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RARE TROPICAL TREES OF SOUTH FLORIDA



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RARE TROPICAL TREES OF SOUTH FLORIDA

by

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ABSTRACT

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Sixty of the species of native tropical trees of South Florida, about 100, are confined to the three southernmost counties (Dade, Monroe, and Collier) or slightly beyond and are classed as rare. Their distribution and occurrence within parks and other preserves are compiled. All are native beyond in the West Indies, though three varieties are endemic. A few of the rarest merit additional protection in new preserves.

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Cover: *Pseudophoenix sargentii*, Florida cherrypalm or buccaneer-palm. In hammock on Elliott Key. Photograph by Stanley C. Kiem.

RARE TROPICAL TREES OF SOUTH FLORIDA

By Elbert L. Little, Jr.¹

INTRODUCTION

South Florida has the greatest collection of rare native trees anywhere in continental United States, about 100 tropical species found nowhere else in the country. An inventory may be timely, because of the increasing interest in preservation of endangered species. This compilation of about 60 species of rare tropical trees of the 3 southernmost counties (Dade, Monroe, and Collier) or slightly beyond summarizes their distribution and shows their occurrence within parks and other preserves. All are native also in the West Indies and would be classed in Florida as border or peripheral species.

According to this compilation, a few of the rarest tree species merit additional protection in new preserves. All the native palms and a few other tree species of South Florida are protected by State law.

The second in a series on rare and local native trees of the United States, this report revises a preliminary one prepared in 1971. The first was "Rare and Local Conifers of the United States" (Little 1975²).

The Endangered Species Act of 1973 (Public Law 93-205) stressed the need for an inventory and authorized the Smithsonian Institution to prepare within 1 year a proposed list of endangered and threatened plant species. This report (Smithsonian Institution 1975) contains more than 2,000 species. The author submitted names of rare tree species, based upon Forest Service records and publications (Little 1953, 1971).

The Act also provides that the Secretary of the U.S. Department of the Interior must review this report and determine whether or not any species is truly threatened or endangered. Three lists derived from the Smithsonian report were published in the Federal Register (U.S. Department of the Interior 1975) as notice of consideration. However, only proposed lists are available, and there is no official, approved list of threatened or endangered plant species.

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²Names and dates in parentheses refer to Literature Cited, p. 18.

South Florida, roughly the lower third of the State south of Lake Okeechobee, has a subtropical climate. It is in plant hardiness zone 10, which has average annual minimum temperatures of 30° to 40° F. The Florida Keys extend nearly 150 miles southwestward. This island chain is the only part of the State that never has freezing temperatures and which has a truly tropical climate.

The Florida Keys and southern part of the mainland possess many kinds of wild tropical trees that are not hardy in cool climates and that cannot survive winters northward. Obviously, some species are rare. Nearly all are found in greater numbers through various islands of the West Indies or even beyond.

The rare tropical trees of South Florida are not classed as endangered or threatened with extinction in a technical sense under the Endangered Species Act and are not on the proposed list by the Smithsonian Institution cited above. They are excluded because of additional occurrence outside the United States.

Nevertheless, the rare tropical trees of South Florida merit inclusion in the State list of rare plants. The list is important nationally because these tropical species are native in no other State. Disappearance in Florida, though not extinction of a species, would make the wild plants unavailable in this country.

Definitions

Two definitions may be quoted from the Endangered Species Act. "The term 'endangered species' means any species which is in danger of extinction throughout all or a significant portion of its range" "The term 'threatened species' means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." Survival of an endangered species requires assistance. When a species has small numbers of individuals, loss of or changes in habitat, over-exploitation,

competition, disease, or other factors could cause extinction.

A few more definitions may be repeated from the first report (Little 1975). A *rare* species has small numbers of individuals throughout its range, which may be restricted or widespread, and may become endangered if environmental conditions become more adverse. The term *local* species is used here for a species of relatively small range but which is sufficiently common not to be called rare. A species whose range is limited to a particular area, usually small, is cited as *endemic*. *Border or peripheral* species reach the limit of their natural range a short distance into the United States, where they may be classed also as rare or local. Of course, these border species could become extinct in the United States and still be common and not endangered in a neighboring country.

Scientific names (with slight revision) and common names follow the Forest Service Check List (Little 1953). The same definition of a tree is used: a woody plant having one erect perennial stem or trunk at least 3 inches (7.5 centimeters) in diameter at breast height (4½ feet or 1.4 meters) a more or less definitely formed crown of foliage, and a height of at least 12 feet (almost 4 meters).

Previous Work

Nuttall (1842-49; 1: viii) prepared perhaps the first detailed botanical descriptions, some with colored plates, of the tropical trees of South Florida. He mentioned the large collection of at least 40 tree species from Key West made for the U.S. Army by John Loomis Blodgett (1809-53), local physician. Small, the outstanding authority on the flora of Florida, published much information about the trees of South Florida in books and articles (Small, 1903, 1913a, 1913b, 1913c, 1913d, 1933).

West and Arnold (1946) prepared an illustrated reference on the native trees of Florida. Buswell (1945, 1946) wrote bulletins on the native trees and shrubs of South Florida. Among local lists are the flora of Big Pine Key (Dickson, Woodbury, and Alexander 1953) and a preliminary checklist of trees of Everglades National Park (Dilley and Craighead 1957). Stevenson (1969) has prepared an illustrated list of the native trees and larger shrubs of the Everglades National Park and the Florida Keys and has compiled small maps.

Long and Lakela (1971) have written a new descriptive flora of tropical Florida, following a preliminary checklist (Lakela and Craighead 1965). Craighead (1971) has published a first volume on the trees of South Florida.

Tomlinson (1974) has made a special study of the breeding mechanisms in the trees and shrubs of southern Florida south of Lake Okeechobee, plus coastal strips on each side whose limits correspond to 50° F. January isotherm. In this region, which was called tropical Florida, he listed 114 species of woody plants, 98 of them tropical.

This Compilation

The basis of this report is the compilation of distribution maps showing the natural range of each tree species for the "Atlas of United States Trees" (Little 1971). A separate volume for the native trees of Florida is in preparation. Preliminary maps have been compiled mainly from specimens and unpublished maps in the herbaria of four universities: University of South Florida, University of Miami, University of Florida, and Florida State University. Credit is due the staffs of these herbaria for permission to use these basic records and for assistance. Records have been compiled also from publications, especially floras, local floras, and tree books. Additional information on tree distribution was contributed by George N. Avery, Frank C. Craighead, Sr., William T. Gillis, and Roy O. Woodbury.

