Rare Plants of South Florida:

Their History, Conservation, and Restoration

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The Institute for Regional Conservation

A publication of
The Institute for Regional Conservation's
Restoring South Florida's Native Plant Heritage program

Copyright 2002
The Institute for Regional Conservation
ISBN Number 0-9704997-0-5

Published by
The Institute for Regional Conservation
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Printed by River City Publishing
a division of Titan Business Services
6277 Powers Avenue
Jacksonville, Florida 32217

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.

Funding for *Rare Plants of South Florida* was provided by The Elizabeth Ordway Dunn Foundation, National Fish and Wildlife Foundation, and the Steve Arrowsmith Fund.

Major funding for the *Floristic Inventory of South Florida*, the research program upon which this manual is based, was provided by the National Fish and Wildlife Foundation and the Steve Arrowsmith Fund.

Chapter 5
The Critically Imperiled Plants of South Florida

This chapter provides accounts of 244 species that have been ranked by IRC as critically imperiled in South Florida, as defined in Table 1.1 in Chapter 1. Each account provides a detailed history of the plant in South Florida, obtained through the study of herbarium specimens, literature, correspondence with other botanists, field surveys, and additional sources. Herbarium citations (e.g. USF) are provided (Appendix 11). In some cases we had to make difficult decisions concerning reported but undocumented occurrences. We welcome any additional information on these taxa for incorporation into future editions of this manual.

The South Florida conservation status of each plant is indicated at the beginning of its account under "South Florida Status," and includes the IRC ranking and a list of known occurrences. Additional data is provided for the convenience of users. "Taxonomy" indicates the group of plants to which the taxon belongs (dicotyledon, monocotyledon, or pteridophyte), and its family, primarily following Wunderlin (1998). "Habit" indicates the form of the taxon (tree, herb, epiphyte, etc.). "Distribution" indicates the global range of the taxon, and "South Florida Distribution" gives the specifics of its range in the region. "South Florida Habitats" indicates from which South Florida habitats the species is known. "Protection Status" indicates if the taxon is listed as endangered or threatened by the U.S. Fish and Wildlife Service (USFWS), the Florida Department of Consumer Services, Division of Plant Industry (FDACS), or the Florida Natural Areas Inventory (FNAI). "Identification" supplies references to photographs, illustrations, and other tools. "References" are given for additional useful literature. "Synonyms" are from Wunderlin (1998) and other publications cited in the manual.

The chapter is divided into three parts. The first treats taxa not known from any conservation areas. The second part treats taxa that are known from a single conservation area in South Florida. The third part treats all other critically imperiled taxa.

The history of each taxon was used to make conservation and restoration recommendations. In this chapter, recommendations are broad and include but are not limited to: surveying, mapping, monitoring, vouchering, habitat management, and reintroduction. These recommendations follow the guidelines discussed in Chapter 3.

The IRC Website (www.regionalconservation.org) has additional data on the plants covered in this chapter, including photographs of some species.

Part 1. Plants Not Known In Any Conservation Area

Anagallis pumila Sw.
Florida Pimpernel

South Florida Status: Critically imperiled. One occurrence at Pelican Marsh in Collier County.
Taxonomy: Dicotyledon; Primulaceae.
Habit: Annual terrestrial herb.
Distribution: Native to South Florida, central Florida (Highlands County), the West Indies, Mexico, Central America, and South America.
South Florida Distribution: Collier and Lee counties.
South Florida Habitats: Mesic flatwoods, pond margins, and river banks.
Protection Status: Not listed by any agency.
Identification: There are three species of *Anagallis* in Florida. *A. pumila* can be distinguished from the other two by having pedicellate flowers and opposite or whorled leaves (Wunderlin, 1998).
References: Chapman, 1878; Chapman, 1883; Small, 1933a; Long & Lakela, 1976; Godfrey & Wooten, 1981; Wunderlin, 1998.
Synonyms: *Centunculus pentandrus* R. Br.; *Centunculus. tenellus* Duby; *Micropyxis pumila* (Sw.) Duby.

Historical Context in South Florida: Alvan W. Chapman (1878) first reported Florida pimpernel from the banks of the Caloosahatchee River, presumably in Lee County. Abram P. Garber probably collected the specimen upon which this report was based, but we have been unable to locate the specimen. Florida pimpernel was not reported again for Lee County until 1985, when Elliott Brown collected it in a “damp pineland” just north of Tamiami Village and west of US 41 in North Fort Myers (s.n., USF). Gann briefly surveyed this station in 2000. No plants were found, but additional surveys of this site should be conducted.

Olga Lakela made the first collections in Collier County in 1966 near Immokalee, north of State Road 29 in “pineland; white sand with scrub oaks and Serenoa repens…” (29417, USF). Kristi

Pierce collected it again in Collier County in 1998 at Pelican Marsh in the vicinity of Naples Park (s.n., USF).

Major Threats: Habitat destruction at Pelican Marsh station.

Preliminary recommendations:

- Survey Tamiami Village Flatwoods Site.
- Map and monitor plants at Pelican Marsh annually.
- Acquire Tamiami Village Flatwoods Site.
- Review for listing by FDACS and FNAI.

