"Weed," defined by the Weed Science Society of America as "a plant growing where it is not desired," is a word familiar to everyone. Homeowners battle weeds in their lawns, gardens, or ponds. Weeds are considered unsightly in parks and playgrounds. Foresters manage weeds to enhance the growth of commercial forests. Weeds interfere with transportation and can cause hazardous conditions along highways, railroads, and waterways. In the United States alone, farmers spend $8 billion annually to control weeds; still, annual losses caused by weeds to crops are $10 billion (Coble 1993).

Weeds are also a major problem and a growing concern in natural areas—lands that have been designated for preservation (or restoration) of native plant communities (Cronk and Fuller 1995, Luken and Thieret 1997, McKnight 1993, Randall and Marinelli 1996, U.S. Congress Office of Technology Assessment 1993). Plants considered weeds in natural areas are undesirable because they disrupt natural processes, such as fire and water flow, and displace native plant and animal species, including endangered species. While the total amount of money currently spent to control weeds in natural areas (or potential future cost) has not been calculated, the effort is clearly expensive. Since 1986, partial control of melaleuca (Melaleuca quinquenervia) and Australian pine (Casuarina equisetifolia) in the East Everglades, adjacent to Everglades National Park, has required 14,000 labor hours and $546,000 in herbicide and helicopter costs. In addition, there are the intangible costs associated with native habitat loss.

Various terminologies have been used to describe weeds in natural areas. Randall (1997) uses the terms "natural-area weed" and "natural-area plant pest" interchangeably to refer to indigenous and nonindigenous species, populations, and individual plants that interfere with management goals and objectives and are therefore unwanted. These management goals in natural areas may be to support or increase populations of certain species, to maintain particular vegetation types or biological communities, or to restore ecosystem processes such as fire or seasonal flooding. While some indigenous (native) plants can be weedy under certain conditions, the impact of nonindigenous (non-native, alien, or exotic) plants on native plant and animal communities is the major concern to natural-area managers. The presence and spread of non-native plants and animals is a problem on many of these sites, and in some cases it is the single greatest threat to the species or communities the preserves are designated to protect (Randall 1997). Cronk and Fuller (1995) refer to natural-area weeds as invasive plants and incorporate non-native into their definition as follows:

... an alien plant spreading naturally (without the direct assistance of people) in natural or seminatural habitats, to produce a significant change in terms of composition, structure or ecosystem processes.

This publication concerns natural-area weeds in Florida. It presents information on 62 non-native species that have spread into the state's public and private conservation lands. These plants have formed self-sustaining and expanding populations within plant communities with which they were not previously associated, and thus they are defined
as invasive. Non-native plants are those that exist outside their natural range or natural
zone of dispersal and include domesticated and feral species and all hybrids, except those
that naturally occur between native species (U.S. Congress Office of Technology Assess-
ment 1993).

Only a few non-native plants become invasive, and many, in fact, are beneficial. Citrus, for
example, one of the early introductions by the Spanish, is grown in greater
quantity than any other fruit in the United States. Numerous horticultural introductions
have served to beautify our homes and landscapes. On the other hand, just over 300
non-native plants are invading wildlands of the 49 continental states and the Canadian
provinces, and about half of these were brought here as horticultural commodities
(Randall and Marinelli 1996).

With the beginnings of agriculture, humans began to move crops for their use,
and weeds were probably accidentally moved as well (Jarvis 1977). These early move-
ments of plants by people would have been over relatively short distances and probably
did not significantly alter dispersal patterns. Long-distance movement of plants by
people across natural barriers, such as oceans, deserts, and mountain ranges, has acceler-
ated with developing transportation technologies and international commerce (Cronk
and Fuller 1995, Randall and Marinelli 1996, Wagner 1993). The arrival in the Ameri-
cas of Columbus in 1492, considered to be the first European contact with the New
World, was followed by large-scale introductions of non-native plants for purposes such
as agriculture and horticulture.

Florida, especially the southern portion, is prone to introductions and naturaliza-
tion by non-native organisms (Simberloff 1997). In 1920 Charles Torrey Simpson,
renowned pioneer naturalist of Florida, wrote, “. . . there are the adventive plants, the
wanderers, of which we have, as yet, comparatively few species; but later, when the
country is older and more generally cultivated, there will surely be an army of them.” In
1978, over 170 non-native plant species were naturalized (reproducing and continuing
to exist without cultivation) in St. Lucie, Martin, Palm Beach, Broward, and Dade
counties of the southeastern coast of Florida (Austin 1978). Statewide, 1,200, or 29%, of
plant species now growing outside cultivation in Florida are non-native (Wunderlin et al.
1996).

Of those non-native plants that are invasive, some are more invasive than others,
and some may be invasive in certain areas and not others. Invasiveness of certain intro-
ductions has been obvious because of their rapid expansion and widespread detrimental
ecological impacts. Just four examples of invasive introductions with easily recognized
impacts are Australian pines (Casuarina spp.), which have devastated beach plant com-
munities; Brazilian pepper (Schinus terebinthifolius), which now infests over 405,000 ha
(1 million acres) in the state; melaleuca (Melaleuca quinquenervia), which now forms
monocultures in nearly 162,000 ha (400,000 acres) of wetlands; and hydrilla (Hydrilla
verticillata), which has displaced native aquatic plant communities in over 50% of
Florida’s water bodies. Such species also present a clear demonstration of the potential
impact of other invasive introductions. However, the invasiveness of some plants may be subtle and recognizable only to ecologists and land managers who are closely familiar with the biotic community that is being invaded. And some species may be limited in their Florida spread by environmental conditions such as freezing winter temperatures, high summer temperatures, high humidity, low-nutrient soils, and so on.

The choice of species included in this publication is based primarily on several years’ work by the Plant List Committee of the Florida Exotic Pest Plant Council (EPPC), a nonprofit professional society that was founded in 1984 to build public awareness about the serious threat invasive non-native plants pose to native ecosystems and to develop integrated management and control methods for preventing the spread of these plants. In recent years the committee has developed and published a list of invasive non-native species to help land managers focus and prioritize their management efforts related to natural-area weeds. All of the species treated here are considered “Category I” problems on the EPPC 1997 list; that is, they are non-native species known to have invaded Florida natural areas, and they are displacing native plants or otherwise disrupting the natural community structure and/or function. Placement in this category is derived from observed ecological damage and does not depend on economic severity of the problem or its geographic extent. Another section of the EPPC list includes “Category II” species, plants considered to have a real potential to become Category I problems but are not yet known to be disrupting natural-area communities. The list is revised every two years by consensus of the committee members.

Members of the EPPC Plant List Committee are D. F. Austin (Chair), Florida Atlantic University; K. C. Burks, Florida Department of Environmental Protection (DEP); N. C. Coile, Florida Department of Agriculture and Consumer Services; J. G. Duquesnel, DEP; D. W. Hall, Consulting Botanist; T. O. Hendrickson, Consulting Botanist; R. Hofstetter, University of Miami; S. Koptur, Florida International University; K. A. Langeland, University of Florida/IFAS; J. Maguire, Miami-Dade County Department of Environmental Resource Management; M. M C Mahon, Restoration Consultant; R. Pemberton, U.S. Department of Agriculture; D. R. Ward, University of Florida; and R. P. Wunderlin, University of South Florida.

Some species described in this manual are officially regulated by federal, state, and/or local law. Included under the Federal Noxious Weed Act (USDA, 7CFR-360) are Hydrilla verticillata, Hygrophila polysperma, Imperata cylindrica, Ipomoea aquatica, Mimosa pigra, Solanum torvum, and Solanum viarum. These species may only be moved into or through the United States by special permit. Florida’s Noxious Weed Rule (FDACS, 5B-57) includes Imperata cylindrica, M. dalea quinquenervia, M. mosa pigra, Sapinum sebiferum, Schinus terebinthifolius, Solanum torvum, and Solanum viarum. These species cannot be introduced into the state or be held, moved, or released without a special permit. Prohibited under state environmental rules (FDEP 62C-52) are Casuarina spp., Eichhorinia crassipes, Hydrilla verticillata, Hygrophila polysperma, Ipomoea aquatica, M. dalea quinquenervia, M. mosa pigra, Pistia stratiotes, and Schinus terebinthifolius.
These species cannot be held, collected, transported, cultivated, or imported except under specially permitted circumstances. The state and federal lists noted here include other species as well; the lists may be modified by legislation over time and should be checked periodically for changes. Additional species are regulated by local ordinances (check with your local natural-resources department).

This publication is designed to provide information on plants that may or do pose threats to natural resource areas in Florida, not to imply regulatory requirements. Some species covered here are “produced commercially within the Florida nursery industry” (R. Gaskalla, Florida Department of Agriculture and Consumer Services, 1998 personal communication).* Any decision to restrict sale of a particular plant species must include many considerations; that is, economic as well as ecological factors. For example, new cultivars of some escaped ornamental species are reproductively sterile, thus providing for planted landscapes a ready substitute that will not subsequently invade natural areas. The availability of such cultivars is noted in the species treatments where appropriate and known.

*Species of particular economic interest to the Florida nursery industry, a list provided by W. Jolly, Florida Department of Agriculture and Consumer Services (1998 personal communication):

- Ardisia crenata
- Asparagus densiflorus
- Cinnamomum camphora
- Colocasia esculenta
- Eugenia uniflora
- Ficus microcarpa
- Lantana camara
- Ligustrum sinense
- Lonicera japonica
- Nandina domestica
- Psidium cattleianum
- Scaevola sericea
- Schefflera actinophylla
The purpose of this manual is twofold. It is primarily intended to provide a field guide to assist land managers in recognizing the non-native plants of greatest concern that are invading natural areas and, therefore, help develop appropriate control programs. The individual treatments also provide background documentation on the species, including literature reviews and current ranges. Such information has been requested by many interested parties but has not been previously compiled in one document. Besides giving the common names, botanical synonyms, and origin of the non-native plant, each species treatment includes the following subsections:

**Botanical Description**

Details of the plant's form are given in this subsection, including its general habit and identification characters of its stems, leaves, flowers, and fruits. A graduated rule in centimeters and inches is provided inside the book cover for use with the various measurements given. Plants covered in the manual are grouped by their taxonomic class; that is, by their basic relationship of form and reproductive structure. The included class groups are the ferns and the two subclasses of flowering plants—monocots and dicots (see the section title pages for general identification tips for each group). Within each group, the plants are arranged alphabetically by family and within families alphabetically by genus and species. Alphabetical indexes to the scientific names (including synonyms and families) and to the common names of species and families are provided at the end of the manual. The color coding at the top of the page indicates the taxonomic classes.

**Ecological Significance**

An important feature of the manual is this subsection, which provides referenced information about the plant's history of introduction and its impact on native ecosystems. Every effort has been made to draw from the scientific literature published in refereed journals when available. In some cases, little research has been published so far, in part because funding for scientific study of invasive plants has generally been far from adequate. The recent publication of books such as *Strangers in Paradise* (Simberloff et al. 1997) and *Invasive Plants: Weeds of the Global Garden* (Randall and Marinelli 1996) clearly suggests, however, a growing concern among scientists about the impacts of introduced species in natural areas. And here in Florida, university and government scientists have documented observations of invasive non-natives since the 1970s (e.g., Austin 1978, Morton 1976). The increased experience and concern of our natural-area managers, themselves botanists or ecologists working daily in the field with the problem of invasive non-native plants, also strongly suggest that nonjournal information, or “anecdotal” evidence, cannot be taken lightly. Consequently, the summaries in this manual rely upon not only the available scientific literature but also unrefereed government and horticultural publications and personal communications from veteran observers. The availability of sterile cultivars may be noted in this subsection or the next.
Distribution

This subsection provides current information on the native and naturalized range of a plant species worldwide. For Florida range information, two observational databases are frequently referred to, either here or in the “ecological significance” subsection. One is cited as EPPC 1996, a computerized database established by the Florida Exotic Pest Plant Council to build a central source of information on the occurrences of invasive non-natives in Florida natural areas. It is derived from detailed sight records submitted by land managers, that is, local, state, and federal biologists closely familiar with our natural landscapes. Many, but not all, of the records are further supported by herbarium vouchers (identified plant specimens held for future reference in Florida’s regional herbaria). A second database is cited as Wunderlin et al. 1995 (Internet version) or 1996 (CD-ROM version); it was established by the Institute for Systematic Botany at the University of South Florida to provide a quick reference to counties where a plant species occurs (or has occurred) in Florida outside of cultivation. It is based on studies of herbarium specimens housed at USF, Florida State University, University of Florida, and Fairchild Tropical Garden. See the “Literature Cited” list for further details on these databases.

Life History

Referenced information in this subsection focuses on the traits of a plant species that allow it to survive and reproduce, including what is known about the conditions it may thrive in or be limited by. For example, a plant’s cold hardiness is described when information is available; temperature tolerances can be correlated to those on the Florida map on page 7, which delineates hardiness zones established by the U.S. Department of Agriculture. Knowledge about a plant’s developmental characteristics can often help a land manager decide whether a species can be expected to become a major problem in a particular locale, or which season is best for implementation of control measures.

