

A Floristic Survey and Rare Plant Assessment of
Caloosahatchee Creeks Preserve, Lee County, Florida
Final Report

Steven W. Woodmansee and Steven E. Green
Woodmansee@regionalconservation.org

December 8, 2006



Submitted by
The Institute for Regional Conservation
22601 S.W. 152 Avenue, Miami, Florida 33170
George D. Gann, Executive Director



Submitted to
Cathy Olson
Conservation 2020 Land Stewardship Supervisor
Lee County Parks & Recreation
3410 Palm Beach Boulevard
Fort Myers, Florida 33916

Table of Contents

Introduction	03
Study Design	03
Results	03
Acknowledgements	05
Table 1: The Vascular Plants of Caloosahatchee Creeks Preserve	06
Table 2: The Vascular Plants of Caloosahatchee Creeks Preserve, by Genus	21
Table 3: The Rare Plants of Caloosahatchee Creeks Preserve	40
Table 4: The Rare Plant locations at Caloosahatchee Creeks Preserve	41
Table 5: The Florida Exotic Pest Plant Council (FLEPPC) Plants of Caloosahatchee Creeks Preserve	45
Appendix 1: The Rare Plants of Caloosahatchee Creeks Preserve	47
Appendix 2: The Habitats of Caloosahatchee Creeks Preserve	54
Figure 1: Rare Plants of Caloosahatchee Creeks Preserve Overview	69
Figure 2: Rare Plants of Caloosahatchee Creeks Preserve Western Outparcels	70
Figure 3: Rare Plants of Caloosahatchee Creeks Preserve West of I-75	71
Figure 4: Rare Plants of Caloosahatchee Creeks Preserve East of I-75	72
Figure 5: Rare Plants of Caloosahatchee Creeks Preserve Eastern Outparcel	73
Citations	74

Cover photo: Rough skullcap (*Scutellaria integrifolia*), a species once listed as Historical in South Florida by IRC, is now listed as Critically Imperiled in South Florida as a result of its discovery at Caloosahatchee Creeks Preserve. Photos were taken by primary author.

Introduction:

Lee County Parks and Recreation manages the 1,290 acre Caloosahatchee Creeks Preserve (CCP). Lee County possessed very little floristic data on CCP including floristic inventories, lists of rare plant species, lists of exotic species, or status of rare plant species. The Institute for Regional Conservation (IRC) was contracted to provide these data to Lee County for this property.

Methods:

Before visits were made, an IRC biologist coordinated with Lee County staff for any maps, habitat maps, or plant list data for CCP. CCP was visited in each of the seasons by two IRC biologists January 31st, February 1st, April 25th&27th, August 2nd-3rd, and October 18th-19th, 2006. An attempt was made to visit all areas of CCP over the entire study period. At each visit a list of plants was developed and augmented for CCP, existing plant data was reviewed, and these species were sought after with special attention being paid toward rare plants. Taxonomy followed Wunderlin (1998) or Gann et al. (2001-2006). After the second survey date, population sizes on a log₁₀ scale were estimated for all vascular plant species encountered. Population sizes were amended as necessary during subsequent visits. Population estimates are for non cultivated mature adults and do not include seedlings or saplings.

During each visit an attempt was made to visit all habitats for the site as well as new ones encountered. A list of plants for each habitat was made. Habitat guidelines followed Florida Natural Areas Inventory (FNAI) (FNAI & DNR, 1992) and The Institute for Regional Conservation (Gann et al., 2001-2006).

Throughout the study, locations of rare plants were sought after. Plants were considered rare if they were listed by any of the following agencies: The United States Fish and Wildlife Service (USFWS) (FNAI, 2006), The Florida Department of Agriculture and Consumer Services (FDACS) (Coile & Garland, 2001), FNAI (2006), and/or IRC (Gann et al., 2001-2006). When rare plants were encountered, habitat, population size, and plant associates were recorded. Latitudinal and longitudinal coordinates were also recorded for each rare plant population with a Global Positioning System (GPS) device. During surveys if a rare plant species was found to occupy large non-discrete areas, the recording GPS coordinates desisted, and the plant species was recorded as throughout.

In addition to a checklist, plants were collected for herbarium vouchers during this study. Native plants collected met strict criteria. Collections encompassed less than 5% of the population for herbaceous species or 5% of an entire individual for woody species. If determinations could not be made in the field, plants were new to Lee County, or documentation of unusual species was deemed important plants were vouchered. Special attention was paid toward those species which were new or important records for Lee County, or invasive exotic plants which are poorly documented. Exotic plant species are those determined to have become naturalized in Florida after 1492 (post Columbus) or species outside their historic range. Primary herbarium voucher collections were deposited in part at Fairchild Tropical Botanic Garden Herbarium (FTG) in Coral Gables, FL. Duplicate specimens were housed at FTG and are to be deposited at The University of South Florida Herbarium (USF) and other registered herbaria.

Results:

Within the CCP, a total of 518 native and naturalized plant species were recorded in our surveys. An additional 18 plants not recorded during these surveys were reported from an unpublished plant

list provided by Lee County staff (Anonymous, 2005). Of these, five are thought to be false records (*Dalbergia bronnei*, *Galium pilosum*, *Krameria lanceolata*, *Pinus clausa*, and *Taxodium distichum*), one is considered to be doubtful at the site (*Cenchrus gracillimus*), and the remaining nine are assumed to be present despite searches (Table 2). The reports of *Dalbergia bronnei*, *Galium pilosum*, and *Taxodium distichum* may have been misidentifications of the more common *Dalbergia ecastaphyllum*, *Galium hispidulum*, and *Taxodium ascendens* respectively, all absent from the original list. A different taxonomic system which lumps the two *Taxodiums* may also be a reason for treating *T. distichum* as a false record. *Krameria lanceolata* and *Pinus clausa* are two distinct species which have not been documented for Lee County, and would be unusual to CCP. Despite searches for these two highly recognizable species, they were never encountered by IRC staff. On the southwest coast of Florida, *Cenchrus gracillimus* has not been collected south of Sarasota County (Wunderlin & Hansen, 2004), and although there is habitat (scrubby and mesic flatwoods) for this species, its occurrence is listed as doubtful.

With the inclusion of the additional 12 reported species (Anonymous, 2005) a total of 530 plants were present or assumed present for CCP (Tables 1 & 2). Of these 406 (77%) are considered native to Lee County, two species are doubtfully native (<1%), and 119 (23%) are considered exotic and naturalized. Of the 406 native plants at CCP, 29 (7%) are ruderal (species typical of disturbance only), and occur predominantly in disturbance areas. The two plant species which are doubtfully native to CCP are *Juniperus virginiana* and *Wolffia columbiana*. A single 40 foot tall tree of *Juniperus virginiana* was observed on the edge of mesic hammock and mesic flatwoods. As this species is commonly cultivated nearby, it is unknown whether the germplasm of this individual arrived from plants in cultivation or those naturally occurring along the gulfcoast to the north, therefore it is best to treat the occurrence of this species as doubtfully native. Gann et al. (2001-2006) report *Wolffia columbiana*'s nativity to Florida as doubtful. Of the 119 naturalized exotic species found on the preserve, 54 were considered ruderal or potentially invasive and not invading any natural area of which 19 were listed as invasive or potentially invasive by the Florida Exotic Pest Plant Council (FLEPPC) (tables 2 & 5). Sixty-five exotic plant species were found to be invading intact habitat, of which 37 vascular plants were listed as invasive or potentially invasive by the FLEPPC (Tables 2 & 5). An additional three exotic species, *Ananas comosus*, *Hibiscus rosa-sinensis* var. *schizopetalus*, and *Mangifera indica* were found to be only cultivated at CCP (Table 2).

No plant species listed by the U.S.F.W.S. were recorded. Eleven plant species listed by FDACS either as commercially exploited, threatened, or endangered were recorded. Five plant species listed by FNAI in Florida were recorded. Two species listed by both FDACS and FNAI are not native to CCP. *Roystonea regia* is listed as endangered by FDACS and as imperiled (S2) by FNAI, however, its presence at CCP as well as Lee County is outside of its historic native range, and it is presumed to have been naturalized here from nearby cultivated material. Similarly, *Swietenia mahagoni*, listed as threatened by FDACS, and rare (S3) by FNAI, is even further from its native range on the southern tip of peninsular Florida and Upper Florida Keys. Both species are listed as not native and invasive at CCP. Thirteen plant species considered Critically Imperiled (SF1) in South Florida by IRC (Gann et al, 2001-2006) were recorded. A total of 22 rare plant species native to CCP were recorded (Tables 3 & 4), 5% of the total native plant species recorded. Descriptions, history, and management recommendations for each rare species are provided in Appendix 1.

A total of 13 habitats were surveyed during this study. Habitats surveyed included: coastal berm, depression marsh, disturbed upland, disturbed wetland, floodplain swamp, freshwater tidal swamp, hydric hammock, mesic flatwoods, mesic hammock, scrubby flatwoods, shell mound, strand swamp,

and tidal marsh. Descriptions for each habitat including management recommendations are provided in Appendix 2.

The compiled plant list is provided in two formats. Table 1 provides a list of vascular plants (excluding false or doubtful records) recorded at the site arranged by group, family, and then genus/species. Common names and native status are also provided here. It is recommended that this table be used for distribution. Table 2 provides a list of all vascular plants recorded or reported at the site arranged by genus/species with common names. In Table 2, presence, native status, cultivated status, state status, FNAI status, IRC status, FLEPPC status, habitat location, and collector/collector # are provided. Also in Table 2, population size estimates on a \log_{10} scale of all native and naturalized species recorded by IRC staff are noted. Table 3 provides a list of rare plants recorded at the site. Table 4 provides a list of rare species with GPS coordinates in decimal degrees for discrete locations, and a description of where the plants were observed. It is recommended that Table 4 not be used for distribution. Table 5 provides a list of FLEPPC species recorded at the site.

A total of 89 vascular plant collections were made at the preserve and included 86 vascular plant species.

An electronic copy of this report and a plant list with the above information as well as Invasive Status (ruderal, potentially invasive, etc.) in Microsoft Access format is also provided and also includes herbarium label data for all plants collected.

Acknowledgements:

As with any research endeavor, the authors are indebted to others for their contribution to this project. Hearty thanks go out to Lee County staff Jim Green who assisted with field work and or transportation. Stephen Hodges of IRC assisted with field work and plant collections. Kirsten Hines of IRC assisted with edits. George Wilder provided help with rare species records.

Table 1
The Vascular Plants of
Caloosahatchee Creeks Preserve



The Institute for Regional Conservation
 Miami, Florida

Compiled from an anonymous plant list (Anonymous, 2005) provided by Lee County staff and field observations made by IRC staff: Steven W. Woodmansee and Steven E. Green on January 31st, February 1st, April 25th, 27th, and August 2nd-3rd, 2006 and Steven W. Woodmansee and Stephen Hodges on October 18th -19th, 2006

Dicots

Acanthaceae

- | | | |
|---|-----------------------------|--|
| E | <i>Blechnum pyramidatum</i> | Green shrimpplant, Browne's blechnum |
| | <i>Ruellia succulenta</i> | Thickleaf wild petunia |
| E | <i>Ruellia tweediana</i> | Britton's wild petunia, Mexican bluebell |

Aceraceae

- | | | |
|--|--------------------|-----------|
| | <i>Acer rubrum</i> | Red maple |
|--|--------------------|-----------|

Aizoaceae

- | | | |
|--|--------------------------------|---|
| | <i>Sesuvium portulacastrum</i> | Perennial sea-purslane, Shoreline seapurslane |
|--|--------------------------------|---|

Amaranthaceae

- | | | |
|---|------------------------------------|--|
| E | <i>Achyranthes aspera</i> | Common Devil's-horsewhip |
| E | <i>Alternanthera philoxeroides</i> | Alligatorweed |
| | <i>Amaranthus australis</i> | Southern water-hemp, Southern amaranth |
| E | <i>Amaranthus blitum</i> | Purple amaranth |
| E | <i>Gomphrena serrata</i> | Globe-amaranth |
| | <i>Iresine diffusa</i> | Bloodleaf, Juba's bush |

Anacardiaceae

- | | | |
|----|---------------------------------|--------------------|
| CE | <i>Mangifera indica</i> | Mango |
| | <i>Rhus copallinum</i> | Winged sumac |
| E | <i>Schinus terebinthifolius</i> | Brazilian-pepper |
| | <i>Toxicodendron radicans</i> | Eastern poison-ivy |

Annonaceae

- | | | |
|--|---------------------------|------------------------------|
| | <i>Annona glabra</i> | Pond-apple |
| | <i>Asimina reticulata</i> | Common pawpaw, Netted pawpaw |

Apiaceae

- | | | |
|--|------------------------------|---|
| | <i>Centella asiatica</i> | Coinwort, Spadeleaf |
| | <i>Cicuta maculata</i> | Spotted water-hemlock |
| | <i>Eryngium aromaticum</i> | Fragrant eryngium, Fragrant Eryngo |
| | <i>Eryngium baldwinii</i> | Baldwin's eryngo |
| | <i>Eryngium yuccifolium</i> | Button snakeroot, Button rattlenakemaster |
| | <i>Hydrocotyle umbellata</i> | Manyflower marshpennywort |

<i>Hydrocotyle verticillata</i>	Whorled marshpennywort
<i>Ptilimnium capillaceum</i>	Mock bishopsweed, Herbwilliam
<u>Apocynaceae</u>	
<i>Rhabdadenia biflora</i>	Mangrove rubbervine, Mangrovevine
<u>Aquifoliaceae</u>	
<i>Ilex cassine</i>	Dahoon holly, Dahoon
<i>Ilex glabra</i>	Gallberry, Inkberry
<u>Araliaceae</u>	
E <i>Schefflera actinophylla</i>	Australian umbrellatree
<u>Asclepiadaceae</u>	
E <i>Asclepias curassavica</i>	Scarlet milkweed, Bloodflower
<i>Asclepias pedicellata</i>	Savannah milkweed
<i>Cynanchum scoparium</i>	Hairnetvine, Leafless swallowwort
<i>Sarcostemma clausum</i>	Whitevine, White twinevine
<u>Asteraceae</u>	
<i>Ageratina jucunda</i>	Hammock snakeroot
<i>Ambrosia artemisiifolia</i>	Common ragweed
<i>Aster carolinianus</i>	Climbing aster
<i>Aster subulatus</i>	Annual saltmarsh aster
<i>Baccharis angustifolia</i>	Narrowleaved groundsel, Saltwater Falsewillow
<i>Baccharis glomeruliflora</i>	Silverling
<i>Baccharis halimifolia</i>	Saltbush, Groundsel tree, Sea-myrtle
<i>Baldwinia angustifolia</i>	Yellow-buttons, Coastalplain Honeycombhead
<i>Bidens alba</i> var. <i>radiata</i>	Spanish-needles
<i>Carphephorus corymbosus</i>	Florida paintbrush, Coastalplain chaffhead
<i>Carphephorus odoratissimus</i> var. <i>subtropicanus</i>	Pineland purple, False vanillaleaf
<i>Chromolaena odorata</i>	Jack-in-the-bush
<i>Cirsium nuttallii</i>	Nuttall's thistle
<i>Conyza canadensis</i> var. <i>pusilla</i>	Dwarf Canadian horseweed
<i>Coreopsis floridana</i>	Florida tickseed
<i>Coreopsis leavenworthii</i>	Leavenworth's tickseed
<i>Eclipta prostrata</i>	False-daisy
<i>Elephantopus elatus</i>	Florida elephant's-foot, Tall elephant's-foot
E <i>Emilia fosbergii</i>	Florida tasselflower
E <i>Emilia sonchifolia</i>	Lilac tasselflower
<i>Erechtites hieracifolia</i>	Fireweed, American burnweed
<i>Erigeron quercifolius</i>	Southern-fleabane, Oakleaf fleabane
<i>Erigeron vernus</i>	Early whitetop fleabane
<i>Eupatorium capillifolium</i>	Dog-fennel
<i>Eupatorium leptophyllum</i>	Falsefennel
<i>Eupatorium mikanioides</i>	Semaphore eupatorium, Semaphore
<i>Eupatorium rotundifolium</i>	Roundleaf thoroughwort, False horehound
<i>Eupatorium serotinum</i>	Lateflowering thoroughwort
<i>Euthamia caroliniana</i>	Slender goldenrod
<i>Euthamia graminifolia</i> var. <i>hirtipes</i>	Flattop goldenrod
<i>Flaveria linearis</i>	Narrowleaf yellowtops
<i>Flaveria trinervia</i>	Annual yellowtops, Clustered yellowtops
<i>Gnaphalium falcatum</i>	Cudweed, Narrowleaf purple everlasting
<i>Gnaphalium obtusifolium</i>	Rabbit's tobacco, Sweet everlasting

<i>Helianthus angustifolius</i>	Narrowleaf sunflower, Swamp sunflower
<i>Heterotheca subaxillaris</i>	Camphorweed
<i>Liatris tenuifolia</i> var. <i>quadriflora</i>	Shortleaf gayfeather
<i>Lygodesmia aphylla</i>	Roserush
<i>Melanthera angustifolia</i>	Prairie blackanthers
<i>Mikania cordifolia</i>	Florida Keys hempvine
<i>Mikania scandens</i>	Climbing hempweed, Climbing hempvine
<i>Palafoxia feayi</i>	Feay's palafox
<i>Pectis prostrata</i>	Spreading cinchweed
<i>Pityopsis graminifolia</i>	Narrowleaf silkgrass
<i>Pluchea carolinensis</i>	Cure-for-all
<i>Pluchea foetida</i>	Stinking camphorweed
<i>Pluchea odorata</i>	Sweetscent
<i>Pluchea rosea</i>	Rosy camphorweed
<i>Pterocaulon pycnostachyum</i>	Blackroot
<i>Rudbeckia hirta</i>	Blackeyed susan
<i>Senecio glabellus</i>	Butterweed
<i>Solidago fistulosa</i>	Pinebarren goldenrod
<i>Solidago gigantea</i>	Giant goldenrod
<i>Solidago odora</i> var. <i>chapmanii</i>	Chapman's goldenrod
<i>Solidago sempervirens</i>	Seaside goldenrod
<i>Solidago stricta</i>	Narrow-leaved goldenrod, Wand goldenrod
<i>Solidago tortifolia</i>	Twistedleaf goldenrod
E <i>Sonchus asper</i>	Spiny sowthistle
<i>Verbesina virginica</i>	Frostweed, White crownbeard
<i>Vernonia blodgettii</i>	Florida ironweed
E <i>Vernonia cinerea</i>	Little ironweed
E <i>Wedelia trilobata</i>	Creeping wedelia, Creeping oxeye
E <i>Youngia japonica</i>	Rocketweed, Oriental false hawksbeard
<u>Avicenniaceae</u>	
<i>Avicennia germinans</i>	Black mangrove
<u>Bignoniaceae</u>	
<i>Campsis radicans</i>	Trumpet vine, Trumpet creeper
<u>Brassicaceae</u>	
<i>Rorippa teres</i>	Southern marsh yellowcress
<u>Buddlejaceae</u>	
<i>Polypremum procumbens</i>	Rustweed, Juniperleaf
<u>Burseraceae</u>	
<i>Bursera simaruba</i>	Gumbo-limbo
<u>Cactaceae</u>	
<i>Opuntia humifusa</i>	Pricklypear
<u>Campanulaceae</u>	
<i>Lobelia glandulosa</i>	Glade lobelia
<u>Caprifoliaceae</u>	
<i>Sambucus canadensis</i>	Elderberry, American elder
<i>Viburnum obovatum</i>	Small viburnum, Walter's viburnum

Caryophyllaceae

Drymaria cordata

West Indian chickweed, Drymary

Casuarinaceae

E *Casuarina equisetifolia*

Australian-pine, Horsetail casuarina

Cistaceae

Helianthemum corymbosum

Pinebarren frostweed

Lechea sessiliflora

Pineland pinweed

Lechea torreyi

Piedmont pinweed

Clusiaceae

Hypericum cistifolium

Roundpod St. John's-wort

Hypericum crux-andreae

St. Peter's-wort

Hypericum hypericoides

St. Andrew's-cross

Hypericum mutilum

Dwarf St. John's-wort

Hypericum reductum

Atlantic St. John's-wort

Hypericum tetrapetalum

Fourpetal St. John's-wort

Combretaceae

Laguncularia racemosa

White mangrove

Convolvulaceae

Dichondra carolinensis

Pony-foot, Carolina ponyfoot

Ipomoea alba

Common moonflowers, Moonflowers

Ipomoea indica var. *acuminata*

Ocean-blue morningglory

Ipomoea sagittata

Everglades morningglory

Cornaceae

Cornus foemina

Stiff cornel, Swamp dogwood, Stiff dogwood

Crassulaceae

E *Kalanchoe pinnata*

Common liveleaf, Cathedral bells, Life plant

Cucurbitaceae

Melothria pendula

Creeping-cucumber

E *Momordica charantia*

Wild balsam-apple, Balsampear

Ebenaceae

Diospyros virginiana

Persimmon, Common persimmon

Ericaceae

Bejaria racemosa

Tarflower

Gaylussacia dumosa

Dwarf black-huckleberry, Dwarf huckleberry

Lyonia fruticosa

Coastalplain staggerbush

Lyonia lucida

Fetterbush

Vaccinium myrsinites

Shiny blueberry

Vaccinium stamineum

Deerberry

Euphorbiaceae

Acalypha gracilens

Slender threeseed mercury

E *Bischofia javanica*

Javanese bishopwood

Chamaesyce hirta

Hairy spurge, Pillpod sandmat

Chamaesyce hypericifolia

Eyebane, Graceful sandmat

Chamaesyce hyssopifolia

Eyebane, Hyssopleaf sandmat

Chamaesyce thymifolia

Gulf sandmat

	<i>Cnidioscolus stimulosus</i>	Tread-softly, Finger-rot, 7-minute-itch
	<i>Euphorbia polyphylla</i>	Pineland euphorbia, Lesser Florida spurge
E	<i>Manihot esculenta</i>	Tapioca
E	<i>Pedilanthus tithymaloides subsp. smallii</i>	Jacob's ladder, Devil's backbone
E	<i>Phyllanthus urinaria</i>	Chamber bitter
E	<i>Ricinus communis</i>	Castor-bean
E	<i>Sapium sebiferum</i>	Popcorn tree, Chinese tallow tree