Asplenium xbiscaynianum (D.C. Eaton) A.A. Eaton
Biscayne Spleenwort

South Florida Status: Critically imperiled. One occurrence at Warwick Hammock.
Taxonomy: Pteridophyte; Aspleniaceae.
Habit: Perennial lithophytic herb.
Distribution: Endemic to South Florida.
South Florida Distribution: Miami-Dade County.
South Florida Habitats: Moist, exposed limestone in rockland hammocks.
Protection Status: Not listed by FDACS due to its hybrid status. Listed as critically imperiled by FNAI.
Identification: Chafin (2000) has illustrations and a color photo; Nelson (2000) has a black and white photo; the IRC Website has a color photo.
References: Eaton, 1906; Small, 1938; Darling, 1961; Lakela & Long, 1976; Long & Lakela, 1976; Avery & Loope, 1980a; Flora of North America Editorial Committee, 1993; Wunderlin, 1998; Chafin, 2000; Nelson, 2000; Wunderlin & Hansen, 2000.
Synonyms: *A. rhizophyllum* L. var. *biscaynianum* D.C. Eaton.

Historical Context in South Florida: Isaac Holden first collected Biscayne spleenwort in 1887 in Brickell Hammock (s.n., NY). It was collected again in Brickell Hammock by Ralph M. Munroe in 1888 (s.n., NY), and by John Kunkel Small and Joel J. Carter in 1906 (s.n., FTG). Eaton (1906) reported that it was abundant at the bluffs near the "Punch Bowl" in Brickell Hammock. Walter M. Buswell made several collections from 1938 to 1949 in Miami that were presumably from Brickell Hammock (e.g. s.n., FTG). The

last collection from Brickell Hammock was by E.P. Kearsley in 1946 (s.n., NY). Thomas Darling, Jr. observed it there again in 1961 (Darling, 1961). A single specimen was seen in a small hammock near the Rickenbacker Causeway, possibly what is now Alice C. Wainwright Park. Don Keller also reports seeing a single individual at Alice Wainwright Park in the late 1980s on the bluff facing Biscayne Bay (personal communication, 8 February 2001). This could have been the same station that was observed by Darling. Recent surveys of that hammock by Gann, Bradley, and others have failed to locate any plants.

The next station to be vouchered was at Warwick Hammock, where Small and others made the first collection in 1922 (10731A, NY, US). Frank C. Craighead and Monroe R. Birdsey probably made the next collection there in 1959 (s.n., FTG), although their locality data is somewhat vague. William G. Atwater also collected it at that station in 1960 (s.n., ARCH, USF). P.B. Tomlinson made another collection in 1962 (12562, FTG), and stated that the hammock was mostly destroyed by that date. It was later developed for single-family residences. Gann found plants in 1995 that were persisting on exposed limestone in a private garden (s.n., FTG). About 50 plants were observed. Subsequently this property was sold. While the status of the plants at this station is unknown, Biscayne spleenwort is reported to be extant in another private yard in Warwick Hammock (D. Keller, personal communication, 8 February 2001).

Small and others also made a collection in Addison Hammock, now in the Deering Estate at Cutler, in 1923 (11103, NY), as did Donovan S. Correll, Helen B. Correll, and John Popenoe in 1974 (41536, FTG). The label says that it was “Very Rare!” and it has not been observed or collected there since that time. The last station to be discovered and vouchered was at Castellow Hammock Park, where Roger L. Hammer discovered a small population in 1984 on exposed limestone in the vicinity of *Asplenium dentatum* (s.n., FTG). This population has not been observed since Hurricane Andrew in 1992, and it may no longer be extant (R.L. Hammer, personal communication, 31 January 2001).

Frank C. Craighead translocated some plants into Everglades National Park in the 1950s, and they have been observed by a

number of people over the years. Don Keller most recently observed one plant there in 1993 (personal communication, 8 February 2001).

Major Threats: Habitat degradation and destruction at Warwick Hammock stations; long-term drainage on the Miami Rock Ridge; exotic pest plant invasions; off-target damage from exotic pest plant control programs; poaching; extirpation of the parent species (both parents are extant together only at Warwick Hammock).

Comments: *Biscayne spleenwort is a hybrid between* A. dentatum *and* A. verecundum. *Both the parents and Biscayne spleenwort require exposed limestone and adequate moisture and humidity, conditions that are now found in few rockland hammocks in Miami-Dade County. Due to the lowering of the regional freshwater table, it does not seems feasible to attempt to reintroduce Biscayne spleenwort to Brickell Hammock at this time.*

Preliminary recommendations:

- Survey Warwick Hammock and Castellow Hammock Park.
- Map known plants at least every three years.
- Monitor known plants at least every year.
- Develop conservation agreements with owners of the Warwick Hammock stations. Provide technical assistance to help manage these populations.
- Consider augmenting population at Warwick Hammock.
- Consider reintroducing Biscayne spleenwort to other sites within its historical range, including the Deering Estate at Cutler (through the reintroduction of *A. verecundum*), and Castellow Hammock Park (through the reintroduction of *A. dentatum*).
- Promote a higher regional water table on the Miami Rock Ridge.

Carya glabra (Mill.) Sweet
Pignut Hickory

South Florida Status: Critically imperiled. One occurrence along Alligator Creek in Charlotte County.
Taxonomy: Dicotyledon; Juglandaceae.
Habit: Tree.

