

Rare Plants of South Florida:

Their History, Conservation, and Restoration



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The Institute for Regional Conservation



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Cover photos by George D. Gann: Top: mahogany mistletoe (*Phoradendron rubrum*), a tropical species that grows only on Key Largo, and one of South Florida's rarest species. Mahogany poachers and habitat loss in the 1970s brought this species to near extinction in South Florida. Bottom: fuzzywuzzy airplant (*Tillandsia pruinosa*), a tropical epiphyte that grows in several conservation areas in and around the Big Cypress Swamp. This and other rare epiphytes are threatened by poaching, hydrological change, and exotic pest plant invasions.

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Part 2. Plants In One Conservation Area

Adiantum villosum L. Woolly Maidenhair

South Florida Status: Critically imperiled. One occurrence at Castellow Hammock Park.

Taxonomy: Pteridophyte; Adiantaceae.

Habit: Perennial lithophytic herb.

Distribution: Native to South Florida, the West Indies, Mexico, Central America, and South America.

South Florida Distribution: Miami-Dade County.

South Florida Habitats: Oolitic limestone in rockland hammocks.

Protection Status: Not listed by any agency.

Identification: Nelson (2000) has a color photo.

References: Nauman, 1987b; Wunderlin, 1998; Liogier & Martorell, 2000; Nelson, 2000; Wunderlin & Hansen, 2000.

Synonyms: *A. tetraphyllum* of Nauman, not Humb. & Bonpl. ex Willd.

Historical Context in South Florida: Alan Cressler discovered woolly maidenhair in 1987 in Ross Hammock in Castellow Hammock Park, and it was vouchered there that same year by Clifton E. Nauman, Roger L. Hammer, and Cressler (1881, FTG). Only one plant was present, and this individual is still the only plant known in Florida.

Major Threats: Stochastic events (e.g., hurricanes); poaching; exotic pest plant invasions; off-target damage from exotic species control efforts; long-term drainage on the Miami Rock Ridge.

Comments: *Wunderlin (1998) lists this as an exotic, but there is no evidence that this species has escaped from cultivation (Nauman, 1987b). Wunderlin & Hansen (2000) treats it as a recent range extension from the West Indies.*

Preliminary recommendations:

- Map plant(s) at Castellow Hammock Park on an annual basis.
- Monitor plant(s) on a quarterly basis.
- Protect from poaching.
- Consider establishing an *ex situ* collection of germplasm.

***Anagallis minima* (L.) E.H.L. Krause**
Chaffweed

South Florida Status: Critically imperiled. One occurrence at Corkscrew Regional Ecosystem Watershed.

Taxonomy: Dicotyledon; Primulaceae.

Habit: Annual terrestrial herb.

Distribution: Native to much of North America south to Mexico. It is also present in the Old World.

South Florida Distribution: Charlotte, Collier, Glades, and Lee counties. Reported in error for the Florida Keys in Monroe County by Small (1913). Wunderlin (1998) reports it as occasional in Florida in the peninsula and the central and western panhandle.

South Florida Habitats: Moist, usually disturbed soils.

Protection Status: Not listed by any agency.

Identification: Godfrey & Wooten (1981) has an illustration.

References: Chapman, 1883; Small, 1933a; Long & Lakela, 1976; Godfrey & Wooten, 1981; Wunderlin, 1998.

Synonyms: *Centunculus minimus* L.

Historical Context in South Florida: Alvan W. Chapman first collected chaffweed in the mid 1800s along the Caloosahatchee River (s.n., US), presumably in Lee County. Paul C. Standley collected it next in Lee County in a pineland ditch in Fort Myers in 1916 (2641, US). William C. Brumbach collected chaffweed on Sanibel Island four times between 1969 (6605, FLAS) and 1973 (8253, NY). All of these collections were from damp, disturbed soils. Loran C. Anderson observed it in 1997 in the Flint Pen Strand section of what is now Corkscrew Regional Ecosystem Watershed (Anderson, 1997), where it is presumed to be extant.

Allan H. Curtiss collected chaffweed in 1901 in ditches near Punta Gorda in Charlotte County (6756, NY, USF). In 1924, John Kunkel Small and others made a collection on the edge of a swamp near Naples in Collier County (11156, NY). In 1968, Olga Lakela made a collection along State Road 29 north of Immokalee (31708, USF). Frank C. Craighead collected it in 1962 about eight miles west of Palmdale along State Road 74 in Glades County (s.n., FTG).

Major Threats: Exotic pest plant invasions; hydrological modifications.

Comments: *This is a small, annual terrestrial herb that could easily be overlooked. Collections from South Florida have been made from January through April, when surveys should be conducted.*

Preliminary recommendations:

- Voucher plants at Corkscrew Regional Ecosystem Watershed.
- Survey along Caloosahatchee River, including Caloosahatchee Regional Park.
- Survey other historical stations.
- Map and monitor known stations on a regular basis.

***Aristida floridana* (Chapm.) Vasey
Key West Threeawn**

South Florida Status: Critically imperiled. One occurrence at Little Hamaca Park.

Taxonomy: Monocotyledon; Poaceae.

Habit: Perennial terrestrial herb.

Distribution: Apparently native to South Florida. Native to Mexico.

South Florida Distribution: Monroe County Keys.

South Florida Habitats: Dry, disturbed sites.

Protection Status: Not listed by any agency due to dispute as to origin (see Comments).

Identification: Hitchcock & Chase (1950) has an illustration.

References: Chapman, 1883; Hitchcock, 1924; Henrard, 1926; Small, 1933a; Hitchcock & Chase, 1950; Long & Lakela, 1976; Hall, 1978; Wunderlin, 1998.

Synonyms: *A. ternipes* Cav., misapplied; *Ortachne floridana* (Chapm.) Nash; *Streptachne floridana* Chapm.

Historical Context in South Florida: Key West threeawn was collected first on the island of Key West in the mid 1800s by either John Loomis Blodgett (s.n., NY) or Alvan W. Chapman (s.n., NY). It was not seen again until George N. Avery observed it in 1965 on Ramrod Key on a disturbed roadside (Avery's Notes, 29 July

1965). Avery returned to that station in 1978, but the site had been destroyed (Avery's Notes, 17 August 1978). Avery also found Key West threeawn on Key West along a railroad embankment in 1966, a site that was almost completely destroyed by 1978 (Avery's Notes, 7 August 1966, 30 August 1978). Bradley rediscovered Key West threeawn in 1998 along a disturbed roadside at Little Hamaca Park on Key West.

Major Threats: Stochastic extinction (e.g., hurricanes); management error; exotic pest plant invasions.

Comments: *There has been some discussion as to whether or not Key West threeawn is really native (e.g., Austin, 1981). It has been found only in the lower Florida Keys in open, dry, disturbed soils. Although it was originally thought to be a South Florida endemic, it is now known to be native to the Yucatan peninsula in Mexico, where it is relatively abundant. This issue needs further study. At a minimum, Key West threeawn should be protected from extirpation until the issue can be resolved.*

Preliminary recommendations:

- Map and monitor known stations on a regular basis.
- Study nativity of Key West threeawn. If the species is native, implement additional recommendations.
- Conduct conservation biology and conservation horticulture studies.
- Consider establishing an *ex situ* collection of germplasm.
- Consider augmenting population at Little Hamaca Park.
- Consider introducing populations to other sites within its historical range.

***Aristolochia pentandra* Jacq.
Marsh's Dutchman's-pipe**

South Florida Status: Critically imperiled. One occurrence at Biscayne National Park.

Taxonomy: Dicotyledon; Aristolochiaceae.

Habit: Perennial vine.

Distribution: Native to South Florida and the West Indies.

South Florida Distribution: Miami-Dade County and the Monroe County Keys.

South Florida Habitats: Coastal rockland hammocks and coastal berms.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: Correll & Correll (1982) has an illustration.

References: Chapman, 1883; Small, 1933a; Pfeifer, 1970; Long & Lakela, 1976; Correll & Correll, 1982; Wunderlin, 1998; Coile, 2000.

Synonyms: None.

Historical Context in South Florida: Abram P. Garber first collected Marsh's dutchman's-pipe in 1877 in Miami (1129a; F, GH, NA, US), presumably in Brickell Hammock. In 1913, John Kunkel Small and George K. Small collected it in a hammock between Miami and Coconut Grove (4634, NY). This collection was almost certainly from Brickell Hammock. In 1926, Small and others made the last collection on the South Florida mainland at what is now Deering Estate at Cutler (s.n., USF).

Small and George V. Nash first collected Marsh's dutchman's-pipe in the Florida Keys in 1901 on Elliott Key (223, NY), in what is now Biscayne National Park. It has been collected three other times on Elliott Key, once by J.L. Fennell in 1939 (1046, UC), once by Frank C. Craighead in 1966 (s.n., FTG), and once by George N. Avery in 1978 (1823, FTG, USF). It has been observed on Elliott Key more recently by Roger L. Hammer in 1990 and 1996 (personal communication, 5 March 2001), and by Bradley and Woodmansee in 2001. The plants are primarily found on a coastal berm that runs along the eastern side of the island. Bradley and Woodmansee have collected geographical coordinates for the plants they have located on the island.

In 1904, Nathaniel L. Britton collected Marsh's dutchman's-pipe on Soldier Key (335, F, NY), also in what is now Biscayne National Park. Small and Joel J. Carter subsequently collected it there in 1909 (3141, FTG, GH, NY, US). Bradley and Woodmansee surveyed this station in 2001, but no viable habitat for this species remains due to anthropogenic disturbances and rising sea level. In 1915, Small and Charles A. Mosier made a collection on Pumpkin Key (5674, MO, NY), a privately held island just outside of Biscayne National Park in Monroe County. Small and Mosier

also made a single collection in 1912 in a hammock on Upper Matecumbe Key (3912, NY). This is the only known record for the middle Florida Keys.

Major Threats: Exotic pest plant invasions, especially latherleaf (*Colubrina asiatica*); off-target damage from exotic species control efforts; sea-level rise.

Comments: *This species is a larval food plant for the polydamus swallowtail butterfly (Battus polydamas). The presence of a population of polydamus swallowtails on Elliott Key indicates that the population of Marsh's Dutchman's-pipe on Elliott Key may be larger than thought (R.L. Hammer, personal communication, 5 March 2001).*

Preliminary recommendations:

- Survey Pumpkin Key and Upper Matecumbe Key.
- Map and monitor known stations on a regular basis.
- Control latherleaf and other exotic pest plants on Elliott Key.
- Conduct conservation biology and conservation horticulture studies.
- Consider establishing an *ex situ* collection of germplasm.
- Consider reintroducing Marsh's dutchman's-pipe to other sites within its historical range, including Addison Hammock at the Deering Estate at Cutler.
- Consider introducing Marsh's dutchman's-pipe to other sites within its historical range, including Alice Wainwright Park, Simpson Park, and Vizcaya Museum and Gardens within historic Brickell Hammock, and Attwood Addition, Indian Key Historic State Park on Upper Matecumbe Key.

***Asimina obovata* (Willd.) Nash**
Bigflower Pawpaw

South Florida Status: Critically imperiled. One occurrence at Jonathan Dickinson State Park.

Taxonomy: Dicotyledon; Annonaceae.

Habit: Shrub.

Distribution: Endemic to peninsular Florida.

South Florida Distribution: Glades and Martin counties. Kral (1960a) cited an improperly labeled specimen attributed to Miami-

Dade County (J. Popenoe, personal communication, 13 March 2001). The Martin County station needs to be vouchered.

South Florida Habitats: Scrub.

Protection Status: Not listed by any agency.

Identification: Taylor (1992) has a color photo; Nelson (1996) has a photo and an illustration; Taylor (1998) has a color photo.

References: Small, 1933a; Kral, 1960a; Godfrey, 1988; Taylor, 1992; Nelson, 1996; Flora of North America Editorial Committee, 1997; Wunderlin, 1998.

Synonyms: *Pityothamnus obovatus* (Willd.) Small.

Historical Context in South Florida: Ruben P. Sauleda first collected bigflower pawpaw in 1981 near Palmdale in Glades County (4991, FTG), in the vicinity of what is now the Fisheating Creek Wildlife Management Area. Loran C. Anderson recently discovered it at Jonathan Dickinson State Park (Anderson, 1997), but this station needs to be vouchered.

Major Threats: Fire suppression; exotic pest plant invasions.

Preliminary recommendations:

- Voucher plants at Jonathan Dickinson State Park.
- Survey Fisheating Creek Wildlife Management Area.
- Map and monitor known stations on a regular basis.

***Asplenium abscissum* Willd.
Cutleaf Spleenwort**

South Florida Status: Critically imperiled. One occurrence at Fern Forest Nature Center.

Taxonomy: Pteridophyte; Aspleniaceae.

Habit: Perennial lithophytic herb.

Distribution: Native to peninsular Florida, the West Indies, Mexico, Central America, and South America. Wunderlin & Hansen (2000) reports it as occasional in Florida from Alachua County south to Miami-Dade County.

South Florida Distribution: Broward and Miami-Dade counties.

South Florida Habitats: Exposed limestone in rockland hammocks.

Protection Status: Not listed by any agency.

Identification: Nelson (2000) has a color photo; the IRC Website has a color photo.

References: Chapman, 1883; Small, 1938; Lakela & Long, 1976; Long & Lakela, 1976; Flora of North America Editorial Committee, 1993; Wunderlin, 1998; Liogier & Martorell, 2000; Nelson, 2000; Wunderlin & Hansen, 2000.

Synonyms: *A. firmum* Kunze.

Historical Context in South Florida: John J. Soar first collected cutleaf spleenwort in 1903 in a hammock near Homestead (s.n., NY), possibly at Hattie Bauer Hammock, Fuchs Hammock, or Meissner Hammock. In 1979, Grace Iverson collected cutleaf spleenwort in Broward County (s.n., USF), in what is now Fern Forest Nature Center. Bradley and Alan Cressler observed this population in 1996. Fewer than 10 plants were observed.

Major Threats: Exotic pest plant invasions; off-target damage from exotic species control programs; poaching; long-term drainage of rockland hammock habitat in both Broward and Miami-Dade counties.

Preliminary recommendations:

- Map and monitor plants at Fern Forest Nature Center.
- Protect from poaching.
- Consider augmenting population at Fern Forest Nature Center.
- Consider introducing cutleaf spleenwort to other sites within its historical range, including Hattie Bauer Hammock, Fuchs Hammock, and Meissner Hammock.

***Asplenium erosum* L.
Eared Spleenwort**

South Florida Status: Critically imperiled. One occurrence at Fakahatchee Strand Preserve State Park.

Taxonomy: Pteridophyte; Aspleniaceae.

Habit: Perennial epiphytic herb.

Distribution: Native to peninsular Florida, the West Indies, Central America, and South America. Wunderlin & Hansen (2000) reports it as occasional in Florida in the central and southern peninsula.

South Florida Distribution: Collier County.

South Florida Habitats: Strand swamps.

Protection Status: Listed as endangered by FDACS and imperiled by FNAI.

Identification: Nelson (2000) has color photos; Chafin (2000) has an illustration.

References: Small, 1938; Lakela & Long, 1976; Long & Lakela, 1976; Flora of North America Editorial Committee, 1993; Wunderlin, 1998; Chafin, 2000; Coile, 2000; Nelson, 2000; Liogier & Martorell, 2000; Wunderlin & Hansen, 2000.

Synonyms: *A. auritum* Sw.

Historical Context in South Florida: Eared spleenwort was collected first in 1938 by Walter M. Buswell in "Big Cypress Hammock" (s.n., NY) and on the same day by W.S. Phillips in "Big Cypress" (s.n., FTG, USF). Presumably the two were collecting together. Both locations refer to the Fakahatchee Strand, now within Fakahatchee Strand Preserve State Park. Subsequent collections were made in 1938 by Roy O. Woodbury and "Waldeck" (s.n., FTG, USF), in 1943 by Buswell (s.n., FTG), in 1944 by Buswell (s.n., FTG, USF), in 1945 by Leonard J. Brass (15801, ARCH), in 1963 by J.A. Lassiter and Rita Lassiter (1, USF), in 1968 by E. Skinner and C. Weymouth (s.n., FTG), in 1978 by Daniel F. Austin and others (6760, USF; 6761, USF), and in 1978 by Clifton E. Nauman and others (330, USF). Florida Park Service biologist Mike Owen estimates that there are fewer than 1,000 plants in Fakahatchee Strand Preserve State Park (personal communication, 22 January 2001).

Major Threats: Poaching; exotic pest plant invasions, especially Old World climbing fern (*Lygodium microphyllum*); hydrological modifications.

Comments: *Lakela & Long (1976), in error, reported this species as being introduced from Jamaica.*

Preliminary recommendations:

- Continue ongoing surveys in Fakahatchee Strand Preserve State Park.
- Map and monitor known stations on a regular basis.
- Protect from poaching.

- Control Old World climbing fern and other exotic pest plants that threaten eared spleenwort.

***Boussieria radula* (Poir.) G. Don**
Rough Strongback

South Florida Status: Critically imperiled. One occurrence at Little Hamaca Park and nearby areas on the island of Key West.

Taxonomy: Dicotyledon; Boraginaceae.

Habit: Shrub or small tree.

Distribution: Native to South Florida and the West Indies.

South Florida Distribution: Monroe County Keys.

Southern Florida Habitats: Rockland hammocks.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: Distinguished in the field from *B. succulenta* (syn. = *B. ovata*) by its having very rough leaves, rather than having relatively smooth leaves like adult *B. succulenta*. *B. succulenta*, however, can have rough leaves when young, and has been misidentified as *B. radula* at a number of sites in the Florida Keys. Scurlock (1987) has color photos of both species; Chafin (2000); has an illustration of *B. radula* and a photo of *B. succulenta*.

References: Nuttall, 1849; Small, 1933a; Ward & Fantz, 1977; Little, 1978; Tomlinson, 1980; Scurlock, 1987; Nelson, 1994; Nelson, 1996; Wunderlin, 1998; Chafin, 2000; Coile, 2000; Liogier & Martorell, 2000.

Synonyms: *B. revoluta* Kunth, misapplied; *Cordia floridana* Nutt.; *Ehretia radula* Poir.

Historical Context in South Florida: John Loomis Blodgett first collected rough strongback on the island of Key West between 1838 and 1853 (s.n., NY). Other collections were made in 1874 by Edward Palmer (405, NY), in 1877 by Abram P. Garber (s.n., NY), in 1895 by Allan H. Curtiss (5427, NY), and in 1913 by John Kunkel Small and George K. Small (4935, NY). It also has been collected and observed many times in several yards in the city of Key West where it is extant. George N. Avery discovered it at the Key West Cemetery in 1964 (Avery's Notes, 28 August 1964). This occurrence was vouchered by Bradley in 1995 (266, FTG), and last observed by Bradley in 2001, when fewer than 10 plants were seen. T. Ann Williams discovered rough strongback at Little

Hamaca Park in the city of Key West in 1986 (s.n., FTG). One mature individual was observed (T.A. Williams, personal communication, 6 March 2001). It was extant there in 1992, when Gann observed a single mature plant, presumably the same individual discovered by Williams. Little (1978) also reported rough strongback from Stock Island just north of Key West, although no collections from that island have been seen by the authors.

Rough strongback is cultivated throughout South Florida, and has sparingly naturalized outside of its natural range.

Major Threats: Exotic pest plant invasions; destruction of individual plants; stochastic events (e.g., hurricanes).

Preliminary recommendations:

- Map individual plants on an annual basis.
- Monitor individual plants on a quarterly basis and observe condition and reproductive status.
- Conduct conservation biology and conservation horticulture studies.
- Consider establishing an *ex situ* collection of germplasm.
- Consider augmenting population at Little Hamaca Park.
- Consider restoring rockland hammock on Key West and introducing rough strongback.

***Brasenia schreberi* J.F. Gmel.**
Watershield

South Florida Status: Critically imperiled. One occurrence at Savannas Preserve State Park.

Taxonomy: Dicotyledon; Cabombaceae.

Habit: Perennial aquatic herb.

Distribution: Native to North America, the West Indies, Central America, South America, and the Old World. Wunderlin (1998) reports it as occasional in Florida from the northern counties south to the central peninsula.

South Florida Distribution: Martin County.

South Florida Habitats: Basin marshes.

Protection Status: Not listed by any agency.

Identification: Bell & Taylor (1982) has a color photo.

References: Chapman, 1883; Small, 1933a; Wood, 1959; Long & Lakela, 1976; Godfrey & Wooten, 1981; Bell & Taylor, 1982; Wunderlin, 1998; Flora of North America Editorial Committee, 2000.

Synonyms: *B. peltata* Pursh.

Historical Context in South Florida: Gann and Bradley first observed watershield in 1997 at Savannas Preserve State Park in Martin County. Bradley and Woodmansee vouchered this population in 2001 (1333, FTG).

Major Threats: Hydrological modifications; exotic pest plant invasions.

Comments: *This is the southernmost station for watershield in Florida. It is unknown why there is a gap in its natural range in the rest of South Florida. It is widespread in North America and tropical America.*

Preliminary recommendations:

- Map and monitor known stations on a regular basis.

***Burmattia flava* Mart.
Fakahatchee Bluethread**

South Florida Status: Critically imperiled. One occurrence at Big Cypress National Preserve.

Taxonomy: Monocotyledon; Burmanniaceae.

Habit: Annual terrestrial herb.

Distribution: Native to South Florida, Cuba, Central America, and South America.

South Florida Distribution: Collier and Lee counties.

South Florida Habitats: Mesic flatwoods.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: There is an illustration in Ward (1978).

References: Jonker, 1938; Long & Lakela, 1976; Ward, 1978; Godfrey & Wooten, 1979; Popenoe, 1986; Wunderlin, 1998; Coile, 2000.

Synonyms: None.

Historical Context in South Florida: Jeanette P. Standley first collected Fakahatchee bluethread in 1916 in the vicinity of Fort Myers (376, NY). Leonard J. Brass made the next collection in 1946, six miles west of Miles City (15874, US), either in what is now the Fakahatchee Strand Preserve State Park or in what is now the Florida Panther National Wildlife Refuge. Ward (1978) provides an account of this discovery. Fakahatchee bluethread is extant in Big Cypress National Preserve, where John Popenoe first collected it in 1984 in the Kissimmee Billy Strand area (2394, FTG, USF). Popenoe (1986) described this discovery. Alan Herndon also collected it in 1988 in the Bear Island area of Big Cypress National Preserve (2271, FTG). Bradley collected it at two localities in Bear Island in 1997 (1067, FTG; 1099, FTG).

Major Threats: Fire suppression; recreational off-road vehicle use in Big Cypress National Preserve; wild hog damage; exotic pest plant invasions.

Comments: *Fakahatchee bluethread is overlooked easily in the field. It flowers spring through fall, when surveys should be conducted. Ward (1978) suggested that it may be partially saprophytic, and dependent upon mycorrhizal fungi for the decomposition of organic matter.*

Preliminary recommendations:

- Survey Kissimmee Billy Strand area of Big Cypress National Preserve, Fakahatchee Strand Preserve State Park, and Florida Panther National Wildlife Refuge.
- Map and monitor known stations on a regular basis.
- Conduct conservation biology and conservation horticulture studies.
- Consider establishing an *ex situ* collection of germplasm.

***Caesalpinia pauciflora* (Griseb.) C. Wright
Fewflower Holdback**

South Florida Status: Critically imperiled. One occurrence at the National Key Deer Refuge and surrounding private properties on Big Pine Key.

Taxonomy: Dicotyledon; Fabaceae.

Habit: Shrub.

Distribution: Native to South Florida and the West Indies.

South Florida Distribution: Monroe County Keys.

South Florida Habitats: Pine rocklands.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: Scurlock (1987) has color photos; Chafin (2000) has illustrations and a color photo.

References: Chapman, 1883; Small, 1933a; Isely, 1982; Long & Lakela, 1976; Isely, 1980; Scurlock, 1987; Nelson, 1996; Wunderlin, 1998; Chafin, 2000; Coile, 2000.

Synonyms: None.

Historical Context in South Florida: Allan H. Curtiss first collected fewflower holdback in 1880 on Big Pine Key (713, US, NY). Since that collection, numerous other collections have been made on Big Pine Key, where the species occurs today within the boundaries of National Key Deer Refuge. T. Ann Williams has observed plants on Big Pine Key in pinelands south of Watson Boulevard and east of Key Deer Boulevard, and in another area in a pineland near the industrial area behind the Chamber of Commerce building (personal communication, 6 March 2001).

Francis W. Pennell vouchered plants on Cudjoe Key in 1917 (9563, US). It was not seen there again until George N. Avery observed it in 1964 and 1965 (Avery's Notes, 1964-1965). Bruce F. Hansen and others vouchered it there in 1985 (10674, USF, FTG). Presumably this station was in or near National Key Deer Refuge property on the island. In 1964, Avery discovered a population on Summerland Key (Avery's Notes, 11 February 1964). Robert W. Long and R. Broome vouchered this population in 1967 (2480, USF). No recent reports from this island have been seen, and it is probably extirpated there. Suitable habitat for this species may exist on other islands, such as Sugarloaf Key or Little Pine Key. T. Ann Williams has searched for this species extensively on No Name Key to no avail (personal communication, 6 March 2001).

Davis (1942) reported fewflower holdback from the lower Sandy Keys, west of Key West. No specimens from this area have been seen. Gann and Bradley surveyed this area in 1996, but no plants were seen. Davis' report may have been made in error.

Major Threats: Fire suppression; exotic pest plant invasions; habitat destruction; sea-level rise.

Preliminary recommendations:

- Survey Cudjoe Key and Summerland Key.
- Map and monitor known stations on a regular basis.
- Acquire private sites with populations of fewflower holdback and add to National Key Deer Refuge.

***Campylocentrum pachyrrhizum* (Rchb. f.) Rolfe**
Leafless Bentspur Orchid

South Florida Status: Critically imperiled. One occurrence at Fakahatchee Strand Preserve State Park.

Taxonomy: Monocotyledon; Orchidaceae.

Habit: Perennial epiphytic herb.

Distribution: Native to South Florida, the West Indies, and South America.

South Florida Distribution: Collier County.

South Florida Habitats: Strand swamps.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: Luer (1972) has both illustrations and color photos; Bell & Taylor (1982) has a color photo; Chafin (2000) has illustrations and a color photo.

References: Small, 1933a; Correll, 1950; Luer, 1972; Long & Lakela, 1976; Ward, 1978; Bell & Taylor, 1982; Wunderlin, 1998; Chafin, 2000; Coile, 2000; Liogier & Martorell, 2000.

Synonyms: None.

Historical Context in South Florida: Alvah A. Eaton first collected leafless bentspur orchid in 1905 (s.n., NY), presumably in what is now Fakahatchee Strand Preserve State Park. It was subsequently vouchered there by Daniel B. Ward in 1965 (5364, FLAS, FSU) and by George N. Avery in 1969 (2075, FTG). It is extant in deep sloughs in the center of the strand. Gann and Woodmansee observed it there in 2000 on a field trip led by Florida Park Service biologist Mike Owen. Owen estimates that there are fewer than 1,000 plants present in the Fakahatchee Strand (personal communication, 7 February 2001).

E.P. St. John also made two collections in the late 1930s from the Deep Lake area (s.n., FLAS; s.n., FLAS), which is located immediately to the east of the Fakahatchee Strand within Big Cypress National Preserve. However, St. John's Deep Lake specimens all appear to be from the Fakahatchee Strand. Black & Black (1980) reported leafless bentspur orchid from Big Cypress National Preserve based upon a 1956 specimen, which we have been unable to verify. It seems doubtful that leafless bentspur orchid was ever present in Big Cypress National Preserve.

Major Threats: Poaching; hydrological modifications; exotic pest plant invasions, especially Old World climbing fern (*Lygodium microphyllum*).

Comments: *This is one of the few epiphytic orchids that will grow on the trunks of royal palms (Roystonea regia) (R.L. Hammer, personal communication, 19 February 2001).*

Preliminary recommendations:

- Continue ongoing surveys in Fakahatchee Strand Preserve State Park.
- Map and monitor known stations on a regular basis.
- Protect from poaching.
- Control Old World climbing fern and other exotic pest plants that threaten leafless bentspur orchid.

***Campyloneurum angustifolium* (Sw.) Fée**
Narrow Strap Fern

South Florida Status: Critically imperiled. One occurrence at Fakahatchee Strand Preserve State Park.