According to the distribution maps, about 100 species of native trees are confined to South Florida and may be classed as tropical. These are found mostly in the southern third of the State, the peninsula from Lake Okeechobee southward. Some extend northward along the coasts in the central part to Cape Kennedy or beyond on the east coast and to Tampa Bay or even Cedar Key on the west.

Of the native tropical tree species in South Florida, more than one-third have a relatively broad distribution in several counties and are not classed as rare. These trees apparently are hardy and tolerant of winter temperatures several degrees below freezing. Some are common locally, and most are protected somewhere within parks, natural areas, or other preserves. The 41 tropical tree species native in South Florida but omitted here as not rare are listed in the appendix.

The rare tropical trees of South Florida are to be sought among the species restricted to the three southernmost counties, Dade, Monroe, and Collier, and especially those confined to the chain of islands mostly in Monroe County extending southwestward to Key West and known as the Florida Keys. These islands are further divided from north to south into the Upper Keys and Lower Keys. (The similar term Everglade Keys is applied to limestone ridges in the Everglades region on the mainland in southern Dade County and partly within Everglades National Park.)

The 60 species of rare native trees of South Florida discussed in this compilation are listed alphabetically in the index. They are restricted to three southernmost counties, rarely a short distance beyond, and are classed here as rare or local. These species may be grouped according to local distribution as follows:

- Keys only, 13 species
 - Lower Keys only, 6 species
 - Upper Keys only, 3 species
 - Both Lower and Upper Keys, 4 species
- Mainland only, 9 species
- Both keys and mainland, 38 species

Thirty, or one-half, of these 60 species are native at least as far as Puerto Rico and the U.S. Virgin Islands about 1,000 miles east-southeast of Florida. Descriptions and illustrations of them and many others of the total of 98 species appear in the reference on trees of Puerto Rico and the Virgin Islands (Little and Wadsworth 1964; Little, Woodbury, and Wadsworth 1974). Twenty drawings from that source showing foliage, flowers, and fruits are reproduced in plates II-VI, arranged alphabetically by scientific name.

PARKS AND OTHER PRESERVES

Many species of rare tropical plants are found within parks and other preserves of South Florida. Thus some protection is provided against expanding human activities. However, additional areas are needed, especially to protect those species absent from existing refuges. This region has no National Forests.

Everglades National Park, under the National Park Service, is the largest, containing 858,500 acres of land and about 370,000 acres of water. It extends over more than one-half of Monroe County and one-fourth of Dade County. A small area on Key Largo near the mainland is included. Biscayne National Monument in Dade County at the northern end of the Upper Keys comprises these and smaller keys: Sands, Elliott, and Old Rhodes. The National Key Deer Refuge, under the U.S. Fish and Wildlife Service, occupies parts of Big Pine Key (including Watson Hammock) and adjacent islands in the Lower Keys.

Several parks in South Florida under State or local administration contain rare plants. The largest, Collier-Seminole State Park, is in south-

western Collier County. Chekika State Recreation Area (formerly Grossman Hammock State Park) is 11 miles northwest of Homestead, Dade County. On the keys these preserves possess rare trees: John Pennekamp Coral Reef State Park (on Key Largo), Lignum Vitae Key State Park, Long Key State Recreation Area, and Bahia Honda State Recreation Area.

Dade County (county seat, Miami) has these county parks with rare plants: Matheson (south of Miami), Viscaya (includes part of Brickell Hammock), Castellow Hammock, Camp Owaissa Bauer (includes Timms Hammock), Fuchs Hammock, Greynolds, and Crandon. Simpson Park and Wainwright Park, city parks within Miami, preserve part of Brickell Hammock.

Also, rare trees are protected in cultivation in these and other parks and gardens: Fairchild Tropical Garden (south of Miami), Gifford Arboretum at the University of Miami (Coral Gables), and the Girl Scout Park in Homestead. Corkscrew Swamp Sanctuary is a preserve in northwestern Collier County.

ENDEMIC TREES

Long and Lakela (1971, p. 15) noted that more than 300 endemic or localized flowering plant species are recorded from Florida, mostly in the Lake District of the central region. A second concentration is in the southern part, including the Florida Keys. About 9 percent of the flora of tropical Florida is endemic, the majority herbaceous dicotyledons,

presumably of recent origin. Endemism in Florida was reviewed earlier by James (1961) and by Long, Lakela, and Broome (1969).

Florida does have several tree species classed as local or endemic, but these are found northward and are not tropical. The Lake District or sandhill area of central Florida with scrub vegetation of evergreen

oaks and sand pine has been mentioned. Two endemic tree species there are: *Carya floridana* Sarg., scrub hickory, and *Illicium parviflorum* Michx., yellow anise-tree. Two endemic tree varieties there, both originally named as species, are: *Ilex opaca* var. *arenicola* (Ashe) Ashe, dune holly, and *Persea borbonia* var. *humilis* (Nash) Kopp, silkbay.

Likewise, northern Florida has 4 endemic tree species: *Taxus floridana* Nutt., Florida yew; *Torreya taxifolia* Arn., Florida torreya; *Magnolia ashei* Weatherby, Ashe magnolia; and *Salix floridana* Chapm., Florida willow (also in 2 counties of Georgia).

Sand pine, *Pinus clausa* (Chapm.) Vasey, merits mention as a common tree species widespread across Florida but restricted to that State and Baldwin County, Alabama. It ranges into South Florida along the Atlantic Coast to Broward and the northern edge of Dade County and down the Gulf Coast to Collier County.

Apparently South Florida has no local or endemic tree species confined within the 3 southernmost counties, according to current conservative taxonomic references. This discovery was unexpected. However, at least 3 endemic varieties are distinguished. Four endemic species (including 2 treelike cacti) were listed in the preliminary compilation made in 1971.

Several tree species from South Florida were named as new by earlier workers. However, as a result of additional studies, all tree species formerly regarded as endemic in South Florida have now been united as synonyms or varieties of species named previously from the West Indies.

Thus, all species of tropical trees native in South Florida may be classed as border or peripheral species. They are native also in foreign lands, mostly in the Bahamas or Cuba or farther in the West Indies or even elsewhere on the continent. Many are also rare or local in Florida. Several, as indicated below, are threatened with extinction or are endangered in Florida and should have additional protection. However, if destroyed there, these rare native species probably would survive through other populations overseas.

Three or possibly more taxonomic groups of tropical trees in South Florida are sufficiently distinct from the nearest relatives to be distinguished by scientific name as endemic varieties. These endemic varieties and their distribution are summarized below.