Specific information on the control of particular invasive non-native plant species is not included in this manual. However, such information may be found in Control of Non-native Plants in Natural Areas of Florida, Publication SP 242, available at low cost from IFAS Publications, 1-800-226-1764.
Average minimum-temperature ranges for Florida

<table>
<thead>
<tr>
<th>Region</th>
<th>Temperature Range (°F)</th>
<th>Temperature Range (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8A</td>
<td>15° to 10°</td>
<td>(-9.5° to -12.2°C)</td>
</tr>
<tr>
<td>8B</td>
<td>20° to 15°</td>
<td>(-6.7° to -9.4°C)</td>
</tr>
<tr>
<td>9A</td>
<td>25° to 20°</td>
<td>(-3.9° to -6.6°C)</td>
</tr>
<tr>
<td>9B</td>
<td>30° to 25°</td>
<td>(-1.2° to -3.8°C)</td>
</tr>
<tr>
<td>10A</td>
<td>35° to 30°</td>
<td>(+1.6° to -1.1°C)</td>
</tr>
<tr>
<td>10B</td>
<td>40° to 35°</td>
<td>(+4.4° to +1.7°C)</td>
</tr>
<tr>
<td>11</td>
<td>40°F &amp; above</td>
<td>(+4.5°C &amp; above)</td>
</tr>
</tbody>
</table>
Ferns are vascular plants that do not produce seeds. Sexual reproduction is accomplished by the release of spores, which develop in special structures called sporangia (singular: sporangium). The sporangia usually occur in clusters called sori (singular: sorus), found on the underside of “fertile” leaves. Fern leaves, often called fronds, usually arise from underground stems (rhizomes). The primary divisions of compound leaves are referred to as pinnae (singular: pinna), and further divisions of pinnae are known as pinnules.
Nephrolepis cordifolia (L.) Presl
Dryopteridaceae/Wood Fern Family

**Common Names:** Erect sword fern, tuber sword fern, fish-bone fern, ladder fern, Boston fern

**Synonymy:** Polypodium cordifolium L., Aspidium cordifolium (L.) Swartz
[also sometimes placed in Nephrolepidaceae, ladder fern family, or Davalliaceae, sword fern family]

**Origin:** Tropics, perhaps pantropical

**Botanical Description:** Epiphytic, epilithic (on rock), or terrestrial in habit. Rhizomes suberect, with spreading, orange-brown to pale brown linear scales, these with hairlike tips; wiry, straw colored, scaly stolons usually present in great numbers, often producing small, scaly underground tubers. Leaves (fronds) once pinnate, fertile and sterile fronds similar in shape and size, to 1 m (3 ft) long and 7 cm (2.8 in) wide; petioles to 20 cm (8 in) long, with spreading, pale-brown scales; leaflets (pinnae) many, 40-100 on each side of rachis (main stalk of frond); each leaflet (pinna) oblong-lanceolate with a deltoid lobe (auricle) on upper side of blade base that usually overlaps rachis; leaflet margins entire to slightly toothed; leaflet midvein glabrous above; rachis with two-toned (bicolored) scales above, pale brown with distinctly darker point of attachment. Sori numerous at ends of veinlets between leaflet midvein and margin, with kidney-shaped indusia (tissue covering the sporangia).

**Note:** May be confused with native N. exaltata (L.) Schott, which never bears tubers, has one-color rachis scales (sometimes obscurely bicolored), and has leaflet tips more sharply pointed than those of N. cordifolia (Coile 1996a). Other Nephrolepis species in Florida also with pointed leaflet tips and without the bicolored rachis scales of N. cordifolia.

Scaly tubers

Scaly rachis
**Ecological Significance:** Occurs most densely in partial or full shade of hammocks, as far north as Florida Panhandle (Clewell 1985). Also noted as naturalized in Georgia (Duncan and Kartesz 1981). Can spread aggressively in the landscape, tending to form dense stands that displace native ground cover (K. A. Langeland, University of Florida, personal observations). Said to thrive in common or even poor conditions and produce dense crowns of long, drooping leaves (Bailey and Bailey 1976). By 1981 (Nauman), noted as a widespread escapee from cultivation in central and south Florida. Reported from conservation areas of Dade, Palm Beach, Martin, Collier, and Pinellas counties, in pine rocklands, flatwoods, and marsh edges as well as in hammocks (EPPC 1996). Once thought by some writers (e.g., Wherry 1964) to be native to southernmost Florida, but many herbarium specimens of *N. exaltata* previously misidentified as *N. cordifolia* (Nauman 1981). *N. cordifolia* also not described for Florida in earlier works (e.g., Small 1918a, 1918b), and presently distributed in the state without conformity to natural boundaries such as the frost line (Nauman 1981). Natural populations in Old World found in areas as remote as northwest Himalayas (Gaur and Painuli 1993). Origin in New or Old World tropics still considered uncertain (Nauman 1993b).

**Distribution:** Most abundantly naturalized in peninsular Florida, from Gainesville south (Nauman 1981). Documented by herbarium specimens from 23 counties: Escambia, Leon, and Duval in north Florida, and on both coasts and in the interior from Citrus, Marion, and Volusia south to Dade and Collier (Wunderlin et al. 1995).

**Life History:** Fertile all year (Wunderlin 1982). Spread by natural dispersal of spores and by accidental movement of stolons, tubers, and rhizomes, particularly by dumping of yard refuse. Tuber production apparently limited to plants growing in humus (Nauman 1981). Fronds of plants north of the frost line overwintering in protected areas or dying back—the rhizomes, stolons, or tubers producing new fronds in spring.
Common Name: Incised halberd fern  
Synonymy: Tectaria martinicensis (Spreng.) Copel., Aspidium martinicense Spreng., Aspidium macrophyllum Rudolphi  
[sometimes placed in Aspleniacae, or placed under illegitimate family name of Aspidiacae]  
Origin: Mexico, Central and South America, West Indies  

**Botanical Description:** Terrestrial or epilithic (on rock) in habit. Rhizomes stout, short-creeping, with brownish black scales. Leaves (fronds) pale green, once pinnate, fertile and sterile fronds similar in shape and size; petioles as long or longer than blades, pale brown above, dark brown and scaly at base, pubescent on both sides; blades to 90 cm (35 in) long and 60 cm (24 in) wide, with a large, deeply lobed terminal leaflet (pinna) and below that, 3-6 pairs of mostly entire pinnae; each leaflet of the lowest pair with usually 1 large, downward-pointing (basiscopic) lobe. Sori in 1-several rows on lower surface of leaflets between midvein and margin; indusia (tissue covering sporangia) round-reniform, attached at 1 edge (not centrally attached).

**NOTE:** May be confused with native T. heracleifolia (Willd.) Underw., which has centrally attached (peltate) indusia; dark green, slightly shiny fronds, with all margins at least shallowly lobed and on each of the basal pinnae at least 2 basiscopic lobes. Other Tectaria species in Florida much smaller in size.

**Ecological Significance:** First noted in Florida in the late 1970s (Nauman 1978, Austin et al. 1979), in a few localities. Since noted for several more localities in Dade and Broward County tropical hammocks (D. Austin, Florida Atlantic University, 1997 personal communication), where it competes in the understory with rare native ferns, such as the state-listed threatened species, T. heracleifolia. Thought by some to be of uncertain origin (G. Gann, Institute for Regional Conservation, 1997 personal communication) or possibly native (Lucansky, University of Florida, 1997 personal communication), but appearing from best current evidence to be a recent introduction. Not described for Florida in earlier works (Small 1918a and 1918b, Long and Lakela 1971, Lakela and Long 1976). By 1985 (Lellinger), noted as “rare to infrequent” in Dade and Broward. Grown as a landscape plant (Lellinger 1985) and possibly escaped from cultivation via dumping of yard refuse (Ward, University of Florida, 1997 personal communication). Considered “often a weedy plant” by Standley (1927) in describing ferns of the Panama Canal Zone, a plant “able to persist in partly denuded areas” of Barro Colorado Island. Also noted by Kenoyer (1928) as remaining common in “pioneer forest” areas on the island 50 years after abandoned agricultural cultivation.

**Distribution:** Widely distributed in its native range (Morton 1966). In Florida, found in Dade County in Bill Fadowsky Park, Charles Deering Estate, Black Creek Forest, and Hattie Bauer Hammock, and in Broward County in the Fern Forest Nature Area. Documented by herbarium specimens from these two counties (Wunderlin et al. 1995).
**Lygodium japonicum** (Thunb.) Sw.
Lygodiiaceae/Climbing Fern Family

**Common Name:** Japanese climbing fern

**Synonymy:** Ophioglossum japonicum Thunb. ex Murray [sometimes placed in Schizeaceae, ray fern family]

**Origin:** Eastern Asia, temperate to tropical

**Botanical Description:** Fern with climbing, twining fronds of indeterminate growth, to 30 m (90 ft) long; main rachis wiry, stemlike. Leafy branches off main rachis (constituting the pinnae) compound, triangular in overall outline, 10-20 cm (4-8 in) long and about as wide. Leaflets (pinnules) lobed, stalked, with terminal lobes often dissected (pinnatifid), basal lobes irregularly lobed or dissected; leaf-blade tissue pubescent below with short, curved hairs. Fertile leaflets contracted in shape, with two rows of sporangia along the leaf margin, which is enrolled to partially cover the sporangia.

**Note:** May be confused with *L. microphyllum* (Cav.) R. Brown, Old World climbing fern, but its leaflets unlobed (usually), glabrous below, articulate stalked (leaving wiry stalks when blade detached).

**Ecological Significance:** Present as a weed in the Philippines and considered a common weed in Taiwan (Holm et al. 1979). Most frequently naturalized in north and west Florida, in shady or sunny, usually damp, disturbed areas such as yards and roadsides, but also in less disturbed edges of swamps, marshes, lakes, creeks, hammocks, and upland woodlands. Can form tangle masses over ground cover and shrubs, its dense canopy eliminating the underlying vegetation (Nauman 1993a). Reported forming sun-blocking “walls” of fern in tributary floodplains of the Apalachicola River (L. C. Anderson, Florida State University, 1997 personal communication), and smothering seedlings of overstory tree species (K. C. Burks, Fla. Dept. of Env. Protection, personal observations). Introduced in 1932 as an ornamental (Gordon and Thomas 1994). Reported as weedy in southern Alabama as well (Nauman 1993a).

**Distribution:** Occurs naturalized in the U.S. from the Carolinas through Georgia, Florida, Alabama, Mississippi, and Louisiana, to Texas and Arkansas. In Florida, occurs across north and west Florida and south into central Florida, with documented sightings as far south as Hardee and Highlands counties (Fla. Dept. of Agriculture, unpublished records), and Broward County (R. Pemberton, U. S. Dept. Of Agriculture, 1997 personal communication). Verified herbarium specimens collected from naturalized populations in 29 Florida counties (Wunderlin et al. 1995).

**Life History:** North of the frost line, leaflets die in winter but stalks of leaves usually remain intact, providing a “ladder” for climbing stalks of new growth. Spores wind-dispersed, and perhaps carried in dust on moving objects such as vehicles. Thought to prefer soils of circumneutral pH (Nauman 1993).
Japanese climbing fern

- **Fertile pinnae**
- **At hammock edge, Gulf County**
- **Section of rachis, 2 pinnae**
Lygodium microphyllum (Cav.) R. Brown
Lygodiaceae/Climbing Fern Family

Common Name: Old World climbing fern
Synonymy: Lygodium scandens (L.) Sw., Ugena microphylla Cav.
[sometimes placed in Schizeaceae, ray fern family]
Origin: Africa to Southeast Asia, south Pacific islands, Australia

Botanical Description: Fern with dark brown, wiry rhizomes and climbing, twining fronds of indeterminate growth, to 30 m (90 ft) long; main rachis (leaf stalk above petiole) wiry, stemlike. Leafy branches off main rachis (constituting the pinnae) once compound, oblongish in overall outline, 5-12 cm (2-5 in) long. Leaflets (pinnules) usually unlobed, stalked, articulate (leaving wiry stalks when detached); leaf-blade tissue usually glabrous below; fertile leaflets of similar size, fringed with tiny lobes of enrolled leaf tissue covering the sporangia along the leaf margin.

Note: May be confused with L. japonicum, whose pinnae are often twice compound (see preceding pages).

Ecological Significance: Considered a principal agricultural weed in Malaysia and present as a weed in Vietnam (Holm et al. 1979). Reported from Florida natural areas of Broward, Highlands, Lee, Martin, Palm Beach, and Sarasota counties (EPPC 1996). In 1993, infested 1,233 acres (11% of the area) of Jonathan Dickinson State Park and the Loxahatchee National Wild and Scenic River, including many acres of cypress swamps (Roberts and Richardson 1995). By 1995, infested 17,000 acres (12% of the area) of the Loxahatchee National Wildlife Refuge (Palm Beach County), blanketing entire tree islands and even clambering over sawgrass in standing water (Jewell 1996). Poses management problems for both wildfires and prescribed burns because growth into canopy creates an avenue for fire to spread where swamp waters have usually provided a natural barrier. Has caused loss of some canopy trees with such “crown” fires, as well as loss of native bromeliads residing on tree trunks (S. Farnsworth, Palm Beach County, 1995 personal communication; Roberts 1996).
**Distribution:** Center of dispersal in Florida reported by Beckner (1968) and Nauman and Austin (1978) as Loxahatchee River Basin in southern Martin and northern Palm Beach counties. Herbarium specimens now recorded from Broward, Collier, DeSoto, Highlands, Lee, Polk, and Sarasota counties (Wunderlin et al. 1996). Widespread in Old World tropics from Africa and India to Malaysia and in Australia from Ryukyu Islands south to New South Wales (Singh and Panigrahi 1984, Tagawa and Iwatsuki 1979).

