

# THE VASCULAR FLORA OF GARDEN KEY AND FORT JEFFERSON, DRY TORTUGAS NATIONAL PARK, FLORIDA, U.S.A.

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## ABSTRACT

Garden Key, the site of Fort Jefferson, is an island that comprises 14.9 acres (6.44 hectares). Garden Key is located at 24.62° N latitude, 82.87° W longitude and is approximately 109 km west of Key West, Florida. This study was undertaken to prepare a complete inventory of the vascular flora of Fort Jefferson and Garden Key, including the taxa collected by previous investigators and those identified in the present study. The flora includes 144 species within 118 genera and 46 families. In numbers of species, the largest families in the flora are the Poaceae (27), Fabaceae (17) and Euphorbiaceae (10). The largest genera are *Euphorbia* (8), *Cenchrus* (4), and *Sida* (4). Five genera are represented by three species. Sixty-one non-native taxa composed 42% of the flora.

KEY WORDS: vascular plant species, Fort Jefferson, Garden Key, Dry Tortugas, National Park, Florida

## RESUMEN

Garden Key, el sitio de Fort Jefferson, es una isla que comprende 14.9 acres (6.44 hectáreas). Garden Key está localizado a latitud 24.62° N, longitud 82.87° W y está aproximadamente 109 km al oeste de Key West, Florida. Este estudio se realizó para preparar un inventario completo de la flora vascular de Fort Jefferson y Garden Key, incluyendo los taxa colectados por investigadores previos y los identificados en el presente estudio. La flora incluye 144 especies de 118 géneros y 46 familias. En número de especies, las familias mayores de la flora son las Poaceae (27), Fabaceae (17) y Euphorbiaceae (10). Los mayores géneros son *Euphorbia* (8), *Cenchrus* (4) y *Sida* (4). Cinco géneros están representados por 3 especies. Sesenta y un taxa exóticos componen el 42% de la flora.

## INTRODUCTION

Garden Key, Dry Tortugas National Park, comprising 14.9 acres (6.44 hectares), is located at 24.628° N, 82.873° W in the lower Florida Keys, 109 km west of Key West, Florida (Figure 1). Garden Key was selected for a lighthouse that was constructed between 1825 and 1826. In 1829, Commodore John Rodgers stopped at the site and was impressed by the geology of the outer and inner harbors, which provided safe anchorage for the ships of that era. Cognizant of the site's strategic importance, Rodgers believed that United States shipping would be imperiled if the site was occupied by a hostile power. Based on his recommendation, a series of engineering studies was initiated after numerous bureaucratic delays. In 1846, 17 years later, construction of the fort in Garden Key officially began. (Historical information for Fort Jefferson can be found at [www.drytortugas.com/fort-jefferson-history](http://www.drytortugas.com/fort-jefferson-history)).

During the American Civil War, the population was nearly 2,000, of which 1,729 were military personnel. At the end of the Civil War, 1865, the Fort's population declined to 1,013, consisting of 486 soldiers or civilians and 527 prisoners. That same year, the fort received four special prisoners involved with, and/or charged with, the conspiracy to assassinate President Lincoln. The most famous prisoner was Dr. Samuel Mudd, who set John Wilkes Booth's leg after Booth injured himself leaping from Lincoln's theatre box at Ford's Theatre after the notorious assassination. When a yellow fever epidemic struck the fort in 1867, prisoner Mudd provided much needed care to yellow fever victims. Because of his good work, Mudd was pardoned by President Andrew Johnson and released in 1869.

Garden Key and four additional sand keys are part of Dry Tortugas Bank, which covers 100 km<sup>2</sup>. Originally consisting of 11 sand keys in 1775, three keys were washed away between 1775 and 1875 and three additional keys were lost between 1875 and 1977.

Stoddart and Fosberg (1981) prepared a detailed study of the topographic and floristic changes in the Dry



FIG. 1. Fort Jefferson, Garden Key, Dry Tortugas National Park, Florida.

