&F 04-71, 14-37, E (CANA: 7275, 8009); CH; UN  
*Lepidium virginicum* L. C: S&F 15-8, E (CANA: 7258, KSC: FTU-65); DIS; CM  
*Nasturtium floridana* (Al-Shehbaz & Rollins) Al-Shehbaz & R. A. Price C: S&F 04-483; FM; R
- BROMELIACEAE**  
*Tillandsia fasciculata* Sw. var. *densispica* Mez FL-E; C: S&F 03-299, 03-611, 03-685; CH, MH; CM  
*Tillandsia recurvata* (L.) L. C: S&F 04-357, 04-489, E (CANA: 8007); OSP, CH, MH; AB  
*Tillandsia simulata* Small C: S&F 04-475, E (CANA: 8008); MH; R  
*Tillandsia usneoides* (L.) L. C: S&F 04-355, E (CANA: 7259); CH, MH; AB  
*Tillandsia utriculata* L. FL-E; C: S&F 04-492; CH, MH; UN
- BURSERACEAE**  
*Bursera simaruba* (L.) Sarg. C: S&F 04-67; CH; R
- CABOMBACEAE**  
*Brasenia schreberi* J. F. Gmel. C: S&F 04-420, 04-558; FM; R
- CACTACEAE**  
*Harrisia fragrans* Small ex Britton & Rose FL-E; A.R. Franck 473 (USF); CH; R  
*Opuntia humifusa* (Raf.) Raf. C: S&F 04-356, E (CANA: 7260); OSP; UN  
*Opuntia stricta* (Haw.) Haw. FL-T; C: S&F 03-618; CD, CH; CM
- CAMPANULACEAE**  
*Campanula floridana* S. Watson ex A. Gray C: S&F 03-339, 04-266, 04-465; MH, FM; UN  
*Lobelia feayana* A. Gray C: S&F 03-283, 03-406, 04-46, 04-264, 15-10, E (CANA: 7265); FM, MH; UN  
*Lobelia paludosa* Nutt. C: S&F 03-277, 03-428, E (CANA: 7266); OSP; UN  
*Lobelia puberula* Michx. E (KSC: FTU-66); DIS; R
- CANNACEAE**  
*Canna flaccida* Salisb. C: S&F 04-360; FM; R
- CARICACEAE**  
*Carica papaya* L. Introd.; C: S&F 04-351; CH, DIS; UN
- CARYOPHYLLACEAE**  
*Paronychia americana* (Nutt.) Fenzl ex Walp. C: S&F 04-200, E (KSC: S 83-186); OSP; UN
- CASUARINACEAE**  
*Casuarina equisetifolia* L. Introd.; EPPC-CI; C: S&F 03-660; DIS; UN  
*Casuarina glauca* Sieber ex Spreng. Introd.; EPPC-CI; E (KSC: FTU-71); DIS; R
- CELTIDACEAE**  
*Celtis laevigata* Willd. C: S&F 04-72, E (CANA: 7440, KSC: FTU-264); CH, MH; AB
- CHRYSOBALANACEAE**  
*Licania michauxii* Prance C: S&F 15-12, 15-13, 15-20, E (CANA: 8010, KSC: S 83-196, FTU-77); OSP, CST, CSC; CM
- CISTACEAE**  
*Helianthemum corymbosum* Michx. C: S&F 14-22, 14-26, E (KSC: FTU-79); OSP, CSC; CM  
*Lechea divaricata* Shuttlew. ex Britton FL-E; C: S&F 02-078, 05-110; OSP; R  
*Lechea minor* L. C: S&F 03-452, E (KSC: S 94-14, 94-20); OSP; R  
*Lechea mucronata* Raf. C: S&F 03-02; OSP; R  
*Lechea sessiliflora* Raf. C: S&F 02-075, 02-076, 02-155; OSP; UN  
*Lechea torreyi* (Chapm.) Legg. ex Britton C: S&F 03-472, E (CANA: 7276); FW, OSP; UN
- CLUSIACEAE**  
*Hypericum brachyphyllum* (Spach) Steud. C: S&F 02-165, 04-417, 04-418; FM; UN  
*Hypericum cistifolium* Lam. C: S&F 04-323, 04-560, E (CANA: 7339); FM, MH, FW; UN  
*Hypericum galioides* Lam. C: S&F 03-477; FM; R  
*Hypericum gentianoides* (L.) Britton et al. C: S&F 02-020, 06-105; OSP, DIS; R  
*Hypericum hypericoides* (L.) Crantz. C: S&F 02-017, 04-23, E (CANA: 7340, 7341); MH, CH; CM  
*Hypericum mutilum* L. C: S&F 03-405, 04-419; FM; R  
*Hypericum tenuifolium* Pursh C: S&F 04-442, E (CANA: 7342); OSP; UN  
*Hypericum tetrapetalum* Lam. C: S&F 04-203, E (CANA: 7343); OSP, FW; CM
- COMBRETACEAE**  
*Conocarpus erectus* L. C: S&F 03-700, 10-1, E (CANA: 7277-7279); M, SM; CM  
*Laguncularia racemosa* (L.) C. F. Gaertn. C: S&F 04-349, 04-448, E (CANA: 7280); M, SM; AB
- COMMELINACEAE**  
*Callisia ornata* (Small) G. C. Tucker C: S&F 03-292; OSP; UN  
*Commelina benghalensis* L. Introd.; C: S&F 12-19; DIS; R  
*Commelina communis* L. Introd.; C: S&F 03-575; MH; R

*Commelina diffusa* Burm. f. var. *diffusa* Introd.; C: S&F 03-260, 03-398; FW; R

*Commelina erecta* L. C: S&F 02-113, 03-503, E (CANA: 7281); DIS; CM

*Tradescantia ohiensis* Raf. C: S&F 02-137, E (CANA: 7282, KSC: FTU-80); DIS; CM

#### CONVOLVULACEAE

*Cuscuta exaltata* Engelm. C: S&F 07-03; OSP; R

*Cuscuta indecora* Choisy C: S&F 04-440; DIS; R

*Cuscuta pentagona* Engelm. E (CANA: 7283, 7284); R

*Ipomoea alba* L. C: S&F 02-238, 04-335, E (CANA: 7291); CH; UN

*Ipomoea imperati* (Vahl) Griseb. C: S&F 04-447, 04-450, F 09-14; CD; UN

*Ipomoea indica* (Burm.) Merr. var. *acuminata* (Vahl) Fosberg C: S&F 02-240, E (CANA: 7285); CH; R

*Ipomoea pes-caprae* (L.) R. Br. subsp. *brasiliensis* (L.) Ooststr. C: S&F 04-449, E (CANA: 7286); CD, CST; UN

*Ipomoea purpurea* (L.) Roth Introd.; E (KSC: FTU-81); DIS; R

*Ipomoea sagittata* Poir. C: S&F 04-436, E (CANA: 7287-7290); FM, DIS; UN

*Merremia dissecta* (Jacq.) Hallier f. Introd.; C: S&F 06-82, E (CANA: 7292); DIS; UN

#### CORNACEAE

*Cornus foemina* Mill. C: S&F 04-229; MH, CH; CM

*Nyssa sylvatica* Marshall var. *biflora* (Walter) Sarg. C: S&F 04-407; FM; R

#### CRASSULACEAE

*Kalanchoe pinnata* (Lam.) Pers. Introd.; EPPC-CII; C: S&F 04-491; DIS; R

#### CUCURBITACEAE

*Melothria pendula* L. C: S&F 03-568; CH, MH; UN

*Momordica charantia* L. Introd.; EPPC-CII; C: S&F 04-380; DIS; UN

#### CYMODOCEACEAE

*Halodule wrightii* Aschers C: S&F 04-495, E (KSC: FTU-90); SG; CM

*Syringodium filiforme* Kütz. C: S&F 04-496; SG; CM

#### CYPERACEAE

*Bulbostylis barbata* (Rottb.) C. B. Clarke Introd.; C: S&F 03-451, 13-2; OSP; R

*Bulbostylis ciliatifolia* (Elliott) Fernald C: S&F 02-154, 11-104; OSP; UN

*Carex alata* Torr. C: S&F 03-432, 04-271, E (CANA: 7295); FM, DIS; UN

*Carex fissa* Mack. var. *aristata* F. J. Herm. C: S&F 03-315, 04-11; FM, DIS; UN