Taxonomy: Pteridophyte; Polypodiaceae.

Habit: Perennial epiphytic herb.

Distribution: Native to South Florida, the West Indies, Central America, and South America.

South Florida Distribution: Miami-Dade and Collier counties.

South Florida Habitats: Rockland hammocks and strand swamps.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: Chafin (2000) has illustrations and a color photo; Nelson (2000) has color photos; the IRC Website has a color photo.

References: Eaton, 1906; Small, 1938; Lakela & Long, 1976; Long & Lakela, 1976; Ward, 1978; Flora of North America Editorial Committee, 1993; Wunderlin, 1998; Chafin, 2000; Coile, 2000; Liogier & Martorell, 2000; Nelson, 2000; Wunderlin & Hansen, 2000.

Synonyms: *Polypodium angustifolium* Sw.

Historical Context in South Florida: John J. Soar and Alvah A. Eaton first collected narrow strap fern in 1903 in Timms Hammock (Eaton, s.n., NY; Small, 1938), now part of the Miami-Dade County park Camp Owaissa Bauer. Eaton (1906) reported that there were a considerable number of plants in Timms Hammock. It was collected again in Timms Hammock by Charles A. Mosier in 1918 and 1919 (s.n., NY; s.n., NY), and by Mary W. Diddell in 1932 (s.n., FLAS). The last collection of narrow strap fern at Timms Hammock was by "Mrs. Peterson" in 1935 (s.n., FTG).

E.P. Kearsley first collected narrow strap fern outside of Miami-Dade County in 1949 "40 miles west of Miami" (s.n., NY). It is probable that this collection came from what is now the Pinecrest region of Big Cypress National Preserve, where there are numerous rockland hammocks providing appropriate habitat for narrow strap fern.

In 1931, John Kunkel Small mentioned narrow strap fern only for Timms Hammock, but, by the time of his 1938 work, he knew of its presence in the Fakahatchee Strand (Small 1931, 1938). Eaton (1906) reported that Oakes Ames observed numerous plants in bayheads near Naples, which referred probably to the Fakahatchee Strand. Bruce E. Tatje and Jane H. Thompson vouchered it at Fakahatchee Strand Preserve State Park in 1978 (157, FAU, USF). Gann and Woodmansee observed it there in 2000 on a field trip led by Florida Park Service biologist Mike Owen. Owen estimates that there are fewer than 100 plants present in Fakahatchee Strand Preserve State Park (personal communication, 22 January 2001).

Major Threats: Poaching; hydrological modifications; exotic pest plant invasions, especially Old World climbing fern (*Lygodium microphyllum*).

Comments: *Although Small (1931, 1938) stated that its preferred habitat was live oak (Quercus virginiana) trees, this preference refers to its habitat in Timms Hammock. Plants in the Fakahatchee grow on hardwoods, such as pond apple (Annona glabra) and pop ash (Fraxinus caroliniana).*

Preliminary recommendations:

- Continue ongoing surveys in Fakahatchee Strand Preserve State Park.
- Survey Pinecrest region of Big Cypress National Preserve.
- Map and monitor known stations on a regular basis.
- Protect from poaching.
- Control Old World climbing fern and other exotic pest plants that threaten narrow strap fern.
- Conduct conservation biology and conservation horticulture studies.
- Consider establishing an *ex situ* collection of germplasm.
- Consider augmenting Fakahatchee population.
- Consider reintroducing narrow strap fern to other sites within its historical range, including Timms Hammock in Camp Owaissa Bauer.

***Carex verrucosa* Muhl.
Warty Sedge**

South Florida Status: Critically imperiled. One occurrence in two conservation areas (Corkscrew Regional Ecosystem Watershed & Corkscrew Swamp Sanctuary).

Taxonomy: Monocotyledon; Cyperaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to the southeastern coastal plain. Wunderlin (1998) reports it as frequent nearly throughout Florida.

South Florida Distribution: Collier, Lee, and Palm Beach counties.

South Florida Habitats: Freshwater swamps.

Protection Status: Not listed by any agency.

Identification: There is an illustration in Godfrey & Wooten (1979).

References: Chapman, 1883; Small, 1933a; Long & Lakela, 1976; Godfrey & Wooten, 1979; Wunderlin, 1998.

Synonyms: *C. joorii* L.H. Bailey, misapplied.

Historical Context in South Florida: Paul C. Standley first collected warty sedge in 1919 near Fort Myers (18952, US). In 1921, Walter M. Buswell made another collection in Lee County from an unspecified station (s.n., FTG). Since then, it remained uncollected in Lee County until 1995, when Steven L. Orzell and Edwin L. Bridges collected it in the Flint Pen Strand (24160, FTG), now part of the Corkscrew Regional Ecosystem Watershed. In 1968, Olga Lakela made a single collection of this species in Collier County in the Corkscrew area (31353, USF). It also is reported for Corkscrew Swamp Sanctuary (Judd, 1994), which is located in both Collier and Lee counties. It is assumed to be extant there, but needs to be vouchered. These two stations are thought to represent a single population.

A collection was made in Palm Beach County in 1980 by David and Sally Black at the J.W. Corbett Wildlife Management Area (851, FTG). The authors have spent considerable time at Corbett, but have not observed warty sedge there. This occurrence is treated as historical.

Major Threats: Exotic pest plant invasions, especially Old World climbing fern (*Lygodium microphyllum*); hydrologic modifications.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Voucher plants at Corkscrew Swamp Sanctuary.
- Survey J.W. Corbett Wildlife Management Area.
- Map and monitor known stations on a regular basis.

***Catopsis nutans* (Sw.) Griseb.
Nodding Strap Airplant**

South Florida Status: Critically imperiled. One occurrence at Fakahatchee Strand Preserve State Park.

Taxonomy: Monocotyledon; Bromeliaceae.

Habit: Perennial epiphytic herb.

Distribution: Native to South Florida, the West Indies, Mexico, Central America, and South America.

South Florida Distribution: Collier County.

South Florida Habitats: Strand swamps.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: Chafin (2000) has a color photo.

References: Long & Lakela, 1976; Smith & Downs, 1977; Ward, 1978; Flora of North America Editorial Committee, 1997; Wunderlin, 1998; Chafin, 2000; Coile, 2000; Liogier & Martorell, 2000.

Synonyms: None.

Historical Context in South Florida: Henry E. Brown and William G. Atwater discovered nodding strap airplant in 1959 in Collier County (Ward, 1978), in what is now Fakahatchee Strand Preserve State Park. C. Eugene Delchamps vouchered it there that same year (s.n., US). In a 1960 letter from Brown to Lyman B. Smith of the Smithsonian Institution, Brown described the many stations where he and Atwater found plants, often in abundance, believing it to be the most abundant *Catopsis* in the Fakahatchee. Roger L. Hammer has observed it at a dozen or more stations within the Fakahatchee Strand (personal communication, 26 March 2001). Nodding strap airplant is extant there, and was observed in 2000 by Gann and Woodmansee on a field trip led by Florida Park Service biologist Mike Owen. Owen estimates that there are fewer than 1,000 plants present in the Fakahatchee Strand (personal communication, 11 June 2000).

Major Threats: Poaching; hydrological modifications; exotic pest plant invasions, especially by Old World climbing fern (*Lygodium microphyllum*).

Comments: *Chapman (1883) used Catopsis nutans for plants that were really C. berteroniana (Small, 1905), and Small (1933a) used the name Catopsis nutans to refer to plants that were really C. floribunda (Ward, 1978).*

Preliminary recommendations:

- Continue ongoing surveys at Fakahatchee Strand Preserve State Park.
- Map and monitor known stations on a regular basis.
- Protect from poaching.
- Control Old World climbing fern and other exotic pest plants that threaten nodding strap airplant.

***Cayaponia americana* (Lam.) Cogn.
American Melonleaf**

South Florida Status: Critically imperiled. One occurrence at Castellow Hammock Park.

Taxonomy: Dicotyledon; Cucurbitaceae.

Habit: Perennial vine.

Distribution: Native to South Florida and the West Indies.

South Florida Distribution: Miami-Dade County.

South Florida Habitats: Rockland hammocks.

Protection Status: Not listed by any agency.

Identification: Correll & Correll (1982) has an illustration of a related species, *C. racemosa*. In South Florida, *Cayaponia americana* most resembles *Melothria pendula*. *Cayaponia* can be distinguished from *Melothria* by its green or greenish white corolla instead of a yellow corolla and its fruit in racemes rather than solitary fruit (R.P. Wunderlin, personal communication, 23 May 2001).

References: Small, 1905; Small, 1933a; Long & Lakela, 1976; Correll & Correll, 1982; Wunderlin, 1998; Liogier & Martorell, 2000.

Synonyms: *C. racemosa* Cogn., misapplied.

Historical Context in South Florida: American melonleaf was collected first by Ferdinand Rugel in 1846 in "Florida" (s.n., US), but this specimen almost certainly came from Miami-Dade County. John Kunkel Small and Joel J. Carter made the next collection in 1903 between Cutler and Camp Longview (792, NY). Camp Longview was historically located to the west of present day Florida City. Small and Percy Wilson made another collection near Camp Longview in 1904 (1593, NY). Small (1905) reported on his discovery of this species in Florida. In 1906, Small and Carter collected American melonleaf in Castellow Hammock (2722, NY), now part of Castellow Hammock Park. It was

observed there several times by George N. Avery from 1976 to 1982 (Avery's Notes), and was vouchered by Avery in 1976 (1245, FTG) and 1982 (2370, GH, FTG). Gann and Bradley observed fewer than 100 plants there in 1997.

Major Threats: Exotic pest plant invasions; off-target damage from exotic plant species control efforts.

Preliminary recommendations:

- Map and monitor plants at Castellow Hammock Park.
- Control exotic pest plants, while preventing off-target damage to American melonleaf.
- Conduct conservation biology and conservation horticulture studies.
- Consider establishing an *ex situ* collection of germplasm.
- Consider introducing American melonleaf to other sites within its historical range.
- Review for listing by FDACS and FNAI.

***Celtis iguanaea* (Jacq.) Sarg.
Iguana Hackberry**

South Florida Status: Critically imperiled. One occurrence at Mound Key Archaeological State Park.

Taxonomy: Dicotyledon; Ulmaceae.

Habit: Shrub.

Distribution: Native to South Florida, central Florida (Manatee County), the West Indies, Mexico, Central America, and South America.

South Florida Distribution: Collier and Lee counties.

South Florida Habitats: Shell mounds.

Protection Status: Listed as endangered by FDACS and as historical by FNAI.

Identification: Chafin (2000) has an illustration; the IRC Website has a color photo.

References: Small, 1933a; Long & Lakela, 1976; Ward, 1978; Tomlinson, 1980; Correll & Correll, 1982; Nelson, 1996; Wunderlin, 1998; Chafin, 2000; Coile, 2000; Liogier & Martorell, 2000.

Synonyms: *Momisia iguanaea* (Jacq.) Rose & Standl.

Historical Context in South Florida: John Kunkel Small first collected iguana hackberry in 1922 on Horr's Island in Collier County (10479, GH, NY). George N. Avery collected it again on Horr's Island in 1970 (838, FTG, USF), as did Bruce F. Hansen and others in 1988 (11806, USF). It was apparently absent from the island when Bradley and Joseph O'Brien surveyed it in 1996. The island was in the process of being developed at the time, and the species is probably extirpated there.

George Cooley and others collected iguana hackberry in 1954 on Sanibel Island in Lee County (s.n., GH). William C. Brumbach also collected it on Sanibel Island in 1972 at the J.N. "Ding" Darling National Wildlife Refuge (7856, US). However, it was not recorded for the refuge by Wunderlin et al. (1980), who conducted extensive fieldwork there in 1978 and 1979. Brumbach collected it on upper Captiva Island in 1971 (7772, GH, USF), 1972 (8060, GH), and again in 1978 (9348, FTG, GH, USF). It is assumed to be extirpated there due to development. Susan Todd collected it at the Mound Key Archaeological State Park in 1974 (44, USF). It was observed there in 2001 by Gann and Florida Park Service biologists R. "Bobby" Hattaway and Sally Braem.

Major Threats: Exotic pest plant invasions.

Comments: *This species is reported in the United States only for peninsular Florida and southern Texas, although the report of plants from Texas may be in error (Flora of North America Editorial Committee, 1997). Joseph H. Simpson collected the Manatee County specimen in 1891 (s.n., GH, NY), where it is extirpated. The only known plants in the continental United States are at Mound Key Archaeological State Park.*

Preliminary recommendations:

- Survey J.N. "Ding" Darling National Wildlife Refuge.
- Map and monitor known stations on a regular basis.
- Consider establishing an *ex situ* collection of germplasm.
- Conduct conservation biology and conservation horticulture studies.
- Consider augmenting population at Mound Key Archaeological State Park.

- Consider reintroducing iguana hackberry to other sites within its historical range.
- Consider introducing iguana hackberry to other sites within its historical range.
- Review FNAI rank.

***Cenchrus myosuroides* Kunth** **Big Sandbur**

South Florida Status: Critically imperiled. One occurrence at Dry Tortugas National Park.

Taxonomy: Monocotyledon; Poaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to Florida, the West Indies, Texas, Mexico, Central America, and South America.

South Florida Distribution: Lee, Collier and Monroe counties.

South Florida Habitats: Shell mounds, coastal berms, dunes, and disturbed areas.

Protection Status: Not listed by any agency.

Identification: Hitchcock & Chase (1950) has an illustration.

References: Chapman, 1883; Chase, 1920; Small, 1933a; Hitchcock & Chase, 1950; Delisle, 1963; Long & Lakela, 1976; Hall, 1978; Correll & Correll, 1982; Wunderlin, 1998; Liogier & Martorell, 2000.

Synonyms: None.

Historical Context in South Florida: John Loomis Blodgett first collected big sandbur between 1838 and 1853 on the island of Key West. Allan H. Curtiss made the next collection prior to 1896 on Indian Key (3620, ISC, US), in what is now Indian Key Historic State Park. Curtiss collected it again on Indian Key in 1896 (5643, ISC, MO, US), and John Kunkel Small and Nathaniel L. Britton collected it there in 1919 (9347, NY). John Kunkel Small and others collected it on West Summerland Key in 1911 (3629, NY). It was observed there again by George N. Avery in 1966 (Avery's Notes, 12 February 1966), and vouchered again by John Popenoe in 1981 (1950, USF). F.R. Fosberg made a collection on Loggerhead Key in Dry Tortugas National Park in 1962 (43041, US). Reimus and Robertson (1997) reported that it has been observed south of the lighthouse on that key since 1962. Richard E. Reimus reports that he observed perhaps 10-15 plants on

Loggerhead Key in March 2001 (personal communication, March 12, 2001).

There are also a few collections of big sandbur from the middle and upper Keys. Percy Jones made a collection "South of Upper Matecumbe Key" in 1898 (985, US). This collection was made on railroad and road fill, and may not have represented a native population. Agnes Chase made a collection on Key Largo in 1907 (3936, US), in an "open hammock near Planter." This may have been in the vicinity of what is now Dove Creek Hammocks, Florida Keys Wildlife and Environmental Area, near the southern end of Key Largo. Jason R. Swallen made a collection on "Key Vacca (Grassy Key)" in 1935 (5201, US), presumably in the vicinity of what is now Curry Hammock State Park. George N. Avery observed it once at Boot Key south of Marathon 1964 (Avery's Notes, 7 August 1964). In 1980, R.W. Pohl made a collection on dunes on the Atlantic side of 20th Street on "Key Vaca" (13901, ISC). This collection was probably made on Boot Key.

Additional collections and reports have been made for islands in Florida Bay, in what is now Everglades National Park. Alvah A. Eaton made the first collection on Joe Kemps Key in 1905 (1345, US). William B. Robertson collected it on Frank Key, just south of Joe Kemps Key, in 1968 (s.n., FTG).

Abram P. Garber collected big sandbur at "Caloosa" in 1878 (11906, MO), presumably in what is now coastal Lee County. It also was collected on Marco Island in coastal Collier County. Joseph H. Simpson made the first collection there in 1891 (281, US). Subsequent collections were made by Harold N. Moldenke in 1930 (s.n., FTG) and Olga Lakela in 1962 (s.n., USF; 29070, USF; 29086, USF; 29243, USF).

Major Threats: Exotic pest plant invasions; sea-level rise.

Comments: *Wunderlin (1998) lists big sandbur only for Collier and Monroe counties. There is a specimen collected by Robert Combs in 1898 at Homosassa in Citrus County (Chase, 1920), where it is apparently extirpated. J. Richard Abbott also collected it in Levy County in 1996 (9518, FLAS). This is a perennial*

species that rarely produces inflorescences in its first year (Delisle, 1963).

Preliminary recommendations:

- Survey Curry Hammock State Park, West Summerland Key and islands in Florida Bay in Everglades National Park, and Tigertail Beach County Park on Marco Island.
- Map and monitor known stations on a regular basis.
- Conduct conservation biology and conservation horticulture studies.
- Consider establishing an *ex situ* collection of germplasm.
- Consider augmenting population at Dry Tortugas National Park.
- Consider reintroducing big sandbur to other sites within its historical range, including Indian Key Historic State Park.
- Review for listing by FDACS and FNAI.

***Cheilanthes microphylla* (Sw.) Sw.
Southern Lip Fern**

South Florida Status: Critically imperiled. One occurrence at Everglades National Park.

Taxonomy: Pteridophyte; Adiantaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to the southern United States, the West Indies, Mexico, Central America, and South America. Wunderlin & Hansen (2000) reports it as rare in Washington County and the peninsula. Wunderlin & Hansen (2001) record it for Alachua, Citrus, Collier, Duval, and Washington counties.

South Florida Distribution: Collier County.

South Florida Habitats: Coastal shell mounds.

Protection Status: Listed as endangered by FDACS and as rare by FNAI.

Identification: Nelson (2000) has a black and white photo; Wunderlin & Hansen (2000) has illustrations.

References: Chapman, 1883; Small, 1938; Evans, 1975; Lakela & Long, 1976; Long & Lakela, 1976; Ward, 1978; Correll & Correll, 1982; Flora of North America Editorial Committee, 1993; Wunderlin, 1998; Coile, 2000; Liogier & Martorell, 2000; Nelson, 2000; Wunderlin & Hansen, 2000

Synonyms: None.

Historical Context in South Florida: John Kunkel Small first collected southern lip fern in 1916 on the Turner River Mound near the mouth of the Turner River (7756, FTG, NY), now in Everglades National Park. It was collected at the same station in 1933 by Hugh O'Neill (7590, NY, US), in 1938 by John H. Davis, Jr. (s.n., FLAS), and in 1960 by Frank C. Craighead (s.n., FLAS). Bradley and Woodmansee observed these plants in 1997. Fewer than 100 plants were seen growing in small swales on the backside of the mound.

In 1977, Sally Black and K. Hipps collected southern lip fern on Horr's Island in association with *Celtis iguanaea* (s.n., FTG). Bradley and Joseph O'Brien surveyed Horr's Island in 1996, but southern lip fern was not seen. The island was undergoing rapid residential development at that time. James N. Burch reported that he had seen some plants in the 1990s on an island in Addison Bay that had been mostly destroyed for fill (personal communication, November, 2000). It is unknown whether or not this station is extant. There have been other reports of southern lip fern on shell mounds in southwestern Florida, but none that we have been able to verify. More surveys should be conducted in the Ten Thousand Islands region.

There was one station in Miami-Dade County that was observed as early as 1959 (Darling, 1962), and collected in 1963 by E.S. Ford (s.n., FLAS). This specimen was found growing on a rock wall in Matheson Hammock Park, but it is not clear that this station represented a native population of this fern, or even if this actually represented *C. microphylla* (Knoblock, 1967; Evans, 1975; Wunderlin & Hansen, 2000).

Major Threats: Exotic pest plant invasions; sea-level rise; poaching.

Comments: *It appears that the natural habitat and range of southern lip fern is on shell mounds in southwestern Florida, and that it has never been common. However, with the loss of the Horr's Island station, it would be prudent to establish at least one other population between Turner River Mound and Horr's Island.*

Preliminary recommendations:

- Survey shell mounds in the Ten Thousand Islands region.
- Map and monitor known stations on a regular basis.
- Protect from poaching.
- Conduct conservation biology and conservation horticulture studies.
- Consider establishing an *ex situ* collection of germplasm.
- Consider introducing southern lip fern to other sites within its historical range.

***Chrysopsis mariana* (L.) Elliott
Maryland Goldenaster**

South Florida Status: Critically imperiled. One occurrence at Big Cypress National Preserve.

Taxonomy: Dicotyledon; Asteraceae.

Habit: Perennial terrestrial herb.

Distribution: Native to eastern North America. Wunderlin (1998) lists it as frequent in Florida from the northern counties south to the central peninsula.

South Florida Distribution: Charlotte and Collier counties.

South Florida Habitats: Flatwoods.

Protection Status: Not listed by any agency.

Identification: Taylor (1992) has a color photo.

References: Small, 1933a; Cronquist, 1980; Semple, 1981; Taylor, 1992; Wunderlin, 1998.

Synonyms: *Heterotheca mariana* (L.) Shinnery.

Historical Context in South Florida: Elliott Brown collected Maryland goldenaster once in 1985 in cleared flatwoods at the “head of Lake Port Charlotte” (s.n., USF), presumably in the vicinity of Port Charlotte in Charlotte County. The locality data for this specimen is confusing, and Gann was unable to find this station in 2000. Also, it is unclear whether or not this station represented a native population.

Bradley collected Maryland goldenaster again in 1997 in the Bear Island area of Big Cypress National Preserve (1085, FTG, USF). Bradley and Woodmansee observed it there as recently as 2001.

Major Threats: Fire suppression; recreational off-road vehicle use in Big Cypress National Preserve; exotic pest plant invasions; wild hog damage.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida. Maryland goldenaster flowers during the fall, when surveys should be conducted.*

Preliminary recommendations:

- Map and monitor known stations on a regular basis.

***Clitoria mariana* L.
Atlantic Pigeonwings**

South Florida Status: Critically imperiled. One occurrence at Juno Dunes Natural Area.

Taxonomy: Dicotyledon; Fabaceae.

Habit: Perennial vine.

Distribution: Native to the eastern United States. Wunderlin (1998) lists it as frequent nearly throughout Florida.

South Florida Distribution: Collier, Miami-Dade, and Palm Beach counties.

South Florida Habitats: Mesic flatwoods, scrubby flatwoods, and pine rocklands.

Protection Status: Not listed by any agency.

Identification: Taylor (1992) has a color photo; Taylor (1998) has a color photo.

References: Chapman, 1883; Small, 1933a; Isely, 1990; Taylor, 1992; Wunderlin, 1998.

Synonyms: *Martiusia mariana* (L.) Small.

Historical Context in South Florida: John Kunkel Small and others first collected Atlantic pigeonwings in 1915 in a pineland south of the Miami River (6432, FLAS, NY). William G. Atwater made the next collection in 1958 on Marco Island in Collier County (s.n., FLAS). Nixon Smiley collected Atlantic pigeonwings in 1976 in the Kissimmee Billy Strand area of what is now Big Cypress National Preserve (s.n., FTG). Donovan S. Correll and others vouchered it there that same year (47169, FTG). It is unknown whether or not plants at this station are extant. Atlantic

pigeonwings was recorded for Palm Beach County at Juno Dunes Natural Area by Palm Beach County biologist Steve Farnsworth (1995a, 1997). Bradley and Woodmansee vouchered this station in 1997 (339, FTG). It is estimated that fewer than 10 plants are present.

Major Threats: Fire suppression; exotic pest plant invasions.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Survey Kissimmee Billy Strand area in Big Cypress National Preserve.
- Map and monitor known stations on a regular basis.
- Consider feasibility of restoring scrubby flatwoods on Marco Island and reintroducing Atlantic pigeonwings.
- Consider restoring pine rocklands along the Miami River and reintroducing Atlantic pigeonwings.

***Coelorachis tuberculosa* (Nash) Nash**
Florida Joint-tail Grass

South Florida Status: Critically imperiled. One occurrence at Jonathan Dickinson State Park and perhaps adjacent private properties.

Taxonomy: Monocotyledon; Poaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to the southeastern coastal plain. Wunderlin (1998) reports it as occasional in Florida from the northern counties south to the central peninsula.

South Florida Distribution: Martin County.

South Florida Habitats: Depression marshes.

Protection Status: Listed as threatened by FDACS and as rare by FNAI.

Identification: Hitchcock & Chase (1950) has an illustration; Tobe et al. (1998) has an illustration.

References: Small, 1933a; Hitchcock & Chase, 1950; Hall, 1978; Godfrey & Wooten, 1979; Tobe et al., 1998; Wunderlin, 1998; Coile, 2000.

Synonyms: *Manisuris tuberculosa* Nash.

Historical Context in South Florida: John Popenoe first collected Florida joint-tail grass in 1975 at Jonathan Dickinson State Park (350, FTG). It also was collected there in 1995 by Edwin L. Bridges and Randy L. Mears (23905, FTG), and later that year by Bradley (166, FTG). Sally Black also collected it in 1989 near Jonathan Dickinson State Park at the Diamond T. Ranch in Martin County (1174, FLAS). It may be present at this or other private properties adjacent to Jonathan Dickinson State Park.

Major Threats: Exotic pest plant invasions; hydrological modifications; wild hog damage; habitat destruction outside of Jonathan Dickinson State Park.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Survey appropriate habitats in Martin County for additional plants.
- Map and monitor known stations on a regular basis.
- Acquire lands with depression marshes near Jonathan Dickinson State Park.

***Croton humilis* L.
Pepperbush**

South Florida Status: Critically imperiled. One occurrence at Big Cypress National Preserve.

Taxonomy: Dicotyledon; Euphorbiaceae.

Habit: Shrub.

Distribution: Native to South Florida, the West Indies, and Mexico.

South Florida Distribution: Collier and Monroe counties.

South Florida Habitats: Rockland hammocks.

Protection Status: Listed as endangered by FDACS.

Identification: There are 12 species of *Croton* in Florida. Wunderlin (1998) has a key. This species superficially resembles *Rivina humilis*. The IRC Website has a color photo

References: Chapman, 1883; Ferguson, 1901; Small, 1933a; Long & Lakela, 1976; Correll & Correll, 1982; Wunderlin, 1998; Coile, 2000; Liogier & Martorell, 2000.

Synonyms: *C. berlandieri* Torr.

Historical Context in South Florida: Alva Bennett first collected pepperbush in 1834 or 1835 on the island of Key West (s.n., NY). It was collected there again by John Loomis Blodgett between 1938 and 1852 (s.n., NY), by Allan H. Curtiss in the late 1800s, and by John Kunkel Small in 1913 (4899, NY; s.n., FTG). In 1952, it was collected at Cactus Hammock on Big Pine Key by Ellsworth P. Killip (41961, NY), and later the same year by "Dickson" (s.n., FTG). Cactus Hammock is located within the National Key Deer Refuge.

Hugh O'Neill made the first collection on the mainland in the Pinecrest area in 1929 (s.n., FTG), either in or near what is now Big Cypress National Preserve. Other vouchers were collected in that area by Frank C. Craighead in 1963 (s.n., USF), by George N. Avery in 1971 (1040, FTG, USF), and by David and Sally Black in 1978 (218, FTG). Black & Black (1980) reported it as rare in Big Cypress National Preserve. Ann Buckley and Ted Hendrickson last vouchered this station in 1984 (46, FAU), but it is assumed to be extant.

It also was collected once in Miami-Dade County in 1978 as a weed at Fairchild Tropical Garden by Donovan S. Correll (50387, FTG). This should not be considered part of its natural range in Florida.

Major Threats: Exotic pest plant invasions.

Comments: *Plants with a known provenance from the Pinecrest area are in cultivation by Joyce W. Gann and by Bradley.*

Preliminary recommendations:

- Map and monitor known stations on a regular basis.
- Conduct conservation biology and conservation horticulture studies.
- Consider establishing an *ex situ* collection of germplasm.
- Consider reintroducing pepperbush to sites within its historical range, including Cactus Hammock in the National Key Deer Refuge.

- Consider introducing pepperbush to other sites within its historical range, including Little Hamaca Park.
- Review for listing by FNAI.