Fabaceae

E	<i>Abrus precatorius</i>	Rosary-pea, Crab-eyes
E	<i>Acacia auriculiformis</i>	Earleaf acacia
	<i>Aeschynomene americana</i>	Shy leaf
E	<i>Albizia lebbek</i>	Woman's tongue, Rattlepod
	<i>Amorpha fruticosa</i>	Bastard indigobush, False indigobush
	<i>Apios americana</i>	Groundnut
	<i>Caesalpinia bonduc</i>	Gray nicker-bean
	<i>Canavalia rosea</i>	Beach-bean, Baybean, Seaside jackbean
	<i>Centrosema virginianum</i>	Spurred butterfly-pea
	<i>Chamaecrista fasciculata</i>	Partridge pea
	<i>Chamaecrista nictitans var. aspera</i>	Hairy sensitive-pea, Hairy partridge-pea
E	<i>Crotalaria pallida var. obovata</i>	Smooth rattlebox
	<i>Crotalaria rotundifolia</i>	Rabbitbells
E	<i>Crotalaria spectabilis</i>	Showy rattlebox
	<i>Dalbergia ecastaphyllum</i>	Coinvine
	<i>Desmodium incanum</i>	Beggar's-ticks
	<i>Desmodium paniculatum</i>	Panicled leaf ticktrefoil
E	<i>Desmodium triflorum</i>	Threeflower ticktrefoil
E	<i>Enterolobium contortisiliquum</i>	Earpod tree
	<i>Erythrina herbacea</i>	Coralbean, Cherokee bean
	<i>Galactia elliotii</i>	Elliott's milkpea
	<i>Galactia regularis</i>	Eastern milkpea
	<i>Galactia volubilis</i>	Downy milkpea
E	<i>Indigofera birsuta</i>	Hairy indigo
E	<i>Indigofera spicata</i>	Creeping indigo, Trailing indigo
E	<i>Leucaena leucocephala</i>	White lead tree
E	<i>Macroptilium lathyroides</i>	Wild-bean, Wild bushbean
E	<i>Pongamia pinnata</i>	Karum tree, Poonga-oil tree
E	<i>Senna alata</i>	Candlestick plant
E	<i>Senna pendula var. glabrata</i>	Valamuerto
	<i>Sesbania herbacea</i>	Danglepod
E	<i>Sesbania punicea</i>	False-rattlebox
	<i>Vicia acutifolia</i>	Sand vetch, Fourleaf vetch
	<i>Vigna luteola</i>	Cow-pea, Hairypod cowpea

Fagaceae

	<i>Quercus chapmanii</i>	Chapman's oak
	<i>Quercus geminata</i>	Sand live oak
	<i>Quercus laurifolia</i>	Laurel oak, Diamond oak
	<i>Quercus minima</i>	Dwarf live oak
	<i>Quercus myrtifolia</i>	Myrtle oak
	<i>Quercus pumila</i>	Running oak
	<i>Quercus virginiana</i>	Virginia live oak

Gentianaceae

Sabatia brevifolia
Sabatia calycina

Shortleaf rosegentian
Coastal rosegentian

Geraniaceae

Geranium carolinianum

Carolina cranesbill

Lamiaceae

Hyptis alata
E *Hyptis pectinata*
E *Hyptis spicigera*
E *Hyptis verticillata*
Piloblephis rigida
Scutellaria integrifolia
Trichostema dichotomum

Musky mint, Clustered bushmint
Comb bushmint
Marubio
John Charles
Wild pennyroyal
Rough skullcap, Helmet skullcap
Forked bluecurls

Lauraceae

Persea palustris

Swamp bay

Lentibulariaceae

Pinguicula pumila
Utricularia gibba
Utricularia subulata

Small butterwort
Cone-spur bladderwort, Humped bladderwort
Zigzag bladderwort

Loganiaceae

Mitreola petiolata

Miterwort, Lax hornpod

Lythraceae

Ammannia coccinea
Ammannia latifolia
E *Cuphea carthagenensis*
Lythrum alatum var. *lanceolatum*
Lythrum flagellare
Lythrum lineare
Rotala ramosior

Scarlet ammannia, Valley redstem
Pink redstem, Toothcup
Colombian waxweed
Winged loosestrife
Florida loosestrife
Wand loosestrife
Toothcup, Lowland rotala

Magnoliaceae

Magnolia virginiana

Sweet-bay

Malvaceae

Hibiscus furcellatus
Hibiscus grandiflorus
CE *Hibiscus rosa-sinensis* var. *schizopetalus*
Kosteletzkya virginica
Malachra urens
Sida acuta
E *Sida cordifolia*
E *Sida rhombifolia*
E *Urena lobata*

Lindenleaf rosemallow
Swamp hibiscus, Swamp rosemallow
Fringed rosemallow
Virginia saltmarsh mallow
Roadside leafbract
Common wireweed, Common fanpetals
Lima
Cuban jute, Indian hemp
Caesarweed

Melastomataceae

Rhexia cubensis
Rhexia mariana
Rhexia nuttallii

West Indian meadowbeauty
Pale meadowbeauty, Maryland meadowbeauty
Nuttall's meadowbeauty

Meliaceae

- E *Melia azedarach*
- E *Swietenia mahagoni*

Chinaberrytree
West Indian mahogany

Moraceae

- E *Ficus altissima*
- Ficus aurea*
- E *Ficus microcarpa*
- Morus rubra*

Council tree
Strangler fig, Golden fig
Laurel fig, Indian laurel
Red mulberry

Myricaceae

- Myrica cerifera*

Wax myrtle, Southern Bayberry

Myrsinaceae

- E *Ardisia elliptica*
- Ardisia escallonioides*
- Rapanea punctata*

Shoe-button ardisia
Marlberry
Myrsine, Colicwood

Myrtaceae

- Eugenia axillaris*
- Eugenia foetida*
- E *Eugenia uniflora*
- E *Melaleuca quinquenervia*
- Myrcianthes fragrans*
- E *Psidium cattleianum*
- E *Psidium guajava*
- E *Syzygium cumini*
- E *Syzygium jambos*

White stopper
Spanish stopper, Boxleaf stopper
Surinam-cherry
Punkt tree
Twinberry, Simpson's stopper
Strawberry guava
Guava
Jambolan-plum, Java-plum
Rose-apple, Malabar-plum

Nymphaeaceae

- Nymphaea elegans*

Blue waterlily, Tropical royalblue waterlily

Olacaceae

- Ximenia americana*

Hog-plum, Tallowwood

Oleaceae

- Forestiera segregata*
- Fraxinus caroliniana*

Florida privet, Florida swampprivet
Water ash, Carolina ash, Pop ash

Onagraceae

- Gaura angustifolia*
- Ludwigia alata*
- Ludwigia maritima*
- Ludwigia octovalvis*
- E *Ludwigia peruviana*
- Ludwigia repens*

Southern gaura, Southern beeblossum
Winged primrosewillow
Seaside primrosewillow
Mexican primrosewillow
Peruvian primrosewillow
Creeping primrosewillow

Oxalidaceae

- Oxalis corniculata*

Lady's-sorrel, Common yellow woodsorrel

Passifloraceae

- Passiflora suberosa*

Corkystem passionflower

Phytolaccaceae

- Phytolacca americana*

American pokeweed

Plantaginaceae

Plantago virginica

Southern plantain, Virginia plantain

Polygalaceae

Polygala grandiflora

Candyweed, Showy milkwort

Polygala lutea

Orange milkwort

Polygala nana

Candyroot

Polygala polygama

Racemed milkwort

Polygonaceae

Coccoloba unifera

Seagrape

Polygonella polygama

Wideleaf October flower

Polygonum densiflorum

Denseflower knotweed

Polygonum hydropiperoides

Mild water-pepper, Swamp smartweed

Polygonum punctatum

Dotted smartweed

Rumex verticillatus

Swamp dock

Primulaceae

Anagallis pumila

Florida pimpernel

Samolus ebracteatus

Water pimpernel, Limewater brookweed

Samolus valerandi subsp. parviflorus

Pineland pimpernel, Seaside brookweed

Rhizophoraceae

Rhizophora mangle

Red mangrove

Rosaceae

Rubus cuneifolius

Sand blackberry

Rubus trivialis

Southern dewberry

Rubiaceae

Cephalanthus occidentalis

Common buttonbush

Chiococca parvifolia

Pineland snowberry

Diodia teres

Poor joe, Rough buttonweed

Diodia virginiana

Buttonweed, Virginia buttonweed

Galium bispidulum

Coastal bedstraw

Hedyotis procumbens

Innocence, Roundleaf bluet

Hedyotis uniflora

Clustered mille graine

Psychotria nervosa

Shiny-leaved wild coffee

Psychotria sulzneri

Shortleaf wild coffee

Randia aculeata

White indigoberry

E *Richardia brasiliensis*

Tropical Mexican clover

Spermacoce assurgens

Woodland false buttonweed

E *Spermacoce verticillata*

Shrubby false buttonweed

Rutaceae

E *Citrus aurantium*

Sour orange

Zanthoxylum fagara

Wild-lime, Lime prickly-ash

Salicaceae

Salix caroliniana

Coastal Plain willow

Sapindaceae

E *Cupaniopsis anacardioides*

Carrotwood

Sapotaceae

Sideroxylon foetidissimum
Sideroxylon reclinatum

Wild mastic, False mastic
Recline Florida bully

Saururaceae

Saururus cernuus

Lizard's tail

Scrophulariaceae

Bacopa monnieri
Buchnera americana
Gratiola hispida
Linaria canadensis
E *Lindernia crustacea*
Lindernia grandiflora
Micranthemum glomeratum
Scoparia dulcis
Seymeria pectinata

Water hyssop, Herb-of-grace
American bluehearts
Rough hedgehyssop
Canada toadflax
Malaysian false-pimpernel
Savannah false-pimpernel
Manatee mudflower
Sweetbroom, Licoriceweed
Piedmont blacksenena

Solanaceae

E *Lycopersicon esculentum*
Physalis pubescens
Solanum americanum
E *Solanum tampicense*
E *Solanum torvum*
E *Solanum viarum*

Tomato, Garden tomato
Husk tomato
Common nightshade, American black nightshade
Aquatic soda-apple
Turkeyberry
Tropical soda-apple

Sterculiaceae

Melochia spicata

Bretonica peluda

Ulmaceae

Celtis laevigata

Sugarberry, Southern Hackberry

Urticaceae

Boehmeria cylindrica
Parietaria floridana

Button-hemp, False nettle, Bog hemp
Florida pellitory

Verbenaceae

Callicarpa americana
E *Lantana camara*
Phyla nodiflora
E *Verbena brasiliensis*
Verbena scabra

American beautyberry
Shrubverbena
Frogfruit, Turkey tangle fogfruit, Capeweed
Brazilian vervain
Harsh verbena, Sandpaper vervain

Violaceae

Viola sororia

Common blue violet

Vitaceae

Ampelopsis arborea
Cissus verticillata
Parthenocissus quinquefolia
Vitis cinerea var. *floridana*
Vitis rotundifolia
Vitis shuttleworthii

Peppervine
Possum-grape, Seasonvine
Virginia-creeper, Woodbine
Florida grape
Muscadine, Muscadine grape
Calusa grape

Gymnosperms

Cupressaceae

- DN *Juniperus virginiana* Red cedar
Taxodium ascendens Pond cypress

Pinaceae

- Pinus elliottii* var. *densa* South Florida slash pine

Monocots

Agavaceae

- E *Sansevieria hyacinthoides* Bowstring-hemp, Mother-in-laws tongue
Yucca aloifolia Spanish-bayonet, Aloe yucca

Amaryllidaceae

- Crinum americanum* Swamp-lily, Seven-sisters, String-lily
E *Crinum asiaticum* Poison bulb
Hymenocallis palmeri Alligatorlily

Araceae

- Arisaema triphyllum* Jack-in-the-pulpit
E *Colocasia esculenta* Wild taro, Dasheen, Coco-yam
E *Epipremnum pinnatum* cv. *Aureum* Golden pothos
Peltandra virginica Green arum, Green arrow arum
E *Pistia stratiotes* Water-lettuce
E *Syngonium podophyllum* Nephthytis, American evergreen
E *Xanthosoma sagittifolium* Arrowleaf elephantear

Arecaceae

- E *Phoenix reclinata* Senegal date palm
E *Roystonea regia* Royal palm, Florida royal palm
Sabal palmetto Cabbage palm
Serenoa repens Saw palmetto
E *Syagrus romanzoffiana* Queen palm
E *Washingtonia robusta* Desert palm, Washington fan palm

Bromeliaceae

- CE *Ananas comosus* Pineapple
Tillandsia balbisiana Reflexed wild-pine, Northern needleleaf
Tillandsia fasciculata var. *densispica* Stiff-leaved wild-pine, Cardinal airplant
Tillandsia recurvata Ball-moss
Tillandsia setacea Thin-leaved wild-pine, Southern needleleaf
Tillandsia usneoides Spanish-moss
Tillandsia utriculata Giant wild-pine, Giant airplant

Cannaceae

- Canna flaccida* Golden canna, Bandana-of-the-everglades

Commelinaceae

- E *Callisia repens* Basket plant, Creeping inchplant
E *Commelina diffusa* Common dayflower
Commelina erecta Whitemouth dayflower
E *Commelina gambiae* Gambian dayflower
E *Murdannia spirata* Asiatic dewflower

Cyperaceae

	<i>Bulbostylis ciliatifolia</i>	Densetuft hairsedge
	<i>Carex longii</i>	Long's sedge
	<i>Carex lupuliformis</i>	Hop sedge
	<i>Carex vexans</i>	Florida hammock sedge
	<i>Carex verrucosa</i>	Warty sedge
	<i>Cladium jamaicense</i>	Saw-grass, Jamaica swamp sawgrass
	<i>Cyperus articulatus</i>	Jointed flatsedge
	<i>Cyperus croceus</i>	Baldwin's flatsedge
	<i>Cyperus flavescens</i>	Yellow flatsedge
	<i>Cyperus haspan</i>	Haspan flatsedge
	<i>Cyperus involucratus</i>	Umbrella plant
	<i>Cyperus ligularis</i>	Swamp flatsedge
	<i>Cyperus odoratus</i>	Fragrant flatsedge
	<i>Cyperus polystachyos</i>	Manyspike flatsedge
E	<i>Cyperus pumilus</i>	Low flatsedge
	<i>Cyperus retrorsus</i>	Pinebarren flatsedge
	<i>Cyperus rotundus</i>	Nut-grass
	<i>Cyperus surinamensis</i>	Tropical flatsedge
	<i>Cyperus tetragonus</i>	Fourangle flatsedge
	<i>Eleocharis baldwinii</i>	Baldwin's spikerush, roadgrass
	<i>Eleocharis cellulosa</i>	Gulf Coast spikerush
	<i>Eleocharis interstincta</i>	Knotted spikerush
	<i>Fimbristylis autumnalis</i>	Slender fimbry
E	<i>Fimbristylis cymosa</i>	Hurricane sedge, Hurricanegrass
	<i>Fimbristylis puberula</i>	Hairy fimbry
E	<i>Fimbristylis schoenoides</i>	Ditch fimbry
	<i>Fimbristylis spadicea</i>	Marsh fimbry
E	<i>Kyllinga brevifolia</i>	Shortleaf spikesedge
E	<i>Lipocarpus aristulata</i>	Awned halfchaff sedge
	<i>Rhynchospora colorata</i>	Starrush whitetop
	<i>Rhynchospora divergens</i>	Spreading beaksedge
	<i>Rhynchospora fascicularis</i>	Fascicled Beaksedge
	<i>Rhynchospora globularis</i>	Globe beak-rush
	<i>Rhynchospora inundata</i>	Narrowfruit horned beaksedge
	<i>Rhynchospora megalocarpa</i>	Sandyfield beaksedge
	<i>Rhynchospora microcarpa</i>	Southern beaksedge
	<i>Rhynchospora miliacea</i>	Millet beaksedge
	<i>Rhynchospora odorata</i>	Fragrant beaksedge
	<i>Rhynchospora plumosa</i>	Plumed beaksedge
	<i>Scirpus robustus</i>	Saltmarsh bulrush
	<i>Scirpus tabernaemontani</i>	Softstem bulrush
	<i>Scleria georgiana</i>	Slenderfruit nutrush
	<i>Scleria triglomerata</i>	Whip nutrush
	<i>Scleria verticillata</i>	Low nutrush

Dioscoreaceae

E	<i>Dioscorea bulbifera</i>	Common air-potato
---	----------------------------	-------------------

Eriocaulaceae

	<i>Lachnocaulon anceps</i>	Whitehead bogbutton
	<i>Syngonanthus flavidulus</i>	Yellow hatpins

Haemodoraceae

Lachnanthes caroliniana

Bloodroot, Carolina redroot

Hypoxidaceae

Hypoxis wrightii

Bristleseed yellow stargrass

Iridaceae

Iris hexagona

Dixie iris, Prairie iris

E *Sisyrinchium rosulatum*

Annual blueeyed-grass

Juncaceae

Juncus effusus var. *solutus*

Soft rush

Juncus marginatus

Shore rush, Grassleaf rush

Juncus roemerianus

Black needle rush, Needle rush, Black rush

Juncus scirpoides

Needlepod rush

Juncaginaceae

Triglochin striata

Arrowgrass

Lemnaceae

Lemna obscura

Little duckweed

Lemna valdiviana

Valdivia duckweed

DN *Wolffia columbiana*

Columbian water meal

Orchidaceae

Encyclia tampensis

Florida butterfly orchid

Eulophia alta

Wild-coco

Habenaria floribunda

Rein orchid, Toothpetal false reinorchid

Habenaria quinqueseta

Longhorn false reinorchid

Spiranthes praecox

Greenvein lady's-tresses

Poaceae

Andropogon glomeratus var. *glaucopsis*

Purple bluestem

Andropogon glomeratus var. *hirsutior*

Hairy bushy bluestem

Andropogon glomeratus var. *pumilus*

Common bushy bluestem

Andropogon longiberbis

Hairy bluestem

Andropogon ternarius

Splitbeard bluestem

Andropogon virginicus

Broomsedge bluestem

Andropogon virginicus var. *decipiens*

Chalky bluestem

Andropogon virginicus var. *glaucus*

Southern wiregrass

Aristida beyrichiana

Tall threeawn

Aristida patula

Bottlebrush threeawn

Aristida spiciformis

Tropical carpetgrass, Broadleaf carpetgrass

Axonopus compressus

Common carpetgrass

Axonopus fissifolius

Big carpetgrass

Axonopus furcatus

Southern sandbur

Cenchrus echinatus

Slender sandbur

Cenchrus gracillimus

Coastal sandbur

Cenchrus incertus

Shiny woodoats

Chasmanthium nitidum

Florida false beardgrass

Chrysopogon pauciflorus

E *Cynodon dactylon*

Bermuda grass

E *Dactyloctenium aegyptium*

Crow's-foot grass, Durban crowfootgrass

Dichanthelium aciculare

Needleleaf witchgrass

	<i>Dichanthelium commutatum</i>	Variable witchgrass
	<i>Dichanthelium dichotomum</i>	Cypress witchgrass
	<i>Dichanthelium ensifolium</i>	Cypress witchgrass
	<i>Dichanthelium laxiflorum</i>	Openflower witchgrass
	<i>Dichanthelium portoricense</i>	Hemlock witchgrass
	<i>Dichanthelium strigosum</i> var. <i>glabrescens</i>	Glabrescent roughhair witchgrass
	<i>Digitaria ciliaris</i>	Southern crabgrass
E	<i>Echinochloa colona</i>	Jungle-rice
	<i>Echinochloa walteri</i>	Coast cockspur
E	<i>Eleusine indica</i>	Indian goose grass
E	<i>Eragrostis amabilis</i>	Feather love grass
E	<i>Eragrostis atrovirens</i>	Thalia love grass
	<i>Eragrostis elliottii</i>	Elliott's love grass
	<i>Eragrostis virginica</i>	Coastal love grass
E	<i>Eremochloa ophiuroides</i>	Centipede grass
	<i>Eustachys glauca</i>	Prairie fingergrass, Saltmarsh fingergrass
	<i>Eustachys petraea</i>	Common fingergrass, Pinewoods fingergrass
	<i>Imperata brasiliensis</i>	Brazilian satintail
E	<i>Imperata cylindrica</i>	Congongrass, Cogongrass
E	<i>Neyraudia reynaudiana</i>	Burmareed, Silkreed
	<i>Oplismenus hirtellus</i>	Woodsgrass, Basketgrass
	<i>Panicum dichotomiflorum</i> var. <i>bartovense</i>	Hairy fall panic grass
	<i>Panicum hemitomon</i>	Maidencane
	<i>Panicum bians</i>	Gaping panicum
E	<i>Panicum maximum</i>	Guineagrass
E	<i>Panicum repens</i>	Torpedo grass
	<i>Panicum rigidulum</i>	Redtop panicum
	<i>Panicum virgatum</i>	Switchgrass
	<i>Paspalidium geminatum</i>	Egyptian paspalidium
	<i>Paspalum conjugatum</i>	Sour paspalum, Hilograss
	<i>Paspalum dissectum</i>	Mudbank crowngrass
	<i>Paspalum floridanum</i>	Florida paspalum
	<i>Paspalum monostachyum</i>	Gulfdune paspalum
E	<i>Paspalum notatum</i>	Bahia grass
	<i>Paspalum setaceum</i>	Thin paspalum
E	<i>Paspalum urvillei</i>	Vasey grass
E	<i>Pennisetum purpureum</i>	Napier grass, Elephantgrass
	<i>Phragmites australis</i>	Common reed
E	<i>Rhynchosyris repens</i>	Rose Natalgrass
	<i>Saccharum giganteum</i>	Sugarcane plumegrass
E	<i>Sacciolepis indica</i>	Indian cupscale
	<i>Sacciolepis striata</i>	American cupscale
	<i>Schizachyrium sanguineum</i>	Crimson bluestem
	<i>Setaria parviflora</i>	Knotroot foxtail, Yellow bristlegrass
	<i>Sorghastrum secundum</i>	Lopsided Indian grass
	<i>Spartina bakeri</i>	Sand cordgrass
	<i>Sporobolus domingensis</i>	Coral dropseed
E	<i>Sporobolus indicus</i> var. <i>pyramidalis</i>	West Indian dropseed
	<i>Sporobolus junceus</i>	Pineywoods dropseed
E	<i>Stenotaphrum secundatum</i>	St. Augustine grass
	<i>Tripsacum dactyloides</i>	Eastern gamagrass, Fakahatchee grass
E	<i>Urochloa mutica</i>	Paragrass
	<i>Zizaniopsis miliacea</i>	Southern wild-rice, Giant cut-grass