Tortugas, Florida between 1904 and 1977. Their brief anthropogenic and geological description of Garden Key follows. "Garden Key, the Bush Key of Gauld's (1790) survey of 1773–75, has been enormously altered by the construction of Fort Jefferson, said to be the largest brick construction in the western hemisphere, during 1846–1864. The original sand key, on which the lighthouse was built in 1825, was estimated at 75 acres (30,350 m<sup>2</sup>) by Tatnall and Gednery in 1829, and 8.8 acres by Bache in 1845. The total area of the Fort, including the moat, is 64,400m<sup>2</sup>, and the area within the walls 34,000 m<sup>2</sup>. The Fort was abandoned in 1875; the island was used as a coaling station by the U.S. Navy from 1901–1905, when its area was increased and modified by dredging in the channel to the east and on the site of Bush Key; and it was again abandoned in 1910 and once more in 1925. It was declared a National Monument in 1935."

The history of land use at the fort is provided in detail by Stoddart and Fosberg (1981). Stoddart and Fosberg agree that after the Fort's abandonment in 1874, human impact on the island was minimal. In 1908, the site was designated a wildlife refuge to protect nesting birds from egg collectors. After a visit to the site, Presi-

dent Roosevelt designated the Fort a National Monument (Fort Jefferson National Monument) in 1935. On October 26, 1992, the Dry Tortugas including Fort Jefferson were established as a National Park.

The flora of the Florida Keys, including Garden Key, has been analyzed by a number of investigators (Small 1913; Davis 1942; McGuire & Brown 1974; Forsgren & Kephant 1978; Austin et al. 1987; Guala 1993). Principal among the floristic studies at Garden Key are those by Millspaugh (1907), Bowman (1918), Davis (1940, 1942), and Stoddart and Fosberg (1981).

Because 36 years have elapsed since the last survey of the Fort's taxa by Stoddart in 1977 (Stoddart & Fosberg 1981), the present study was undertaken to compile a complete list of the taxa at Fort Jefferson and Garden Key, including all taxa collected and reported by earlier investigators from 1904 to 1977.

### Climate

Climate data presented are from the nearest weather station, Key West, 109 km east of the preserve. Rainfall data at Key West date back to 1832. The climate at Fort Jefferson is milder and drier than Key West. Stoddart and Fosberg (1981) reported the long-term mean annual rainfall as 961 mm with extremes recorded in 1870 (1770 mm) and 1838 (520 mm). The climate of Fort Jefferson is subtropical-marine, characterized by dry, mild winters and long, warm summers. The average annual temperature is 78°F (25.56°C). January is the coolest month, with a mean of 70.3°F (20.1°C) while July is the warmest month averaging 84.5°F (29.1°C). Annual rainfall at Fort Jefferson is 40.65 in (1032 mm). Most rainfall occurs in August, September, and October: 4.94 in (125 mm), 5.91 in (150 mm) and 4.69 in (119 mm), respectively. Those 3 months have a collective total of 15.54 in (395 mm). The highest monthly rainfall, 533 mm, occurred in November 1954. February is the driest month, averaging 1.77 in (50 mm), followed by March 1.83 in [46.5mm], and April 1.87 in [47.5mm], totaling 5.27 in (134 mm). No frost has ever been recorded at the Key West weather station. The lowest recorded temperature at Key West was 41°F (5°C). The lower Florida Keys receive the least rainfall in the entire state (Anonymous 1974).

Infrequent hurricanes may bring damaging winds, storm surges, and abundant rain. The most recent

hurricane to strike Fort Jefferson was Hurricane Irene in August 2012. The vegetation, especially the taxa protected within the Fort's walls, suffered little damage from Hurricane Irene's wind, storm surge, and salt spray.

### Geology

Coral reefs once occupied much more area of the submerged southern Florida plateau than they do now. Behind these reefs, in the warm still waters of the Gulf, countless tons of lime have precipitated from decomposing calcareous organisms, becoming the oolitic limestone or oolite that makes the lower Florida Keys geology so unique (Lazell 1989). Waters exiting the Gulf of Mexico dissected the oolite plateau into relict platforms. There are storm borne drift sand, coral, and detritus collected in ridges or berms along the edges of the platforms of oolite. This loose sedimentary material traps rainwater and supports narrow lenses of fresh water. Fresh water from rain which enters the oolite is readily trapped there within a lithic or rocky lens. The large lenses provide fresh water that enables species survival in the lower Keys where average yearly rainfall is less than that in the middle or upper Keys, and is least at Garden Key, averaging 1032mm/y. Finally, sea level rise and fall (and subsequent erosion) have combined to influence the geology of the lower Florida Keys and the taxa that now inhabit these islands. Additional information about the geology of the region was provided by Agassiz (1888), Vaughan (1914), Field (1919), Ginsberg (1953), Shinn et al. (1977), and Lazell (1989).