*Carex gigantea* Rudge C: S&K 11-111; FM; R

*Cladium jamaicense* Crantz C: S&F 04-409; FM; CM

*Cyperus croceus* Vahl E (KSC: S 84-09); MH; R

*Cyperus diffiformis* L. Introd.; E (CANA: 8012); R

*Cyperus distinctus* Steud. C: S&F 03-440; FM; UN

*Cyperus erythrorhizos* Muhl. C: S&F 03-510; MH; CM

*Cyperus esculentus* L. Introd.; C: S&F 08-55, E (KSC: FTU-93); DIS; UN

*Cyperus ligularis* L. C: S&F 03-562, 03-563, E (CANA: 8011); SM, DIS; UN

*Cyperus odoratus* L. C: S&F 02-035, 02-131, 03-463, 03-489, 03-647, 03-686, E (CANA: 7296, KSC: S 84-07); SM, FM, M, MH; CM

*Cyperus ovatus* Baldwin C: S&F 02-213, 02-231, 02-248, 03-648, 03-691, E (CANA: 7298); OSP, CST, CSC, DIS; AB

*Cyperus planifolius* Rich. C: S&F 03-564, 03-578; CST, CH; UN

*Cyperus polystachyos* Rottb. C: S&F 02-056, 03-314, 03-430, 03-688, E (CANA: 7297); FM, DIS; CM

*Cyperus strigosus* L. C: S&F 03-719; FM; R

*Cyperus tetragonus* Elliott C: S&F 02-013, 02-116, 02-138, 02-178, 02-187, 02-212, 03-595, 03-649, 03-615, 03-687, E (CANA: 7299); MH, CH; CM

*Eleocharis albida* Torr. C: S&F 03-340, 03-651; FM; UN

*Eleocharis baldwinii* (Torr.) Chapm. C: S&F 02-055, 02-152; FM; UN

*Eleocharis geniculata* (L.) Roem. & Schult. C: S&F 03-571, 04-426, E (KSC: S 93-65); FM, SM; UN

*Fimbristylis dichotoma* (L.) Vahl C: S&F 03-717; DIS; R

*Fimbristylis puberula* (Michx.) Vahl C: S&F 03-407, 03-442, 03-650; MH, FM; UN

*Fimbristylis spadicea* (L.) Vahl C: S&F 02-130, 03-574, E (CANA: 7301, KSC: S 93-66, 93-67); SM; UN

*Fuirena pumila* (Torr.) Spreng. C: S&F 02-083, 03-511, 03-549; FM; UN

*Fuirena scirpoidea* Michx. C: S&F 03-386, 03-462, 03-480, 03-560; FM; UN

*Rhynchospora colorata* (L.) H. Pfeiff. C: S&F 03-334, 03-436, E (CANA: 7300); FM; CM

*Rhynchospora fascicularis* (Michx.) Vahl C: S&F 02-074, 02-159, 03-393, 03-435, 03-449, 03-476, 03-725, 04-366, E (CANA: 7302, 7303); FM; UN

*Rhynchospora fernaldii* Gale C: S&F 03-434; OSP; R

*Rhynchospora filifolia* A. Gray C: S&F 03-715; DIS; R

*Rhynchospora grayi* Kunth C: S&F 03-394, 04-467; OSP; UN

*Rhynchospora inundata* (Oakes) Fernald C: S&F 02-034, 03-408, 03-470; FM; UN

*Rhynchospora megalocarpa* A. Gray C: S&F 04-375; OSP; UN

*Rhynchospora microcarpa* Baldwin ex A. Gray C: S&F 03-429, 03-431, 03-542, 03-716; FM, DIS; R

*Rhynchospora microcephala* (Britton) Britton ex Small C: S&F 03-450; FM; R

*Rhynchospora odorata* C. Wright ex Griseb. C: S&F 03-433, E (KSC: S 84-12); FM; R

- Rhynchospora plumosa* Elliott C: S&F 03-718, 04-361; OSP; UN
- Rhynchospora trayci* Britton C: S&F 04-406, 04-562; FM; R
- Schoenoplectus robustus* (Pursh) M. T. Strong C: S&F 02-134, 04-43, 04-44, 04-362, E (CANA: 7304); FM, SM; UN
- Scleria ciliata* Michx. var. *ciliata* C: S&F 03-391; OSP, FW; R
- Scleria ciliata* Michx. var. *pauciflora* (Muhl. ex Willd.) Kük. C: S&F 02-153, 03-422; FM; UN
- Scleria reticularis* Michx. C: S&F 03-541, 03-561; FM; UN
- Scleria triglomerata* Michx. C: S&F 02-080, 03-419, 03-420, 03-421, 03-317; OSP, CSC; CM
- Scleria verticillata* Muhl. ex Willd. C: S&F 03-131, 03-557, 03-669, 03-670, 03-671; FM; R
- Websteria confervoides* (Poir.) S. S. Hooper C: S&F 03-563; FM; R
- DIOSCOREACEAE**
- Dioscorea bulbifera* L. Introd.; EPPC-CI; C: S&F 02-102; DIS; R
- DROSERACEAE**
- Drosera brevifolia* Pursh C: S&F 03-261; FW, FM; UN
- Drosera capillaris* Poir. C: S&F 02-163; FW, FM; R
- EBENACEAE**
- Diospyros virginiana* L. C: S&F 14-32, E (CANA: 7305, KSC: S 83-28); OSP, DIS; CM
- ERICACEAE**
- Bejaria racemosa* Vent. C: S&F 14-29, E (CANA: 7306, KSC: FTU-107); FW, OSP; UN
- Gaylussacia dumosa* (Andrews) Torr. & A. Gray C: S&F 04-218; OSP; UN
- Lyonia ferruginea* (Walter) Nutt. C: S&F 04-220; OSP; CM
- Lyonia fruticosa* (Michx.) G. S. Torr. C: S&F 04-204, 14-31; OSP, FW; CM
- Lyonia lucida* (Lam.) K. Koch C: S&F 04-216; FW; CM
- Vaccinium arboreum* Marshall C: S&F 02-027, 03-351; MH; R
- Vaccinium corymbosum* L. C: S&F 03-271; MH; R
- Vaccinium darrowii* Camp C: S&F 04-305; FW; R
- Vaccinium myrsinites* Lam. C: S&F 02-162, 03-370, E (CANA: 7307); OSP, FW; CM
- Vaccinium stamineum* L. C: S&F 04-401; OSP; CM
- ERIOCAULACEAE**
- Eriocaulon compressum* Lam. C: S&F 04-372, 04-415; FM; UN
- Lachnocaulon beyrichianum* Sporl. ex Körn. C: S&F 04-390; FW; R
- Syngonanthus flavidulus* (Michx.) Ruhland C: S&F 03-287, 03-392, 03-423, 03-448, 03-475, E (CANA: 7308); FW, FM; UN
- EUPHORBIACEAE**
- Acalypha gracilens* A. Gray C: S&F 02-023, 09-38, E (KSC: S 96-88); DIS; R
- Chamaesyce bombensis* (Jacq.) Dugand C: S&F 03-579, 03-609, 03-628; CD; UN
- Chamaesyce cumulicola* Small FL-E; C: S&F 02-172, 02-210, 04-633, 05-01, 06-69, 06-80, 06-140; CD, CST, OSP, DIS; UN
- Chamaesyce hirta* (L.) Millsp. C: S&F 03-365, E (KSC: FTU-112); DIS; UN
- Chamaesyce hyssopifolia* (L.) Small C: S&F 02-093, 02-099, 02-114, 02-125, 03-333, 03-550, 03-565, 11-128, 13-3, E (CANA: 7309); DIS; CM
- Chamaesyce maculata* (L.) Small C: S&F 02-173, 02-182, 03-363, 03-610, 03-645; DIS; UN
- Chamaesyce mesembrianthemifolia* (Jacq.) Dugand C: S&F 02-169; CD; UN
- Cnidoscolus stimulosus* (Michx.) Engelm. & Gray C: S&F 04-321, E (CANA: 7310); CD, CST, DIS; AB
- Croton glandulosus* L. var. *glandulosus* C: S&F 03-621, E (CANA: 7311, KSC: S 92-38, 93-38); DIS; UN
- Croton punctatus* Jacq. C: S&F 04-452, E (CANA: 7312); CD; UN
- Poinsettia cyathophora* (Murray) Bartl. C: S&F 04-70, 10-8, E (CANA: 7313); CH, DIS; AB
- Poinsettia heterophylla* (L.) Klotzsch & Garcke ex Klotzsch C: S&F 04-438, E (KSC: FTU-113); CST, DIS; UN
- Ricinus communis* L. Introd.; EPPC-CII; C: S&F 04-346, E (CANA: 7314, 7315); DIS; R
- Stillingia sylvatica* L. C: S&F 04-202, E (KSC: S 85-14); OSP; UN
- Tragia urens* L. C: S&F 03-324; DIS; R
- FABACEAE**
- Abrus precatorius* L. Introd.; EPPC-CI; C: S&F 06-142; FW, DIS; UN
- Albizia julibrissin* Durazz. Introd.; EPPC-CI; C: S&F 06-68; DIS; R
- Alysicarpus ovalifolius* (Schumach. & Thonn.) J. Leonard Introd.; S&F 15-26; DIS; R
- Amorpha fruticosa* L. C: S&F 02-009; OSP, DIS; UN
- Apios americana* Medik. C: S&F 02-079; HS; R
- Bauhinia variegata* L. Introd.; EPPC-CI; E (KSC: S 93-07); DIS; R
- Caesalpinia bonduc* (L.) Roxb. C: S&F 07-21; CH, DIS; UN
- Canavalia rosea* (Sw.) DC. C: S&F 04-429, E (CANA: 7316, 7317); CD, CST, DIS; UN
- Centrosema virginianum* (L.) Benth. C: S&F 02-157, 03-499, E (CANA: 7318); OSP, DIS; CM
- Chamaecrista fasciculata* (Michx.) Greene C: S&F 04-209, E (CANA: 7261, 7262, 7264); OSP, FW, DIS; CM
- Chamaecrista nictitans* (L.) Moench var. *aspera* (Muhl. ex Elliott) H. S. Irwin & Barneby C: S&F 04-550, 04-566, E (CANA: 7263); OSP, DIS; CM
- Clitoria mariana* L. C: S&F 03-388, E (KSC: S 94-18, 94-19); OSP, DIS; UN