Pontederiaceae

E *Eichbornia crassipes*
Pontederia cordata

Common water-hyacinth
Pickerelweed

Smilacaceae

Smilax auriculata
Smilax bona-nox
Smilax laurifolia
Smilax tamnoides

Earleaf greenbrier
Saw greenbrier
Catbrier, Laurel greenbrier, Bamboo vine
Catbrier, Bristly greenbrier, Hogbrier

Typhaceae

Typha domingensis

Southern cat-tail

Xyridaceae

Xyris brevifolia
Xyris caroliniana
Xyris difformis var. *floridana*
Xyris elliottii
Xyris smalliana

Shortleaf yelloweyed grass
Carolina yelloweyed grass
Florida yelloweyed grass
Elliott's yelloweyed grass
Small's yelloweyed grass

Pteridophytes

Azollaceae

Azolla caroliniana

Carolina Mosquito Fern

Blechnaceae

Blechnum serrulatum
Woodwardia virginica

Swamp fern, Toothed midsorus fern
Virginia chain fern

Dennstaedtiaceae

Pteridium aquilinum var. *caudatum*
Pteridium aquilinum var. *pseudocaudatum*

Lacy bracken fern
Tailed bracken fern

Nephrolepidaceae

E *Nephrolepis cordifolia*
Nephrolepis exaltata
E *Nephrolepis multiflora*

Tuberous sword fern
Wild Boston fern
Asian sword fern

Osmundaceae

Osmunda cinnamomea
Osmunda regalis var. *spectabilis*

Cinnamon fern
Royal fern

Parkeriaceae

E *Ceratopteris thalictroides*

Watersprite

Polypodiaceae

Pleobodium aureum
Pleopeltis polypodioides var. *michauciana*

Golden polypody
Resurrection fern

Psilotaceae

Psilotum nudum

Whisk-fern

Pteridaceae

Acrostichum aureum
Acrostichum danaeifolium
E *Pteris vittata*

Golden leather fern
Giant leather fern
China brake

Salviniaceae

E *Salvinia minima*

Water spangles

Thelypteridaceae

E *Thelypteris dentata*

Thelypteris kunthii

Thelypteris ovata

Thelypteris palustris var. pubescens

Downy maiden fern

Southern shield fern

Ovate maiden fern

Marsh fern

Vittariaceae

Vittaria lineata

Shoestring fern

E = Not Native to the site

EC = Not Native to the site, cultivated

DN = Doubtfully Native to the site

Table 2
The Vascular Plants of Caloosahatchee Creeks Preserve, by genus

Scientific Name	Common Names	Occurrence	Native Status	Cultivated Status	State Status	FNAI state status	FNAI global status	IRC status	FLEPPC	Estimated Population Size	Habitats											SW collector number		
											Coastal Berm	Depression Marsh	Disturbed Dry	Disturbed Wet	Floodplain Swamp	Freshwater Tidal Swamp	Hydric Hammock	Mesic Flatwoods	Mesic Hammock	Scrubby Flatwoods	Shell Mound		Strand Swamp	Tidal Marsh
<i>Abrus precatorius</i>	Rosary-pea, Crab-eyes	P	E	A					I	1,001-10,000			x					x						
<i>Acacia auriculiformis</i>	Earleaf acacia	P	E	A					I	11-100	x													
<i>Acalypha gracilens</i>	Slender threeseed mercury	P	N	A						11-100								x						1975
<i>Acer rubrum</i>	Red maple	P	N	A						101-1,000			x	x	x		x							
<i>Achyranthes aspera</i>	Common Devil's-horsewhip	P	E	A						11-100								x						1790
<i>Acrostichum aureum</i>	Golden leather fern	S	N	A	T	S3	G5																	
<i>Acrostichum danaeifolium</i>	Giant leather fern	P	N	A						100,001-1,000,000				x	x	x		x				x	x	
<i>Aeschynomene americana</i>	Shyleaf	P	N	A						101-1,000			x										x	1956
<i>Ageratina jucunda</i>	Hammock snakeroot	P	N	A						101-1,000			x				x	x						
<i>Albizia lebbek</i>	Woman's tongue, Rattlepod	P	E	A					I	11-100			x					x						
<i>Alternanthera philoxeroides</i>	Alligatorweed	P	E	A					II	101-1,000		x		x										
<i>Amaranthus australis</i>	Southern water-hemp, Southern amaranth	P	N	A						1,001-10,000		x		x									x	
<i>Amaranthus blitum</i>	Purple amaranth	P	E	A						2-10			x											1892
<i>Ambrosia artemisiifolia</i>	Common ragweed	P	N	A						100,001-1,000,000			x					x						
<i>Ammannia coccinea</i>	Scarlet ammannia, Valley redstem	P	N	A						11-100													x	
<i>Ammannia latifolia</i>	Pink redstem, Toothcup	P	N	A						11-100			x	x			x							1972

<i>Amorpha fruticosa</i>	Bastard indigobush, False indigobush	P	N	A													x	x	x			x					
<i>Ampelopsis arborea</i>	Peppervine	P	N	A									x		x			x		x							
<i>Anagallis pumila</i>	Florida pimpernel	P	N	A															x								
<i>Ananas comosus</i>	Pineapple	P	E	C																							
<i>Andropogon glomeratus var. glaucopsis</i>	Purple bluestem	P	N	A																							
<i>Andropogon glomeratus var. hirsutior</i>	Hairy bushy bluestem	P	N	A																							
<i>Andropogon glomeratus var. pumilus</i>	Common bushy bluestem	P	N	A																							
<i>Andropogon longiberbis</i>	Hairy bluestem	P	N	A																							
<i>Andropogon ternarius</i>	Splitbeard bluestem	P	N	A																							
<i>Andropogon virginicus</i>	Broomsedge bluestem	P	N	A																							
<i>Andropogon virginicus var. decipiens</i>		P	N	A																							
<i>Andropogon virginicus var. glaucus</i>	Chalky bluestem	P	N	A																							
<i>Annona glabra</i>	Pond-apple	P	N	A																							
<i>Apios americana</i>	Groundnut	P	N	A																							
<i>Ardisia elliptica</i>	Shoe-button ardisia	P	E	A																							
<i>Ardisia escallonioides</i>	Marlberry	P	N	A																							
<i>Aristida beyrichiana</i>	Southern wiregrass	P	N	A																							
<i>Aristida patula</i>	Tall threeawn	P	N	A																							
<i>Aristida spiciformis</i>	Bottlebrush threeawn	P	N	A																							
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	P	N	A																							
<i>Asclepias curassavica</i>	Scarlet milkweed, Bloodflower	P	E	A																							
<i>Asclepias pedicellata</i>	Savannah milkweed	P	N	A																							
<i>Asimina reticulata</i>	Common pawpaw, Nettle pawpaw	P	N	A																							
<i>Aster carolinianus</i>	Climbing aster	P	N	A																							
<i>Aster subulatus</i>	Annual saltmarsh aster	P	N	A																							
<i>Avicennia germinans</i>	Black mangrove	P	N	A																							
<i>Axonopus compressus</i>	Tropical carpetgrass, Broadleaf carpetgrass	P	N	A																							
<i>Axonopus fissifolius</i>	Common carpetgrass	P	N	A																							
<i>Axonopus furcatus</i>	Big carpetgrass	P	N	A																							
<i>Azolla caroliniana</i>	Carolina Mosquito Fern	P	N	A																							
<i>Baccharis angustifolia</i>	Narrowleaved groundsel, Saltwater Falsewillow	P	N	A																							

<i>Commelina diffusa</i>	Common dayflower	P	E	A					1,001-10,000			x	x			x		x			x		
<i>Commelina erecta</i>	Whitemouth dayflower	P	N	A					1,001-10,000		x	x					x	x					
<i>Commelina gambiae</i>	Gambian dayflower	P	E	A					101-1,000			x											1949
<i>Conyza canadensis var. pusilla</i>	Dwarf Canadian horseweed	P	N	A					1,001-10,000			x											
<i>Coreopsis floridana</i>	Florida tickseed	P	N	A					101-1,000			x											1957
<i>Coreopsis leavenworthii</i>	Leavenworth's tickseed	P	N	A					11-100			x											
<i>Cornus foemina</i>	Stiff cornel, Swamp dogwood, Stiff dogwood	P	N	A					1,001-10,000			x		x		x						x	
<i>Crinum americanum</i>	Swamp-lily, Seven-sisters, String-lily	P	N	A					10,001-100,000				x	x	x	x						x	x
<i>Crinum asiaticum</i>	Poison bulb	P	E	A					2-10			x											
<i>Crotalaria pallida var. obovata</i>	Smooth rattlebox	P	E	A					11-100			x											
<i>Crotalaria rotundifolia</i>	Rabbitbells	P	N	A					101-1,000			x					x						
<i>Crotalaria spectabilis</i>	Showy rattlebox	S	E	A																			
<i>Cupaniopsis anacardioides</i>	Carrotwood	P	E	A				I	0	x						x							
<i>Cuphea carthagenensis</i>	Colombian waxweed	P	E	A					11-100			x											
<i>Cynanchum scoparium</i>	Hairnetvine, Leafless swallowwort	P	N	A					101-1,000					x									
<i>Cynodon dactylon</i>	Bermuda grass	P	E	A					100,001-1,000,000			x	x										
<i>Cyperus articulatus</i>	Jointed flatsedge	P	N	A					11-100		x												
<i>Cyperus croceus</i>	Baldwin's flatsedge	P	N	A					1,001-10,000			x		x									
<i>Cyperus flavescens</i>	Yellow flatsedge	P	N	A					11-100			x											
<i>Cyperus haspan</i>	Haspan flatsedge	P	N	A					1,001-10,000			x				x					x		
<i>Cyperus involucratus</i>	Umbrella plant	P	E	A				II	11-100		x												
<i>Cyperus ligularis</i>	Swamp flatsedge	P	N	A					101-1,000			x	x			x					x		
<i>Cyperus odoratus</i>	Fragrant flatsedge	P	N	A					101-1,000			x	x			x							
<i>Cyperus polystachyos</i>	Manyspike flatsedge	P	N	A					1,001-10,000			x					x				x		1903
<i>Cyperus pumilus</i>	Low flatsedge	P	E	A					101-1,000			x											1953
<i>Cyperus retrorsus</i>	Pinebarren flatsedge	P	N	A					1,001-10,000	x		x											
<i>Cyperus rotundus</i>	Nut-grass	P	N	A					11-100			x											
<i>Cyperus surinamensis</i>	Tropical flatsedge	P	N	A					1,001-10,000			x	x										
<i>Cyperus tetragonus</i>	Fourangle flatsedge	P	N	A					11-100			x											1901
<i>Dactyloctenium aegyptium</i>	Crow's-foot grass, Durban crowfootgrass	P	E	A					101-1,000			x									x		
<i>Dalbergia brownii</i>	Brown's Indian rosewood	F	F		E				0														
<i>Dalbergia ecastaphyllum</i>	Coinvine	P	N	A					101-1,000	x		x	x			x							
<i>Desmodium incanum</i>	Beggar's-ticks	P	N	A					10,001-100,000							x					x		x

<i>Epipremnum pinnatum</i> cv. <i>Aureum</i>	Golden pothos	P	E	A					II	2-10			x														
<i>Eragrostis amabilis</i>	Feather love grass	P	E	A						11-100			x														
<i>Eragrostis atrovirens</i>	Thalia love grass	P	E	A						11-100			x														
<i>Eragrostis elliottii</i>	Elliott's love grass	P	N	A						11-100			x														
<i>Eragrostis virginica</i>	Coastal love grass	P	N	A						11-100														x			1965
<i>Erechtites hieracifolia</i>	Fireweed, American burnweed	P	N	A						1,001-10,000			x				x	x	x								
<i>Eremochloa opbiuroides</i>	Centipede grass	P	E	A						101-1,000			x														
<i>Erigeron quercifolius</i>	Southern-fleabane, Oakleaf fleabane	P	N	A						1,001-10,000			x	x													
<i>Erigeron vernus</i>	Early whitetop fleabane	P	N	A						11-100														x			
<i>Eryngium aromaticum</i>	Fragrant eryngium, Fragrant Eryngo	P	N	A						2-10															x		
<i>Eryngium baldwinii</i>	Baldwin's eryngo	P	N	A						11-100				x													
<i>Eryngium yuccifolium</i>	Button snakeroot, Button rattlenakemaster	P	N	A						11-100			x											x			
<i>Erythrina herbacea</i>	Coralbean, Cherokee bean	P	N	A						101-1,000			x		x		x	x	x					x			
<i>Eugenia acillaris</i>	White stopper	P	N	A						101-1,000	x				x		x								x		
<i>Eugenia foetida</i>	Spanish stopper, Boxleaf stopper	P	N	A						2-10															x		
<i>Eugenia uniflora</i>	Surinam-cherry	P	E	A					I	2-10	x												x				
<i>Eulophia alba</i>	Wild-coco	P	N	A						2-10			x	x													
<i>Eupatorium capillifolium</i>	Dog-fennel	P	N	A						1,001-10,000			x														
<i>Eupatorium leptophyllum</i>	Falsefennel	P	N	A						101-1,000														x			
<i>Eupatorium mikanioides</i>	Semaphore eupatorium, Semaphore thoroughwort	P	N	A						11-100			x														
<i>Eupatorium rotundifolium</i>	Roundleaf thoroughwort, False horehound	P	N	A						101-1,000			x											x			1904
<i>Eupatorium serotinum</i>	Lateflowering thoroughwort	P	N	A						10,001-100,000			x	x			x	x	x							x	
<i>Euphorbia polyphylla</i>	Pineland euphorbia, Lesser Florida spurge	P	N	A						2-10															x		
<i>Eustachys glauca</i>	Prairie fingergrass, Saltmarsh fingergrass	P	N	A						11-100				x										x			
<i>Eustachys petraea</i>	Common fingergrass, Pinewoods fingergrass	P	N	A						101-1,000			x														
<i>Euthamia caroliniana</i>	Slender goldenrod	P	N	A						101-1,000			x														
<i>Euthamia graminifolia</i> var. <i>hirtipes</i>	Flattop goldenrod	P	N	A					SF1	101-1,000			x											x			1971

<i>Iris hexagona</i>	Dixie iris, Prairie iris	P	N	A						11-100		x		x			x		x			x			
<i>Juncus effusus</i> var. <i>solutus</i>	Soft rush	P	N	A						11-100				x											
<i>Juncus marginatus</i>	Shore rush, Grassleaf rush	P	N	A						101-1,000			x												
<i>Juncus roemerianus</i>	Black needle rush, Needle rush, Black rush	P	N	A						1,001-10,000							x		x				x		
<i>Juncus scirpoides</i>	Needlepod rush	P	N	A						101-1,000			x											1897	
<i>Juniperus virginiana</i>	Red cedar	P	D	A						2-10			x						x					1976	
<i>Kalanchoe pinnata</i>	Common liveleaf, Cathedral bells, Life plant	S	E	A					II																
<i>Kosteletzkya virginica</i>	Virginia saltmarsh mallow	P	N	A						1,001-10,000				x			x						x		
<i>Krameria lanceolata</i>		F	F							0															
<i>Kyllinga brevifolia</i>	Shortleaf spikesedge	P	E	A						1,001-10,000				x											
<i>Lachnocaulon anceps</i>	Whitehead bogbutton	P	N	A						1,001-10,000			x											1833	
<i>Lachnanthes caroliniana</i>	Bloodroot, Carolina redroot	P	N	A						101-1,000			x				x			x					
<i>Laguncularia racemosa</i>	White mangrove	P	N	A						1,001-10,000				x			x						x		
<i>Lantana camara</i>	Shrubverbena	P	E	A					I	11-100			x												
<i>Lecbea sessiliflora</i>	Pineland pinweed	P	N	A						11-100			x												
<i>Lecbea torreyi</i>	Piedmont pinweed	P	N	A						11-100			x											1912	
<i>Lemna obscura</i>	Little duckweed	P	N	A						100,001-1,000,000		x		x	x										
<i>Lemna valdiviana</i>	Valdivia duckweed	P	N	A						100,001-1,000,000				x										1820	
<i>Leucaena leucocephala</i>	White leadtree	P	E	A					II	1,001-10,000	x		x				x								
<i>Liatris tenuifolia</i> var. <i>quadriflora</i>	Shortleaf gayfeather	P	N	A						11-100			x											1914	
<i>Linaria canadensis</i>	Canada toadflax	P	N	A						101-1,000								x							
<i>Lindernia crustacea</i>	Malaysian false-pimpernel	P	E	A						1,001-10,000			x					x	x						
<i>Lindernia grandiflora</i>	Savannah false-pimpernel	P	N	A						101-1,000				x										1859	
<i>Lipocarpus aristulata</i>	Awned halfchaff sedge	P	E	A						101-1,000			x											1954	
<i>Lobelia glandulosa</i>	Glade lobelia	P	N	A						2-10			x											1959	
<i>Ludwigia alata</i>	Winged primrosewillow	P	N	A						2-10								x							
<i>Ludwigia maritima</i>	Seaside primrosewillow	P	N	A						10,001-100,000									x						
<i>Ludwigia octovalvis</i>	Mexican primrosewillow	P	N	A						101-1,000			x	x				x					x	x	
<i>Ludwigia peruviana</i>	Peruvian primrosewillow	P	E	A						1,001-10,000			x	x	x				x						
<i>Ludwigia repens</i>	Creeping primrosewillow	P	N	A						101-1,000				x					x				x	x	1973
<i>Lycopersicon esculentum</i>	Tomato, Garden tomato	P	E	A						1									x						
<i>Lygodesmia apbylla</i>	Roserush	P	N	A						11-100										x					
<i>Lygodium microphyllum</i>	Small-leaf climbing fern	P	E	A					I	11-100										x					
<i>Lyonia fruticosa</i>	Coastalplain staggerbush	P	N	A						10,001-			x						x			x			

<i>Solidago odora</i> var. <i>chapmanii</i>	Chapman's goldenrod	P	N	A						1,001-10,000			x					x		x				
<i>Solidago sempervirens</i>	Seaside goldenrod	P	N	A						1,001-10,000			x	x				x						x
<i>Solidago stricta</i>	Narrow-leaved goldenrod, Wand goldenrod	P	N	A						101-1,000			x					x						
<i>Solidago tortifolia</i>	Twistedleaf goldenrod	P	N	A						11-100								x			x			
<i>Sonchus asper</i>	Spiny sowthistle	P	E	A						2-10			x					x						
<i>Sorghastrum secundum</i>	Lopsided Indian grass	P	N	A						11-100											x			
<i>Spartina bakeri</i>	Sand cordgrass	P	N	A						1,001-10,000		x	x	x				x						x
<i>Spermacoce assurgens</i>	Woodland false buttonweed	P	N	A						101-1,000			x					x						
<i>Spermacoce verticillata</i>	Shrubby false buttonweed	P	E	A						11-100			x											
<i>Spiranthes praecox</i>	Greenvein lady's-tresses	P	N	A				SF1		11-100			x											
<i>Sporobolus domingensis</i>	Coral dropseed	P	N	A						11-100			x											
<i>Sporobolus indicus</i> var. <i>pyramidalis</i>	West Indian dropseed	P	E	A						10,001- 100,000			x											
<i>Sporobolus juncens</i>	Pineywoods dropseed	P	N	A						11-100								x						
<i>Stenotaphrum secundatum</i>	St. Augustine grass	P	E	A						101-1,000			x								x			
<i>Swietenia mahagoni</i>	West Indian mahogany	P	E	A						0			x					x						1962
<i>Syagrus romanzoffiana</i>	Queen palm	P	E	A				II		0			x					x						
<i>Syngonanthus flavidulus</i>	Yellow hatpins	P	N	A						1,001-10,000			x								x			
<i>Syngonium podophyllum</i>	Nephtytis, American evergreen	P	E	A				I		11-100			x											
<i>Syzygium cumini</i>	Jambolan-plum, Java-plum	P	E	A				I		101-1,000	x			x				x	x		x			x
<i>Syzygium jambos</i>	Rose-apple, Malabar-plum	P	E	A				II		11-100											x			
<i>Taxodium ascendens</i>	Pond cypress	P	N	A						2-10								x						x
<i>Taxodium distichum</i>	Bald cypress	F	F							0														
<i>Thelypteris dentata</i>	Downy maiden fern	P	E	A						11-100								x			x			
<i>Thelypteris kunthii</i>	Southern shield fern	P	N	A						11-100			x					x			x			x
<i>Thelypteris ovata</i>	Ovate maiden fern	P	N	A						11-100								x						
<i>Thelypteris palustris</i> var. <i>pubescens</i>	Marsh fern	P	N	A						11-100								x						
<i>Tillandsia balbisiana</i>	Reflexed wild-pine, Northern needleleaf	P	N	A	T					101-1,000	x							x	x				x	x
<i>Tillandsia fasciculata</i> var. <i>densispica</i>	Stiff-leaved wild-pine, Cardinal airplant	P	N	A	E					101-1,000	x		x					x	x		x	x		
<i>Tillandsia recurvata</i>	Ball-moss	P	N	A						101-1,000	x							x	x	x	x	x	x	x
<i>Tillandsia setacea</i>	Thin-leaved wild-pine, Southern needleleaf	P	N	A						101-1,000	x							x	x	x	x	x	x	x
<i>Tillandsia usneoides</i>	Spanish-moss	P	N	A						101-1,000	x		x					x	x	x	x	x	x	x
<i>Tillandsia utriculata</i>	Giant wild-pine, Giant airplant	P	N	A	E					11-100	x		x					x	x	x			x	x
<i>Toxicodendron radicans</i>	Eastern poison-ivy	P	N	A						1,001-10,000	x		x					x			x			x