***Cyperus squarrosus* L. Bearded Flatsedge**

South Florida Status: Critically imperiled. Two occurrences in one conservation area (National Key Deer Refuge) and one non-conservation area (Valhalla Rock Barren Site).

Taxonomy: Monocotyledon; Cyperaceae.

Habit: Annual terrestrial herb.

Distribution: Native to the United States, Mexico, Central America, South America, the West Indies, and the Old World. Wunderlin (1998) reports it as occasional in Florida in South Florida, and in Hillsborough County, Escambia County, and the central panhandle.

South Florida Distribution: Collier County and the Monroe County Keys.

South Florida Habitats: Coastal rock barrens, rockland hammocks, shell mounds, and disturbed sites.

Protection Status: Not listed by any agency.

Identification: There are about 50 species of *Cyperus* in Florida. Wunderlin (1998) has a key.

References: Chapman, 1883; Small, 1933a; McLaughlin, 1944; Long & Lakela, 1976; Godfrey & Wooten, 1979; Correll & Correll, 1982; Wunderlin, 1998.

Synonyms: *C. aristatus* Rottb.; *C. inflexus* Muhl.

Historical Context in South Florida: John Loomis Blodgett first collected bearded flatsedge between 1838 and 1853 on the island of Key West (s.n., NY). It also was observed at Key West by J. Cosmo Melville in 1872 (Melville, 1884). Subsequent collections were made by John Kunkel Small and Elizabeth W. Small in 1913 (4885, NY) and by Small and Charles A. Mosier in 1915 (5981, NY). Small and others made a collection on Big Pine Key in 1921 (10144, NY). This collection was made on the southern end of the island, probably in Cactus Hammock, which is now part of the National Key Deer Refuge. George N. Avery observed this population in 1964 (Avery's Notes, 23 August 1964) and vouchered it there in 1971 (1074, USF). Bradley observed this

population in 2001. In 1966, Avery also observed plants in Watson Hammock on Big Pine Key (Avery's Notes, 1 July 1966). In 1966, Avery observed plants on Crawl Key at the Valhalla Rock Barren site (Avery's Notes, 31 August 1966), and he vouchered this population in 1981 (s.n., USF). Bradley re-vouchered plants there in 1998 (1468, FTG, USF). It is estimated that fewer than 100 plants occur on Crawl Key.

Olga Lakela collected bearded flatsedge first in Collier County in 1965 on a shell mound on Marco Island (29238, NY, USF). This station has been destroyed. Bradley collected bearded flatsedge at a second station in Collier County in Immokalee in 1998 (1853, FTG, USF). This population was growing along the edge of a road, and may not represent a native population.

Major Threats: Habitat destruction; sea-level rise.

Preliminary recommendations:

- Survey Cactus Hammock and Watson Hammock on Big Pine Key in the National Key Deer Refuge.
- Map and monitor known stations annually.
- Acquire Valhalla Rock Barren site.
- Consider introducing bearded flatsedge to other sites within its historical range, including Little Hamaca on Key West.

***Dalea pinnata* (J.F. Gmel.) Barneby var. *pinnata*
Summer Farewell**

South Florida Status: Critically imperiled. One occurrence at Jonathan Dickinson State Park.

Taxonomy: Dicotyledon; Fabaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to the southeastern United States. Wunderlin (1998) reports it as frequent in Florida from the northern counties south to the central peninsula.

South Florida Distribution: Martin County.

South Florida Habitats: Flatwoods.

Protection Status: Not listed by any agency.

Identification: Taylor (1998) has a color photograph. The species is distinguished from other species of *Dalea* in South Florida by having flower spikes subtended by a conspicuous involucre and by having plumose calyx segments (Wunderlin

1998). The variety is distinguished from var. *adenopoda* by having leaflets that are filiform to linear rather than elliptic-oblongate and 0.3-0.6 mm wide rather than 1-2 mm wide (Wunderlin, 1998).

References: Small, 1933a; Long & Lakela, 1976; Barneby, 1977; Isely, 1990; Wunderlin, 1998.

Synonyms: *Kuhnistera pinnata* (J.F. Gmel.) Kuntze; *Petalostemon pinnatum* (J.F. Gmel.) S.F. Blake.

Historical Context: Richard Meyers first collected summer farewell in 1967 at Jonathan Dickinson State Park (s.n., FAU). Roy O. Woodbury also collected it there in 1989 (s.n., FTG). In 1997, Bradley and Woodmansee collected it along the Loxahatchee River within Jonathan Dickinson State Park (585, FTG).

A number of authors have reported occurrences of *Dalea pinnata* or *Petalostemon pinnata* from sites in Collier, Lee, Palm Beach, and Martin counties. Reports in Palm Beach and Martin counties may be referable to this taxon, but they need to be verified. Reports from Collier and Lee counties probably refer to *D. pinnata* var. *adenopoda*.

Threats: Fire suppression; exotic pest plant invasions.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Map and monitor known stations on a regular basis.

***Dichanthelium scabriusculum* (Elliott)
Gould & C.A. Clark
Woolly Witchgrass**

South Florida Status: Critically imperiled. One occurrence at Pal-Mar.

Taxonomy: Monocotyledon; Poaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to the southeastern coastal plain. Wunderlin (1998) reports it as occasional in Florida from the northern counties south to Hillsborough County.

South Florida Distribution: Palm Beach County, where it is disjunct from the nearest population in Hillsborough County.

South Florida Habitats: Wet flatwoods.

Protection Status: Not listed by any agency.

Identification: Hitchcock & Chase (1950) has an illustration; Tobe et al. (1998) has a photo and illustrations. This is a large *Dichanthelium* with culms 1-1.5 meters tall (Hitchcock & Chase, 1950).

References: Chapman, 1883; Small, 1933a; Hitchcock & Chase, 1950; Hall, 1978; Godfrey & Wooten, 1979; Hansen & Wunderlin, 1988; Tobe et al., 1998; Wunderlin, 1998.

Synonyms: *Panicum cryptanthum* Ashe; *Panicum scabriusculum* Elliott.

Historical Context in South Florida: Bradley and Woodmansee first collected woolly witchgrass in 1997 at Pal-Mar in Palm Beach County (229, FTG). Fewer than 10 plants were seen in one small colony. It has been reported for Dupuis Reserve (Woodbury, no date), which is located nearby in Palm Beach and Martin counties, but this report needs to be verified.

Major Threats: Drainage of wet flatwoods habitat; fire suppression; exotic pest plant invasions; wild hog damage.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Survey Dupuis Reserve, Pal-Mar Natural Area, and un-acquired portions of the Pal-Mar CARL Site.
- Map and monitor known stations on a regular basis.

***Digitaria pauciflora* Hitchc.
Twospike Crab Grass**

South Florida Status: Critically imperiled. One occurrence at Everglades National Park.

Taxonomy: Monocotyledon; Poaceae.

Habit: Perennial terrestrial herb.

Distribution: Endemic to South Florida.

South Florida Distribution: Miami-Dade County.

South Florida Habitats: Pine rocklands and marl prairies.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI. Currently under review for listing by USFWS (2001).

Identification: Hitchcock & Chase (1950) has an illustration; the IRC Website has a color photo.

References: Small, 1933a; Henrard, 1950; Hitchcock & Chase, 1950; Hall, 1978; Avery & Loope, 1980a; Avery, 1983b; Webster & Hatch, 1990; Wunderlin, 1998; Bradley & Gann, 1999b; Coile, 2000; USFWS, 2000.

Synonyms: *Syntherisma pauciflorum* (Hitchc.) Hitchc. ex Small.

Historical Context in South Florida: John Kunkel Small and Joel J. Carter first collected twospike crab grass in 1903 between Cutler and Camp Longview in Miami-Dade County (916, NY). Alvah A. Eaton was probably with Small and Carter when he collected it also in 1903 (230, US), reporting the station as Cutler. Twospike crabgrass was collected next by W.A. Silveus in 1939 in South Miami (5285, TAES). It was not seen again until 1963 when Frank C. Craighead collected it on Long Pine Key in Everglades National Park (s.n., FTG). It subsequently was found at many stations on Long Pine Key by a number of botanists. George N. Avery gives detailed notes about finding it at many stations from 1978 to 1980 (Avery's Notes, 1978-1980). Gann and Bradley observed it on Long Pine Key in 2000. In 2001, Gann and Bradley assisted Fairchild Tropical Garden biologists Cynthia Lane, Meghan Fellows, and Jennifer Possley, who began the process of mapping twospike crabgrass in Everglades National Park.

In 1996, Bradley and Roger L. Hammer found a single plant at the Luis C. Martinez U.S. Army Reserve Station in the Richmond Pine Rocklands (Hammer, 1996c). Only a single sterile plant was observed in a marl prairie. While it was observed several times in 1996, surveys in subsequent years have failed to find this plant. It may be extirpated there, but additional surveys are needed.

There are three specimens labeled as having been collected on Big Pine Key in the U.S. National Herbarium. Jason R. Swallen collected them all on the same day in 1954. From an examination of Swallen's collection books at the herbarium library, it seems

unlikely that Swallen actually collected this species on Big Pine Key.

Major Threats: Habitat destruction at Luis C. Martinez U.S. Army Reserve Station; hydrological modifications; fire suppression; exotic pest plant invasions.

Comments: *This species may be sensitive to hydrological changes, which may have contributed to its demise at the Richmond Pine Rocklands. It may also be affected, negatively or positively, by the Everglades restoration. An increase in water delivery to Long Pine Key north of main park road could have a negative impact upon this species.*

Preliminary recommendations:

- Continue surveys at Luis C. Martinez U.S. Army Reserve Station.
- Continue mapping plants at Everglades National Park.
- Monitor plants at Everglades National Park on a regular basis.
- Transfer surplus 144-acre parcel at Luis C. Martinez U.S. Army Reserve Station to a conservation agency.
- Conduct conservation biology and conservation horticulture studies.
- Conduct research to determine the effects of the Everglades restoration on twospike woolly crabgrass.
- Encourage USFWS to list *Digitaria pauciflora*.

***Eleocharis albida* Torr.
White Spikerush**

South Florida Status: Critically imperiled. One occurrence at Bill Baggs Cape Florida State Park.

Taxonomy: Monocotyledon; Cyperaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to the southeastern coastal plain west to Texas and Mexico. It is also native to Bermuda. Wunderlin (1998) reports it as occasional nearly throughout Florida.

South Florida Distribution: Collier, Lee, Hendry, Martin, Miami-Dade, and Palm Beach counties.

South Florida Habitats: Moist brackish soils.

Protection Status: Not listed by any agency.

Identification: Godfrey & Wooten (1979) has an illustration.

References: Chapman, 1883; Small, 1933a; Ward & Hodgson, 1975; Godfrey & Wooten, 1979; Wunderlin, 1998.

Synonyms: None.

Historical Context in South Florida: Joseph H. Simpson first collected white spikerush in Fort Myers in 1892 (588, NY). Albert S. Hitchcock also collected it in Fort Myers in 1900 (405, US). The next collections in Lee County were not made until 1975 and 1976 when William C. Brumbach vouchered it on Sanibel Island at "Caloosa Bayous" (8781, USF; 9031, FTG, USF). This station appears to be near or within the J.N. "Ding" Darling National Wildlife Refuge, but white spikerush was not recorded for that site by Wunderlin et al. (1980), who conducted extensive inventory work there in 1978 and 1979.

In 1956, white spikerush was collected in "Palm Beach & Martin Cos., Jupiter Island" by George R. Cooley and Erdman West (s.n., USF). It was mapped for both of these counties by Ward & Leigh (1975), which has been followed by Wunderlin & Hansen (2001). It is unclear if white spikerush was collected in both counties, or only one of them. Frank C. Craighead made a collection in Hendry County in 1962, somewhere along a 17-mile stretch of State Road 29 between Felda and La Belle (s.n., FTG). In 1967, Olga Lakela collected white spikerush in Collier County on Marco Island in a beach lagoon (30960, USF). Marco Island has been extensively developed since that time, and it is probably extirpated there.

White spikerush is currently known only from the cultural area at Bill Baggs Cape Florida State Park. William T. Gillis first collected it there in 1970 (9262, FTG). It was subsequently collected there by Gillis in 1971 (10865, FTG, USF), by George N. Avery and others in 1972 (1196, USF), and by Gann and others in 1995 (136, FTG). It was observed there as recently as 2000 by Gann and Florida park service biologist Janice A. Duquesnel. Fewer than 100 plants were seen. The population appeared to be declining due to the installation of a nature trail and other factors.

Major Threats: Habitat degradation; exotic pest plant invasions; hydrological modifications.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Survey Blowing Rocks Preserve, the Jupiter Island portion of Hobe Sound National Wildlife Refuge, the vicinity of Caloosa Bayous on Sanibel Island, and Tigertail Beach County Park on Marco Island.
- Map and monitor known stations on a regular basis.
- Consider augmenting population at Bill Baggs Cape Florida State Park.
- Consider introducing white spikerush to other sites within its historical range, including Blowing Rocks Preserve and Hobe Sound National Wildlife Refuge on Jupiter Island and J.N. "Ding" Darling National Wildlife Refuge.

***Encyclia pygmaea* (Hook.) Dressler
Dwarf Butterfly Orchid**

South Florida Status: Critically imperiled. One occurrence at Fakahatchee Strand Preserve State Park.

Taxonomy: Monocotyledon; Orchidaceae.

Habit: Perennial epiphytic herb.

Distribution: Native to South Florida, the West Indies, Mexico, Central America, and South America.

South Florida Distribution: Collier County.

South Florida Habitats: Strand swamps.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: Luer (1972) has illustrations and color photos; Chafin (2000) has a color photo.

References: Small, 1933a; Correll, 1950; Luer, 1972; Long & Lakela, 1976; Ward, 1978; Wunderlin, 1998; Chafin, 2000; Coile, 2000; Liogier & Martorell, 2000.

Synonyms: *Epidendrum pygmaeum* Hook.; *Hormidium pygmaeum* (Hook.) Benth. & Hook. f. ex Hemsl.; *Prosthechea pygmaea* (Hook.) W.E. Higgins.

Historical Context in South Florida: Alvah A. Eaton first collected dwarf butterfly orchid in 1905 in the Fakahatchee Strand (1400, AMES), within what is now Fakahatchee Strand Preserve

State Park. William G. Atwater re-vouchered this population in 1960 (M-193, FLAS). Gann and Woodmansee observed this population in 2000 on a field trip led by Florida Park Service biologist Mike Owen. Owen estimates that there are fewer than 100 plants present in the Fakahatchee Strand (personal communication, 25 January 2001).

Major Threats: Poaching; hydrological modifications; exotic pest plant invasions, especially by Old World climbing fern (*Lygodium microphyllum*).

Preliminary recommendations:

- Continue ongoing surveys in Fakahatchee Strand Preserve State Park.
- Map and monitor known stations on a regular basis.
- Protect from poaching.
- Control Old World climbing fern and other exotic pest plants that threaten dwarf butterfly orchid.
- Conduct conservation biology and conservation horticulture studies.
- Consider augmenting population at Fakahatchee Strand Preserve State Park.

***Epidendrum strobiliferum* Rchb. f.
Big Cypress Star Orchid**

South Florida Status: Critically imperiled. One occurrence at Fakahatchee Strand Preserve State Park.

Taxonomy: Monocotyledon; Orchidaceae.

Habit: Perennial epiphytic herb.

Distribution: Native to South Florida, the West Indies, Mexico, Central America, and South America.

South Florida Distribution: Collier County.

South Florida Habitats: Strand swamps.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: Luer (1972) has illustrations and color photos.

References: Small, 1933a; Correll, 1950; Luer, 1972; Long & Lakela, 1976; Wunderlin, 1998; Coile, 2000.

Synonyms: *Spathiger strobiliferus* (Rchb. f.) Small.

Historical Context in South Florida: Oakes Ames first collected Big Cypress star orchid in 1904 (s.n., NY), presumably in the Fakahatchee Strand (cf. Ames, 1904b). Alvah A. Eaton collected it again in 1904 (1126, AMES; 1125, AMES) and 1905 (1386, NY). Both of these collections were from what is now Fakahatchee Strand Preserve State Park. J.A. Lassiter and Rita Lassiter re-vouchered it for the Fakahatchee Strand in 1963 (14, USF), as did R. Vagner in 1966 (s.n., USF). Gann and Woodmansee observed this population in 2000 on a field trip led by Florida Park Service biologist Mike Owen. Owen estimates that there are fewer than 1,000 plants present in the Fakahatchee Strand (personal communication, 25 January 2001).

John Kunkel Small and Walter M. Buswell also made a single collection from the Deep Lake area in 1925 (12709, NY). Deep Lake is located immediately to the east of the Fakahatchee Strand and is now mostly within the boundaries of Big Cypress National Preserve. No plants have been observed or collected in that area since 1925, and Big Cypress star orchid is not thought to be extant in Big Cypress National Preserve. It is possible that Small and Buswell's collection was from the Fakahatchee Strand.

Major Threats: Poaching; hydrological modifications; exotic pest plant invasions, especially by Old World climbing fern (*Lygodium microphyllum*).

Comments: *A specimen at Harvard University (AMES) collected by Hugh O'Neill (7880) is from "a hammock, 3 miles north of Homestead, along Avocado Drive." in 1933. This refers to either Fuchs Hammock or Meissner Hammock. No other reports are known from Miami-Dade County, and this label data may be in error.*

Preliminary recommendations:

- Continue ongoing surveys in Fakahatchee Strand Preserve State Park.
- Map and monitor known stations on a regular basis.
- Protect from poaching.
- Control Old World climbing fern and other exotic pest plants that threaten Big Cypress star orchid.

***Eragrostis tracyi* Hitchc.**
Sanibel Island Love Grass

South Florida Status: Critically imperiled. One occurrence at Mound Key Archaeological State Park and one occurrence on private property on Sanibel Island.

Taxonomy: Monocotyledon; Poaceae.

Habit: Annual terrestrial herb.

Distribution: Endemic to the west coast of peninsular Florida from Pinellas County to Lee County.

South Florida Distribution: Lee County.

South Florida Habitats: Shell mounds, coastal grasslands, and disturbed sites.

Protection Status: Listed as endangered by FDACS and as historical by FNAI.

Identification: Hitchcock & Chase (1950) has an illustration.

References: Hitchcock & Chase, 1950; Lakela, 1965; Koch, 1972; Hall, 1978; Koch, 1978; Ward, 1978; Peterson, 1996; Wunderlin, 1998; Coile, 2000.

Synonyms: *E. pectinacea* (Michx.) Nees ex Jedwabn. var. *tracyi* (Hitchc.) P.M. Peterson.

Historical Context in South Florida: Samuel M. Tracy first collected Sanibel Island love grass in 1901 on Sanibel Island (7168, US). Other collections were made on Sanibel Island by George R. Cooley in 1953 (4938, USF) and 1954 (2608, USF), and by William C. Brumbach in 1976 (8938, USF). Ward (1978) stated that Brumbach had found this plant on all parts of Sanibel Island, but it was not reported for the J.N. "Ding" Darling National Wildlife Refuge by Wunderlin et al. (1980). Sanibel-Captiva Conservation Foundation biologist David Ceilley reported that Sanibel love grass had been found at the Sea Oats subdivision adjacent to one of the Foundation's conservation areas on Sanibel Island (personal communication, 27 July 2001), but this area needs to be surveyed. Gann, Dick Workman, and others observed plants on the edge of an unpaved road on eastern Sanibel Island in 2001, but this station needs to be vouchered.

In 1978, Sandy Morrill collected Sanibel love grass on North Captiva Island (112, USF), to the north of Sanibel Island. It was

reported for Cayo Costa State Park (Florida Park Service District 4, 1994a), which includes the southern portion of North Captiva Island. Gann and Florida Park Service biologist R. "Bobby" Hattaway surveyed the Cayo Costa State Park portion of North Captiva Island in March 2001, but did not observe any plants.

Olga Lakela discovered Sanibel Island love grass on Mound Key in 1964 (27043, USF), now Mound Key Archaeological State Park. Gann, Hattaway, and Florida Park Service biologist Sally Braem observed it there during a brief survey 2001. Plants were seen growing on the disturbed edge of a nature trail. This station should be re-vouchered.

Major Threats: Exotic pest plant invasions.

Comments: *This species tolerates disturbance and colonizes recently disturbed areas. Koch (1972) conducted surveys for Sanibel Island love grass at Gasparilla Island in Charlotte County, Pine Island and Fort Myers Beach in Lee County, and Naples in Collier County. No new stations were discovered.*

Preliminary recommendations:

- Voucher plants at Mound Key Archaeological State Park and Sanibel Island stations.
- Survey North Captiva Island and Sanibel Island.

***Eupatorium compositifolium* Walter**
Yankeeweed

South Florida Status: Critically imperiled. Two occurrences in one conservation area (Nixon Smiley Pineland Preserve) and one non-conservation area (Federal Correctional Institution in the Richmond Pine Rocklands).

Taxonomy: Dicotyledon; Asteraceae.

Habit: Perennial terrestrial herb.

Distribution: Native primarily to the southeastern coastal plain. Wunderlin (1998) reports it as common nearly throughout Florida.

South Florida Distribution: Martin and Miami-Dade counties.

South Florida Habitats: Pine rocklands and flatwoods.

Protection Status: Not listed by any agency.

Identification: Taylor (1992) has a color photo; Taylor (1998) has a color photo.

References: Small, 1933a; Long & Lakela, 1976; Cronquist, 1980; Godfrey & Wooten, 1981; Taylor, 1992; Wunderlin, 1998.

Synonyms: None.

Historical Context in South Florida: Nathaniel L. Britton first collected yankeeweed in 1904, in pinelands in Perrine in Miami-Dade County (148, NY). John Kunkel Small also made a collection in 1916 in pinelands to the west of Perrine (7896, NY), perhaps in or near the Richmond Pine Rocklands. In 2000, Bradley and Woodmansee discovered it in the Richmond Pine Rocklands at the Federal Correctional Institution (Bradley et al., 2000a). Only one plant was observed at this station, so it was not vouchered. In 1975, George N. Avery discovered yankeeweed at what is now the Nixon Smiley Pineland Preserve, which is located to the north of the Richmond Pine Rocklands and to the northwest of Perrine (1663, USF, FTG). Bradley observed this station again in 1995. Fewer than 100 plants are thought to be present there. Two other stations were vouchered in Miami-Dade County. Small and Joel J. Carter made a collection in 1906 between Perrine and Homestead (2736, NY), and Walter M. Buswell made a collection in a rocky pineland in Coral Gables in 1943 (s.n., FTG).

Leland M. Baltzell made a collection of yankeeweed in 1977 in the vicinity of Marcy in northeastern Martin County (10028, FLAS). No habitat data was given but it may have been collected in flatwoods. It has been reported for a number of conservation areas in South Florida that need to be verified. These sites include Corkscrew Swamp Sanctuary (Judd, 1994) and Corkscrew Regional Ecosystem Watershed (Anderson, 1997), both of which are located in Collier and Lee counties. It has also been reported for a number of sites in Palm Beach County, including Juno Dunes Natural Area (Farnsworth, 1995a), Loxahatchee Slough Natural Area (Farnsworth, 1994c), and Royal Palm Beach Pines Natural Area (Farnsworth, 1995c).

Major Threats: Fire suppression; exotic pest plant invasions; habitat destruction at the Federal Correctional Institution in the Richmond Pine Rocklands.

Comments. *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

However, the disjunct population in Miami-Dade County is floristically interesting and should be protected. Small plants of *Eupatorium capillifolium* can be mistaken for *E. compositifolium*.

Preliminary recommendations:

- Survey Corkscrew Swamp Sanctuary, Corkscrew Regional Ecosystem Watershed, Juno Dunes Natural Area, Loxahatchee Slough Natural Area, and Royal Palm Beach Pines Natural Area.
- Map and monitor known stations on a regular basis.
- Negotiate conservation agreement the Federal Correctional Institution to restore and maintain a viable population of yankeeweed. Provide technical assistance to help restore and manage this population.

***Euphorbia inundata* Torr. ex Chapm.
Florida Pineland Spurge**

South Florida Status: Critically imperiled. One occurrence at Fred C. Babcock-Cecil M. Webb Wildlife Management Area.

Taxonomy: Dicotyledon; Euphorbiaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to Florida and southern Alabama. Wunderlin (1998) reports it as occasional in Florida in the peninsula and in the central and western panhandle.

South Florida Distribution: Charlotte, Collier, and Lee counties.

South Florida Habitats: Flatwoods.

Protection Status: Not listed by any agency.

Identification: Tobe et al. (1998) has an illustration and a color photo.

References: Chapman, 1883; Norton, 1900; Small, 1933a; Godfrey & Wooten, 1981; Tobe et al., 1998; Wunderlin, 1998.

Synonyms: *Galarhoeus inundatus* (Torr. ex Chapm.) Small.

Historical Context in South Florida: O.E. Frye first collected Florida pineland spurge in 1946 at an unspecified locality in Charlotte County (s.n., FLAS). This collection was made in a “pine slough – man made.” John Beckner collected it in flatwoods in eastern Charlotte County in 1968 (2265, FLAS). In 1996, Gann and Bradley observed it at Fred C. Babcock-Cecil M. Webb

Wildlife Management Area, several miles to the west of Beckner's station, but this station needs to be vouchered.

Ray Garrett made a collection in Collier County in 1951 northeast of Naples (s.n., FLAS). In 1985, Elliott Brown collected it in Lee County in North Fort Myers (s.n., USF). This station was located to the north of the clubhouse in Tamiami Village, a station that has almost certainly been destroyed. The Tamiami Village Flatwoods Site, which is located just to the north of Tamiami Village, may contain habitat for this species.

Major Threats: Drainage of flatwoods habitat; fire suppression; exotic pest plant invasions.

Preliminary recommendations:

- Voucher plants at Fred C. Babcock-Cecil M. Webb Wildlife Management Area.
- Survey Tamiami Village Flatwoods Site.
- Map and monitor known stations on a regular basis.
- Acquire Tamiami Village Flatwoods Site.

***Evolvulus grisebachii* Peter
Grisebach's Dwarf Morningglory**

South Florida Status: Critically imperiled. One occurrence at National Key Deer Refuge and adjacent private properties.

Taxonomy: Dicotyledon; Convolvulaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to South Florida and Cuba.

South Florida Distribution: Monroe County Keys.

South Florida Habitats: Pine rocklands.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: Chafin (2000) has illustrations and a color photo.

References: Small, 1933a; Ooststroom, 1934; Ward, 1968b; Long & Lakela, 1976; Wunderlin, 1998; Chafin, 2000; Coile, 2000.

Synonyms: *Evolvulus wrightii* House.

Historical Context in South Florida: John Loomis Blodgett first collected Grisebach's dwarf morningglory between 1838 and 1853 on Big Pine Key in Monroe County (s.n., NY). It has never been

vouchered for any other islands in South Florida. Numerous collections have been made on Big Pine (e.g., Small 3809, NY; Killip 31449, US; Avery et al. 1745, USF; Brumbach 9669, FSU), but few give good data on where plants were found. Grisebach's dwarf morningglory seems to be restricted to the vicinity of Key Deer Boulevard and Watson Boulevard, near the Blue Hole, including private property and property owned by the National Key Deer Refuge. The authors have observed plants there as recently as 2001.

Major Threats: Fire suppression; exotic pest plant invasions; habitat destruction; sea-level rise.

Comments: *Ward (1968b) reported this species from Puerto Rico, apparently in error. The status of this species in Cuba is unknown.*

Preliminary recommendations:

- Map and monitor known stations on a regular basis.
- Acquire private properties with Grisebach's dwarf morningglory and incorporate into National Key Deer Refuge.
- Conduct conservation biology and conservation horticulture studies.
- Determine status in Cuba.

***Gratiola pilosa* Michx.
Shaggy Hedgehyssop**

South Florida Status: Critically imperiled. One occurrence at Jonathan Dickinson State Park.

Taxonomy: Dicotyledon; Scrophulariaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to the eastern United States. Wunderlin (1998) reports it as frequent nearly throughout Florida.

South Florida Distribution: Glades, Martin, and Palm Beach counties.

South Florida Habitats: Flatwoods, depression marshes, and disturbed sites.

Protection Status: Not listed by any agency.

Identification: Tobe et al. (1998) has a color photo.