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: Charlotte County.
South Florida Habitats: Mesic hammocks.
Protection Status: Not listed by any agency.
Identification: Nelson (1994) has a color photo.
References: Chapman, 1883; Small, 1933a; Godfrey & Wooten, 1981; Nelson, 1994; Flora of North America Editorial Committee, 1997; Wunderlin, 1998.
Synonyms: *C. ovalis* (Wagenh.) Sarg.; *Hicoria austrina* Small; *Hicoria glabra* (Mill.) Britton.

Historical Context in South Florida: Gann and Bradley discovered pignut hickory in 1996, south of a rest area at the intersection of I-75 and Charlotte County Road 768, on the banks of Alligator Creek. This station is owned by the Florida Department of Transportation. Bradley vouchered pignut hickory there in 1998 (1288, FTG, USF). Fewer than 100 plants were observed at this station, although more plants may be present along other parts of Alligator Creek.

Major Threats: Habitat destruction; exotic pest plant invasions.

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

Preliminary recommendations:
- Survey along Alligator Creek.
- Map plants at Alligator Creek at least every three years.
- Monitor plants at Alligator Creek at least every year.
- Designate Alligator Creek Pignut Hickory Site as a conservation area.

Cucurbita okeechobeensis (Small) L.H. Bailey
Okeechobee Gourd

South Florida Status: Critically imperiled. One occurrence on islands in Lake Okeechobee.

Taxonomy: Dicotyledon; Cucurbitaceae.
Habit: Annual vine.
Distribution: Endemic to peninsular Florida.
South Florida Distribution: Glades and Palm Beach counties.
South Florida Habitats: Hardwood swamp forests and wet disturbed sites.
Protection Status: Listed as endangered by the USFWS, as endangered by FDACS, and as critically imperiled by FNAI.
Identification: Chafin (2000) has illustrations and a color photo.
References: Small, 1922; Bailey, 1930; Small, 1933a; Bailey, 1943; Long & Lakela, 1976; Ward, 1978; Avery & Loope, 1980a; Walters et al., 1992; Wunderlin, 1998; Chafin, 2000; Coile, 2000; USFWS, 2000.
Synonyms: *Pepo okeechobeensis* Small.

Historical Context in South Florida: Okeechobee gourd was collected first by John Kunkel Small and George K. Small in 1913 on Torrey Island in Lake Okeechobee in Palm Beach County (4155, NY). It was this specimen that Small (1930b) designated as the type specimen of *Pepo okeechobeensis*. Small also collected it in 1917 at the southwestern shore of Lake Okeechobee (8243, FLAS), and observed it in "hammocks of the four islands of Lake Okeechobee and in the hammocks of the southern and eastern shores" (Small, 1922). Small is referring to Torrey, Kreamer, and Ritta islands, and probably Observation Island. The entire range of the plant lies within the levee that now surrounds Lake Okeechobee.

Okeechobee gourd has been collected at Lake Okeechobee numerous times since 1917: in 1930 by Walter M. Buswell (s.n., FTG), in 1941 by John H. Davis, Jr. (s.n., FLAS), in 1965 by John Beckner (705, NY), in 1978 and 1982 by John Popenoe (1852, FTG; 2366, FTG), in 1981 by Donovan S. Correll and others (51517, FTG), and in 1990 by Terrence Walters and others (614, FTG; 615, FTG). It also was collected several times in 1997 by Bradley and Woodmansee (e.g., 939, FTG), who were shown several colonies of plants by South Florida Water Management biologist Mike Bodle. Plants were observed on Ritta Island, Torrey Island, and in the South Bay area. Bodle has observed these populations annually since 1997. Fewer than 1,000 plants are thought to be extant within any one year.

Okeechobee gourd has recently been reported in disturbed areas in Broward and Miami-Dade counties (USFWS, 2000), but it does not appear that these populations are native. As a federally listed plant, much research has been conducted on Okeechobee gourd. This research is reviewed in U.S. Fish and Wildlife Service (2000). An *ex situ* collection of germplasm is maintained at Bok Tower Gardens (USFWS, 2000).

Major Threats: Hydrological modifications in Lake Okeechobee; exotic pest plant invasions, especially melaleuca (*Melaleuca quinquenervia*).

Comments: Okeechobee gourd *was discovered in 1774 by William Bartram (1791) along the St. Johns River in northern Florida. It has been rediscovered in that area and has been collected in Lake, Seminole, and Volusia counties (USFWS, 2000; Wunderlin & Hansen, 2001).*

Preliminary recommendations:

- Map and monitor known stations annually
- Control exotic pest plants, especially melaleuca.
- Ensure that water management practices in Lake Okeechobee do not threaten Okeechobee gourd.
- Continue conservation biology and conservation horticulture studies.
- Continue maintenance of *ex situ* collection of germplasm at Bok Tower Gardens.
- Consider augmenting population in Lake Okeechobee.

Cuscuta americana L.
American Dodder

South Florida Status: Critically imperiled. One occurrence on disturbed private property in Miami-Dade County.
Taxonomy: Dicotyledon; Convolvulaceae.
Habit: Annual parasitic vine.
Distribution: Native to peninsular Florida, the West Indies, Mexico, and South America. Wunderlin (1998) reports it as rare in Florida. It has been collected in South Florida, and in Lake and Polk counties (Wunderlin & Hansen, 2001).