Cereus robinii (Lem.) L. Benson var. *deeringii* (Small) L. Benson (Cactus Succulent J. Am. 41: 126. 1969), Deering tree-cactus (*Cephalocereus deeringii* Small, *Pilocereus deeringii* (Small) Kunth). Rare and endangered and possibly nearly extinct. George

Avery reports that he had looked for it in past years. Upper Florida Keys, the type from Lower Matecumbe Key, to the north end of Key Largo. Not found on mainland. *C. robinii* var. *robinii*, the typical variety, is in the Lower Florida Keys and Cuba.

Myrcianthes fragrans (Sw.) McVaugh var. *simpsonii* (Small) R. W. Long (Rhodora 72: 23. 1970), Simpson stopper (*Anamomis simpsonii* Small, *Eugenia simpsonii* (Small) Sarg., *Myrcianthes simpsonii* (Small) K. A. Wilson). Named as a species by Small (1917), transferred to another genus by Wilson (1960), and reduced to a variety by Long (1970). Rare and local on mainland in Dade County. Within Everglades National Park. Reports from the Upper Keys need confirmation. Protected by State law (as *Eugenia simpsonii*). *M. fragrans* var. *fragrans*, the typical variety, known as naked stopper, has a wider range in South Florida and tropical America.

Pinus elliottii Engelm. var. *densa* Little & Dorman (J. For. 50: 921, figs. 1, 2. 1952), South Florida slash pine. This endemic variety is common and dominant in pine forests of southern peninsular Florida north along coasts to central Florida, farther north than the tropical trees of this report, and also on 8 or more of the Lower Florida Keys, including Big Pine, Little Pine, No Name, Cudjoe, Ramrod, Big Torch, Middle Torch, and Howe. Extinct on Key Largo in Upper Florida Keys (Alexander 1953). Within Everglades National Park and National Key Deer Refuge and other preserves. This common large tree of commercial importance for lumber was long included under *Pinus caribaea* Morelet, Caribbean pine, of Bahamas, Cuba, and Central America, and at times also under *P. elliottii* Engelm., slash pine, of southeastern United States, until separated and named as a distinct variety (Little and Dorman 1952). Slash pine (typical variety), *P. elliottii* var. *elliottii*, is widespread in the Coastal Plain of southeastern United States from central Florida north to South Carolina and northwest to Louisiana.

An explanation for the absence of endemic tree species in South Florida is apparent. This peninsula and the keys are relatively young geologically. Though isolated from the main part of the continent by the climate barrier, South Florida is relatively near the Bahamas and Cuba. Thus, the West Indies have been a seed source by water and air, especially in hurricanes. Also, at the time of maximum glaciation in the Pleistocene Epoch, the sea level was as much as 200 feet lower and the land mass of the Bahamas was several times as large as now. The three endemic varieties suggest that some changes are in progress and that a few new taxonomic groups are originating.

EXCLUDED SPECIES

Four tree species formerly listed as native on the Florida Keys, though also in the West Indies or beyond, have been excluded from the flora, as explained below. The first was based upon plants found only once. The third represented misidentification of a sterile specimen. The second and fourth are now considered as introduced, rather than native. Also, 6 former endemic tree species of South Florida now reduced to synonyms are mentioned. No native tree species of the region has become extinct, so far as known.

Andira inermis (W. Wright) DC. (*Geoffroea inermis* W. Wright), cabbage angelin. Not now known as a wild tree in Florida and possibly an accidental migration. Living specimens collected on Bahia Honda Key were grown on the former Deering reservation at Buena Vista, Florida, where they flowered in 1924 (Small 1933, p. 712). Roy O. Woodbury and George N. Avery both reported unsuccessful searches. This widespread tropical species is occasionally cultivated in the Miami area and in time may escape. Also through West Indies from Cuba to Puerto Rico and Virgin Islands and Trinidad, from central Mexico south to Peru, Bolivia, and Brazil, and in western tropical Africa.

Bucida buceras L., oxborn bucida (black-olive). Not known in recent years as a wild tree in Florida but commonly planted for shade and ornament. A grove was found on Elliott Key in 1886 (Sargent 1886, 1891-1902, 5: 22. 1893). R. Bruce Ledin (manuscript on file in Biology Dept., Univ. Miami, 1958?) noted that the only 2 collections of this species in a supposed native habitat on Elliott Key were by Alvin W. Curtiss, a professional plant collector, with Charles S. Sargent on April 19, 1886, when the plants were in flower, and on July 3, 1895, in fruit. Sargent mentioned a grove of trees on the border of the forest near a house and a pineapple plantation. No other collections or sight records of this species as native in Florida were or are known after nearly a century. Ledin's explanation is accepted here, and this species excluded from the native flora. Through West Indies from Bahamas and Cuba to Puerto Rico and Virgin Islands and Lesser Antilles; from southern Mexico to Panama and northern South America to Guianas.

Clusia flava Jacq. Recorded as native at Key West by Nuttall (1842-1849; 2: 111-113, pl. 77. 1846) from incomplete material collected by John Loomis Blodgett in 1839 or 1840 but not found in recent years (Small 1933, p. 865; Little 1953). The 2 specimens, both sterile, were referred to *C. rosea* Jacq. by Howard (1962), as noted under that species. According to R. Bruce Ledin (manuscript on file in

Biology Dept., Univ. Miami, 1958?), the single collection by Blodgett was *C. rosea* from Big Pine Key. He quoted the supposition by Sargent in 1889 that Nuttall mistook this plant, as he did that of *Terminalia catappa*, a cultivated plant for an indigenous one.

Crescentia cujete L., common calabash-tree. Excluded as apparently not native in Florida. First collected at Key West by John Loomis Blodgett and recorded by Nuttall (1842-1849; 3: 71-73) but not found as a wild tree in Florida in recent years. Accepted in Check List (Little 1953) because recorded from Florida Keys by Small (1933, p. 1242). Planted in South Florida and in California but not naturalized. Throughout West Indies from Bahamas and Cuba to Puerto Rico and Virgin Islands and Lesser Antilles and from southern Mexico to Peru and Brazil. The range probably has spread somewhat through cultivation.

Six former endemic tree species of South Florida now reduced to synonyms are accounted for below. Many other synonyms are cited in current references (Little 1953; Long and Lakela 1971).

Bumelia angustifolia Nutt. of southern Florida and the West Indies has been united as a synonym of *B. celastrina* H.B.K., saffron-plum, which ranges from southern Texas and Mexico to Venezuela. However, Long and Lakela (1971, p. 680) accepted for South Florida both *B. celastrina* var. *celastrina*, the typical variety, and var. *angustifolia* (Nutt.) R. W. Long (Rhodora 72: 26. 1970) as an endemic variety. The leaf shapes vary greatly from rounded to very narrow.

