

**Status Survey of Aboriginal Pricklyapples,
Harrisia aboriginum Small ex Britton & Rose,
in Southwestern Florida**

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Cover Photo: *Aboriginal Pricklyapple* (*Harrisia aboriginum* Small ex Britton & Rose) at Manasota Beach Park on North Manasota Key. Steven W. Woodmansee, September 2003.

Section 1

Introduction

Harrisia aboriginum Small ex Britton & Rose, aboriginal pricklyapples, is a member of the cactus family (Cactaceae). The species is endemic to southwestern Florida. It was described by John Kunkel Small in Britton & Rose (1920) after he discovered it on Terra Ceia Island in Manatee County. Later botanists and naturalists reported plants from shell mounds north of the Ten Thousand Islands northward to the Tampa Bay area (Small 1933). Its typical habitats are shell mounds, coastal berms, coastal strand, maritime hammocks, and coastal grasslands.

The coastal habitats that this species inhabits have been heavily impacted by development. Shell mounds, created by American Indians, were among the first areas colonized by early Western Europeans because of their high elevations, and were later extensively utilized for construction material, resulting in their complete destruction. Coastal hammocks, strands, and berms, because of their proximity to the beach and higher elevations, were also used for coastal residential construction. Only occasional isolated fragments of suitable habitat for *H. aboriginum* remain.

Prior to this study, only a few small populations of the species were known (Gann et al. 2002). This study was conducted to compile available information on the status of the species and to conduct additional field studies to accurately determine its status. The species is listed as endangered by the State of Florida, Division of Agriculture and Consumer Services.

Several studies of the status of *H. aboriginum* were previously conducted. The first, by Austin et al. (1980), reported historical data on the species, including four reliable historic populations. Only one colony on Buck Key in Lee County, consisting of four clumps of plants was reported as extant. While somewhat unclear, it appears that searches were conducted on Longboat Key, Terra Ceia Island, Marco Island, and in Fort Pierce. The Fort Pierce record in St. Lucie County was believed to be erroneous.



Morris and Miller (1981) also conducted a study of *H. aboriginum* in southwest Florida. They reported *H. aboriginum* for four sites, one on Longboat Key, two on Manasota Key, and one on Live Oak Key, now known as Kitchen Key, just off of Gasparilla Island. The four sites together had approximately 371 clumps of plants. Each of the four sites was privately owned at the time. Their report does not indicate whether other sites were searched.

Johnson and Muller (1993) published an assessment of coastal upland sites greater than 20 acres in southwest Florida, from Pasco County south to Florida Bay in Monroe and Miami-Dade counties. No populations of *H. aboriginum* were located during surveys of 53 sites, including 26 from Manatee to Collier Counties. An erroneous comment is made that *H. aboriginum* was known from only Sarasota County, citing Morris & Miller (1981).

The Florida Natural Areas Inventory (FNAI) database contains 10 records of *H. aboriginum*, with the most recent record being an observation of one on Buck Key by Ann Johnson and Bob

Repenning in 1991. All other records are from the period 1977 to 1981. These remaining records are primarily from the Morris & Miller report, but included are reports from Cayo Costa Island (Herwitz, 1977).

Hooten (1991), while not having conducted a formal status survey, wrote of *H. aboriginum*: “Unfortunately, several years of surveying likely habitats have so far been unsuccessful. To date, the author has not seen any specimens conforming to the description of *H. aboriginum*. Because of increasing habitat destruction along the coastline due to land ‘developers,’ it may very well have become extinct.” Hooten further discusses a colony of *Harrisia* on Buck Key, which he describes as a distinct species, *H. donae-antoniae* Hooten.

The species is extirpated in part of its historical range. The type locality, Terra Ceia Island, no longer contains any plants. John Kunkel Small wrote that he discovered it on the western shore of Terra Ceia Island, this may have been in the vicinity of Madira Bickel Mound, which is protected in the Madira Bickel Mound State Archaeological Site. This site was purchased for preservation and donated to the state in 1948. No plants were seen there in our surveys, although the mound there is dominated by native plant species. Austin (1984) reported that the species was extirpated there by the 1970s. The mound itself is part of a once larger archaeological site that extended to the northwest to the edge of Miguel Bay, but areas outside of the park have been developed.

Fellows et al. (2001) and Gann et al. (2002) reported two occurrences of *H. aboriginum* in three conservation areas from Charlotte County southward (Manatee and Sarasota Counties were not treated in the publication), one on Gasparilla Island and adjacent Kitchen Key, and another on Buck Key. In subsequent field surveys in 2002 Gann and biologists from Fairchild Tropical Botanic Garden (FTBG) and Roger Clark of Lee County searched for and mapped plants at the Bocilla Preserve in Lee County, where it had been previously reported by Lee County staff.

This survey was initiated to determine the full distribution of the species in southwestern Florida. It was expected that undiscovered populations existed, especially in unexplored shell mounds and coastal prairies of Lee and Charlotte counties. It was uncertain as to its status in areas north of Charlotte County as much coastal development has taken place in recent years.