**Life History:** Wiry rhizomes able to accumulate into dense mats 1 m (3 ft) or more thick above native soil (J. Street, Palm Beach County, 1996 personal communication). Vegetative growth and production of fertile pinnules continuous throughout year. Can germinate from spores in 6-7 days, with 5-month-old spores still having an 80% germination rate (Brown 1984). Fertile pinnules usually produced where plant receives sunlight, with such exposed locations also aiding windborne dispersal of the spores. Often establishes first at pineland/wetland ecotone. Usually killed back by fire, but not eliminated (Maithani et al. 1986).
Monocots

Like all flowering plants, monocots produce flowers and form seeds within fruits. The common name of this class of plants derives from the trait of producing 1 seed leaf (cotyledon) at germination. Monocots are nearly always herbaceous in form, never forming true wood (apparent exceptions, such as bamboo stems and palm trunks, derive from hardened vascular bundles or leaf bases, not from true wood cells). The roots of monocots are usually fibrous (i.e., without a taproot), and the leaves usually have parallel veins. The flower parts (sepals, petals, etc.) are usually in threes or multiples of 3.
**Colocasia esculenta (L.) Schott**

**Araceae/Arum Family**

**Common Names:** Taro, wild taro, dasheen

**Synonymy:** Colocasia antiquorum var. esculenta Schott, Caladium esculentum Hort.

**Origin:** India, southeastern Asia

**Botanical Description:** Perennial herb to 1.5 m (4 ft) tall, with thick shoots from a large corm; slender stolons also often produced, along with offshoot corms. Leaf blades to 60 cm (24 in) long and 50 cm (20 in) wide, arrowhead shaped, with upper surface dark green and velvety; leaves peltate (stalked from back of blade); petioles large, succulent, often purplish near top. Inflorescence on a fleshy stalk shorter than leaf petioles; part of fleshy stalk enveloped by a long yellow bract (spathe). Flowers tiny, densely crowded on upper part of fleshy stalk, with female flowers below and male flowers above. Fruit a small berry, in clusters on the fleshy stalk.

**NOTE:** May be confused with other plants in Florida having large arrowhead-shaped leaf blades, such as the native arums (*Peltandra* spp.) and the exotic elephant’s ear (*Xanthosoma sagittifolium*), but leaves of all similar-looking species not peltate (i.e., their petioles are attached at the leaf-blade margin).

**Distribution:** Now found throughout the tropics and much of the subtropics. Considered a principal agricultural weed in Puerto Rico and present as a weed in Jamaica (Holm et al. 1979). Dense to scattered populations reported from natural areas throughout Florida, particularly on the peninsula (EPPC 1996). Also reported from natural areas in southern Georgia, Alabama, Louisiana, and Texas (C. Jacono, U.S. Geological Survey, 1998 personal communication).

**Life History:** Can grow in a wide range of dry to wet sites (de la Pena 1983). Dispersed primarily by purposeful or accidental movement of vegetative fragments. Only a portion of corm crown and petiole needed to establish new plant (Begley 1979). Flowers occasionally, fruit not often seen (Godfrey and Wooten 1979). Seed production (2-5 per berry) considered uncommon, with low viability and difficulty in germination (Jackson et al. 1977, Nyman and Arditti 1985, O’Hair et al. 1982, Strauss 1983).
**Common Name:** Waterlettuce  
**Synonymy:** None  
**Origin:** Africa or South America

**Botanical Description:** Floating herb in rosettes of gray-green leaves, rosettes occurring singly or connected to others by short stolons. Roots numerous, feathery. Leaves often spongy near base, densely soft pubescent with obvious parallel veins, slightly broader than long, widest at apex, to 15 cm (6 in) long. Flowers inconspicuous, clustered on small fleshy stalk nearly hidden in leaf axils, with single female flower below and whorl of male flowers above. Fruit arising from female flower as a many-seeded green berry.

**Ecological Significance:** May have been introduced to North America by natural means or by humans (Stoddard 1989). Seen as early as 1774 by William Bartram, in “vast quantities ... several miles in length, and in some places a quarter of a mile in breadth” in the St. Johns River (Van Doren 1928). Has been suggested that trade via St. Augustine, founded in 1565, may have provided an early avenue for introduction into the St. Johns watershed (Stuckey and Les 1984). Capable of forming vast mats that disrupt submersed plant and animal communities and interfere with water movement and navigation (Bruner 1982, Attionu 1976, Sharma 1984, Holm et al. 1977); also serves as host for at least 2 genera of mosquitoes (Holm et al. 1977). Considered a serious weed in Ceylon, Ghana, Indonesia, and Thailand and at least present as a weed in 40 other countries (Holm et al. 1979). A target of management research and control in Florida for at least 2 decades.
**Distribution**: Now one of the most widely distributed hydrophytes in the tropics (Holm et al. 1977). In North America, occurs in peninsular Florida and locally westward to Texas (Godfrey and Wooten 1979). Also found persisting in coastal South Carolina (Nelson 1993). Occurred in 68 public water bodies in Florida by 1982 and in 128 water bodies by 1989, but total abundance reduced by half over same time period as a result of a statewide management program (Schardt and Schmitz 1990).

**Life History**: Reproduces rapidly by vegetative offshoots formed on short, brittle stolons. Varies seasonally in density of rosettes, from less than 100 to over 1,000 per m² in south Florida (Dewald and Lounibos 1990). Seed production, once thought not to occur in North America, now considered important to reproduction and dispersal (Dray and Center 1989). Not cold tolerant (Holm et al. 1977). Can survive for extended periods of time on moist muck, sandbars, and banks (Holm et al. 1977).
**Common Names:** Oyster plant, boat lily, Moses-in-a-boat  
**Synonymy:** Tradescantia spathacea Swartz, Rhoeo discolor (L’Hèr.) Hance  
**Origin:** West Indies, Mexico, Central America

**Botanical Description:** Perennial herb with short, stout stem nearly hidden by overlapping leaf bases. Forms clumps by offshoots from fleshy rootstock. Leaves spreading-erect, closely overlapping in spiral pattern. Blades broadly linear, sharp-tipped, waxy, stiff, somewhat fleshy, 15-30 cm (6-12 in) long and 2.5-8 cm (1-3 in) wide; upper surfaces dark green or green with pale yellow stripes; lower surfaces usually purple. Flowers small, white, clustered within a folded (boat-shaped) bract (spathé) 3-4 cm long, short-stalked from leaf axils. Three petals, 6 stamens with hairy stalks; fruit a 2-seeded capsule, in clusters within the bract.

**Ecological Significance:** Introduced from tropical America (Morton and Ledin 1952, Small 1933). A favorite garden plant in the tropics, noted in 1933 (Small) as naturalized in peninsular Florida, in cultivated grounds and pinelands. Also noted as naturalized in 1947 (Bailey and Bailey), in 1968 (Ward), and later as a rare escapee from cultivation in southwest Florida (Wunderlin 1982). Noted as spreading irrepressibly in south Florida, volunteering far from planting sites on rock walls and building roofs, and on trees (Morton 1976, 1982). Spreads readily from cultivation by both seed and self-propagation of offshoots (Watkins and Wolfe 1986). Forms dense ground cover and clumps quickly (Hunt 1977). Has escaped into coastal tropical hammocks, where the dense cover prevents seedling growth of native canopy tree species (D. F. Austin, Florida Atlantic University, 1996 personal communication).
**Distribution:** Cultivated widely in the tropics and as a houseplant elsewhere (Small 1933). Reported from natural areas of Brevard, Broward, Dade, Lee, Martin, and Palm Beach counties, in scrub, hammocks, and slough edges (EPPC 1996). Naturalized populations documented by herbarium specimens from Broward, Dade, Lee, and Monroe counties (Wunderlin et al. 1995).

**Life History:** Roots renewed easily when pulled up or broken (Morton 1982). Sensitive to freezing; can grow in high or medium light (Broschat and Meerow 1991). Flowers all year (Wunderlin 1982), providing year-round availability of small, slender seeds. Cross-pollinated by insects, or self-pollinated (Zomlefer 1983). Dispersed by seed to aerial surfaces such as walls, but vector of transport uncertain, perhaps wind. Recent “dwarf” cultivars apparently sterile or limited in their seed production, spreading primarily by vegetative offshoots where planted (Steve Kent, Tree of Life Nursery, 1998 personal communication). Leaves eaten, or at least nibbled, by raccoons, ducks, and dogs (Morton 1982). Can cause in humans a stinging, itching, and/or rash from contact with plant surfaces or the copious astringent juice (Morton 1982).
Common Names: Green, or white-flowered, wandering Jew
Synonymy: T. albiflora Kunth
Origin: Tropical South America

Botanical Description: Creeping, trailing, subsucculent perennial herb, much branched, with branch tips erect; often forming dense ground cover; prostrate stems rooting freely at nodes. Leaves parallel-veined, alternate, simple, all glossy green or tinged with purple below; leaf blades arising from short, closed sheaths (tops often ciliate); blades to 5 cm (2 in) long and 2 cm (0.75 in) wide, oblong to ovate, with tips pointed; glabrous or with ciliate margins. Flowers white, in small clusters at stem tips, subtended by 1-3 leaflike bracts similar in size and form to stem leaves; 3 sepals and petals, separate; sepals usually with a line of hairs; 6 stamens, white bearded (pilose); ovary 3-celled, 6-seeded. Fruits small, 3-parted capsules; seeds black, pitted.

Ecological Significance: Occurs most densely in partial or full shade of disturbed and undisturbed hammocks, particularly in moist or wet areas but also in well-drained woodlands and shady residential yards. Forms dense monocultural ground cover that can be 60 cm (2 ft) deep in overlapping leafy stems (Kelly and Skipworth 1984). Smothers native ground cover and seedlings of overstory species (K. C. Burks, Florida DEP, personal observation; Godfrey and Wooten 1979); acts similarly in remnant lowland forests of New Zealand (Kelly and Skipworth 1984), where it has become an important natural-area pest. Also a weed of disturbed areas in New South Wales, Australia (Reed 1977), and an agricultural weed in its native range, particularly Brazil (Kelly and Skipworth 1984). Recognized in 1947 (Bailey and Bailey 1947) as a common weed under benches in commercial greenhouses, and as naturalized in the Southeast (Bailey and Bailey 1976). Noted as naturalized in sandy woods and waste places from Florida to North Carolina (Small 1933), but in later works shown only for Florida (e.g., Radford et al. 1968, Godfrey and Wooten 1979). Still cultivated, most often as a house or patio plant. Once established, difficult to control without nontarget damage (J. Weimer, Paynes Prairie Preserve, 1996 personal communication).
**Distribution:** Found most abundantly naturalized in north central Florida, from Gainesville to Orlando, but documented by herbarium specimens for 10 counties, including Leon and Calhoun in the Panhandle, Flagler on the east coast, and Hillsborough on the west (Wunderlin et al. 1995). Reported by conservation-area managers primarily for Alachua and Marion counties (EPPC 1996), with several dense populations noted in bottomland forests.

**Life History:** Spreads successfully by vegetative means; stem fragments with just 1 node remaining viable and rooting freely (Kelly and Skipworth 1984). May have main stems averaging 1.5 m (5 ft) long, with an additional 1.5 m of branches; a dense square meter of cover potentially supporting a standing crop of 900 m (2,880 ft) of plant (Kelly and Skipworth 1984). Flowers in spring and fall in north Florida; level of seed viability not known. Resists cold to -4°C (25°F) in laboratory experiments (Bannister 1986). Cultivars with variegated leaves apparently revert to full green in shade (IMP 1985). Can be used as larval host for native noctuid moth, Mouralia tinctoides (Guenè), a species related to cabbage and soybean loopers but not reported as a pest itself (Landolt 1993).
**Dioscorea alata L.**
Dioscoreaceae/Yam Family

**Common Names:** Greater, water, white, or winged yam  
**Synonymy:** D. atropurpurea Roxb., D. purpurea Roxb., D. sativa Del.  
**Origin:** Southeast Asia

**Botanical Description:** Vigorously twining herbaceous vine, from massive underground tuber. Stems to 10 m (30 ft) or more in length, freely branching above; internodes square in cross section, with corners compressed into “wings,” these often red-purple tinged. Aerial tubers (bulbils) formed in leaf axils (not as freely as in D. bulbifera), elongate, to 10 cm (4 in) x 3 cm (1.2 in), with rough, bumpy surfaces. Leaves long petioled, opposite (often with only 1 leaf persistent); blades to 20 cm (8 in) or more long, narrowly heart shaped, with basal lobes often angular. Flowers small, occasional, male and female arising from leaf axils on separate plants (i.e., a dioecious species), male flowers in panicles to 30 cm (1 ft) long, female flowers in smaller spikes. Fruit a 3-parted capsule; seeds winged.

**Note:** May be confused with D. bulbifera L., which has small or absent underground tubers, more numerous aerial tubers, and alternate leaves (see next pages). Native wild yams, D. floridana Bartl. and D. quarternata (Walt.) Gmel., infrequent in hammocks and floodplains of north and west Florida, never forming aerial tubers, leaf blades rarely to 15 cm (6 in) long.


**Distribution:** Cultivated throughout the tropics for its edible underground tuber, and

**Life History:** Normally grows for 8-10 months, then goes dormant for 3-4 months, with aerial stems dying back during dormancy (Martin and Rhodes 1977). Grown commercially as far north as southern Japan, a latitude similar to south Georgia's (Okagami 1986). Said to survive winters in France if planted deep enough (Coursey 1967). Fertile seeds rarely produced; spread by aerial tubers and fragments of underground tuber (Coursey 1967).
**Dioscorea bulbifera L.**
Dioscoreaceae/Yam Family

**Common Names:** Air potato, potato yam, air yam

**Synonymy:**
- D. anthropophagum Chev.
- D. hoffa Cordemoy
- D. sativa Thunb.
- D. sylvestris de Wild.
- Helmia bulbifera Kunth.

**Origin:** Tropical Asia

**Botanical Description:** Vigorously twining herbaceous vine, with small or absent underground tubers. Stems to 20 m (66 ft) or more in length, freely branching above; internodes round or slightly angled in cross section, not winged (as in *D. alata*). Aerial tubers (bulbils) freely formed in leaf axils, usually roundish, to 12 cm (5 in) x 10 cm (4 in), with mostly smooth surfaces. Leaves long petioled, alternate; blades to 20 cm (8 in) or more long, broadly heart shaped, with basal lobes usually rounded. Flowers rare (in Florida), small, fragrant, male and female arising from leaf axils on separate plants (i.e., a dioecious species), in panicles or spikes to 11 cm (4 in) long. Fruit a capsule; seeds partially winged.