South Florida Distribution: Miami-Dade County and the Monroe County Keys.
South Florida Habitats: Rockland hammocks, pinelands, and disturbed sites.
Protection Status: Not listed by any agency.
Identification: Austin (1980) has an illustration; Correll & Correll (1982) has an illustration.
References: Yuncker, 1932; Small, 1933a; Long & Lakela, 1976; Austin, 1980; Correll & Correll, 1982; Wunderlin, 1998; Liogier & Martorell, 2000.
Synonyms: None.

Historical Context in South Florida: John Kunkel Small and others first collected American dodder in 1925 in a rockland hammock on Lower Matecumbe Key (s.n., FLAS, NY). This is the only known collection from the Florida Keys. That same year, Ethel Z. Bailey made a collection in Coconut Grove in Miami-Dade County (6457, NY). It was collected in a pineland at Buena Vista in 1929 by Charles A. Mosier (s.n., NY), and again in 1930 by Mosier (s.n., NY) and Harold N. Moldenke (372a, NY). Buena Vista was located just north of present-day downtown Miami. Walter M. Buswell made several collections in Coral Gables beginning in 1940 (s.n., FTG), and ending in 1943 (s.n., FTG; s.n., NY). Robert T. Clausen and Buswell also made a collection in Coral Gables in 1943 (6231, NY). American dodder was not recorded again until 1999, when Bradley found it growing in a disturbed thicket across the street from Old Dixie Pineland in Naranja. Bradley vouchered this station in 2000 (2086, FTG).

Major Threats: Habitat destruction.

Comments: *American dodder flowers in the summer through fall, when surveys should be conducted.*

Preliminary recommendations:
- Map and monitor known stations annually.
- Acquire Old Dixie Pineland site.
- Consider establishing an *ex situ* collection of germplasm.

- Assess appropriateness and study feasibility of introducing American dodder to other sites within its historical range, including the Old Dixie Pineland site and Klopp Tract, Lignumvitae Key Botanical State Park on Lower Matecumbe Key.
- Assess appropriateness and study feasibility of restoring sandy pine rocklands near the Miami River and reintroducing American dodder.
- Review for listing by FDACS and FNAI.

Desmodium strictum (Pursh) DC.
Pinebarren Ticktrefoil

South Florida Status: Critically imperiled. One occurrence at the Ludlam Florida Power and Light Easement in southern Miami-Dade County.
Taxonomy: Dicotyledon; Fabaceae.
Habit: Perennial terrestrial herb.
Distribution: Native to eastern North America. Wunderlin (1998) reports it as occasional nearly throughout Florida.
South Florida Distribution: Miami-Dade County, where it is disjunct from Polk County.
South Florida Habitats: Sandy pockets in pine rocklands.
Protection Status: Not listed by any agency.
Identification: There are 26 species of *Desmodium* in Florida. Wunderlin (1998) has a key.
References: Chapman, 1883; Small, 1933a; Isely, 1990; Wunderlin, 1998.
Synonyms: *Meibomia stricta* (Pursh) Kuntze.

Historical Context in South Florida: George N. Avery first collected pinebarren ticktrefoil in 1978 at the Ludlam Pineland (1975, FTG, FLAS; 1983, FTG, FLAS), just north of what is now Deering Estate at Cutler. Part of Ludlam Pineland is now the Ludlam Pineland Tract, a Miami-Dade County conservation area, and part is a power line easement owned by Florida Power and Light. Although it is not certain, it appears that Avery found plants on property now owned by the county, just across the property line from the Florida Power and Light easement. In the mid-1990s Bradley found plants about 25 meters away in the Florida Power

and Light easement. Bradley and Woodmansee observed this station again in 2000.

Major Threats: Habitat destruction at the Ludlam Florida Power and Light Easement; fire suppression; exotic pest plant invasions, especially by Burmareed (*Neyraudia reynaudiana*).

Preliminary recommendations:

- Survey Ludlam Pineland Tract.
- Map plants at Ludlam Pineland at least every three years.
- Monitor plants at Ludlam Pineland at least every year.
- Develop conservation agreement with Florida Power and Light to restore and manage a viable population of pinebarren ticktrefoil at the Ludlam Florida Power and Light Easement. Provide technical assistance to help restore and manage this population.
- Control exotic pest plants, especially Burmareed.

Dicranopteris flexuosa (Schrad.) Underw.
Drooping Forked Fern

South Florida Status: Critically imperiled. One occurrence on the bank of a canal in northwestern Palm Beach County.
Taxonomy: Pteridophyte; Gleicheniaceae.
Habit: Perennial terrestrial herb.
Distribution: Native to Florida, Alabama, the West Indies, Mexico, Central America, and South America.
South Florida Distribution: Palm Beach County.
South Florida Habitats: Known only from a disturbed canal bank.
Protection Status: Not listed by any agency.
Identification: Nelson (2000) has two color photos; Wunderlin & Hansen (2000) has two illustrations; the IRC Website has a color photo.
References: Small, 1938; Lakela & Long, 1976; Moyroud & Nauman, 1989; Flora of North America Editorial Committee, 1993; Wunderlin, 1998; Liogier & Martorell, 2000; Nelson, 2000; Wunderlin & Hansen, 2000.
Synonyms: None.

Historical Context in South Florida: Drooping forked fern was discovered first in northeastern Palm Beach County by Steve Farnsworth in 1988 (Moyroud and Nauman, 1989), and vouchered by Richard Moyroud that same year (s.n.; NY, USF), and again in 1989 (s.n.; USF). The colony is growing on the bank of a canal adjacent to a school. The North County Water Control District manages this site. Richard Moyroud observed this colony in 2000, and fewer than 1,000 plants were thought to be present (R. Moyroud, personal communication, 19 January 2001).