Methods

Searches of state and local herbaria were conducted for specimens of *H. aboriginum*: Fairchild Tropical Botanic Garden (FTG), Marie Selby Botanical Gardens (SEL), New York Botanical Garden (NY), Rancho Santa Ana Botanical Garden (RSA), University of Florida (FLAS), University of South Florida (USF), and the U.S. National Herbarium (US). Contacts with park managers, botanists and naturalists also were made to ensure that all known populations were visited. Individuals who were contacted include Charlotte County Parks and Recreation (Cathy Olsen), Florida Department of Environmental Protection (Andrea Bishop, Annette Nielsen, and Bob Repenning), Gasparilla Island Conservation and Improvement Association (Misty Nabers), Rick Joyce, Lee County Parks and Recreation (Roger Clark), George Luer, Marie Selby Botanical Gardens (Dr. Bruce Holst and Dr. John Beckner), Clyde Nabers, New College of

Florida (Dr. Julie Morris and Dr. Jono Miller), Larry Rabinowitz, University of South Florida (Dr. Richard .P. Wunderlin and Dr. Bruce F. Hansen), and Richard Workman.

A survey was planned at all sites where either herbarium label data or personal reports indicated that *H. aboriginum* might persist. Locations for this survey were identified by communicating with above contacts. Sites visited recently by IRC and FTBG staff were not surveyed in this study, although these data are included in this report.

Public properties were surveyed first. Private properties were searched provided permission was granted. Fieldwork was conducted over between April 2003 and October 2003 by Keith A. Bradley, Steven W. Woodmansee, Jimi L. Sadle, and Melissa E. Abdo of IRC, and Andrea Bishop and others of FDEP. Sixteen properties were surveyed within 12 days of fieldwork. These occur over a 162 km (101 mi)stretch of coastline in southwestern Florida north-south from Terra Ceia Island in Manatee County to Delnor Wiggins State Park in Collier County.

Results

Herbarium label data for *H. aboriginum* was collected from the New York Botanical Garden (NY) U.S. National Herbarium (US), University of South Florida (USF), and the University of Florida (FLAS). Other herbaria that were contacted did not have any specimens.



Photo by Steve Woodmansee

Conversations with land managers, botanists, and naturalists yielded reports of several populations previously unknown to us or to the United States Fish and Wildlife Service. Annette Nielsen, who most recently found *Harrisia aboriginum* on Cayo Costa Island, directed us to the Boggess Ridge station in the Charlotte harbor state buffer preserve. Her former colleague and manager at Charlotte harbor state buffer preserve, Bob Repenning, directed us to another station on Cayo Pelau. Repenning directed us to George Luer, who informed us of the station at the private conservation area, Historic Spanish Point. Luer mentioned Bruce Holst at Marie Selby Botanical Gardens who directed us to five other sites, four of which were surveyed successfully.

Based on historical data, *H. aboriginum* once occurred along approximately 125 km (78 mi) of the Southwestern Florida coast, from Terra Ceia Island in Manatee County, south to Buck Key in Lee County, just north of Sanibel Island. There are three doubtful records from further to the south, a report on Sanibel Island in Lee County by Herwitz (1990), a report from Delnor-Wiggins Pass State Park in Collier County (Anonymous, 1994), and a sterile specimen by Lakela (28593-A, USF; see Austin 1980) from Marco Island. The Lakela specimen probably represents seedlings of *Acanthocereus tetragonus*, according to Richard P. Wunderlin (pers. comm.).

A report from Delnor-Wiggins State Park (Anonymous 1994) also seems to be in error. The species appears on a plant list for the park, which at the time of preparation also included lands now designated as Barefoot Beach Conservation area, just to the north. Only a small amount of suitable habitat for the species exists at Delnor-Wiggins, and no plants were found there.

Suitable habitat does exist at Barefoot Beach, but no plants were located there during our surveys.

In 1991 Mark L. Hooten described plants from Buck Key as a new species, *H. donae-antoniae* (Hooten 1991). The species was distinguished from *H. aboriginum* by having flower buds that are white-hairy rather than brown hairy. Wunderlin (2002 and 2003) do not recognize the species as having been validly published. Wunderlin (pers. comm.) also believes that even if the publication had been valid, it is merely a variant of *H. aboriginum*. The Flora of North America Editorial Committee (2004) also treats it as “an invalid name for a local Florida variant of *H. aboriginum*.”

There are currently ten known occurrences of *H. aboriginum* (Table 1, Figure 1), ranging along a 100 km (62 mi) stretch of the west coast. Plants occur in six public and private conservation areas (Table 1). Each occurrence is described individually in Section 2, with each site described under each occurrence if there are multiple owners. Approximately 350-400 plants exist in the wild, with occurrences having a range of one individual to 200 plants.

A single collection was made in 1911 in Osprey in Sarasota County by John G. Webb (s.n., NY). Little is known of Webb, who settled in Osprey in 1868, and is listed on the 1897 census as postmaster and hotel owner (<http://www.rootsweb.com/~flsaraso/1897.htm>). This is the only plant specimen we know of that he collected, and the exact location of his collection in or around Osprey is uncertain. The collection may have been made at the nearby Spanish Point where *H. aboriginum* still occurs.

There have been several erroneous reports of *H. aboriginum*. Lakela & Craighead (1965) reported it for Collier County. Long & Lakela (1976) reported it for the 10,000 Islands and the Florida Keys. Avery and Loope (1980) reported it for Everglades National Park, presumably based on the 10,000 Islands reference in Long and Lakela (1971). Hammer & Bradley (1998) and subsequently Stalter et al. reported it for Biscayne National Park in Miami-Dade County, where only *H. simpsonii* occurs. Austin (1980) also discussed a specimen (Small s.n., NY) collected in St. Lucie County that had been annotated as *Cereus gracilis* var. *aboriginum* by Lyman Benson. This annotation seems to have been in error, since it was not reported for that county by Benson (1982). This was almost certainly a specimen of *H. fragrans*.