Cephalocereus keyensis Britton & Rose, Key West tree-cactus (cephalocereus), of the Lower Florida Keys, including Big Pine Key, is a synonym of *Cereus robinii* (Lem.) L. Benson var. *robinii* of Western Cuba.

Dodonaea microcarya Small, Florida hopbush, formerly accepted as an endemic species of the Florida Lower Keys and named from Big Pine Key, has been united with a West Indian form of *D. viscosa* (L.) Jacq. var. *arborescens* (Cunn.) Sherff (*D. ehrenbergii* Schlecht.), 1 of 3 varieties represented also on the Florida mainland.

Eugenia anthera Small, Smalls eugenia, of the mainland and Florida Keys, was named in 1933. It has been united tentatively with *E. rhombea* (Berg) Krug & Urban, spiceberry eugenia, of the Lower Florida Keys and also in West Indies (Long and Lakela 1971, p. 645). However, the former may merit recognition as an endemic variety. The reported range is Florida Keys from Key West to Key Largo, north on east coast to Roseland and north on

west coast to Sanibel Island and Cedar Key, also within Everglades National Park.

Torrubia globosa Small, roundleaf blolly, (*Guapira globosa* (Small) Little), of South Florida mainland and Florida Keys, apparently is a synonym of *Guapira discolor* (Spreng.) Little of the West Indies. These two related species of South Florida and

the West Indies have been reduced by Gillis (1974) to synonymy also: *T. bracei* Britton and *T. longifolia* (Heimerl) Britton.

Trema floridana Britton has been reduced to a synonym or variety of *T. micrantha* (L.) Blume, Florida trema (*T. micrantha* var. *floridana* (Britton) Standl. & Steyerl.).

VERY RARE SPECIES OF FLORIDA KEYS

Only about 13 species of native trees are confined to the Florida Keys and absent from the mainland. However, all are present also in the West Indies and are classed as border or peripheral species, thus neither endemic nor threatened with extinction. Nine of these are very rare and endangered locally and nearly extinct in Florida, though no tree species is known to have become extinct there. A few apparently were rare or accidental in the undisturbed vegetation and perhaps not more numerous in the past than now and never a conspicuous part of the vegetation. Seeds might have been transported by hurricanes or birds. A few species might persist from introductions by early settlers and thus appear to be native. Four others have been mentioned as excluded.

Five of the 9 very rare species are found on the Lower Keys and 3 on the Upper Keys, and 1 has varieties in each group. The following list includes a summary of distribution within Florida and outside and, if known, notes about the discovery.

Cereus robinii (Lem.) L. Benson, the tree-cactus, has been mentioned (plate I). It is represented by 2 varieties, originally named as endemic species. Both are classed as endangered and listed as commercially exploited species privately collected. *C. robinii* var. *robinii* (*Cephalocereus keyensis* Britton & Rose), Key West tree-cactus or the typical variety, is known from the Lower Florida Keys north to Big Pine Key and also in Cuba. Var. *deeringii* (Small) L. Benson (*Cephalocereus deeringii* Small), Deering tree-cactus, is endemic to the Upper Florida Keys. (Incidentally, the varietal names were reversed by Long and Lakela, 1971.) Nuttall

(1842-49; 1: viii) mentioned the cacti 30 or more feet high observed at Key West about 1839 or 1840 by Blodgett, who collected flowers. Not until 1909 did Britton and Rose publish a name. Wild plants disappeared from Key West about 1915. (Saguaro, *Cereus giganteus* Engelm., the larger, giant cactus of Arizona, was collected later but named earlier in 1848.)

Clusia rosea Jacq., copey clusia (plate II). First reported from Florida at Big Pine Key by Small (1913a, 1913b), as having been discovered by John Loomis Blodgett, of Key West, and not afterwards collected. Rediscovered at Big Pine Key in 1938 by Roy O. Woodbury and John Waldeck. George Avery reported to the author that he saw wild plants there in 1967, but most recent searchers have not found them. Noted to be very rare on Little Torch Key, apparently within National Key Deer Refuge, but not found on Big Pine Key (Dickson, Woodbury, and Alexander 1953, p. 196). However, Avery stated that the one tree on the former key died in 1960. Reported also from Sugarloaf, Cudjoe, and Bahia Honda Keys (Long and Lakela 1971). Avery noted that the large plant seen by him on Sugarloaf Key in 1962 was on a midden area, now a subdivision, and may be a persistent plant or seedling from cultivation or a wild plant. The one tree on Cudjoe Key died in 1967, but this species was found wild on No Name Key in 1968. The only plants known by him on Bahia Honda Keys were cultivated. Also nearly through West Indies from Bahamas and Cuba to Puerto Rico and Virgin Islands, and Trinidad and Tobago and from southern Mexico to Colombia, Venezuela, and French Guiana.

Plate I. Four rare trees

Upper left, *Cephalocereus robinii* var. *deeringii*, Deering tree-cactus. Lower Matecumbe Key, where first found, photograph published with original description by John K. Small (1917). F-523647

Upper right, *Swietenia mahagoni*, West Indies mahogany. Spreading crown of large tree in Everglades National Park. Photograph by Connie Toops, National Park Service. F-523650

Lower left, *Roystonea elata*, Florida royalpalm. Everglades National Park. Photograph by Connie Toops, National Park Service. F-523649

Lower right, *Acotorrhapha wrightii*, paurotis. Photograph by Walter M. Buswell. F-523648



The 2 sterile specimens collected by Blodgett in 1839 or 1840 were identified by Nuttall (1842-1849; 2: 111-113, pl. 77) as *Clusia flava* Jacq., but were referred to *C. rosea* by Howard (1962). R. Bruce Ledin (manuscript on file in Biology Dept., Univ. Miami, 1958?) noted also the correction to *C. rosea* from Big Pine Key and concluded that the species was not native but was planted by an early settler. He quoted the supposition by Sargent in 1889 that Nuttall mistook this plant as indigenous as he did *Terminalia catappa*. Ledin wrote that the plant on Big Pine Key was growing at the edge of a hammock but in the same area with date palms, coconuts, and other introduced plants. He quoted John D. Dickson that the small plant found on Little Torch Key in 1952 appeared to be growing in an old grove. *Clusia rosea* is tentatively retained here as native.