- Crotalaria pallida* Aiton var. *obovata* (G. Don) Polhill  
Introd.; C: S&F 03-643, E (KSC: Hinkle 82-21); DIS;  
UN
- Crotalaria pumila* Ortega C: S&F 03-303, 03-378, 03-385,  
03-622, E (CANA: 8013, KSC: Simon 84-37); CD, CST;  
UN
- Crotalaria purshii* DC. C: S&F 02-089, 02-208, 03-275, 03-  
332, 03-353, 03-376, 03-512, 03-608; OSP, CST, CD; CM
- Crotalaria rotundifolia* J. F. Gmel. C: S&F 03-682, E  
(CANA: 8014); OSP, CSC; UN
- Dalea feayi* (Chapm.) Barneby C: S&F 15-30, E (CANA:  
7367, KSC: FTU-131, 132); OSP; UN
- Dalea pinnata* (J. F. Gmel.) Barneby var. *adenopoda*  
(Rydb.) Barneby C: S&F 14-40, E (KSC: S 85-19); OSP,  
DIS; R
- Desmodium floridanum* Chapm. C: S&F 03-03; OSP; R
- Desmodium incanum* DC. Introd.; C: S&F 02-012, 03-538,  
E (CANA: 7319, KSC: FTU-119); DIS; CM
- Desmodium paniculatum* (L.) DC. C: S&F 02-033, 02-123,  
03-681; OSP, DIS; UN
- Desmodium strictum* (Pursh) DC. C: S&F 02-062, 02-063,  
03-453, E (KSC: FTU-121); OSP; R
- Desmodium tortuosum* (Sw.) DC. Introd.; C: S&F 02-096,  
03-502, E (CANA: 7320); DIS; R
- Desmodium triflorum* (L.) DC. Introd.; C: S&F 02-209; CD;  
R
- Erythrina herbacea* L. C: S&F 04-314, E (CANA: 7321);  
CST, CSC, OSP; AB
- Galactia eliottii* Nutt. C: S&F 04-304, E (CANA: 7322);  
OSP, DIS; CM
- Galactia volubilis* (L.) Britton C: S&F 02-011, 02-098, 02-  
124, 03-374, 03-383, E (CANA: 7323, KSC: FTU-125);  
MH, CH, DIS; AB
- Indigofera caroliniana* Mill. C: S&F 02-247, 03-395, 03-478,  
04-482; OSP; UN
- Indigofera hirsuta* L. Introd.; C: S&F 03-707, 06-131, E  
(KSC: S 85-20); DIS; UN
- Indigofera miniata* Oretaga var. *leptosepala* (Nutt. ex  
Torr. & A. Gray) B. L. Turner C: S&F 02-225, 03-368,  
03-380, 03-624, E (CANA: 8015); CD, CST; UN
- Indigofera spicata* Forssk. Introd.; C: S&F 03-357, E  
(CANA: 7324); DIS; UN
- Indigofera suffruticosa* Mill. Introd.; C: S&F 03-641, 06-01,  
13-1; OSP, DIS; UN
- Leucaena leucocephala* (Lam.) de Wit Introd.; EPPC-CII;  
C: S&F 02-189, E (CANA: 7368, 7369); CH; UN
- Lupinus diffusus* Nutt. C: S&F 04-462, 06-29; OSP; UN
- Macropitium lathyroides* (L.) Urban Introd.; E (CANA:  
7326); DIS; R
- Medicago lupulina* L. Introd.; C: S&F 03-319, 03-358, 03-  
397, 04-24, E (CANA: 8016); DIS; CM
- Medicago polymorpha* L. Introd.; E (CANA: 8017); DIS; R
- Melilotus albus* Medik. Introd.; C: S&F 03-320, E (CANA:  
7325); DIS; UN
- Melilotus indicus* (L.) All. Introd.; C: S&F 03-359; DIS; R
- Mimosa strigillosa* Torr. & A. Gray C: S&F 04-276, 04-388;  
OSP, DIS; UN
- Phaseolus polystachios* (L.) Britton et al. var. *polystachios*  
C: S&F 02-183; CST, CH; UN
- Pueraria montana* (Lour.) Merr. var. *lobata* (Willd.)  
Maesen & S. M. Almeida ex Sanjappa & Predeep.  
Introd.; EPPC-CI; C: S&F 03-501; DIS; R
- Rhynchosia cinerea* Nash C: S&F 03-04; OSP; UN
- Rhynchosia minima* (L.) DC. C: S&F 02-097, 02-220, 02-222,  
06-143, E (KSC: S&F 1-10); CD, CST, FW, DIS; UN
- Senna alata* (L.) Roxb. Introd.; C: S&F 04-396; CST; R
- Senna obtusifolia* (L.) H. S. Irwin & Barneby Introd.; C:  
S&F 04-481, 14-39; DIS; UN
- Sesbania punicea* (Cav.) Benth. Introd.; EPPC-CII; C: S&F  
04-393, E (KSC: FTU-135, 136); DIS; UN
- Sesbania vesicaria* (Jacq.) Elliott C: S&F 04-568, E (KSC:  
FTU-127); FM, DIS; UN
- Sophora tomentosa* L. var. *truncata* Torr. & A. Gray C:  
S&F 04-435, E (CANA: 7327, 7328, KSC: FTU-271);  
CST; R
- Tephrosia angustissima* Shuttlew. ex Chapm. var. *cur-  
tissii* (Small ex Rydb.) Isely FL-E; C: S&F 02-221, 03-  
373, 03-585, 03-623; CST; UN
- Trifolium repens* L. Introd.; C: S&F 04-215; DIS; R
- Vicia acutifolia* Elliott C: S&F 03-274, 03-336, 03-337, 04-  
17, E (CANA: 8018); FM, MH, DIS; CM
- Vigna luteola* (Jacq.) Benth. C: S&F 14-30, E (CANA: 7329,  
7330, KSC: S 84-08, FTU-139); MH, SM, DIS; AB
- FAGACEAE
- Quercus chapmanii* Sarg. C: S&F 04-224, 04-225, E  
(CANA: 7331); OSP; CM
- Quercus geminata* Small C: S&F 04-207; OSP; CM
- Quercus laurifolia* Michx. C: S&F 04-402; MH, CH; AB
- Quercus minima* (Sarg.) Small C: S&F 04-383, E (CANA:  
7332); FW; UN
- Quercus myrtifolia* Willd. C: S&F 04-206, E (CANA: 7333);  
OSP; CM
- Quercus pumila* Walter C: S&F 02-01, E (CANA: 7334);  
FW; R
- Quercus virginiana* Mill. C: S&F 04-211, E (CANA: 7335);  
CH, CSC, MH; AB
- GELSEMIACEAE
- Gelsemium sempervirens* (L.) W. T. Aiton C: S&F 02-188,  
03-500; CH, MH; UN
- GENTIANACEAE
- Eustoma exaltatum* (L.) Salisb. ex G. Don C: S&F 04-347,  
E (CANA: 7336); SM; UN
- Sabatia brevifolia* Raf. C: S&F 04-374; OSP, FW; R
- Sabatia campanulata* (L.) Torr. C: S&F 04-387, 04-422, 04-  
480, E (KSC: FTU-150); SM; UN
- Sabatia grandiflora* (A. Gray) Small C: S&F 02-047, 03-471,  
E (CANA: 7337); FM, FW; UN
- GERANIACEAE
- Geranium carolinianum* L. C: S&F 04-18; DIS; R