References: Chapman, 1883; Small, 1933a; Pennell, 1935; Long & Lakela, 1976; Godfrey & Wooten, 1981; Tobe et al., 1998; Wunderlin, 1998

Synonyms: *Tragiola pilosa* (Michx.) Small & Pennell ex Pennell; *Tragiola pilosa* var. *epilis* (Pennell) Small & Pennell ex Pennell.

Historical Context in South Florida: Leonard J. Brass first collected shaggy hedgehyssop in 1945 in Palmdale in Glades County (15456, US), in the vicinity of what is now Fisheating Creek Wildlife Management Area. John Popenoe made the next collection in 1981 at Jonathan Dickinson State Park in Martin County (1937, FTG), where it is assumed to be present. While the label states that it was a “weed in moist area” it was most likely persisting in an area where its habitat had been cleared, or it recruited from a nearby natural area. Popenoe also collected it in Palm Beach County in 1983 along the Loxahatchee River (2352, USF), in what is now Jonathan Dickinson State Park.

There are a number of additional reports of this species that should be verified. It has been reported for Palm Beach County at Royal Palm Beach Pines Natural Area (Farnsworth, 1995c) and Pal-Mar (Bradley et al., 1997b). It also has been reported for the Dupuis Reserve (Woodbury, no date), which is located in both Palm Beach and Martin counties.

Major Threats: Fire suppression; exotic pest plant invasions; wild hog damage.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Survey Dupuis Reserve, Fisheating Creek Wildlife Management Area, Pal-Mar, and Royal Palm Beach Pines Natural Area.
- Map and monitor known stations on a regular basis.

***Gymnopogon ambiguus* (Michx.) Britton et al.
Bearded Skeleton Grass**

South Florida Status: Critically imperiled. One occurrence in one conservation area and two non-conservation areas in the Richmond Pine Rocklands (Larry and Penny Thompson Park, former U.S. Naval Observatory site, & U.S. Coast Guard Communication Station).

Taxonomy: Monocotyledon; Poaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to the southeastern United States and the West Indies. Wunderlin (1998) reports it as frequent in Florida from the northern counties south to the central peninsula.

South Florida Distribution: Miami-Dade and Palm Beach counties.

South Florida Habitats: Pine rocklands and probably mesic flatwoods.

Protection Status: Not listed by any agency.

Identification: Hitchcock & Chase (1950) has an illustration.

References: Chapman, 1883; Small, 1933a; Hitchcock & Chase, 1950; Smith, 1971; Hall, 1978; Wunderlin, 1998.

Synonyms: *G. racemosus* P. Beauv.

Historical Context in South Florida: John Kunkel Small and Joel J. Carter first collected bearded skeleton grass in 1903 in between Cutler and Camp Longview in Miami-Dade County (921, NY; s.n., US). Camp Longview was historically located to the west of present day Florida City. Alvah A. Eaton also made a collection, probably on the same date, between "Miami and Jenkins Camp" (192, US). He probably was collecting with Small and Carter at the time.

The next collection from Miami-Dade County was made in 1979 by Alan H. Herndon near Camp Choe (277, USF), a Girl Scout camp in Perrine across the Florida's Turnpike from the Richmond Pine Rocklands. George N. Avery observed one plant at Camp Choe in 1980 (Avery's Notes, 23 August 1980). Also in 1980, Avery and Herndon observed one plant at Larry and Penny Thompson Park in the Richmond Pine Rocklands (Avery's Notes, 19 January 1980). Bradley and Woodmansee observed this station in 2000.

Fewer than 10 plants were seen. In 1996, Bradley and Gann observed bearded skeleton grass at what was the U.S. Naval Observatory, also in the Richmond Pine Rocklands (Bradley & Gann, 1996), a site that now is owned by the University of Miami. Fewer than 10 plants were observed. In 2000, Bradley and Woodmansee observed it at the U.S. Coast Guard Communications Station, also in the Richmond Pine Rocklands (Bradley et al., 2000a). Fewer than 10 plants were observed. All of these stations are considered to be the same occurrence.

In 1979, Avery made a collection in the Redland area at the Camp Owaissa Bauer Addition (2184, USF). He saw only “2 little clumps” (Avery’s Notes, 31 October 1979). Bradley has surveyed this station several times, but has not seen this species there.

C.V. Piper made a collection of bearded skeleton grass in 1917 at “Annie” in Palm Beach County (s.n., US).

Major Threats: Habitat destruction in the Richmond Pine Rocklands and at Camp Choe; fire suppression; exotic pest plant invasions.

Comments: *All collections in South Florida have been made during October and November, when surveys should be conducted.*

Preliminary recommendations:

- Survey Camp Choe.
- Map and monitor known stations on a regular basis.
- Develop conservation agreements with the Girl Scouts of America, the University of Miami, and the U.S. Coast Guard to restore and manage viable populations of bearded skeleton grass at their respective sites. Provide technical assistance to help manage these populations.

***Helenium flexuosum* Raf.
Purplehead Sneezeweed**

South Florida Status: Critically imperiled. Two occurrences in one conservation area (Everglades National Park) and one non-conservation area (Notre Dame Pineland).

Taxonomy: Dicotyledon; Asteraceae.

Habit: Perennial terrestrial herb.

Distribution: Native to the eastern and central United States. Wunderlin (1998) lists it as occasional in Florida from the northern counties south to the central peninsula and Miami-Dade County.

South Florida Distribution: Miami-Dade County, where it is disjunct from the nearest populations in Polk County.

South Florida Habitats: Pine rocklands.

Protection Status: Not listed by any agency.

Identification: There are six species of *Helenium* in Florida. This species is a branched perennial with reddish disk flowers (Wunderlin, 1998).

References: Small, 1933a; Long & Lakela, 1976; Cronquist, 1980; Godfrey & Wooten, 1981; Wunderlin, 1998.

Synonyms: *H. floridanum* Fernald; *H. nudiflorum* Nutt.

Historical Context in South Florida: John Kunkel Small and Percy Wilson first collected purplehead sneezeweed in 1904 in a pineland near Camp Longview (1675, NY; 1803, NY). This station was located to the west of present-day Florida City. In 1959, Frank C. Craighead first collected purplehead sneezeweed on Long Pine Key in Everglades National Park (s.n., NY; s.n., USF). This station was vouchered again by George N. Avery in 1976 (1219, FTG), by Alan Herndon in 1980 (363, FTG), and by Rick and Jean Seavey in 1985 (99, FTG). The authors have observed plants on Long Pine Key as recently as 2000.

Only two other collections of this species are known from South Florida. Harold N. Moldenke made a collection in Goulds in 1930 (539, NY). In 1998, Bradley collected a specimen at the privately owned Notre Dame Pineland (1824, FTG), which is located to the west of the Homestead Air Reserve Base.

Major Threats: Habitat destruction at Notre Dame Pineland; fire suppression; exotic pest plant invasions.

Comments: *This species seems to grow only in periodically inundated pine rocklands, a habitat that has been eliminated outside of Everglades National Park. The population at Notre Dame Pineland may be declining due to a drop in the water table, while the population in Everglades National Park could be affected by changes in water delivery from the Everglades restoration.*

The plants in South Florida lack ray flowers.

Preliminary recommendations:

- Survey pine rocklands in the Goulds area, including Andrew Dodge Memorial Pineland, Black Creek Forest, Goulds Pineland, and Institute for Regional Conservation Preserve.
- Map and monitor known stations on a regular basis.
- Acquire Notre Dame Pineland.
- Conduct research to determine the effects of the Everglades restoration on purplehead sneezeweed.

***Helianthus radula* (Pursh) Torr. & A. Gray**
Stiff Sunflower

South Florida Status: Critically imperiled. One occurrence at Big Cypress National Preserve.

Taxonomy: Dicotyledon; Asteraceae.

Habit: Perennial terrestrial herb.

Distribution: Native to the southeastern coastal plain. Wunderlin (1998) reports this as frequent nearly throughout Florida.

South Florida Distribution: Collier County, where it is disjunct from Hardee and Okeechobee counties.

South Florida Habitats: Mesic flatwoods.

Protection Status: Not listed by any agency.

Identification: Bell & Taylor (1982) has a color photo; Taylor (1992) has a color photo.

References: Chapman, 1883; Small, 1933a; Long & Lakela, 1976; Cronquist, 1980; Godfrey & Wooten, 1981; Bell & Taylor, 1982; Taylor, 1992; Wunderlin, 1998.

Synonyms: None.

Historical Context in South Florida: William G. Atwater first collected stiff sunflower in 1958 “5 miles e. of Miles City” in Collier County (C-7, FLAS). This station is probably the same as that vouchered in the Bear Island area of Big Cypress National Preserve by Bradley in 1997 (662, FTG), and by Jordan Muss in 1998 (s.n., USF). Bradley and Woodmansee observed plants there as recently as 2001.

Major Threats: Fire suppression; recreational off-road vehicle use in Big Cypress National Preserve; exotic pest plant invasions; wild hog damage.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Map and monitor known stations on a regular basis.

***Hexalectris spicata* (Walt.) Barnhart**
Spiked Crested Coralroot

South Florida Status: Critically imperiled. One occurrence at J.N. "Ding" Darling National Wildlife Refuge.

Taxonomy: Monocotyledon; Orchidaceae.

Habit: Perennial terrestrial saprophytic herb.

Distribution: Native to the southeastern United States, west to Arizona and New Mexico. Wunderlin (1998) reports it as occasional in Florida from the peninsula west to the central panhandle.

South Florida Distribution: Lee County.

South Florida Habitats: Hammocks.

Protection Status: Listed as endangered by FDACS.

Identification: Luer (1972) has illustrations and color photos; Taylor (1998) has a color photo.

References: Small, 1933a; Correll, 1950; Luer, 1972, Wunderlin, 1998; Coile, 2000.

Synonyms: *H. aphylla* (Nutt.) Raf. Ex S. Watson & S.M. Coults.

Historical Context in South Florida: William C. Brumbach first collected spiked crested coralroot in 1977 on Captiva Island (9261, USF). Joyce W. Gann and G. Donald Gann observed flowering plants on Captiva Island in 1982 (Avery's Notes, 29 May 1982). These plants were found on the edge of a clearing in partial shade (G. Donald Gann, personal communication, 19 February 2001). This island has undergone extensive residential and commercial development since the early 1980s and it is doubtful that any plants remain on Captiva Island.

Bruce F. Hansen and JoAnn Hansen collected spiked crested coralroot on neighboring Sanibel Island in 1979 (5692, USF), at the J.N. "Ding" Darling National Wildlife Refuge. It is assumed to be present there. William C. Brumbach made another collection on private property on western Sanibel Island in 1980 (9561, NY, USF). It is unknown whether or not this population is extant.

Major Threats: Exotic pest plant invasions; poaching.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Map and monitor known stations on a regular basis.

***Hibiscus coccineus* Walter** **Scarlet Rosemallow**

South Florida Status: Critically imperiled. One occurrence at Corkscrew Swamp Sanctuary.

Taxonomy: Dicotyledon; Malvaceae.

Habit: Shrub.

Distribution: Native to Florida, southern Georgia, and Alabama. Wunderlin (1998) reports it as occasional in Florida from the peninsula to the central and western panhandle.

South Florida Distribution: Collier County, where it is disjunct from Hillsborough and Polk counties.

South Florida Habitats: Cypress swamps.

Protection Status: Not listed by any agency.

Identification: Taylor (1992) has a color photo; Nelson (1996) has a color photo; Tobe et al. (1998) has color photos.

References: Chapman, 1883; Small, 1933a; Long & Lakela, 1976; Godfrey & Wooten, 1981; Taylor, 1992; Nelson, 1996; Tobe et al., 1998; Wunderlin, 1998.

Synonyms: *H. semilobatus* Chapm.

Historical Context in South Florida: M. Menzel and D. Wise first collected scarlet rosemallow in 1972 at Corkscrew Swamp Sanctuary in Collier County (72-19, FSU; 72-20, FSU). Gann and Tiffany Troxler Gann observed it at this station in 1999.

A specimen also exists that has been attributed to Broward County. Wise collected the specimen in 1972 (72-6, FSU), one day before he collected *H. coccineus* with Menzel at Corkscrew. We have seen no other reports from Broward County, and believe that this is a mislabeled specimen actually collected at Corkscrew Swamp Sanctuary.

Roger L. Hammer recently discovered a population of scarlet rosemallow in the Big Cypress Swamp that appears to have escaped from cultivated plants (personal communication, 13 June 2001).

Major Threats: Exotic pest plant invasions, especially Old World climbing fern (*Lygodium microphyllum*).

Preliminary recommendations:

- Map and monitor known stations on a regular basis.
- Control Old World climbing fern and other exotic pest plants that may threaten scarlet rosemallow.

***Huperzia dichotoma* (Jacq.) Trevis.
Hanging Clubmoss**

South Florida Status: Critically imperiled. One occurrence at Fakahatchee Strand Preserve State Park.

Taxonomy: Pteridophyte; Lycopodiaceae.

Habit: Perennial epiphytic herb.

Distribution: Native to South Florida, the West Indies, Mexico, Central America, and South America.

South Florida Distribution: Collier County.

South Florida Habitats: Strand swamps; epiphytic on pond apple (*Annona glabra*) and pop ash (*Fraxinus caroliniana*).

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: Tobe et al. (1998) has photos and an illustration; Nelson (2000) has a color photo; Wunderlin & Hansen (2000) has illustrations; the IRC Website has a color photo.

References: Small, 1938; Lakela & Long, 1976; Long & Lakela, 1976; Austin, 1981; Nauman, 1986a; Flora of North America Editorial Committee, 1993; Tobe et al., 1998; Wunderlin, 1998; Coile, 2000; Liogier & Martorell, 2000; Nelson, 2000; Wunderlin & Hansen, 2000.

Synonyms: *Lycopodium dichotomum* Jacq.; *Phlegmariurus dichotomus* (Jacq.) W.H. Wagner.

Historical Context in South Florida: Charles A. Mosier and J.B. McFarlin first collected hanging clubmoss in 1934 in the Fakahatchee Strand (Mosier s.n., NY; McFarlin & Mosier 7357, NY), within what is now Fakahatchee Strand Preserve State Park. Clifton E. Nauman and others vouchered it again without a date (322, USF), presumably before 1980. Other observers include C. Eugene Delchamps, Roger L. Hammer, and George N. Avery (Avery's Notes, 17 November 1968, 11 November 1976, and 18 July 1979). Hammer, Alan Cressler and Don Keller observed three plants in 1988 (R.L. Hammer, personal communication, 8 February 2001). Cressler, Bradley, and Carol Lippincott observed three plants in 1995. The Fakahatchee station remains the only known station in Florida. Florida Park Service biologist Mike Owen estimates that there are fewer than 10 plants in Fakahatchee Strand Preserve State Park.

Major Threats: Poaching; exotic pest plant invasions, especially by Old World climbing fern (*Lygodium microphyllum*).

Preliminary recommendations:

- Continue ongoing surveys in Fakahatchee Strand Preserve State Park.
- Map and monitor known stations on a regular basis.
- Protect from poaching.
- Control Old World climbing fern and other exotic pest plants that threaten hanging clubmoss.
- Conduct conservation biology and conservation horticulture studies.
- Consider establishing an *ex situ* collection of germplasm.
- Consider augmenting population at Fakahatchee Strand Preserve State Park.

***Ilex ambigua* (Michx.) Torr.
Carolina Holly**

South Florida Status: Critically imperiled. One occurrence at Jonathan Dickinson State Park.

Taxonomy: Dicotyledon; Aquifoliaceae.

Habit: Shrub or small tree.

Distribution: Native to the southeastern coastal plain and piedmont. Wunderlin (1998) reports it as common in Florida from the northern counties south to the central peninsula.

South Florida Distribution: Lee and Martin counties.

South Florida Habitats: Mesic hammocks, flatwoods, and floodplain forests.

Protection Status: Not listed by any agency.

Identification: Nelson (1994) has a color photo; Nelson (1996) has an illustration.

References: Chapman, 1883; Small, 1933a; Long & Lakela, 1976; Wunderlin & Poppleton, 1977; Little, 1978; Godfrey, 1988; Nelson, 1994; Nelson, 1996; Wunderlin, 1998.

Synonyms: *I. buswellii* Small; *I. caroliniana* (Raf.) Trel.

Historical Context in South Florida: Walter M. Buswell first collected Carolina holly in 1923 at Fort Myers (s.n., USF). After that, it was collected on a number of occasions in the Fort Myers area, up until 1920, when Harold N. Moldenke made the last collection (991, NY). In 1923, Buswell also collected it along the Caloosahatchee River east of Fort Myers (s.n., NY). Small designated this as the type specimen of a new species, *I. buswellii*, which is now considered conspecific with *I. ambigua*. Buswell also collected it at this station in 1929 (s.n., NY). Carolina holly was not vouchered again in Lee County until George N. Avery collected it at Koreshan State Historic Site in 1973 (1475, FTG). Gann and Florida Park Service biologists R. "Bobby" Hattaway and Sally Braem searched for this species during a brief survey in 2001, but were unable to locate any plants. It is possible that construction of a parking lot destroyed the plants, but more survey work should be conducted at Koreshan.

In 1987, Roy O. Woodbury made the first collection in Martin County at Jonathan Dickinson State Park (s.n., FTG). Woodbury also collected it at several private properties in Martin County: south of Palm City in 1989 (M-1083, FTG) and in 1990 (M-1084, FTG); north of Palm City in 1989 (s.n., FTG); west of Stuart in 1990 (M-1085; M-1086, FTG); and, "SR 713" in 1992 (1068, FTG). The latter station possibly refers to State Road 714, which runs west of Palm City. While plants are presumably extant at

Jonathan Dickinson State Park, it is not known whether or not plants at the other stations remain.

Major Threats: Exotic pest plant invasions; habitat destruction.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Survey Koreschan State Historic Site and Woodbury's Martin County stations.
- Map and monitor known stations on a regular basis.

***Kosteletzkya depressa* (L.) O.J. Blanch. et al.
White Fenrose**

South Florida Status: Critically imperiled. One occurrence at Everglades National Park.

Taxonomy: Dicotyledon; Malvaceae.

Habit: Short-lived sub-shrub.

Distribution: Native to South Florida, the West Indies, Mexico, Central America, and South America.

South Florida Distribution: Monroe County mainland.

South Florida Habitats: Salt marshes, coastal berms, and open buttonwood forests.

Protection Status: Listed as endangered by FDACS.

Identification: It can be distinguished from *K. virginica* by having white flowers less than 1 cm long, rather than having pink flowers 2-4 cm long (Wunderlin, 1998).

References: Small, 1933a; Long & Lakela, 1976; Godfrey & Wooten, 1981; Wunderlin, 1998; Coile, 2000.

Synonyms: *K. pentasperma* (Bertero ex DC.) Griseb.

Historical Context in South Florida: John Kunkel Small and others first collected white fenrose in 1921 "between Flamingo and Coot Bay" (10306, NY, US). Small and others collected it again in the Flamingo region in 1922 (10688, NY). It was not collected again until 1954, when Frank C. Craighead collected it at "Alligator Creek" (s.n., Everglades National Park herbarium). Since then, it has been collected in the Flamingo area by Craighead in 1962 (s.n., USF), by George N. Avery in 1966 (297, USF), and by

Richard G. Reimus in 1993 (149, FTG). Gann and Bradley have observed plants in the Flamingo region as recently as 2001.

Major Threats: Exotic pest plant invasions, especially Brazilian-pepper (*Schinus terebinthifolius*) and latherleaf (*Colubrina asiatica*); sea-level rise.

Preliminary recommendations:

- Map and monitor known stations on a regular basis.
- Control Brazilian-pepper and latherleaf in the Flamingo/Cape Sable area of Everglades National Park.
- Review for listing by FNAI.

***Leptochloa uninervia* (J. Presl) Hitchc. & Chase
Mexican Sprangletop**

South Florida Status: Critically imperiled. One occurrence at Frog Pond/L-31 N Transition Lands. Other occurrences of waif populations may be present in southern Miami-Dade County.

Taxonomy: Monocotyledon; Poaceae.

Habit: Annual terrestrial herb.

Distribution: Native to the United States, Mexico, and South America. Wunderlin (1998) reports it as occasional nearly throughout Florida.

South Florida Distribution: Lee, Miami-Dade, and Palm Beach counties.

South Florida Habitats: Rocky glades, salt marshes, and wet disturbed sites.

Protection Status: Not listed by any agency.

Identification: Hitchcock & Chase (1950) has an illustration.

References: Small, 1933a; Hitchcock & Chase, 1950; Hall, 1978; Correll & Correll, 1982; Wunderlin, 1998; Liogier & Martorell, 2000.

Synonyms: *Diplachne uninervia* (J. Presl.) Parodi.

Historical Context in South Florida: Robert Kral first collected Mexican sprangletop in 1957 at J.W. Corbett Wildlife Management Area in Palm Beach County (5707, FSU). This collection was made in an abandoned tomato field, and may not represent a native population. In 1964, Robert K. Godfrey collected it along the Caloosahatchee River in Fort Myers in tidal flats adjacent to a mangrove swamp (65429, FSU). In 1971, Stephen D. Koch

collected it again in Lee County in a cleared area on the north side of the Caloosahatchee River in North Fort Myers (7122, FSU). It was reported to be locally abundant.

George N. Avery collected Mexican sprangletop first in Miami-Dade County in 1976 in "rocky glades west of Homestead" (1691, USF). This station is now protected in a remote area of Everglades National Park four to five miles from its eastern boundary (1691, USF). In 1997, Bradley collected it at the Frog Pond/L-31 N Transition Area (1186, FTG), an area of farm fields and rocky glades managed by the South Florida Water Management District. This collection was made at the edge of a farm field, although it may have historically occurred at the site in rocky glades. Bradley also collected the species in 1997 in a tree farm in marl soil northeast of the Homestead Air Reserve Base (1259, FTG). The species may have historically occurred in marl prairies in the area.

Major Threats: Exotic pest plant invasions.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida. It has weedy tendencies in many of the sites where it has been collected, and it is uncertain whether or not it was historically native at some of these localities.*

Preliminary recommendations:

- Survey Avery station in Everglades National Park.
- Map and monitor known stations on a regular basis.

***Leptochloa virgata* (L.) P. Beauv.
Tropical Sprangletop**

South Florida Status: Critically imperiled. Two occurrences in one conservation area (Fakahatchee Strand Preserve State Park) and one non-conservation area (Pelican Marsh).

Taxonomy: Monocotyledon; Poaceae.

Habit: Perennial terrestrial herb.

Distribution: Peninsular Florida, southern Texas, the West Indies, Central America, and South America. Wunderlin (1998) reports it as rare in Florida in Seminole, Collier, and Miami-Dade counties.

South Florida Distribution: Collier, Miami-Dade, and the Monroe County Keys.

South Florida Habitats: Freshwater marshes, rockland hammocks, and disturbed sites.

Protection Status: Not listed by any agency.

Identification: Hitchcock & Chase (1950) has an illustration.

References: Chapman, 1883; Small, 1933a; Hitchcock & Chase, 1950; Long & Lakela, 1976; Hall, 1978; Correll & Correll, 1982; Tobe et al., 1998; Wunderlin, 1998; Liogier & Martorell, 2000.

Synonyms: *L. domingensis* (Jacq.) Trin.; *Diplachne domingensis* (Jacq.) Chapm.

Historical Context in South Florida: Tropical sprangletop may have been collected first by Joseph H. Simpson in 1892, but his label states only "Southern Florida" (s.n., NY, US). While not definitely from the range of this manual, Simpson did make other collections in the Florida Keys and Marco Island during the same month. Alvah A. Eaton made the first definite collection from South Florida in 1903 at the town of Newport on Key Largo (432, US). Additional collections were made on Key Largo in 1909 by John Kunkel Small and Joel J. Carter (2850, NY), in 1925 by Small (11640, NY), and in 1928 by Paul Weatherwax (1164, US). Both of Small's collections state that plants were found in "Hammocks" while the Weatherwax collection was made on a roadside. Weatherwax also stated that the species was "Probably Introduced."

Harold N. Moldenke first collected tropical sprangletop in Miami-Dade County in 1930 in "dry sandy soil along roadside" in the Black Point area (5543, NY). Frank C. Craighead made the next collection in 1961 in Everglades National Park (s.n., USF). The exact location of this collection is unknown. The only data provided on the specimen states "Concrete bridge," possibly referring to the Taylor Slough bridge on the main park road.

In 1961, William G. Atwater made a collection of tropical sprangletop in a roadside ditch northwest of Copeland in Collier County (2030, USF). This collection was probably from what is now Fakahatchee Strand Preserve State Park. In 1999, Bruce F. Hansen collected it nearby at the edge of the Fakahatchee Strand Preserve State Park along SR 26, north of Jerome (12888, USF).

Tropical sprangletop has also been reported for the Fakahatchee (Austin et al., 1990). It was also collected further north in Collier County at Pelican Marsh just east of Naples Park by Kristi Pierce in 1998 (s.n., USF). This collection was made from "Open marsh." This station is presumed to be extant, but it needs to be surveyed.

Major Threats: Habitat destruction at Pelican Marsh station; exotic pest plant invasions; hydrological modifications; fire suppression; wild hog damage.

Comments: This species has also been reported in Florida from Seminole County. It is unknown if this occurrence is extant or even if it was a native occurrence.

Preliminary recommendations:

- Survey Pelican Marsh.
- Map and monitor known stations on a regular basis.

***Licaria triandra* (Sw.) Kosterm.
Gulf Licaria**

South Florida Status: Critically imperiled. One occurrence at Simpson Park.

Taxonomy: Dicotyledon; Lauraceae.

Habit: Tree.

Distribution: Native to South Florida and the West Indies.

South Florida Distribution: Miami-Dade County.

South Florida Habitats: Rockland hammocks.

Protection Status: Listed as endangered by FDACS and as historical by FNAI.

Identification: Chafin (2000) has illustrations and a color photo.

References: Small, 1933a; Long & Lakela, 1976; Little, 1978; Tomlinson, 1980; Nelson, 1994; Wunderlin, 1998; Chafin, 2000; Coile, 2000; Liogier & Martorell, 2000.

Synonyms: *Misanteca triandra* (Sw.) Mez.

Historical Context in South Florida: John Kunkel Small first collected Gulf licaria in 1904 in Brickell Hammock in Miami (2241, NY). It has been collected numerous times in Brickell Hammock by a number of botanists. Today it is only extant at Simpson Hammock Park, where it was observed as early as 1965 by

George N. Avery (Avery's Notes, 11 November 1965). The authors have observed plants at this station as recently as 2000. Fewer than 10 trees are present, although there are dozens, if not hundreds, of seedlings present (R.L. Hammer, personal communication, 13 June 2001). Fairchild Tropical Garden has germplasm of *Gulf lcaria* (M. Collins, personal communication, 3 July 2001), but it is not entirely clear if these plants are of Florida provenance.

Major Threats: Exotic pest plant invasions; management error; stochastic events (e.g., hurricanes).

Comments: *A number of local botanists have this species in cultivation from seeds collected in Brickell Hammock or from their progeny.*

Preliminary recommendations:

- Map and monitor plants at Simpson Park.
- Consider introductions to other sites within historical Brickell Hammock, including Alice Wainwright Park and Vizcaya Museum and Gardens.
- Review listing by FNAI.

***Liparis nervosa* (Thunb.) Lindl.
Pantropical Widelif Orchid**

South Florida Status: Critically imperiled. One occurrence at Fakahatchee Strand Preserve State Park.

Taxonomy: Monocotyledon; Orchidaceae.

Habitat: Perennial terrestrial herb.

Distribution: Native to peninsular Florida, the West Indies, Mexico, Central America, South America, and the Old World. Wunderlin (1998) reports it as rare in Florida in Collier, Hernando, and Hillsborough counties.

South Florida Distribution: Collier County.

South Florida Habitats: Strand swamps.

Protection Status: Listed as endangered by FDACS.

Identification: Luer (1972) has illustrations and color photos; the IRC Website has a color photo.

References: Small, 1933a; Correll, 1950; Luer, 1972; Long & Lakela, 1976; Godfrey & Wooten, 1979; Wunderlin, 1998; Coile, 2000; Liogier & Martorell, 2000.

Synonyms: *L. elata* Lindl.