Cupania glabra Sw., Florida cupania. Very rare and endangered at Watson Hammock on Big Pine Key but protected within National Key Deer Refuge. Seen there by the author in September 1952 and August 1971. Reported from Johnson Key in 1965 and on Summerland Key in 1963-66 by Avery, who thinks the plants are no longer on the last named. Discovered about 1840 by Blodgett and lost until rediscovered in 1921 on Big Pine Key by J. K. Small (Sudworth 1927, p. 197). Also Cuba and Jamaica and from Mexico to Costa Rica.

Guaiaecum sanctum L., holywood lignumvitae (plate II). Rare on Upper Keys. Local in lower and upper Key Largo. Also Elliott, Sands, Old Rhodes, and Totten Keys within Biscayne National Monument. Seen by Avery as a wild tree also on Lower Matecumbe, Upper Matecumbe, and Plantation Keys. Preserved in the State park on Lignum Vitae Key, named for this tree. Nuttall (1842-49; 3: 17) reported the discovery by John Loomis Blodgett who found this species to be abundant in Key West. Apparently the trees were cut for their valuable wood. Not now known as wild on Big Pine Key or other Lower Keys. Protected by State law.

Gyminda latifolia (Sw.) Urban, West Indies falsebox (plate II). Very rare, recorded as wild on 11 Lower Keys. On Big Pine Key this species is within the National Key Deer Refuge. Avery found it also on Sugarloaf, Cudjoe, Middle Torch, Ramrod, Little Torch, No Name, Vaca, Boot, and Grassy Keys. Recorded from Howe Key. Also West Indies from Bahamas and Cuba to Puerto Rico and Virgin Islands and Lesser Antilles and in northeastern Mexico. Reported by Sargent (1891-1902; 2: 14) as common and generally distributed through the islands of South Florida from Marquesas Keys to

Upper Matecumbe Key. First recorded from Key West area by Blodgett.

Pseudophoenix sargentii H. Wendl., Florida cherrypalm, known locally also as buccaneer-palm or Sargent-palm (cover photograph). The rarest palm native in Florida, according to Ledin, Kiem, and Read (1959). This border or peripheral species is endangered and now nearly extinct in South Florida except in cultivation. Recorded as native from only three of the Upper Keys, Sands, Elliott, and Long. However, the only tree on Sands Key was seen last in 1925 and apparently has disappeared. The colony of several hundred individuals on Long Key, where the species was discovered, was destroyed by vandals who removed the trees and sold them as royal palms (Small 1933, p. 238). However, Roy O. Woodbury recalled seeing trees there in the 1940's. George N. Avery found none there in 1966 and thinks this population was destroyed by the hurricane of 1960. In 1958 Ledin, Kiem, and Read found 28 palms on Elliott Key and 3 old plants, also many stumps, on Long Key. Frank C. Craighead, Sr., stated to the author that the only wild trees seen by him were a group of about 15 on Elliott Key, where the species was once abundant. Elliott and Sands Keys are within Biscayne National Monument. Long Key is about 50 miles southwest, separated by others. Transplanted and introduced on other islands, such as Upper and Lower Matecumbe Keys. Also Bahamas, Cuba, Hispaniola, Mona (formerly 1 plant), and Dominica; southeastern Mexico and British Honduras.

Zanthoxylum flavum Vahl, yellowheart or yellowwood (plate II). Very rare on Bahia Honda Key. Several trees were noted within Bahia Honda State Park by Roy O. Woodbury in 1937 and later. In 1969, W. L. Stern (according to labels on Nos. 2760, 2764, Univ. Md.—MARY), found only 2 trees at the south end of the State park, the larger 25 ft. high and 8-9 in. in diameter at base and protected within a wire fenced enclosure. Avery found only a female tree on that island, producing sterile seeds. Another tree was reported from the Marquesas Keys in 1969 by Sandy Sprunt IV and John C. Ogden. Also Brickell Hammock near Miami, apparently planted. Nuttall (1842-1849; 3: 14), naming the Key West tree as *Z. floridanum* Nutt., noted that John Loomis Blodgett, the discoverer, found it to be large and common. The trees probably were cut for the valuable wood, known also as satinwood. Also Bermuda and West Indies from Bahamas and Cuba to Puerto Rico and Lesser Antilles.

Plate II. Four very rare trees of the Florida Keys. Upper left, *Clusia rosea*, covey clusia. Upper right, *Guaiaecum sanctum*, holywood lignumvitae. Lower left, *Gyminda latifolia*, West Indies falsebox. Lower right, *Zanthoxylum flavum*, yellowheart. All drawings one-half natural size except the last, which is one-third.



Two species of *Acacia*, listed below, have been discovered on the Florida Keys as recently as 1963 and 1967 and are apparently native (Isely 1973). It is uncertain whether these very rare trees represent relatively recent accidents of migration by chance introduction or the last of former larger populations. Both are endangered and need protection in South Florida though more common in the West Indies.

Acacia choriophylla Benth. One tree was found in 1967 on northern Key Largo (Alexander 1968). This tree was growing in an undisturbed tropical hammock of native species (formerly pine forest) with no evidence of human activity in the area. The tree may be crowded out by other trees or destroyed by

planned development or might have been killed by a fire in 1975. Obviously very rare. Also Bahamas and Cuba.

Acacia macracantha Humb. & Bonpl. ex Willd. (*A. macracanthoides* Bert. ex DC.), long-spine acacia. Fifteen plants, apparently native, were found on Ramrod Key (near Big Pine Key) in 1963 (Ward 1967). This species is very rare as a wild tree but is also in cultivation. It was observed also as apparently persistent after cultivation at 2 other Florida localities. Reported as introduced about 1915 as an ornamental, escaping along roadsides elsewhere in South Florida. Also West Indies and northern South America.

OTHER SPECIES CONFINED TO FLORIDA KEYS

Four other tree species are confined to the Florida Keys and absent from the mainland. They are local, perhaps not rare, and appear also in the West Indies. The first species below is limited to the Lower Keys while the other three are in both Lower and Upper Keys. Those on Big Pine Key apparently are within the National Key Deer Refuge. Certain species probably are within Bahia Honda, Key Largo, and other State parks.

Pisonia rotundata Griseb., pisonia. Big Pine Key and nearby keys, not rare. Also Bahamas and Cuba.

Drypetes diversifolia Krug & Urban, milkbark. Recorded as abundant on Key Largo and also on Rhodes, Elliott, and Totten Keys within Biscayne National Monument. Noted by Avery from these

Keys: Vaca, Boot, Big Pine, Cudjoe, Big Torch, Bahia Honda, Sugarloaf, Ramrod, Grassy, and Long. Recorded also from Little Torch and doubtfully from Arsenicker Key. To be expected on any key which has a hammock. Also Bahamas.