### Vegetation Sampling

Taxa documented during the present study were collected on 23 December 2012 and photographed on a second trip, 9 September 2013 (Appendix). Nomenclature follows that of Wunderlin and Hansen (2008). All specimens are housed at the Everglades National Park Herbarium (FNPS).

### Plant Communities

The vascular flora of the lower Florida Keys has much in common with the West Indies flora (Davis 1942; Robertson 1955; Correll & Correll 1982; Stalter 1993; Stalter et al. 1999). Davis (1942) described four major Florida Keys plant communities: hammock forest, scrub zone, dune zone, and strand-beach zone. Only one of Davis's communities occurs at Fort Jefferson, the strand-beach community. A second community, a ruderal community composed of lawns and gardens, also occurs at Fort Jefferson. Before Fort Jefferson was constructed on Garden Key, the Key may have supported a mangrove forest community, as this community is common in unspoiled islands west of Key West.

## RESULTS AND DISCUSSION

The vascular flora of Fort Jefferson National Monument consists of 144 species, 118 genera, and 46 families. Sixty-one species (42%) are not native to the region (Table 2). The major families in the flora are the Poaceae (27 spp.), Fabaceae (17 spp.) and Euphorbiaceae (10 spp.). One invasive fern, *Pteris vittata*, was identified at the site for the first time. Thirty percent of the species occurred in the Poaceae and Fabaceae. The largest genera in the flora were *Euphorbia* (8), *Sida* and *Cenchrus* (4) while five genera were represented by three taxa. Eight taxa in the present study were exclusively collected or observed on Garden Key outside Fort Jefferson: *Argusia gnaphalodes*, *Cakile lanceolata*, *Cynanchum blodgettii*, *Ipomoea pes-caprae*, *Pentalinon luteum*, *Sarcostemma clausum*, *Scaevola plumieri*, and *Suriana maritima*. The marine sea grasses are additionally found in the Gulf of Mexico. *Uniola paniculata* thrived on the low dunes at the campsite but was also observed near the entrance within the Fort.

There have been six floristic inventories of Garden Key and Fort Jefferson beginning with Millspaugh's (1907) study in 1904 (Table 1). Millspaugh collected 35 species, including 18 that were native. Bowman (1918) next listed of 53 taxa, of which 21 were native, 22 were introduced, and 8 taxa whose status could not be determined with certainty. Twenty-two years passed before Davis (1942) conducted a survey in 1937, where 39 taxa were identified. These included 14 native species, 13 introduced species and 9 species of questionable origin. Fosberg (1962) listed 71 species; only 9 were native, 51 were introduced, and 11 were of undetermined status. Stoddart botanized the island in 1977, collecting 21 taxa and adding one taxon, *Ochrosia elliptica* to the island's flora and eight additional taxa to the list generated exclusively by Stoddart and Fosberg (1981).

TABLE 1. Botanical forays at Garden Key, as reported by Stoddart and Fosberg (1981).

Investigator and Year of Investigation	Date of Floristic Inventory	No. of Taxa
Millspaugh (1907)	19–22 March 1904	35
Bowman (1918)	July 1915; 1916	53
Taylor (1926, 1928)	June 1926 0000	-
Tandy (unpublished)	June–July 1931, August 1933; no collection list	-
Davis (1940, 1942)	1937, 1938	39
Fosberg (1981)	August 1962	71
Stoddart and Fosberg (1981)	May–June 1977	21
Stalter (2012, 2013)	December 2012, September 2013 2222	76

TABLE 2. A summary of the vascular flora at Fort Jefferson, Garden Key, Florida.

	Spore plants	Gymnosperms	Dicots	Monocots	Total
Families	1	0	33	12	46
Genera	1	0	77	40	118
Species	1	0	94	49	144
Native species	0	0	61	22	83
Non-native species	1	0	33	27	61

The flora of the island is ever-changing. Only four taxa, *Boerhavia coccinea*, *Cyperus planifolius*, *Melanthera nivea*, and *Stachytarpheta jamaicensis*, have been identified by all 6 investigators over a 109 year period. If we combine the Stoddart and Fosberg (1981) collections (which was conducted to increase the number of taxa reported in the Stoddart and Fosberg (1981) study) two additional species, *Ipomoea pes-capre* and *Suriana maritima*, bring the total common to all botanists to six. Millspaugh (1907) was the only scientist to collect *Paspalum distichum* and *Argemone mexicana*.