Major Threats: Habitat destruction; exotic pest plant invasions, including Old World climbing fern (*Lygodium microphyllum*); hydrological modifications; poaching.

Comments: *Drooping forked fern prefers soil with a high clay content (Wunderlin & Hansen, 2000), and probably became established in South Florida after a canal was constructed, exposing a clay-like hardpan (Moyroud and Nauman, 1989). Based upon canal construction data obtained by Moyroud and Nauman, the Palm Beach County colony was less than 13 years old at the time of its discovery. Moyroud (personal communication, 19 January 2001) feels that unique conditions, including an even moisture flow across the hardpan from the adjacent uplands, low soil fertility, and highly acid soils provide the appropriate habitat for this species. It is uncertain that these conditions would be found in South Florida except in unusual, and temporary, circumstances. It seems possible that, without human disturbance, drooping forked fern would not have become well established in South Florida.*

Preliminary recommendations:

- Map and monitor plants annually.
- Develop a conservation agreement with the North County Water Control District to protect and manage Drooping Forked Fern Site. Provide technical assistance to help manage this population.
- Control exotic pest plants, especially Old World climbing fern.
- Consider introducing drooping forked fern to other sites within Palm Beach County, where it can be managed and studied.

Gymnopogon chapmanianus Hitchc.
Chapman's Skeleton Grass

South Florida Status: Critically imperiled. One occurrence in scrub along State Road 764 in Charlotte County.
Taxonomy: Monocotyledon; Poaceae.
Habit: Perennial terrestrial herb.
Distribution: Endemic to Florida. Wunderlin (1998) reports it as occasional in the peninsula west to Wakulla County.
South Florida Distribution: Broward, Charlotte, Collier, and Lee counties.
South Florida Habitats: Flatwoods and scrub.
Protection Status: Listed as rare by FNAI.
Identification: Hitchcock & Chase (1950) has an illustration.
References: Small, 1933a; Hitchcock & Chase, 1950; Smith, 1971; Long & Lakela, 1976; Hall, 1978; Wunderlin, 1998.
Synonyms: *G*. *floridanus* Swallen.

Historical Context in South Florida: John Kunkel Small and Joel J. Carter first collected Chapman's skeleton grass in 1903 in pinelands in Fort Lauderdale (1030, NY). It was collected twice in Charlotte County, the first time in 1946 in flatwoods without precise locality data by O.E. Frye (s.n., FLAS), and the second time in 1999 by Richard P. Wunderlin along State Road 764 (10714, USF). The latter station is the only extant station known.

Olga Lakela collected Chapman's skeleton grass several times in Collier County beginning in 1964. She collected it first west of Immokalee (27419, USF), and again in 1964 in scrub northwest of Naples at County Road 846 (27703, USF). She collected it again in 1965 in scrub in the vicinity of Little Hickory Pass (29251, USF), and collected it twice in 1967 on Marco Island, the first time in scrub (27527, FLAS, USF), and the second in partly cleared scrub on the grounds of the schoolhouse (31185, FLAS, USF).

Olga Lakela collected Chapman's skeleton grass once in Lee County in 1967 on Pine Island in a recently cleared area, on the east side of State Road 767 north of the junction with State Road 78 (30566, USF). Gann attempted to locate the this station in 2001, but it appeared to have been destroyed. However, there are

pinelands in the vicinity that could contain populations of Chapman's skeleton grass, and these sites should be surveyed.

Major Threats: Habitat destruction of only known population; fire suppression; exotic pest plant invasions.

Preliminary recommendations:

- Survey Pine Island in Lee County.
- Map and monitor known stations annually.
- Acquire State Road 764 Chapman's Skeleton Grass Site.
- Consider introducing Chapman's skeleton grass to other sites within its historical range, including the Fort Lauderdale Executive Airport Gopher Tortoise Preserve in Broward County.
- Consider restoring scrub and scrubby flatwoods on Marco Island and reintroducing Chapman's skeleton grass.

Lactuca floridana (L.) Gaertn.
Woodland Lettuce

South Florida Status: Critically imperiled. One occurrence on Observation Island in Lake Okeechobee.
Taxonomy: Dicotyledon; Asteraceae.
Habit: Annual or biennial herb.
Distribution: Native to the eastern United States. Wunderlin (1998) reports this as occasional nearly throughout Florida.
South Florida Distribution: Glades County.
South Florida Habitats: Mesic hammocks.
Protection Status: Not listed by any agency.
Identification: It can be distinguished from other *Lactuca* species in Florida by having achenes with a short stout beak to 1/3 as long as the body, or no beak, rather than having a filiform beak more than 1/2 as long as the body (Wunderlin, 1998).
References: Chapman, 1883; Small, 1933a; Long & Lakela, 1976; Cronquist, 1980; Wunderlin, 1998; Liogier & Martorell, 2000.
Synonyms: *Mulgedium floridanum* (L.) DC.; *Mulgedium villosum* (Jacq.) Small.

Historical Context in South Florida: Gann and Bradley first collected woodland lettuce in Glades County in 1997 on

Observation Island in Lake Okeechobee (1000, FTG). Fewer than 10 plants were found on disturbed ground in a mesic hammock.