Exostema caribaeum (Jacq.) Roem. & Schult., Caribbean princewood. Collected on several keys, including Elliott, Largo, Upper Matecumbe, Plantation, Big Pine, and Ramrod. Also West Indies and from Mexico to Costa Rica.

Savia bahamensis Britton, Bahama maidenbush. Big Pine, Little Torch, Sugarloaf, Ramrod, No Name, and other Lower Keys, also Key Largo. Also Bahamas, Cuba, and Jamaica.

RARE SPECIES OF MAINLAND ABSENT FROM FLORIDA KEYS

Nine tree species listed below are rare and local on the mainland in Dade County or also Monroe County or slightly beyond. They are absent from the Florida Keys but appear again in the West Indies and a few also on the continent. The first 3 are very rare in Brickell Hammock at Miami, Dade County. The next 5 are in the Everglades National Park and less rare. The last is coastal.

Enallagma latifolia (Mill.) Small, black-calabash (*Dendrosicus latifolius* (Mill.) A. Gentry; plate III). Very rare at Biscayne Bay including Brickell Hammock in Dade County. Endangered by urban development. Reported in error from Upper Keys. Also West Indies, southern Mexico, Central America, and northern South America.

Licaria triandra (Sw.) Kosterm., Gulf licaria (plate III). Very rare and endangered. Local within Miami, Dade County, known only from a few trees and seedlings in Simpson Park and around houses, Brickell Hammock. The first 2 trees of this West Indian species were discovered in Brickell Hammock by J. K. Small in 1904. Walter M. Buswell reported about 25 trees in Miami in 1946 but predicted that they would soon be cut (Little 1953, p. 226). Apparently a few persist around houses. Also in West Indies.

Picramnia pentandra Sw., bitterbush (plate III). Very rare in Brickell Hammock including Simpson Park in Miami and other hammocks, such as Pine Island, of Dade County. Listed as planted in

Plate III. Four very rare trees of the Florida mainland. Upper left, *Enallagma latifolia*, black-calabash. Upper right, *Hypelate trifoliata*, inkwood (also on very few keys). Lower left, *Licaria triandra*, Gulf licaria. Lower right, *Picramnia pentandra*, bitterbush. All drawings one-half natural size except the first, which is one-third.



Everglades National Park. Reported in error from Florida Keys. Also in West Indies, Colombia, and Venezuela.

Acoelorrhapha wrightii (Griseb. & H. Wendl.) H. Wendl., paurotis or paurotis-palm (*Paurotis wrightii* (Griseb. & H. Wendl.) Britton; plate I). Hammocks and low savannas in Dade, Monroe, and Collier Counties, including Everglades National Park (to Cape Sable and common in lower part) and Collier-Seminole State Park. Also Bahamas, Cuba, and Central America to Nicaragua.

Alvaradoa amorphoides Liebm., Mexican alvaradoa. Confined to several hammocks, locally common, in southern Dade County, including Costellow, Timms, Ross, and Deer Horn Hammocks, and Everglades National Park (Long Pine Key). Reported from Key Largo, one of the northernmost Upper Keys. Also Bahamas, Cuba, and from Mexico to Costa Rica.

Colubrina cubensis (Jacq.) Brongn., Cuba colubrina. Local in hammocks of southern Dade County, including Sykes and Nixon-Lewis, near Homestead, and Everglades National Park. Var. *floridana* M. C. Johnston is in Florida and Andros of the Bahamas, while other varieties are found in Cuba and Hispaniola.

Prunus myrtifolia (L.) Urban, myrtle laurel-cherry or West Indian cherry. Rare in hammocks and pine lands, including Miami, Homestead, Matheson Hammock, Timms Hammock, Sykes Hammock, and Everglades National Park (Long Pine Hammock) in Dade County, southwestern Collier County, and Estero, Lee County. Reported in error from Florida Keys. Also in West Indies and to Brazil and Argentina.

Roystonea elata (Bartr.) F. Harper, Florida royalpalm (*R. regia* (H.B.K.) O.F. Cook; plate I). Rare as a native tree but common in cultivation. Hammocks of Dade, Monroe, and Collier Counties, including Everglades National Park to Cape Sable region, and Big Cypress, including Collier-Seminole State Park. Formerly north to St. John River near Lake George in central Florida but extinct northward. Classed as endangered and protected by State law. Also Cuba.

Zanthoxylum coriaceum A. Rich., Biscayne prickly-ash. Rare along east coast in Dade, Broward, and Palm Beach Counties. Key Biscayne but not on other Florida Keys as reported earlier. Also in West Indies.

SPECIES OF BOTH FLORIDA KEYS AND MAINLAND

About 38 species of native trees have restricted ranges in both the Florida Keys and the mainland at the southern end of the peninsula. Most are limited to Dade and Monroe Counties, but a few extend to Collier County or slightly beyond. All are native in the West Indies, and some in continental tropical America. Nearly all are recorded within Everglades National Park or National Key Deer Refuge on Big Pine Key, some on both.

Bourreria ovata Miers, Bahama strongbark, locally called strongback. First reported from Key West by Blodgett (Nuttall 1842-49; 3: 83-84).

Bourreria succulenta Jacq., rough strongbark, locally called strongback (*B. revoluta* H.B.K.; plate IV).

Byrsonima lucida DC., Long Key byrsonima, locally called locust-berry (plate VI).

Calyptanthus pallens Griseb., pale lidflower, locally called spicewood. Common.

Calyptanthus zuygium (L.) Sw., myrtle-of-the-river (plate V). On keys south only to Key Largo.

Canella winterana (L.) Gaertn., canella, locally called wild-cinnamon (plate IV). Northwest to Everglades City, Collier County. Uncommon in Everglades National Park.

Coccothrinax argentata (Jacq.) Bailey, Florida silverpalm. North to Fort Lauderdale, Broward County.

Colubrina arborescens (Mill.) Sarg., coffee colubrina.

Colubrina elliptica (Sw.) Briz. & Stern, soldierwood (*C. reclinata* (L'Hér.) Brongn.; plate VI). Upper Keys. Old reports from mainland lack confirmation.

Cordia sebestena L., Geiger-tree. First reported from Key West by Blodgett (Nuttall 1842-49, 3: 81-83). Widely planted, perhaps introduced and naturalized (Sargent 1891-1902, 6: 72). The English common name honors John Geiger, a ship pilot of the early 19th century, who first planted this tree at Key West.