No collector or team of collectors has identified more than 82 species at Fort Jefferson (Stoddart & Fosberg 1981). Stoddart and Fosberg (1981) vouchered 55 species, housed in the Smithsonian Institution, Washington, DC, and added 27 sight records. Stalter identified 76 species, vouchering 66, providing photographs of five, and adding four sight records. Stalter's 76 species included 26 non-native species, 35% of his flora while Stoddart and Fosberg identified 33 non-native taxa, 40% of their total. Others who have contributed to the Fort's flora are Bowman (53 species), Davis (39 species) and Millspaugh (36 species) (Table 1).

Non-native taxa compose 42% of the flora, a value higher than that reported for Biscayne National Park in the eastern Upper Keys by Stalter et al. (1999) where 25% of the vascular plant species were not native to the region. In an unpublished study of Pescatello Torchwood Hammock Preserve situated in Little Torch Key, 45 km east of Key West, Stalter and Lynch identified only one non-native taxon, *Thespezia populnea* from their unpublished list of 101 taxa. With the exception of mosquito ditches excavated in the 1960s and a narrow nature trail constructed in the 1990s, the Torchwood Hammock Preserve has been undisturbed. The Preserve is gated and few people visit there, a potential source of seeds of invasive taxa. By comparison, Fort Jefferson is visited by tens of thousands of people each year, possibly introducing seeds of non-native taxa.

The mangrove *Rhizophora mangle* was reported at Garden Key by Bowman (1918) and as drifts seedlings by Davis (1940). *Avicennia germinans* was vouchered by Fosberg in 1962. *Laguncularia racemosa* was reported by Stoddart on Bush Key, which now is joined to Long Key and Garden Key by a narrow spit of sand. The exotic *Casurina equisetoides* was reported by Davis in 1944 at Garden Key but was not observed in a later study by Fosberg in 1962 or Stoddart in 1977 (Stoddart & Fosberg 1981).

The island's small size may account for the low number of taxa identified there. Simberloff's (1976) study on insect immigration, extinction, and diversity concluded that island distance from the mainland influences species richness on mangrove islands in the Florida Keys. He also concluded that insect species turnover is

minimal, and species richness changes little, following initial colonization. Our floristic data at Garden Key suggests a large turnover of vascular plant species over time, which may be a function of the island's small size, supporting small populations that are more susceptible to local extinction. Moreover, competition among taxa, anthropogenic disturbance (e.g., mowing, weeding, cultivating), natural events (e.g., hurricanes, Guala 1993; Howard 1995), wide differences in yearly rainfall (the driest recorded yearly rainfall was less than one third of that of the wettest year), and community development may lead to local species extinction at Fort Jefferson. Because of the small number of taxa identified by individual collectors at Fort Jefferson, comparative comments on species turnover cannot be determined with accuracy as lists of the island's flora may be incomplete (Table 1).

We conclude that the flora at Garden Key is dynamic and ever-changing. Most of the taxa reported by previous investigators were not observed in the present study. Twenty-eight taxa were recorded in this report at Garden Key for the first time. Vascular plant species become established and/or extirpated, especially invasive taxa that inhabit gardens and lawns that are targeted for eradication from time to time. This study is unique as few sites in the United States have a comparative history of vascular plant species inventories over 100 years. Fort Jefferson and Garden Key provide a protected environment for comparative floristic inventories in the future.

## APPENDIX

Checklist of the native and naturalized non-native vascular flora of Garden Key and Fort Jefferson, 1907 to 2013. Numbers following each species indicate floristic studies. **1** = Millspaugh (1907), **2** = Bowman (1918), **3** = Davis (1942), **4** = Stoddart and Fosberg (1962–1977), **5** = Stalter (2013) (Present study). Nomenclature and nativity status follows Wunden L. and Hansen (2008). Non-native species are marked with an asterisk (\*). Species have been arranged according to the following categories: spore plants (lycophytes and monilophytes), gymnosperms, dicots, and monocots. Within each category, families and lower taxa have been arranged alphabetically. Each entry includes the following information sequence: scientific name; pertinent synonym, enclosed in brackets; habitat; relative abundance in the study area, using the categories: rare (scarce, less than 5 populations), infrequent (uncommon, occasionally, 5 to 10 populations), frequent (common, more than 10 populations).

