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 submerged 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).
**Rhoeo spathacea** (Sw.) Stearn
Commelinaceae/Dayflower Family

**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 (spatha) 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

---

**Winged stem**

**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 Corderoy
- 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).
**HYDRILLA VERTICILLATA** (L.F.) royle
Hydrocharitaceae/Frog’s-Bit Family

**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 2 mm 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).

![Tubers](image)
**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:** Radioolally 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. Zahorckak, 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).

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 Saccolepis 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).
**imperata cylindrica** (L.) Raesuschel
Poaceae (Gramineae)/Grass Family

**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).

Leaf blade, off-center midvein
**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).
**Neyraudia reynaudiana** (Kunth) Keng ex Hitchc.
Poaceae (Gramineae)/Grass Family

**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).
**Pennisetum purpureum** Schumach.

**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 (*Setaria* spp., also called bristle grasses), but their spikelet bristles persistent on the flowering stalks, not falling with mature spikelets. Distinguished from other *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., Diz et al. 1994, Philips et al. 1993, Spitaleri et al. 1994, Williams and Hanna 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).
**Common Names:** Pará grass, California grass, buffalo grass, water grass, Scotch grass, Carib grass

**Synonymy:** Brachiaria mutica (Forsk.) Stapf, Brachiaria purpurescens (Raddi) Henr., Panicum muticum Forsk., Panicum purpurescens 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).
**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).
**Eichhornia crassipes** (Mart.) Solms-Laub.

Pontederiaceae/Pickerelweed Family

**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 Hawai‘i, 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 draw-downs (K. A. Langeland, University of Florida, personal observations).

![Crowding out bulrush community](image_url)