Plate IV. Four tree species of both Florida Keys and mainland. Upper left, *Bourreria succulenta*, rough strongbark. Upper right, *Byrsonima lucida*, Long Key byrsonima. Lower left, *Calyptanthus zuygium*, myrtle-of-the-river. Lower right, *Canella winterana*, canella. All drawings one-half natural size.



Crossopetalum rhacoma Crantz, Florida crossopetalum (plate VI). Through Keys to pinelands of Dade County.

Drypetes lateriflora (Sw.) Krug & Urban, Guiana-plum. Rare from Lower Florida Keys north along east coast to Martin and Brevard Counties. Reported to be common in Brickell Hammock.

Eugenia confusa DC., redberry eugenia or red stopper. Reported as common in hammocks on mainland, including Brickell Hammock. Also Biscayne National Monument. Listed as protected by State Law.

Eugenia rhombea (Berg) Krug & Urban (?*E. anthera* Small), spiceberry eugenia, known also as red stopper. The first is recorded from Key West and other Lower Keys but not Big Pine Key. The second, formerly treated as an endemic species but reduced to a synonym or variety, ranges from Key West north on east coast to Roseland and north on west coast to Sanibel Island and Cedar Key.

Ficus citrifolia Mill., shortleaf fig (*F. laevigata* Vahl, *F. brevifolia* Nutt.) North to Lee County.

Genipa clusiifolia (Jacq.) Griseb., seven-year-apple (*Casasia clusiifolia* (Jacq.) Urban). Along coasts north to Broward and Lee Counties.

Guapira discolor (Spreng.) Little, longleaf blolly (*Pisonia discolor* (Spreng.) Britton, *Torrubia bracei* Britton, *T. longifolia* (Heimerl) Britton, *T. globosa* Small; plate V). Variations in leaf shape and size formerly were regarded as separate species.

Guettarda elliptica Sw., velvetseed. North to Broward County and northwest to Sanibel Island.

Guettarda scabra (L.) Vent., roughleaf velvetseed (plate V). North to Palm Beach County.

Gymnanthes lucida Sw., oysterwood or crabwood (*Ateramnus lucidus* (Sw.) Rothm.; plate V). Keys to Dade County.

Hippomane mancinella L., manchineel (plate IV). Through Keys to coasts of Dade and Monroe Counties. Trees have been eradicated near settlements, because the palatable reddish yellow fruits are deadly poisonous. Also the milky sap is injurious both externally and internally.

Hypelate trifoliata Sw., inkwood (plate III). "One of the rarest species in our area" (Long and Lakela 1971, p. 574). Known from very few keys, including Big Pine Key and Key Largo, also Long Pine Key within Everglades National Park. Hammocks near Homestead.

Ilex krugiana Loes., tawnyberry holly or Krug holly. Rare and scattered in southern Dade County,

including Everglades National Park. Recorded doubtfully from Lower Keys.

Jacquinia keyensis Mez, joewood. North from the keys on west coast to islands of Lee and Charlotte Counties. Protected by State law.

Lysiloma bahamense Benth., Bahama lysiloma, locally called wild-tamarind. Common locally. North to Broward and Collier Counties.

Manilkara bahamensis (Baker) Lam & Meeuse, wild-dilly (*Achras emarginata* (L.) Little). Common locally through Florida Keys to southern Dade County.

Maytenus phyllanthoides Benth., guttapercha mayten. Rare in Lower and Upper Florida Keys and from Everglades north along west coast to Pasco and Levy Counties.

Piscidia piscipula (L.) Sarg., Florida fishpoison-tree. Common locally through keys and north along west coast to Sanibel Island.

Pithecellobium guadalupense (Pers.) Chapm., Guadeloupe blackbead (*P. keyense* Britton). Through Keys and east coast of Dade County.

Psidium longipes (Berg) McVaugh (*Eugenia longipes* Berg, *E. bahamensis* auth.). Local in Keys and pinelands of Dade County.

Reynosia septentrionalis Urban, darling-plum. Common in Bahia Honda State Park. Found in a variety of vegetation types (Long and Lakela 1971, p. 580).

Schaefferia frutescens Jacq., Florida-boxwood (plate VI). Rare through Florida Keys and on lower eastern coast in Dade County.

Schoepfia chrysophylloides (A. Rich.) Planch., Gulf graytwig. Rare from Long Key north along east coast to Brevard and Volusia Counties and along west coast to Pinellas County

Swietenia mahagoni (L.) Jacq. West Indies mahogany (plates I, VI). Rare in Upper Keys and coastal hammocks of Everglades National Park, where protected. Threatened by cutting for the valuable cabinet wood. Extinct northward but widely planted as a street tree in South Florida.

Tetrazygia bicolor (Mill.) Cogn., Florida tetrazygia. Pinelands and hammocks of southern Dade County, including Everglades National Park. Reported northward nearly to Miami. "Very common" (Long and Lakela 1971, p. 650). Also Key Largo (Frank C. Craighead, Sr.). Protected by State law. Classed as one of the most attractive native shrubs of South Florida, with white flowers and purplish berries.

Plate V. Four tree species of both Florida Keys and mainland. Upper left, *Colubrina elliptica*, soldierwood. Upper right, *Crossopetalum rhacoma*, Florida crossopetalum. Lower left, *Guapira discolor*, longleaf blolly. Lower right, *Guettarda scabra*, roughleaf velvetseed. All drawings one-half natural size.



Thrinax morrisii H. Wendl., brittle thatchpalm or Key thatchpalm (*T. microcarpa* Sarg.). North to Broward County. As a palm, protected by State law.

Thrinax radiata Lodd. ex J. A. & J. H. Schult., Florida thatchpalm (*T. floridana* Sarg., *T. parviflora* auth.). Formerly northwest to Cape Romano, Collier County, where reported as extinct (Small

1933). As a palm, protected by State law.

Trema lamarckiana (Roem. & Schult.) Blume, West Indies trema. Upper Keys from Key Largo to Key Biscayne and adjacent mainland in Dade County. Common locally and spreading on disturbed areas and roadsides.

DISCUSSION

This inventory aims to list the rare tropical trees of South Florida and to summarize their natural distribution and their occurrence within preserves.

The rare tropical trees of South Florida are not protected under the Endangered Species Act. All are native also in the West Indies and would be classed in Florida as border or peripheral species. However, many are protected by State law. These tropical trees are native nowhere else in continental United States. Several species are known from only a few islands or from trees few enough to be counted.