<i>Trichostema dichotomum</i>	Forked bluecurls	P	N	A						11-100			x						x					
<i>Triglochin striata</i>	Arrowgrass	P	N	A						11-100				x					x					1821
<i>Tripsacum dactyloides</i>	Eastern gamagrass, Fakahatchee grass	P	N	A						101-1,000			x	x					x					
<i>Typha domingensis</i>	Southern cat-tail	P	N	A						1,001-10,000				x					x					x
<i>Urena lobata</i>	Caesarweed	P	E	A					II	100,001- 1,000,000			x		x				x	x	x			
<i>Urochloa mutica</i>	Paragrass	P	E	A					I	1,001-10,000			x											1955
<i>Utricularia gibba</i>	Cone-spur bladderwort, Humped bladderwort	P	N	A						101-1,000		x												
<i>Utricularia subulata</i>	Zigzag bladderwort	P	N	A						11-100			x											
<i>Vaccinium myrsinites</i>	Shiny blueberry	P	N	A						1,001-10,000									x			x		
<i>Vaccinium stamineum</i>	Deerberry	P	N	A						11-100			x						x	x	x			1828
<i>Verbena brasiliensis</i>	Brazilian vervain	P	E	A						11-100			x											
<i>Verbena scabra</i>	Harsh verbena, Sandpaper vervain	P	N	A						11-100			x	x										1895
<i>Verbesina virginica</i>	Frostweed, White crownbeard	P	N	A						101-1,000			x		x				x	x	x			
<i>Vernonia blodgettii</i>	Florida ironweed	P	N	A		S3	G3			11-100											x			
<i>Vernonia cinerea</i>	Little ironweed	P	E	A						11-100												x		
<i>Viburnum obovatum</i>	Small viburnum, Walter's viburnum	P	N	A						1			x											
<i>Vicia acutifolia</i>	Sand vetch, Fourleaf vetch	P	N	A						101-1,000		x		x					x					
<i>Vigna luteola</i>	Cow-pea, Hairypod cowpea	P	N	A						1,001-10,000		x	x	x	x				x			x		x
<i>Viola sororia</i>	Common blue violet	P	N	A						2-10									x					
<i>Vitis cinerea var. floridana</i>	Florida grape	P	N	A						101-1,000					x				x				x	
<i>Vitis rotundifolia</i>	Muscadine, Muscadine grape	P	N	A						10,001- 100,000	x		x		x				x	x	x	x		
<i>Vitis shuttleworthii</i>	Calusa grape	P	N	A						11-100									x					
<i>Vittaria lineata</i>	Shoestring fern	P	N	A						1,001-10,000	x		x		x							x	x	
<i>Washingtonia robusta</i>	Desert palm, Washington fan palm	P	E	A					II	2-10			x											
<i>Wedelia trilobata</i>	Creeping wedelia, Creeping oxeye	P	E	A					II	101-1,000			x											
<i>Wolffia columbiana</i>	Columbian water meal	P	D	A						10,001- 100,000		x												1967
<i>Woodwardia virginica</i>	Virginia chain fern	P	N	A						1,001-10,000			x						x	x				
<i>Xanthosoma sagittifolium</i>	Arrowleaf elephantear	P	E	A					II	2-10			x											
<i>Ximenesia americana</i>	Hog-plum, Tallowwood	P	N	A						101-1,000	x		x		x				x	x	x			x

<i>Xyris brevifolia</i>	Shortleaf yelloweyed grass	P	N	A						101-1,000			x					x		x				
<i>Xyris caroliniana</i>	Carolina yelloweyed grass	P	N	A						101-1,000			x					x		x				
<i>Xyris difformis var. floridana</i>	Florida yelloweyed grass	P	N	A						11-100			x											
<i>Xyris elliptii</i>	Elliott's yelloweyed grass	P	N	A						101-1,000								x						
<i>Xyris smalliana</i>	Small's yelloweyed grass	P	N	A						11-100			x											
<i>Youngia japonica</i>	Rocketweed, Oriental false hawkbeard	P	E	A						11-100									x					
<i>Yucca aloifolia</i>	Spanish-bayonet, Aloe yucca	P	N	A						2-10			x					x	x			x		
<i>Zanthoxylum fagara</i>	Wild-lime, Lime prickly-ash	P	N	A						11-100									x					
<i>Zizaniopsis miliacea</i>	Southern wild-rice, Giant cut-grass	P	N	A						2-10				x				x						

Occurrence	State Status
P = Present	T = Threatened
S = Assumed present	E = Endangered
F = Recorded as present in error	C = Commercially Exploited
D = Doubtfully present	
X = Extirpated	
	FNAI State Status
	S2 = Imperiled in Florida
Native Status	S3 = Very rare or local throughout its range in Florida
N = Native	
E = Exotic (non native)	FNAI Global Status
F = Recorded as present in error	G2 = Imperiled globally
D = Doubtfully native	G3 = Either very rare and local throughout its range or found locally in a restricted range or vulnerable to extinction from other factors.
	G5 = demonstrably secure globally
Cultivated Status	
A = not cultivated	IRC status
C = cultivated	SF1 = Critically Imperiled in South Florida (SF)

FL EPPC Status
I = species that are invading and disrupting native plant communities
II = species that have shown a potential to disrupt native plant communities

Table 3
The Rare Plants of Caloosahatchee Creeks Preserve

Scientific Name	Common Names	State Status	FNAI State Status	FNAI Global Status	IRC Status	Estimated Population Size
<i>Acrostichum aureum</i>	Golden leather fern	T	S3	G5		?
<i>Anagallis pumila</i>	Florida pimpernel				SF1	2-10
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit				SF1	101-1,000
<i>Campsis radicans</i>	Trumpet vine, Trumpet creeper				SF1	101-1,000
<i>Carex verrucosa</i>	Warty sedge				SF1	2-10
<i>Chasmanthium nitidum</i>	Shiny woodoats				SF1	101-1,000
<i>Encyclia tampensis</i>	Florida butterfly orchid	C				11-100
<i>Euthamia graminifolia</i> var. <i>hirtipes</i>	Flattop goldenrod				SF1	101-1,000
<i>Hypericum crux-andreae</i>	St. Peter's-wort				SF1	11-100
<i>Lytbrum flagellare</i>	Florida loosestrife	E	S2	G2	SF1	1001-10,000
<i>Malachra urens</i>	Roadside leafbract				SF1	11-100
<i>Myrcianthes fragrans</i>	Twinberry, Simpson's stopper	T				2-10
<i>Osmunda cinnamomea</i>	Cinnamon fern	C				101-1,000
<i>Osmunda regalis</i> var. <i>spectabilis</i>	Royal fern	C				11-100
<i>Polygala polygama</i>	Racemed milkwort				SF1	1
<i>Scirpus robustus</i>	Saltmarsh bulrush				SF1	1,001-10,000
<i>Scutellaria integrifolia</i>	Rough skullcap, Helmet skullcap				SF1	11-100
<i>Spiranthes praecox</i>	Greenvein lady's-tresses				SF1	11-100
<i>Tillandsia balbisiana</i>	Reflexed wild-pine, Northern needleleaf	T				101-1,000
<i>Tillandsia fasciculata</i> var. <i>densispica</i>	Stiff-leaved wild-pine, Cardinal airplant	E				101-1,000
<i>Tillandsia utriculata</i>	Giant wild-pine, Giant airplant	E				11-100
<i>Vernonia blodgettii</i>	Florida ironweed		S3	G3		11-100

State Status	FNAI State Status
T = Threatened	S2 = Imperiled in Florida
E = Endangered	S3 = Very rare or local throughout its range in Florida
C = Commercially Exploited	
	FNAI Global Status
IRC status	G2 = Imperiled globally
SF1 = Critically Imperiled in South Florida (SF)	G3 = Either very rare and local throughout its range or found locally in a restricted range or vulnerable to extinction from other factors.
	G5 = demonstrably secure globally

Table 4
The Rare Plant Locations at Caloosahatchee Creeks Preserve

Scientific Name	CommonNames	Decimal Degrees		Estimated Population Size	Comments
		Latitude	Longitude		
<i>Acrostichum aureum</i>	Golden leather fern	0	0	?	Not observed by IRC staff, most likely would occur in Freshwater Tidal Swamp or Tidal Marsh habitats
<i>Anagallis pumila</i>	Florida pimpernel	26.7081	-81.82101	2-10	In trail and adjacent mesic flatwoods.
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	26.70953	-81.79089	101-1,000	Hydric Hammock and floodplain swamp with <i>Quercus laurifolia</i> , <i>Quercus virginiana</i> , <i>Rapanea punctata</i> , <i>Blechnum serrulatum</i> , <i>Sabal palmetto</i> , and <i>Osmunda cinnamomea</i>
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	26.71041	-81.7942	11-100	Hydric Hammock and floodplain swamp with <i>Sabalpalmetto</i> , <i>Pinus elliottii</i> , <i>Rapanea punctata</i> , <i>Blechnum serrulatum</i> , <i>Psidium cattleianum</i> , and <i>Carya aquatica</i>
<i>Campsis radicans</i>	Trumpet vine, Trumpet creeper	0	0	101-1,000	Throughout appropriate habitats on the preserve
<i>Campsis radicans</i>	Trumpet vine, Trumpet creeper	26.70342	-81.83912	11-100	Mesic to xeric hammock on river bank
<i>Campsis radicans</i>	Trumpet vine, Trumpet creeper	26.70827	-81.81993	101-1,000	Disturbed hydric hammock next to creek growing up <i>Sabal</i> palm with <i>Persea palustris</i> , <i>Quercus virginicus</i> , <i>Myrica cerifera</i> , <i>Schinus terebinthifolius</i> , and <i>Acrostichum danaeifolium</i>
<i>Campsis radicans</i>	Trumpet vine, Trumpet creeper	26.7101	-81.7917	11-100	Floodplain Swamp
<i>Carex verrucosa</i>	Warty sedge	26.70812	-81.82034	1	Hydric hammock
<i>Carex verrucosa</i>	Warty sedge	26.70839	-81.82092	1	Hydric Hammock on bank of old ditch (dominated by native plants)
<i>Chasmanthium nitidum</i>	Shiny woodoats	26.71009	-81.79173	101-1,000	Floodplain Swamp
<i>Encyclia tampensis</i>	Florida butterfly orchid	0	0	11-100	Throughout mesic hammock habitats
<i>Encyclia tampensis</i>	Florida butterfly orchid	26.70916	-81.79143	11-100	Growing on <i>Carya aquatica</i> on shell mound
<i>Euthamia graminifolia</i> <i>var. birtipes</i>	Flattop goldenrod	26.69947	-81.82471	11-100	Edge of trail next to weird <i>Pluchea rosea</i> .

<i>Euthamia graminifolia</i> <i>var. hirtipes</i>	Flattop goldenrod	26.6995	-81.81914	11-100	Mesic flatwoods
<i>Euthamia graminifolia</i> <i>var. hirtipes</i>	Flattop goldenrod	26.70002	-81.82468	11-100	In trail and in mesic flatwoods with <i>Serenoa repens</i> , <i>Vitis rotundifolia</i> , <i>Myrica cerifera</i> , <i>Quercus chapmanii</i> , <i>Baccharis halimnifolia</i> , <i>Galactia elliottii</i> , and <i>Pteridium aquilinum var. pseudocaudatum</i>
<i>Euthamia graminifolia</i> <i>var. hirtipes</i>	Flattop goldenrod	26.70406	-81.82639	11-100	Trail (disturbed upland)
<i>Euthamia graminifolia</i> <i>var. hirtipes</i>	Flattop goldenrod	26.70889	-81.79119	11-100	Disturbed pasture with <i>Rubus cuneifolia</i> , <i>Myrica cerifera</i> , <i>Andropogon</i> spp., and <i>Paspalum notatum</i>
<i>Euthamia graminifolia</i> <i>var. hirtipes</i>	Flattop goldenrod	26.71096	-81.77836	11-100	Disturbed wetland/field under powerlines on east side of preserve
<i>Hypericum crux-andreae</i>	St. Peter's-wort	26.70069	-81.82475	2-10	Edge of mesic flatwoods
<i>Hypericum crux-andreae</i>	St. Peter's-wort	26.70381	-81.82532	11-100	Fire suppressed mesic flatwoods
<i>Lytbrum flagellare</i>	Florida loosestrife	26.70216	-81.82694		Depression Marsh
<i>Lytbrum flagellare</i>	Florida loosestrife	26.70253	-81.82703		Depression Marsh
<i>Lytbrum flagellare</i>	Florida loosestrife	26.70352	-81.82705	101-1,000	Depression Marsh
<i>Lytbrum flagellare</i>	Florida loosestrife	26.70947	-81.81999	1,001-10,000	Habitat is field underneath powerline easement west of railroad tracks with reclaimed water sprinkling it on a regular basis from nearby trailer park. Growing with <i>Paspalum setaceum</i> , <i>Erigeron quercifolius</i> , <i>Centella asiatica</i> , and <i>Bacopa monnieri</i> .
<i>Malachra urens</i>	Roadside leafbract	26.70953	-81.79181	11-100	In black humus soils with adjacent limestone outcrops in coastal hydric hammock
<i>Myrcianthes fragrans</i>	Twinberry, Simpson's stopper	26.70916	-81.79143	2-10	Shell mound
<i>Osmunda cinnamomea</i>	Cinnamon fern	0	0	101-1,000	Throughout appropriate habitats
<i>Osmunda regalis var. spectabilis</i>	Royal fern	0	0	11-100	Throughout Floodplain Swamp and hydric hammock
<i>Polygala polygama</i>	Racemed milkwort	26.70071	-81.82618	1	In mesic hammock with lots of human/hog disturbance
<i>Scirpus robustus</i>	Saltmarsh bulrush	26.70728	-81.79207	1,001-10,000	Throughout coastal marshes
<i>Scutellaria integrifolia</i>	Rough skullcap, Helmet skullcap	26.70048	-81.82481	2-10	Disturbed trail running through flatwoods.
<i>Scutellaria integrifolia</i>	Rough skullcap, Helmet skullcap	26.70069	-81.82475	2-10	Edge of mesic flatwoods

<i>Scutellaria integrifolia</i>	Rough skullcap, Helmet skullcap	26.70383	-81.82556	11-100	Roadside and mesic flatwoods (fire suppressed) with <i>Serenoa repens</i> , <i>Vitis rotundifolia</i> , <i>Cyperus retrorsus</i> , <i>Sporobolus indicus</i> var. <i>pyramidalis</i> , <i>Abrus precatorius</i> , <i>Commelina erecta</i> , and <i>Polypremum procumbens</i> .
<i>Scutellaria integrifolia</i>	Rough skullcap, Helmet skullcap	26.7081	-81.82097	0	Mesic flatwoods (fire suppressed) roughly 20-30 meters from nearby creek. Growing with <i>Serenoa repens</i> , <i>Vitis rotundifolia</i> , <i>Smilax bonanox</i> , <i>Pteridium aquilinum</i> var. <i>pseudocaudatum</i> , <i>Callicarpa americana</i> , <i>Chamaecrista fasciculata</i> , <i>Scoparium dulce</i> , <i>Lyonia fruticosa</i> , <i>Quercus virginiana</i> , <i>Myrica cerifera</i> , <i>Dichanthelium strigosum</i> var. <i>glaberescens</i> , <i>Quercus laurifolia</i> , <i>Rhus copallinum</i> , <i>Galactia elliottii</i> , <i>Quercus chapmanii</i> . This record is the same population as below (coordinates: 26.70811; -81.82105)
<i>Scutellaria integrifolia</i>	Rough skullcap, Helmet skullcap	26.70811	-81.82105	11-100	Mesic flatwoods (fire suppressed) roughly 20-30 meters from nearby creek. Growing with <i>Serenoa repens</i> , <i>Vitis rotundifolia</i> , <i>Smilax bonanox</i> , <i>Pteridium aquilinum</i> var. <i>pseudocaudatum</i> , <i>Callicarpa americana</i> , <i>Chamaecrista fasciculata</i> , <i>Scoparium dulce</i> , <i>Lyonia fruticosa</i> , <i>Quercus virginiana</i> , <i>Myrica cerifera</i> , <i>Dichanthelium strigosum</i> var. <i>glaberescens</i> , <i>Quercus laurifolia</i> , <i>Rhus copallinum</i> , <i>Galactia elliottii</i> , <i>Quercus chapmanii</i> .
<i>Scutellaria integrifolia</i>	Rough skullcap, Helmet skullcap	26.7086	-81.82073	11-100	Disturbed mesic flatwoods
<i>Scutellaria integrifolia</i>	Rough skullcap, Helmet skullcap	26.71101	-81.77957	2-10	Disturbed upland under powerlines on east side of preserve
<i>Spiranthes praecox</i>	Greenvein lady's-tresses	26.70872	-81.79114	11-100	In Bahia pasture with <i>Rhexia mariana</i> , <i>Paspalum notatum</i> , and <i>Galactia elliottii</i>
<i>Tillandsia balbisiana</i>	Reflexed wild-pine, Northern needleleaf	0	0	101-1,000	Throughout preserve
<i>Tillandsia fasciculata</i> var. <i>densispica</i>	Stiff-leaved wild-pine, Cardinal airplant	0	0	101-1,000	Throughout preserve
<i>Tillandsia utriculata</i>	Giant wild-pine, Giant airplant	26.6985	-81.82482	1	Disturbed edge habitat dominated by <i>Schinus terebinthifolius</i> and <i>Acrostichum danaeifolium</i>
<i>Tillandsia utriculata</i>	Giant wild-pine, Giant airplant	26.69985	-81.83762	1	Growing on <i>Pinus elliottii</i> var. <i>densa</i>
<i>Tillandsia utriculata</i>	Giant wild-pine, Giant airplant	26.70004	-81.82458	1	Mesic flatwoods
<i>Tillandsia utriculata</i>	Giant wild-pine, Giant airplant	26.7086	-81.7915	1	On <i>Schinus terebinthifolius</i> in fire suppressed mesic flatwoods

<i>Tillandsia utriculata</i>	Giant wild-pine, Giant airplant	26.71131	-81.77824	2-10	Disturbed mesic flatwoods
<i>Vernonia blodgettii</i>	Florida ironweed	26.70031	-81.82463	11-100	Edge of mesic flatwoods
<i>Vernonia blodgettii</i>	Florida ironweed	26.70229	-81.82527	2-10	Edge of mesic flatwoods

Table 5

The Florida Exotic Pest Plant Council (FLEPPC) Plants of Caloosahatchee Creeks Preserve

Scientific Name	Common Names	FLEPPC Status	Estimated Population Size	Occurrence	Invasive Status
<i>Abrus precatorius</i>	Rosary-pea, Crab-eyes	I	1,001-10,000	P	I
<i>Acacia auriculiformis</i>	Earleaf acacia	I	11-100	P	I
<i>Albizia lebbbeck</i>	Woman's tongue, Rattlepod	I	11-100	P	I
<i>Alternanthera philoxeroides</i>	Alligatorweed	II	101-1,000	P	I
<i>Ardisia elliptica</i>	Shoe-button ardisia	I	1,001-10,000	P	I
<i>Bischofia javanica</i>	Javanese bishopwood	I	11-100	P	I
<i>Blechnum pyramidatum</i>	Green shrimpplant, Browne's blechnum	II	100,001-1,000,000	P	I
<i>Casuarina equisetifolia</i>	Australian-pine, Horsetail casuarina	I	101-1,000	P	I
<i>Colocasia esculenta</i>	Wild taro, Dasheen, Coco-yam	I	1,001-10,000	P	I
<i>Cupaniopsis anacardioides</i>	Carrotwood	I	0*	P	I
<i>Cyperus involucratus</i>	Umbrella plant	II	11-100	P	I
<i>Dioscorea bulbifera</i>	Common air-potato	I	101-1,000	P	I
<i>Eichhornia crassipes</i>	Common water-hyacinth	I	11-100	P	I
<i>Epipremnum pinnatum</i> cv. <i>Aureum</i>	Golden pothos	II	2-10	P	PI
<i>Eugenia uniflora</i>	Surinam-cherry	I	2-10	P	I
<i>Ficus altissima</i>	Council tree	II	0*	P	I
<i>Ficus microcarpa</i>	Laurel fig, Indian laurel	I	2-10	P	I
<i>Imperata cylindrica</i>	Congongrass, Cogongrass	I	11-100	P	I
<i>Kalanchoe pinnata</i>	Common liveleaf, Cathedral bells, Life plant	II	-	S	PI
<i>Lantana camara</i>	Shrubverbena	I	11-100	P	PI
<i>Leucaena leucocephala</i>	White leadtree	II	1,001-10,000	P	I
<i>Lygodium microphyllum</i>	Small-leaf climbing fern	I	11-100	P	I
<i>Melaleuca quinquenervia</i>	Punkt tree	I	101-1,000	P	I
<i>Melia azedarach</i>	Chinaberry tree	II	1	P	PI
<i>Nephrolepis cordifolia</i>	Tuberous sword fern	I	11-100	P	I

<i>Nephrolepis multiflora</i>	Asian sword fern	I	1,001-10,000	P	I
<i>Neyraudia reynaudiana</i>	Burmareed, Silkreed	I	2-10	P	PI
<i>Panicum maximum</i>	Guineagrass	II	11-100	P	R
<i>Panicum repens</i>	Torpedo grass	I	1,001-10,000	P	I
<i>Pennisetum purpureum</i>	Napier grass, Elephantgrass	I	11-100	P	PI
<i>Phoenix reclinata</i>	Senegal date palm	II	2-10	P	I
<i>Pistia stratiotes</i>	Water-lettuce	I	101-1,000	P	I
<i>Psidium cattleianum</i>	Strawberry guava	I	101-1,000	P	I
<i>Psidium guajava</i>	Guava	I	2-10	P	I
<i>Pteris vittata</i>	China brake	II	2-10	P	PI
<i>Rhynchelytrum repens</i>	Rose Natalgrass	I	101-1,000	P	PI
<i>Ricinus communis</i>	Castor-bean	II	-	S	R
<i>Ruellia tweediana</i>	Britton's wild petunia, Mexican bluebell	I	2-10	P	I
<i>Sansevieria hyacinthoides</i>	Bowstring-hemp, Mother-in-laws tongue	II	11-100	P	PI
<i>Sapium sebiferum</i>	Popcorn tree, Chinese tallow tree	I	11-100	P	I
<i>Schefflera actinophylla</i>	Australian umbrellatree	I	1	P	I
<i>Schinus terebinthifolius</i>	Brazilian-pepper	I	10,001-100,000	P	I
<i>Senna pendula var. glabrata</i>	Valamuerto	I	101-1,000	P	I
<i>Sesbania punicea</i>	False-rattlebox	II		S	R
<i>Solanum tampicense</i>	Aquatic soda-apple	I	11-100	P	I
<i>Solanum torvum</i>	Turkeyberry	II	2-10	P	PI
<i>Solanum viarum</i>	Tropical soda-apple	I	-	S	R
<i>Syagrus romanoffiana</i>	Queen palm	II	0*	P	I
<i>Syngonium podophyllum</i>	Nephtytis, American evergreen	I	11-100	P	PI
<i>Syzygium cumini</i>	Jambolan-plum, Java-plum	I	101-1,000	P	I
<i>Syzygium jambos</i>	Rose-apple, Malabar-plum	II	11-100	P	I
<i>Urena lobata</i>	Caesarweed	II	100,001-1,000,000	P	I
<i>Urochloa mutica</i>	Paragrass	I	1,001-10,000	P	PI
<i>Washingtonia robusta</i>	Desert palm, Washington fan palm	II	2-10	P	PI
<i>Wedelia trilobata</i>	Creeping wedelia, Creeping oxeye	II	101-1,000	P	PI
<i>Xanthosoma sagittifolium</i>	Arrowleaf elephantear	II	2-10	P	PI

* sapling

Appendix 1

The Rare Plants of Caloosahatchee Creeks Preserve

The following species accounts may be geo-referenced in Table 4 and Figures 1-5.