**Note:** May be confused with *D. alata* L. or native wild yams (see note under *D. alata*).

**Ecological Significance:** Listed by Holm et al. (1979) as a serious weed in west Polynesia. Introduced to the Americas from Africa during the slave trade (Coursey 1967). Apparently introduced to Florida in 1905 as a USDA sample sent to an Orange County horticulturist, Henry Nehrling, who found that it “soon formed impenetrable masses,” adding that except for kudzu vine, he had “never seen a more aggressive and dangerous vine in Florida” (Morton 1976). Described in 1971 (Long and Lakela) as being grown ornamentally but “an unwanted plant in central and south Florida.” Noted as “becoming extensively naturalized” in 1977 (Ward) and well established in Dade and Broward counties (Austin 1978). By 1982 (Bell and Taylor, Wunderlin), invading a variety of habitats including pinelands and hammocks. Considered “rampant on undeveloped land” in Hillsborough County (Martinez 1993). Can quickly engulf native vegetation, climbing high into mature tree canopies. Produces large numbers of aerial tubers, which accelerate its spread. Reported from natural areas in 23 Florida counties, from Duval County south throughout the peninsula to Collier and Dade counties (EPPC 1996).
**Distribution:** Widely distributed in Asia and Africa in the wild state (Coursey 1967) and widely naturalized elsewhere in the tropics and subtropics, including Central and South America (Schultz 1993). In Florida, herbarium records now reported for naturalized populations in 17 counties, from Jackson and Franklin counties in the Panhandle, and Alachua and Marion counties in the north-central peninsula, south to Dade County (Wunderlin et al. 1996).

**Life History:** Has a dormant period (like *D. alata*), even in south Florida, with aerial stems dying back during winter months (Schultz 1993). Aerial tubers considered the main storage organ (Coursey 1967), but underground tubers found in Florida populations, to 25 cm in diameter (Schultz 1993). Tubers known to float, aiding in dispersal (Coursey 1967), but plants slowed in growth under flooded conditions (K. Burks, Florida Department of Environmental Protection, unpublished data). Once thought not to flower in Florida (e.g., Long and Lakela 1971), but flowers observed in north Florida, and flowers and fruits in south Florida (Schultz 1993). Cultivated in Oceania and West Indies, but wild-form tubers usually bitter and often poisonous (Martin 1974).
**Common Names:** Hydrilla, water thyme, Florida elodea, waterweed

**Synonymy:** None

**Origin:** Warmer regions of Old World

**Botanical Description:** Submersed, usually rooted, aquatic perennial herb with slender ascending stems to 9m (30 ft) long, heavily branched. Stems from slender rhizomes, these often tipped with a small tuber. Leaves whorled, 3-8 per whorl, 2-4 mm (0.1-0.2 in) wide and 6-20 mm (0.2-0.8 in) long, bearing coarse (visible) teeth along the margins and usually 1-4 small conical bumps along underside of midrib, which is often red. Fleshy axillary buds (turions) often formed at leaf axils, to 5 cm (2 in) long, with 3 sepals and 3 petals, each about 4 mm (0.3 in) long, whitish or translucent, floating at water surface. Male flowers detached and free floating at maturity, with 3 sepals and 3 petals, white to reddish brown, about 2mm long, releasing floating pollen from stamens when flower pops open at water surface.

**NOTE:** May be confused with another invasive non-native submersed aquatic, Egeria densa Planch., Brazilian waterweed, which has close whorls of 3-6 leaves usually 2-3 cm long, with minute teeth on margins and no conical bumps on midrib below.

**Ecological Significance:** Introduced in Florida waters in 1960 and spreading to all drainage basins in the state by the early 1970’s (Langeland 1996). By 1991, found in 41% of Florida’s public water bodies (Schmitz et al. 1993); by 1994, found in 43% (182), with an estimated coverage of 38,500 ha (95,000 acres) (Schardt 1997). Competitively displaces native submersed plant communities (Haller and Sutton 1975, Bowes et al. 1977). In dense stands, alters fisheries populations (Colle and Shireman 1980), causes shifts in zooplankton communities (Schmitz and Osborne 1984), and affects water chemistry (Canfield et al. 1983).
**Distribution**: Found on every continent except Antarctica (Cook and Lüönd 1982). In the United States, dioecious plants (fortunately just 1 sex, female) found in Florida, Georgia, Alabama, Tennessee, Mississippi, Louisiana, Texas, California, and Connecticut; monoecious plants found in Maryland, Delaware, Washington, and Washington, D.C.; both types found in the Carolinas and Virginia (Netherland 1997).

**Life History**: Radioually dispersed by movement of plant fragments (Langeland and Sutton 1980). Can produce up to 6,000 tubers per m² (Sutton et al. 1992). Tubers viable for several days out of water (Basiouny et al. 1978), for over 4 years in undisturbed sediment (Van and Steward 1990), and after ingestion and regurgitation by waterfowl (Joyce et al. 1980). Can produce nearly 3,000 turions per m² (Thullen 1990). Viable seed produced by monoecious plants, but their importance to dispersal not known (Langeland and Smith 1984). Female dioecious plants from Florida found able to cross with monoecious strains and produce viable seed under laboratory conditions (Steward 1993).
**Asparagus densiflorus (Kunth) Jessop**
Liliaceae/Lily Family

**Common Names:** Asparagus fern, Sprenger's asparagus fern, emerald fern

**Synonymy:** Asparagus sprengeri Regel

**Origin:** South Africa

**Botanical Description:** Evergreen perennial herb from a crown of tuberous roots, to 60 cm (2 ft) in height, with stems stiff or spreading-arching to 2 m (6 ft) long. Larger branches usually bearing minute axillary spines. Branchlets (cladophylls) flat, needle-like, light bright green, to 2.5 cm (1 in) long, clustered at branch nodes. Leaves tiny, scale-like, at bases of branchlets. Flowers small, white or pinkish white, and fragrant. Fruit a bright red berry about 8 mm (< 1 in) in diameter; 3 seeds per fruit.

**Ecological Significance:** Widely planted as a ground cover (Stresau 1986). Escaped from cultivation (Long and Lakela 1971, Wunderlin 1982). Found in large colonies on several scrub sites in Palm Beach County, displacing native ground cover and understory shrubs (Austin et al. 1992), and in Dade County, found in 7 local parks (R. Hammer, Miami-Dade County Parks Department, 1997 personal communication). Has escaped as well into tropical hammocks in Palm Beach County, overtopping young native plants such as wild coffee, Psychotria nervosa (A. Zahorcak, Florida Department of Environmental Protection, 1998 personal communication). Naturalized in barrier-island habitats of Sarasota County (K. A. Langeland, University of Florida, personal observation). Also reported from natural areas in Citrus, Lake, and Lee counties (EPPC 1996).
**Distribution:** Native to South Africa and long cultivated in the United States and elsewhere as a potted plant (Bailey and Bailey 1947, 1976). In Florida, herbarium specimens of naturalized populations recorded from Hillsborough, Manatee, Pinellas, Lee, Polk, and Monroe counties (Wunderlin et al. 1995).

**Hymenachne amplexicaulis** (Rudge) Nees

Poaceae (Gramineae)/Grass Family

**Common Names:** West Indian marsh grass, trompetilla

**Synonymy:** Panicum amplexicaulis Rudge

**Origin:** West Indies, tropical Central and South America

**Botanical Description:** Robust perennial grass from stolons. Stems floating, creeping, or ascending to 1 m (3 ft) or more in height, sparingly branched, rooting at the lower nodes; stems pithy, not hollow. Leaf sheaths glabrous but with hairs on upper margins; ligule a membrane. Leaf blades flat, to 35 cm (14 in) long and to 4 cm (1.6 in) wide, cordate at the base and clasping the stem (amplexicaul); glabrous but with long hairs on lower margins. Inflorescence a terminal panicle, dense and spike-like, about 8 mm (0.3 in) wide and to 50 cm (20 in) long; spikelets short stalked, 3.3-4.3 mm long, scabrous on the veins, often opened slightly at the apex.

**Note:** May be confused with the native Sacciolepis striata (L.) Nash, American cupscale, which has a similar inflorescence, or with other marsh grasses of similar form, but *Hymenachne* stems distinctive in containing white pith (most grass stems are hollow) (Pohl and Lersten 1975).

**Ecological Significance:** First noted in botanical works for Florida in 1968 (Ward); described by Hall (1978) as “rare” in “low wet pastures” of south Florida. Possibly a natural introduction by migratory birds; can form extensive colonies in its natural habitats (Hill 1996). Has become, along with pará grass, the dominant species in much of the Myakka River basin’s native maidencane marsh, occurring primarily in the deeper water along the river channel while pará grass dominates the shallower zones near the uplands (J. Huffman 1992). Observed in 1993 as “common” in ditches, marshes, and mucky wet areas south of Clewiston, and in “large stands” in nearby detention ponds (E. C. Watson, U.S. Sugar Corp., 1993 personal communication). Dense populations also reported for the Ringling MacArthur tract in Sarasota County and for Mountain Lake in Hernando County (EPPC 1996), and for marsh areas along Fisheating Creek, near Lake Okeechobee, where it is displacing maidencane communities (Jackie Smith, Florida Department of Environmental Protection, 1995 personal communication). Scattered colonies reported for Collier Seminole State Park (EPPC 1996). Colonizing and becoming difficult to control along drainage canals of south central Florida (Mike Bodle, South Florida Water Management District, 1997 personal communication).

**Distribution:** Now found in tropics of both hemispheres (Howard 1979). In Florida, documented by herbarium specimens from Collier, Hendry, Lee, Palm Beach, and Sarasota counties (Wunderlin et al. 1995). Considered a principal agricultural weed in Surinam, a common weed in Indonesia, and present as a weed in Trinidad (Holm et al. 1979).
**Life History:** Adapted to fluctuating water levels, i.e., cycles of flooding and drying, which allow massive regeneration by seed and ensure persistence after extensive drought periods (Wildin 1988). Observed as tolerating 40 weeks of flooding and maximum flooding depths of 1.2 m (4 ft) (Tejos 1980). Flowers in the fall (Wunderlin 1982), with observed germination rates variable, 0-86% (Hill 1996). Seed more widely dispersed during periods of high standing water (J. Mullahey, University of Florida, personal observations).
Common Name: Cogon grass
Synonymy: Imperata cylindrica (L.) Beauv.; I. brasiliensis Trinius misapplied
Origin: Southeast Asia

Botanical Description: Perennial grass, growing in loose or compact tufts, from stout, extensively creeping, scaly rhizomes with sharp-pointed tips. Leaf sheaths relatively short, glabrous or pubescent; ligule a membrane, 0.5-1 mm long. Leaf blades erect, narrow and pubescent at base, flat and glabrous above, to 1.2 m (4 ft) tall and to 2 cm (<1 in) wide, with whitish midvein noticeably off-center; blade margins scabrous, blade tips sharp pointed. Inflorescence a narrow, dense terminal panicle, white silky and plume-like, to 21 cm (8 in) long and 3.5 cm (1.5 in) wide. Spikelets crowded, paired on unequal stalks, with each spikelet surrounded by long white hairs.

Ecological Significance: Considered one of the top 10 worst weeds in the world, reported by 73 countries as a pest in a total of 35 crops (Holm et al. 1977). Introduced to the United States in 1911 near Mobile, Alabama as packing material in a shipment of plants from Japan (Dickens 1974, Tabor 1949, Tabor 1952); and into Mississippi as a forage crop from the Philippines before 1920 (Dickens and Buchanan 1971, Patterson et al. 1979, Tabor 1949 and 1952, Tanner and Werner 1986). Replanted to Florida from Mississippi for forage and soil stabilization in Gainesville, Brooksville, and Withlacoochee (Hall 1983, Tabor 1949)—these areas now with high densities of naturalized populations (Dickens and Buchanan 1971, Willard 1988). By 1949, more than 405 ha (1,000 acres) of the grass established in central and northwest Florida (Dickens 1974). Now frequent along transportation and utility corridors throughout Florida. Has invaded dry to moist natural areas in over 20 counties (EPPC 1996), including habitats of federally listed endangered and threatened native plant species (K. C. Burks, Florida Department of Environmental Protection, 1997 personal communication).
**Distribution:** Commonly found in humid tropics but has spread to warm temperate zones worldwide (Hubbard et al. 1944). Currently reported for all of Florida, plus parts of Alabama, Georgia, Louisiana, and Mississippi, along with an adventive (but perhaps not persistent) population in South Carolina (Allen and Thomas 1991, Elmore 1986, Bryson and Carter 1993).

**Life History:** Fast-growing; thrives in areas of minimal tillage, such as orchards, lawns, and roadsides (Patterson et al. 1979). Produces new rhizomes readily, facilitating the plant’s spread at newly colonized sites; can propagate by rhizome fragments but does not survive well under regular deep tilling (Wilcut et al. 1988). Roots and rhizomes remarkably resistant to fire (Bryson and Carter 1993). Disperses over long distances into a variety of habitats by windborne seeds (Bryson and Carter 1993). Flowers in spring or fall, or year-round in central and south Florida (Willard 1988).
Common Names: Silk reed, Burma reed, cane grass
Synonymy: None (N. arundinacea (L.) Henr. misapplied)
Origin: South Asia

Botanical Description: Robust, reed-like perennial to 3 m (10 ft) tall, forming clumps from short, coarse rhizomes. Stems often branched and filled with soft pith. Leaf sheaths 10-25 cm (4-10 in) long, smooth, shining, clasping, woolly at the top with a line of collar hairs and ligule of hairs. Leaf blades linear, flat or involute, 20-100 cm (8-39 in) long and 8-25 mm (0.3-1 in) wide, glabrous below, sparsely short-hairy above, with margins smooth or rough and midvein inconspicuous; blades often deciduous from sheaths. Inflorescence a large, feathery, silver-hairy terminal panicle, 30-60 cm (12-24 in) long, densely and finely branched, nodding. Spikelets 6-8 mm (0.2-0.3 in) long, 4- to 8-flowered, with lemmas long-hairy and slender-awned (awns often curved).