## FERNS

## Pteridaceae

\**Pteris vittata* L.; Stalter 9 September 2013; digital photo. **5**

## DICOTS

## Aizoaceae

*Sesuvium portulacastrum* (L.) L.; Stoddart 8011 (US); Stalter 47.

**1 2 3 4**

*Trianthema portulacastrum* L.; Stalter 3. **5**

## Amaranthaceae

*Alternanthera maritima* (Mart.) A. St. Hil.; Bowman 1918. **2**

*Amaranthus viridis* L.; Lansing 2521 (F). **1**

*Atriplex pentandra* (Jacq.) Standl.; Lansing 2522 (F); Stoddart 8081 (US). **1 2 4**

*Blutaparion vermiculare* (L.) Mears [*Phloxeris vermicularis* (L.) Sm.]; Stalter. **1 5**

## Apocynaceae

\**Catharanthus roseus* (L.) G. Don; Fosberg sight record 1962. **2 4 5**

\**Cryptostegia grandiflora* (Roxb. ex R. Br.) R. Br.; Fosberg sight record 1962. **4**

*Cynanchum blodgettii* (A. Gray) Shinnery; Stalter 23 December, 2012. **5**

\**Nerium oleander* L.; Fosberg sight record, 1962. **3 4**

\**Ochrosia elliptica* Labill.; Stoddart 8064 (US). **4**

*Pentalinon luteum* (L.) B.F. Hansen & Wunderlin [*Urechites luteus* (L.) Britt.]; Stalter. **5**

*Sarcostemma clausum* (Jacq.) Roem. & Schult.; Stalter 72. **5**

## Araliaceae

\**Polyscias guilfoylei* (W. Bull.) L.H. Bailey; Fosberg sight record 1962. **4**

## Asteraceae

*Bidens alba* (L.) DC. [*Bidens leucantha* Willd.]; Lansing 2506 (F); Fosberg 42987 (US). Stalter 44, 68, 114. **1 2 4 5**

*Coryza canadensis* (L.) Cronquist; Fosberg 42984(US); Stalter sight record. **1 2 4 5**

\**Cyanthillium cinereum* (L.) H. Rob.; Stalter 45, 84. **5**

*Gaillardia pulchella* Fouq.; Fosberg 43022 (US). **4**

*Iva imbricata* Walt.; Davis 1942. **1 2 3**

*Melanthera nivea* (L.) Small; Stalter 69, 91, 118. **1 2 3 4 5**

*Sonchus oleraceus* L.; Fosberg 42988 (US); Stalter. **1 2 3 4 5**

## Boraginaceae

\**Cordia sebestena* L.; Stoddart 8096 (US); Stalter 18. **2 4**

*Heliotropium angiospermum* Murray; Fosberg 43024 (US). **4**

*Heliotropium curassavicum* L.; Fosberg 43066 (US). **1 3 4**

*Heliotropium gnaphalodes* L. [*Argusia gnaphalodes* (L.) Heine, *Tournefortia gnaphalodes* (L.) Kunth]; Stalter 37.; Stoddart 8066 (US). **1 2 4 5**

## Brassicaceae

*Cakile lanceolata* (Willd.) O.E. Schulz [*C. fusiformis* Greene]; Lansing 2517, 2526 (F); Stoddart 8002 (US); Stalter 101, 102. **1 2 4 5**

*Lepidium virginicum* L.; Fosberg 43025 (US); Stalter sight record. **2 4 5**

## Burseraceae

*Bursera simaruba* (L.) Sarg.; Fosberg sight **2 3** record, 1962; Stalter 46. **2 3 4 5**

## Cactaceae

\**Cereus hexagonus* (L.) Mill.; Stalter (photo). **5**

*Opuntia stricta* (Haw.) Haw. [*Opuntia dillenii* (Ker.) Haw.]; Davis 1942. **1 2 3**

## Casuarinaceae

\**Casuarina equisetifolia* L.; Davis 1942. **3**

**Combretaceae**

*Conocarpus erectus* L.; Fosberg 42992, 42993 (US); Stoddart 8066, 8067 (US); Stalter 42, 98, 122, 113. **2 3 4 5**