## GOODENIACEAE

- Scaevola plumieri* (L.) Vahl FL-T; C: S&F 04-40, 04-445; CD, CST; R  
*Scaevola taccada* (Gaertn.) Roxb. var. *sericea* (Vahl) H. St. John Introd.; EPPC-I; C: S, F&K 14-13; CD; R

## HAEMODORACEAE

- Lachnanthes caroliana* (Lam.) Dandy C: S&F 04-565, E (CANA: 7338); FM; UN

## HYDROCHARITACEAE

- Halophila engelmannii* Asch. ex Neumayer C: S&F 04-494; SG; CM  
*Hydrilla verticillata* (L.f.) Royle Introd.; EPPC-CI; C: S&F 04-484; FM; R  
*Limnobium spongia* (Bosc) Rich. ex Steud. C: S&F 05-117; FM, HS; UN

## HYPOXIDACEAE

- Hypoxis juncea* Sm. C: S&F 02-166, 03-266; OSP; UN

## IRIDACEAE

- Nemastylis floridana* Small FL-E; C: S&F 03-546; FM; R  
*Sisyrinchium angustifolium* Mill. C: S&F 03-264, 04-15; FM, MH; UN

## JUGLANDACEAE

- Carya floridana* Sarg. C: S&F 04-413; OSP; UN  
*Carya glabra* (Mill.) Sweet C: S&F 04-403, E (CANA: 7344, 7345); MH, CH; UN

## JUNCACEAE

- Juncus effusus* L. subsp. *solutus* (Fernald & Wiegand) Hämet-Ahti C: S&F 04-413; FM; R  
*Juncus elliotii* Chapm. C: S&F 02-059; HS; R  
*Juncus marginatus* Rostk. C: S&F 02-090, 03-341, 03-411, 03-412, 03-444, 03-445, 03-446, 03-447, 04-268, 04-367; FM, DIS; UN  
*Juncus megacephalus* M. A. Curtis C: S&F 03-461, 04-269, 04-270; FM, DIS; UN  
*Juncus repens* Michx. C: S&F 04-443; FM; UN  
*Juncus roemerianus* Scheele C: S&F 04-364, E (CANA: 8019); SM; UN  
*Juncus scirpoides* Lam. C: S&F 02-024, E (CANA: 7346, 7347); FM, DIS; R

## LAMIACEAE

- Callicarpa americana* L. C: S&F 04-324, E (CANA: 7442); CH, MH; AB  
*Clerodendrum indicum* (L.) Kuntze Introd.; C: S&F 03-659; CH, DIS; R  
*Hyptis alata* (Raf.) Shinnars C: S&F 06-87; FM, DIS; R  
*Hyptis mutabilis* (Rich.) Briq. Introd.; C: S&F 02-192, 03-607, 03-642, 05-118, E (CANA: 7348, KSC: FTU-168, 169); DIS; UN

- Monarda punctata* L. C: S&F 14-18, E (CANA: 7349); DIS; UN  
*Physostegia purpurea* (Walter) S. F. Blake C: S&F 04-427; MH; R  
*Pilobolophis rigida* (W. Bartram ex Benth.) Raf. C: S&F 07-20; OSP; R  
*Salvia coccinea* Buc'hoz ex Etl. C: S&F 02-018, E (CANA: 7350); MH, CH; CM  
*Salvia lyrata* L. C: S&F 04-34, E (CANA: 7351); DIS; CM  
*Salvia serotina* L. C: S&F 03-698; CH; R  
*Scutellaria integrifolia* L. C: S&F 03-417; FM; R  
*Teucrium canadense* L. C: S&F 04-554, 15-29, S&K 11-105, E (CANA: 7352-7354); MH, FM; UN  
*Trichostema dichotomum* L. C: S&F 04-434, E (CANA: 7355); CST, DIS; CM

## LAURACEAE

- Cassytha filiformis* L. E (KSC: S 94-33); OSP; R  
*Ocotea coriacea* (Sw.) Britton C: S&F 04-66, E (CANA: 8020); CH; R  
*Persea borbonia* (L.) Spreng. var. *borbonia* C: S&F 15-18, E (CANA: 7356, KSC: FTU-73); MH, CH; AB  
*Persea borbonia* (L.) Spreng. var. *humilis* (Nash) L. E. Kopp C: S&F 02-168; OSP; R  
*Persea palustris* (Raf.) Sarg. C: S&F 04-228; HS, MH; UN

## LENTIBULARIACEAE

- Pinguicula pumila* Michx. C: S&F 03-293; OSP; R  
*Utricularia foliosa* L. C: S&F 05-116; HS; R  
*Utricularia purpurea* Walter C: S&F 02-164, 15-9; FM; UN  
*Utricularia radiata* Small C: S&F 05-115; HS; R  
*Utricularia subulata* L. C: S&F 03-265; FM; UN

## LOASACEAE

- Mentzelia floridana* Nutt. ex Torr. & A. Gray C: S&F 04-320, E (CANA: 8021); CST, DIS; UN

## LOGANIACEAE

- Mitreola petiolata* (J. F. Gmel.) Torr. & A. Gray C: S&F 03-424, 03-469, 03-683, 04-466, 04-553, 06-111; FM; UN

## LYTHRACEAE

- Ammannia latifolia* L. C: S&F 02-040, 03-515, E (CANA: 7358); FM; UN  
*Lythrum alatum* Pursh var. *lanceolatum* (Elliott) Torr. & A. Gray ex Rothr. C: S&F 03-455; FM; R  
*Lythrum lineare* L. E (CANA: 7359); R

## MAGNOLIACEAE

- Magnolia grandiflora* L. C: S&F 04-410, 04-411, E (CANA: 7360); MH; CM

## MALVACEAE

- Kosteletzkya pentacarpos* (L.) Ledeb. C: S&F 02-115, 03-520, 03-521, 03-606, E (CANA: 7361, 7362); SM, FM; UN