NOTE: May be confused with the common reed, Phragmites australis (Cav.) Trin. ex Steud., but its rhizomes long, often forming leafy stolons; its leaf sheaths without a hairy collar; and its spikelets without awns.

Ecological Significance: Introduced by USDA to its Plant Introduction Station in Coconut Grove in 1916 (Gordon and Thomas 1997). Reported as escaping in southeastern Florida by several authors (Hitchcock and Chase 1951, Ward 1968, Bailey and Bailey 1976, Morton 1976, Austin 1978, Hall 1978). By 1990, documented as a serious pest in Dade County and as naturalized in Collier County (Guala 1990). Able to colonize marginal and undisturbed habitats once established in an area (Guala 1990). Now well established in the globally rare pine rockland habitats of Dade County and viewed as a threat to rare species there, especially since its high flammability promotes frequent fires, enhancing its spread (Schmitz et al. 1997). By 1993, established in nearly 75% of Dade County pine rocklands outside Everglades National Park, with high mortality of the native south Florida slash pine (Pinus elliottii var. densa) linked to fires involving this grass (Maguire 1993). In its native range, reported to grow gregariously by roadsides and in old clearings, bogs, and agricultural fields, often on infertile and rocky soils (Lazarides 1980).
Distribution: Occurs in a wide variety of habitats to 2,000 m (6,500 ft) in elevation in its native range (Bor 1960, Lazarides 1980). Reported as introduced in the Bahamas (Correll and Correll 1982). In Florida, currently found in Collier, Monroe (including the Florida Keys), Dade, Broward, and Palm Beach counties (Schmitz 1994, Wunderlin et al. 1996), and possibly in Highlands County, where it was once cultivated (Guala 1990). Has been cultivated as far north as southern Georgia (Schmitz et al. 1997, Guala 1990).

Life History: Tolerant of a wide range of soil, light, and water regimes, including marshy areas, but appears to prefer open, sunny, dry sites, usually disturbed ones (Guala 1990). Aerial stems usually killed by freezing temperatures, but observed to vigorously resprout from rhizomes after hard frosts (Guala 1990). Flowers nearly year-round, seeds dispersed by wind.
**Common Names:** Torpedo grass, quack grass, bullet grass  
**Synonymy:** Panicum littorale Mohr ex Vasey  
**Origin:** Old World

**Botanical Description:** Perennial grass to 1 m (3 ft) tall, from sturdy, vigorous, widely creeping or floating rhizomes with overlapping brownish to white scales and rigid sharp-pointed (torpedo-like) growing tips. Aerial stems erect or leaning, lower portions often wrapped in bladeless sheaths. Upper leaf sheaths glabrous or hairy, usually at least with hairs on upper margins; ligule a short-ciliate membrane; leaf blades stiff, linear, flat or folded, to 26 cm (10 in) long and 5.3 mm (0.3 in) wide, glabrous or sparsely hairy below, usually long-hairy above, especially near base behind ligule; blade surfaces often with a whitish waxy coating (“bloom”). Inflorescence a loose open terminal panicle, 7-22 cm (3-9 in) long, with branches erect or ascending. Spikelets 2-3 mm long and about 1 mm wide, glabrous, the first glume (outermost spikelet bract) short, truncate, loose, nearly encircling the base of the other spikelet bracts.

**Ecological Significance:** Reported as a weed of 17 crops in 27 countries, considered one of the most serious grass weeds (Holm et al. 1977). Introduced into Gulf Coast of United States before 1876, being first collected that year near Mobile, Alabama (Beal 1896). Seed introduced for forage crops in the South from 1926 (Tarver 1979). By 1950, planted in nearly every southern Florida county and in a few central and north-central counties (Hodges and Jones 1950). Quickly forms monocultures that displace native vegetation, particularly in or near shallow waters (Shilling and Haller 1989). Occurred in 70% of Florida’s public waters by 1992, with the largest infestation in Lake Okeechobee, displacing nearly 5,670 ha (14,000 acres) of native marsh (Schardt 1994). Also reported from parks and preserves throughout Florida (EPPC 1996). Has cost an estimated $2 million a year for its management in flood control systems (Schardt and Schmitz 1991). Has seriously infested citrus groves and golf courses throughout Florida (Baird et al. 1983, Fleming et al. 1978).
**Distribution:** Now found in the tropics and subtropics from approximately 43° North latitude to 35° South latitude (Holm et al. 1977). Occurs from Florida to Texas in the Southeast (Godfrey and Wooten 1979), northward along the Atlantic Coast to North Carolina (C. Jacono, U.S. Geological Survey, 1998 personal communication), and in California (Small 1933) and Hawaii, where it is a pest in sugarcane (Holm et al. 1977). Occurs naturalized in 75% of Florida’s 67 counties (Wunderlin et al. 1995).

**Life History:** Tolerant of drought and partial shade, and can grow on heavy upland soils, but thrives in moist to wet sandy or organic soil (Hodges and Jones 1950, Holm et al. 1977). Stimulated in its spread by tilling and fertilization (Hodges and Jones 1950). Reproduces principally by rhizome extension and fragmentation (Holm et al. 1977). Flowers nearly year-round, but variable in its seed abundance and viability (Whyte et al. 1959, Peng and Twu 1979, Wilcut et al. 1988).
\textit{Pennisetum purpureum} Schumach.

\textbf{Poaceae (Gramineae)/Grass Family}

**Common Names:** Napier grass, elephant grass, Merker grass  
**Synonymy:** None  
**Origin:** Africa

**Botanical Description:** Robust perennial to 4 m (13 ft) tall, forming thick clumps or colonies from basal offshoots or short rhizomes. Stems often branched above; internodes more or less bluish glaucous; young nodes with white hairs, later becoming smooth, glabrous. Leaf sheaths glabrous, usually shorter than the internodes; ligule a narrow rim densely fringed with long white hairs. Leaf blades linear to tapering, flat, often bluish green, to 1 m (39 in) long and 3 cm (1 in) wide, pilose near the base, especially on margins; blade margins generally rough; midvein stout, whitish above, strongly keeled below. Inflorescence a dense terminal panicle, spike-like, bristly, tawny to purple-tinged, to about 20 cm (8 in) long and 2 cm (0.8 in) across. Spikelets 4-6 mm long, solitary or in clusters of 2-6 on hairy axis, surrounded by sparsely plumose bristles to 2 cm long that fall with the spikelets at maturity; outermost glume minute or absent.

**Note:** May be confused with the larger native foxtails (\textit{Setaria} spp., also called bristle grasses), but their spikelet bristles persistent on the flowering stalks, not falling with mature spikelets. Distinguished from other \textit{Pennisetum} species in Florida by long leaf blades, sparsely plumose bristles, and minute or absent first glumes.

**Ecological Significance:** Reported as a weed in 19 crops in 25 countries, including the United States (Holm et al. 1977). In dense growth, prevents regeneration of native species (Cronk and Fuller 1995). Can dominate fire-adapted savanna communities (Holm et al. 1977). Introduced to the United States in 1913 as a forage crop (Thompson 1919, Hoover et al. 1948). Noted as escaping in 1968 (Ward 1968), and as established in glades in south Florida by 1971 (Long and Lakela 1971). Now commonly naturalized in central and south Florida, infrequently in north and west Florida, most often in disturbed areas such as roadsides, canal banks, and fields, but also in scrub, pine rockland, hammock, sink, lake shore, swamp, and prairie habitats (Hall 1978). Reported in colonies on the shores of 11 public water bodies by 1992 (Schardt 1994). Has also created problems in flood-control systems by blocking access to canals, reducing water flows, and overgrowing pump stations (Schardt and Schmitz 1991). Still the subject of research for improved cultivars and hybrids as forage and silage in Florida and elsewhere (e.g., Díaz et al. 1994, Philips et al. 1993, Spitaleri et al. 1994, Williams and Hanaa 1995).
**Distribution**: Throughout the tropics and subtropics, Old and New World (Archer and Bunch 1953). Currently found in 29 Florida counties (Wunderlin et al. 1995). Reported from 10 preserves in south Florida (EPPC 1996). Also naturalized and weedy in California, Hawaii, Puerto Rico, and the Virgin Islands (Holm et al. 1979, USDA 1997).

**Life History**: Grows well on a wide range of soils and in many habitats; very drought resistant; can form “reed jungles” in rich, moist soils (Holm et al. 1977). Forms dense clumps by extensive tillering; propagated vegetatively by root crown divisions or rhizome and stem fragments (Holm et al. 1977). Resprouts easily from small rhizomes left after mechanical control (Cunningham 1991). Able to persist in changing conditions from extensive, deep, fibrous root system, but can be injured by freezes (Holm et al. 1977). Flowers July through February. Does not readily produce viable seed in many countries, but good seed crops reported in El Salvador (Holm et al. 1977).
**Urochloa mutica** (Forsk.) Nguyen

*Poaceae (Gramineae)/Grass Family*

**Common Names:** Pará grass, California grass, buffalo grass, water grass, Scotch grass, Carib grass

**Synonymy:** Brachiaria mutica (Forsk.) Stapf, Brachiaria purpureascens (Raddi) Henr., Panicum muticum Forsk., Panicum purpureascens Raddi

**Origin:** Africa

**Botanical Description:** Perennial grass from widely creeping stolons. Stems reclining at base, rooting at the lower nodes, to 1 m (3 ft) tall when erect, to 3 m (15 ft) long when creeping; nodes swollen, densely hairy. Leaf sheaths with dense stiff hairs below, slightly hairy above; ligule a densely ciliate membrane; leaf blades flat, 10-15 mm (0.4-0.6 in) wide and 25-30 cm (10-12 in) long, glabrous but often with small fine hairs at base above and below. Inflorescence a terminal panicle to 20 cm (8 in) long, with 8-20 ascending, alternate branches; spikelets (reduced flowers) dense on the branches, paired, each about 3 mm long, glabrous, often purple tinged.

**Ecological Significance:** Introduced in most tropical and subtropical regions of the world as a fodder grass, but also considered one of the world’s worst weeds; reported as an agricultural pest in 23 crops in 34 countries, including the United States (Holm et al. 1977). Competes aggressively with other plants, with fast growth, high productivity, and allelopathic abilities that allow it to form dense monocultural stands (Chang-Hung 1977, Handley et al. 1989). Probably introduced into the Americas via Brazil “at an early date” (Hitchcock and Chase 1951); may have been introduced into Florida as early as the late 1870s (Austin 1978); recommended for pasturage here in 1919 (Thompson 1919b). Invades disturbed low areas such as canals, but also displaces native vegetation along river and lake shorelines and in marshes and swamps. Found in 51 public water bodies in 1982 and 183 water bodies by 1994—down from a 1986 high of 207, or 52% of Florida’s public waters (Schardt and Schmitz 1991, Schardt 1997).

*In Myakka River basin, Sarasota County*
Distribution: Now commonly escaped from cultivation in central and south Florida. Documented by herbarium specimens from 15 counties, from Pinellas on the west to Brevard on the east and south to the Florida Keys (Wunderlin et al. 1995). Also reported from wetland natural areas in Sarasota, Hillsborough, Martin, and Palm Beach counties (EPPC 1996).

Life History: Flourishes in wet conditions, able to form a stolon mat 1 m (3 ft) or more in depth (Holm et al. 1977) and send floating stems of 6 m (18 ft) or more in length across slow-moving water (Handley and Ekern 1981). Also tolerant of drought and of brackish water, but susceptible to frost (Holm et al. 1977). Reproduces and spreads primarily by stem fragments (Sainty and Jacobs 1981). Flowers from September through December in Florida (Hall 1978), but production of fertile seeds apparently low (Thompson 1919b).
**Common Names:** Waterhyacinth, water-orchid

**Synonymy:** Piaropus crassipes (Mart.) Britt.

**Origin:** Amazon basin

**Botanical Description:** Floating aquatic herb, rooting in mud if stranded, usually in dense mats with new plantlets attached on floating green stolons. Submersed roots blue-black to dark purple, feathery, dense near root crown, tips with long dark root caps. Leaves formed in rosettes; petioles to 30 cm (12 in) or more, spongy, usually inflated or bulbous, especially near base; leaf blades roundish or broadly elliptic, glossy green, to 15 cm (6 in) wide. Inflorescence a showy spike above rosette, to 30 cm (12 in) long. Flowers lavender-blue with a yellow blotch, to 5 cm (2 in) wide, somewhat 2-lipped; 6 petals, 6 stamens. Fruit a 3-celled capsule with many seeds.

**NOTE:** May be confused with emergent form of the native frog's bit (Limnobium spongia (Bosc) Steud.), but its petioles not inflated and its flowers small, white, single in leaf axils.

**Ecological Significance:** Reported as a weed in 56 countries (Holm et al. 1979). Introduced to the United States in 1884 at an exposition in New Orleans, reaching Florida in 1890 (Gopal and Sharma 1981). By late 1950s, occupied about 51,000 ha (126,000 acres) of Florida's waterways (Schmitz et al. 1993). Grows at explosive rates exceeding any other tested vascular plant (Wolverton and McDonald 1979); doubles its populations in as little as 6-18 days (Mitchell 1976). In large mats, degrades water quality and dramatically alters native plant and animal communities (Gowanloch 1944, Penfound and Earle 1948).
**Distribution**: Now occurs globally in the tropics and subtropics, and further north and south where it can escape severe cold (Holm et al. 1977). Found throughout Florida, north to Virginia (and New York) and west to California and Hawaii, 16 states in all (USDA 1997).