\**Terminalia catappa* L.; Fosberg sight (1962); Stalter 103. **2 4 5**

**Convolvulaceae**

*Ipomoea macrantha* Roem. & Schult. **2 4**

*Ipomoea pes-caprae* (L.) R. Br. subsp. *brasilienis* (L.) Ooststr.; Stoddart 8074 (US); Stalter 56, 83, 104. **1 2 3 4 5**

*Ipomoea violacea* L.; Stoddart 8079 (US). **4**

**Euphorbiaceae**

\**Codiaeum variegatum* (L.) A. Juss.; Fosberg sight record 1962. **4**

*Euphorbia adenoptera* Bertol. subsp. *pergamena* (Small) Oudejans; Lansing 2502 (F).

*Euphorbia blodgettii* Engelm. ex Hitchc. [*Chamaesyce blodgettii* (Engelm. ex Hitchc.) Small]; Fosberg 42980 (US); Stalter 11, 73. **4 5**

*Euphorbia heterophylla* L. [*E. havanensis* Willd.]; Lansing 2536 (F);

Fosberg 42989 (US); Stoddart 8054 (US); Stalter 7. **1 3 4 5**

*Euphorbia hirta* L. [*Chamaesyce hirta* (L.) Millsp.]; Fosberg 43015 (US); Stalter 8, 105. **4 5**

*Euphorbia hypericifolia* L. [*Chamaesyce hypericifolia* (L.) Millsp.]; Fosberg 42994, 40362 (US). **2 4**

*Euphorbia mesembryanthemifolia* Jacq. [*E. buxifolia* Lam.]; Lansing 2523 (F); Stalter 9, 12, 13, 106. **1 2 3 5**

\**Euphorbia prostrata* Aiton [*Chamaesyce prostrata* (Aiton) Small]; Fosberg 42991 (US). **4**

*Euphorbia tithymaloides* L. [*Pedilanthus tithymaloides* (L.) Poit. Fosberg site record 1962. **4**

\**Ricinus communis* L.; Reported by Bowman 1918. **2**

**Fabaceae**

\**Abrus precatorius* L.; Fosberg sight record 1962. **4**

*Caesalpinia bonduc* (L.) Roxb.; Stoddart 8059 (US). **1 2 4**

\**Caesalpinia pulcherrima* (L.) Sw.; Fosberg sight record 1962. **4**

\**Cajanus cajan* (L.) Millsp.; Reported by Bowman 1918. **2**

\**Canavalia rosea* (Sw.) DC. [*C. obtusifolia* (Lam.) DC.]; Lansing 2516 (F); Fosberg 43057 (US); Stoddart 8063 (US). **1 2 3 4**

*Ceratonia siliqua* L. **4**

\**Crotalaria pallida* Aiton; Stoddart 8078 (US). **4**

\**Crotalaria retusa* L.; Stalter 15, 88. **5**

\**Delonix regia* (Boij.) Raf.; Stoddart 8070 (US). **4**

*Desmanthus virgatus* (L.) Willd. [*D. depressus* Humb. & Bonpl. ex Willd.]; Fosberg 43011 (US); Stalter 4, 14. **4 5**

*Desmodium incanum* DC.; Fosberg 43067 (US); Stalter 17, 19, 108. **4 5**

\**Indigofera spicata* Forsk.; Stalter 16, 58, 70, 93. **5**

*Rhynchosia parviflora* (E. Mey.) Steud.; reported by Bowman 1918. **2**

\**Sesbania sericea* (Willd.) Link; Stalter 71, 92, 94. **5**

*Sesbania* sp. **1 2 3**

*Stylosanthes hamata* (L.) Taub.; Stalter 89, 120. **5**

\**Tamarindus indica* L.; Fosberg sight record 1962. **2 3 4**

**Gentianaceae**

*Eustoma exaltatum* (L.) Salisb. ex G. Don; Fosberg 42979 (US); Stalter 99. **4 5**

**Goodeniaceae**

*Scaevola plumieri* (L.) Vahl; Stoddart 8072 (US); Stalter 107. **2 4 5**

**Lythraceae**

\**Lawsonia inermis* L.; Fosberg 43065 (US). **4**

**Malvaceae**

\**Hibiscus rosa-sinensis* L.; Fosberg sight record 1962; Stalter 55. **4 5**

*Malvaviscus arborea* Cav.; Fosberg sight record 1962. **4**

\**Sida abutilifolia* Mill. [*Sida procumbens* Sw.]; Fosberg 43012 (US). **1 2 4**

