

Rare Plants of South Florida:

Their History, Conservation, and Restoration



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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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Chapter 1

The Floristic Inventory of South Florida

The Floristic Inventory of South Florida (FISF) was initiated in 1994 to provide baseline data on the flora of South Florida that can be used to improve plant conservation efforts and ecological restoration programs in the region.

FISF Goals

The goals of the inventory are:

- To determine the status of the South Florida flora.
- To determine how effectively the conservation area system protects rare plants.
- To determine the importance of small conservation areas in the protection of rare plants.
- To improve the conservation of rare plants.
- To identify opportunities to restore rare plant populations and their habitats.

Study Area

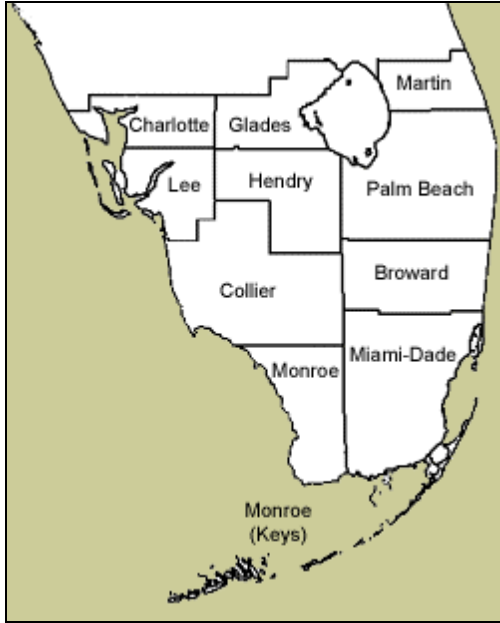
In this study, South Florida is defined as the ten southernmost counties of Florida: Broward, Charlotte, Collier, Glades, Hendry, Lee, Martin, Miami-Dade, Monroe, and Palm Beach (Figure 1.1). This encompasses the southern tip of peninsular Florida, from the northern rim of Lake Okeechobee, south through the Florida Keys, an area of 13,950 square miles, or almost nine million acres. South Florida, as defined here, comprises 24% of Florida and contains about half of the native plants species in the state.

Preliminary Plant List

The FISF began with the development of a preliminary species list for the region. This list was based upon a draft of what was published as the *Atlas of Florida Vascular Plants* (Wunderlin et al., 1996; Wunderlin & Hansen, 2001). Data derived from the atlas were amended using observations of the authors and other sources. This list of species has changed, over time, with the

addition of species not included in the atlas, and the deletion of species erroneously reported for South Florida.

Figure 1.1. South Florida as defined by the FISF.



Data Sources for Conservation Areas

Published and unpublished plant lists were obtained when they existed for conservation lands in South Florida. Some sites, such as Everglades National Park, had fairly complete plant lists, while others either had none available, or very preliminary ones.

When no plant list was available or when it was incomplete, IRC staff has attempted to conduct a floristic inventory. Inventories were initiated in 1996, and continue at sites ranging from Big Cypress National Preserve, where new acquisitions necessitate additional inventory work, to small county and city parks. In each case, we have attempted to visit all of the major plant communities occurring within each site before considering a preliminary inventory complete. In some cases, IRC staff worked alone. In others, agency staff collaborated on the inventories. While preliminary inventories have been completed for most large

conservation areas, many small sites still need to be inventoried. This is especially true for county- and city-owned conservation areas. In general, inventory methods used by IRC follow the recommended methods described in the Floristic Inventories section of Chapter 3.

Wherever possible, IRC staff vouchered plant specimens from conservation areas. In particular, we attempted to voucher new county records, unusual occurrences, and rare species if they had not been vouchered already for a specific station. Permits were secured from conservation managers prior to collecting and, in the case of state-listed species, a permit was obtained from the Florida Department of Agriculture and Consumer Services, Division of Plant Industry. Vouchers were deposited at the Fairchild Tropical Garden Herbarium (FTG), while some duplicates were sent to the University of South Florida Herbarium (USF) and other herbaria.

Development of the FISF Database

The Floristic Inventory of South Florida Database was developed to manage the data compiled as part of the FISF. The initial database was designed in Paradox in 1995, and was moved into Microsoft Access in 1999.

This relational database is based upon an Accepted Names Table, used to normalize all taxonomic names. All plant records in the database must correspond to an accepted name, or the information is not used. In general, accepted names follow Wunderlin (1998), or Wunderlin & Hansen (2000), although there are some exceptions. The Accepted Names Table also contains supplemental information on each taxon, including origin, habit (plant form), and substrate (e.g. terrestrial, epiphytic). Small (1933), Long & Lakela (1976), Wunderlin (1998), Wunderlin & Hansen (2000), and other resources have been used to determine native status.

A Site Table was developed for conservation areas and other sites in South Florida. Blanchard and Jue (1997), Blanchard et al. (1998), and Jue et al. (2001) were used as resources for conservation areas in South Florida, although additional data were collected directly from conservation agencies. The Site Table

includes information on whether or not the site is a conservation area, the county or counties where the site is located, and its size.