Historical Context in South Florida: James Layne first discovered pantropical widelip orchid in 1903 (s.n., AMES; Ames, 1904b), in what is now Fakahatchee Strand Preserve State Park. Other collections were made there in 1937 by Walter M. Buswell (s.n., USF) and in 1963 by J.A. Lassiter and Rita Lassiter (16, USF). Numerous botanists, including the authors, have observed this population over the years. Gann and Woodmansee also observed this population in 2000 on a field trip led by Florida Park Service biologist Mike Owen. Owen estimates that there are between 1,000 and 10,000 plants in the Fakahatchee Strand. Pantropical widelip orchid also has been reported for Big Cypress National Preserve based upon a 1956 specimen (Black & Black, 1980), but we have not been able to verify this occurrence. A 1988 collection said to have been from Everglades National Park cannot be verified, and is treated here as a false record.

Major Threats: Exotic pest plant invasions; poaching; hydrological modifications.

Preliminary recommendations:

- Map and monitor known stations on a regular basis.
- Protect from poaching.
- Review for listing by FNAI.

***Ludwigia palustris* (L.) Elliott
Marsh Seedbox**

South Florida Status: Critically imperiled. One occurrence at Jonathan Dickinson State Park.

Taxonomy: Dicotyledon; Onagraceae.

Habit: Perennial terrestrial herb.

Distribution: Native to temperate North America, Eurasia, and Africa. Wunderlin (1998) reports it as frequent in Florida from the northern counties to the central peninsula.

South Florida Distribution: Charlotte and Martin counties.

South Florida Habitats: Floodplain forests and flatwoods.

Protection Status: Not listed by any agency.

Identification: Godfrey & Wooten (1981) has an illustration.

References: Small, 1933a; Godfrey & Wooten, 1981; Wunderlin, 1998; Liogier & Martorell, 2000.

Synonyms: *Isnardia palustris* L.

Historical Context in South Florida: O.E. Frye first collected marsh seedbox in 1946 in Charlotte County (s.n., FLAS). No specific locality data was given. In 1977, John Popenoe made the first collection in Martin County at Jonathan Dickinson State Park (1025, FTG). Donovan S. Correll and others also collected it there twice in 1978 (19899, FTG; 49911, FTG, NY). All of these collections were made near the Loxahatchee River in floodplain forests or flatwoods. Marsh seedbox has been reported for the Dupuis Reserve (Woodbury, no date), which is located in Martin and Palm Beach counties, but this report needs to be verified.

Major Threats: Exotic pest plant invasions; wild hog damage; hydrological modifications.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Survey Dupuis Reserve.
- Map and monitor known stations on a regular basis.

***Ludwigia virgata* Michx.
Savannah Primrosewillow**

South Florida Status: Critically imperiled. One occurrence at Pal-Mar.

Taxonomy: Dicotyledon; Onagraceae.

Habit: Perennial terrestrial herb.

Distribution: Native to the southeastern coastal plain. Wunderlin (1998) reports it as frequent in Florida in the northern and central peninsula.

South Florida Distribution: Palm Beach County.

South Florida Habitats: Wet flatwoods.

Protection Status: Not listed by any agency.

Identification: Tobe et al. (1998) has an illustration and a color photo.

References: Chapman, 1883; Small, 1933a; Long & Lakela, 1976; Godfrey & Wooten, 1981; Taylor, 1992; Tobe et al., 1998; Wunderlin, 1998.

Synonyms: None.

Historical Context in South Florida: Bradley and Woodmansee first collected Savannah primrosewillow in 1997 in wet flatwoods at Pal-Mar in Palm Beach County (699, FTG). Fewer than 10 plants were observed. It has been reported for Dupuis Reserve (Woodbury, no date), which is located nearby in Martin and Palm Beach counties, and Snake Creek/Miramar Pineland Natural Area in Broward County (Broward County Parks & University of Florida, 1998k), but these reports need to be verified.

Major Threats: Drainage of wet flatwoods habitat; fire suppression; exotic pest plant invasions; wild hog damage.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida. It is extremely similar to L. maritima, and has been erroneously reported for several stations in South Florida.*

Preliminary recommendations:

- Survey Dupuis Reserve, Pal-Mar Natural Area, un-acquired portions of the Pal-Mar CARL Site, and Snake Creek/Miramar Pineland Natural Area.
- Map and monitor known stations on a regular basis.

***Lythrum flagellare* Shuttlew. ex Chapm.
Florida Loosestrife**

South Florida Status: Critically imperiled. Two occurrences in one conservation area (Fred C. Babcock-Cecil M. Webb Wildlife Management Area) and one non-conservation area (a roadside swale next to Tamiami Village in North Fort Myers).

Taxonomy: Dicotyledon; Lythraceae.

Habit: Perennial terrestrial herb.

Distribution: Endemic to peninsular Florida. Wunderlin (1998) reports it as occasional in Florida in the central peninsula.

South Florida Distribution: Charlotte, Collier, Glades, Hendry, and Lee counties.

South Florida Habitats: Creek bottoms, marshes, and wet disturbed sites.

Protection Status: Listed as endangered by FDACS and as imperiled by FNAI.

Identification: It can be distinguished from the other three species of *Lythrum* in Florida by having the uppermost leaves alternate, and usually being decumbent (Wunderlin, 1998).

References: Chapman, 1883; Small, 1933a; Graham, 1975; Long & Lakela, 1976; Godfrey & Wooten, 1981; Tobe et al., 1998; Wunderlin, 1998; Coile, 2000.

Synonyms: None.

Historical Context in South Florida: John Kunkel Small first collected Florida loosestrife in 1917 near Fort Shackleford in Hendry County (8342, FSU, NY). This station is located in what is now the Big Cypress Seminole Indian Reservation. In 1964, Leonard J. Brass made a collection at Rainy Slough near Tasmania in Glades County, where it was reported to be common (33208, USF). Bradley visited this station in 2000, but most of the vegetation was desiccated and no plants were observed. In 1965, Olga Lakela made a collection north of Immokalee in Collier County (28712, FSU). The next year, Lakela collected it a second time north of Immokalee (29805, US, USF). In 1986, Elliott Brown made a collection in Lee County in a roadside swale along US 41 adjacent to Tamiami Village in North Fort Myers (s.n., USF). Gann and Tiffany Troxler Gann found this small station in 2000. It is only a matter of time before this population is destroyed. It is possible that some plants are present at the Tamiami Village Flatwoods Site immediately to the north of Tamiami Village.

Gann and Bradley collected Florida loosestrife at the Fred C. Babcock-Cecil M. Webb Wildlife Management Area in Charlotte County in 1996 (688, USF). A few plants were found growing in the headwaters of a small creek. Florida loosestrife has been reported from the Dupuis Reserve (Woodbury, no date; Gann et al., 1998), which is located in Martin and Palm Beach counties, but these reports need to be verified.

Major Threats: Drainage of wetland habitats; exotic pest plant invasions; wild hog damage.

Preliminary recommendations:

- Survey Big Cypress Seminole Indian Reservation, Immokalee area, Tamiami Village Flatwoods Site, and Tasmania area.
- Map and monitor known stations on a regular basis.
- Consider translocation of Tamiami Village population to a more secure location.
- Acquire Tamiami Village Flatwoods Site.

***Mitchella repens* L.
Partridgeberry**

South Florida Status: Critically imperiled. One occurrence at Jonathan Dickinson State Park.

Taxonomy: Dicotyledon; Rubiaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to eastern and central North America. Wunderlin (1998) reports it as frequent in Florida from the northern counties south to the central peninsula.

South Florida Distribution: Martin County.

South Florida Habitats: Floodplain forests.

Protection Status: Not listed by any agency.

Identification: Bell & Taylor (1982) has a color photo; Nelson (1996) has a color photo; Taylor (1998) has a color photo.

References: Chapman, 1883; Small, 1933a; Godfrey & Wooten, 1981; Bell & Taylor, 1982; Nelson, 1996; Wunderlin, 1998.

Synonyms: None.

Historical Context in South Florida: John Popenoe collected partridgeberry in 1978 along the banks of the Loxahatchee River in Jonathan Dickinson State Park (1195, FTG). A small population persists there (R.E. Roberts, personal communication, 16 May 2001).

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Map and monitor plants at Jonathan Dickinson State Park.

***Najas wrightiana* A. Braun**
Wright's Waternymph

South Florida Status: Critically imperiled. One occurrence in the Big Cypress National Preserve.

Taxonomy: Monocotyledon; Najadaceae.

Habit: Annual aquatic herb.

Distribution: South Florida, the West Indies, Mexico, Central America, and South America.

South Florida Distribution: Collier and Broward counties, and the Monroe County mainland.

South Florida Habitats: Brackish creeks, cypress swamps, and canals.

Protection Status: Not listed by any agency.

Identification: Distinguished from other species of *Najas* in South Florida by having leaves with small but conspicuous marginal teeth, tapering leaf bases, and fruits that are glossy and finely reticulate (Wunderlin 1998).

References: Long & Lakela, 1976; Godfrey & Wooten, 1979; Correll & Correll, 1982; Wunderlin, 1998; Flora of North America Editorial Committee, 2000.

Synonyms: *N. flexilis* (Willd.) Rostk. & W. Schmidt, misapplied.

Historical Context in South Florida: Olga Lakela first collected Wright's waternymph in 1964 in a cypress swamp off Turner River Road east of Ochopee in Collier County (27796, USF). Lakela and F. Almeda made the next collection in 1968 about 16 miles to the west at "Remuda Ranch Estates" (31526, USF), a development now known as Port of the Islands. Haynes and Wentz (1974) reported the species as new to the United States based upon this collection. The collection was made in "road embankments along canals marginal to cypress swamps." In 1978, George N. Avery made a collection in a cypress strand along Loop Road in Big Cypress National Preserve (1972, FTG). In 1980, Renee Beymer made a collection in Halfway Creek at the Old Wooten's Indian Village (s.n., Big Cypress National Preserve Herbarium).

Durbin Tabb made a single collection in Broward County in 1978 at Indian Trace, a development in the northern part of the county

close to Water Conservation Area 2A (s.n., FTG). This collection was made in a canal, and it is not certain if it represents a native population.

Major Threats: Exotic pest plant invasions, hydrological modifications, off road vehicles.

Comments: Haynes (in *Flora of North America Editorial Committee, 2000*) considered this to be introduced in Florida. Other authors, such as Godfrey and Wooten (1979) and Wunderlin (1998) consider it to be native.

Preliminary recommendations:

- Survey Water Conservation Area 2A in Everglades and Francis S. Taylor Wildlife Management Area.
- Map and monitor known stations on a regular basis.

***Nothoscordum bivalve* (L.) Britton
Crowpoison**

South Florida Status: Critically imperiled. One occurrence at Six Mile Cypress Slough Preserve.

Taxonomy: Monocotyledon; Amaryllidaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to the southeastern United States. Wunderlin (1998) reports it as occasional in Florida from the northern counties to the central peninsula.

South Florida Distribution: Lee County, where it is disjunct from the nearest populations in Brevard County.

South Florida Habitats: Mesic flatwoods and disturbed sites.

Protection Status: Not listed by any agency.

Identification: Bell & Taylor (1982) has a color photo; Taylor (1992) has a color photo.

References: Small, 1933a; Bell & Taylor, 1982; Taylor, 1992; Wunderlin, 1998.

Synonyms: *Allium bivalve* (L.) Kuntze.

Historical Context in South Florida: Paul C. Standley first collected crowpoison in 1916 near Fort Myers (2822, US). It was subsequently collected by Richard P. Wunderlin and others in 1980 in Fort Myers (8851, USF) and by Elliott Brown in 1984 north

of the sewer plant at Tamiami Village in North Fort Myers (s.n., USF). Plants could still be present at the Tamiami Village Flatwoods Site just north of Tamiami Village. In 1997, Bradley and Woodmansee found plants at the Six Mile Cypress Slough Preserve (773, FTG; 784, FTG, USF), which is located southeast of Fort Myers.

Major Threats: Fire suppression; exotic pest plant invasions.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Survey Tamiami Village Flatwoods Site.
- Map and monitor known stations on a regular basis.
- Acquire Tamiami Village Flatwoods Site.

***Nymphaea mexicana* Zucc.**
Yellow Waterlily

South Florida Status: Critically imperiled. Two occurrences in one conservation area (Arthur R. Marshall Loxahatchee National Wildlife Refuge) and one non-conservation area (Lake Okeechobee).

Taxonomy: Dicotyledon; Nymphaeaceae.

Habit: Perennial aquatic herb.

Distribution: Native to the southern United States and Mexico. Wunderlin (1998) reports it as occasional in Florida from the peninsula and from Wakulla County.

South Florida Distribution: Collier, Glades, Lee, Miami-Dade, and Palm Beach counties.

South Florida Habitats: Lakes, rivers, and canals.

Protection Status: Not listed by any agency.

Identification: Bell & Taylor (1982) has a color photo; Taylor (1992) has a color photo; Tobe et al. (1998) has an illustration and a color photo.

References: Chapman, 1883; Conard, 1905; Small, 1933a; Wood, 1959; Long & Lakela, 1976; Ward, 1977; Godfrey & Wooten, 1981; Bell & Taylor, 1982; Taylor, 1992; Flora of North America Editorial Committee, 1997; Tobe et al., 1998; Wunderlin, 1998.

Synonyms: *N. flava* Leitn.; *Castalia flava* (Leitn. ex A. Gray) Greene.

Historical Context in South Florida: Abram P. Garber first collected yellow waterlily in 1877 on the "Upper Miami River" (3141, NY). Garber also made a collection somewhere along Prairie Creek in 1877 (s.n., FLAS, US). Prairie Creek runs through Charlotte County, where it empties into Charlotte Harbor, but much of it is in De Soto County. It is possible that Garber's collection was from De Soto County.

In 1913, John Kunkel Small and George K. Small collected yellow waterlily in Lake Okeechobee near Torrey Island in Palm Beach County (4154, NY). In 1997, Bradley and Woodmansee also made a collection in Lake Okeechobee, but in Glades County at the mouth of Fisheating Creek (417, FTG). Daniel F. Austin (1974) reported yellow waterlily for the Arthur R. Marshall Loxahatchee National Wildlife Refuge in Palm Beach County. It is presumably extant there, but needs to be vouchered.

L. Eleanor Scull made a collection in Collier County in 1937 in a pond at a golf course in Naples (s.n., FLAS), where it may have been introduced. Yellow waterlily also has been collected on Sanibel Island in Lee County, but it may be introduced there as well. In 1972, William C. Brumbach collected it where it had "escaped to a canal" (7886, NY). John Popenoe also observed it on Sanibel in 1973 in a ditch (Avery's Notes, 11 October 1973). In 1980, yellow waterlily was collected in "a small pool" in a developed portion of North Fort Myers in Lee County by John Beckner and Walter Pagels (2443, USF). It is not clear whether or not it was cultivated or introduced at this station, or if it was persisting from a former natural occurrence. Yellow waterlily is reported from Corkscrew Swamp Sanctuary (Judd, 1994), which is located in both Collier and Lee counties, but this station needs to be verified.

A specimen that was collected by Olga Lakela (29674, USF) is labeled "Hugh Taylor Birch State Park. ...Primary hammock with extensions of subtropical flora." This is most likely a labeling error.

Major Threats: Manipulations of water levels in Lake Okeechobee; off-target damage from exotic pest plant control programs.

Preliminary recommendations:

- Survey Arthur R. Marshall Loxahatchee National Wildlife Refuge and Corkscrew Swamp Sanctuary.
- Map and monitor known stations on a regular basis.

***Nyssa sylvatica* Marshall var. *biflora* (Walter) Sarg.
Swamp Tupelo**

South Florida Status: Critically imperiled. One occurrence at Caloosahatchee Regional Park.

Taxonomy: Dicotyledon; Nyssaceae.

Habit: Tree.

Distribution: Native to the southeastern United States. Wunderlin (1998) reports it as frequent in Florida from the northern counties to the central peninsula.

South Florida Distribution: Glades and Lee counties.

South Florida Habitats: Riverside swamp forests.

Protection Status: Not listed by any agency.

Identification: Nelson (1994) has a color photo; Tobe et al. (1998) has an illustration and color photos.

References: Small, 1933a; Long & Lakela, 1976; Godfrey & Wooten, 1981; Godfrey, 1988; Burckhalter, 1992; Nelson, 1994; Nelson, 1996; Tobe et al., 1998; Wunderlin, 1998.

Synonyms: *N. biflora* Walter; *N. ursina* Small.

Historical Context in South Florida: Leonard J. Brass first collected swamp tupelo in 1945 at "Hailpen Gully," somewhere along Fisheating Creek in Glades County (14808, ARCH, GH). It may be extant in the newly established Fisheating Creek Wildlife Management Area.

It is present at the Caloosahatchee Regional Park in Lee County. In 2000, Lee County biologist Roger Clark showed a single tree to Gann and Lee County biologist Rob Irving, although additional trees are known from another area of the park (R. Clark, personal communication, 13 January 2001). This station needs to be vouchered. Swamp tupelo is also reported for the Koreshan State

Historic Site in Lee County (Florida Park Service District 4, 1994d), but this report is thought to be in error, or represent cultivated plants. Judd (1994) reported it for Corkscrew Swamp Sanctuary, which is located in Lee and Collier counties, but this report needs to be verified.

Major Threats: Hydrological modifications; exotic pest plants; wild hog damage.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Voucher plants at Caloosahatchee Regional Park.
- Survey Corkscrew Swamp Sanctuary, Fisheating Creek Wildlife Management Area, and Koreshan State Historic Site.
- Map and monitor known stations on a regular basis.

***Oncidium ensatum* Lindl.
Florida Dancinglady Orchid**

South Florida Status: Critically imperiled. One occurrence at Everglades National Park.

Taxonomy: Monocotyledon; Orchidaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to South Florida, Mexico, and Central America.

South Florida Distribution: Collier and Miami-Dade counties, and the Monroe County mainland.

South Florida Habitats: Rockland hammocks, coastal berms, and strand swamps.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: Luer (1972) has both illustrations and color photos; Chafin (2000) has both illustrations and color photos.

References: Small, 1933a; Correll, 1950; Luer, 1972; Long & Lakela, 1976; Correll & Correll, 1982; Wunderlin, 1998; Chafin, 2000; Coile, 2000.

Synonyms: *O. floridanum* Ames; *O. sphacelatum* Lindl., misapplied.

Historical Context in South Florida: John Kunkel Small and Joel J. Carter first collected Florida dancinglady orchid in 1903 between Cutler and Black Point in Miami-Dade County (980, NY). Small and Percy Wilson collected it again near Black Point in 1904 (s.n., NY, US). There is a Small specimen at New York Botanical Garden that is labeled from the Black Creek area (12670, NY), but it appears that this specimen was actually collected near Flamingo in Monroe County in Everglades National Park. There are no verifiable collections or observations of Florida dancinglady orchid from the Black Point area after 1904.

Alvah A. Eaton collected one specimen near Brown's Homestead in the Redland area of Miami-Dade County in 1903 (Ames, 1904a). Small made two other collections from hammocks on the Miami Rock Ridge, the first from Hattie Bauer Hammock in 1915 (2966, NY), most of which is now a Miami-Dade County conservation area, and the second from Horton Hammock, a hammock of uncertain locality, in 1916 (7274, NY).

Eaton also made a collection on Paradise Key in 1903 (Ames, 1904a), in what is now Everglades National Park. Small made the first collection on nearby Long Pine Key in 1909 (2945, NY), and it has been vouchered and observed for a number of hammocks in and around Long Pine Key and Paradise Key. Small collected it again in 1916 (7254, NY), and Olga Lakela collected it with Frank C. Craighead in 1963 (s.n., USF). George N. Avery observed it in eight hammocks on Long Pine Key from 1967-1978 (Avery's Notes). Roger L. Hammer estimates that there are fewer than 100 plants on Long Pine Key today (personal communication, 19 February 2001). Eaton also collected it at Coot Bay near Flamingo in Everglades National Park in 1905 (1372, AMES). It was collected in that same area by Small in 1925 (12668, NY), but has not been seen there since that time.

Eaton also collected Florida dancinglady orchid in the Fakahatchee Strand in 1904 (1114, AMES). Luer (1972) reported plants from the area, but it is not certain whether or not this station was in what is now Fakahatchee Strand Preserve State Park, the Florida Panther National Wildlife Refuge, or a private property. Austin et al. (1979, 1990), reported it for Fakahatchee Strand Preserve State Park, but this record was based upon Luer (1972).

It has not been seen in this area in many years, despite much botanical activity.

Sauleda and Adams (1989) reported Florida dancinglady orchid for the Big Cypress Swamp in both Collier and Monroe counties, and cited the Monument Road area in Big Cypress National Preserve as a locality where it was historically abundant. They further stated that changes in water flow in the Big Cypress swamp had led to its virtual demise there. No recent observations from Big Cypress National Preserve are known.

Major Threats: Poaching; exotic pest plant invasions; wild and prescribed fires during the dry season in Everglades National Park.

Comments: *This is one of the species that may be affected by the Everglades restoration. More water delivery south of main park road could have benefits for Florida dancinglady orchid, which requires moist organic soils and high humidity levels.*

Preliminary recommendations:

- Survey Florida Panther National Wildlife Refuge.
- Map and monitor known stations on a regular basis.
- Protect from poaching.
- Consider reintroducing Florida dancinglady orchid to other sites within its historical range, including Hattie Bauer Hammock.
- Conduct research to determine the effects of the Everglades restoration on Florida dancinglady orchid.

***Oncidium undulatum* (Sw.) Salisb.
Mule-ear Orchid**

South Florida Status: Critically imperiled. One occurrence at Everglades National Park.

Taxonomy: Monocotyledon; Orchidaceae.

Habit: Perennial epiphytic herb.

Distribution: Native to South Florida and the West Indies.

South Florida Distribution: Miami-Dade County and the Monroe County mainland.

South Florida Habitats: Coastal berms and rockland hammocks.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: Luer (1972) has both illustrations and color photos; Chafin (2000) has both illustrations and color photos; the IRC Website has a color photo.

References: Small, 1933a; Correll, 1950; Luer, 1972; Long & Lakela, 1976; Wunderlin, 1998; Chafin, 2000; Coile, 2000.

Synonyms: *O. luridum* Lindl., misapplied; *O. luridum* var. *guttatum* Lindl., misapplied.

Historical Context in South Florida: Alvah A. Eaton first collected mule-ear orchid in 1903 on Paradise Key in the Long Pine Key area of what is now Everglades National Park (Ames, 1904a). It was reported as scarce and subsequently was not collected there. Eaton also made a collection near Flamingo in 1905 (1328, AMES). John Kunkel Small and others collected more plants in the Flamingo area in 1923 (10881, NY), as did Harold N. Moldenke in 1930 (835a, NY), and Walter M. Buswell in 1943 (s.n., FLAS, USF) and 1945 (s.n., USF). Gann, Bradley and many others have observed plants in this region of the park in both Miami-Dade and Monroe counties. Roger L. Hammer estimates that there are fewer than 500 plants in Everglades National Park today (personal communication, 19 February 2001).

Mule-ear orchid was apparently collected first outside of Everglades National Park by John Kunkel Small and J.B. DeWinkeler in 1920 in a hammock at Buena Vista (9620, FLAS), north of present-day downtown Miami. No other plants from that area were vouchered or observed, but L. Eleanor Scull collected a second specimen labeled from "below Miami" in 1938 (s.n., FLAS). The locality data for both of these specimens is suspect, and both of these records could refer to plants originally collected in what is now Everglades National Park.

Hammer discovered a single plant in Fuchs Hammock just north of Homestead in 1977, a station visited that same year by George N. Avery and the members of the Native Plant Workshop (Avery's Notes, 30 August 1977, 7 September 1977). This plant was poached by April 1978 (Avery's Notes, 22 April 1978), before it came into flower (R.L. Hammer, personal communication, 19 February 2001). According to Chuck McCartney, Fred J. Fuchs,

Sr. probably placed this plant into Fuchs Hammock following his purchase of the hammock with the intention of turning it into an Orchid Jungle-like tourist attraction (personal communication, 21 February 2001).

Major Threats: Poaching; exotic pest plant invasions, especially Brazilian-pepper (*Schinus terebinthifolius*) and latherleaf (*Colubrina asiatica*); sea-level rise.

Preliminary recommendations:

- Map and monitor known stations on a regular basis.
- Protect from poaching.
- Control Brazilian-pepper and latherleaf in the Flamingo/Cape Sable area of Everglades National Park.
- Consider reintroducing mule-ear orchid to Paradise Key.
- Conduct research to determine the effects of sea-level rise on mule-ear orchid.

***Ophioglossum nudicaule* L. f.
Slender Adder's-tongue**

South Florida Status: Critically imperiled. One occurrence in Royal Palm Beach Pines Natural Area.

Taxonomy: Pteridophyte; Ophioglossaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to North America, the West Indies, Mexico, Central America, South America, and the Old World. Wunderlin (1998) reports it as occasional in Florida from the central panhandle to the peninsula.

South Florida Distribution: Broward, Charlotte, Lee, Miami-Dade, and Palm Beach counties.

South Florida Habitats: Flatwoods, Indian middens, and presumably pine rocklands.

Protection Status: Not listed by any agency.

Identification: Nelson (2000) has an illustration; the IRC Website has a color photo.

References: Chapman, 1883; Small, 1931b; Clausen 1938; Small, 1938; Lakela & Long, 1976; Flora of North America Editorial Committee, 1993; Wunderlin, 1998; Nelson, 2000; Wunderlin & Hansen, 2000.

Synonyms: *O. dendroneuron* E.P. St. John; *O. mononeuron* E.P. St. John; *O. nudicaule* var. *minus* R.T. Clausen; *O. nudicaule* var.

tenerum (Mett. ex Prantl) R.T. Clausen; *O. pumilio* E.P. St. John; *O. tenerum* Mett. ex Prantl.; *O. vulgatum* L. var. *nudicaule* (L. f.) D.C. Eaton.

Historical Context in South Florida: Abram P. Garber first collected slender adder's-tongue in 1878 in Miami (2259, MO), presumably in moist pinelands near the Miami River. In 1903, Alvah A. Eaton made a single collection from an Indian mound in Fort Lauderdale (s.n., GH). It was collected once in the vicinity of Fort Myers by Jeanette P. Standley in 1916 (354, FLAS, NY), and C.R. Jackson made a single collection from Charlotte County about three miles north of Punta Gorda in 1949 (s.n., FTG).

David Black first collected slender adder's-tongue in Palm Beach County in 1978 (317, FTG). The specimen was collected on a drained pond bottom on a private site that has most likely been developed (personal communication, 24 January 2001). Richard Moyroud also made a collection in Hypoluxo in a cleared pineland in 1986 (s.n., FTG). In 1996, Black found plants of slender adder's-tongue at Royal Palm Beach Pines Natural Area, which he photographed (personal communication, 24 January 2001). He has not seen plants there recently, but thinks that the plants might be underground most of the time, or that they may respond to disturbance. We are presuming that these plants are extant, but this station needs to be vouchered.

Major Threats: Exotic pest plant invasions.

Comments: *Slender adder's-tongue seems to be quite ephemeral in South Florida.*

Preliminary recommendations:

- Voucher plants at Royal Palm Beach Pines Natural Area.
- Map and monitor known stations on a regular basis.

***Opuntia cubensis* Britton & Rose**
Bullsuckers

South Florida Status: Critically imperiled. One occurrence at National Key Deer Refuge.

Taxonomy: Dicotyledon; Cactaceae.

Habit: Perennial terrestrial succulent herb.

Distribution: Native to South Florida and the West Indies.

South Florida Distribution: Monroe County Keys.

South Florida Habitats: Coastal rock barrens.

Protection Status: Not listed by any agency.

Identification: Benson (1982) has a black and white photo of plants from Big Pine Key.

References: Small, 1933a; Britton & Rose, 1937; Long & Lakela, 1976; Benson, 1982; Wunderlin, 1998.

Synonyms: *O. ochrocentra* Small ex Britton & Rose.

Historical Context in South Florida: John Kunkel Small and others first collected bullsuckers in 1921(s.n., NY) and 1922 (s.n., NY) on the southern end of Big Pine Key in Monroe County. These collections were presumably made in the vicinity of Cactus Hammock, which is now located within the boundaries of the National Key Deer Refuge. Ellsworth P. Killip collected it at the same location in 1935 (31423, US). It also was reported for Big Pine Key by Dickson et al. (1953) and by Franklin (1968). Austin et al. (1980a) listed it for National Key Deer Refuge. The last collections were made by Lyman D. Benson, probably in the 1970s (15368a, POM; 16576, POM) and are cited by Benson (1982). We have not seen these specimens. In 1982, Benson stated that bullsuckers was nearly extinct on the southeastern end of Big Pine Key, due to road building. In 2001, Bradley and Woodmansee observed a few plants at the Cactus Hammock station, but this station needs to be vouchered.