*Sida acuta* Burm.f. **1 2 4**

*Sida ulmifolia* Mill. [*Sida ciliaris* L.]; Fosberg 43012 (US); Stalter 74, 82, 116. **4 5**

\**Thespesia populnea* (L.) Soland. ex Correa; Stoddart 8068 (US). **2 3 4**

**Myrtaceae**

\**Psidium guajava* L.; Fosberg 43069 (US). **2 3 4**

**Nyctaginaceae**

*Boerhavia coccinea* Mill. [*B. viscoa* Lag. & Rodr.]; Lansing 2530 (F); Fosberg 43061 (US); Stalter 49. **1 2 3 4 5**

\**Bougainvillea glabra* Choisy; Fosberg sight record 1962; Stalter 85, 87. **4 5**

**Oxalidaceae**

*Oxalis corniculata* L.; Stalter 48. **5**

**Papaveraceae**

*Argemone mexicana* L.; Lansing 2531 (F). **1**

**Phyllanthaceae**

\**Breynia disticha* J.R. & G. Forst.; Fosberg sight record 1962. **4**

*Pedilanthus tithymaloides* (L.) Poit.; Fosberg sight record 1962. **4**

\**Phyllanthus amarus* Schumacher & Thonn.; Fosberg 43014 (US); Stalter 103. **4 5**

**Polygonaceae**

*Coccoloba uvifera* (L.) L.; Stoddart 8062 (US); Stalter 50, 115. **2 3 4 5**

**Portulacaceae**

\**Portulaca oleracea* L.; Fosberg 43008, 43009 (US) **1 2**; Stoddart 8073 (US). Stalter 2, 39. **4 5**

*Portulaca pilosa* L.; Stalter 23 December, 2012. **5**

**Rhizophoraceae**

*Rhizophora mangle* L.; Bowman 1918. **2 3**

**Rutaceae**

\**Citrus aurantiifolia* (Christm.) Swingle; Fosberg sight record 1962. **4**

**Scrophulariaceae**

*Capraia biflora* L. [= *C. lanceolata* L.f., *C. saxifragifolia* Schlttdl. & Cham.]; Lansing 2501 (F); Fosberg 43028 (US); Stalter 52. **1 4 5**

**Sterculiaceae**

*Waltheria indica* L.; Fosberg 43068 (US). Stalter 51, 117. **4 5**

**Surianaceae**

*Suriana maritima* L.; Stoddart 8071 (US) **1 2 3 4 5**; Stalter 81, 100.

**Urticaceae**

*Parietaria* sp.; Stalter 119. **5**

**Verbenaceae**

*Avicennia germinans* (L.) L.; Fosberg 43058 (US). **2 3 4**

*Phyla nodiflora* (L.) Greene [*Lippia nodiflora* (L.) Michx.]; Fosberg 43010, 43020 (US); Stalter 53, 54. **2 4 5**

*Stachytarpheta jamaicensis* (L.) Vahl; Fosberg 42997 (US); Stoddart 8077 (US); Stalter 95, 121; Bowman 1918. **1 2 3 4 5**

**ANGIOSPERMAE-MONOCOTYLEDONEAE****Agavaceae**

\**Agave americana* L.; Davis 1942; not recently Observed. **3**

*Agave decipiens* Baker; Bowman 1918. **2**

\**Agave sisalana* Perrine; Stalter 75, 76. **5**

\**Sansevieria hyacinthoides* (L.) Druse; Fosberg sight record 1962. **4**

*Yucca aloifolia* L.; Davis 1942. **3**

**Amaryllidaceae**

\**Hymenocallis latifolia* (Mill.) M. Roem.; Davis 1942; Fosberg sight record 1962; Stalter 90. **1 2 3 4 5**

\**Hymenocallis littoralis* (Jacq.) Salisb. **4**

**Arecaceae**

\**Cocos nucifera* L.; Stoddart sight record 1966, Stalter digital photo. **4 5**

\**Phoenix canariensis* hort ex Chabaud; Historical record Bowman 1918, Davis 1942. **2 3**