**Life History**: Reproduces both vegetatively and sexually (Penfound and Earle 1948, Gopal and Sharma 1981). Quickly forms new rosettes on floating stolons, with stolons easily broken; plants and mats transported by wind and water. Leaves killed back by moderate freezes, but quickly regrows from stem tip protected beneath water surface. Flowers year-round in mild climates, producing abundant seeds in developed mats (Penfound and Earle 1948). Numerous seedlings seen in conjunction with lake drawdowns (K. A. Langeland, University of Florida, personal observations).
Like all flowering plants, dicots produce flowers and form seeds within fruits. The common name of this class of plants derives from the trait of producing 2 seed leaves (cotyledons) at germination. These plants may be herbaceous or truly woody in growth form; their roots may be fibrous or may include a persistent taproot. Dicot leaves usually have netted, or branched, venation. Their flower parts (sepals, petals, etc.) are usually in fours or fives, or multiples of 4 or 5.
**Hygrophila polysperma** (Roxb.) T. Anders.
Acanthaceae/Water-Willow Family

**Common Name:** Hygro, East Indian hygrophila, Miramar weed

**Synonymy:** Justicia polysperma Roxb., Hemidelphis polysperma (Roxb.) Nees in Wall.

**Origin:** India, Malaysia

**Botanical Description:** Perennial aquatic herb with squarish stems ascending to creeping, mostly submersed, usually rooted in substrate; also roots freely at floating nodes. Leaves opposite, to 8 cm (3 in) long (aerial leaves smaller) and to 2 cm (0.8 in) wide, usually broader toward tip; sessile, with bases joined at node by ciliated flanges of tissue, the cilia (hairs) easily observed, to 1.5 mm long. Flowers small, solitary in uppermost leaf axils, nearly hidden by leaves, calyx 5-lobed, corolla bluish white, 2-lipped; 2 fertile stamens. Fruit a narrow capsule, splitting lengthwise to release tiny round seeds.

**NOTE:** May be confused vegetatively with small, opposite-leaved natives sometimes found submersed, such as *Ludwigia repens* and *Diodia* spp., but these without flanges at nodes (*Ludwigia*) or with flat-bristled flanges (*Diodia*). The native marsh species, *Hygrophila lacustris* (Schlecht. & Cham.) Nees is larger (aerial leaves to 15 cm long) and erect in habit, with larger flowers in axillary clusters along upper stems.

**Ecological Significance:** Appeared in the aquarium trade in 1945 as “oriental ludwigia” (Innes 1947). First collected in Florida near Tampa as an escapee from cultivation in 1965, but naturalized populations on east coast, especially one near the town of Miramar in Broward County, first brought to public and scientific attention in the late 1970s (Vandiver 1980, Les and Wunderlin 1981). Reported as an expanding problem in south Florida canals in 1980 (Vandiver); now replacing the well-known hydrilla as the most serious weed in these waterways (Sutton 1995), clogging irrigation and flood-control systems and interfering with navigation (Woolfe 1995). Able to compete with hydrilla (Vandiver 1980, Les and Wunderlin 1981); able to expand a population rapidly, in one case from 0.04 ha (0.1 acre) to over 0.41 ha (10 acres) in 1 year (Vandiver 1980). Difficult to control (Schmitz 1985). Found in a dozen public lakes and rivers by 1990 (Schardt and Schmitz 1991), and in 18 public water bodies by 1994 (Schardt 1997).
**Distribution:** Native to East Indies. Naturalized in Florida from Dade and Lee counties north into the Panhandle (Wunderlin et al. 1995, Schardt 1997). Also naturalized in Texas (Angerstein and Lemke 1994), and reported for the Richmond, Virginia area (Reams 1953).

**Life History:** Stems brittle, easily fragmenting, easily developing new stands from rooted nodes of even small fragments (Les and Wunderlin 1981). Able to form dense monocultural stands with emersed stem tips from depths as great as 3 m (10 ft) or more (Hall and Vandiver 1990). Able to photosynthesize in lower light than most native submersed species (Spencer and Bowes 1984). Tends to grow more vigorously in flowing water (Van Dijk et al. 1986). Flowers in fall and winter, with a high percentage of seed set in Florida populations (Les and Wunderlin 1981).
**Schinus terebinthifolius** Raddi
Anacardiaceae/Cashew Family

**Common Names:** Brazilian pepper, Florida holly, Christmas berry, pepper tree

**Synonymy:** None

**Origin:** Brazil, Argentina, Paraguay

**Botanical Description:** Evergreen shrub or tree to 13 m (43 ft) tall, often with multi-stemmed trunks and branches arching and crossing, forming tangled masses. Leaves alternate, odd-pinnately compound with 3-11 (usually 7-9) leaflets, these elliptic-oblong, 2.5-5 cm (1-2 in) long, with upper surfaces dark green (lateral veins obvious, lighter in color), lower surfaces paler, and leaflet margins often somewhat toothed. Leaves aromatic when crushed, smelling peppery or like turpentine. Flowers unisexual (dioecious), small, in short-branched clusters at leaf axils of current-season stems; 5 petals, white to 2 mm long. Fruit a small, bright-red spherical drupe.

**Ecological Significance:** Imported as an ornamental in the 1840s (Barkley 1944). Has invaded a variety of areas including, but not limited to, fallow farmland, pinelands, hardwood hammocks, roadsides, and mangrove forests, in areas with a high degree of disturbance and natural areas with little disturbance (Woodall 1982, Laroche 1994a). Forms dense thickets of tangled woody stems that completely shade out and displace native vegetation. Has displaced some populations of rare listed species, such as the Beach Jacquemontia (Jacquemontia reclinata House, U.S. and Fla. Endangered), and Beach Star (Remirea maritima Aubl., Fla. Endangered) (D. F. Austin, Florida Atlantic University, personal observations). Produces certain allelopathic agents, which appear to suppress other plants' growth (Mahendra et al. 1995). Seeds spread by consumption and deposition of the fruit by wildlife; spread enhanced by decorative use of branches and fruit (Morton 1978). Now estimated to occupy over 283,400 ha (700,000 acres) in central and south Florida (Ferriter 1997, Wunderlin et al. 1995).
**Distribution**: Naturalized in most tropical and subtropical regions, including other South American countries, parts of Central America, Bermuda, the Bahama islands, the West Indies, Guam, Mediterranean Europe, North Africa, southern Asia, and South Africa. In the United States, occurs in Hawaii, California, southern Arizona, and Florida—in Florida as far north as Levy and St. Johns counties and as far west as Santa Rosa County (EPPC 1996).

**Life History**: Sprouts easily from the trunk and roots, even if the plant is undamaged. Seen in flower in every month of the year in Florida, with the most intense period of flowering in the fall season, September through November. Fruits profusely in southern and central Florida, with wildlife consumption of fruits contributing in large part to the spread of seeds (Ewel et al. 1982). Produces chemicals in leaves, flowers, and fruits that irritate human skin and respiratory passages (Ewel et al. 1982, Morton 1978).
**Common Names:** Schefflera, Queensland umbrella tree, octopus tree

**Synonymy:** Brassaia actinophylla Endl.

**Origin:** Northern Australia, New Guinea, Java

**Botanical Description:** Evergreen tree to 12 m (40 ft) tall, with single or multistemmed trunks and greenish bark. Leaves alternate with petioles to 61 cm (2 ft) long; palmately compound with mostly 7-16 leaflets, these shiny, light green, oblanceolate, to 30 cm (12 in) long, with margins entire (or sparsely toothed when young). Flowers 25 mm (1 in) across, borne in dense clusters that form a large, red, showy inflorescence at stem tips above foliage. Fruit a purplish black, round, fleshy drupe to 7 mm (1/4 in) in diameter.

**Ecological Significance:** A common indoor plant that reaches tree size and produces huge numbers of seeds outdoors in central and southern Florida (Maxwell 1984). Introduced to Florida landscaping in 1927 and noted as escaping cultivation in southern Florida in the late 1970s, often growing as seedlings in the boots of cabbage palms in the manner of strangler figs (Morton 1976). Noted as escaping in Pinellas County in 1982 (Wunderlin). Now naturalized and spreading in a variety of habitats, from cypress strands to sand pine scrub, from the full sun of beach dunes to the deep shade of hammocks (Thayer 1998). Invading endangered remnants of scrub habitat, where it is shading out listed rare plants such as the Florida-threatened scrub pinweed, Lechua cernua Sm. (D. F. Austin, Florida Atlantic University, and K. C. Burks, Florida Department of Environmental Protection, personal observations). Extremely invasive in undisturbed tropical hardwood hammocks of Dade County, growing on trees and rocks as well as in soil (R. Hammer, Miami-Dade County Natural Resources Department, 1996 personal communication). Difficult to control (Thayer 1998).
**Distribution:** Native to northern Queensland in Australia, New Guinea, and Java, becoming weedy where introduced in southern Queensland (Austin 1996). In Florida, now reported in 28 designated natural areas of Monroe, Dade, Broward, Palm Beach, Brevard, Collier, and Pinellas counties (EPPC 1996). Herbarium specimens collected from naturalized populations in Pinellas, Palm Beach, Broward, Dade, and Monroe counties (Wunderlin et al. 1995).

**Life History:** Restricted outdoors to warmer areas with minimum temperatures above 1.7°C (35°F) (Broschat and Meerow 1991). Grows on a variety of substrates. Flowers in summer and early fall, prolifically producing seeds. Seeds dispersed by birds, including crows, starlings, mockingbirds, and parrots (Austin 1996).
Nandina domestica Thunb.
Berberidaceae/Barberry Family

Common Name: Heavenly bamboo, nandina
Synonymy: None
Origin: India to east Asia

Botanical Description: Evergreen glabrous shrub to 1.8 m (6 ft) tall, growing in multi-stemmed clumps and perennating by rhizomes. Leaves alternate, large, 2-3 times odd-pinnately compound, i.e., usually with 3 primary divisions from petiole, having a somewhat lacy appearance and turning red in cool season. Leaflets 2-6 cm (1-2 in) long, narrowly ovate to lanceolate, tips with long acute taper, upper surfaces dark green (in growing season), sublustrous. Inflorescence a large, erect, stalked panicle, to 30 cm (1 ft) tall, from uppermost leaf axil of season; panicle branches usually purplish-red. Flowers small, bisexual, with petaloid parts pinkish white and anthers yellow. Fruit a bright red, 2-seeded globose berry, 6-12 mm in diameter.


Distribution: Native to central China and Japan and west to India (Chongxi and Foster 1992). Introduced in the southeastern United States, with seedlings frequent near plantings and mature plants found far from areas of current cultivation (Whetstone et al. 1997). In Florida, herbarium specimens deposited from Escambia, Gadsden, and Leon counties (Wunderlin et al. 1995).

Nandina domestica Thunb.
Compound leaves, fruits
**Life History:** Can survive temperatures throughout Panhandle and peninsular Florida (Broschat and Meerow 1991). Grows in full sun to shade; propagated by division of clumps and by seed (Hunt 1977, Bailey and Bailey 1976). Seeds may take many months to germinate (M. Zeller, Florida Department of Environmental Protection, 1997 personal communication) or 2 seasons, and difficult to induce germination under artificial conditions (Roger Newton, Hillsborough County Cooperative Extension Service, 1998 personal communication). Flowers in late spring; fruits in fall and winter. Fruits dispersed by birds, including mockingbirds, cedar waxwings, and robins (Kellum 1997) and cardinals (B. McCurnin, Tallahassee, 1997 personal communication); may be dispersed by small mammals as well, such as opossums and raccoons (Ludlow 1995). Cultivars Nana, Harbour Dwarf, and Firepower do not produce seed in nursery environment (Steve Kent, Tree of Life Nursery, 1998 personal communication).
**Macfadyena unguis-cati** (L.) A. Gentry
Bignoniaceae/Bignonia Family

**Common Name:** Cat's-claw vine  
**Synonymy:** Doxantha unguis-cati (L.) Rehd., Bignonia unguis-cati L., Bignonia tweediana Lindley  
**Origin:** Tropical America

**Botanical Description:** High-climbing woody vine, with stems to 6 cm (2.4 in) in diameter and roots becoming elongate-tuberous with age. Branches and runners with adventitious aerial roots. Leaves opposite, compound, with 2 leaflets and a terminal 3-forked tendril; tips of tendril forks stiffly hooked, clawlike. Leaflets mostly 3-7 cm (1-3 in) long, oval to lance shaped, with margins entire. Flowers showy, trumpet shaped, to 7 cm (3 in) long and 10 cm (4 in) across, solitary or in few-flowered clusters at leaf axils; petals joined into yellow floral tube with orange lines in the throat. Fruit a linear, flat capsule, to 50 cm (20 in) long, with oblong, winged seeds.

**NOTE:** Distinguished from the native cross-vine, Bignonia capreolata L., by its yellow (rather than orange-red) floral tubes and clawlike tendril forks. From a distance, when flowering, may be confused with yellow trumpet-flowered native jessamines (*Gelsemium* spp.), but their leaves simple and without tendrils.

**Distribution:** Native from West Indies and Mexico to Argentina (Bailey and Bailey 1976, Morton 1971a). Herbarium specimens now recorded for naturalized populations in Escambia, Leon, Alachua, Lake, Seminole, Brevard, Polk, Hillsborough, Hernando, Palm Beach, and Dade counties (Wunderlin et al. 1996). Also cultivated in Alabama, Louisiana, and South Carolina (Meyer et al. 1994).

**Life History:** Thrives in full sun or partial shade and in a wide variety of soils (Morton 1971a, Nelson 1996). Stays at seedling stage for some time, while enlarging roots into tuberlike storage organs; then rapidly elongates stems, forming long runners when no erect substrate is within reach (Godfrey 1988). Clings tenaciously to any substrate with adventitious roots and clawed tendrils (Godfrey 1988). Flowers in spring, with high seed production (Menninger 1970), but may not begin flowering until vine is well established (Odenwald and Turner 1980). Seeds dispersed by wind (Dickey 1968).
**Common Name:** Japanese honeysuckle

**Synonymy:** Nintoa japonica (Thunb.) Sweet

**Origin:** East Asia

**Botanical Description:** Twining or trailing woody vine with young stems pubescent. Leaves evergreen, opposite, simple, mostly 4-8 cm (1.6-3.2 in), with short pubescent petioles. Leaf blades ovate, elliptic, or oblong, usually with at least sparse pubescence on midrib above and below, entire except on vigorous spring shoots which often have blades pinnately lobed. Flowers fragrant, white turning to creamy yellow with age, occurring singly or more often in pairs, in leaf axils; corolla strongly bilabiate (2-lipped). Fruit a black, globose berry, 5-6 mm (0.25 in) long, with 2-3 seeds per berry.