Discussion

This survey showed that there are more occurrences of *H. aboriginum* remaining in the wild than previously known. However, the species is still known from only a small number of stations, most with very few individuals. Plants occur on seven private properties, six conservation areas, and two public properties that are not conservation areas. The private stations are all threatened by habitat destruction. Each plant station, private and public, faces numerous threats including exotic pest plant invasions, poaching, and sea-level rise. Misty Nabers has observed that introduced iguanas eat flowers of plants on Gasparilla Island, likely limiting sexual reproduction in this group of plants. Possible effects of sea-level rise on Kitchen Key were noted by Morris & Miller (1981), and recent cabbage palm deaths observed by Gann indicate that this is a continuing problem there. Given that all stations occur just slightly above mean sea level, this will be a continuing problem for the species.

Every attempt should be made to acquire private lands with *H. aboriginum*. In many cases this will be impossible, but conservation agreements with landowners are probably feasible. A reintroduction of the species to Terra Ceia Island at Madira Bickel State Archaeological Site is also worth consideration. While the site does not have sufficient area to sustain a large number of plants, it is a high elevation site, and represents the northernmost locality ever known for the species. Introductions to other shell mounds and coastal sites should also be considered. Augmentation of the Cayo Costa occurrence, which has only a single plant, should be attempted. Management plans for all conservation lands where the species occurs should address factors such as invasive plant and animal management, poaching, and sea-level rise as they relate to this species.

Table 1
Remaining Natural Occurrences of *Harrisia aboriginum* from North to South in
Southwestern Florida

Water Club Preserve, Longboat Key, Sarasota County
Historic Spanish Point, Sarasota County
North Manasota Key, Sarasota County
Charlotte harbor state buffer preserve, Charlotte County
Kitchen Key and Gasparilla Island Conservation and Improvement Association Tract A
on
Cayo Pelau, Lee County
Gasparilla Island, Lee County
Bocilla Preserve, Pine Island, Lee County
Cayo Costa Island, Cayo Costa State Park, Lee County
Buck Key, J.N. "Ding" Darling National Wildlife Refuge, Lee County

Harrisia aboriginum in Southwestern Florida

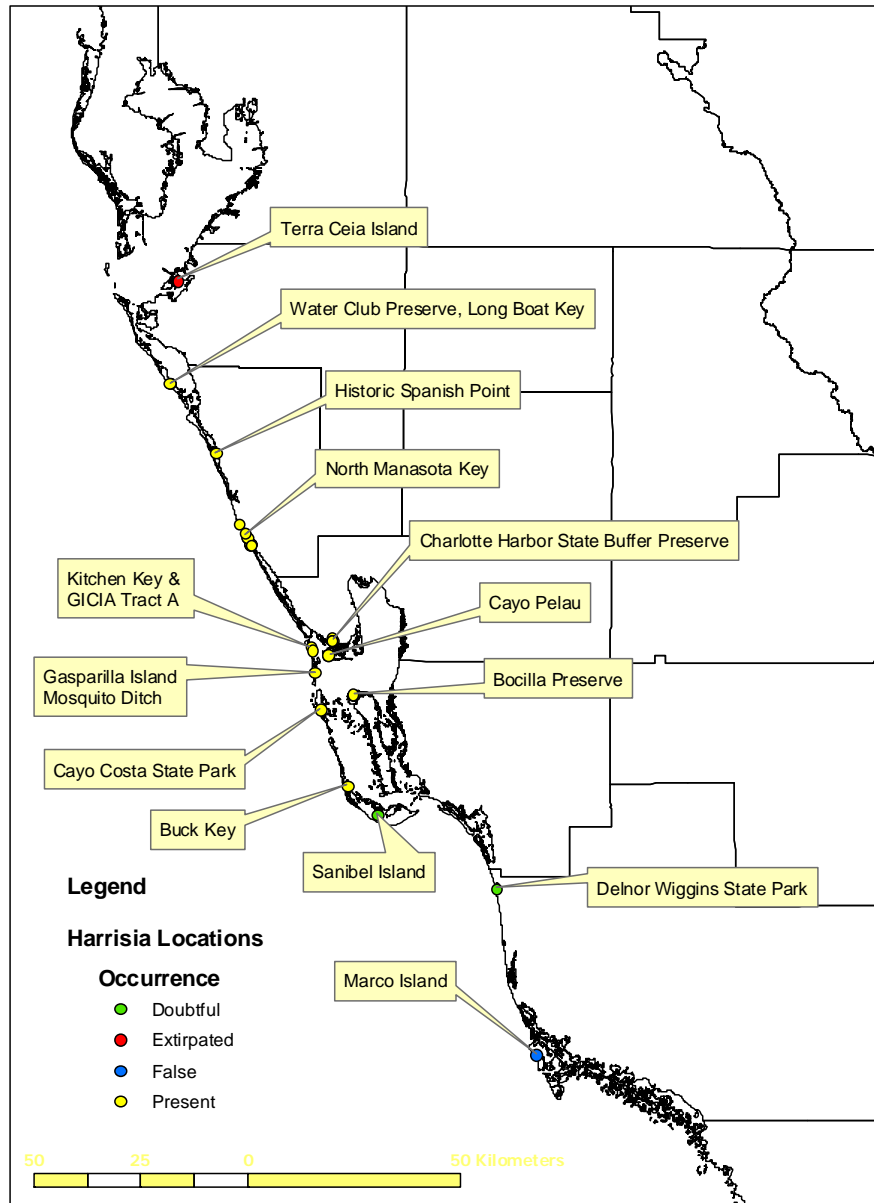


Figure 1. *Harrisia aboriginum* Small ex Britton and Wilson locations in southwestern Florida.