Major threats: Exotic pest plant invasions; damage from *Cactoblastis cactorum* larvae; sea-level rise.

Comments: *Members of the genus Opuntia in South Florida are affected by the larvae of the exotic moth Cactoblastis cactorum.*

Preliminary recommendations:

- Voucher plants at Cactus Hammock.
- Map and monitor known stations on a regular basis.
- Protect plants from the larvae of *Cactoblastis cactorum*.
- Review for listing by FDACS and FNAI.

***Panicum abscissum* Swallen**
Cut-throat Grass

South Florida Status: Critically imperiled. One occurrence at Yamato Scrub Natural Area.

Taxonomy: Monocotyledon; Poaceae.

Habit: Perennial terrestrial herb.

Distribution: Endemic to peninsular Florida. Wunderlin (1998) reports it as rare in the central peninsula.

South Florida Distribution: Palm Beach County. Reported for Glades County (Jue et al., 2001).

South Florida Habitats: Scrubby flatwoods.

Protection Status: Listed as endangered by FDACS and as rare by FNAI.

Identification: Hitchcock & Chase (1950) has an illustration; Tobe et al. (1998) has photos and illustrations.

References: Hitchcock & Chase, 1950; Hall, 1978; Tobe et al., 1998; Wunderlin, 1998; Coile, 2000.

Synonyms: None.

Historical Context in South Florida: Cut-throat grass was collected first in 1993 by Donald R. Richardson in north Boca Raton in Palm Beach County (s.n., USF). It has been reported from several additional locations very close by, primarily along Military Trail, from Clint Moore Road south to Potomac Road. Most of these stations have been destroyed. Farnsworth (1998) discovered cut-throat grass at the Yamato Scrub Natural Area where it is extant. Bradley and Woodmansee observed this station in 1998. Fewer than 100 plants were seen. Cut-throat grass has been reported for the Fisheating Creek Conservation Easement in Glades County (Jue et al., 2001), but this report needs to be verified.

Major Threats: Hydrological modifications; exotic pest plant invasions; fire suppression.

Comments: *Cut-throat grass is an unusual scrubby flatwoods plant in that it requires constant moisture delivered along a seepage gradient. It may be declining, where it occurs, because*

of drainage and lowering of the water table. It is also very specific to certain soils.

Preliminary recommendations:

- Voucher plants at Yamato Scrub Natural Area.
- Survey Fisheating Creek Conservation Easement.
- Map known stations at least every three years.
- Monitor known stations at least every year.
- Conduct conservation biology and conservation horticulture studies.

Pecluma plumula (Humb. & Bonpl. ex Willd.)

M.G. Price

Plume Polypody

South Florida Status: Critically imperiled. Two occurrences in Everglades National Park.

Taxonomy: Pteridophyte; Polypodiaceae.

Habit: Perennial epiphytic herb.

Distribution: Native to peninsular Florida, the West Indies, Mexico, Central America, and South America. Wunderlin (1998) reports it as frequent in peninsular Florida.

South Florida Distribution: Miami-Dade County and the Monroe County Keys.

South Florida Habitats: Rockland hammocks and mesic hammocks.

Protection Status: Listed as endangered by FDACS and as imperiled by FNAI.

Identification: Chafin (2000) has a color photo; Nelson (2000) has color photos; the IRC Website has a color photo.

References: Chapman, 1883; Small, 1931b; Small, 1938; Evans, 1968; Lakela & Long, 1976; Long & Lakela, 1976; Correll & Correll 1982; Flora of North America Editorial Committee, 1993; Wunderlin, 1998; Chafin, 2000; Coile, 2000; Liogier & Martorell, 2000; Nelson, 2000; Wunderlin & Hansen, 2000.

Synonyms: *Polypodium plumula* Humb. & Bonpl. ex Willd.

Historical Context in South Florida: C.L. Pollard first collected plume polypody in 1898 on Key Largo (203, US), but it has not been collected or observed there since that time. Pollard (1899)

wrote that only a single plant was found on a dead tree trunk near the village of Aiken.

John Kunkel Small made the next collection in 1919 in Miami-Dade County in a hammock about 20 miles southwest of Royal Palm Hammock (9179, NY), in what is now Everglades National Park. Nellie C. Knappen (1929) also collected it there in 1928 (s.n., US). Volunteer botanist Rick Seavey has observed what appears to be the same station in a hammock southeast of Mahogany Hammock (personal communication, 24 January 2001). He estimates that fewer than 100 plants are present. Plume polypody also has been collected on Long Pine Key in Everglades National Park, beginning with a Walter M. Buswell collection in 1938 (s.n., FTG). Frank C. Craighead also collected it there in 1961 (s.n., FTG). Carol Lippincott discovered a population in a hammock on Long Pine Key, which she later showed to Rick Seavey (R. Seavey, personal communication, 24 January 2001). Seavey estimates that there are about 10 plants in that hammock.

Major Threats: Poaching; exotic pest plant invasions.

Comments: *More water delivery into the Long Pine Key area south of the main park road would probably help this species, as it requires relatively moist conditions and high humidity. However, an increase in water delivery into the area north of Long Pine Key and south of Mahogany Hammock could flood out the supporting trees and cause the extirpation of plume polypody.*

Preliminary recommendations:

- Map and monitor known stations on a regular basis.
- Protect from poaching.
- Conduct research to determine the effects of the Everglades restoration on plume polypody.

***Peperomia rotundifolia* (L.) Kunth**
Yerba Linda

South Florida Status: Critically imperiled. One occurrence at Big Cypress National Preserve.

Taxonomy: Dicotyledon; Piperaceae.

Habit: Perennial epiphytic herb.

Distribution: Native to South Florida, the West Indies, Central America, South America, Africa, and Madagascar.

South Florida Distribution: Collier County.

South Florida Habitats: Strand swamps.

Protection Status: Not listed by any agency. Approved for listing by FDACS by the Florida Endangered Plant Advisory Council.

Identification: It is distinguished from other species of *Peperomia* in Florida by having succulent orbicular to round elliptic to subovate leaves to 12 mm long and 10 mm wide. The IRC Website has a color photo

References: Liogier & Martorell, 2000.

Synonyms: None.

Historical Context in South Florida: National Park Service biologist Tony Pernas discovered yerba linda in 1999 in the Loop Road area of Big Cypress National Preserve. Bradley, Pernas, and Amy Ferriter vouchered this station later in 1999 (2005, FTG, USF). Plants were observed to be abundant around a small pond in the center of a strand swamp on four trees of pop ash (*Fraxinus caroliniana*) and two trees of cocoplum (*Chrysobalanus icaco*).

Major Threats: Poaching; exotic pest plants; hydrological modification.

Comments: *This species was discovered after the publication of Wunderlin (1998).*

Preliminary recommendations:

- Map and monitor plants at Big Cypress National Preserve on a regular basis.
- Protect from poaching.
- List by FDACS. Review for listing by FNAI.

***Peperomia* species A (Unidentified)**

South Florida Status: Critically imperiled. One occurrence at Fakahatchee Strand Preserve State Park.

Taxonomy: Dicotyledon; Piperaceae.

Habit: Perennial epiphytic herb.

Distribution: Unknown.

South Florida Distribution: Collier County in the Fakahatchee Strand.

South Florida Habitats: Strand swamps.

Protection Status: Not listed by any agency.

Identification: N/A.

References: N/A.

Synonyms: N/A.

Historical Context in South Florida: In April 2000, Roger L. Hammer and Don Keller found a species of *Peperomia* that was unfamiliar to them in Collier County in the Fakahatchee Strand Preserve State Park. A few weeks later Hammer showed these plants to Bradley. Fewer than 50 plants were found on several trees in a small area of strand swamp. The species has not been identified. Fruiting specimens need to be collected and sent to an expert for identification.

Major Threats: Poaching; exotic pest plant invasions.

Preliminary recommendations:

- Voucher fertile specimen and determine identity.
- Continue ongoing surveys at Fakahatchee Strand Preserve State Park.
- Map and monitor plants at Fakahatchee Strand Preserve State Park on a regular basis.
- Protect from poaching.
- Control Old World climbing fern and other exotic pest plants that threaten this species.
- Based upon determination, review for listing by FDACS and FNAI.

***Phoebanthus grandiflorus* (Torr. & A. Gray)**

S.F. Blake

Florida False Sunflower

South Florida Status: Critically imperiled. One occurrence at Jonathan Dickinson State Park.

Taxonomy: Dicotyledon; Asteraceae.

Habit: Perennial terrestrial herb.

Distribution: Endemic to peninsular Florida. Wunderlin (1998) reports it as frequent in Florida in the peninsula.

South Florida Distribution: Martin County.

South Florida Habitats: Scrub.

Protection Status: Not listed by any agency.

Identification: Taylor (1998) has a color photo.

References: Chapman, 1883; Small, 1933a; Long & Lakela, 1976; Cronquist, 1980; Wunderlin, 1998.

Synonyms: *Helianthella grandiflora* Torr. & A. Gray.

Historical Context in South Florida: Roy O. Woodbury first collected Florida false sunflower in 1989 at Jonathan Dickinson State Park in 1989 (s.n., FTG). The species was reported as being “rare on north side of park in pine scrub, moist to dry.” It is assumed to be extant there. Other reports of this species have been made for Loxahatchee Slough Natural Area in Palm Beach County (Farnsworth, 1994c) and for Corkscrew Regional Ecosystem Watershed in Collier County (Hilsenbeck, 1997). These reports are doubtful, due to a lack of appropriate habitat.

Major Threats: Fire suppression; exotic pest plant invasions.

Preliminary recommendations:

- Map and monitor known stations on a regular basis.

***Phoradendron rubrum* (L.) Griseb.
Mahogany Mistletoe**

South Florida Status: Critically imperiled. One occurrence at Dagny Johnson Key Largo Hammocks Botanical State Park.

Taxonomy: Dicotyledon; Viscaceae.

Habit: Perennial parasitic herb.

Distribution: Native to South Florida, the Bahamas, and Cuba.

South Florida Distribution: Monroe County Keys. Reported, but unverified, for Miami-Dade County.

South Florida Habitats: Rockland hammocks. It grows parasitically only on West Indian mahogany (*Swietenia mahagoni*).

Protection Status: Listed as endangered by FDACS and critically imperiled by FNAI.

Identification: The IRC Website has a color photo.

References: Cooley, 1963; Long & Lakela, 1976; Ward, 1978; Correll & Correll, 1982; Kellogg, 1986; Campbell, 1995; Nelson, 1996; Wunderlin, 1998; Coile, 2000; Gann, 2000.

Synonyms: None.

Historical Context in South Florida: J.M. Crevasse first collected mahogany mistletoe in 1941 on Key Largo from an unspecified station (s.n., FLAS). S.J. Lynch collected it again in 1944 on the "south end" of Key Largo (s.n., FLAS), but it has not been documented there since that time. Ray Garrett collected a specimen at an unspecified station on Key Largo in 1953 (s.n., FLAS).

In 1963, Frank C. Craighead discovered plants in a hammock south of Dispatch Slough and east of Old State Road 905 on North Key Largo (s.n., FLAS, FTG, USF). This station was observed first by Craighead during an aerial survey flown at 50 feet above the trees (Cooley, 1963) and corresponds to hammock L1/10b in Weiner (1980). George N. Avery searched for these plants without luck. Subsequently the hammock burned during a dry period. The plants at that station were assumed extirpated by the mid-1960s (Avery's Notes).

Crafton Clift found the next station in 1976 in Crossroads Hammock (hammock L1/9 in Weiner 1980). There were several plants on one tree. Avery and Clift collected a specimen of these plants in May of that year (1243, FLAS), and material from these plants was accessioned at Fairchild Tropical Garden. By 1977, extensive logging was occurring in this hammock. Arthur H. Weiner and Karen Achor did not observe mahogany mistletoe during their survey of the hammock in June of that year (Weiner 1980). However, Avery and Florida Park Service biologist Renate H. Skinner collected branches of the Crossroads Hammocks host tree around 1980 after it had been poached (R.H. Skinner, personal communication, 18 April 2001).

Josef Nemec discovered the next station on the edge of Avery Hammock (hammock L1/6 in Weiner 1980) along Dispatch Slough in March 1998. Gann and Florida Park Service biologist Janice A. Duquesnel verified this station in April 1999. More than 20 plants were growing on three trees. The smallest host tree died during late April or early May 1999. The Florida Park Service has mapped the three mahogany trees known to have hosted mahogany mistletoe, and is currently monitoring the two remaining

trees on a monthly basis. Gann, Duquesnel and others have conducted extensive surveys in Dagny Johnson Key Largo Hammocks Botanical State Park, but have been unable to locate additional plants. Gann (2000) recommended that the Florida Park Service consider augmenting mahogany mistletoe at Key Largo Hammock State Botanical Site, and this project was initiated in 2001.

The report of mistletoe from Miami-Dade County is based upon George Cooley's report of Craighead's observations flying over islands in what is now Biscayne National Park (Cooley, 1963). Craighead stated, "The mistletoe is here [Sands Key and Old Rhodes Key] also from what I could make out in flying over." These sightings were never verified on the ground. Surveys in 2001 by the authors have failed to locate any plants in Biscayne National Park.

Mahogany mistletoe is cultivated at Fairchild Tropical Garden, and techniques for establishing mistletoe on mahogany have been published by Rob Campbell (Campbell, 1995). Germplasm from the Crossroads Hammock station is maintained at Fairchild Tropical Garden (Accession #76-288).

Major Threats: Stochastic extinction (e.g., hurricane, severe drought); exotic pest plant invasions.

Other Comments: *Although Ward (1978) reports that mahogany mistletoe grows on other hardwoods in the Bahamas, Correll & Correll (1982) states that it is specific to Swietenia. With the exception of the occurrence at Avery Hammock, all records have indicated that mahogany mistletoe grows on large mahogany trees. It is important to note that the relatively small host tree that died in 1999 was unable to support mistletoe during a prolonged hot, dry period. Craighead (in Cooley 1963) reported that mahogany mistletoe eventually kills even large mahogany trees. It most easily can be seen during the dry season when West Indian mahogany drops its leaves.*

Preliminary recommendations:

- Continue surveys in Biscayne National Park.
- Continue mapping host trees on an annual basis.
- Continue monitoring plants on a monthly basis.

- Continue efforts to augment plants at Dagny Johnson Key Largo Hammocks Botanical State Park.
- Consider reintroducing mahogany mistletoe to other rockland hammocks on Key Largo outside of Dagny Johnson Key Largo Hammocks Botanical State Park, including Dove Creek Hammocks.
- Consider collecting and accessioning new germplasm from Avery Hammock station to augment existing *ex situ* material at Fairchild Tropical Garden.

***Pilosocereus bahamensis* (Britton) Byles & G.D. Rowley**
Bahama Tree Cactus

South Florida Status: Critically imperiled. One occurrence at John Pennekamp Coral Reef State Park.

Taxonomy: Dicotyledon; Cactaceae.

Habit: Tree.

Distribution: Native to South Florida and the Bahamas.

South Florida Distribution: Monroe County Keys.

South Florida Habitats: Rockland hammocks.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: This species is difficult to distinguish from *P. robinii*, and is considered by some (e.g. Anderson, 2001) to be conspecific with it (as *P. polygonus* (Lam.) Byles & G.D. Rowley). Britton & Rose (1937) has descriptions of *P. bahamensis* and the other South Florida taxa of *Pilosocereus*. Also, see *P. robinii* in Part 3 of this chapter. The IRC Website has a color photo

References: Britton & Rose, 1937; Correll & Correll, 1982; Adams & Lima, 1994b; Wunderlin, 1998; Coile, 2000.

Synonyms: *Cereus bahamensis* (Britton) Vaupel; *Cephalocereus bahamensis* Britton.

Historical Context in South Florida: Bahama tree cactus is known from a single clonal plant growing in a rockland hammock surrounded by a mangrove swamp in John Pennekamp Coral Reef State Park. Joseph O'Brien discovered this station in 1992 (s.n., FTG). Gann and Florida Park Service biologists Janice A. Duquesnel and James G. Duquesnel observed it in 1999. Gann took a geographical coordinate of the station. Some stems had been recently vandalized.

Major Threats: Vandalism; poaching; exotic pest plant invasions; stochastic extinction (e.g., hurricanes).

Comments: Wunderlin (1998) did not include *P. bahamensis* because no specimen was seen. Wunderlin & Hansen (2001) includes this species in the South Florida flora.

Preliminary recommendations:

- Map outline of plants on an annual basis.
- Monitor plants on a quarterly basis.
- Protect from poaching and vandalism.
- Establish an *ex situ* collection in case the plants are poached or vandalized.

***Pleurothallis gelida* Lindl.
Flor de Llantén**

South Florida Status: Critically imperiled. One occurrence at Fakahatchee Strand Preserve State Park.

Taxonomy: Monocotyledon; Orchidaceae.

Habit: Perennial epiphytic herb.

Distribution: Native to South Florida, the West Indies, Mexico, Central America, and South America.

South Florida Distribution: Collier County.

South Florida Habitats: Strand swamps.

Protection Status: Listed as endangered by FDACS and as imperiled by FNAI.

Identification: Luer (1972) has illustrations and color photos; Chafin (2000) has illustrations and a color photo.

References: Small, 1933a; Correll, 1950; Luer, 1972; Long & Lakela, 1976; Wunderlin, 1998; Chafin, 2000; Coile, 2000; Liogier & Martorell, 2000.

Synonyms: None.

Historical Context in South Florida: Alvah A. Eaton first collected flor de llanten in 1905 (1401, NY), presumably in what is now Fakahatchee Strand Preserve State Park. In 1968, a plant was collected there by C. Eugene Delchamps and accessioned by Fairchild Tropical Garden (Accession #68-186; Avery's Notes, 17 November 1968). George N. Avery, Roger L. Hammer, and many

others have observed this species over the years. Gann and Woodmansee observed plants in the Fakahatchee in 2000 on a field trip led by Florida Park Service biologist Mike Owen. Owen estimates that there are fewer than 100 plants in the Fakahatchee Strand (personal communication, 22 January 2001).

Frank C. Craighead attempted to introduce flor de llanten into the Long Pine Key area of Everglades National Park (Botanical Notes of Frank C. Craighead). George N. Avery, Maxie Simmons, and Glen Simmons observed a single plant in Deer Hammock in 1976. Avery discovered this plant dead following the freeze of January 19-20, 1977 (Avery's Notes, 11 May 1976, 25 February 1977). There is no indication that flor de llanten was ever native to Everglades National Park.

Major Threats: Poaching; exotic pest plant invasions, especially Old World climbing fern (*Lygodium microphyllum*); hydrological modifications.

Preliminary recommendations:

- Continue ongoing surveys at Fakahatchee Strand Preserve State Park.
- Map and monitor known stations on a regular basis.
- Protect from poaching.
- Control Old World climbing fern and other exotic pest plants that threaten flor de llanten.
- Consider augmenting population at Fakahatchee Strand Preserve State Park.
- Review FNAI rank.

***Polygonella gracilis* Meisn.
Tall Jointweed**

South Florida Status: Critically imperiled. One occurrence at Don Pedro Island State Park and adjoining private property.

Taxonomy: Dicotyledon; Polygonaceae.

Habit: Annual terrestrial herb.

Distribution: Native to the southeastern coastal plain. Wunderlin (1998) reports it as frequent nearly throughout Florida.

South Florida Distribution: Broward, Charlotte, Collier, and Miami-Dade counties.

South Florida Habitats: Scrub, scrubby flatwoods, mesic flatwoods, and sandy pockets in pine rocklands.

Protection Status: Not listed by any agency.

Identification: Taylor (1992) has a color photo; the IRC Website has a color photo.

References: Chapman, 1883; Small, 1933a; Long & Lakela, 1976; Taylor, 1992; Nelson, 1996; Wunderlin, 1998.

Synonyms: *Delopyrum filiforme* Small; *Delopyrum gracile* (Meisn.) Small.

Historical Context in South Florida: Ferdinand Rugel first collected tall jointweed in 1846 in Miami (s.n., NY), presumably in sandy pine rocklands near the Miami River. Additional collections from Miami-Dade County were made in 1912 by John Kunkel Small between Miami and Coconut Grove (4089, NY), in 1929 by Harold N. Moldenke in northern Miami-Dade at Buena Vista (308a, NY), and in 1934 in Miami by Walter M. Buswell (s.n., FTG), probably between downtown Miami and Coral Gables. In 1903, Small and Joel J. Carter made the first collection in Broward County at Fort Lauderdale (1167, NY). Additional collections from the Fort Lauderdale area were made by Buswell in 1934 (s.n., FTG) and 1941 (s.n., FTG). Buckley & Hendrickson (1983a) reported tall jointweed for the Fort Lauderdale Executive Airport Gopher Tortoise Preserve, but this report needs to be verified. George N. Avery collected tall jointweed in Collier County on Horr's Island, adjacent to Marco Island, in 1970 (s.n., FTG). Bradley and Joseph O'Brien observed it there in 1996, but the island was undergoing rapid development. It is doubtfully extant on the island.

In 1979, Bruce F. Hansen and Donald R. Richardson collected tall jointweed near Cape Haze in Charlotte County (6838, USF). In 2000, Gann located the Hansen and Richardson station. The colony was split into two by State Road 775. The western side is now a mainland base for Don Pedro Island State Park. The eastern side was private property that was in the process of being developed. The Don Pedro Island State Park station needs to be vouchered.

Major Threats: Habitat destruction; fire suppression; exotic pest plant invasions.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Voucher plants at Don Pedro Island State Park.
- Survey Fort Lauderdale Executive Airport Gopher Tortoise Preserve.
- Map and monitor known stations on a regular basis.
- Consider restoring pine rocklands near the Miami River and reintroducing tall jointweed.

***Polygonum setaceum* Baldwin**
Bog Smartweed

South Florida Status: Critically imperiled. One occurrence at Nicodemus Slough.

Taxonomy: Dicotyledon; Polygonaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to the eastern United States. Wunderlin (1998) reports it as occasional nearly throughout Florida.

South Florida Distribution: Throughout except for Martin County and the Florida Keys.

South Florida Habitats: Lake margins, cypress swamps, swales, and disturbed wet areas.

Protection Status: Not listed by any agency.

Identification: Godfrey & Wooten (1981) has an illustration.

References: Small, 1933a; Long & Lakela, 1976; Godfrey & Wooten, 1981; Nelson, 1996; Wunderlin, 1998.

Synonyms: *Persicaria setacea* (Baldwin) Small.

Historical Context in South Florida: Although bog smartweed has been collected nearly throughout South Florida, few recent records are known. John Kunkel Small and George K. Small made the first collection in 1913 on the shores of Observation Island in Lake Okeechobee in Glades County (4406, NY). The authors conducted a series of surveys on Observation Island and other islands in Lake Okeechobee in 1997, but failed to locate any plants. In 1960, bog smartweed was collected by William P. Adams “ca 6 miles south of Brighton,” a station about nine miles northwest of Lake Okeechobee. In 1997, Bradley and

Woodmansee collected bog smartweed at Nicodemus Slough (444, FTG), a conservation area located just west of Lake Okeechobee in Glades County.

In 1915, Small and others made a collection near Royal Palm Hammock in Miami-Dade County (6642, NY), presumably in or near Taylor Slough in what is now Everglades National Park. In 1916, Small made a collection in the Everglades west of Coconut Grove (8054, NY), an area that has been completely developed. In 1918, Small made a collection in "Everglades along Tamiami Trail" (8836, NY), followed by Olga Lakela, who made an additional collection along Tamiami Trail in 1963 (26210, USF). The exact locations of the Tamiami Trail collections are not known, but it seems likely that bog smartweed was collected in or near the Shark River Slough in what is now Everglades National Park. Alan H. Herndon made an additional collection from Miami-Dade County in 1985 in the Redland area at a disturbed site covered with nursery trash (1231, NY). It does not appear that this collection represented a native population.

In 1925, Hugh O'Neill collected bog smartweed at the Belle Glade Experimental Station in Palm Beach County (s.n., FLAS). It was collected just east of this station in 1944 by "Tisdale, Townsend, & West" at the edge of a canal (s.n., FLAS). In 1947, John H. Davis, Jr. made the only known collection in Broward County "in Everglades" along US 27 at 26 Mile Bend (s.n., FLAS). This collection was made in either Water Conservation Area 2A or 3A. Bradley and Woodmansee conducted surveys of Water Conservation Area 2A in 1997, but did not observe bog smartweed. In 1947, Davis made a collection in the "Loxahatchee area" of Palm Beach County (s.n., FLAS). However, Austin (1974) did not report bog smartweed for Arthur R. Marshall Loxahatchee National Wildlife Refuge. Robert K. Godfrey and Grady W. Reinert made a collection in 1961 near Port Charlotte in Charlotte County (60959, FSU).

In 1964, Daniel B. Ward made a collection of bog smartweed at Pinecrest in Big Cypress National Preserve in Monroe County (3966, FLAS). In 1967, Olga Lakela made another collection in the same general area of Big Cypress National Preserve, this time south of Tamiami Trail and east of Monroe Station in Collier County (30654, USF). However, Black & Black (1980) did not

report this species for the park. William C. Brumbach made two additional collections in 1967 and 1968 on Sanibel Island in Lee County (5744, FLAS; 6484, FLAS).

Major Threats: Development; hydrological modifications; exotic pest plant invasions.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida. However, it may be more common than is indicated here. It may simply be misidentified as other Polygonum species.*

Preliminary recommendations:

- Survey the Pinecrest/Loop Road area of Big Cypress National Preserve, the Taylor Slough and Shark River Slough areas of Everglades National Park, and Water Conservation Area 3A in the Everglades and Francis S. Taylor Wildlife Management Area.
- Map and monitor known stations on a regular basis.

***Pseudophoenix sargentii* H. Wendl. ex Sarg.
Sargent's Cherry Palm**

South Florida Status: Critically imperiled. One occurrence at Biscayne National Park.

Taxonomy: Monocotyledon; Arecaceae.

Habit: Tree.

Distribution: Native to South Florida, the West Indies, Mexico, and Central America.

South Florida Distribution: Miami-Dade County and the Monroe County Keys.

South Florida Habitats: Rockland hammocks and coastal berms.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: *Pseudophoenix* is one of two native palm genera having pinnate leaves, the other genus being *Roystonea*. *Pseudophoenix* is distinguished from *Roystonea* in being of much smaller stature, and by having an inflorescence that emerges from among the leaves rather than below it (Wunderlin, 1998). Scurlock (1987) has color photos.

References: Small, 1933a; Ledin et al., 1959; Read, 1968; Long & Lakela, 1976; Ward, 1976; Little, 1978; Scurlock, 1987; Lippincott, 1992a; Nelson, 1994; Lippincott, 1995; Wunderlin, 1998; Coile, 2000; Flora of North America Editorial Committee, 2000.

Synonyms: *P. vinifera* (Mart.) Becc., misapplied.

Historical Context in South Florida: Commodore Ralph Munroe discovered Sargent's cherry palm in 1886 on Long Key in Monroe County (Munroe, 1930; Read, 1968), and Allan H. Curtiss vouchered it there in 1896 (5637, GH, NY, US). Also in 1886, Charles S. Sargent and Allan H. Curtiss discovered it on Elliott Key in Miami-Dade County (s.n., NY), where a total of six individuals were observed (Read, 1968). In 1923, a single tree was found on Sands Key by Wirth Munroe, which was vouchered by John Kunkel Small and John B. DeWinkeler (10770, GH; Ledin et al. 1959; Read, 1968). Excellent and detailed histories of the species in South Florida are provided by Ledin et al. (1959), Read (1968), and Lippincott (1992a, 1995). As reported by Read, as many as 200 individuals were found at a single time on Long Key and as many as 150 on Elliott Key.

John Kunkel Small (1922) reported Sargent's cherry palm from Upper Matecumbe Key, but the plants were transplants from Long Key.