\**Phoenix dactylifera* L.; Fosberg sight record 1966; Stalter digital photo. **2 3 4 5**

\**Pritchardia* sp.; Fosberg sight record 1962. **4**

\**Washingtonia filifera* (Linden ex André) H. Wendl.; Fosberg- sight record 1962. **4**

**Asphodelaceae**

\**Aloe succotrina* All.; Stalter 59. **5**

\**Aloe vera* (L.) Burm.f.; Fosberg sight record 1962. **4**

**Asparagaceae**

\**Asparagus aethiopicus* (L.) Kunth; Stalter 5, 80. **5**

**Commelinaceae**

\**Tradescantia spathacea* Sw. [*Rhoea spathacea* (Sw.) Stearn]; Fosberg sight record 1962; Stalter 38. **4 5**

**Cymodoceaceae**

*Halodule wrightii* Asch.; Fosberg 43018 (US). **4**

*Syringodium filiforme* Kütz.; Fosberg 43013 (US); Stalter 96. **4 5**

**Cyperaceae**

*Cyperus planifolius* Rich. [= *C. brunneus* Sw.]; Lansing 2529 (F); Fosberg 42982, 43054, 43055 (US); Stalter 34, 35, 60, 111. **1 2 3 4 5**

*Fimbristylis cymosa* R. Br.; Stalter 36. **5**

**Hydrocharitaceae**

*Thalassia testudinum* Banks & Sol. ex K.D. König; Stalter 97. **5**

**Musaceae**

\**Musa paradisiaca* L. [*Musa sapientum* L.]; Fosberg sight record 1962, Stalter sight record. **4 5**

**Pandanaceae**

\**Pandanus tectorius* Parkinson ex Du Roi; Fosberg sight record 1962. **4**

**Poaceae**

\**Bothriochloa pertusa* (L.) A. Camus; Stalter 30, 31. **5**

*Cenchrus echinatus* L.; Lansing 2512 (F); Fosberg 43059 (US). **1 2 3 4**

*Cenchrus incertus* M.A. Curtis; Fosberg 42983, 42990, 43060 (US). **1 4**

*Cenchrus spinifex* (L.) Cav.; Stalter 27, 43, 63. **5**

*Cenchrus tribuloides* L.; Lansing 2511 (F).

\**Cynodon dactylon* (L.) Pers.; Fosberg 42996 (US). Stalter 26, 33, 61. **2 3 4 5**

\**Dactyloctenium aegyptium* (L.) Willd. ex Asch. & Schweinf.; Stalter 23. **5**

\**Digitaria horizontalis* Willd.; Fosberg 42981 (US); not recently observed. **4**

\**Digitaria sanguinalis* (L.) Scop.; Fosberg 42985 (US). Stalter 110, 23. **1 2 3 4 5**

\**Digitaria* sp.; December, 2012. **5**

\**Eleusine indica* (L.) Gaertn.; Stalter 24, 25. **5**

\**Eragrostis ciliaris* (L.) R. Br.; Fosberg 43017 (US). **4**

\**Eragrostis prolifera* (Sw.) Steud.; Fosberg 43019 (US); Stoddart 8065 (US); not recently observed. **4**

\**Eragrostis tenella* (L.) P. Beauv. ex. Roem. & Schult.; Fosberg 43032 (US). **3 4**

*Eustachys petraea* (Sw.) Desv.; Fosberg 43056 (US). **1 3 4**

*Paspalum caespitosum* Flügge; Bowman 1918; Davis 1942. **2 3**

*Paspalum distichum* L.; Lansing (F). **1**

*Paspalum vaginatum* Sw.; Stalter 97. **5**

*Schizachyrium sanguineum* (Retz.) Alston; Stalter 62. **5**

*Setaria parviflora* (Poir.) Kerguelen; Stalter 40. **5**

*Sporobolus domingensis* (Trin.) Kunth; Stalter 28, 64. **5**

*Sporobolus virginicus* (L.) Kunth; Fosberg 4300 (US); Stoddart 8004 (US); Stalter 65, 67. **2 3 4 5**

*Stenotaphrum secundatum* (Walt.) Kuntze; Stalter 109. **4 5**

*Uniola paniculata* L.; Stalter 21. **1 2 4 5**

\**Urochloa distachya* (L.) T.Q. Nguyen [follows *Brachiaria*]; Stalter 29, 32. **4 5**

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