- Malvastrum corchorifolium* (Desr.) Britton ex Small C: S&F 03-629; CST, DIS; R
- Pavonia spinifex* (L.) Cav. C: S&F 02-198, 02-199, 02-200, E (CANA: 7363, 7364); CH; CM
- Sida rhombifolia* L. C: S&F 02-095, E (CANA: 7366); DIS; R
- Sida ulmifolia* Mill. C: S&F 02-104, 02-121, 02-242, 03-630, E (CANA: 7365); CH, CST, DIS; CM
- Urena lobata* L. Introd.; EPPC-CI; C: S&F 04-227; MH; R
- MELASTOMATACEAE
- Rhexia mariana* L. C: S&F 03-706; FM; R
- Rhexia nuttallii* C. W. James C: S&F 02-038; FW; UN
- Rhexia petiolata* Walter C: S&F 03-460, 03-536, 15-56; FM; R
- MOLLUGINACEAE
- Mollugo verticillata* L. Introd.; C: S&F 02-108, 02-184, 04-343, 04-463, 11-132; OSP, CH, DIS; UN
- MORACEAE
- Broussonetia papyrifera* (L.) Vent. Introd.; EPPC-CII; E (KSC: FTU-184); DIS; R
- Ficus aurea* Nutt. C: S&F 03-566, 15-24; CH, CST; UN
- Morus rubra* L. C: S&F 04-26, 04-214, E (CANA: 8022); MH, CH; CM
- MYRICACEAE
- Myrica cerifera* L. C: S&F 04-214, E (CANA: 7370); HS, FM, FW, OSP, CST, CSC; AB
- MYRSINACEAE
- Ardisia escallonioides* Schiede & Deppe ex Schldl. & Cham. C: S&F 04-76, E (CANA: 7371, KSC: FTU-186); CH, MH; AB
- Myrsine cubana* A. DC. C: S&F 04-33, 04-77, 04-350, E (CANA: 7372); CH, MH, CST, CSC; AB
- MYRTACEAE
- Eugenia axillaris* (Sw.) Willd. C: S&F 04-80, 14-38, E (CANA: 7373, 7374); CH; CM
- Eugenia uniflora* L. Introd.; EPPC-CI; E (CANA: 8023); DIS; R
- Myrcianthes fragrans* (Sw.) McVaugh FL-T; C: S&F 15-23, E (CANA: 7375, 7376, KSC: S 83-197); CST, CSC, CH, MH; AB
- Psidium guajava* L. Introd.; EPPC-CI; C: S&F 03-699; DIS; R
- NARTHECIAEAE
- Aletris lutea* Small C: S&F 15-17, FW; R
- NYCTAGINACEAE
- Boerhavia diffusa* L. C: S&F 03-626, E (CANA: 7377); DIS; R
- NYMPHAEEAE
- Nymphaea capensis* Thunb. var. *zanzibariensis* (Casp.) Conrad Introd.; C: S&F 03-415, 15-59; FM; UN
- Nymphaea odorata* Sol. C: S&F 15-14, 15-27; FM; R
- OLEACEAE
- Forestiera segregata* (Jacq.) Krug & Urban C: S&F 02-101, 04-365, E (CANA: 7379); CST, CH, DIS; AB
- Osmanthus americanus* (L.) Benth. & Hook. f. ex A. Gray C: S&F 14-25, 14-42, E (CANA: 7380, 7381, KSC: S 92-06, 92-21, 92-22); OSP, CSC; UN
- ONAGRACEAE
- Gaura angustifolia* Michx. C: S&F 03-635, 04-42, E (CANA: 7382, KSC: FTU-195); DIS; CM
- Ludwigia alata* Elliott C: S&F 02-039, 03-547; FM; R
- Ludwigia decurrens* Walter C: S&F 03-548, 03-704, 04-267; FM; UN
- Ludwigia erecta* (L.) H. Hara C: S&F 03-400; FM; R
- Ludwigia lanceolata* Elliott C: S&F 03-705; DIS; R
- Ludwigia maritima* R. M. Harper C: S&F 03-459, 03-494, 04-460, E (CANA: 7383, 7384, KSC: FTU-196); FM; UN
- Ludwigia microcarpa* Michx. S&F 15-57; FM; R
- Ludwigia peruviana* (L.) H. Hara Introd.; EPPC-CI; C: S&F 02-129, 04-231, E (CANA: 7385); FM, DIS; UN
- Ludwigia repens* J. R. Forst. C: S&F 04-262, E (KSC: FTU-197); FM, HS; R
- Ludwigia suffruticosa* Walter C: S&F 02-158, 03-479, 15-28; FM; UN
- Oenothera humifusa* Nutt. C: S&F 03-308, E (CANA: 8024, KSC: FTU-198); CD, CST, DIS; UN
- Oenothera laciniata* Hill C: S&F 03-364, 04-437, E (CANA: 7386); DIS; UN
- ORCHIDACEAE
- Encyclia tampensis* (Lindl.) Small FL-CE; E (CANA: 8025); CH; R
- Epidendrum conopseum* R. Br. FL-CE; C: S&F 03-625; CH; UN
- Habenaria floribunda* Lindl. C: S&F 04-29, 05-111; CH, MH; R
- Pteroglossaspis cristata* (Fernald) Rolfe FL-T; C: S&F 04-468; OSP; R
- Spiranthes praecox* (Walter) S. Watson C: S&F 15-15; FW; R
- OROBANCHACEAE
- Agalinis fasciculata* (Elliott) Raf. C: S&F 02-061, 03-535; MH, FM; R
- Agalinis filifolia* (Nutt.) Raf. C: S&F 03-534, 03-558; OSP; UN
- Agalinis maritima* (Raf.) Raf. C: S&F 06-106; SM; R
- Aureolaria pectinata* (Nutt.) Pennell E (CANA: 7424); R
- Buchnera americana* L. C: S&F 04-338, E (CANA: 7426-7430); DIS; UN
- Seymeria pectinata* Pursh C: S&F 04-443; OSP; UN

## OXALIDACEAE

*Oxalis corniculata* L. C: S&F 03-285, 03-321, 03-587, E (CANA: 8026); DIS; CM

## PASSIFLORACEAE

*Passiflora incarnata* L. C: S&F 04-311, 04-373, E (CANA: 7387, KSC: FTU-199); DIS; CM

*Passiflora suberosa* L. C: S&F 04-444, E (CANA: 8027); CST, CSC; CM

## PHYLLANTHACEAE

*Phyllanthus abnormis* Baill. C: S&F 02-181; CD, CST, CH; CM

## PHYTOLACCACEAE

*Phytolacca americana* L. C: S&F 04-352, E (CANA: 7388); DIS; UN

*Rivina humilis* L. C: S&F 04-431, E (CANA: 7389); CH, DIS; UN

## PLANTAGINACEAE

*Bacopa monnieri* (L.) Pennell C: S&F 03-403, 04-342, E (CANA: 7425); SM, FM; UN

*Gratiola hispida* (Benth. ex Lindl.) Pollard C: S&F 14-23, E (CANA: 7431, KSC: FTU-258); OSP; UN

*Linaria canadensis* (L.) Chaz. C: S&F 03-282, 03-284, E (CANA: 8039, KSC: S 95-70); FM, DIS; UN

*Mecardonia acuminata* (Walter) Small subsp. *peninsularis* (Pennell) Rossow C: S&F 03-404, 06-86, S&K 12-6, E (CANA: 7432); FM, DIS; UN

*Penstemon multiflorus* (Benth.) Chapm. ex Small C: S&F 03-05, E (CANA: 7433); OSP; R

*Plantago lanceolata* L. Introd.; C: S&F 04-479; DIS; R

*Plantago virginica* L. C: S&F 03-312, 03-318, 03-361, E (CANA: 8028); DIS; CM

*Scoparia dulcis* L. C: S&F 02-045, E (CANA: 7434); OSP, DIS; R

## PLUMBAGINACEAE

*Limonium carolinianum* (Walter) Britton E: R.W. Long 2269 (USF), A.G. Shuey M0777 (USF); SM; UN

*Plumbago zeylanica* L. C: S&F 02-236, E (CANA: 7390); CH; UN

## POACEAE

*Amphicarpum muhlenbergianum* (Schult.) Hitchc. C: S&F 02-053, 02-151, 03-561, 12-23; FM; UN

*Andropogon brachystachyus* Chapm. C: S&F 02-140, 03-441, 03-710, 03-724, E (KSC: S 83-130); OSP, FM; UN

*Andropogon floridanus* Scribn. C: S&F 02-030, 02-141, 02-142, 03-163, 03-483; OSP; UN

*Andropogon glomeratus* (Walter) Britton et al. var. *glaucoptis* (Elliott) C. Mohr C: S&F 03-711; FW, DIS; R

*Andropogon glomeratus* (Walter) Britton et al. var. *hirsutior* (Hack.) C. Mohr C: S&F 03-678; FW, DIS; R

*Andropogon glomeratus* (Walter) Britton et al. var. *pumilus* (Vasey) Vasey ex L. H. Dewey C: S&F 02-103, 02-171, 02-194, 03-164, 03-637, 03-672, 03-692, 06-693, 03-694, E (CANA: 8029); FW, DIS; CM