**NOTE:** May be confused with the native coral honeysuckle (*Lonicera sempervirens* L.), but its young stems and leaves glabrous, its flowers red with yellow within.

**Ecological Significance:** Occurs most densely in open woodlands, prairies, thickets, fence rows, and old fields, but also invades mature forests (dry and moist), thriving in tree gaps created by natural or artificial disturbance and persisting in partially shaded areas. Interrupts plant succession in once-forested areas by overtopping and smothering young trees, preventing their recruitment to the overstory (Myster and Pickett 1992). Can disrupt understory structure in mature forests by eliminating smaller tree species important to birds (Sather 1987). Deemed in 1971 by the U.S. Department of Agriculture to be one of the worst nonagricultural weeds in the Southeast, able to colonize various habitats and eliminate native flora (Sasek and Strain 1991). More recently also found to serve as temporary host for a spider mite pest of corn and peanuts (Margolies and Kennedy 1985) and for the tobacco budworm and corn earworm in Georgia and Florida (Pair 1994). Introduced in 1806 for ornament and later for erosion control; by 1919 naturalized from the Gulf of Mexico to Massachusetts (Sather 1987). Reported by Florida land managers for conservation areas in 7 counties from Okaloosa to Marion County (EPPC 1996). Also reported elsewhere in the eastern U.S. as an important pest in managed forests (Dillenburg et al. 1993) and natural areas (e.g., Thomas 1980). Still available in the Southeast as an ornamental, and sometimes promoted as deer forage (Dyess et al. 1994).

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**Lonicera japonica** Thunb.

Caprifoliaceae/Honeysuckle Family

![Flowers](image-url)
**Distribution:** In Florida, found commonly in most Panhandle and northern counties, and south on the peninsula to Orange, Hillsborough, Sarasota, and Dade counties (Wunderlin et al. 1995). Now one of the most common vine species in the Southeast, and presently ranges in the U.S. from southern New England to Florida, west to Texas, Kansas, and Missouri, and north to Indiana, Illinois, and Michigan (Godfrey 1988).

**Life History:** With evergreen leaves, able to photosynthesize at a relatively high rate year-round, compared to woody deciduous natives (Schierenbeck and Marshall 1993). Twinning stems able to climb small-diameter tree trunks, and with numerous lateral runners, can form dense overtopping mats of vegetation (Sather 1987). Provides strong below-ground root competition as well (Dillenburg et al. 1993). Flowers and fruits from spring to fall. Fruits eaten by deer, rabbits, turkeys, quail (Dyess et al. 1994), with seed dispersed primarily by birds (Sather 1987).
**Casuarina equisetifolia** L.
Casuarinaceae/Beefwood Family

**Common Names:** Australian-pine, beefwood, ironwood, she-oak, horsetail tree

**Synonymy:** Casuarina littorea L. ex Fosberg & Sachet, C. littorea Rumpheus ex Stickman

**Origin:** Australia, south Pacific Islands, Southeast Asia

**Botanical Description:** Evergreen tree to 46 m (150 ft) tall, usually with single trunk and open, irregular crown. Bark reddish brown to gray, rough, brittle, peeling. Branchlets pine-needle-like, grayish green, jointed, thin (<1 mm wide), 10-20 cm (4-8 in) long, minutely ridged, hairy in furrows. Leaves reduced to tiny scales, 6-8 in whorls encircling joints of branchlets. Flowers unisexual (monoecious), inconspicuous, female in small axillary clusters, male in small terminal spikes. Fruit a tiny, 1-seeded, winged nutlet (samara), formed in woody cone-like clusters (fruiting heads), these brown, to 2 cm (3/4 in) long and 1.3 cm (1/2 in) wide.

**NOTE:** May be confused with the related exotics, C. glauca, which has 10-17 leaf scales per whorl (see following pages), and C. cunninghamiana Miquel, which has 8-10 scales per whorl.

**Ecological Significance:** Introduced to Florida in the late 1800s (Morton 1980). Naturalized since the early 1900s along coastal dunes (Small 1927). Planted extensively in the southern half of the state as windbreaks and shade trees (Morton 1980). Seeds freely throughout the area and has spread rapidly (Long and Lakela 1971). Salt tolerant, growing even in front-line dunes (Watkins 1970). With rapid growth, dense shade, dense litter accumulation, and other competitive advantages, displacing and extremely destructive to native vegetation (Nelson 1994). Can encourage beach erosion by displacing deep-rooted native vegetation (Klukas 1969). Interferes with nesting of endangered sea turtles and the American crocodile (Klukas 1969).
**Distribution:** Occurs throughout south Florida, from Orlando south, on sandy shores and in pinelands. Frequently colonizes disturbed sites, such as filled wetlands, road shoulders, cleared land, and undeveloped lots (Maxwell 1984). Occurs as far north as Dixie County on the west coast and Volusia County on the east (Wunderlin et al. 1995). Naturalized also in West Indies, Mexico, and elsewhere in tropical America (Long and Lakela 1971).

**Life History:** Not freeze tolerant; sensitive to fire (Morton 1980). Loses branches easily and topples easily in high winds (Morton 1980). Produces allelopathic compounds that inhibit growth of other vegetation (Morton 1980). Can colonize nutrient-poor soils easily by nitrogen-fixing microbial associations (Wilson 1997). Reproduces prolifically by seed, as many as 300,000 to the pound, with seeds dispersed by birds (especially exotic parrots and parakeets), water, and wind (Morton 1980). Fruiting heads float (Maxwell 1984).
**Common Names:** Suckering Australian-pine, swamp she-oak, Brazilian beefwood  
**Synonymy:** Casuarina lepidophloia F. Muell. and C. cristata Miq. misapplied  
**Origin:** Australia

**Botanical Description:** Evergreen tree to 20 m (70 ft) tall, with a dense, pyramidal shape. Bark gray-brown, finely fissured, scaly. Branchlets pine-needle-like, green, occasionally waxy, jointed, thin (<1mm wide), 20-26 cm (8-10 in) long, minutely ridged, glabrous. Leaves reduced to tiny scales, in whorls of 10-17 at joints of branchlets. Flowers unisexual (dioecious), inconspicuous, female in small axillary clusters, male in small terminal spikes; female plants rare in Florida. Fruit a tiny, 1-seeded, winged nutlet (samara), formed in woody cone-like clusters (fruited heads), these brown, to 1.8 cm (2/3 in) long and 0.9 cm (1/3 in) wide.

**NOTE:** Differs from *C. equisetifolia* (preceding pages) in having 10-17 leaf scales per whorl, glabrous branchlets, and separate male and female plants. *C. cunninghamiana* also dioecious, but with 8-10 leaf scales per whorl.

**Ecological Significance:** Introduced to Florida before 1924, and planted widely in southern Florida as windbreaks, roadside trees, and hedges (Morton 1980). Suckers aggressively from widely spreading roots, especially when pruned, creating “local jungles” of dense casuarina branches, excluding other vegetation (Long and Lakela 1971, Morton 1980). Displacing and extremely destructive to native plant communities, tending to completely take over areas it invades (Nelson 1994). Along with *C. equisetifolia*, has had devastating effect on native plant communities of barrier islands along southwest coast, such as Sanibel and Captiva (Morton 1980).
**Distribution:** Herbarium specimens collected from naturalized populations in Seminole, Orange, Brevard, Polk, Hillsborough, Pinellas, Manatee, Desoto, Highlands, Indian River, Martin, Charlotte, Collier, Broward, Dade, and Monroe counties (Wunderlin et al. 1995). Recorded from natural areas in Dade, Lee, Martin, and Palm Beach counties (EPPC 1996).

**Life History:** Can colonize nutrient-poor soils easily by nitrogen-fixing microbial associations (Wilson 1997). Reproduces prolifically by root suckers; reported until recently as not producing fruit in Florida (Long and Lakela 1971, Morton 1980). Fruiting heads observed in Homestead area (R. Hammer, Miami-Dade Parks Department, 1995 personal communication) and in Fakahatchee Strand State Preserve (D. F. Austin, Florida Atlantic University, 1997 personal communication). Hybrids known to form in the wild in Florida among the 3 species of Casuarina mentioned above, which may bear cones (Bailey and Bailey 1976, Morton 1980, Wilson 1997).

Monoculture, Indian River County
**Calophyllum antillanum** Britt.
Clusiaceae (Guttiferae)/Pitch-Apple Family

**Common Names:** Beauty leaf, Santa-maria

**Synonymy:** Calophyllum brasiliense Camb. var. antillanum (Britt.) Standl., C. calaba Jacq., non L., C. jacquinii Fawc. & Rendle

**Origin:** Caribbean, Cuba to Grenada

**Botanical Description:** Straight-trunked tree typically 12 m (40 ft) tall. Young stems green, 4-angled, minutely hairy, becoming gray with age. Leaves opposite, simple, petiolated, elliptic, 10-15 cm (4-6 in) long; blades very shiny, with numerous parallel veins at right angles to midvein; margins entire; blade tips rounded to minutely notched. Flowers small, in few-flowered racemes at leaf axils, white, fragrant, with many yellow stamens. Fruit a 1-seeded, hard-shelled drupe, brown, globose, about 2.5 cm (1 in) wide.

**NOTE:** May be confused with mast-wood, *C. inophyllum* L., the Asian exotic also cultivated in south Florida and reported as naturalized (Wunderlin et al. 1996), but its trees often taller, its leaves larger, to 20 cm (8 in) long and 10 cm (4 in) wide, not as shiny; its flower clusters larger, showier; and its fruits to 4 cm (1.5 in) wide.

**Ecological Significance:** Noted as introduced in southern Florida in 1964 (Little and Wadsworth 1964). Widely planted in southern Florida as a landscape subject. Invades mangrove forests and other coastal areas (M. McMahon, Biological and Environmental Consulting, and R. Hammer, Miami-Dade County Parks Department, 1996 personal communications). Dense stands of seedlings and saplings observed along the fringes of coastal mangrove and buttonwood forests and occasionally in inland hardwood forests as well. Abundant in and around Matheson Hammock Park in south Dade County, and observed in other mangrove areas in Dade County, where it is a target of eradication by Miami-Dade County Parks and Recreation Department. Also reported from parks in Broward County (EPPC 1996). Listed as an invasive species in Hawaii (Wester 1992).
**Distribution:** Locally naturalized in coastal regions of Dade, Broward, Palm Beach, and Martin counties (R. Hammer, Miami-Dade County Parks Department, and D. F. Austin, Florida Atlantic University, personal observations). Also naturalized in Bermuda (Little and Wadsworth 1964).

**Life History:** Limited to southernmost Florida where minimum temperatures are 4.4-1.7°C (40-35°F) (Broschat and Meerow 1991). Can withstand inundation and is resistant to brackish conditions (Stresau 1986). Flowers in summer. Fruits prolifically in southern Florida, and is spread by seed (R. Hammer, Miami-Dade County Parks Department, 1996 personal communication). Spontaneous seed germination common beneath mature landscape trees. Fruits inedible for humans, those of related *C. inophyllum* known to be poisonous (Morton 1971b).
Common Names: Water-spinach, Chinese water-spinach or morning-glory, water bindweed

Synonymy: Ipomoea repens Roth, I. reptans Poiret, Convolvulus repens Vahl

Origin: Central to south China

Botanical Description: Herbaceous trailing vine with milky sap. Stems hollow, to 3 m (9 ft) long or more, rooting at nodes, floating in aquatic situations. Leaves alternate, simple, with glabrous petioles 3-14 cm (1-6 in) long; leaf blades generally arrowhead shaped but variable, glabrous or rarely pilose, to 17 cm (7 in) long, with tips pointed; blades held above water when stems floating. Flowers showy, funnelform like morning-glory blooms, solitary or in few-flowered clusters at leaf axils; petals white or pink-lilac. Fruit an oval or spherical capsule, woody at maturity, about 1 cm (1/2 in) wide, holding 1-4 grayish seeds, these often short-hairy.

NOTE: Two basic forms (with many cultivars of each) recognized worldwide for this species: “red,” with red-purple tinged stems and pale pink to lilac flowers; and “green,” with fully green stems and white flowers—all “races” observed in Florida exhibiting the same growth habit.

Ecological Significance: Introduced repeatedly to Florida waters since 1979, despite its state and federal listing as a prohibited plant and noxious weed (R. Kipker, Florida Department of Environmental Protection, unpublished data). Popular among some recent immigrants as a common potherb from the homeland (T. Q. Ngo, Vietnamese Community of Florida, Pinellas Park, 1995 personal communication), and has been studied in Florida as a vegetable crop (e.g., Bruemmer and Roe 1979, Snyder et al. 1981). Recognized early as a threat to natural areas in Florida (Ochse 1951, Gilbert 1984). Has been found naturalized in Florida primarily in canals and ditches, but also invading shallows of more than a dozen natural lakes (R. Kipker, Florida Department of Environmental Protection, unpublished data). Forms dense floating mats of intertwined stems over water surfaces, shading out native submersed plants and competing with native emergents (K. C. Burks, Florida Department of Environmental Protection, personal observations). Under good conditions, can produce 190,000 kg fresh weight biomass per ha (84 tons per acre) in 9 months (Massal and Barrau 1956). Considered the second greatest problem plant in the Philippines, where it tends to overgrow freshwater marginal areas (Gangstadt 1976). A common to serious weed, or present as a weed in many areas of the tropics (Holm et al. 1979).
**Distribution:** Native to China, but widely cultivated and naturalized in Asia, Africa, Australia, Pacific Islands, and South America (Staples 1996). In Florida, naturalized populations found in scattered locations from Bay County in the Panhandle to Dade County in south Florida, with eradication attempts always made but not always successful (R. Kipker, Florida Department of Environmental Protection, 1997 personal communication). Herbarium specimens documented so far only from the Tampa Bay area (Wunderlin et al. 1995), where it may now be found cultivated under specially permitted quarantine conditions for out-of-state sale.