Section 2

Summary of extant *Harrisia aboriginum* stations

Occurrence 1: The Water Club Preserve, Longboat Key, Sarasota County

Owner: The Water Club

Background: This is a four acre private “conservation area”. Plants were originally observed here by Bruce Holst of Marie Selby Botanical Gardens. Woodmansee and Sadle observed plants here on September 2, 2003. This site was part of a larger site described by Morris & Miller (1981) who reported 226 “clumps” here (Ansel property then). Robert W. Long and Olga Lakela in 1964 (27609, USF) and again Lakela (28145, USF) collected *H. aboriginum* on the south end of Longboat Key. This is the same occurrence as the existing station.



Location: 1241-1281 Gulf of Mexico Drive, Longboat Key (figure 2).

Site Description: This “conservation area” is primarily composed of maritime hammock dominated by *Juniperus virginiana*. This site also contains the northernmost known station of *Crossopetalum rhacoma*.

Plant Description: Five adult plants in three distinct groupings were observed here. In one grouping, a single adult plant with 12 branches was seen. There appeared to be evidence of herbivory, possibly by snails. A second grouping possessed two adult plants with approximately 100 stems. Some newer growth tips of stems were dying off, surrounded by gnats. Aerial roots were observed on one individual stem. The third grouping contained two adult plants, one with 3 stems and the other with 10 stems. In addition on the site, three dead plants were observed. It appears that they died of natural causes or over-shading as the canopy was quite dense.

Plant associates: *Agave decipiens*, *Chiococca alba*, *Chiococca parvifolia*, *Coccoloba uvifera*, *Crossopetalum rhacoma*, *Eugenia axillaris*, *Eugenia foetida*, *Ficus aurea*, *Forestiera segregata*, *Juniperus virginiana*, *Lantana depresssa* var. *sanibelensis*, *Lantana involucrata*, *Psychotria nervosa*, *Randia aculeata*, *Sideroxylon celastrinum*, *S. foetidissimum*, and *Zanthoxylum fagara*.

Threats: Although this site is termed a “conservation area”, it is part of a development, and may not be protected. One area had been bulldozed, and native species were landscaped there. This site may also be threatened by fire suppression, as some areas seem to



have been coastal strand at one time. Exotic plants such as *Schinus terebinthifolius* threaten to out-compete the remaining *H. aboriginum* plants.

Soils: Canaveral fine sand. Nearly level and gently sloping, somewhat poorly drained or moderately drained soil is on low dunelike ridges and side slopes bordering sloughs and mangrove swamps (Hyde et al., 1991).

Water Club Preserve, Longboat Key, Sarasota County



Figure 2. *Harrisia aboriginum* at Water Club Preserve, Longboat Key, Sarasota County

Occurrence 2: Historic Spanish Point, Sarasota County

Owner: Gulf Coast Heritage Association, Inc., a not for profit organization which manages the property as a historical site.

Background: Plants were originally observed at this site by George Luer (pers comm.). It was first reported for this site by Rabinowitz (1998). Woodmansee and Sadle observed plants here on September 2, 2003. In 1912, J.G. Webb collected a specimen of *H. aboriginum* at Osprey (s.n., NY). The specimen may have been collected at or near Spanish Point.



Location: 337 North Tamiami Trail, Osprey (figure 3).

Site Description: Plants observed to be growing on shell mound along nature trail. The site is very disturbed, with a long history of human activity.

Plant Description: Two adult plants were observed on each side of the walking trail (one of which is marked with an identification sign). The plant on the north side of the trail possessed an immature flower, whereas the plant on the south side of the trail possessed an immature fruit.

Plant associates: *Agave decipiens*, *Ardisia escallonoides*, *Caesalpinia bonduc*, *Capparis cynophallophora*, *Celosia nitida*, *Chiococca alba*, *Cissus trifoliata*, *Desmodium incanum*, *Eugenia axillaris*, *Forestiera segregata*, *Galactia volubilis*, *Heliotropium angiospermum*, *Ipomoea violacea*, *Juniperus virginiana*, *Lantana involucrata*, *Parthenocissus quinquenervia*, *Passiflora suberosa*, *Psychotria nervosa*, *Sideroxylon celastrinum*, *S. foetidissimum*, *Tillandsia usneoides*, *T. utriculata*, and *Zanthoxylum fagara*.

Threats: Plants are largely threatened by nearby exotics including: *Asparagus densiflorus*, *Sansevieria hyacinthoides*, and *Hylocereus undatus*.

Soils: Hyde et al. (1991) describes the soils as Delray fine sand, depressional - Nearly level, very poorly drained soil is in depression on flatwoods. However, being shell mound, the actual soil was of a shelly/sand substrate.



Historic Spanish Point



Figure 3. *Harrisia aboriginum* at Historic Spanish Point, Sarasota County.