Major Threats: Manipulation of water levels in Lake Okeechobee; 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 or ephemeral in South Florida. In 1980, George N. Avery collected this species in Miami-Dade County at the edge of a guava thicket (2210, FTG). This was probably an introduced, short-lived occurrence.*

Preliminary recommendations:
- Map and monitor plants on Observation Island annually.
- Control wild hogs.

Nelumbo lutea Willd.
American Lotus

South Florida Status: Critically imperiled. Three occurrences in Lake Okeechobee, Lake Hicpochee, and Lake Trafford.
Taxonomy: Dicotyledon; Nymphaeaceae.
Habit: Perennial aquatic herb.
Distribution: Native to eastern and central North America. Wunderlin (1998) reports it as occasional in Florida from the central peninsula to the central panhandle.
South Florida Distribution: Collier, Glades, and Palm Beach counties. It needs to be vouchered in Collier County.
South Florida Habitats: Lakes.
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 a color photo.
References: Chapman, 1883; Small, 1933a; Wood, 1959; Long & Lakela, 1976; Godfrey & Wooten, 1981; Bell & Taylor, 1982; Taylor, 1992; Flora of North America Editorial Committee, 1997; Tobe et al., 1998; Wunderlin, 1998.
Synonyms: *N. pentapetala* (Walter) Willd.; *Nelumbium luteum* Willd.

Historical Context in South Florida: William G. Atwater first collected American lotus in 1960 along the western shore of Lake

Okeechobee in Glades County (M-234, FLAS). The Glades County occurrence was re-vouchered in 1997 by Bradley and Woodmansee, who observed large stands of American lotus in Fisheating Bay (406, FTG). Bradley and Woodmansee also collected it that same year in Palm Beach County along the eastern edge of Torrey Island in Lake Okeechobee (384, FTG).

Florida Department of Environmental Protection biologist Jackie Smith observed plants in Lake Hicpochee in Glades County in 2000 and in Lake Trafford in Collier County in 2001 (personal communication, 26 February 2001). Black & Black (1980) reported American lotus for Big Cypress National Preserve, but this probably represented a cultivated population. American lotus has been cultivated elsewhere in South Florida outside of its historical range (e.g., Treetops Park in Broward County), but it is not known to escape from cultivation.

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

Comments: *This is a temperate species at the southern end of its range, and it always may have been uncommon in South Florida. The dried infructescences of this species have been collected in Lake Okeechobee and used in floral arrangements. It is unknown what impact this collecting has had on the population.*

Preliminary recommendations:

- Voucher plants in Lake Hicpochee and Lake Trafford.
- Survey Big Cypress National Preserve.
- Map known stations at least every three years.
- Monitor known stations annually.
- Determine impacts of the collecting of infructescences on American lotus.

Nolina atopocarpa Bartlett
Florida Beargrass

South Florida Status: Critically imperiled. One occurrence in northwestern Lee County and southwestern Charlotte County on non-conservation lands along Burnt Store Road.
Taxonomy: Monocotyledon; Agavaceae.

Habit: Perennial terrestrial herb.
Distribution: Endemic to Florida. Wunderlin (1998) reports it as occasional from the central panhandle to the central peninsula.
South Florida Distribution: Charlotte and Lee counties.
South Florida Habitats: Mesic flatwoods.
Protection Status: Listed as threatened by FDACS and as rare by FNAI.
Identification: It can be distinguished from *N. brittoniana* of central Florida by having leaves 2-4 mm wide, rather than 6-15 mm wide (Wunderlin, 1998).
References: Small, 1933a; Ward, 1978; Wunderlin, 1998; Coile, 2000.
Synonyms: *N. georgiana* Michx., misapplied.

Historical Context in South Florida: Florida beargrass has been collected three times in South Florida. All three collections were made near the Charlotte County-Lee County line off State Road 765 (Burnt Store Road). Robert B. McCartney and Nancy Bissett made the first collection in 1989 in Charlotte County (s.n., USF), followed in 1991 by Steven L. Orzell and Edwin L. Bridges in Lee County (16497, USF) and Dorothy P. Zysko in Charlotte County (s.n., USF). Gann briefly surveyed the Charlotte County stations in 2000. The McCartney and Bissett station had been destroyed, but habitat was still present in the vicinity of the Zysko station, both on private property and in the Yucca Pen Unit of the Fred C. Babcock-Cecil M. Webb Wildlife Management Area. In 2001, Gann also attempted to locate the Orzell and Bridges station. Habitat still exists at the station, but it is in private ownership and is posted. Florida beargrass is assumed to be extant at one or both of the latter two stations.

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

Comments: *Florida beargrass flowers in the spring, when surveys should be conducted*.

Preliminary recommendations:

- Survey appropriate habitats along Burnt Store Road in Charlotte and Lee counties, including the Yucca Pen Unit of Fred C. Babcock-Cecil M. Webb Wildlife Management Area.

- Map known stations at least every three years.
- Monitor known stations at least every year.
- Continue acquisition projects to expand Fred C. Babcock-Cecil M. Webb Wildlife Management Area and Charlotte Harbor State Buffer Preserve along Burnt Store Road.