***Acrostichum aureum* (Golden leatherfern)**

Golden leatherfern is listed as threatened in Florida by the Florida Department of Agriculture and Consumer Services (FDACS) (Coile & Garland, 2004) and as rare in Florida (S3) by FNAI (2006). It is a large perennial shrub which is easily confused with the more common giant leatherfern, which is ubiquitous at Caloosahatchee Creeks Preserve (CCP). It differs in having sporangia on the underside of the frond at the distal pinna only (3-5 pairs). In addition, pairs of pinnae of golden leatherfern are spaced further apart, and unlike giant leatherfern, this species also possesses a venation pattern in which veins on the underside of the pinnae do not intersect the midvein (Tobe et al., 1998). Golden leatherfern may be locally common in freshwater, brackish, salt marshes, coastal hammocks, and mangrove swamps in southern Florida (Tobe et al., 1998). This species was reported on an anonymous plant list (2005), and despite searches through appropriate habitats at CCP, it was never encountered by IRC staff. It may occur in freshwater tidal swamp or tidal marsh plant communities at CCP. Due to the presence of large areas of these plant communities at CCP it is assumed present despite searches by the authors. Further searches for golden leatherfern should be conducted on an annual basis. If plants are found, they should be mapped and monitored on a regular basis whose intervals would be determined by rarity at CCP.

***Anagallis pumila* (Florida pimpernel)**

Florida pimpernel is ranked as Critically Imperiled in South Florida by IRC (Gann et al., 2002). This small member of the Primulaceae often goes unnoticed due to its diminutive size. It is an annual and is very rare at CCP as it was encountered only once. On February 1, 2006 a handful of plants were found in an animal trail running through mesic flatwoods. (Figure 3). In South Florida it has only been documented from Collier and Lee counties and elsewhere in Florida, Highlands County. Within Lee County, it is also known from Prairie Pines Preserve (Woodmansee & Sadle, 2004) and Yellow Fever Creek Preserve (Woodmansee & Green, report in progress). This species is typically found in mesic flatwoods, pond margins, and river banks all of which occur at CCP and may be found elsewhere at CCP with additional surveys, especially after fires, during its reproductive period in March, April or May. In addition to conducting further surveys for this species, this population should be monitored on an annual basis during its reproductive period. Should more Florida pimpernel be discovered at CCP it is recommended that this station be documented with an herbarium voucher should the population of this species be able to sustain a collection (< 20 individuals for a single plant voucher (Gann et al, 2002)). If no additional plants are found, augmenting this species to appropriate undisturbed habitats should be considered.

***Arisaema triphyllum* (Jack-in-the-pulpit)**

Jack-in-the-pulpit is ranked as Critically Imperiled in South Florida by IRC (Gann et al., 2002). This member of the Aroid family (Araceae) is easy to identify, however it is above ground seasonally. It is a perennial and is locally common at CCP. On February 1, 2006 two populations together numbering 100-1,000 plants were found in hydric hammock and floodplain swamp habitats (Figure 4). This station was documented with an herbarium voucher by Woodmansee and Green (Woodmansee, 1781, FTG). In South Florida it has been documented at a handful of conservation

areas in Palm Beach and Martin counties however it hasn't been documented from Collier and Lee counties in 15 years (Gann et al, 2002; Gann et al., 2001-2006) and currently, this is the only station from where it is known in Lee County. Jack-in-the-pulpit is common throughout the remainder of Florida (Wunderlin & Hansen, 2004). In South Florida, this species is typically found in baygall, floodplain forest, floodplain swamp and freshwater tidal swamp habitats, of which all but baygall (and floodplain forest) occur at CCP; it may be found elsewhere at CCP with additional surveys during late winter through summer. In addition to conducting further surveys for this species, this population should be monitored on an annual basis during its above ground period.

***Campsis radicans* (Trumpet vine)**

Trumpet vine is ranked as Critically Imperiled in South Florida by IRC (Gann et al., 2001-2006). It is a terrestrial climbing vine and is locally common at CCP having been found in several areas throughout most of the preserve. Although three distinct locations are listed in this report (Figures 2-4), plants were observed throughout appropriate habitats at CCP. In South Florida, this species is reported for mesic hammock habitat (Gann et al., 2002), however at CCP it was recorded in disturbed upland, floodplain swamp, hydric hammock, and shell mound habitats. Between 101 and 1,000 plants were observed by Woodmansee, Green, and Stephen Hodges throughout 2006. One of these stations was documented with an herbarium voucher by Woodmansee and Green (Woodmansee, 1891, FTG). This collection is a first for trumpet vine in Lee County. In Lee County, it is also known from Caloosahatchee Regional Park (Gann et al., 2002) and has also been recorded for Collier County at Big Cypress National Preserve and Hendry County at LaBelle Nature Park (Gann et al., 2001-2006). It has been reported for Corkscrew Swamp Sanctuary and Koreshan Historic State Park (Gann et al., 2001-2006). Trumpet vine should be monitored at CCP on a biennial basis.

***Carex verrucosa* (Warty sedge)**

Warty sedge is ranked as Critically Imperiled in South Florida by IRC (Gann et al., 2001-2006). It is a perennial terrestrial herb and is extremely rare at CCP as it was only encountered twice. On February 1, 2006 a single plant was observed by Woodmansee and Green on the bank of a ditched creek in hydric hammock and on August 2, 2006 the same observers discovered an additional plant nearby in the same hammock (Figure 4). In South Florida, warty sedge is also known from Corkscrew Swamp Sanctuary and Corkscrew Regional Ecosystem Watershed (both of which occur in Collier and Lee counties) and Big Cypress National Preserve and Picayune Strand State Forest in Collier County (Gann et al., 2001-2006). It is considered historical at J.W. Corbett Wildlife Management area in Palm Beach County. Wunderlin & Hansen (2004) list it mostly throughout elsewhere in Florida. In South Florida, this species is typically found in freshwater swamps and marshes (Gann et al., 2001-2006). Warty sedge may be found elsewhere at CCP with additional surveys during its reproductive period in spring through summer. In addition to conducting further surveys for this species, these plants should be monitored on an annual basis during its reproductive period. Should more warty sedge be discovered at CCP it is recommended that this station be documented with an herbarium voucher should the population of this species be able to sustain a collection (< 20 individuals for a single plant voucher (Gann et al, 2002)). If no additional plants are found, augmenting this species to appropriate undisturbed habitats should be considered.

***Chasmanthium nitidum* (Shiny woodoats)**

Shiny woodoats is ranked as Critically Imperiled in South Florida by IRC (Gann et al., 2001-2006). It is a perennial terrestrial herb and is locally common in floodplain swamp and hydric hammock at

CCP. On August 3, 2006, 101-1,000 plants were observed by Woodmansee and Green (Figure 4). That same day, this station was documented with an herbarium voucher (Woodmansee, 1918, FTG). Previous to this study, shiny woodoats was reported for CCP on an anonymous plant list (2005), and is newly recorded for South Florida and Lee County. A collection of Shiny woodoats was recently reported by Wilder & McCombs (2006) who listed it as occasional in Hammock, Lee (County). This record was confirmed to be the same population as the one at CCP (personal communication with George Wilder, December 7, 2006). Otherwise, the closest record of this species to this population is DeSoto County to the north (Wunderlin & Hansen, 2004). Wunderlin & Hansen (2003; 2004) list it for swamps and floodplain forests and report its distribution as DeSoto County northward and westward in the panhandle. This occurrence is the only population known for South Florida. Shiny woodoats should be monitored on an annual basis.

***Encyclia tampensis* (Florida butterfly orchid)**

Florida butterfly orchid is listed as commercially exploited in Florida by FDACS (Coile & Garland, 2004). It is a perennial and epiphytic herb and is occasional to common at CCP. Woodmansee and Green observed 11-100 plants throughout mesic hammocks and 11-100 plants on shell mound at CCP. This species is one of the most common epiphytic orchids in South Florida and merits no special management other than monitoring for and discouraging poaching at CCP.

***Euthamia graminifolia* var. *hirtipes* (Flat top goldenrod)**

Flat top goldenrod is ranked as Critically Imperiled in South Florida by IRC (Gann et al., 2001-2006). It is a terrestrial perennial suffrutescent herb and is occasional throughout CCP. Six colonies containing a combined 101-1,000 plants were observed by Woodmansee, Green, and Stephen Hodges throughout 2006 (Figures 3 & 5). One of these stations was documented with an herbarium voucher by Woodmansee and Hodges (Woodmansee, 1971, FTG). This species was first documented in South Florida by William Buswell (s.n., FTG) in 1930 when he collected it in Fort Myers. Since then, it hadn't been observed in South Florida until 2003 when Woodmansee & Sadle (2004) collected it at Prairie Pines Preserve (Woodmansee, 1353, FTG) the only other known South Florida population. Flat top goldenrod may exist in mesic flatwoods elsewhere at CCP, and further surveys should be conducted in open grassy areas of mesic flatwoods, especially after fire. In October 2006, Woodmansee and Hodges observed that one of the stations was destroyed during the expansion of a fire break on the north side of CCP, west of I-75. It is unknown whether these plants will return to this area, they may even further recruit the newly created fire break since many of the populations were in trails. This area should be monitored to see if more flat top goldenrod reoccurs. Depending on the results of these surveys, before further fire break expansions, areas should be surveyed for rare plants, and if found, plants should be relocated. The remaining colonies of flat top goldenrod should be monitored on an annual basis.

***Hypericum crux-andreae* (St. Peter's-wort)**

St. Peter's-wort is ranked as Critically Imperiled in South Florida by IRC (Gann et al., 2001-2006). It is a terrestrial perennial shrub and is rare at CCP having only been found in two locations. Two colonies of plants were observed by Woodmansee and Green on August 2, 2006. A small colony of 2-10 plants was observed on the edge of mesic flatwoods and a second colony of 11-100 plants was observed within fire suppressed mesic flatwoods (Figure 3). The latter station was documented with an herbarium voucher by Woodmansee and Green (Woodmansee, 1906, FTG). This species was also discovered at Yellow Fever Creek Preserve by the authors on the previous day. In Lee County it is also present at Corkscrew Regional Ecosystem Watershed (Gann et al., 2001-2006). Elsewhere in South Florida it is known from two conservation areas in Collier and Hendry counties (Gann et

al, 2001-2006. It occurs sporadically in central Florida and becomes more frequent northward in Florida (Wunderlin & Hansen, 2004). St. Peter's-wort may occur elsewhere at CCP and special attention should be made towards open grassy areas of mesic flatwoods or after fires in mesic flatwoods. These stations should be monitored on an annual basis during the flowering and fruiting period summer-fall, or after fires.

***Lythrum flagellare* (Florida loosestrife)**

Florida loosestrife is listed as endangered in Florida by FDACS (Coile & Garland, 2004), is ranked as Imperiled in Florida by FNAI (2006) and as Critically Imperiled in South Florida by IRC (Gann et al., 2001-2006). It is a terrestrial perennial herb and is rare (locally common) at CCP having only been found in two locations. Two colonies of plants were observed by Woodmansee and Green on April 25-27, 2006. A colony of 100-200 plants was observed in two adjacent depression marshes and a second colony of 1,000-2,000 plants was observed in disturbed wetland beneath a powerline easement in a water reclamation field (Figures 2-3). Both stations were documented with an herbarium voucher by Woodmansee and Green (Woodmansee, 1824 & 1857, FTG). Florida loosestrife is endemic to central and South Florida (Coile & Garland, 2004). In Lee County it is also present at a private property near Tamiami Village (Gann et al., 2002). Elsewhere in South Florida it is known from a Fred C. Babcock-Cecil M. Webb Wildlife Management Area in Charlotte County (Gann et al, 2002) and is documented for Hendry and Glades counties (Wunderlin & Hansen, 2004). Elsewhere in Florida it occurs in Sarasota, Manatee, DeSoto, Okeechobee, Hernando, and Orange counties (Wunderlin & Hansen, 2004). Florida loosestrife may occur elsewhere at CCP and special attention should be made towards dry downs in depression marshes and wet disturbed areas. These stations should be monitored on an annual basis during the flowering and fruiting period in the spring.

***Malachra urens* (Roadside leafbract)**

Roadside leafbract is ranked as Critically Imperiled in South Florida by IRC (Gann et al., 2001-2006). It is a terrestrial perennial shrub and is rare at CCP having only been found in one location. A single colony of 10-20 plants was observed in coastal hydric hammock by Woodmansee and Hodges on October 18, 2006 (Figure 4). This station was documented with a partial herbarium voucher by Woodmansee and Hodges (Woodmansee, 1961, FTG). In Lee County it is also present at Manatee Park (Gann et al., 2002). Elsewhere in South Florida it is known from Big Cypress National Preserve in Monroe and Collier counties (Gann et al., 2001-2006) and Everglades National Park in Collier, Miami-Dade, and Monroe counties (Gann et al, 2002). Roadside leafbract has not been documented elsewhere in Florida (Wunderlin & Hansen, 2004). This population is the northernmost known to occur for this species. Roadside leafbract may occur elsewhere at CCP and special attention should be made towards moist coastal hammocks and coastal marshes where it has also been reported (Gann et al, 2002). This station should be monitored on an annual basis during the flowering and fruiting period in the spring.

***Myrcianthes fragrans* (Twinberry stopper, Simpson's stopper)**

Simpson's stopper is listed as threatened in Florida by FDACS (Coile & Garland, 2004). It is a tree and is rare at CCP having only been found in one location. A single colony of 2-10 plants were observed on a small shell mound by Woodmansee and Green on April 25, 2006 (Figure 4). It is throughout elsewhere in South Florida as it is known from at least 25 conservation areas (Gann et al., 2001-2006) Elsewhere in Florida, Simpson's stopper occurs along the East Coast from St. Johns County southward (Wunderlin & Hansen, 2004). Simpson's stopper may occur elsewhere at CCP

and special attention should be made towards hammocks. This station should be monitored on an annual basis.

***Osmunda cinnamomea* (Cinnamon fern)**

Cinnamon fern is listed as commercially exploited in Florida by FDACS (Coile & Garland, 2004). It is a perennial terrestrial herb and is common at CCP. Woodmansee, Green, and Hodges observed 101-1,000 plants throughout floodplain swamp, hydric hammock, mesic flatwoods, and mesic hammock plant communities at CCP. Cinnamon fern is widespread in Florida (Wunderlin & Hansen, 2004). This species merits no special management other than monitoring for and discouraging poaching at CCP.

***Osmunda regalis* var. *spectabilis* (Royal fern)**

Royal fern is listed as commercially exploited by FDACS (Coile & Garland, 2004). It is a perennial terrestrial herb and is occasional at CCP. Woodmansee, Green, and Hodges observed 11-100 plants throughout floodplain swamp and hydric hammock habitats at CCP. Royal fern is widespread in Florida (Wunderlin & Hansen, 2004). This species merits no special management other than monitoring for and discouraging poaching at CCP.

***Polygala polygama* (Racemed milkwort)**

Racemed milkwort is ranked as Critically Imperiled in South Florida by IRC (Gann et al., 2001-2006). It is a terrestrial perennial herb and is extremely rare at CCP in a mesic hammock. It may go unnoticed since it resembles the more ubiquitous *Polygala grandiflora* (now *P. violacea*) (Wunderlin & Hansen, 2004), however, this species differs in having underground cleistogamous flowers in addition to above ground flowers. A single plant was observed by Woodmansee and Green on April 25, 2006 (Figure 3). Portions of this plant were accidentally removed, and were then documented with a partial herbarium voucher by Woodmansee and Green (Woodmansee, 1830, FTG). This species was thought to be extirpated in Lee County, as it had not been reported since 1969 (Gann et al, 2002). Coincidentally, the authors discovered this species at Yellow Fever Creek Preserve the subsequent day. Elsewhere in South Florida it is known from three conservation areas in Collier, Palm Beach, and Martin counties (Gann et al, 2001-2006). It is sporadically throughout elsewhere in Florida (Wunderlin & Hansen, 2004). Racemed milkwort may occur elsewhere at CCP and special attention should be made towards mesic flatwoods and mesic hammock areas with animal disturbance. In addition to conducting more surveys for Racemed milkwort, this station should be monitored annually. If no additional plants are found, augmenting this species to appropriate habitats should be considered.

***Scirpus robustus* (Saltmarsh bulrush)**

Saltmarsh bulrush is ranked as Critically Imperiled in South Florida by IRC (Gann et al., 2001-2006). It is a terrestrial perennial herb and is locally abundant at CCP having been found in one large area of disturbed wetland. A single expansive colony of 1,000-10,000 plants was observed by Woodmansee and Green on February 1, 2006 in a recently cleared area of Brazilian-pepper and tidal marsh adjacent to the Caloosahatchee River (Figure 4). This station was documented with an herbarium voucher by Woodmansee and Green (Woodmansee, 1778, FTG). It is not known from any other conservation areas in Lee County (Gann et al., 2002). Elsewhere in South Florida it is known from Collier Seminole State Park Collier County and Everglades National Park in Collier and Monroe counties (Gann et al, 2002). Gann et al. (2001-2006) also report it as present in Charlotte and Martin counties and possibly extirpated from Palm Beach County. Saltmarsh bulrush has been documented throughout the rest of the coastal areas of Florida (Wunderlin & Hansen, 2004). As this

large area of disturbance is subject to dramatic change due to the recent clearing event, this station should be monitored on an annual basis during the flowering and fruiting period in the spring.

***Scutellaria integrifolia* (Rough skullcap)**

Rough skullcap is ranked as Critically Imperiled in South Florida by IRC (Gann et al., 2001-2006). It is a terrestrial perennial herb and is rare at CCP in disturbed upland and mesic flatwoods. Seven colonies totaling 11-100 plants were observed by Woodmansee and Green throughout 2006 (Figures 3 & 5). Two colonies were documented with an herbarium voucher each by Woodmansee and Green (Woodmansee, 1860 & 1902, FTG). Before this study, Rough skullcap was thought to be possibly extirpated in South Florida, as it had not been reported since 1976 (Gann et al, 2002). The last time this species was documented in Lee County was when Paul Standley collected it in 1927 (Gann et al., 2002). It is also reported from Charlotte County, where it is presumed extirpated (Gann et al, 2001-2006). This is the only conservation area in South Florida where rough skullcap is known to exist. It is throughout elsewhere in Florida (Wunderlin & Hansen, 2004). Rough skullcap may exist in mesic flatwoods elsewhere at CCP, and further surveys should be conducted in open grassy areas of mesic flatwoods, especially after fire. In October 2006, Woodmansee and Hodges observed that two of the stations were destroyed during the expansion of a fire break on the north side of CCP, west of I-75. It is unknown whether these plants will return to this area, they may even further recruit the newly created fire break since many of the populations were in trails. This area should be monitored to see if rough skullcap reoccurs. Depending on the results of these surveys, before further fire break expansions, areas should be surveyed for rare plants, and if found, plants should be relocated. The remaining colonies of rough skullcap should be monitored on an annual basis.