Occurrence 3: North Manasota Key, Sarasota County

Background: In 1967, John Beckner (1715, FLAS) collected *H. aboriginum* “two miles north of public beach at bridge, north part of Manasota Key.” This area is closest to Casperson Beach. Stations of *H. aboriginum* on North Manasota Key were next reported by Morris & Miller (1981) who described eight clumps on a vacant lot. Hansen and Richardson also collected the species in this area in 1979 (6819, USF). Bruce Holst of Marie Selby Botanical Gardens reported that there were several stations occurring on North Manasota Key (Pers. comm., 2003). An attempt was made to visit all stations, and plants were found in all areas except Casperson Beach, for which we possessed incorrect coordinates and ran out of time to survey. Plants very likely still occur on Casperson Beach, and this area should be surveyed. Four sites with different owners were visited: Manasota Beach Park, North Manasota Key “Guard House”, North Manasota Key Vacant Lot, and a single plant in the roadside near the end of Manasota Beach Road. The address of the lot described by Morris & Miller (1981) did not appear to correspond to any of the sites visited.

Manasota Beach Park

Owner: Sarasota County

Location: At the intersection of Manasota Key Road and the Manasota Beach Road, Englewood (figure 4).

Site Description: Two groupings were observed at this park. The northern grouping predominantly occurs in coastal strand and back dunes. This grouping is north of the main park area. The southern grouping occurs in coastal strand and coastal berm on the southern edge of the park, just north of the first house.



Plant Description: Two groupings were observed. The northern grouping comprised 100 plants which were found throughout coastal strand. Plants were predominantly growing at the bases of *Sabal palmetto* and within clumps of *Ernodea littoralis*. Six plants were in fruit, one plant was in flower, and two plants were fruiting and flowering. Some plants were in fire suppressed coastal strand with *Rhus copallinum* and *Callicarpa americana* but this seems atypical. The southern grouping comprised three plants growing beneath *Sabal palmetto*. One plant was in fruit.

Plant associates: *Alternanthera flavescens*, *Andropogon* sp., *Cassytha filiformis*, *Centrosema virginica*, *Chamaecrista fasciculata*, *Chioococca alba*, *Coccoloba uvifera*, *Commelina erecta*, *Conyza canadensis* ssp. *pusilla*, *Cnidoscolus stimulosus*, *Crotalaria rotundifolia*, *Cyperus planifolius*, *Cyperus tetragonus*, *Ernodea littoralis*, *Eustachys petrae*, *Forestiera segregata*, *Galactia striata*, *Galium*



hispidulum, *Heterotheca subaxillaris*, *Iresine diffusa*, *Lantana involucrata*, *Licania michauxii*, *Opuntia humifusa*, *Opuntia stricta*, *Panicum amarum*, *Passiflora suberosa*, *Phlebodium aureum*, *Phyllanthus abnormis*, *Polygala grandiflora*, *Portulaca rubricaulis*, *Randia aculeata*, *Rapanea punctata*, *Rhynchosia michauxii*, *Sabal palmetto*, *Sideroxylon celastrinum*, *Smilax auriculata*, *Toxicodendron radicans*, *Trichostema dichotoma*, *Uniola paniculata*, *Verbesena virginica*, *Vitis rotundifolia*, *Vittaria lineata*, and *Yucca aloifolia*.

Threats: Plants are threatened by human activity such as wildfires, dumping, and local habitat destruction (from aggressive use). Plants are also threatened by exotic plants such as: *Catharanthus roseus*, *Schinus terebinthifolius*, *Selenicereus pteranthus*, and *Stenotaphrum secundatum*.

Soils: Canaveral fine sand. Nearly level and gently sloping, somewhat poorly drained or moderately drained soil is on low dunelike ridges and side slopes bordering sloughs and mangrove swamps.

North Manasota Key “Guard House”

Owner: Private

Location: This site is located where the public portions of Manasota Beach Road end just north of the Manasota Bridge Road, Englewood. Plants are on the west side of the road and guard house, an entrance to a private community (figure 4).

Site Description: This population is a continuance of the Manasota Beach Park population. Plants were growing on disturbed soil in coastal berm.

Plant Description: Two plants were observed in this location. One single-stemmed plant was observed growing in mulch at the base of *Sabal palmetto* with landscaped plants. A second three-stemmed plant was observed growing at the base of *Sabal palmetto* in shade of disturbed coastal berm.

Plant associates: *Chiococca alba*, *Cynanchum scoparium*, *Cyperus planifolius*, *Eugenia axillaris*, *Forestiera segregata*, *Parthenocissus quinquefolia*, *Psychotria nervosa*, *Sabal palmetto*, *Serenoa repens*, and *Vitis rotundifolia*.

Threats: These two plants could easily be wiped out since the area is being landscaped, and one plant was even rising from the mulch bed. Exotic encroachment by *Schinus terebinthifolius* is also a threat.

Soils: Canaveral fine sand. Nearly level and gently sloping, somewhat poorly drained or moderately drained



soil is on low dunelike ridges and side slopes bordering sloughs and mangrove swamps.

North Manasota Key Vacant Lot

Owner: Private

Location: Located within the community of North Manasota Key, the lot south of 770 North Manasota Key, Englewood (figure 4).

Site Description: Plants are all growing in and along the edge of coastal strand on a small lot sandwiched between two residences.

Plant Description: Nineteen plants were observed, most of which were at the bases of *Sabal palmetto*. Two plants were in fruit. One plant was in flower.