*Andropogon gyrans* Ashe var. *gyrans* C: S&F 02-031, 02-143, E (KSC: S 83-125); OSP; UN

*Andropogon longiberbis* Hack. C: S&F 02-232, 03-584, 03-593, 03-658; CD, CST, CSC; UN

*Andropogon ternarius* Michx. C: S&F 03-713, E (KSC: S 83-126); OSP, FM; UN

*Andropogon virginicus* L. var. *decipiens* C. S. Campb. C: S&F 02-185, 03-675, 03-676, 03-677, 05-108; DIS; UN

*Andropogon virginicus* L. var. *glaucus* Hack. C: S&F 02-144, 03-674; FM; UN

*Aristida purpurascens* Poir. var. *purpurascens* C: S&F 06-136; OSP; R

*Aristida purpurascens* Poir. var. *tenuispica* (Hitchc.) Allred C: S&F 03-301, 03-552, 03-709, 03-723, 04-564, 11-133; OSP; UN

*Aristida spiciformis* Elliott C: S&F 02-032; FM; UN

*Aristida stricta* Michx. var. *beyrichiana* (Trin. & Rupr.) D. B. Ward C: S&F 04-549, 06-104; FW, OSP; UN

*Arundo donax* L. Introd. C: S&F 04-476; DIS; UN

*Axonopus fissifolius* (Raddi) Kuhl. C: S&F 03-410, 03-482, 03-498, 03-540; FM, MH; UN

*Cenchrus echinatus* L. C: S&F 02-216, 04-363, E (CANA: 7392, KSC: S 93-33, 93-34); CD, DIS; UN

*Cenchrus spinifex* Cav. C: S&F 02-081, E (CANA: 7393, KSC: FTU-208); CD, DIS; AB

*Chasmanthium laxum* (L.) H. A. Yates var. *sessiliflorum* (Poir.) Wipff & S. D. Jones C: S&F 02-014, 03-466; MH, CH; UN

*Coelorachis rugosa* (Nutt.) Nash C: S&K 11-108; E (KSC: FTU-216); FM; R

*Cynodon dactylon* (L.) Pers. Introd.; C: S&F 03-369, 03-638, E (KSC: S 92-29, 92-32); DIS; CM

*Dactyloctenium aegyptium* (L.) Willd. ex Asch. & Schweinf. Introd.; EPPC-CII; C: S&F 04-631; DIS; AB

*Dichanthelium aciculare* (Desv. ex Poir.) Gould & C. A. Clark C: S&F 02-086, 02-106, 02-176, 03-269, 03-281, 03-289, 03-311, 03-329, 03-330, 03-345, 03-347, 03-697; MH, OSP, CH; CM

*Dichanthelium acuminatum* (Sw.) Gould & C. A. Clark var. *acuminatum* C: S&F 02-092; DIS; R

*Dichanthelium commutatum* (Schult.) Gould C: S&F 02-028, 02-085, 02-107, 02-174, 02-186, 02-217, 02-281, 03-370; CH, MH; AB

*Dichanthelium dichotomum* (L.) Gould C: S&F 02-025, 02-147, 03-296, 04-199; OSP; UN

*Dichanthelium ensifolium* (Baldwin ex Elliott) Gould var. *breve* (Hitchc. & Chase) B. F. Hansen & Wunderlin C: S&F 02-026; MH; CM

*Dichanthelium ensifolium* (Baldwin ex Elliott) Gould var. *ensifolium* C: S&F 03-348; MH; R

*Dichanthelium laxiflorum* (Lam.) Gould C: S&F 03-346, 04-368; MH; R

*Dichanthelium oligosanthes* (Schult.) Gould C: S&F 03-279, 03-288; OSP; UN

- Dichantherium portoricense* (Desv. ex Ham.) B. F. Hansen & Wunderlin C: S&F 02-087, 02-218, 03-349, 03-616; CH, MH, OSP; UN
- Dichantherium scabriusculum* (Elliott) Gould & C. A. Clark C: S&F 03-356, 03-371, 03-372, 03-382; CH; UN
- Dichantherium scoparium* (Lam.) Gould C: S&F 03-280; OSP; R
- Dichantherium sphaerocarpon* (Elliott) Gould C: S&F 03-331, 04-369; MH, FW; UN
- Dichantherium strigosum* (Muhl. ex Elliott) Freckmann var. *leucoblepharis* (Trin.) Freckmann C: S&K 11-106, E (KSC: S 84-10); FW; R
- Digitaria ciliaris* (Retz.) Koeler C: S&F 02-082, 02-111, 03-485, 03-598, 03-689, 03-690, E (KSC: S 93-30, 93-31, 94-12, 94-36); CH, DIS; AB
- Digitaria filiformis* (L.) Koeler var. *filiformis* C: S&F 03-576, 03-708, 04-14, 06-141, 09-39, 11-130; OSP, FW, DIS; UN
- Distichlis spicata* (L.) Greene C: S&F 14-33, E (CANA: 7394, KSC: S 93-68, 93-69); SM; CM
- Echinochloa muricata* (P. Beauv.) Fernald C: S&F 04-425; FM; R
- Echinochloa walteri* (Pursh) A. Heller C: S&F 02-037, 03-487, 04-371; FM, HS, DIS; UN
- Eleusine indica* (L.) Gaertn. Introd.; C: S&F 02-109, 03-514; MH, DIS; UN
- Eragrostis ciliaris* (L.) R. Br. Introd.; C: S&F 02-179, 03-302; CH; R
- Eragrostis elliottii* S. Watson C: S&F 03-509, 03-522, 03-528, 03-529, 03-577, 03-601; DIS; CM
- Eragrostis hirsuta* (Michx.) Nees C: S&F 02-204, 03-668, E (KSC: S 94-24, 94-25); DIS; UN
- Eragrostis secundiflora* J. Presl subsp. *oxylepis* (Torr.) S. D. Koch C: S&F 03-597, 03-663, 12-5; DIS; UN
- Eragrostis spectabilis* (Pursh) Steud. C: S&F 02-094, 02-118, 02-175, E (KSC: FTU-214); DIS; UN
- Eremochloa ophiuroides* (Munro) Hack. Introd.; C: S&F 03-596, 03-614, 03-639, 03-662; DIS; CM
- Eriochloa michauxii* (Poir.) Hitchc. var. *michauxii* C: S&F 04-385, 06-109; DIS; R
- Eustachys glauca* Chapm. C: S&F 14-41; FM; R
- Eustachys petraea* (Sw.) Desv. C: S&F 03-322, 03-486, 14-28, E (KSC: FTU-209); MH, CST, DIS; AB
- Heteropogon melanocarpus* (Elliott) Elliott ex Benth. C: S&F 06-132; OSP; R
- Imperata cylindrica* (L.) P. Beauv. Introd.; EPPC-CI; C: S&F 04-27, 12-2; DIS; R
- Melinis repens* (Willd.) Zizka Introd.; EPPC-CI; C: S&F 14-17, E (KSC: Hinkle 82-22); DIS; CM
- Monanthochloe littoralis* Engelm. C: S, F&K 15-65; SM; R
- Oplismenus hirtellus* (L.) P. Beauv. C: S&F 02-180, 02-197; CH, MH; AB
- Panicum amarum* Elliott C: S&F 14-46, E (CANA: 8030, KSC: FTU-218); CD; UN
- Panicum anceps* Michx. C: S&F 02-019, 02-205, 03-495, 03-524, 03-525, 03-559, 12-24; FM, MH; CM
- Panicum dichotomiflorum* Michx. var. *bartowense* (Scribn. & Merr.) Fernald C: S&F 03-655; FM; R
- Panicum hemitomom* Schult. C: S&F 03-409, 03-527, 03-673, 04-487; FM; UN
- Panicum hians* Elliott C: S&F 03-473; FM; R
- Panicum longifolium* Torr. C: S&F 02-160, 03-387, 03-484; FM; UN
- Panicum maximum* Jacq. Introd.; EPPC-CII; C: S&F 05-105, 11-129; DIS; CM
- Panicum rigidulum* Bosc ex Nees C: S&F 02-084, 02-110, 02-146, S&K 12-4; FM; UN
- Panicum verrucosum* Muhl. C: S&F 02-091, 02-145, 03-526, 03-684, 12-22; FM; UN
- Panicum virgatum* L. C: S&F 02-120, 03-664; FM, DIS; UN
- Paspalum caespitosum* Flügge C: S&F 03-594; CH; R
- Paspalum conjugatum* P. J. Bergius C: S&F 03-508; MH, FM; UN
- Paspalum floridanum* Michx. C: S&F 02-117, 03-517, 03-556; FM, DIS; UN
- Paspalum notatum* Flügge var. *saurae* Parodi Introd.; C: S&F 04-313, E (CANA: 7395); DIS; AB
- Paspalum setaceum* Michx. C: S&F 02-016, 02-196, 02-214, 02-215, 03-366, 03-492, 03-493, 03-553, 03-554, 03-627, 04-428, E (KSC: S 94-16, 94-17, 94-29, 94-30); CH, MH, OSP, DIS; AB
- Paspalum urvillei* Steud. Introd.; C: S&F 02-015, E (CANA: 7396); FM, DIS; CM
- Paspalum vaginatum* Sw. C: S&F 02-132, 02-135, 03-633, E (KSC: S 84-124, 93-70, 93-71); SM, M; UN
- Pennisetum purpureum* Schumach. Introd.; EPPC-CI; C: S&F 04-628; DIS; UN
- Phragmites australis* (Cav.) Trin. ex Steud. E (KSC: FTU-226); DIS; R
- Polypogon monspeliensis* (L.) Desf. Introd.; C: S&F 03-418, 04-384, 04-424; DIS; UN
- Saccharum giganteum* (Walter) Pers. C: S&F 04-412; FM; UN
- Sacciolepis striata* (L.) Nash C: S&F 03-464, 03-661, E (KSC: S 84-123); FM; UN
- Schizachyrium scoparium* (Michx.) Nash var. *scoparium* C: S&F 02-203, 03-592, 03-712, E (KSC: FTU-203, 204); CST, DIS; UN
- Setaria corrugata* (Elliott) Schult. E (KSC: S 95-24, 95-25); OSP; R
- Setaria macrosperma* (Scribn. & Merr.) K. Schum. C: S&F 02-126, E (CANA: 8031); MH, CH; UN
- Setaria magna* Griseb. C: S&F 03-488; FM; R
- Setaria parviflora* (Poir.) Kerguelen C: S&F 02-088, 02-105, 03-465; MH, OSP, DIS; CM
- Sorghastrum secundum* (Elliott) Nash C: S&F 02-161; OSP, CSC; UN
- Sorghum halepense* (L.) Pers. Introd.; E (KSC: FTU-229); DIS; R
- Spartina alterniflora* Loisel. C: S&F 02-133, 03-634; SM; UN
- Spartina bakeri* Merr. C: S&F 04-370, E (CANA: 8032, KSC: FTU-230); SM, FM; CM
- Spartina patens* (Aiton) Muhl. E (KSC: S 93-72); CD, SM; UN