A photograph taken by Clifton Adams in the herbarium of the Smithsonian Institution shows a single mature plant surrounded by native vegetation on Lower Matecumbe Key. A letter accompanying the photograph was written by David Fairchild to O.F. Cook. The letter described the photograph as having been taken in 1931, and indicates that Fairchild also saw the plant. We have not seen a discussion of this station elsewhere (e.g. Read, 1968), and cannot be certain that it was not a cultivated plant.

Unfortunately, Sargent's cherry palm became highly desirable as a landscape plant and plant collectors plundered the populations on Elliott Key and Long Key (Lippincott, 1992a). Other plants were destroyed on Elliott Key by settlers clearing land for pineapples and other fruit crops (Lippincott, 1992a). By 1966, George N. Avery was unable to locate any plants on Long Key, where he had

previously found the species (Botanical Notes of George N. Avery, 1 August 1966). A subsequent survey in 1990 by Fairchild Tropical Garden biologist Carol Lippincott and Florida Park Service biologist James G. Duquesnel was also in vain (Lippincott, 1992a).

While plants on Long Key were extirpated, a small population persisted on Elliott Key. Surveys by Biscayne National Park staff in the 1970s and 1980s resulted in the location of 29 plants (Lippincott, 1992a). By 1990, additional surveys by the staffs of the National Park Service, Fairchild Tropical Garden, and the Florida Park Service had recorded 47 plants (Lippincott, 1992a). In August 1992 Hurricane Andrew killed 19 of the tallest plants on Elliott Key (Lippincott, 1995), reducing the population to 28 plants.

Fairchild Tropical Garden maintains a collection of germplasm from South Florida, and has done extensive horticultural work on this species. In addition, Fairchild has worked with the National Park Service and the Florida Park Service to augment the population on Elliott Key and reintroduce a population on Long Key. Lippincott (1992a, 1995) gives excellent accounts of these translocation efforts. Fairchild Tropical Garden and Florida Park Service staffs continue to map and monitor both wild and translocated plants at both sites.

Major Threats: Poaching; exotic pest plant invasions.

Comments: *An unpublished paper written by R. Bruce Ledin disputes the nativity of this species. We have seen no evidence to suggest that Sargent's cherry palm was introduced.*

Preliminary recommendations:

- Continue mapping and monitoring of wild plants on Elliott Key.
- Continue augmentation project on Elliott Key.
- Continue reintroduction project on Long Key.

***Quercus xrolfsii* Small
Rolfs' Oak**

South Florida Status: Critically imperiled. One occurrence at County Line Scrub, Miami-Dade County.

Taxonomy: Dicotyledon; Fagaceae.

Habit: Shrub.

Distribution: Endemic to peninsular Florida.

South Florida Distribution: Broward and Miami-Dade counties.

South Florida Habitats: Scrubby flatwoods.

Protection Status: Not listed by any agency.

Identification: This hybrid is not included in any modern keys. Small (1933) has a key of 42 species and hybrids of the southeastern United States.

References: Small, 1905; Small, 1933a; Wunderlin, 1998.

Synonyms: None.

Historical Context in South Florida: John Kunkel Small and Joel J. Carter first collected Rolfs' oak in 1903 near Fort Lauderdale in Broward County (1244, NY). Small (1905) described it as a new species based upon this collection. Small collected it again in Fort Lauderdale in 1904 (s.n., FTG). While it has not been collected again in Broward County, Gann and Bradley collected it in extreme northern Miami-Dade County in 1996 at County Line Scrub (815, FTG), a scrubby flatwoods conservation area managed by Miami-Dade County.

Rolfs' oak has recently been reported for Rookery Bay National Estuarine Research Reserve in Collier County (Burch, 1998), but this report needs to be verified.

Major Threats: Fire suppression; exotic pest plant invasions.

Comments: *This is a hybrid between Q. chapmanii and Q. minima. Other collections have been made in Clay, Highlands, and Orange counties (Wunderlin & Hansen, 2001).*

Preliminary recommendations:

- Map and monitor known stations on a regular basis.
- Survey Rookery Bay National Estuarine Research Reserve.
- Review for listing by FNAI.

***Rhipsalis baccifera* (J.S. Mill.) Stearn**
Mistletoe Cactus

South Florida Status: Critically imperiled. One occurrence at Everglades National Park.

Taxonomy: Dicotyledon; Cactaceae.

Habit: Perennial epiphytic herb.

Distribution: Native to South Florida, the West Indies, Central America, and South America. It is also found in Tropical Africa and Sri Lanka.

South Florida Distribution: Miami-Dade County, and possibly the Monroe County mainland. Persisting or escaped from cultivation elsewhere.

South Florida Habitats: Coastal berms and rockland hammocks.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: Benson (1982) has a photo; the IRC Website has a color photo.

References: Small, 1933a; Small, 1935; Britton & Rose, 1937; Long & Lakela, 1976; Benson, 1982; Wunderlin, 1998; Coile, 2000; Liogier & Martorell, 2000.

Synonyms: *Rhipsalis cassutha* Gaertn.

Historical Context in South Florida: Charles A. Mosier first collected mistletoe cactus in 1923 in "Wallensteins Hammock, west of Kendall" in Miami-Dade County (s.n., NY, US). The exact location of this hammock is unknown, but this collection could have been in the vicinity of what is now Kendall Indian Hammocks Park.

Apparently, John Beckner and Roy O. Woodbury discovered mistletoe cactus in the Flamingo area of Everglades National Park in the 1950s (Ward, 1978). Frank C. Craighead collected the earliest known specimen from that region in 1958 (s.n., Everglades National Park herbarium). This collection was made at "Crocodile Point near Snake Bight." Craighead's unpublished notes indicate that this station was just a little south of West Lake. An additional specimen (photograph only) was collected by Lyman Benson in 1965 from "Snakebight Road, four mi. east of Flamingo" (16579, RSA). While this road is in Monroe County, he may have

actually been at Craighead's station east of the county line in Miami-Dade County. Around 1990, Rob Campbell discovered a single plant on a dead buttonwood tree on West Lake (Campbell, 1990), close to Craighead's station. John Ogden and Carol Lippincott vouchered this station in 1991 (46, FTG). Roger Hammer was present also on this trip (R.L. Hammer, personal communication, 10 August 2001). This is the only native population of mistletoe cactus known to exist in South Florida.

Fairchild Tropical Garden has a collection of germplasm from the West Lake plant (Accession #91-601). Mistletoe cactus is widely cultivated in peninsular Florida, and reports from stations other than Kendall and Everglades National Park are thought to represent plants persisting from cultivation, or perhaps naturalized populations from cultivated plants (e.g., Kral 49266, GH; Kral 70796, GH).

Major Threats: Poaching; stochastic events (e.g., hurricanes).

Preliminary recommendations:

- Survey Flamingo area of Everglades National Park.
- Map and monitor known stations on a regular basis.
- Protect from poaching.
- Maintain *ex situ* collection of germplasm.
- Consider introducing a population to Kendall Indian Hammocks Park.

***Rhynchospora baldwinii* A. Gray**
Baldwin's Beaksedge

South Florida Status: Critically imperiled. One occurrence at Pal-Mar & Pal-Mar CARL Site.

Taxonomy: Monocotyledon; Cyperaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to the southeastern coastal plain. Wunderlin (1998) reports it as occasional in Florida from the western panhandle to the central peninsula.

South Florida Distribution: Charlotte, Lee, and Martin counties.

South Florida Habitats: Wet flatwoods.

Protection Status: Not listed by any agency.

Identification: Tobe et al. (1998) has an illustration.

References: Chapman, 1883; Small, 1933a; Gale, 1944; Godfrey & Wooten, 1979; Tobe et al., 1998; Wunderlin, 1998.

Synonyms: None.

Historical Context in South Florida: Robert Kral first collected Baldwin's beaksedge in 1958, twelve miles east of Punta Gorda in Charlotte County (6535, USF). This collection was probably made inside of, or very close to, Fred C. Babcock-Cecil M. Webb Wildlife Management Area. In 1991, Steven L. Orzell and Edwin L. Bridges collected Baldwin's beaksedge in Martin County at the Pal-Mar CARL Site (16813, FTG). In 1997, Gann and Bradley collected it nearby in Palm Beach County at Pal-Mar, a South Florida Water Management District conservation area (1033, FTG; 1048, FTG). These two stations are considered to be the same occurrence.

Orzell and Bridges also made a collection in 1992 at the Westinghouse L & L property in the vicinity of Estero Bay State Buffer Preserve in Lee County (19402, USF). This property has been developed, but plants may be present at one or more mitigation sites (R. Irving, personal communication, 6 August 2001).

Major Threats: Drainage of wet flatwoods habitat; fire suppression; exotic pest plant invasions; wild hog damage.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Survey Estero Bay State Buffer Preserve, Fred C. Babcock-Cecil M. Webb Wildlife Management Area, Pal-Mar Natural Area, and the Westinghouse L & L property.
- Map and monitor known stations on a regular basis.
- Continue acquisitions of unprotected portions of the Pal-Mar CARL Site.

***Rhynchospora fernaldii* Gale**
Fernald's Beaksedge

South Florida Status: Critically imperiled. One occurrence at Six Mile Cypress Slough Preserve.

Taxonomy: Monocotyledon; Cyperaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to Florida, Georgia, and Alabama. Wunderlin (1998) reports it as frequent nearly throughout Florida.

South Florida Distribution: Charlotte, Collier, Glades, and Lee counties.

South Florida Habitats: Mesic flatwoods and probably dry prairie.

Protection Status: Not listed by any agency.

Identification: Godfrey & Wooten (1979) has an illustration.

References: Gale, 1944; Godfrey & Wooten, 1979; Wunderlin, 1998.

Synonyms: None.

Historical Context in South Florida: Mary Francis Baker first collected Fernald's beaksedge in 1917 in Alva (s.n., US), a town that is located in the vicinity of Caloosahatchee Regional Park in Lee County. In 1992, Steven L. Orzell and Edwin L. Bridges made a collection at the Westinghouse L & L property (19408, USF), in the vicinity of Estero Bay State Buffer Reserve. This property has been developed, but plants may be present in one or more mitigation sites (R. Irving, personal communication, 6 August 2001). In 1997, Bradley and Woodmansee collected Fernald's beaksedge at the Six Mile Cypress Slough Preserve near Fort Myers (795, FTG).

In 1942, John H. Davis made a collection in a "Serenoa prairie" east of Palmdale in Glades County (s.n., FLAS), in or near what is now Fisheating Creek Wildlife Management Area. In 1964, Olga Lakela made the only collection in Collier County along the Lake Trafford Road in Immokalee (27455, USF). In 1990, Orzell and Bridges made a collection in Charlotte County north of El Jobean (14876, USF), near what is now Charlotte Harbor State Buffer Preserve.

Major Threats: Fire suppression; exotic pest plant invasions.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Survey Caloosahatchee Regional Park, Charlotte Harbor State Buffer Preserve, the El Jobean station, Estero Bay State Buffer Reserve, the Westinghouse L & L property, and Fisheating Creek Wildlife Management Area.
- Map and monitor known stations on a regular basis.

***Rorippa floridana* Al-Shehbaz & Rollins
Florida Watercress**

South Florida Status: Critically imperiled. One occurrence at Fakahatchee Strand Preserve State Park.

Taxonomy: Dicotyledon; Brassicaceae.

Distribution: Endemic to Florida. Wunderlin (1998) reports it as frequent in Florida from the western panhandle to the peninsula.

South Florida Distribution: Collier and Miami-Dade counties.

South Florida Habitats: Strand swamps and riverbanks.

Protection Status: Not listed by any agency.

Identification: Tobe et al. (1998) has an illustration and a color photo.

References: Chapman, 1883; Small, 1933a; Rollins, 1993; Tobe et al., 1998; Wunderlin, 1998.

Synonyms: *Cardamine curvisiliqua* Shuttlew. ex Chapm.; *Nasturtium microphyllum* Boenn. ex Rchb., misapplied.

Historical Context in South Florida: Abram P. Garber first collected Florida watercress in 1877 along the Miami River (73, FLAS), a station that was subsequently destroyed. In 1960, William G. Atwater collected Florida watercress northwest of Copeland in the Fakahatchee Strand (M-175, FLAS), presumably in what is now Fakahatchee Strand Preserve State Park. Other collections were made in the Fakahatchee in 1969 by George N. Avery (2059, FLAS), in 1979 by Walter S. Judd (2163, FLAS), and in 1985 by Alan Herndon (1182, FLAS). Florida watercress is assumed to be extant in Fakahatchee Strand Preserve State Park.

Major Threats: Exotic pest plant invasions; hydrological modifications.

Preliminary recommendations:

- Map and monitor plants at Fakahatchee Strand Preserve State Park on a regular basis.

***Schizachyrium niveum* (Swallen) Gould
Pinescrub bluestem**

South Florida Status: Critically imperiled. One occurrence at Seabranh Preserve State Park.

Taxonomy: Monocotyledon; Poaceae.

Habit: Perennial terrestrial herb.

Distribution: Endemic to peninsular Florida. Wunderlin (1998) reports it as rare in central Florida.

South Florida Distribution: Martin County, but still not vouchered.

South Florida Habitats: Scrub.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: Hitchcock & Chase (1950) has an illustration; Chafin (2000) has illustrations and a color photo.

References: Hitchcock & Chase, 1950; Hall, 1978; Wunderlin, 1998; Chafin, 2000; Coile, 2000.

Synonyms: *Andropogon niveus* Swallen.

Historical Context in South Florida: Bradley and Woodmansee first observed pinescrub bluestem in 1998 at Seabranh Preserve State Park in Martin County (Bradley et al., 1999), but this station needs to be vouchered. Fewer than 100 plants were observed.

Major Threats: Exotic pest plant invasions; fire suppression.

Comments: *In a study of scrub sites throughout Martin County in 1998 (Bradley et al., 1999), this species only was seen at Seabranh Preserve State Park.*

Preliminary recommendations:

- Voucher plants at Seabranh Preserve State Park.

- Map and monitor known stations on a regular basis.

***Schizaea pennula* Sw.**
Ray Fern

South Florida Status: Critically imperiled. One occurrence at Arthur R. Marshall Loxahatchee National Wildlife Refuge.

Taxonomy: Pteridophyte; Schizaeaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to South Florida, central Florida in Pinellas County, the West Indies, Central America, and South America.

South Florida Distribution: Miami-Dade and Palm Beach counties.

South Florida Habitats: Moist organic soils in Everglades tree islands and wet rockland hammocks.

Protection Status: Listed as endangered by FDACS and critically imperiled by FNAI.

Identification: Nelson (2000) has a color photo; Wunderlin & Hansen (2000) has an illustration.

References: Small, 1931b; Small, 1938; Lakela & Long, 1976; Long & Lakela, 1976; Flora of North America Editorial Committee, 1993; Wunderlin, 1998; Coile, 2000; Liogier & Martorell, 2000; Nelson, 2000; Wunderlin & Hansen, 2000.

Synonyms: *S. germanii* (Fée) Prantl; *Actinostachys germanii* Fée; *Actinostachys pennula* (Sw.) Hook.

Historical Context in South Florida: Alvah A. Eaton first collected ray fern in 1904 in “intangled growth” along the Miami River (996, USF). Eaton (1906) reported that it was very scarce at that location. It was reported again in 1914 in Royal Palm Hammock in Everglades National Park (Small, 1938), but apparently it never was vouchered there.

Taylor R. Alexander rediscovered ray fern in 1972 on tree islands (bayheads) in Arthur R. Marshall Loxahatchee National Wildlife Refuge in Palm Beach County (Alexander, 1974). This population is extant and was last observed by Bradley and Woodmansee in 2000. It is estimated that fewer than 1,000 plants are present in the Loxahatchee National Wildlife Refuge.

Major Threats: Exotic pest plant invasions, specifically by Old World climbing fern (*Lygodium microphyllum*) which is rapidly invading tree islands in Loxahatchee National Wildlife Refuge and has been found in association with ray fern by Bradley and Woodmansee; off-target damage from exotic species control efforts; hydrological modifications; wildfire.

Comments: *This is one of the species that may be affected by the Everglades restoration.*

Preliminary recommendations:

- Survey tree islands in Arthur R. Marshall National Wildlife Refuge.
- Map individual tree islands known to contain ray fern at least every three years.
- Monitor individual tree islands at least every year.
- Control Old World climbing fern (*Lygodium microphyllum*) and other exotic pest plants without causing off-target damage to ray fern.
- Consider establishing an *ex situ* collection of germplasm.
- Conduct research to determine the effects of the Everglades restoration on ray fern.

***Schoenocaulon dubium* (Michx.) Small**
Florida Feathershank

South Florida Status: Critically imperiled. One occurrence in Jonathan Dickinson State Park.

Taxonomy: Monocotyledon; Liliaceae.

Habit: Perennial terrestrial herb.

Distribution: Endemic to peninsular Florida. Wunderlin (1998) reports it as occasional in peninsular Florida.

South Florida Distribution: Broward, Martin, and Palm Beach counties.

South Florida Habitats: Flatwoods and scrub.

Protection Status: Not listed by any agency.

Identification: Taylor (1998) has a color photo.

References: Chapman, 1883; Small, 1933a; Frame, 1990; Taylor, 1998; Wunderlin, 1998.

Synonyms: *Schoenocaulon gracile* A. Gray.

Historical Context in South Florida: Roy O. Woodbury and Walter M. Buswell first collected Florida feathershank in 1942 in the vicinity of Pompano Beach in northern Broward County (s.n., FTG). Ann Buckley and Ted Hendrickson collected it in 1984 in the same general area of Broward County in Deerfield Beach (33, FTG). Both of these stations probably have been destroyed. In 1977, Daniel F. Austin made a collection at Jonathan Dickinson State Park in Martin County (s.n., FAU), followed by John Popenoe in 1980 (1907, USF). In 1997, Bradley and Woodmansee collected it along the Loxahatchee River Corridor in the Palm Beach County portion of Jonathan Dickinson State Park (94, FTG). Florida feathershank has been reported for Dupuis Reserve (Woodbury, no date), which is located in both Martin and Palm Beach counties, but this report needs to be verified.

Major Threats: Fire suppression; exotic pest plant invasions.

Preliminary recommendations:

- Survey Dupuis Reserve.
- Map and monitor known stations on a regular basis.

***Scleria ciliata* Michx.**
var. *pauciflora* (Muhl. ex Willd.) Kük.
Fewflower Nutrush

South Florida Status: Critically imperiled. Two occurrences in one conservation area (Fred C. Babcock-Cecil M. Webb Wildlife Management Area) and one non-conservation area (Pal-Mar CARL Site).

Taxonomy: Monocotyledon; Cyperaceae.

Habit: Perennial terrestrial herb.

Distribution: The eastern United States, Cuba, Mexico, and Central America. Wunderlin (1998) reports it as occasional nearly throughout Florida.

South Florida Distribution: Charlotte, Collier, Lee, and Martin counties.

South Florida Habitats: Flatwoods.

Protection Status: Not listed by any agency.

Identification: Distinguished from other varieties of *S. ciliata* by having achene bodies that are ridged or papillate instead of reticulate, 1-2 mm long, and 6 tubercles (Wunderlin, 1998).

References: Chapman, 1883; Small, 1933a; Core, 1936; Fairey, 1967; Fairey, 1969; Long & Lakela, 1976; Godfrey & Wooten, 1979; Kessler, 1987; Wunderlin, 1998; Liogier & Martorell, 2000.

Synonyms: *S. pauciflora* Muhl. ex Willd.; *S. pauciflora* var. *caroliniana* (Willd.) A.W. Wood.

Historical Context in South Florida: Leonard J. Brass first collected fewflower nutrush in 1964 in Collier County northeast of Naples in the Golden Gate Estates area (33362, USF). This station has probably been destroyed. In 1990, Steven L. Orzell and Edwin L. Bridges made a collection about 0.5 miles east of Estero Bay near Bonita Springs in Lee County (15197, FTG, USF), in or near what is now Estero Bay State Buffer Preserve. Orzell and Bridges made another collection in 1991 at the Pal-Mar CARL Site in Martin County (16851, FTG). It has also been reported for Jonathan Dickinson State Park in Martin County (Florida Park Service District 5, no date), but this report needs to be verified. Gann and Bradley collected it in 1995 at the Fred C. Babcock-Cecil M. Webb Wildlife Management Area in Charlotte County (53, FTG).

Major Threats: Fire suppression; exotic pest plant invasions.

Preliminary recommendations:

- Survey Estero Bay State Buffer Preserve and Jonathan Dickinson State Park.
- Map and monitor known stations on a regular basis.
- Continue CARL acquisitions to expand Estero Bay State Buffer Preserve and Pal-Mar.

***Scutellaria arenicola* Small
Florida Scrub Skullcap**

South Florida Status: Critically imperiled. One occurrence at Collier-Seminole State Park.

Taxonomy: Dicotyledon; Lamiaceae.

Habit: Perennial terrestrial herb.

Distribution: Endemic to peninsular Florida. Wunderlin (1998) reports it as frequent in the peninsula.

South Florida Distribution: Collier and Lee counties.

South Florida Habitats: Flatwoods.

Protection Status: Not listed by any agency.

Identification: Taylor (1992) has a color photo.

References: Small, 1933a; Epling, 1942; Godfrey & Wooten, 1981; Taylor, 1992; Wunderlin, 1998.

Synonyms: None.

Historical Context in South Florida: Albert S. Hitchcock first collected Florida scrub skullcap in 1900 in Fort Myers (277, NY). Alvah A. Eaton made another collection there in 1904 (1153, AMES). Epling (1942) cited an additional specimen by Eaton, probably in 1905 (1410), but we have not located this specimen. Jeanette P. Standley also collected Florida scrub skullcap in Lee County in the Mullock Creek area in 1917 (440, US). This station is in the vicinity of what is now Estero Bay State Buffer Preserve. In 1982, George N. Avery collected Florida scrub skullcap at Collier-Seminole State Park (2350, FTG). J. Weber also collected it there in 1991 (CS0026, USF).

Major Threats: Fire suppression; exotic pest plant invasions.

Preliminary recommendations:

- Survey Estero Bay State Buffer Preserve.
- Map and monitor known stations on a regular basis.

***Spiranthes costaricensis* Rchb. f.
Costa Rican Lady's-tresses**

South Florida Status: Critically imperiled. One occurrence at Everglades National Park.

Taxonomy: Monocotyledon; Orchidaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to South Florida, the West Indies, and Central America.

South Florida Distribution: Miami-Dade County.

South Florida Habitats: Rockland hammocks.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: Luer (1972) has illustrations and color photos.

References: Luer, 1972; Long & Lakela, 1976; Wunderlin, 1998; Coile, 2000.

Synonyms: *Beloglottis costaricensis* (Rchb. f.) Schltr.

Historical Context in South Florida: John Beckner discovered Costa Rican lady's-tresses in 1953 in or around Long Pine Key in Everglades National Park (Luer, 1972). It was collected on Long Pine Key by George N. Avery in 1980 (2215, FTG), and by Richard G. Reimus and Chuck McCartney in 1991 (s.n., FTG). Avery observed Costa Rican lady's-tresses in five hammocks in the vicinity of Long Pine Key from 1980 to 1983 (Avery's Notes, 1980-1983). It can still be found in at least four hammocks in Everglades National Park (Hammer, 2001). Avery reported one other station of Costa Rican lady's-tresses in 1982 (Avery's Notes, 19 February 1982, 22 December 1982). He found plants growing at Camp Owaissa Bauer, a Miami-Dade County park. About ten plants were present in 1982 (Avery's Notes, 1982), and Chuck McCartney photographed plants there in 1983 (personal communication, 21 February 2001). No subsequent reports from that station have been made despite numerous attempts to find these plants by Roger L. Hammer (Hammer, 2001) and others.

Major Threats: Exotic pest plant invasions; poaching.

Preliminary recommendations:

- Continue surveys at Camp Owaissa Bauer.
- Map and monitor known stations on a regular basis.

***Sporobolus compositus* (Poir.) Merr.**
var. *clandestinus* (Biehler) Wipff & S.D. Jones
Hidden Dropseed

South Florida Status: Critically imperiled. Two occurrences in one conservation area (Everglades National Park), and one non-conservation area (Navy Wells #2).

Taxonomy: Monocotyledon; Poaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to the eastern United States. Wunderlin (1998) reports it as occasional in Florida from the northern counties south to Hillsborough County.

South Florida Distribution: Miami-Dade County, where it is disjunct from the nearest populations in Hillsborough County.

South Florida Habitats: Pine rocklands.

Protection Status: Not listed by any agency.

Identification: Hitchcock & Chase (1950) has an illustration.

References: Small, 1933a; Hitchcock & Chase 1950; Hall, 1978; Wunderlin, 1998.

Synonyms: *S. clandestinus* (Biehler) Hitchc.

Historical Context in South Florida: Alvah A. Eaton first collected hidden dropseed in 1903 on “Border of prairies, South of Cutler” (225, US). It was rediscovered, unwittingly, in 1982 when George N. Avery collected an undetermined grass on Long Pine Key in Everglades National Park (2351, FTG). It remained unidentified until Bradley discovered a population of an unknown grass at a private pine rockland fragment known as Navy Wells #2 in 1997 (729, FTG). Bradley, who had seen Avery’s unidentified specimen, recognized that it was the same. He called the specimens to the attention of Gerald “Stinger” Guala, keeper of the Fairchild Tropical Garden herbarium, who correctly identified them. In 2000, Bradley and Gann observed the colony discovered by Avery in Everglades National Park. The plants at this station are growing along the side of a firebreak road at the edge of a pine rockland.

Major Threats: Habitat destruction at Navy Wells #2; road maintenance on Long Pine Key; fire suppression; exotic pest plant invasions; management error.

Preliminary recommendations:

- Map and monitor known stations on a regular basis.
- Acquire Navy Wells #2.

***Stylisma abdita* T. Myint**
Showy Dawnflower

South Florida Status: Critically imperiled. One occurrence in one conservation area (Rookery Bay National Estuarine Research Reserve) and fragmented occurrences on several private properties in Collier County.

Taxonomy: Dicotyledon; Convolvulaceae.

Habit: Perennial terrestrial herb.

Distribution: Endemic to Florida. Wunderlin (1998) records it as rare in peninsular Florida.

South Florida Distribution: Collier and Lee counties.

South Florida Habitats: Scrub.

Protection Status: Listed as endangered by FDACS and as imperiled to rare by FNAI.

Identification: There are five species of *Stylisma* in Florida. *S. abdita* is distinguished by having leaves that are less than 2 cm long, rather than over 2 cm long (Wunderlin 1998).

References: Myint, 1966; Long & Lakela, 1976; Austin & Burch, 1992; Wunderlin, 1998.

Synonyms: None.

Historical Context in South Florida: Alan R. Smith and Tin Myint first collected showy dawnflower in 1961 (627, FLAS) in Naples. Myint (1966) subsequently described the species. Showy dawnflower was overlooked in Collier County until Jim Burch began making collections in the late 1980s and early 1990s in both Collier and Lee counties. The status of the species in southwest Florida was reported by Austin & Burch (1992). Burch collected it on Marco Island in 1990 (213, Collier County Natural Resources Division Herbarium), the Naples area many times from 1987 (s.n., FAU) to 1991 (423, Collier County Natural Resources Division Herbarium), and the Pelican Bay area many times in 1990 and 1991 (e.g. s.n., USF). Burch made the first collection in Lee County in 1987 in Bonita Springs (s.n., FAU). Burch made another collection in Bonita Springs in 1990 (s.n., FAU). In 2001 Burch found plants at the Rookery Bay National Estuarine Research Reserve (personal communication, 14 January 2002).

While showy dawnflower has been collected or observed on many sites in Collier and Lee counties in the last 15 years, Burch believes that most plants have either been destroyed or will be destroyed in the near future. Burch estimates that between 12 and 15 scrub fragments may remain with the species in Collier County, and it may no longer be extant in Lee County (personal communication, 14 January 2002).

Major Threats: Habitat destruction at private stations.

Preliminary recommendations:

- Survey scrub sites in Collier County and southern Lee County.
- Map and monitor known stations on a regular basis.

***Tephrosia angustissima* Shuttlew. ex Chapm.
var. *curtissii* (Small ex Rydb.) Isely
Curtiss' Hoarypea**

South Florida Status: Critically imperiled. Two occurrences in one conservation area (Hollywood North Beach Regional Park) and one non-conservation area (Lummus Park).