Plant associates: *Alternanthera flavescens*, *Andropogon sp.*, *Chamaecrista fasciculata*, *Chamaesyce cumulicola*, *Chiococca alba*, *Coccoloba uvifera*, *Ernodea littoralis*, *Galactia striata*, *Licania michauxii*, *Monarda punctata*, *Opuntia humifusa*, *Opuntia stricta*, *Phlebodium aureum*, *Phyllanthus abnormis*, *Polygala grandiflora*, *Psychotria nervosa*, *Randia aculeata*, *Rapanea punctata*, *Rhynchosia michauxii*, *Sabal palmetto*, *Sideroxylon celastrinum*, *Smilax auriculata*, *Toxicodendron radicans*, *Uniola paniculata*, *Verbesina virginica*, *Yucca aloifolia*, and *Zamia integrifolia*.

Threats: Plants are severely threatened by development, as this is one of the last undeveloped lots in the community of North Manasota Key. Plants are also threatened by exotics such as: *Hylocereus undatus*, *Schinus terebinthifolius*, *Stenotaphrum secundatum*, and *Tabebuia aurea*.

Soils: Canaveral fine sand. Nearly level and gently sloping, somewhat poorly drained or moderately drained soil is on low dunelike ridges and side slopes bordering sloughs and mangrove swamps.



North Manasota Key Roadside near terminus

Owner: Private

Location: Located on west side of Manasota Key Road, within the community of North Manasota Key, two houses from northern terminus of Road (figure 4).

Site Description: Shady coastal berm/maritime hammock.

Plant Description: A single sterile plant was observed

Plant associates: similar to Vacant Lot site.

Threats: This plant is threatened by development and road widening.

Soils: Canaveral fine sand. Nearly level and gently sloping, somewhat poorly drained or moderately drained soil is on low dune like ridges and side slopes bordering sloughs and mangrove swamps.

North Manasota Key



Figure 4. *Harrisia aboriginum* at North Manasota Key, Sarasota County.

Occurrence 4: Charlotte harbor state buffer preserve, Charlotte County

Owner: State of Florida

Occurrence Background: There are two stations of *H. aboriginum* in the Charlotte harbor state buffer preserve. The first was first observed by Annette Nielsen on Boggess Ridge in the late 1990's. It was again observed there and on Big Mound by Woodmansee, Sadle, Bob Repenning, and Jay Garner in July, 2003.

Boggess Ridge

Location: 3.05 air mi SE of Placida (CR771 & CR776 intersection), on south side of Boggess Hole (figure 5).

Site Description: Boggess Ridge rings around Boggess Hole, a saltwater lake near the southern tip of the Cape Haze Peninsula. The ridge is dominated by scrubby flatwoods. One portion, however, is coastal berm. The coastal berm is sandwiched on the east and west by scrubby flatwoods, on the north by coastal prairie, and on the south by mangrove tidal swamp.

Plant Description: Thirty-six plants were observed to be growing in disturbed shelly coastal berm on the southern side of Boggess Hole. There were many large specimens in fruit. Many fruits have holes where the seeds were eaten presumably by birds. Three seedlings were also observed. Several plants were observed within a few meters of the high tide line.

Plant associates: *Acanthocereus tetragonus*, *Agave decipiens*, *Alternanthera flavescens*, *Celosia nitida*, *Cynanchum scoparium*, *Eugenia axillaris*, *Erythrina herbacea*, *Ficus aurea*, *Palafoxia feayi*, *Persea borbonia* var. *humilis*, *Psychotria nervosa*, *Quercus geminata*, *Randia aculeata*, *Rivina humilis*, *Sabal palmetto*, *Serenoa repens*, *Tillandsia recurvata*, and *Toxicodendron radicans*.

Threats: Human disturbance from boaters landing on the ridge, sea-level rise, and exotics such as *Schinus terebinthifolius*.

Soils: Henderson (1984a) lists soils as peckish mucky fine sand, which is nearly level, very poorly drained soil on broad tidal swamp areas. However, Woodmansee and Sadle observed the soils as are fine white sand with some humus.



Big Mound

Location: 3.25 air mi SE of Placida (CR771 & CR776 intersection), just south of Boggess Ridge (figure 5).

Site Description: Big Mound is a twenty-acre shell mound possessing many tropical hardwoods.

Plant Description: Three plants were observed on shell mound. Plants ranged from 2.5 to 5 meters (8-16 feet) in height. All plants were growing in shade.

Plant associates: *Bursera simaruba*, *Chiococca alba*, *Eugenia axillaris*, *Forestiera segregata*, *Pithecellobium unguis-cati*, *Randia aculeata*, *Yucca aloifolia*, and *Zanthoxylum fagara*.

Threats: Human disturbance and exotics such as *Schinus terebinthifolius*.

Soils: Henderson (1984a) lists soils as peckish mucky fine sand, which is nearly level, very poorly drained soil on broad tidal swamp areas. However, being shell mound, the actual soil was of a shelly/sand substrate.