Orontium aquaticum L.
Goldenclub

South Florida Status: Critically imperiled. One occurrence on private property in Glades County.
Taxonomy: Monocotyledon; Araceae.
Habit: Perennial terrestrial herb.
Distribution: Native primarily to the southeastern coastal plain. Wunderlin (1998) reports it as frequent in Florida from the northern counties south to the central peninsula.
South Florida Distribution: Martin, Glades, and Lee counties, and either Collier or Hendry County.
South Florida Habitats: Cypress swamps.
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 color photos.
References: Chapman, 1883; Small, 1933a; Godfrey & Wooten, 1979; Bell & Taylor, 1982; Taylor, 1992; Tobe et al., 1998; Wunderlin, 1998; Flora of North America Editorial Committee, 2000.
Synonyms: None.

Historical Context in South Florida: John Kunkel Small first collected goldenclub in 1917 in the Okaloacoochee Slough (s.n., US), which runs through both Hendry and Collier counties, and is now partially protected in Big Cypress National Preserve, Florida Panther National Wildlife Reserve, Okaloacoochee Slough State Forest, and Okaloacoochee Slough Wildlife Management Area. Paul C. Standley collected the next specimen in 1927 in a cypress swamp in the vicinity of Fort Myers (52568, US). In 1978, Bruce E. Tatje made a single collection in Martin County on the headwaters of the south fork of the St. Lucie River (61, FAU). This collection may have been made within what is now the South Fork

St. Lucie River site, which is being managed as part of Jonathan Dickinson State Park.

In 2000, Bradley discovered goldenclub in Glades County (2095, FTG). A small colony of plants was found under a bridge along John Hendry Slough just south of the Highlands County line. The species is probably present along the creek on private property to the east and west of this bridge. It seems likely that goldenclub is present in the newly protected Fisheating Creek Wildlife Management Area.

Major Threats: Habitat destruction; hydrological modifications; 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 Fisheating Creek Wildlife Management Area, South Fork St. Lucie River in Jonathan Dickinson State Park, and the Okaloacoochee Slough in Big Cypress National Preserve, Florida Panther National Wildlife Reserve, Okaloacoochee Slough State Forest, and Okaloacoochee Slough Wildlife Management Area.
- Map known stations at least every three years.
- Monitor known stations annually.

Potamogeton pusillus L.
Small Pondweed

South Florida Status: Critically imperiled. One occurrence in Lake Okeechobee.
Taxonomy: Monocotyledon; Potamogetonaceae.
Habit: Perennial terrestrial herb.
Distribution: Native to North America, Mexico, and the Old World. Wunderlin (1998) reports it as occasional in Florida in the panhandle and the central peninsula.
South Florida Distribution: Charlotte, Martin, and Palm Beach counties.
South Florida Habitats: Lakes and creeks.
Protection Status: Not listed by any agency.
Identification: Godfrey & Wooten (1979) has an illustration.

References: Small, 1933a; Godfrey & Wooten, 1979; Wunderlin, 1998.
Synonyms: *P. pusillus* subsp. *tenuissimus* (Mert. & W.D.J. Koch) R.R. Haynes & Hellq.

Historical Context in South Florida: T.S. Denike first collected small pondweed in 1973 in a pond inside the IBM Corporation complex in Boca Raton in Palm Beach County (s.n., FAU). It is not certain whether or not this population was native. In 1980, Ruben P. Sauleda made a collection in Charlotte County in the vicinity of Murdock (3385, USF). The specimen was reported to have been collected in a creek running through a pineland. Gann surveyed this area in 2000, but did not locate any plants. The Murdock area has been heavily developed and all natural waterways have been canalized. In 1983, Ken Langeland collected small pondweed in Martin County in a lake at a Florida Power and Light property in Indiantown (s.n., FLAS). The plants were stated to be frequent there. In 1997, South Florida Water Management District biologist Mike Bodle showed plants of this species to Bradley and Woodmansee at Halifax Bank in Lake Okeechobee in Palm Beach County. Bradley and Woodmansee vouchered this population (390, FTG). A few plants were seen floating in deep water.

Major Threats: Hydrological modifications; exotic pest plant invasions.

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

Preliminary recommendations:
- Survey Indiantown area.
- Map known stations at least every three years.
- Monitor known stations annually.

Rhynchospora pusilla Chapm. ex M.A. Curtis
Fairy Beaksedge

South Florida Status: Critically imperiled. One occurrence at Lake Trafford Flatwoods Site.
Taxonomy: Monocotyledon; Cyperaceae.

Habit: Perennial terrestrial herb.
Distribution: Native to the southeastern coastal plain and the West Indies. Wunderlin (1998) reports it as occasional in Florida from the western panhandle to the peninsula.
South Florida Distribution: Collier, Lee, Glades, and possibly Miami-Dade counties.
South Florida Habitats: Flatwoods.
Protection Status: Not listed by any agency.
Identification: Tobe et al. (1998) has an illustration.
References: Chapman, 1883; Small, 1933a; Long & Lakela, 1976; Godfrey & Wooten, 1979; Tobe et al., 1998; Wunderlin, 1998; Liogier & Martorell, 2000.
Synonyms: *R. intermixta* C. Wright.

Historical Context in South Florida: Abram P. Garber first collected fairy beaksedge in 1877, with the location given as "Everglades. Florida" (s.n., US). This station may have been in Miami-Dade County, where Garber collected extensively in 1877. In 1919, Paul C. Standley made a collection in the vicinity of Fort Myers (18905, US). In 1964, Olga Lakela made a collection in Collier County near Corkscrew Swamp Sanctuary (27057, USF). In 1998, Bradley collected fairy beaksedge at the Lake Trafford Flatwoods Site in Immokalee (1870, FTG). This is the only known extant location. Daniel B. Ward and others also collected fairy beaksedge in Glades County in 1965, southwest of Palmdale (5196, FLAS), in the vicinity of what is now the Fisheating Creek Wildlife Management Area.