- Spartina spartinae* (Trin.) Merr. ex Hitchc. C: S&F 03-342, 07-22; SM; R
- Sphenopholis obtusata* (Michx.) Scribn. C: S&F 03-327; DIS; R
- Sporobolus indicus* (L.) R. Br. var. *indicus* Introd.; C: S&F 03-496, 03-497, 03-506, 03-551, 03-572, 03-573, 03-600, 03-612, 03-667, E (KSC: FTU-232); DIS; AB
- Sporobolus virginicus* (L.) Kunth C: S&F 02-170, 02-201, 03-569, 03-589; SM, CD; CM
- Stenotaphrum secundatum* (Walter) Kuntze C: S&F 03-513; MH, CH, DIS; CM
- Tridens flavus* (L.) Hitchc. var. *chapmanii* (Small) Shinnars C: S&F 02-119, 02-206, 02-207; CH, DIS; UN
- Triplasis purpurea* (Walter) Chapm. C: S&F 02-04, 03-586, 04-567, 12-20, E (KSC: S 96-89); CST, OSP, DIS; UN
- Tripsacum dactyloides* (L.) L. C: S&F 03-646, E (CANADA: 7398); CH, DIS; UN
- Uniola paniculata* L. C: S&F 04-397, E (CANADA: 7399); CD; CM
- Urochloa adspersa* (Trin.) R. D. Webster C: S&F 11-131, 12-18; FM, DIS; R
- Urochloa distachya* (L.) T. Q. Nguyen Introd.; C: S&F 03-613, 03-640, 03-666; CH, DIS; UN
- Urochloa fusca* (Sw.) B. F. Hansen & Wunderlin var. *reticulata* (Torr.) B. F. Hansen & Wunderlin Introd.; C: S&F 03-617; CH; R
- POLEMONIACEAE**
- Ipomopsis rubra* (L.) Wherry C: S&F 14-47, E (CANADA: 7400, KSC: S 83-198); CST, OSP; UN
- Phlox drummondii* Hook. Introd.; C: S&F 04-194; DIS; R
- POLYGALACEAE**
- Polygala cruciata* L. C: S&F 06-102; FW; R
- Polygala incarnata* L. C: S&F 02-072; OSP; UN
- Polygala lutea* L. C: S&F 15-16; FW; R
- Polygala nana* (Michx.) DC. C: S&F 04-336, E (KSC: FTU-238); OSP; UN
- Polygala rugelii* Shuttlew. ex Chapm. C: S&F 04-223, E (CANADA: 7403); FM; UN
- Polygala setacea* Michx. C: S&F 02-073; OSP; UN
- Polygala violacea* Aubl. C: S&F 02-177, 02-229, 03-298, 03-354, 03-396, 03-456, E (CANADA: 7401, 7402, KSC: FTU-235); CST, CSC; CM
- POLYGONACEAE**
- Coccoloba uvifera* (L.) L. C: S&F 14-48, E (CANADA: 7404, 7405, KSC: FTU-241); CD, CST; UN
- Polygonella gracilis* Meisn. C: S&F 14-21, E (KSC: S 85-21); OSP; R
- Polygonum hydropiperoides* Michx. C: S&F 02-043, 04-198; FM; UN
- Polygonum punctatum* Elliott C: S&F 02-127, 03-402, 03-491, 03-533, 03-679, 04-337; FM; UN
- Polygonum scandens* L. var. *cristatum* (Engelm. & A. Gray) Gleason C: S&F 06-133; DIS; R
- Rumex hastatulus* Baldwin C: S&F 04-196; OSP, DIS; R
- Rumex verticillatus* L. C: S&F 03-310, 04-358; MH, HS, DIS; UN
- PONTERIACEAE**
- Pontederia cordata* L. C: S&F 04-404; FM; UN
- PORTULACACEAE**
- Portulaca pilosa* L. C: S&F 04-306, E (CANADA: 7409); OSP, DIS; CM
- PROTEACEAE**
- Grevillea robusta* A. Cunn. Introd.; E (KSC: FTU-277); DIS; R
- RHAMNACEAE**
- Berchemia scandens* (Hill) K. Koch C: S&F 04-41; MH; UN
- Colubrina asiatica* (L.) Brongn. Introd.; EPPC-CI; C: S&F 14-49; CD; R
- Sageretia minutiflora* (Michx.) C. Mohr C: S&F 02-195, 02-219, 02-233, 03-632, E (CANADA: 7410); CH; CM
- RHIZOPHORACEAE**
- Rhizophora mangle* L. C: S&F 15-52, E (CANADA: 8036, KSC: Provancha s.n.); M, SM; UN
- ROSACEAE**
- Prunus angustifolia* Marshall E (KSC: FTU-247); OSP; R
- Prunus caroliniana* (Mill.) Aiton C: S&F 04-78, E (CANADA: 7411); CH, MH; CM
- Prunus persica* (L.) Batsch Introd.; E (KSC: S 93-02); MH; R
- Prunus serotina* Ehrh. C: S&F 09-10; DIS; R
- Rubus pensilvanicus* Poir. C: S&F 02-066; HS; UN
- Rubus trivialis* Michx. C: S&F 04-22; OSP, DIS; UN
- RUBIACEAE**
- Cephalanthus occidentalis* L. C: S&F 04-414; FM, HS; UN
- Chiococca alba* (L.) Hitchc. C: S&F 15-25, E (CANADA: 8037, KSC: S 83-105, 83-264, 94-28); CST, CH; CM
- Diodia teres* Walter C: S&F 04-274, E (CANADA: 7412); OSP, DIS; CM
- Diodia virginiana* L. C: S&F 03-401; FM; R
- Galium hispidulum* Michx. C: S&F 02-100, 02-230, 03-620, 03-695, 04-263, 04-464; CH, MH, DIS; CM
- Galium tinctorium* L. C: S&F 03-335, 04-47, 04-394; MH, DIS; UN
- Houstonia procumbens* (J. F. Gmel.) Standl. C: S&F 03-276, 03-294, 03-355, E (CANADA: 8038); OSP, CSC; UN
- Mitracarpus hirtus* (L.) DC. Introd.; C: S&F 03-537; FM; R
- Oldenlandia corymbosa* L. Introd.; C: S&F 02-202; DIS; R
- Oldenlandia uniflora* L. C: S&F 02-029, 02-049; MH; UN
- Pentodon pentandrus* (Schumach. & Thonn.) Vatke C: S&F 04-555; MH; R
- Psychotria nervosa* Sw. C: S&F 04-330, 04-470, E (CANADA: 7415); CH, MH; AB
- Psychotria sulzneri* Small C: S&F 04-471, E (KSC: S 83-172); CH, MH; UN