Charlotte Harbor State Buffer Preserve

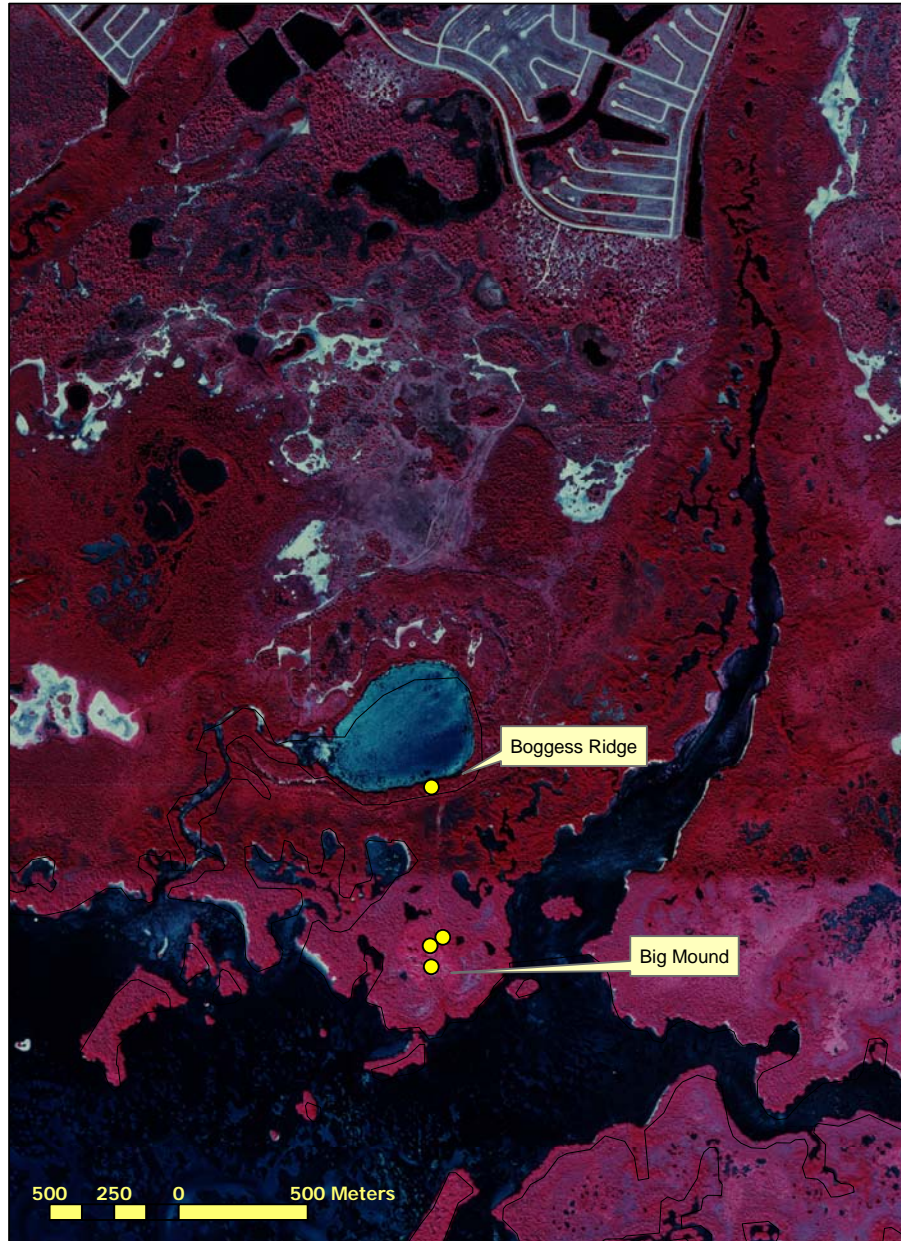


Figure 5. *Harrisia aboriginum* Charlotte Harbor State Buffer Preserve, Charlotte County.

Occurrence 5: Kitchen Key, Charlotte County and Gasparilla Island Conservation and Improvement Association Tract A, Lee County

Kitchen Key, Charlotte County (also known as Live Oak Key)

Owner: Charlotte County

Background: *Harrisia aboriginum* was described from this station by Morris & Miller (1981). It was again observed and mapped there by Gann, Meghan Fellows, Jennifer Possley, Misty Nabers, and Clyde Nabers in 2001 (Fellows et al., 2001). Although owned by Charlotte County, this site is not designated as a conservation area.



Location: Buck Key is a peninsula attached to the east side of Gasparilla Island, 1.5 km (0.9 mi) from the northern end of Gasparilla Island. (figure 6)

Site Description: This property is owned by Charlotte County but not managed as a conservation area. Plants were observed on coastal berm which is being heavily invaded by *Schinus terebinthifolius*. Sea-level rise may be a problem here – *Sabal palmetto* trees are dying.

Plant Description: Fewer than ten plants were observed on coastal berm.

Plant associates: *Quercus virginiana* and *Sabal palmetto*.

Threats: Plants appear to be threatened by sea-level rise and exotic pests plants especially *Schinus terebinthifolius*

Soils: Kesson fine sand. Nearly level, very poorly drained soils on broad tidal swamps.

Gasparilla Island Conservation and Improvement Association Tract A, Lee County

Owner: Gasparilla Island Conservation and Improvement Association

Background: *Harrisia aboriginum* was first observed on this station by Rick Joyce in 1998. It was later observed and mapped there by Gann, Meghan Fellows, Jennifer Possley, Misty Nabers, and Clyde Nabers in 2001.

Location: Just south of Kitchen Key on the eastern side of Gasparilla Island, 2.0 km (1.2 mi) south of the north end of Gasparilla Island, just east of Grouper Hole Court, and just south of the Charlotte County line (figure 6).

Site Description: A thin upland strip along the tidal swamp shoreline.

Plant Description: Only a single plant is present here, probably a vegetative recruit from plants on Kitchen Key.

Threats: Plant is threatened by sea-level rise, exotic pest plants, and stochastic events

Soils: Kesson fine sand. Nearly level, very poorly drained soils on broad tidal swamps (Henderson, 1984b).