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

Preliminary recommendations:

- Survey Corkscrew Swamp Sanctuary, Corkscrew Regional Ecosystem Watershed, and Fisheating Creek Wildlife Management Area.
- Map known stations at least every three years.
- Monitor known stations at least annually.
- Acquire Lake Trafford Flatwoods Site.

Schizachyrium sericatum (Swallen) Gould
Silky Bluestem

South Florida Status: Critically imperiled. One occurrence on a roadside on Ramrod Key.
Taxonomy: Monocotyledon; Poaceae.
Habit: Perennial terrestrial herb.
Distribution: Endemic to South Florida.
South Florida Distribution: Monroe County Keys.
South Florida Habitats: Original habitat unknown, but possibly in pinelands, openings in hammocks, or on coastal berms. Now confined to a single roadside.
Protection Status: Listed as endangered by FDACS and as critically imperiled by FNAI.
Identification: Hitchcock & Chase (1950) has an illustration.
References: Swallen, 1941; Hitchcock & Chase, 1950; Hall, 1978; Avery & Loope, 1980a; Wunderlin, 1998; Coile, 2000.
Synonyms: *Andropogon sericatus* Swallen.

Historical Context in South Florida: W.A. Silveus first collected silky bluestem in 1940 on Ramrod Key (6633, US). This collection was designated as the type specimen when Jason R. Swallen described it as a new species in 1941. No habitat data was specified. It was not seen again until 1995, when Bradley made two collections on roadsides on Ramrod Key (269, FTG; 278, FTG). Fewer than 50 plants were seen. This species was erroneously reported for Key Largo (Hall, 1978).

Major Threats: Mowing; herbicide applications; dumping.

Comments: *This is one of the state's most imperiled plant species. It will be under constant threat of extinction until a population is established within an appropriate habitat in at least one conservation area.*

Preliminary recommendations:
- Survey additional areas on Ramrod Key, including the Ramrod Key Coastal Berm Site.
- Map and monitor plants at least annually.

- Develop conservation agreement with Monroe County to insure that maintenance personnel do not accidentally kill the Ramrod Key population.
- Conduct conservation biology and conservation horticulture studies.
- Consider establishing an *ex situ* collection of germplasm.
- Assess appropriateness and study feasibility of introducing silky bluestem to other sites within its historical range, including Ramrod Hammocks, Florida Keys Wildlife and Environmental Area.
- Review for listing by USFWS.

Tephrosia angustissima Shuttlew. ex Chapm. *var.* ***corallicola*** (Small) Isely **Coral Hoarypea**

South Florida Status: Critically imperiled. One occurrence at USDA Subtropical Horticulture Research Station.
Taxonomy: Dicotyledon; Fabaceae.
Habit: Perennial terrestrial herb.
Distribution: Native to South Florida and Cuba.
South Florida Distribution: Miami-Dade County.
South Florida Habitats: Pine rocklands.
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 *corallicola* is distinguished from other varieties of *T. angustissima* by being finely villous or canescent (Wunderlin, 1998). Chafin (2000) has illustrations and a color photo (by Hammer).
References: Small, 1909; Small, 1933a; León & Alain, 1951; Shinners, 1962b; Long & Lakela, 1976; Austin et al., 1980b; Isely, 1982; Isely, 1990; Wunderlin, 1998; Chafin, 2000; Coile, 2000.
Synonyms: *T. corallicola* (Small) Léon; *Cracca corallicola* Small.

Historical Context in South Florida: John Kunkel Small first collected coral hoarypea in 1904 in pinelands between Coconut Grove and Cutler (2112, NY). Small (1909) later described it as a new species, *Cracca corallicola*. The next collection was not made until 1935, when Walter M. Buswell vouchered it south of

Coral Gables (s.n., FTG, NY) and photographed it in that location in 1937 (s.n., USF). In 1948, Roy O. Woodbury collected it at Cutler (s.n., FTG). It was not seen again until 1968, when George N. Avery collected it in pinelands across from Fairchild Tropical Garden (463, FLAS, FTG, USF), a station that has been destroyed. Avery made another collection at the USDA Subtropical Horticulture Research Station in 1978 (1807, FLAS; Avery's Notes, 4 January 1978). Around 1995, Bradley, Woodmansee, and Dena Garvue observed this station. Plants were found growing in an open mowed field near a small pine rockland fragment. This remains the only known station in South Florida. Fairchild Tropical Garden maintains an *ex situ* collection of coral hoarypea.

Major Threats: Destruction of plants at the USDA Subtropical Horticulture Research Station.

Comments: *The status of this species in Cuba is unknown.*

Preliminary recommendations:

- Map and monitor plants annually.
- Develop conservation agreement with USDA to protect and restore a viable population of coral hoarypea at the USDA Subtropical Horticulture Research Station.
- Consider establishing an *ex situ* collection of germplasm.
- Conduct conservation biology and conservation horticulture studies.
- Consider introducing coral hoarypea to other stations within its historical range, including Ludlam Pineland Tract.
- Determine status in Cuba.