Most of the 60 species of tropical trees confined to the 3 southernmost counties of South Florida or slightly beyond seem not to be near extinction, having some protection within parks or preserves. Many rare trees of the Florida Keys are found on Big Pine Key and nearby islands within the National Key Deer Refuge. Likewise, most species of rare trees at the south end of the peninsula or mainland in Dade and Monroe Counties are protected within the Everglades National Park. This park includes a small area at Key Largo Ranger Station on Key

Largo, one of the Upper Keys. Many of these tropical trees grow also in Matheson Hammock Park south of Miami and in other parks.

Species at the limits of their ranges are especially subject to fluctuations in the climatic and other environmental factors. For example, infrequent but unusually cold weather below freezing could kill the northernmost individuals of tropical species. Also, rare severe hurricanes could destroy some natural vegetation. Plant diseases and insect pests, sometimes introduced, are a further threat.

A few of the rarest merit additional protection in new preserves. This compilation may be useful in further planning. Propagation in botanical gardens, parks, and arboreta, at least for the rarest species, is another method. The Fairchild Tropical Garden south of Miami already is growing nearly all of the rare tree species listed here.

Rare plants and animals, especially where protected within National Parks and similar preserves, have considerable appeal to tourists and therefore possess an indefinite but high monetary value.

SUMMARY

South Florida has the greatest collection of rare native trees anywhere in continental United States, about 100 tropical species found nowhere else in the country. This compilation of about 60 species of rare tropical trees of the 3 southernmost counties (Dade, Monroe, and Collier) summarizes their distribution and shows their occurrence within parks and other preserves. All are native beyond in the West Indies and would be classed as border or peripheral species. According to this compilation, a few of the rarest tree species merit additional protection in new preserves.

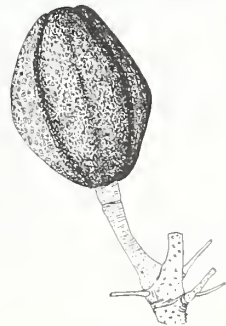
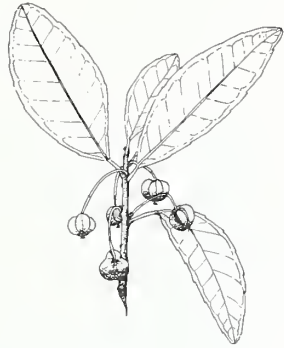
This report is the second in a series on rare and

local native trees of the United States. The Endangered Species Act of 1973 stressed the need for an inventory.

Apparently South Florida has no local or endemic tree species. However, 3 endemic varieties are distinguished.

Only about 13 species of native trees are confined to the Florida Keys and absent from the mainland. Nine tree species are rare and local on the mainland but absent from the Florida Keys. Another is known also from 1 of the uppermost keys. About 38 species of native trees have restricted ranges in both the Florida Keys and the mainland.

Plate VI. Four tree species of both Florida Keys and mainland. Upper left, *Gymnanthes lucida*, oysterwood. Upper right, *Hippomane mancinella*, manchineel (poisonous). Lower left, *Schaefferia frutescens*, Florida-boxwood. Lower right, *Swietenia mahagoni*, West Indies mahogany. All drawings one-half natural size except the last, which is one-third.



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APPENDIX

ADDITIONAL TROPICAL TREES NATIVE IN SOUTH FLORIDA

The 41 tropical tree species listed below are native in South Florida but are not classed as rare. All have a relatively broad distribution in several counties. Many are common locally, and most are protected somewhere within parks, natural areas, or other preserves. A few may merit additional protection. Some extend to central Florida or northward along the coasts, while 3 reappear in Texas and 1 in Arizona. All are native beyond in the West Indies.

Amyris balsamifera L., balsam amyris or torchwood.

Amyris elemifera L., sea amyris or torchwood.

Annona glabra L., pond-apple.

Ardisia escallonioides Schiede & Deppe, marbleberry or marlberry.

Avicennia germinans (L.) L., black-mangrove (*A. nitida* Jacq., also Mississippi, Louisiana, and Texas).

Bumelia celastrina H.B.K., safron-plum (also Texas).

Bursera simaruba (L.) Sarg., gumbo-limbo.

Capparis cynophallophora L., Jamaica caper.

Capparis flexuosa (L.) L., limber caper.

Chrysobalanus icaco L., icaco coco-plum or coco-plum.

Chrysophyllum oliviforme L., satinleaf.

Citharexylum fruticosum L., Florida fiddlewood.

Coccoloba diversifolia Jacq., doveplum or pigeon-plum.

Coccoloba uvifera (L.) L., seagrape.

Conocarpus erectus L., button-mangrove or buttonwood.

Dipholis salicifolia (L.) A. DC., willow bustic.

Dodonaea viscosa (L.) Jacq. hopbush (also Arizona).

Eugenia axillaris (Sw.) Willd., white-stopper eugenia or white-stopper.

Eugenia foetida Pers. boxleaf eugenia or boxleaf stopper (*E. myrtooides* Poir.).

Exothea paniculata (Juss.) Radlk., butterbough or inkwood.

Ficus aurea Nutt., Florida strangler fig.

Forestiera segregata (Jacq.) Krug & Urban, Florida-privet (also Georgia).

Hamelia patens Jacq., scarletbush or firebush.

Krugiodendron ferreum (Vahl) Urban, leadwood ("black-ironwood").

Laguncularia racemosa (L.) Gaertn. f., white-mangrove.

Metopium toxiferum (L.) Krug & Urban, Florida poison-tree or poisonwood.

Mycrianthes fragrans (Sw.) McVaugh (*Eugenia dicrana* Berg).

Nectandra coriacea (Sw.) Griseb., Jamaica nectandra.

Pithecellobium unguis-cati (L.) Mart., catclaw blackbead.

Psychotria ligustrifolia (Northrop) Millsp., Bahama balsamo.

Psychotria nervosa Sw., Seminole balsamo (*Ps. undata* Jacq.).

Rapanea guianensis Aubl., Guiana rapanea or myrsine.

Rhizophora mangle L., mangrove or red mangrove.

Sapindus saponaria L., wingleaf soapberry (*S. marginatus* Willd., also Georgia).

Sideroxylum foetidissimum Jacq., false-mastic.

Simarouba glauca DC., paradise-tree.

Solanum erianthum D. Don, mullein nightshade or potato-tree (*S. verbascifolium*, also southern Texas).

Suriana maritima L., baycedar.

Trema micrantha (L.) Blume, Florida trema (*T. floridana* Britton).

Ximenia americana L., tallowwood.

Zanthoxylum fagara (L.) Sarg., lime prickly-ash (also Texas).

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