***Spiranthes praecox* (Greenvein lady's-tresses)**

Greenvein lady's-tresses is ranked as Critically Imperiled in South Florida by IRC (Gann et al., 2001-2006). It is a terrestrial perennial herb. Greenvein lady's tresses is extremely rare at CCP as only a single colony of 13 plants was observed in an open bahia pasture on April 25, 2006 by Woodmansee and Green (Figure 4). In Lee County, Greenvein lady's-tresses had not been definitively observed since 1930 when Harold Moldenke collected it in a moist grassy ditch near Coconut (Gann et al., 2002). Coincidentally, the authors discovered a smaller population of this species at Yellow Fever Creek Preserve the subsequent day. Elsewhere in South Florida it is at Corkscrew Swamp Sanctuary in Collier County and in four conservation areas in Martin and Palm Beach counties (Gann et al., 2001-2006). It has also been reported for Corkscrew Regional Ecosystem Wetland in either Collier or Lee counties (Anderson, 1997). It is mostly throughout Florida (Wunderlin & Hansen, 2004). More individuals may be encountered in open areas of mesic flatwoods and other moist areas at CCP during the appropriate reproductive season between April and June as well as after fires. If sufficient individuals are found, it is recommended that Greenvein Lady's-tresses be documented with an herbarium voucher and deposited in a registered herbarium in Florida. This station should be monitored on an annual basis during the flowering and fruiting period. If no additional plants are found, moving some existing plants or augmenting Greenvein lady's tresses to appropriate habitats should be considered.

***Tillandsia balbisiana* (Reflexed wild-pine, Northern needleleaf)**

Reflexed wild-pine is ranked as threatened in Florida by FDACS (Coile & Garland, 2003). It is an epiphytic perennial herb which flowers throughout the year. Reflexed wild-pine is relatively common in coastal berm, freshwater tidal swamp, hydric hammock, scrubby flatwoods, and shell mound habitats at CCP. Between 101 and 1,000 adults were observed throughout 2006 by

Woodmansee, Green, and Hodges. Reflexed wild-pine occurs throughout South Florida (Gann et al., 2001-2006) and in southern central Florida (Wunderlin & Hansen, 2004). This species ranking is due to the arrival of the non-native weevil *Metamasius callizona*, which preys on adult plants. No signs of this weevil were noticed at CCP, however, reflexed wild-pine should be monitored for predation by this exotic pest and should it appear that populations of this bromeliad be declining, more frequent monitoring of individual populations should take place.

***Tillandsia fasciculata* var. *densispica* (Stiff-leaved wild-pine, Cardinal airplant)**

Stiff-leaved wild-pine is ranked as endangered in Florida by FDACS (Coile & Garland, 2003). It is an epiphytic perennial herb which flowers throughout the year. Stiff-leaved wild-pine is relatively common in coastal berm, disturbed upland, floodplain swamp, mesic flatwoods and mesic hammock habitats at CCP. Between 101 and 1,000 adults were observed throughout 2006 by Woodmansee, Green, and Hodges. Stiff-leaved wild-pine occurs throughout South Florida (Gann et al., 2001-2006) and in southern and coastal central Florida (Wunderlin & Hansen, 2004). This species ranking is due to the arrival of the non-native weevil *Metamasius callizona*, which preys on adult plants. No signs of this weevil were noticed at CCP, however, stiff-leaved wild-pine should be monitored for predation by this exotic pest and should it appear that populations of this bromeliad be declining, it is recommended that more frequent monitoring of individual populations take place.

***Tillandsia utriculata* (Giant wild-pine, Giant airplant)**

Giant wild-pine is ranked as endangered in Florida by FDACS (Coile & Garland, 2003). It is an epiphytic monocarpic perennial herb which flowers throughout the year. Giant wild-pine is occasional in disturbed upland and mesic flatwoods habitats at CCP. Five colonies totaling 11-100 adult plants were observed throughout 2006 by Woodmansee, Green, and Hodges (Figures 2-5). Giant wild-pine occurs throughout South Florida (Gann et al., 2001-2006) and in central Florida (Wunderlin & Hansen, 2004). This species ranking is due to the arrival of the non-native weevil *Metamasius callizona*, which preys on adult plants. No signs of this weevil were noticed at CCP, however, giant wild-pine should be monitored for predation by this exotic pest and should it appear that populations of this bromeliad be declining, it is recommended that more frequent monitoring of individual populations take place.

***Vernonia blodgettii* (Florida ironweed)**

Florida ironweed is ranked as rare in Florida (S3) by FNAI (2006). It is a terrestrial perennial herb which flowers in the fall. Florida ironweed is rare at CCP. Two colonies of 11-100 plants were observed along edges of mesic flatwoods on August 2, 2006 by Woodmansee and Green (Figure 3). Florida ironweed is common throughout moist pinelands and prairies in most of South Florida (Gann et al., 2001-2006). Outside of South Florida it is known from St. Lucie and Indian River counties (Wunderlin & Hansen, 2004). With more surveys in the fall or after fires, it may be found elsewhere in flatwoods and prairies at CCP. These stations should be monitored on an annual basis in the fall when it flowers.

Appendix 2

The Habitats at Caloosahatchee Creeks Preserve*

Coastal Berm

Coastal berm applies to a variety of plant associations that develop on ridges of storm deposited sand, shells, and debris FNAI & DNR (1990). These associations include dense thickets of large shrubs and small trees, hammocks, or sparse shrubby vegetation with spiny xerophytic plants FNAI & DNR (1990). Typical plants include cabbage palm, cocoplum (*Chrysobalanus icaco*), sea grape, elder berry, beach orach (*Atriplex pentandra*), greenbrier, prickly pear cactus, evening primrose (*Oenothera biennis*), dropseed, poison ivy, marshhay (*Spartina patens*), Spanish bayonet, bay cedar (*Suriana maritima*), wax myrtle, live oak, muhly grass (*Muhlenbergia capillaris*), sea purslane, tall threeawn, saltbush, sea oats (*Uniola paniculata*), beach morning glory (*Ipomoea imperati*), sea oxeye (*Borrighia* spp.), tread-softly (*Cnidocolus stimulosus*), love vine, prickly apple (*Harrisia* spp.), snowberry (*Chiococca alba*), varnish leaf (*Dodonaea viscosa*), stoppers, coral bean, privet, strangler fig, and wild coffee FNAI & DNR (1990).

Coastal berm is generally a ridge of storm-deposited marine debris that is parallel to the shore, occasionally occurring in a series with alternating swales FNAI & DNR (1990). Such storm ridges are usually found along low-energy coastlines, and are often surrounded by mangrove or salt marsh communities FNAI & DNR (1990). Coastal berm may be difficult to differentiate from Indian-constructed shell mound or wind-deposited coastal strand or maritime hammock FNAI & DNR (1990). It is often associated with and may grade into tidal swamp (mangroves) or overwash plain, and may also be confused with dredge spoil FNAI & DNR (1990). Its coastal location subjects coastal berm to maritime influences FNAI & DNR (1990). Coastal berm is listed as G3 and S2 respectively, meaning that it is either very rare or local throughout its range globally or is found locally in a restricted range, or is vulnerable to extinction from other factors. Coastal berm is imperiled in Florida due to its rarity or because of its vulnerability to extinction due to some natural or man-made factor (FNAI, 2006).

There are several examples of coastal berm habitat at Caloosahatchee Creeks Preserve (CCP), only one of which is well developed and not entirely disturbed. All of these habitats are located along the shores of the Caloosahatchee River. The well developed coastal berm is typified by a closed canopy composed of cabbage palm, gumbo-limbo, seagrape and Virginia live oak. Hog-plum, myrsine and marlberry are the dominant shrubs found in this habitat while the herbaceous layer is sparse, composed mainly of seedlings of canopy and sub-canopy species and several vines including coin vine, poison-ivy and Virginia creeper. Coastal berm habitat at CCP grades into freshwater tidal swamp. Fifty-seven plant species were recorded growing in coastal berm habitat at CCP. See Table 2 for a complete list of plant species in coastal berm at CCP.

Three state listed species of wild-pine were recorded growing in coastal berm habitat at CCP. These species include the state threatened reflexed wild-pine, along with the state endangered giant wild-pine and stiff-leaved wild-pine.

* Scientific names in the text are provided for those species not occurring at CCP.

Thirteen exotic plant species were found to be invading the coastal berm habitat at CCP. Of these species, nine are listed as category I invasive species, while two are listed as category II invasive species. The category I invasive species include earleaf acacia, carrotwood, Surinam-cherry, laurel fig, Australian-pine, Jambolan-plum, Brazilian-pepper, Australian umbrellatree, and strawberry guava. The category II invasive species include white leadtree and council tree. In addition, two species not listed by FLEPPC were also found invading coastal berm habitat. These species are Jacob's-ladder and karumtree.

Depression Marsh

Depression marsh is characterized as a shallow, usually rounded depression in sand substrate with herbaceous vegetation, often in concentric bands FNAI & DNR (1990). Typical vegetation includes such plants as St. John's-worts, spikerushes, yellow-eyed-grasses, chain ferns, willows, maidencane, wax myrtle, swamp-primrose (*Ludwigia palustris*), bloodroot, buttonbush, fire flag, pickerelweed, arrowheads, and bladderworts FNAI & DNR (1990).

Depression marshes are typical of karst regions where sand has slumped around or over a sinkhole, and thereby created a conical depression; they are smaller than basin marshes, which are situated in relatively large and irregular-shaped basins FNAI & DNR (1990). They are filled by direct rainfall, runoff, or seepage from surrounding uplands, and may be maintained by a subsurface hardpan FNAI & DNR (1990). Hydroperiods are highly variable, and range from as few as 50 days to more than 200 days per year FNAI & DNR (1990). Fire is important in maintaining this community by limiting peat build-up and preventing the invasion of trees and shrubs (Craighead 1971, in Kushlan 1990). No typical fire frequency for depression marshes is given by FNAI and DNR (1990), but they state that the normal fire interval for basin marshes is one to ten years; (Wade et al. 1980, in Kushlan 1990) state that fire periodicity is about three to five years in most deep water marshes, while shallow water marshes burn on one to three-year cycles, provided plant growth is sufficient to carry a fire. FNAI (2006) lists depression marsh as G4 and S4 respectively, meaning that it is apparently secure globally and in Florida, but may be rare in parts of its range.

Depression marshes at CCP are generally small in diameter and relatively shallow. Vegetation in depression marsh habitat at CCP is dominated by grasses, sedges and forbs such as denseflower knotweed, Dixie iris, frogfruit, hairy fall panic grass, knotted spikerush, sand cordgrass, and softstem bulrush. In addition, the non-native torpedo grass is abundant in this habitat. Some woody species found growing in depression marsh habitat include Coastal Plain willow, and common buttonbush. Depression marsh habitat at CCP grades primarily into mesic hammock and mesic flatwoods. Thirty-seven species were recorded growing in depression marsh habitat at CCP. See table 2 for a complete list of species in depression marsh at CCP.

One rare plant species was recorded growing in depression marsh habitat at CCP. Florida loosestrife, listed as Critically Imperiled by The Institute for Regional Conservation (IRC), imperiled by Florida Natural Areas Inventory (FNAI), and endangered by the State of Florida, was found to be fairly abundant along the upper margins of two depression marshes in the preserve.

Four exotic plant species were found to be invading depression marsh habitat at CCP. Three of these species are listed as invasive by the Florida Exotic Pest Plant Council (FLEPPC). Aquatic soda-apple, and torpedo grass are listed as category I invasive species, and alligatorweed, is listed as a category II invasive species. Water spangles was also recorded invading this habitat, however, it is not listed by any agency.

Disturbed Upland

Disturbed upland includes areas such as roadsides, agricultural fields, or thickets (Gann et al., 2001-2006). Disturbed upland can be characterized by a multitude of different strata and species depending on its context. In general, in addition to the above, disturbed upland can be applied to habitats which were formerly native, but are now dominated by exotics, with 50% or greater coverage. Although exotics do tend toward occupying areas of disturbance, in some cases natives will often persist in areas cleared. Often, rare plant species can occur in these habitats since many disturbance areas occur along former ecotones between key habitats where rare plants often occur. In addition, some rare native species are ruderals, and occur in disturbance dominated areas. Although not often recognized as an official habitat, it nevertheless occurs throughout CCP and hosts a significant component of the flora there.

At CCP disturbed upland includes fire breaks, powerline easements, and areas dominated by non-native plant species. Fire breaks and powerline easements are often dominated by native vegetation and include trees such as southern slash pine, laurel oak, Virginia live oak, and cabbage palm. Shrubs such as St. John's worts, cabbage palm, myrtle oak, running oak, wax myrtle and winged sumac also occur here. Most of the fire breaks and easements are dominated by herbs and grasses however, and include: blue-maidencane, three awns, sandmats, dog-fennel, flat sedges, witch grasses, beak sedges, nut-rushes, hempweed, greenbrier, grapes, and goldenrods. Disturbed upland habitat grades into disturbed wetland, mesic flatwoods, mesic hammock, and scrubby flatwoods habitats. A total of 228 native species were observed growing in disturbed upland habitat. See Table 2 for a complete list of native species found in CCP.

Nine rare plants were recorded for disturbed upland. Three species listed by the state of Florida were also recorded growing in disturbed upland habitat at CCP. Among these species are the endangered stiff-leaved wild-pine and giant wild-pine and the commercially exploited Florida butterfly orchid. In addition, six other species listed as Critically Imperiled in South Florida by IRC are also found in the disturbed upland of CCP. These plant species include Florida pimpernel, trumpet vine, flattop goldenrod, St. Peter's-wort, rough skullcap, and greenvein lady's tresses, the latter of which is only known from disturbed areas.

Eighty-two exotic plant species were recorded growing in disturbed upland, three of which are cultivated only, 32 of which are listed by FLEPPC. For a list of non-native species in this habitat, see Table 2.

Disturbed Wetland

Disturbed wetland includes disturbed wet areas such as ditches, canals, and borrow pits (Gann et al., 2001-2006). In general, in addition to the above, disturbed wetland can be applied to habitats which were formerly native, but are now dominated by exotics, with 50% or greater coverage. Although exotics do tend toward occupying areas of disturbance, in some cases natives will often persist in areas cleared. Often times rare plant species can occur in these habitats since many disturbance

areas occur along former ecotones between key habitats where rare plants often occur. In addition, some rare native species are ruderals, and occur in disturbance dominated areas. Although not often recognized as an official habitat, it nevertheless occurs throughout CCP and hosts a significant component of the flora there.

At CCP disturbed wetland is characterized by fire breaks and powerline easements in low areas, ditches, and large areas of intact and cleared Brazilian-pepper forest (former hydric hammock and tidal marsh habitats). Nonetheless, some areas are dominated by natives including arrowgrass, duckweeds, finger grass, yellowtops, St. John's worts, primrosewillows, panicums, smartweed, rushes, swamp sunflower, bladderworts, and yellow-eyed grass. Disturbed wetland habitat grades into disturbed upland, tidal marsh, freshwater tidal swamp, depression marsh, hydric hammock, strand swamp, and floodplain swamp habitats. A total of 77 native species were observed growing in disturbed wetland habitat. See Table 2 for a complete list of native species found in disturbed wetland at CCP.

Three rare plants were recorded for disturbed wetland. Two species listed by the state of Florida were recorded growing in disturbed wetland habitat at CCP. Among these species are the commercially exploited Florida butterfly orchid and endangered Florida loosestrife. The latter of which is also ranked as Critically Imperiled in South Florida by IRC along with saltmarsh bulrush which is also found in this habitat.

Fifteen exotic plants were observed in disturbed wetland. Five are listed as Invasive by FLEPPC and include punktree, Australian-pine, valamuerto, Jambolan-plum, and Britton's wild petunia. Alligatorweed, listed as Potentially Invasive by FLEPPC, was also recorded for this habitat. For a list of all non-native species in this habitat, see Table 2.

Floodplain Swamp

Floodplain swamps occur on flooded soils along stream channels and in low spots and oxbows within river floodplains FNAI & DNR (1990). Dominant trees are usually buttressed hydrophytic trees such as cypress and tupelo (*Nyssa* spp.); the understory and ground cover are generally very sparse FNAI & DNR (1990). Other typical plants include ogeechee tupelo (*Nyssa ogeche*), water tupelo (*Nyssa aquatica*), swamp titi (*Cyrilla racemiflora*), wax myrtle, dahoon holly, myrtle-leaved holly (*Ilex myrtifolia*), large gallberry (*Ilex coriacea*), possumhaw (*Ilex decidua*), hurrah-bush (*Leucothoe racemosa*), white alder (*Clethra* spp.), lizard's tail, leather fern, royal fern, marsh fern, soft rush, laurel greenbrier, hazel alder (*Alnus serrulata*), hawthorn (*Crataegus* spp.), and swamp privet (*Forestiera acuminata*) FNAI & DNR (1990).

Soils of floodplain swamps are highly variable mixtures of sand, organic, and alluvial materials, although some sites, especially within sloughs or on smaller streams, may have considerable peat accumulation FNAI & DNR (1990). Floodplain swamps are flooded for most of the year, with sites along channels inundated by aerobic flowing water while those of sloughs and backswamps are flooded with anaerobic water for extensive periods of time FNAI & DNR (1990). Soils and hydroperiods determine species composition and community structure FNAI & DNR (1990). Seasonal and often prolonged inundations restrict the growth of most shrubs and herbs, leaving most of the ground surface open or thinly mantled with leaf litter FNAI & DNR (1990). Floods redistribute detrital accumulations to other portions of the floodplain or into the main river channel FNAI & DNR (1990). This rich organic debris is essential to the functional integrity of

downriver ecosystems such as estuaries FNAI & DNR (1990). These swamps are usually too wet to support fire.

Floodplain Swamps are often associated with and grade into floodplain forest or hydric hammock, and occasionally baygall FNAI & DNR (1990). The species composition of floodplain swamps is frequently similar to the slough, strand swamp, dome swamp, and basin swamp communities FNAI & DNR (1990). Alteration of the hydroperiod by impoundments or river diversions and the disruption of floodplain communities by forestry or agriculture have devastating consequences to the entire river and bay systems FNAI & DNR (1990). Many plant and animal species, both onsite and down river, depend upon the presence and natural fluctuations of these swamps for survival and reproduction FNAI & DNR (1990). FNAI (2006) lists floodplain swamp as G4 and S4 respectively, meaning that it is apparently secure globally and in Florida, but may be rare in parts of its range.

Two areas at CCP are composed of floodplain swamp habitat. Both areas are represented by fairly sizeable bands several hundred meters inland from the Caloosahatchee River. Floodplain swamp habitat at this preserve appears to be altered by a modified hydrological scheme, which has resulted in shorter hydroperiods, although the eastern area is wetter. This is indicated by the abundance and diversity of sub-canopy species. The canopy of floodplain swamp habitat at this preserve is closed with few light gaps, and is composed of primarily temperate species such as dahoon holly, oaks, pond cypress, red maple, red mulberry, swamp dogwood, sweet-bay, and water hickory. A diverse shrub and herb layer composed of ferns, grasses, and shrubs includes species such as American beautyberry, common buttonbush, coralbean, giant leather fern, Jack-in-the-pulpit, lizard's tail, marsh fern, myrsine, shiny-leaved wild coffee, wax myrtle, and woodsgrass. Floodplain swamp once abundant along the historical Caloosahatchee River, is now quite rare in Lee County since its canalization and subsequent land modifications. Floodplain swamp habitat at CCP grades into freshwater tidal swamp, hydric hammock, and shell mound. A total of 86 plant species were recorded for floodplain swamp habitat. See table 2 for a complete list of plant species in floodplain swamp at CCP.

A total of eight rare plant species were recorded growing in floodplain swamp habitat at CCP. Three of these species are listed as Critically Imperiled by IRC. These species are Jack-in-the-pulpit, shiny woodoats, and, trumpet creeper. Five species listed by the state of Florida were also recorded growing in floodplain swamp habitat at CCP. Among these species are the commercially exploited cinnamon fern, Florida butterfly orchid, and royal fern. In addition, the state endangered giant wild-pine, and stiff-leaved wild-pine were also recorded for this habitat.

Twelve exotic plant species were recorded growing in floodplain swamp habitat at CCP. Eight of these species are listed as invasive by FLEPPC and include the category I invasive species Asian sword fern, Brazilian-pepper, laurel fig, shoe-button ardisia, strawberry guava, and valamuerto. In addition, two category II invasive species Caesarweed and green shrimpplant were recorded. Four additional exotic plant species not listed by FLEPPC were also found to be invading this habitat. These species are chamber bitter, downy maiden fern, Peruvian primrosewillow, and water spangles.

Freshwater Tidal Swamp

Freshwater tidal swamp occurs on floodplains near the mouths of rivers just inland from mangroves or saltmarshes FNAI & DNR (1990). They are swamp forests with well-developed trees inland and increasingly dwarfed trees towards the coast, often with an extensive mat of convoluted surface roots FNAI & DNR (1990). The dominant trees are usually cabbage palm, black gum (*Nyssa biflora*), bald cypress, southern magnolia (*Magnolia grandiflora*), and red cedar FNAI & DNR (1990). Other typical plants include water tupelo (*Nyssa aquatica*), pumpkin ash (*Fraxinus profunda*), swamp bay, white cedar (*Chamaecyparis thyoides*), titi (*Cyrilla racemiflora*), wax myrtle, cocoplum, dahoon holly, myrtle leaved holly (*Ilex myrtifolia*), saltbush, asters, and leather fern FNAI & DNR (1990).

Freshwater tidal swamps occur near the mouths of rivers, often between anastomosing channels, on soils that are highly organic FNAI & DNR (1990). These swamps are flooded by freshwater at least twice daily in response to tidal cycles. They are extremely vulnerable to hydrological modifications, saltwater intrusion, and clearcut logging FNAI & DNR (1990). Although this natural community is widespread around the southeastern U.S., cabbage palm is a conspicuous element only in Florida FNAI & DNR (1990). Because they are found only near river mouths, their distribution is inherently limited in Florida FNAI & DNR (1990). FNAI (2006) lists freshwater tidal swamp as G3 and S3 respectively, meaning that it is either very rare or local throughout its range globally and in Florida, or found locally in a restricted range, or vulnerable to extinction from other factors.