- Richardia brasiliensis* Gomes Introd.; C: S&F 04-461, E (KSC: S 92-22); DIS; R
- Spermacoce remota* Lam. C: S&F 03-532, 03-644; DIS; UN
- RUPPIACEAE
- Ruppia maritima* L. C: S&F 04-497; SG; CM
- RUSCACEAE
- Sansevieria hyacinthoides* (L.) Druce Introd.; EPPC-CII; C: S&F 04-488; DIS; R
- RUTACEAE
- Amyris elemifera* L. C: S&F 02-223, 02-239, 03-367, E (CANA: 7416); CH; CM
- Citrus xaurantium* L. Introd.; C: S&F 04-472, 04-473, E (CANA: 7417); MH, CH, DIS; CM
- Zanthoxylum clava-herculis* L. C: S&F 04-315, E (CANA: 7418); OSP, CSC, CST, DIS; AB
- Zanthoxylum fagara* (L.) Sarg. C: S&F 04-328, E (CANA: 7419, 7420); CH, MH; CM
- SALICACEAE
- Salix caroliniana* Michx. C: S&F 04-32, E (CANA: 7421); HS, FM; UN
- SAMOLACEAE
- Samolus ebracteatus* Kunth C: S&F 03-304, E (CANA: 8034, KSC: FTU-244, 245); SM; UN
- Samolus valerandi* L. subsp. *parviflorus* (Raf.) Hulten C: S&F 02-128, 03-262, 04-19, 04-423, E (CANA: 8035); FM, HS, MH; CM
- SAPINDACEAE
- Acer rubrum* L. C: S&F 04-230; HS, MH; UN
- Exothea paniculata* (Juss.) Radlk. ex T. Durand C: S&F 04-68, E (KSC: S 83-262); CH; UN
- SAPOTACEAE
- Sideroxylon foetidissimum* Jacq. C: S&F 04-69; CH; R
- Sideroxylon reclinatorum* subsp. *reclinatum* Michx. E (KSC: S 84-11); FW; R
- Sideroxylon tenax* L. C: S&F 11-14, E (CANA: 7422, 7423, KSC: FTU-255); CST, CSC, OSP; CM
- SMILACACEAE
- Smilax auriculata* Walter C: S&F 04-217, E (CANA: 7436); CST, CSC, OSP, FW; AB
- Smilax bona-nox* L. C: S&F 03-655; CH; R
- SOLANACEAE
- Capsicum frutescens* L. Introd.; C: S&F 02-235, E (CANA: 8042); CH; R
- Lycium carolinianum* Walter C: S&F 03-581, 04-75, S, F&K 15-64, E (CANA: 8041); SM, CH; CM
- Physalis pubescens* L. E (CANA: 7437); R
- Physalis walteri* Nutt. C: S&F 04-210, 14-36, E (CANA: 7438); OSP, CST, CSC, DIS; AB
- Solanum americanum* Mill. C: S&F 03-297, 04-21; CH, OSP, DIS; UN
- Solanum chenopodioides* Lam. C: S&F 04-20, S&K 11-10, E (CANA: 8043); OSP, DIS; UN
- TETRACHONDRAEAE
- Polypremum procumbens* L. C: S&F 02-046, 03-457, E (CANA: 7357); OSP, DIS; UN
- TURNERACEAE
- Piriqueta cistoides* (L.) Griseb. subsp. *caroliniana* (Walter) Arbo C: S&F 04-334, E (CANA: 7439, KSC: S 85-15); MH, DIS; UN
- TYPHACEAE
- Typha domingensis* Pers. C: S&F 04-399; FM; UN
- Typha latifolia* L. C: S&F 04-386; FM; R
- ULMACEAE
- Ulmus americana* L. C: S&F 04-234; MH, HS; CM
- URTICACEAE
- Boehmeria cylindrica* (L.) Sw. C: S&F 02-042, E (CANA: 7441); MH, HS; UN
- Parietaria praetermissa* Hinton C: S&F 04-79, 04-339; CH, DIS; UN
- VERBENACEAE
- Glandularia maritima* (Small) Small FL-E; C: S&F 04-37, E (CANA: 7450, 7451); CST, CSC, MH; CM
- Lantana camara* L. Introd.; EPPC-CI; C: S&F 04-310, E (CANA: 7452); DIS; CM
- Lantana depressa* Small var. *floridana* (Moldenke) R. W. Sanders FL-E; C: S&F 03-305, 03-306, 03-379, 04-433, 05-81, 06-145; CST, CSC; UN
- Phyla nodiflora* (L.) Greene C: S&F 14-34, E (CANA: 7453); DIS; AB
- Verbena scabra* Vahl C: S&F 02-060, 03-567; CH, DIS; UN
- VIOLACEAE
- Viola sororia* Willd. C: S&F 03-263, 04-45; MH; UN
- VISCACEAE
- Phoradendron leucarpum* (Raf.) Reveal & M. C. Johnst. E (KSC: S 92-18, 92-19, 92-20); OSP; R
- VITACEAE
- Ampelopsis arborea* (L.) Koehne C: S&F 04-232, 04-432, E (CANA: 7443, 7449); MH, CST, DIS; CM
- Cissis trifoliata* (L.) L. C: S&F 02-234, 04-454, E (CANA: 7444); CST, CH; CM
- Parthenocissus quinquefolia* (L.) Planch. C: S&F 04-213, E (CANA: 7445); MH, CH, CST; AB

*Vitis aestivalis* Michx. C: S&F 04-477, E (CANA: 7446);  
CH; R

*Vitis rotundifolia* Michx. C: S&F 04-307, E (CANA: 7447);  
OSP, FW, CSC, CH, DIS; AB

*Vitis shuttleworthii* House C: S&F 04-233, 04-478, E  
(CANA: 8033); CH, MH, OSP, DIS; AB

#### XIMENIACEAE

*Ximenia americana* L. C: S&F 04-382, E (CANA: 7378);  
OSP, CSC; CM

#### XYRIDACEAE

*Xyris brevifolia* Michx. C: S&F 03-267, 03-268, 03-272, 03-  
291, 03-343, 03-344, 03-539; OSP, FM; UN

*Xyris caroliniana* Walter C: S&F 03-468, E (CANA: 7448);  
OSP; UN

*Xyris elliotii* Chapm. C: S&F 03-389, 03-390, 03-474; FM; R

*Xyris fimbriata* Elliott C: S&F 03-545; FM; R

*Xyris flabeliformis* Kral C: S&F 03-290; FM; R

*Xyris jupicai* Rich. C: S&F 02-051, 02-052, 02-148, 02-149,  
03-467, 03-543, 03-559, 03-714; FM; UN

*Xyris platylepis* Chapm. C: S&F 02-150, 03-544; FM; UN

*Xyris smalliana* Nash C: S&F 03-481; FM; R

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