**Life History:** May root at every node, producing new plants when segmented (Edie and Ho 1969). Grows well in moist soil or in still to flowing waters (Payne 1956). Flowers in warm months (Dressler et al. 1987). Produces 175-245 seeds per plant during peak season (Patnaik 1976).
**Bischofia javanica** Blume
Euphorbiaceae/Spurge Family

**Common Names:** Bishopwood, javawood, toog

**Synonymy:** Bischofia trifoliata (Roxb.) Hook.

**Origin:** Tropical Asia, Pacific Islands

**Botanical Description:** Evergreen tree commonly 12-18 m (35-60 ft) in height, with dense, rounded head, smooth branches, and milky sap. Leaves alternate, long-petioled, trifoliolate (3 leaflets); leaflets shiny, bronze-toned, oval-elliptic, 15-20 cm (6-8 in) long, with margins small toothed. Flowers tiny, without petals, greenish-yellow, in many-flowered clusters (racemes) at leaf axils; male and female flowers on separate plants (dioecious). Fruit pea-sized, berrylike, fleshy, to 9 mm (0.33 in) in diameter, brown or reddish or blue-black, 3-celled.

**Ecological Significance:** Introduced to Florida for ornament earlier this century by a west coast nursery-grower (Morton 1976). Noted as sometimes planted in south Florida in 1947 (Bailey and Bailey). Reported as naturalized in Dade County near Homestead in 1971 (Long and Lakela), as becoming a “weed tree” in south Florida in 1974 (Morton), and as invading hammocks (Morton 1976). Now common in old fields and disturbed wetland sites, and invading intact cypress domes and tropical hardwood hammocks, where it displaces native vegetation and alters the structure of the plant community (personal observations of several veteran land managers in southeast counties). Used extensively in street landscaping throughout south Florida for many years. Its landscape use now discouraged by some horticulturists (Broschat and Meerow 1991).

**Distribution:** Naturalized populations in Florida documented by herbarium specimens from Dade, Broward, and Pinellas counties (Wunderlin et al. 1995). Reported for 21 natural areas in Lee, Collier, Palm Beach, Broward, and Dade counties (EPPC 1996). Cultivated near coasts from Sarasota to Cape Canaveral (Stresau 1986). Apparently not naturalized elsewhere in the Neotropics, but widespread in its native range of tropical Asia.
**Life History:** Fast-growing from seed or cuttings, thriving best in moist soil (Morton 1974). Leaves deciduous in times of drought. Also root suckers. Limited to areas with average minimum temperatures of 1.6 to -1.1°C (35-30°F) (Broschat and Meerow 1991). Flowers in spring. Fruits copiously in Florida, with seeds dispersed by birds (Morton 1976). Seedlings can grow in sun or shade and adapt quickly if light conditions change (Kamaluddin and Grace 1992a, 1992b).
**Sapium sebiferum** (L.) Roxb.
Euphorbiaceae/Spurge Family

**Common Names:** Chinese tallow tree, popcorn tree

**Synonymy:** Croton sebiferus L., Stillingia sebifera Michx., Triadica sebifera (L.) Small

**Origin:** Eastern Asia

**Botanical Description:** Deciduous tree to 16 m (52 ft), commonly to 10 m (33 ft). Sap milky. Leaves simple, alternate; blades entire, broadly ovate, 3-6 cm (1-2.5 in) wide, with broadly rounded bases and abruptly acuminate (tapering to a slender point) tips; petioles slender, 2-5 cm (1-2 in) long. Flowers small, yellow, borne on spikes to 20 cm (8 in) long, with 2-3 sepals (petals absent), 2-3 stamens or 3 styles (plants monoecious). Fruit a 3-lobed capsule, 1 cm (0.5 in) wide, turning brown and splitting open at maturity to reveal 3 dull white seeds, which remain attached for a time.

**Ecological Significance:** Considered a common agricultural weed in Taiwan, requiring constant effort and expense to hold at bay (Holm et al. 1979). Introduced repeatedly to the United States as an ornamental and potential oil crop species (Jones and McLeod 1989). Considered an invasive pest plant in the Carolinas since the 1970s. Has expanded its range on the United States Gulf Coast in low-lying areas, becoming dominant and spreading along roadside ditches and into areas where the soil stays wet (Cameron and LaPoint 1978). Also thrives in upland, well-drained areas near human habitation and in undisturbed areas such as closed canopy forests, in bottomland hardwood forests, shores of waterbodies, and sometimes on floating islands (Godfrey 1988). Survives in both poorly drained freshwater and saline soils as well (Scheld and Cowles 1981). Tends to take over large areas (Bonner 1974).
**Distribution:** Naturalized in outer coastal plain of South Carolina and adjacent North Carolina, also in Richmond County, North Carolina (Radford et al. 1968), south through Florida, and west to eastern Texas (Godfrey 1988). Found throughout Florida south to Manatee County on the Gulf coast and St. Lucie County on the Atlantic coast (Jubinsky 1993). Has potential range through southern Florida to the upper Florida Keys (Broschat and Meerow 1991). Recently found naturalized in Dade County (Wunderlin et al. 1995), and by 1996 (Jubinsky and Anderson), recorded as naturalized in 57% of Florida’s counties.

**Life History:** Early growth rate very rapid with flowering and fruiting from the time the tree is about 1 m (3.3 ft) tall. Also suckers from stumps. Flowers in spring (Broschat and Meerow 1991), with fruit ripening August to November. Seeds primarily dispersed by birds and water (Jubinsky 1993).
**Common Names:** Rosary pea, crab’s eyes, precatory pea, licorice vine  
**Synonymy:** Abrus abrus (L.) W. F. Wight  
**Origin:** India, and perhaps other parts of tropical Asia

**Botanical Description:** High-climbing, twining, or trailing woody vine with slender herbaceous branches. Leaves alternate, petioled, 5-13 cm (2-5 in) long, even-pinnately compound with 5-15 pairs of leaflets, these oval to oblong, to 1.8 cm (<1 in) long, with margins entire. Flowers shaped like pea flowers, white to pink or reddish, small, in short-stalked dense clusters at leaf axils. Fruit a short, oblong pod, splitting before falling to reveal 3-8 shiny hard seeds, 6-7 mm (<1 in) long, scarlet with black bases.


**Distribution:** Now pantropical (Isely 1990). Common across central and south Florida; herbarium specimens of naturalized populations collected from 27 counties, from Hernando, Marion, Lake, and Volusia counties south to the Keys (Wunderlin et al. 1995). Reported from over 40 natural areas in Dade, Broward, Palm Beach, Martin, Indian River, Highlands, Collier, Lee, Sarasota, Manatee, Hillsborough, and Lake counties (EPPC 1996).
**Life History:** Roots deeply and tenaciously, difficult to eradicate (R. Moyroud, Mesozoic Landscapes, 1995 personal communication). Increases in population size following fire (Maithani et al. 1986). Flowers in summer, fruiting prolifically. Seeds dispersed by birds (Austin 1998). Has been investigated for various types of usable extracts, such as for insecticides (e.g., Khanna et al. 1989), antifertility drugs (e.g., Sinha 1990), other medicines (e.g., Wambebe and Amosun 1984), and sweetening agents (Jakinovich et al. 1990).
Common Name: Earleaf acacia  
Synonymy: None  
Origin: Australia, Papua New Guinea, and Indonesia  

Botanical Description: Evergreen, unarmed tree to 15 m (50 ft) tall, with compact spread, often multi-stemmed; young growth glaucous. Leaves alternate, simple, reduced to phyllodes (flattened leaf stalks), these blade-like, slightly curved, 11-20 cm (5-8 in) long, with 3-7 main parallel veins and a marginal gland near the base; surfaces dark green. Flowers in loose, yellow-orange spikes at leaf axils or in clusters of spikes at stem tips; flowers mimosa-like, with numerous free stamens. Fruit a flat, oblong pod, twisted at maturity, splitting to reveal flat black seeds attached by orange, string like arils.

Ecological Significance: Introduced to Florida for ornament before 1932 (Gordon and Thomas 1997). Used extensively in street landscaping in southern Florida for many years. Noted as escaping cultivation by Morton (1976, 1985), Austin (1978), and Isely (1990). Now common in disturbed areas, but also has invaded pinelands, scrub, and hammocks in south Florida, with significant populations in many of the globally imperiled pine rocklands of Dade County (M. M. McMahon, Biological and Environmental Consulting, personal observations). Displacing native vegetation and threatening to shade out rare plants, such as the listed scrub pinweed, Lechea cernua Sm., in remnant scrub areas (K. C. Burks, Florida Department of Environmental Protection, personal observations). Adapted to nutrient-poor soils in humid tropics, including areas subject to periodic fires (Shukor 1993, Moran et al. 1989, Bowman et al. 1990), a description that fits many of Florida’s natural habitats.

Distribution: Planted widely in the Old World for pulp and fuelwood, particularly in India and Southeast Asia; undergoing forestry trials in Africa and Central and South America (Pinyopusarerk 1990, Boland et al. 1991). In Florida, now reported from over 24 natural areas in Dade, Broward, Palm Beach, Martin, Collier, and Lee counties (EPPC 1996). Naturalized populations documented by herbarium specimens from Monroe, Dade, Palm Beach, Martin, and Collier counties (Wunderlin et al. 1995).
Life History: Grows in zones with average minimum temperatures of -1.2 to -6.6°C (30 to 20°F) and above (Broschat and Meerow 1991). Particularly drought resistant, but also tolerates seasonally waterlogged soils; grows in a wide range of soil types and soil pH; and able to withstand competition from cogon grass (see Imperata cylindrica) (Boland et al. 1991). Aided in drought resistance and low-nutrient tolerance by mycorrhizal and nitrogen-fixing bacterial associations of the roots (Osonubi et al. 1991, MacDicken and Brewbaker 1989). Found in its native range from dune ridges to river banks (Boland et al. 1991). Flowers in Florida from spring through fall, fruiting prolifically. Seeds dispersed by several bird species, including the introduced European starling (D. F. Austin, Florida Atlantic University, 1997 personal communication). Seed germination hastened by placing seeds in hot ashes (Bailey and Bailey 1947).
Albizia lebbeck (L.) Bentham
Fabaceae (Leguminosae)/Pea Family

Common Names:    Woman’s tongue, Tibet lebbeck, singer-tree, shack-shack
Synonymy:        Mimosa lebbeck L., M. speciosa (Jacq.) Willd.
Origin:           Tropical Asia, northern Australia

Botanical Description: Deciduous, unarmed tree to 20 m (65 ft) tall, with a rounded,
spreading crown and pale bark. Leaves alternate, twice compound, with 2-5 pairs of
pinnæ, each pinna with 3-10 pairs of leaflets (even-pinnate); leaflets elliptic-oblong, 2-4
cm (1-2 in) long, usually asymmetrical at base, dull green above, paler green below;
petiole with a sessile, elliptic gland near the base above. Flowers mimosa-like, in showy,
rounded clusters near stem tips, 5-6 cm (2-2.5 in) across, cream or yellowish-white, each
flower with numerous long stamens. Fruit a flat, linear pod, to 30 cm (1 ft) long, with
many seeds; dried pods persistent after leaf-fall, often heard rattling in the wind.

NOTE: In Florida, distinguished from other unarmed leguminous trees with twice-
compound leaves by its number of leaflets (usually 20+) and the leaflets’ larger size
(usually > 2 cm long).

Ecological Significance: Introduced to Florida for ornament in 1880s (Gordon and
Thomas 1997). By 1933 (Small 1933), recognized as invading tropical hammocks in the
Florida Keys. Known by 1990 (Isely 1990) as a fast-growing colonizer of disturbed areas,
becoming common in central and south Florida through the Keys (Nelson 1994).
Seedlings now occurring in great numbers throughout Big Cypress National Preserve (T.
Pernas, National Park Service, 1996 personal communication). Invading somewhat
disturbed pinelands of Everglades National Park (D. Jones, National Park Service, 1996
personal communication). Invading pine rocklands and canopy gaps in rockland ham-
mocks in Dade County (R. Hammer, Miami-Dade Parks Department, 1996 personal
communication). Also naturalized on moist and dry coastal hillsides in Puerto Rico, in
pastures in the U.S. Virgin Islands, and elsewhere in the Caribbean and Central and
**Distribution:** Presently pantropical in occurrence, widely planted and naturalized (Little and Wadsworth 1964). In Florida, now reported from more than 20 natural areas in Monroe, Dade, Collier, Palm Beach, Martin, and Lee counties (EPPC 1996). Naturalized populations documented by herbarium specimens from Broward, Collier, Dade, Indian River, Lee, Marion, Polk, and St. Lucie counties (Wunderlin et al. 1996).

**Life History:** Fast-growing from seed (Morton 1971a). Will not tolerate freezing temperatures, but naturally grows in the Himalayas to altitudes of 1,600 m (5,200 ft) above MSL (Lowry et al. 1994). Grows well with average annual rainfalls of 400-2,500 mm (16-98 in), and in soils that are saline or alkaline, but not waterlogged soils (Lowry et al. 1994). A nitrogen-fixing, mycorrhizal-associating legume (Osonubi et al. 1991). Tolerates coastal salt spray, with some protection (Menninger 1964, Little and Wadsworth 1964). Flowers from April to September, but primarily in spring (or onset of rainy season), with pods held nearly throughout the year (Little and Wadsworth 1964, Wunderlin 1982, Barneby and Grimes 1996). Produces massive quantities of seeds, with seedlings appearing in great numbers (Watkins 1970). Crows and squirrels observed feeding on seeds in India (Natarajan et al. 1994).