Freshwater tidal swamp habitat at CCP has suffered immensely from hydrological modifications and exotic pest plant infestations. The primary constituents of this community at CCP include dwarfed woody trees such as Brazilian-pepper, pond-apple, red mangrove and white mangrove. Giant leather fern is especially abundant in this habitat. Several vine species are also common in this habitat. These species include: climbing hempweed, coinvine, common moonflowers, mangrove rubbervine, and whitevine. Abundant herb species include sea purslane, southern amaranth, creeping primrose willow, and wand loosestrife. It is highly variable at CCP, and can be areas with very little canopy or areas dominated by freshwater trees such as pond-apple. Freshwater tidal swamp at CCP grades into coastal berm, disturbed wetland, mesic hammock, hydric hammock, mesic flatwoods, tidal marsh and floodplain swamp. A total of 36 plant species were recorded growing in freshwater tidal swamp habitat at CCP. See table 2 for a complete list of plant species recorded in freshwater tidal swamp at CCP.

Four state listed species and one FNAI listed species were recorded growing in freshwater tidal swamp habitat at CCP. These species include the state threatened reflexed wild-pine and the state endangered giant wild-pine and stiff-leaved wild-pine. Although no additional rare plant species were recorded by IRC staff for this habitat, the report of golden leather fern may have come from this habitat. Golden leather fern is listed as threatened by FDACS (Coile & Garland, 2003), and as rare in Florida by FNAI (2006)

Seven exotic plant species were recorded invading freshwater tidal swamp habitat at CCP, all of which are listed by FLEPPC. Five of these species are category I invasive species, including Brazilian-pepper, common water-hyacinth, Jambolan-plum, punktree, and wild-taro. Senegal

date palm and white leadtree were also recorded invading this habitat, and are FLEPPC category II invasive species.

Hydric Hammock

Hydric hammock is characterized as a well developed hardwood and cabbage palm forest with a variable understory often dominated by palms and ferns FNAI & DNR (1990). Typical plants include cabbage palm, diamond-leaf oak, red cedar, red maple, swamp bay, sweetbay, water oak (*Quercus nigra*), southern magnolia (*Magnolia grandiflora*), wax myrtle, saw palmetto, bluestem palmetto (*Sabal minor*), needle palm (*Rhapidophyllum hystrix*), poison ivy, dahoon holly, myrsine, hackberry, sweetgum (*Liquidambar styraciflua*), loblolly pine (*Pinus taeda*), Florida elm (*Ulmus americana var. floridana*), swamp chestnut oak (*Quercus michauxii*), American hornbeam (*Carpinus caroliniana*), Walter's viburnum, royal fern, peppervine, rattanvine, yellow jessamine (*Gelsemium* spp.), and Virginia creeper FNAI & DNR (1990).

Hydric hammock occurs on low, flat, wet sites where limestone may be near the surface and frequently outcrops FNAI & DNR (1990). Soils are sands with considerable organic material that, although generally saturated, are inundated only for short periods following heavy rains FNAI & DNR (1990). The normal hydroperiod is seldom over 60 days per year FNAI & DNR (1990). Because of their generally saturated soils and the sparseness of herbaceous ground cover, hydric hammocks rarely burn FNAI & DNR (1990).

Hydric hammock occurs as patches in a variety of lowland situations, often in association with springs or karst seepage, and in extensive forests covering lowlands just inland of coastal communities FNAI & DNR (1990). Hydric hammock generally grades into floodplain swamp, strand swamp, basin swamp, baygall, wet flatwoods, coastal berm, maritime hammock, slope forest, upland mixed forest, or upland hardwood forest FNAI & DNR (1990). Hydric hammock is often difficult to differentiate from bottomland forest, prairie hammock, and floodplain forest FNAI & DNR (1990). The normal hydrological regime must be maintained in Hydric Hammock FNAI & DNR (1990). If the water table is lowered, hydric hammock will gradually change to mesic conditions. If the hammock is flooded, many trees will die and eventually be replaced by more hydrophilic species FNAI & DNR (1990). FNAI (2006) lists hydric hammock as G4 and S4 respectively, meaning that it is apparently secure globally and in Florida, but may be rare in parts of its range.

Hydric hammock habitat at CCP occurs in widely scattered patches in substrate depressions, or along inland remnant stream and creek banks that once emptied into the Caloosahatchee River. Hydric hammock habitat at this preserve suffers hydrological modifications, a high degree of exotic pest plant infestations and disturbance from wild hogs. The canopy is closed and primarily composed of cabbage palm, oaks, sweetbay and, water hickory. Some areas of this habitat, especially along ecotones with depression marsh, are completely dominated by a Brazilian-pepper canopy. Otherwise, shrubs are moderate to sparse in hydric hammock habitat at CCP. Some common shrub species found in this habitat are American beautyberry, common buttonbush, hog-plum, marlberry, myrsine, saw palmetto, and wax-myrtle. A species rich understory of grasses, sedges and ferns is also characteristic of hydric hammock habitat at this preserve. Some typical species include basketgrass, beak sedges, cinnamon fern, coinwort, royal fern, smartweeds, Virginia-creeper and witchgrasses. Hydric hammock habitat at CCP grades

into depression marsh, disturbed wetland, freshwater tidal swamp, mesic flatwoods, mesic hammock, and strand swamp. A total of 161 plant species were recorded growing in hydric hammock habitat at CCP. See table 2 for a complete list of plant species found in hydric hammock at CCP.

A total of nine rare plant species were recorded growing in hydric hammock habitat at CCP. IRC lists five of these species as Critically Imperiled in South Florida. These species include Jack-in-the-pulpit, roadside leafbract, shiny woodoats, warty sedge, and trumpet-creeper. Four state listed species also occur in this habitat. Among these species are the commercially exploited cinnamon fern and royal fern, the state threatened reflexed wild-pine and the state endangered giant wild-pine.

Twenty-three exotic plant species were recorded growing in hydric hammock habitat at CCP. Fourteen of these species are listed as category I invasive species by FLEPPC. These species are: aquatic soda-apple, Asian sword fern, Brazilian-pepper, carrotwood, guava, Jambolan-plum, Javanese bishopwood, laurel fig, popcorn tree, shoe-button ardisia, small-leaf climbing fern, strawberry guava, Surinam-cherry, and Valamuerto. Two FLEPPC category II invasive species were also recorded invading this habitat. These species are Caesarweed and green shrimplant. In addition, seven plant species not listed by FLEPPC were found to be invading hydric hammock habitat at this preserve. These species are common dayflower, downy maiden fern, Florida tassel flower, Peruvian primrosewillow, spiny sowthistle, Wild-bean, and West Indian mahogany*.

Mesic Flatwoods

Typical mesic flatwoods communities are characterized by a low, flat topography, and moderately- to poorly-drained, acidic, sandy soils often overlying an organic or clay hardpan (Abrahamson and Hartnett 1990, FNAI and DNR 1990). Generally, an overstory of pines is present, which may consist of longleaf pine (*Pinus palustris*), slash pine, or pond pine (*Pinus serotina*). The understory is quite variable, but generally includes species such as saw palmetto, gallberry, and wiregrass. Other typical taxa include St. John's-worts, dwarf huckleberry, wax myrtle, staggerbush, blueberries, gopher-apple, tarflower, bog-buttons, blackroot, false foxgloves (*Agalinis* spp.), white-topped aster (*Aster paternis*), yellow-eyed-grasses, and cutthroat grass (*Panicum abscissum*) FNAI & DNR (1990).

Due to the presence of the hardpan, mesic flatwoods usually flood for brief periods each year; this is contrasted with the dry season, when groundwater is unattainable for many plant species FNAI & DNR (1990). Fire frequency in mesic flatwoods has been estimated at 1 to 8 years FNAI & DNR (1990). In the absence of fire, mesic flatwoods may develop towards hardwood-dominated forests with a closed canopy that can eliminate the ground cover herbs and shrubs; very frequent or hot fires can eliminate pine recruitment and eventually transform mesic flatwoods into dry prairie FNAI & DNR (1990). FNAI (2006) lists mesic flatwoods as G4 and S4 respectively, meaning that it is apparently secure globally and in Florida, but may be rare in parts of its range.

* Despite being FNAI (S3) and state listed (Threatened) species, West Indian Mahogany is native to extreme southern Florida and has escaped from cultivation outside of its range.

Mesic flatwoods habitat at CCP is altered due to fire suppression. The canopy is composed of a sparse to non-existent, uniformly aged stand of South Florida slash pine, and scattered oak species, indicating a history of fire suppression and resulting hot fires that top-kill pines. Saw palmetto has formed dense, nearly impenetrable walls and is by far the dominant sub-canopy species. Few areas possess the open grassy patches that are typical of healthy mesic flatwoods. Despite the effects of fire suppression, many native species still persist in this habitat. Shrubs such as staggerbush, blueberries and wax myrtle are abundant among the dense stands of saw palmetto. Wherever there is an opening among the saw palmetto thickets, a notable array of graminoid and herbaceous vegetation endures. Species such as beak sedges, bluestems, pennyroyal, clustered millegrain, St. John's-wort, partridge peas, and milk peas are all common in openings where the forest floor is exposed. However, much of the graminoid layer typical of open mesic flatwoods persists along the edges of trails. Mesic flatwoods habitat at CCP grades in to a variety of other habitats including depression marsh, disturbed upland, hydric hammock, mesic hammock, and scrubby flatwoods. A total of 143 plant species were recorded growing in mesic flatwoods habitat at CCP. See Table 2 for a complete list of plant species recorded in mesic flatwoods at CCP.

Six rare plant species were recorded growing in mesic flatwoods habitat at CCP. Four of these species are listed as Critically Imperiled by IRC. These species are flattop golden-rod, Florida pimpernel, rough skullcap, and St. Peter's-wort. In addition, two state-listed species were also recorded growing in this habitat. These species are the commercially exploited cinnamon fern, and the state-endangered stiff-leaved wild-pine.

A total of 16 exotic plant species were recorded invading mesic flatwoods habitat at CCP. Six of these species are listed as category I invasive species by FLEPPC, and include Brazilian-pepper, laurel fig, punktree, strawberry guava, tuberous sword fern, and woman's tongue. Three species listed as category II invasive species by FLEPPC were also found invading mesic flatwoods habitat at this preserve. These species are Caesarweed, queen palm, and rose-apple. An additional seven plant species not listed by FLEPPC were also found invading this habitat. These species include chamber bitter, comb bushmint, Florida tassel flower, hurricane sedge, Malaysian false-pimpernel, threeflower ticktrefoil, and tomato.

Mesic Hammock

Mesic hammock occurs on slight rises in relatively flat terrain (Gann et al 2006.) Mesic hammock is a hardwood forest community of open or closed canopy dominated by live oak, with cabbage palm often present in the canopy and subcanopy (FNAI & DNR, 1990). Epiphytes (ferns, orchids, and bromeliads) are often found and may become abundant in undisturbed stands (FNAI & DNR, 1990). Shrubby understory may be dense or open, tall or short and is composed of saw palmetto, beautyberry, and wax myrtle, with the addition of tropical shrubs, such as Simpson's stopper and wild coffee, in the south. The herb layer is often sparse or patchy and consists of various grasses, including witchgrasses and basket grass, and sedges (FNAI & DNR, 1990).

FNAI & DNR (1990) report that mesic hammock usually occurs as fringes or small patches on the borders of, or in higher parts of, rivers, swamps, marshes, and large lakes, and ranges from central and South Florida (Polk to Dade and Collier counties) northward along the Atlantic and

Gulf coasts to North Carolina and Texas, however it is the authors' experience that in South Florida, mesic hammock may also occur as fire shadows within mesic flatwoods, or along mesic flatwoods ecotones with lowlands. Soils generally consist of sands overlying calcareous marls but may be a more complex association of marl, peat, and sand over limestone. FNAI & DNR (1990) report that soils are sand mixed with organic matter and are normally dry underfoot. FNAI (2006) lists mesic hammock as G3 and S2 respectively, meaning that it is either very rare or local throughout its range globally or is found locally in a restricted range, or is vulnerable to extinction from other factors. Mesic hammock is imperiled in Florida due to its rarity or because of its vulnerability to extinction due to some natural or man-made factor (FNAI, 2006).

Mesic hammock habitat is fairly common at CCP and is mostly found along the edges of depression marshes, as ecotones between swamp habitat and mesic flatwoods, or as fire shadows, scattered throughout the mesic flatwoods. A clear successional pattern from mesic flatwoods to mesic hammock can be observed on this preserve, as the two blend into one another depending on the successional stage. The typical canopy composition of this habitat is dominated by laurel oak and Virginia live oak with scattered cabbage palm and myrsine. Shrubby species are common in this habitat and can include bastard indigobush, coralbean, Florida privet, hog-plum, and saw palmetto. The forest floor vegetation is sparse, but diverse. Species such as whitemouth dayflower, flatsedges, witchgrasses, basketgrass, and pineland pimpernel are all common. Mesic hammock habitat at CCP grades into depression marsh, freshwater tidal swamp, hydric hammock, mesic flatwoods, scrubby flatwoods, and strand swamp. A total of 106 plant species were recorded growing in mesic hammock habitat at this preserve. See Table 2 for a complete list of plant species recorded in mesic hammock at CCP.

A total of six rare plant species were recorded growing in mesic hammock habitat at CCP. Four species listed by the state of Florida, including the commercially exploited cinnamon fern and butterfly orchid, and the state endangered giant wild-pine and stiff-leaved wild-pine, were recorded growing in this habitat. In addition, the FNAI listed Florida ironweed, and the IRC Critically Imperiled racemed milkwort were also recorded for this habitat.

A total of 20 exotic plant species were recorded invading mesic hammock habitat at CCP. Ten of these species are listed by FLEPPC as category I invasive species. These species are Brazilian-pepper, Britton's wild petunia, common air-potato, congongrass, Jambolan-plum, laurel fig, popcorn tree, rosary-pea, shoe-button ardisia and valamuerto. Two species listed by FLEPPC as category II invasive species; Caesarweed, and Senegal date palm, were also recorded invading mesic hammock habitat. In addition, eight species not listed by any agency were found to be invading mesic hammock habitat at CCP. These species are common dayflower, common Devil's-horsewhip, Florida tasselflower, lilac tasselflower, little ironweed, Malaysian false-pimpernel, rocketweed, and sour orange.

Scrubby Flatwoods

Scrubby flatwoods communities generally occur in transitional areas between mesic flatwoods and scrub. While some consider scrubby flatwoods as an ecotonal or even an artificial community, others classify it as a discrete community or association (Abrahamson and Hartnett, 1990; FNAI & DNR, 1990). The canopy is usually composed of scattered pines, which may include slash pine or longleaf pine (*Pinus palustris*). The understory is usually dominated by scrub oaks, saw palmetto or scrub palmetto (*Sabal etonia*), or a combination of these taxa. Other typical taxa include stagerbush,

wiregrass, shiny blueberry, gopher-apple, rusty lyonia (*Lyonia ferruginea*), tarflower, golden-asters (*Chrysopsis* spp.), ground lichens (*Cladonia* spp.), scrub-bay (*Persea borbonia* var. *humilis*), garberia (*Garberia heterophylla*), huckleberries, goldenrods, running oak, pinweeds, and frostweeds (FNAI & DNR, 1990).

Scrubby flatwoods differ from other the types of flatwoods in that they occur at slightly higher elevations, on more well-drained soils. Even under extremely wet conditions, scrubby flatwoods will not flood (Abrahamson et al., 1984). The structure and species composition of scrubby flatwoods is more closely aligned with scrub than with other types of flatwoods. Due to the relatively sparse ground cover, the presence of scrub oaks, and the presence of open, sandy areas, fire frequency in scrubby flatwoods is lower than in other flatwoods communities, and has been estimated at 8 to 25 years (FNAI & DNR, 1990). In the absence of regular fire, scrubby flatwoods may develop towards scrub on drier sites, or xeric live oak hammock on less well-drained sites (Laessle, 1942). A successional pathway from xeric live oak hammock to mesic hammock also has been proposed (Laessle, 1942). FNAI (2006) lists scrubby flatwoods as G3 and S3 respectively, meaning that it is either very rare or local throughout its range globally and in Florida, or found locally in a restricted range, or vulnerable to extinction from other factors.

Scrubby flatwoods habitat at CCP is mostly confined to two out-parcels on the eastern and western boundaries of the preserve, however sections of the canopyless mesic flatwoods in the center possess some flora characteristic of scrubby flatwoods. The canopy is composed of widely scattered South Florida slash pine. Various scrub oaks, saw palmetto and staggerbush are abundant in the sub-canopy layer. Typical herbaceous and graminoid vegetation found in this habitat include bluestems, common pawpaw, densetuft hairsedge, Florida elephant's-foot, golden-rods, piedmont black-senna, witchgrasses, yellow-buttons, and yelloweyed grasses. Scrubby flatwoods at CCP grades into disturbed upland, mesic flatwoods, and mesic hammock. A total of 68 plant species were recorded growing in scrubby flatwoods habitat at CCP. See Table 2 for a complete list of plant species recorded in scrubby flatwoods at CCP.

Two species of wild-pine listed by the state of Florida were recorded growing in Scrubby Flatwoods Habitat at CCP. These species are the state threatened reflexed wild-pine and the state endangered giant wild-pine.

A total of five exotic plant species were recorded invading scrubby flatwoods habitat at CCP. Two of these species; Asian sword fern and punktree are listed as category I invasive species by FLEPPC. In addition, crow's-foot grass, hairy indigo, and St. Augustine grass were also recorded invading this habitat.

Shell Mound

Shell mound is unusual among the biological communities in that it is largely a result of the activities of Indians, instead of natural physical factors FNAI & DNR (1990). Shell mound is generally characterized as an elevated mound of mollusk shells and aboriginal garbage on which a hardwood, closed-canopy forest develops FNAI & DNR (1990). In some cases, a sparse shrubby community, sometimes with cactus, may develop in lieu of hammock vegetation FNAI & DNR (1990). Typical plants include gumbo-limbo, cabbage palm, mastic, red cedar, hackberry, live oak, forestiera, coral bean, marlberry, saffron plum, sagaretia (*Sageretia minutiflora*), coontie (*Zamia integrifolia*), and others FNAI & DNR (1990). Shell mound soils

are composed of shells and shell fragments with an organic component derived from forest litter FNAI & DNR (1990). The soil generally is circumneutral to slightly alkaline (pH = 7-8) and contains 1-20% organic materials FNAI & DNR (1990). The loose collection of shells allows water to drain extremely rapidly FNAI & DNR (1990). The calcareous substrate, in combination with their coastal location, often permits tropical or subtropical species of plants to grow much further north on shell mounds than their normal ranges on other substrates FNAI & DNR (1990).

Their coastal, usually insular, location generally protects shell mounds from fire, but subjects them to marine influences, including high winds, salt spray, high insulation, and storm surge FNAI & DNR (1990). Shell mound is often associated with and grades into rockland hammock, coastal berm, or maritime hammock FNAI & DNR (1990). It is often so similar in species composition to these communities that it may be difficult to differentiate FNAI & DNR (1990). Some shell mounds may also be very similar to coastal rock barren communities FNAI & DNR (1990).

Because they are constructed of archaeological remains, shell mounds are vulnerable to damage by artifact-seekers and archaeological excavations FNAI & DNR (1990). Sites where visitor use is not monitored should not be publicized FNAI & DNR (1990). Archaeological investigations should be conducted with care to protect important botanical features FNAI & DNR (1990). FNAI (2006) lists shell mound as G2 and S2 respectively, meaning that it is imperiled globally and in Florida because of rarity or because of vulnerability to extinction due to some natural or man-made factor

Shell mound habitat at CCP is restricted to a single station in the central part of the preserve east of I-75. This habitat covers a small area, and from a distance, is nearly indistinguishable from the other surrounding habitats. Due to its proximity to the headwaters of a small tidal creek which joins the Caloosahatchee River, and its proximity to upland habitat nearby, it may have once represented a canoe launch by the aboriginal people. The vegetation on this mound is primarily tropical and includes trees such as cabbage palm, Virginia live oak, sugarberry, Simpson's stopper, Spanish stopper, white stopper, swamp bay, and water hickory. Epiphytes in the canopy include Florida butterfly orchid, resurrection fern, Spanish-moss, reflexed wild-pine, thin-leaved wild-pine, golden polypody, and shoestring fern. Shrubs such as bastard indigobush, coral bean, Spanish bayonet, white indigo berry, and shiny-leaved wild coffee are also present. The floor of the mound is sparse, but contains vines and herbaceous species such as Eastern poison-ivy, earleaf greenbrier, trumpet-creeper, variable witchgrass, and Virginia-creeper. Shell mound habitat at CCP grades into a floodplain swamp, hydric hammock, and tidal marsh. A total of 31 plant species were recorded growing in shell mound habitat at CCP. See Table 2 for a complete list of plant species recorded in shell mound at CCP.

Four rare species were recorded growing in shell mound habitat at CCP. Among these species are the state threatened reflexed wild-pine and Simpson's stopper, and the commercially exploited Florida butterfly orchid. In addition, trumpet creeper, listed as Critically Imperiled in South Florida by IRC, was also recorded growing in this habitat.

Only two exotic plant species were recoded invading shell mound habitat at CCP. These species are Brazilian-pepper and strawberry guava. Both of these species are listed as category I invasive species by FLEPPC.

Strand Swamp

Strand swamps are shallow, forested, usually elongated depressions or channels dominated by bald cypress (*Taxodium distichum*) (FNAI & DNR, 1990). They are generally situated in troughs in a flat limestone plain (FNAI & DNR, 1990). Typical plants include red maple (*Acer rubrum*), laurel oak, cabbage palm, strangler fig, red bay (*Persea borbonia*), sweet bay (*Magnolia virginiana*), coastal plain willow, wax myrtle, myrsine, buttonbush, royal palm (*Roystonea regia*), poison ivy, swamp lily (*Crinum americanum*), leather fern (*Acrostichum danaeifolium*), royal fern (*Osmunda regalis* var. *spectabilis*), saw-grass, swamp primrose (*Ludwigia palustris*), water hyssop, floating heart (*Nymphoides aquatica*), dotted smartweed, and arum (*Peltandra* spp.) (FNAI & DNR, 1990). Canopy plants are mainly temperate, while understory and epiphytic plants are mainly tropical (FNAI & DNR, 1990). Small young trees at the outer edge of strand swamps grade into large old ones in the interior, giving a strand a distinctly rounded cross-sectional profile (FNAI & DNR, 1990). Strand swamp soils are peat and sand over limestone and the best developed forests are on deep peat that acts as a wick to draw moisture from groundwater up into the root zone during droughts (FNAI & DNR, 1990).