Taxonomy: Dicotyledon; Fabaceae.

Habit: Perennial terrestrial herb.

Distribution: Endemic to peninsular Florida. Wunderlin (1998) reports it as occasional in the central peninsula.

South Florida Distribution: Broward, Hendry, Miami-Dade, and Palm Beach counties.

South Florida Habitats: Coastal strand and, probably, flatwoods.

Protection Status: Listed as endangered by FDACS (as *T. angustissima*) and as critically imperiled by FNAI.

Identification: *T. angustissima* is distinguished from other species of *Tephrosia* in Florida by having a glabrous style (Wunderlin, 1998). The variety *curtissii* is distinguished from other varieties of *T. angustissima* by being minutely strigose and having leaflets 2-8 times longer than wide (Wunderlin, 1998).

References: Chapman, 1883; Small, 1933a; Shinnars, 1962b; Long & Lakela, 1976; Austin, 1980; Isely, 1982; Isely, 1990; Wunderlin, 1998; Chafin, 2000; Coile, 2000.

Synonyms: *T. curtissii* (Small ex Rydb.) Shinnars; *T. leptostachya* DC., misapplied; *T. seminole* Shinnars; *Cracca curtissii* Small ex Rydb.

Historical Context in South Florida: Allan H. Curtiss first collected Curtiss' hoarypea in 1895 on beach ridges near the Jupiter Inlet in northern Palm Beach County (5561, FLAS, NY). Austin et al. (1980b) reported it for South Beach Park and Red Reef Park in Boca Raton based upon surveys conducted in 1979. Between 100 and 200 plants were observed at South Beach Park, while only four plants were observed at Red Reef Park. Curtiss' hoarypea is not thought to be currently present at either site. Austin has searched for plants at South Beach Park, but has not been able to find any specimens (personal communication, 10 March 2001). In 1984, Jerry Derenthal collected a specimen near

both of these sites, at Spanish River Park (1, FAU), where its status is unknown.

In 1986, Ted Hendrickson and Ann Buckley collected Curtiss' hoarypea at Hollywood North Beach Regional Park in Broward County (501, FTG). Gann and Bradley observed this occurrence in 1995. Plants were growing along a roadside in a disturbed coastal strand. While this site is considered a conservation area (Jue et al., 2001), it is used primarily for beach access.

In 1999, Gary Hunt reported to Bradley that he knew of a population of Curtiss' hoarypea at Lummus Park on Miami Beach. Hunt had known of this station for several years. Bradley observed this station in 1999 (2039, FTG). Fewer than 100 plants were growing in open sand behind beach dunes. Lummus Park is a recreational park with a renourished beach and a very narrow restored beach dune system.

In 1919, Perley Poore Sheehan made a single collection of Curtiss' hoarypea in Hendry County at Godden's Mission, now in the Big Cypress Seminole Indian Reservation (848, NY). It was this specimen that Shinnars (1962b) used as the type for his *T. seminole*, a species that later was placed into synonymy under *T. angustissima* var. *curtissii*.

Major Threats: Habitat destruction at Hollywood North Beach Regional Park and Lummus Park; exotic pest plant invasions, especially beach naupaka (*Scaevola sericea*); coastal erosion; trampling.

Preliminary recommendations:

- Survey Red Reef Park, South Beach Park, and Spanish River Park.
- Map and monitor known stations on a regular basis.
- Develop conservation agreement with the City of Miami to restore and maintain a viable population of Curtiss' hoarypea.
- Control beach naupaka and other exotic pest plants that threaten Curtiss' hoarypea.
- Study feasibility of reintroducing Curtiss' hoarypea to other stations within its historical range.

***Tephrosia chrysophylla* Pursh**
Scurf Hoarypea

South Florida Status: Critically imperiled. One occurrence at Jonathan Dickinson State Park.

Taxonomy: Dicotyledon; Fabaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to the southeastern coastal plain. Wunderlin (1998) reports it as frequent in Florida from the northern counties to the central peninsula.

South Florida Distribution: Lee, Martin, and Miami-Dade counties.

South Florida Habitats: Flatwoods and pine rocklands.

Protection Status: Not listed by any agency.

Identification: Taylor (1992) has a color photo.

References: Chapman, 1883; Small, 1933a; Wood, 1949; Isely, 1990; Taylor, 1992; Wunderlin, 1998.

Synonyms: *Cracca carpenteri* Rydb.; *Cracca chapmanii* (Vail) Small; *Cracca chrysophylla* (Pursh) Kuntze.

Historical Context in South Florida: Albert S. Hitchcock collected scurf hoarypea first in 1900 in Fort Myers in Lee County (81, NY). Walter M. Buswell collected it again in Fort Myers in 1930 (s.n., FTG). In 1948, Roy O. Woodbury made the only collection in Miami-Dade County at Cutler (s.n., FTG), in the vicinity of Deering Estate at Cutler and Ludlam Pineland Tract. In 1978, John Popenoe collected scurf hoarypea at Jonathan Dickinson State Park in Martin County (778, FTG), where it is assumed to be extant.

Major Threats: Fire suppression; exotic pest plant invasions.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Map and monitor known stations on a regular basis.
- Consider restoring pine rocklands near the Miami River and introducing scurf hoarypea.

***Tephrosia hispidula* (Michx.) Pers.
Sprawling Hoarypea**

South Florida Status: Critically imperiled. One occurrence at Jonathan Dickinson State Park.

Taxonomy: Dicotyledon; Fabaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to the southeastern coastal plain and piedmont. Wunderlin (1998) reports it as occasional nearly throughout Florida.

South Florida Distribution: Lee and Martin counties.

South Florida Habitats: Flatwoods.

Protection Status: Not listed by any agency.

Identification: Distinguished from other species of *Tephrosia* in South Florida by having petioles equaling to or shorter than the length of the lowest leaflets, racemes not foliose, fruits short villous, and upper stem and leaf rachis with spreading trichomes (Wunderlin, 1998). Wunderlin (1998) has a key to the seven species of *Tephrosia* in Florida.

References: Chapman, 1883; Small, 1933a; Wood, 1949; Isely, 1990; Wunderlin, 1998.

Synonyms: *Cracca hispidula* (Michx.) Kuntze.

Historical Context in South Florida: Edgar T. Wherry first collected sprawling hoarypea in 1930 south of Fort Myers in Lee County (s.n., PH). It has been reported for Corkscrew Swamp Sanctuary (Judd, 1994), which is located in both Lee and Collier counties, but this report needs to be verified. In 1976, John Popenoe collected sprawling hoarypea at Jonathan Dickinson State Park in Martin County (648, FTG). Roy O. Woodbury collected it there again in 1989 (s.n., FTG, USF), where it is assumed to be extant. It has been reported for the Loxahatchee Slough Natural Area (Farnsworth, 1994c), but this station needs to be verified.

Major Threats: Fire suppression; exotic pest plant invasions.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Survey Corkscrew Swamp Sanctuary and Loxahatchee Slough Natural Area.
- Map and monitor known stations on a regular basis.

***Thelypteris grandis* A.R. Sm.
Stately Maiden Fern**

South Florida Status: Critically imperiled. One occurrence at Fakahatchee Strand Preserve State Park.

Taxonomy: Pteridophyte; Thelypteridaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to South Florida and the West Indies.

South Florida Distribution: Collier County.

South Florida Habitats: Strand swamps.

Protection Status: Listed as endangered by FDACS.

Identification: Nelson (2000) has color photos; the IRC Website has a color photo.

References: Flora of North America Editorial Committee, 1993; Wunderlin, 1998; Coile, 2000; Liogier & Martorell, 2000; Nelson, 2000; Wunderlin & Hansen, 2000.

Synonyms: None.

Historical Context in South Florida: Clifton E. Nauman and Daniel F. Austin first collected stately maiden fern in 1978 in Fakahatchee Strand Preserve State Park (557, USF). Nauman and others made additional collections in 1980 (s.n., USF) and 1981 (1418, USF). Florida Park Service biologist Mike Owen estimates that there are fewer than 100 plants in the Fakahatchee Strand (personal communication, 25 January 2001).

Major Threats: Poaching; exotic pest plant invasions, especially Old World climbing fern (*Lygodium microphyllum*); hydrological modifications.

Preliminary recommendations:

- Continue ongoing surveys at Fakahatchee Strand Preserve State Park.
- Map and monitor known stations on a regular basis.
- Protect from poaching.

- Control Old World climbing fern (*Lygodium microphyllum*) and other exotic pest plants that threaten stately maiden fern.
- Review for listing by FNAI.

***Thelypteris serrata* (Cav.) Alston**
Toothed Lattice-vein Fern

South Florida Status: Critically imperiled. Two occurrences in Jonathan Dickinson State Park.

Taxonomy: Pteridophyte; Thelypteridaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to peninsular Florida, the West Indies, Mexico, Central America, and South America. Wunderlin (1998) reports it as occasional in Florida in the central and southern peninsula.

South Florida Distribution: Martin, Miami-Dade, and Palm Beach counties.

South Florida Habitats: Hydric hammocks, rockland hammocks, and riverine swamps.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: *Thelypteris serrata* and *T. reticulata* are very close in appearance and are dissimilar from other species of *Thelypteris* in South Florida. Of the two, *T. serrata* has significantly narrower pinnae (up to 3.5 cm vs. up to 6 cm wide in *T. reticulata*). Chafin (2000) has illustrations and a color photo; Nelson (2000) has a color photo.

References: Small, 1931b; Small, 1938; Lakela & Long, 1976; Long & Lakela, 1976; Flora of North America Editorial Committee, 1993; Wunderlin, 1998; Liogier & Martorell, 2000; Chafin, 2000; Coile, 2000; Nelson, 2000; Wunderlin & Hansen, 2000.

Synonyms: *Meniscium serratum* Cav.

Historical Context in South Florida: J.W. Harshberger first collected toothed lattice-vein fern in 1912 on the southern shore of Lake Okeechobee (1937, NY), probably in northwestern Palm Beach County. This station has been long destroyed, and no plants have been collected or observed in that area since that time. A second station in Palm Beach County represents a large population along the Loxahatchee River in both Palm Beach and Martin counties, now within Jonathan Dickinson State Park. This

population was first vouchered by John Popenoe in 1972 (s.n., FTG). Popenoe vouchered this population again in 1981 (2177, FTG), and Bradley and Woodmansee collected the most recent specimen in 1997 (52, FTG). Fewer than 3,000 plants are thought to be present in the park. Woodmansee, Sandra Vardaman, and Gwen Burzycki discovered an additional station at the South Fork St. Lucie River site in Jonathan Dickinson State Park in Martin County in 2000 (588b, FTG). The Loxahatchee River station and the South Fork of the St. Lucie River stations are considered to be separate occurrences.

Thomas Darling, Jr. made the first collection in Miami-Dade County in 1959 near the intersection of Quail Roost Drive and S.W. 154 Avenue (s.n., US), apparently along the edge of an old transverse glade. This same station was apparently vouchered again by Frank C. Craighead in 1960 (s.n., FLAS), and subsequently observed by John Popenoe (Avery's Notes, 19 February 1968). Avery visited this station in 1975, but only was able to locate plants of the closely related *T. reticulata* (Avery's Notes, 3 April 1975). Gann attempted to locate this site in the late 1990s, but it had apparently been destroyed for agriculture.

The remaining verifiable stations for toothed lattice-vein fern are all in Everglades National Park in and around Royal Palm Hammock near the park's main entrance. Craighead made the first collection in the park in 1960 in a cypress head without definite locality (s.n., FLAS). Pam Krauss collected the next specimen in April 1979, in the understory of an abandoned agricultural field just east of Pine Island (567, FTG). The overstory was Brazilian-pepper (*Schinus terebinthifolius*). George N. Avery visited this station in June 1979, and observed several plants (Avery's Notes, 8 June 1979). He revisited the station in 1983 with Roland Eves, who took photographs of the plants at that station (Avery's Notes, 2 April 1983). This station needs to be surveyed and nearby habitats explored for plants growing in more natural conditions.

Major Threats: Exotic pest plant invasions; hydrological modifications; habitat modifications (clearing of Brazilian-pepper in Everglades National Park without protecting or translocating populations of toothed lattice-vein fern); poaching.

Comments: *John Kunkel Small apparently never saw live plants of T. serrata. The only plants he was aware of, through 1938, were the plants collected along Lake Okeechobee. Gann and Bradley observed plants along the Fisheating Creek in Highlands County in 1996, in the vicinity of what is now Fisheating Creek Wildlife Management Area.*

Preliminary recommendations:

- Survey Everglades National Park in the vicinity of Pine Island and Fisheating Creek Wildlife Management Area.
- Map and monitor known stations on a regular basis.
- Protect from poaching.
- If plants are found in disturbed areas in Everglades National Park, consider translocating to a more natural habitat (e.g., cypress dome) in the vicinity of Pine Island.

***Trichomanes holopterum* Kunze**
Entire-winged Bristle Fern

South Florida Status: Critically imperiled. One occurrence at Big Cypress National Preserve.

Taxonomy: Pteridophyte; Hymenophyllaceae.

Habit: Perennial epiphytic herb.

Distribution: Native to South Florida and the West Indies.

South Florida Distribution: Collier County, and the Monroe County mainland.

South Florida Habitats: Strand swamps and cypress swamps; epiphytic on cypress (*Taxodium*) trunks, decaying logs, and stumps.

Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.

Identification: Chafin (2000) has a photo; Nelson (2000) has a color photo; the IRC Website has a color photo.

References: Delchamps, 1966; Lakela & Long, 1976; Long & Lakela, 1976; Nauman, 1986b; Flora of North America Editorial Committee, 1993; Wunderlin, 1998; Chafin, 2000, Coile, 2000; Liogier & Martorell, 2000; Nelson, 2000; Wunderlin & Hansen, 2000.

Synonyms: None.

Historical Context in South Florida: Richard and Rhoda Stone first observed entire-winged bristle fern in 1964 in what is now Big Cypress National Preserve (Delchamps, 1966). C. Eugene Delchamps vouchered it that same year near Monroe Station (s.n., FLAS). It was collected again in the same general area in both Collier and Monroe counties by Daniel B. Ward (5307, FLAS), Robert W. Long (1688, USF), and George N. Avery (957, FTG). Clifton E. Nauman and John Popenoe made the last collection in 1986 (1783, FTG). Bradley and Gil Nelson observed this population in 1998. Fewer than 100 plants were present, but many more plants could be present in nearby areas. This area needs to be thoroughly surveyed and mapped.

Major Threats: Hydrological modifications; exotic pest plant invasions; recreational off-road vehicle use; wild hog damage.

Comments: *Wunderlin and Hansen (2000) states that mature sporophytes are uncommon, but that gametophyte colonies are relatively common and extensive.*

Preliminary recommendations:

- Map and monitor known stations on a regular basis.

***Trichostigma octandrum* (L.) H. Walter**
Hoopvine

South Florida Status: Critically imperiled. One occurrence in Everglades and Francis S. Taylor Wildlife Management Area.

Taxonomy: Dicotyledon; Phytolaccaceae.

Habit: Herbaceous vine.

Distribution: Native to South Florida, the West Indies, Mexico, Central America, and South America.

South Florida Distribution: Broward and Collier counties, and the Monroe County Keys.

South Florida Habitats: Shell mounds, rockland hammocks, and bayheads.

Protection Status: Listed as endangered by FDACS.

Identification: Correll & Correll (1982) has an illustration.

References: Small, 1933a; Long & Lakela, 1976; Correll & Correll, 1982; Wunderlin, 1998; Coile, 2000; Liogier & Martorell, 2000, Austin, 2001.

Synonyms: None.

Historical Context in South Florida: Joseph H. Simpson first collected hoopvine in 1891 on Chokoloskee Island (238, US), presumably in a hammock on a shell mound. It was collected there again in 1916 by John Kunkel Small (7718, NY), in 1969 by George N. Avery (739, FTG), and in 1982 by Donovan S. Correll (53231, FTG, NY, USF). The last remnants of natural areas on that island have been developed, and it almost certainly is extirpated there. In 1921, Small and Paul Matthaus collected hoopvine in a rockland hammock on Pumpkin Key in Monroe County (9904, FLAS, NY). Small (1923) writes of the discovery of hoopvine at that location. Avery collected it there again in 1970 (739A, FTG). Portions of this private island were later developed, and it may be extirpated there, but this station should be surveyed. In 1930, Harold N. Moldenke made a collection in Miami in "low swampy ground along roadside" (3703, NY). This is the only collection known from Miami-Dade County, and it is uncertain where this specimen was collected. Black & Black (1980) reported hoopvine for Big Cypress National Preserve based upon a personal communication with George N. Avery. Avery's notes make no mention of observing hoopvine in the Big Cypress, but hoopvine was reported again in 1982 for Hammock C in the Pinecrest region of site (Gunderson & Loope, 1982b), an area that Avery helped to inventory.

An additional mainland station was discovered in 2000 by Michael R. Anderson in Water Conservation Area 3A in Broward County (s.n., USF, FLAS; Austin, 2001), part of the Everglades and Francis S. Taylor Wildlife Management Area. The plants were found growing on four tree islands dominated by *Acer rubrum*. This is apparently the only extant occurrence in Florida. Fewer than 50 plants are thought to be present at this station (M.R. Anderson, personal communication, 23 February 2001).

Threats: Exotic pest plant invasions; manipulation of water levels in Water Conservation Area 3A.

Comments: *This is one of the species that may be affected by the Everglades restoration.*

Preliminary recommendations:

- Survey the Pinecrest Region of Big Cypress National Preserve and Pumpkin Key.
- Map and monitor known stations on a regular basis.
- Acquire Pumpkin Key.
- Consider restoring shell mounds hammocks on Chokoloskee Island and reintroducing hoopvine.
- Conduct research to determine the effects of the Everglades restoration on hoopvine.
- Review for listing by FNAI.

***Tropidia polystachya* (Sw.) Ames**
Young Palm Orchid

South Florida Status: Critically imperiled. One occurrence at Alice Wainwright Park.

Taxonomy: Monocotyledon; Orchidaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to South Florida, the West Indies, Mexico, Central America, and South America.

South Florida Distribution: Miami-Dade County.

South Florida Habitats: Rockland hammocks.

Protection Status: Listed as endangered by FDACS and as extirpated by FNAI.

Identification: Luer (1972) has illustrations and color photos.

References: Ames, 1904a; Small, 1933a; Correll, 1950; Luer, 1972; Long & Lakela, 1976; Wunderlin, 1998; Coile, 2000.

Synonyms: *Tropidia eatonii* Ames.

Historical Context in South Florida: Ferdinand Rugel first collected young palm orchid in 1846 in Miami (s.n., US), presumably in Brickell Hammock, which was located just south of present-day downtown Miami. Allan H. Curtiss vouchered it again in Brickell Hammock in 1897 (5949, AMES), followed by Alvah A. Eaton in 1903 (s.n., AMES, NY) and 1905 (1185, AMES), and by John Kunkel Small in 1906 (2565a, NY). Brickell Hammock has been devastated by development, and only small fragments remain. Young palm orchid is still known from a remnant of Brickell Hammock at Alice Wainwright Park, which is managed by the City of Miami. In 1975, Roger L. Hammer found a few plants

there, which were subsequently observed by George N. Avery (Avery's Notes, 12 March 1975). In 1980, the City of Miami built a nature trail right through the colony, but City of Miami naturalist Ralph Beaudry reported that 10-12 plants remained after the trail had been completed (Avery's Notes, 29 April 1980). In 1989, Hammer and Carol Lippincott surveyed the site and counted six plants (Hammer, 1997). After Hurricane Andrew in 1992, it was thought that young palm orchid was extirpated in South Florida, but in 1998 Chuck McCartney observed three plants at Alice Wainwright Park (Hammer, 2001). Since that time, Hammer has discovered a fourth plant (Hammer, 2001), and a small colony is thought to persist there.

In 1904, Alvah A. Eaton collected young palm orchid in Castellow Hammock, now part of Castellow Hammock Park, reporting "a few plants only" (Ames, 1904a). Despite a great deal of botanical activity in this hammock, no other plants have been reported. In 1915, Small and Charles A. Mosier made a collection in Brogdon Hammock (6326, NY), a hammock of uncertain locality that has probably been destroyed. In 1922, Small and others collected young palm orchid at Warwick Hammock (10732, NY), which is located along Old Cutler Road to the north of what is now Deering Estate at Cutler. This hammock was subsequently subdivided and developed for single-family residences. Gann surveyed hammock fragments in this subdivision in 1995, but did not find any plants of young palm orchid.

Major Threats: Management error; exotic pest plant invasions; vandalism; poaching.

Preliminary recommendations:

- Map and monitor known stations on a regular basis.
- Protect from poaching and vandalism.
- Consider establishing an *ex situ* collection of germplasm.
- Consider augmenting population at Alice Wainwright Park.
- Consider introducing young palm orchid to other sites within its historical range, including Bill Sadowski Park, Castellow Hammock Park, Deering Estate at Cutler, Simpson Park, and Vizcaya Museum and Gardens.
- Review FNAI rank.

***Vaccinium arboreum* Marshall**
Sparkleberry

South Florida Status: Critically imperiled. Two occurrences in one conservation area (Hickey Creek Mitigation Park Wildlife and Environmental Area), and in one non-conservation area (FDOT property on Alligator Creek in Charlotte County).

Taxonomy: Dicotyledon; Ericaceae.

Habit: Tree.

Distribution: Native to the southeastern coastal plain and piedmont. Wunderlin (1998) reports it as frequent in Florida from the northern counties to the central peninsula.

South Florida Distribution: Charlotte, Hendry, Lee and Martin counties.

South Florida Habitats: Mesic hammocks and scrub.

Protection Status: Not listed by any agency.

Identification: Nelson (1994) has an illustration; Nelson (1996) has an illustration and a color photo; Taylor (1998) has a color photo.

References: Chapman, 1883; Small, 1933a; Godfrey, 1988; Nelson, 1994; Nelson, 1996; Wunderlin, 1998.

Synonyms: *Batadendron arboreum* (Marshall) Nutt.

Historical Context in South Florida: Albert S. Hitchcock first collected sparkleberry in 1900 in Alva in Lee County (192, NY), in the vicinity of what is now Caloosahatchee Regional Park. In 1930, Harold N. Moldenke made a collection in the same general area east of Owanita (1015, NY). It was reported near Owanita at Hickey Creek Mitigation Park Wildlife and Environmental Area (Florida Game and Fresh Water Fish Commission and Lee County, 1994), and was observed there by Gann and Lee County biologists Roger Clark and Rob Irving in 2001. This station needs to be vouchered. Walter M. Buswell made an additional collection near Fort Myers in 1931 (s.n., NY). Robin Huck also made a collection in 1986 at a private scrub site east of Bonita Springs (4074, FLAS). The species also is reported for the Koreshan State Historic Site (Florida Park Service District 4, 1994d) but this report has not been confirmed.

In 1957, the only collection from Hendry County was made by Leonard J. Brass at Fort Denaud in a hammock on the bank of the Caloosahatchee River (29028, ARCH).

In 1965, Olga Lakela made a collection in Charlotte County in a "Hammock along creek and berm in white sand scrub, FL 31," probably north of Bermont. In 1996, Gann and Bradley found sparkleberry in a mesic hammock along Alligator Creek just off I-75 at the Alligator Creek Pignut Hickory Site, which is owned by the Florida Department of Transportation. Bradley vouchered this station in 1998 (1289, FTG). Fewer than 100 plants are known to exist here.

Bruce E. Tatje made a single collection in Martin County in 1977, along State Road 714 west of Palm City (s.n., FAU). Sparkleberry also has been reported for the J.W. Corbett Wildlife Management Area in Palm Beach County by Cox (1988) and by Robson & Cox (1988). Since no specimens have been located from Palm Beach County, these reports should be verified.

Major Threats: Development; exotic pest plant invasions.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Voucher plants at Hickey Creek Mitigation Park Wildlife and Environmental Area.
- Survey Caloosahatchee Regional Park, J.W. Corbett Wildlife Management Area, Koreshan State Historic Site, and the Bonita Beach station.
- Designate and manage Alligator Creek Pignut Hickory Site as a conservation area.
- Map and monitor known stations on a regular basis.

***Vanilla phaeantha* Rchb. f.**
Leafy Vanilla

South Florida Status: Critically imperiled. One occurrence at Fakahatchee Strand Preserve State Park.

Taxonomy: Monocotyledon; Orchidaceae.

Habit: Perennial vine.

Distribution: Native to South Florida and the West Indies.

South Florida Distribution: Collier County.

South Florida Habitats: Strand swamps.

Protection Status: Listed as endangered by FDACS and as imperiled by FNAI.

Identification: This is one of three leafy vanilla orchids in South Florida. Besides *V. phaeantha*, *V. inodora* is native (see above), and *V. mexicana*, the commercial vanilla, is exotic. Luer (1972) has illustrations and color photos of all three species.

References: Small, 1933a; Correll, 1950; Luer, 1972; Long & Lakela, 1976; Correll & Correll, 1982; Wunderlin, 1998; Coile, 2000.

Synonyms: None.

Historical Context in South Florida: Alvah A. Eaton first collected leafy vanilla in 1904 in the Fakahatchee Strand (1129, NY), now part of Fakahatchee Strand Preserve State Park. It has been observed there by a number of botanists. Florida Park Service biologist Mike Owen estimates that there are about 1,000 plants in the Fakahatchee Strand (personal communication, 7 February 2001). Leafy vanilla also has been reported for Big Cypress National Preserve (Black & Black, 1980), but this report needs to be verified.

The Everglades National Park records (Avery & Loope, 1980b, 1983; Reimus 1996, 1999) are based upon plants translocated from the Fakahatchee Strand by Craighead (Hammer, 2001). None of these plants are thought to be extant, and there is no indication that leafy vanilla was ever part of the flora of Everglades National Park.

Major Threats: Poaching; exotic pest plant invasions, especially Old World climbing fern (*Lygodium microphyllum*); hydrological modifications.

Preliminary recommendations:

- Continue ongoing surveys in Fakahatchee Strand Preserve State Park.
- Survey Big Cypress National Preserve.
- Map and monitor known stations on a regular basis.
- Protect from poaching.

- Control Old World climbing fern (*Lygodium microphyllum*) and other exotic pest plants that threaten leafy vanilla.
- Review FNAI listing.

***Xyris platylepis* Chapm.**
Tall Yelloweyedgrass

South Florida Status: Critically imperiled. One occurrence at Jonathan Dickinson State Park.

Taxonomy: Monocotyledon; Xyridaceae.

Habit: Perennial terrestrial herb.

Distribution: Native to the southeastern coastal plain. Wunderlin (1998) reports it as common nearly throughout Florida.

South Florida Distribution: Collier, Glades, Lee, and Martin counties.

South Florida Habitats: Flatwoods and pond margins.

Protection Status: Not listed by any agency.

Identification: Tobe et al. (1998) has an illustration and a color photo.

References: Chapman, 1883; Small, 1933a; Kral, 1960b; Kral, 1966b; Long & Lakela, 1976; Godfrey & Wooten, 1979; Tobe et al., 1998; Wunderlin, 1998; Flora of North America Editorial Committee, 2000.

Synonyms: None.

Historical Context in South Florida: Albert S. Hitchcock first collected tall yelloweyedgrass in 1900 in Fort Myers (359, NY, US). It has been reported for Corkscrew Swamp Sanctuary (Judd, 1994), which is located in both Lee and Collier counties, but this report needs to be verified. In 1962, Leonard J. Brass collected tall yelloweyedgrass along the Hall Branch of Fisheating Creek in Glades County (32915, USF), in or near the newly acquired Fisheating Creek Wildlife Management Area. In 1964, Olga Lakela made a collection in a swampy ditch along Lake Trafford Road west of Immokalee in Collier County (27465, USF). In 1995, Edwin L. Bridges and Randy L. Mears made a collection in Jonathan Dickinson State Park in Martin County (23971, FTG, USF). It also has been reported for Dupuis Reserve (Woodbury, no date), which is located in Martin and Palm Beach counties, but this report needs to be verified.

Major Threats: Exotic pest plant invasions; fire suppression; hydrological modifications; habitat destruction.

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida.*

Preliminary recommendations:

- Survey Corkscrew Swamp Sanctuary, Dupuis Reserve, and Fisheating Creek Wildlife Management Area.
- Map and monitor known stations on a regular basis.