All plant data collected or compiled were entered into an Occurrences Table using the plant name as described in the reference material. Where possible, these occurrence data were linked to a site by using an accepted name. In some cases, no link was possible because of incomplete data (such as *Rynchospora* spp.), or the name could not be linked through synonymy to an accepted name (in the case of some rejected names).

The Accepted Occurrences Table merges data from the Occurrences Table and Site Table, so that there is a single occurrence record for each taxon at each site. An accepted occurrence record may have multiple references in the Locations Table, for instance, if a plant is recorded for a site on a list and also as a herbarium specimen. The Accepted Occurrences Table also contains other information about each site record. In general, the fields in the table conform to the Plant Occurrence and Status Scheme developed by the International Working Group on Taxonomic Databases (www.tdwg.org), and compiled by the World Conservation Monitoring Center (www.unep-wcmc.org).

Preliminary Analysis of the Flora

Once the preliminary data were entered into the database table, all native species were ranked. This manual uses an IRC ranking system. IRC ranking definitions follow the Florida Natural Areas Inventory (FNAI) system (www.fnai.org), with some modifications as described in Table 1.1. The FNAI system was developed by The Nature Conservancy for the Natural Heritage Program. In the FNAI system global ranks are preceded by G and state ranks by S. These prefixes have been replaced in the IRC ranking by SF, denoting South Florida.

Additional Data Collection

For all taxa ranked as extirpated, historical, or critically imperiled, additional data were collected from the literature and herbaria, and by personal communications with monographers, herbarium managers, and field botanists. Herbaria visited included Fairchild

Table 1.1. The IRC ranking system.

SFX	Extirpated or Extinct. Believed to be extirpated or extinct in South Florida. The IRC rank requires that botanists have searched for the taxon without success within appropriate habitats in its historical range, or that there is some documented reason that the species is thought to be extirpated or extinct. In most cases, a plant is not considered to be extirpated or extinct unless at least 20 years has passed since it was last observed in South Florida.
SFH	Historical. Occurred historically in South Florida, but has not been observed for many years. The IRC rank is used when the species has not been observed for ten or more years, and there is a basis for believing that the species may not be present, although there is a reasonable possibility that additional searches could locate plants.
SF1	Critically imperiled. Critically imperiled in South Florida because of extreme rarity (five or fewer occurrences, or fewer than 1,000 individuals), or because of extreme vulnerability to extinction due to some natural or human factor. For taxa with two to five occurrences, IRC ranks as critically imperiled those taxa with 3,000 or fewer individuals. For taxa with a single occurrence, IRC ranks as critically imperiled those taxa with 10,000 or fewer individuals.
SF2	Imperiled. Imperiled in South Florida because of rarity (6-20 occurrences, or less than 3,000 individuals) or because of vulnerability to extinction due to some natural or human factor. IRC only ranks as imperiled those taxa with fewer than 10,000 individuals.
SF3	Rare. Either very rare and local throughout its range in South Florida (21-100 occurrences, or less than 10,000 individuals), or found locally in a restricted range. IRC only ranks as rare those taxa with fewer than 100,000 individuals.

Table 1.1. The IRC ranking system (cont.):

- | | |
|------------|---|
| SF4 | Apparently secure. Apparently secure in South Florida (may be rare in parts of range). IRC ranks all taxa with more than 100,000 individuals as apparently secure. |
| SF5 | Demonstrably secure. Demonstrably secure in South Florida. IRC ranks all taxa with more than 1,000,000 individuals as demonstrably secure. |

Tropical Garden, University of South Florida, University of Florida, Florida State University, New York Botanical Garden, and the Smithsonian Institution. Where possible, field surveys were conducted to verify historical collections and observations. A significant amount of data were also obtained from the unpublished botanical notes of George N. Avery and, to a lesser extent, from the unpublished botanical notes of Frank C. Craighead. These data are summarized for each species in Chapters 4 and 5.

Limitations of the Data

Plant data constantly change. New native taxa continue to be discovered, and new exotics established. In addition, species will be added or deleted as herbarium specimens are re-examined and taxonomic treatments change. Plants discussed in this manual were identified before or during visits to regional and national herbaria. In the course of the FISF, additional taxa have been identified that should be discussed, but these will be covered in future editions of this manual following historical research. Also, it is important to note that there is not agreement on the nativity of all species, and that some that we have designated as native may later be determined to be exotic and visa-versa.

A number of conservation areas have little or no floristic data. In most cases, these are small county- or city-owned conservation areas. In some cases, the conservation areas are of significant size (e.g. Picayune Strand State Forest at 65,435 acres [Jue et al., 2001]). Other conservation areas have data, but they are of poor quality. Also, it is difficult to keep data current in view of the ongoing additions of conservation areas throughout South Florida.

Even when preliminary inventory work has been completed, regular updates are necessary.

Finally, native plant species were certainly lost from South Florida before being discovered by botanists. Other species that we now believe are gone may be rediscovered. Therefore, extirpation estimates must be considered a work in progress.