The normal hydroperiod is 200-300 days with a maximum water depth of 18 to 30 inches (FNAI & DNR, 1990). Water is deepest and remains longest near the center where the trees are biggest (FNAI & DNR, 1990). Fire occurs in strand swamps on a cycle of perhaps 30 to 200 years, with the largest trees on the deepest peat towards the center of the strand burning least frequently (FNAI & DNR, 1990). Fire is essential for maintenance of this natural community; without fire, hardwood invasion and peat accumulation would convert the strand to bottomland forest in a few hundred years (FNAI & DNR, 1990). Cypress is very tolerant of light surface fires, but muck fires burning into the peat can kill the trees, lower the ground surface, and transform a strand into a slough (FNAI & DNR, 1990). FNAI (2006) lists strand swamp as G4 and S4 respectively, meaning that it is apparently secure globally and in Florida, but may be rare in parts of its range.

Strand swamp habitat at CCP is restricted to an isolated remnant fragment on the north central part of the preserve, east of I-75. The northern flow of water through this habitat has been cut off completely, and the supply of water is reduced to seepage from adjacent habitats. The canopy is closed and is composed of scattered pond cypress, swamp dogwood, and water ash, with additional hardwoods such as laurel oak and red mulberry, which seem to have become established after the habitat was hydrologically modified. The understory is sparse with few shrubs such as hog-plum, myrsine, and shiny-leaved wild coffee. Typical herbaceous and graminoid vegetation includes creeping primrosewillow, water hyssop, button-hemp, Virginia-creeper, and various witch grasses. Strand swamp habitat at CCP grades into disturbed wetland, fire suppressed mesic flatwoods, mesic hammock, and hydric hammock. A total of 59 plant species were recorded growing in strand swamp habitat at CCP. See Table 2 for a complete list of plant species recorded in strand swamp at CCP.

No rare species were recorded growing in strand swamp habitat at CCP.

A total of seven exotic plant species were recorded invading strand swamp habitat at CCP. Four of these species are listed as category I invasive species by FLEPPC. These species are

Brazilian-pepper, Javanese bishopwood, laurel fig, and popcorn tree. In addition, three species not listed by FLEPPC were also found to be invading this habitat. These species are common dayflower, John Charles, and royal palm*.

Tidal Marsh

Marine and estuarine tidal marshes are Floral Based Natural Communities generally characterized as expanses of grasses, rushes and sedges along coastlines of low wave energy and river mouths FNAI & DNR (1990). They are most abundant and most extensive in Florida north of the normal freeze line, being largely displaced by and interspersed among tidal swamps below this line FNAI & DNR (1990). Black needlerush and smooth cordgrass (*Spartina alterniflora*) are indicator species which usually form dense, uniform stands FNAI & DNR (1990). The stands may be arranged in well-defined zones according to tide levels or may grade subtly over a broad area, with elevation as the primary determining factor FNAI & DNR (1990). In the upper reaches of river mouths, where estuarine tidal marsh begins to blend with freshwater tidal swamp and marsh, sawgrass may occur in dense stands FNAI & DNR (1990). Sawgrass is the least salt tolerant of these tidal marsh species FNAI & DNR (1990). Other typical plants include saltgrass (*Distichlis spicata*), saltmeadow cordgrass (*Leptochloa fascicularis*), gulf cordgrass (*Spartina spartinae*), soft rush and other rushes, salt myrtle, marsh elder, saltwort (*Batis maritima*), sea oxeye (*Borrchia frutescens*), cattail, big cordgrass (*Spartina cynosuroides*), bulrushes, seashore dropseed (*Sporobolus virginicus*), seashore paspalum (*Paspalum distichum*), shoregrass (*Monanthochloe littoralis*), glassworts (*Salicornia* spp.), seablight (*Suaeda* spp.), seaside heliotrope (*Heliotropium curassavicum*), saltmarsh boltonia, and marsh fleabane FNAI & DNR (1990).

Tidal marsh soils are generally very poorly drained muck or sandy clay loams with substantial organic components and often a high sulfur content FNAI & DNR (1990). The elevation of tidal marshes range from just below sea level to slightly above sea level with vegetation occupying the intertidal and supratidal zones FNAI & DNR (1990). The frequently high density of plant stems and roots effectively traps sediments derived from upland runoff or from littoral and storm currents FNAI & DNR (1990). The decaying, dead marsh plants and the transported detritus which the living plants trap, accumulate to form peat deposits FNAI & DNR (1990). Together, these accretion processes may build land FNAI & DNR (1990). Tidal fluctuation is the most important ecological factor in tidal marsh communities, cycling nutrients and allowing marine and estuarine fauna access to the marsh. This exchange helps to make tidal marsh one of the most biologically productive natural communities in the world FNAI & DNR (1990).

Tidal marsh plants live under conditions which would stress most plants FNAI & DNR (1990). High salt content in the soil, poor soil aeration, frequent submersion and exposure, intense sunlight, and occasional fires make the tidal marsh community inhospitable to most plants and require a wide tolerance limit for its inhabitants FNAI & DNR (1990). The landward extent of tidal marsh along the shoreline is directly related to the degree of bottom slope; the more gradual the slope the broader the community band FNAI & DNR (1990). Typical zonation in this community includes smooth cordgrass (*Spartina alterniflora*) in the deeper edges, grading to salt tolerant plants such as black needlerush that withstand less inundation FNAI & DNR (1990).

* Despite being FNAI (S2) and state listed (Endangered) species, royal palm is not native to the Caloosahatchee Creek area and has escaped from cultivation outside of its range.

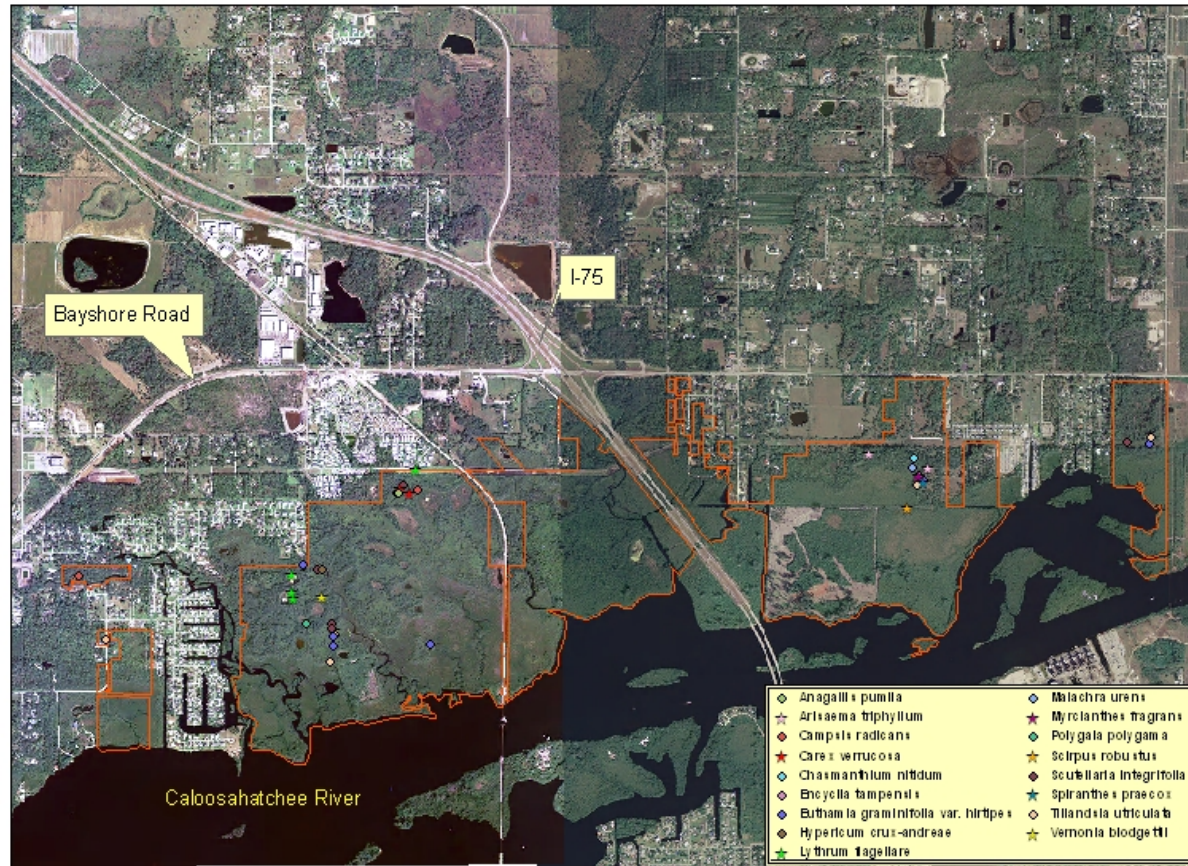
FNAI (2006) lists tidal marsh as G5 and S4 respectively, meaning that demonstrably secure globally and apparently secure in Florida, but may be rare in parts of its range.

Tidal marsh habitat at CCP has a fairly broad distribution and varies species composition from site to site. At CCP, this habitat is typified by broad areas of open grassland with species such as black needle rush, sand cordgrass and saw-grass, grading into freshwater tidal swamp. Small shrubs such as silverling and Virginia saltmarsh mallow can be found interspersed among the grasses and sedges. As the habitat grades into freshwater tidal swamp, woody hydrophilic species such as pond-apple, red mangrove, and white mangrove become more abundant. Tidal marsh at CCP also grades into disturbed upland, disturbed wetland, and hydric hammock plant communities. A total of 38 species were recorded growing in tidal marsh habitat at CCP. See Table 2 for a complete list of plant species recorded in tidal marsh at CCP.

One rare plant species was observed growing in tidal marsh habitat at CCP. Saltmarsh bulrush, listed as Critically Imperiled in South Florida by IRC, was found to be quite abundant in this habitat.

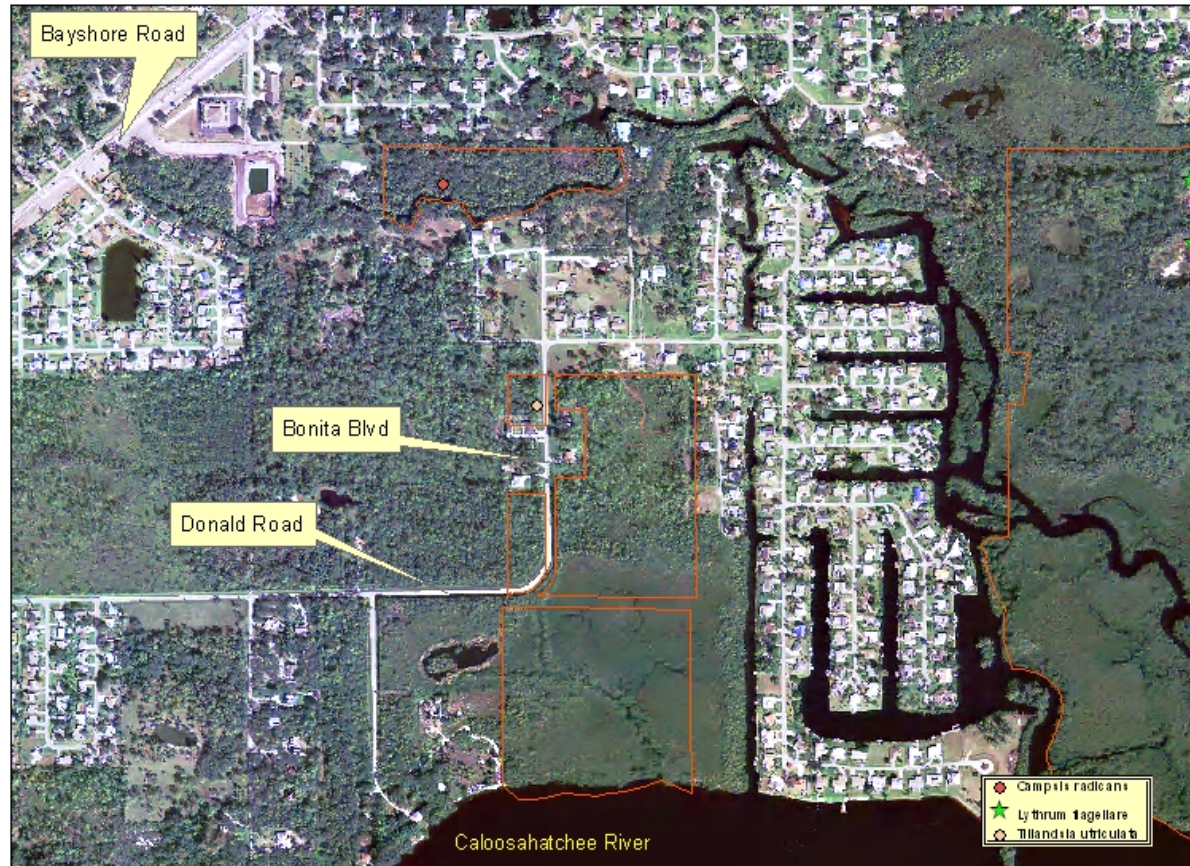
Three exotic plant species were found to be invading tidal marsh habitat at CCP. Two of these species are listed as category I invasive species by FLEPPC. These species are Jambolan-plum and water-lettuce. In addition, watersprite was also found invading this habitat.

Figure 1
Rare Plants of Caloosahatchee Creeks Preserve
Overview



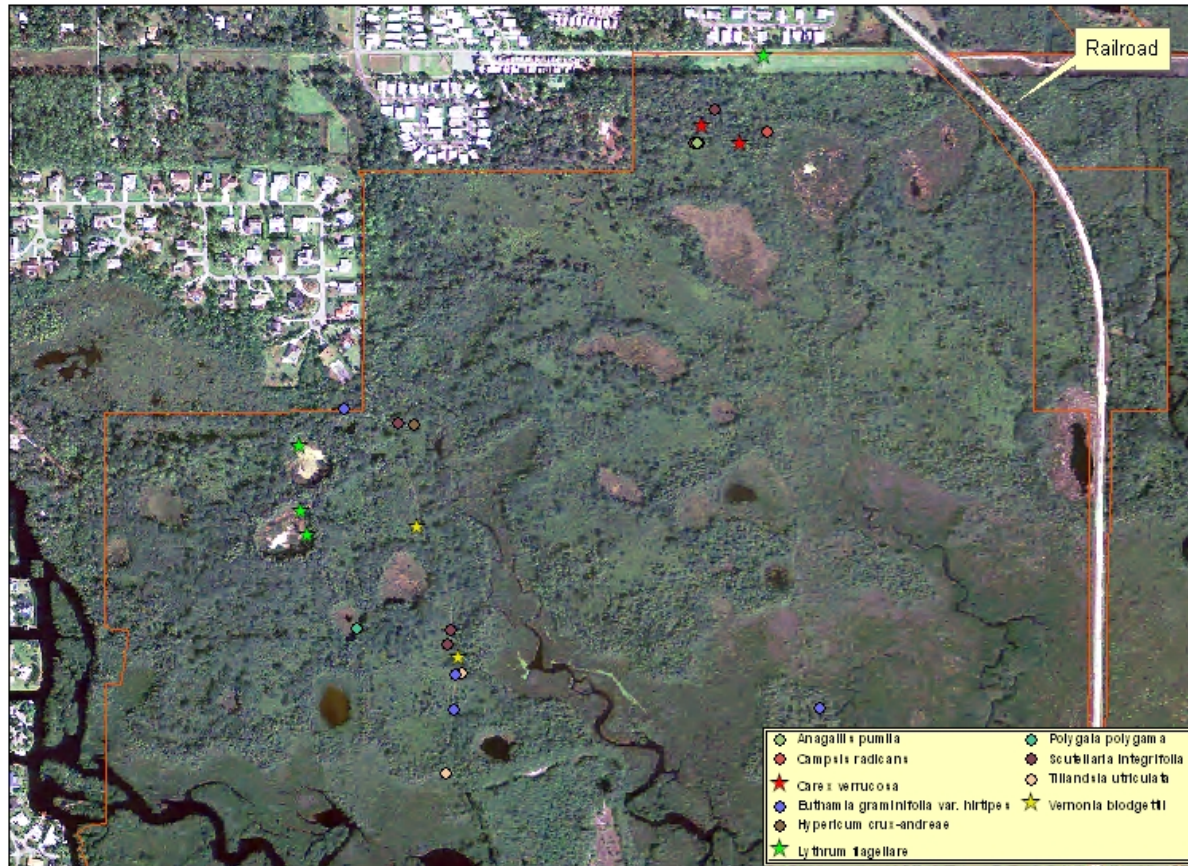
Data collected January - October 2006 by
Steven W Woodmansee, Steven E. Green, and Stephen Hodges
Map prepared by Steven W Woodmansee
The Institute for Regional Conservation
Miami, FL
www.regionalconservation.org

Figure 2
Rare Plants of Caloosahatchee Creeks Preserve
Western Outparcels



Data collected January - October 2006 by
Steven W Woodmansee, Steven E. Green, and Stephen Hodges
Map prepared by Steven W Woodmansee
The Institute for Regional Conservation
Miami, FL
www.regionalconservation.org

Figure 3
Rare Plants of Caloosahatchee Creeks Preserve
West of I-75



Data collected January - October 2006 by
Steven W Woodmansee, Steven E. Green, and Stephen Hodges
Map prepared by Steven W Woodmansee
The Institute for Regional Conservation
Miami, FL
www.regionalconservation.org

Figure 4
Rare Plants of Caloosahatchee Creeks Preserve
East of I-75



Data collected January - October 2006 by
Steven W Woodmansee, Steven E. Green, and Stephen Hodges
Map prepared by Steven W Woodmansee
The Institute for Regional Conservation
Miami, FL
www.regionalconservation.org

Figure 5
Rare Plants of Caloosahatchee Creeks Preserve
Eastern Outparcel



Data collected January - October 2006 by
Steven W Woodmansee, Steven E. Green, and Stephen Hodges
Map prepared by Steven W Woodmansee
The Institute for Regional Conservation
Miami, FL
www.regionalconservation.org

Citations:

Abrahamson, W.G., and D.C. Hartnett. 1990. Pine flatwoods and dry prairies. *In* Ecosystems of Florida (R.L. Myers and J.J. Ewel, eds.), pp. 103-149. University of Central Florida Press, Orlando, Florida.

Abrahamson, W. G., Johnson, A.F., Layne, J.N., and Peroni, P.A. 1984. Vegetation of the Archbold Biological Station, Florida: an example of the southern Lake Wales Ridge. *Fla. Sci.* 47, 209-250.

Anderson, L.C. 1997. Final summary report contract C-7944 inventory of vascular plants for the Isolated Wetland Monitoring Program (Surveys June 1997). Report submitted to the South Florida Water Management District, West Palm Beach, FL.

Anonymous. 2005. Plant sightings at Caloosahatchee Creeks. Unpublished plant list in the files of The Institute for Regional Conservation, Miami, FL.

Coile, N.C & M.A. Garland. 2003. Notes on Florida's endangered and threatened plants. Gainesville: Florida Department of Agriculture and Consumer Services: Division of Plant Industry.

Florida Natural Areas Inventory (FNAI) and Florida Department of Natural Resources (DNR). 1990. Guide to the natural communities of Florida. Amended version located at <http://www.fnai.org/naturalcommguide.cfm>. Tallahassee, Florida.

Florida Natural Areas Inventory (FNAI). 2006. FNAI Element Tracking Summary. October 14, 2006 from <http://www.fnai.org/trackinglist.cfm>. Tallahassee, Florida.

Gann, G.D., K.A. Bradley, & S.W. Woodmansee. 2002. Rare Plants of South Florida: Their History, Conservation, and Restoration. The Institute for Regional Conservation: Miami, Florida.

Gann, G.D., K.A. Bradley and S.W. Woodmansee. 2001-2006. The Floristic Inventory of South Florida Database Online. The Institute for Regional Conservation, Miami.

Godfrey, R.K., and J.W. Wooten. 1979. Aquatic and Wetland Plants of the Southeastern United States: Monocotyledons. Athens: University of Georgia Press.

Kushlan, J.A. 1990. Freshwater marshes. *In* Ecosystems of Florida (R.L. Myers and J.J. Ewel, eds.), pp. 324-363. University of Central Florida Press, Orlando, Florida.

Laessle, A.M. 1942. The plant communities of the Welaka area. Univ. of Florida Publ. Biol. Sci. Ser. (1). Gainesville, Florida.

Tobe, J.D., et al. 1998. Florida Wetland Plants: An Identification Manual. Tallahassee: Florida Department of Environmental Protection.

Wilder, G.J. and M.R. McCombs. 2006. New and significant record of vascular plants for Florida and for Collier County and Lee County, Florida *Sida* 22(1): 787-799.

Woodmansee, S.W. and J.L. Sadle. 2004. A Floristic Survey and Rare Species Assessment of Prairie Pines Preserve, Lee County, Florida, Final Report, Contract #2645 Task 2. October 4th, 2005. Submitted to Lee County Parks and Recreation, Fort Myers, FL.

Wunderlin, R.P. 1998. Guide to the Vascular Plants of Florida. Gainesville: University Presses of Florida.

Wunderlin, R. P., and B. F. Hansen. 2004. *Atlas of Florida Vascular Plants* (<http://www.plantatlas.usf.edu/>). [S. M. Landry and K. N. Campbell (application development), Florida Center for Community Design and Research.] Institute for Systematic Botany, University of South Florida, Tampa.