Kitchen Key and Gasparilla Island Conservation and Improvement Association Tract A

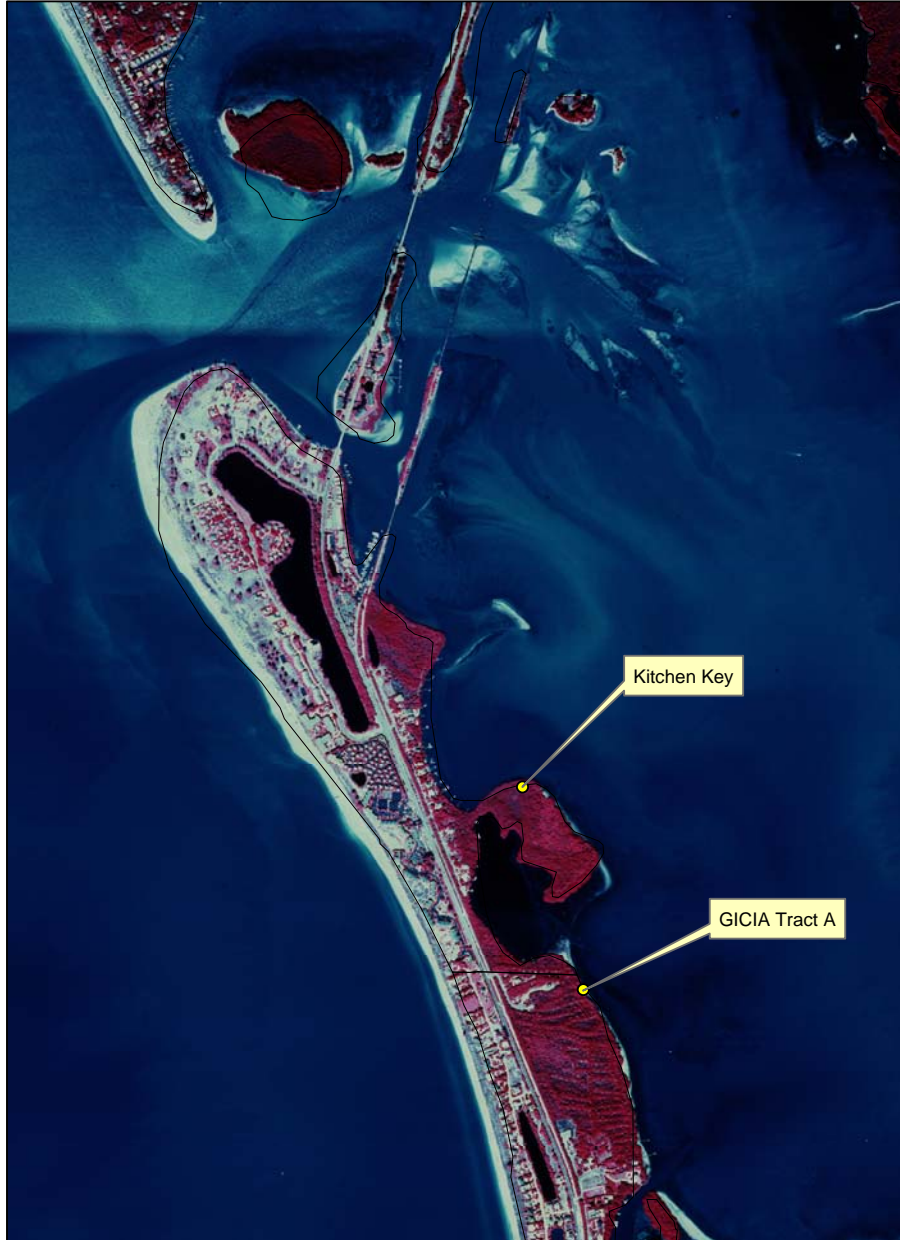


Figure 6. *Harrisia aboriginum* at Kitchen Key, Charlotte County & Gasparilla Island Conservation and Improvement Association Tract A, Lee County. *H. aboriginum* location data was provided by Jennifer Possley, Fairchild Tropical Botanic Garden.

Occurrence 6: Cayo Pelau, Lee County

Owner: Private

Background: In July 2003, a photo of a plant shown to be on this island was shown to Woodmansee & Sadle by Bob Reppenning. It is bisected by the Charlotte/Lee county-line, and plants were originally believed to be on the northern end of the island, which is owned by Charlotte County. Woodmansee and Sadle surveyed Cayo Pelau on September 4, 2003. It was determined that no suitable habitat existed on Charlotte County portions of the island, and plants were observed to be on the Lee County portions of Cayo Pelau only, on private property. The area needs further surveying to the south.



Location: Cayo Pelau is accessible only by boat. Approximately 4 air miles southeast of Gasparilla Pass, 3 air miles northeast of Boca Grande, on Gasparilla Island. Bordered by Bull Bay on the east (figure 7).

Site Description: Plants were predominantly growing on low coastal berm and low shell mound accessed on the western side of the island. Plants were observed growing on elevation is as low as 1 meter in places.

Plant Description: Seven plants observed sporadically across a narrow shell mound that widens to the south. The population seems to be declining based on several dead and dying plants. Several plants were observed within a few meters of the high tide line.

Plant associates: *Acanthocereus tetragonus*, *Agave decipiens*, *Bursera simaruba*, *Borrchia frutescens*, *Caesalpinia bonduc*, *Capparis cynophallophora*, *Eugenia axillaris*, *Forestiera segregata*, *Ipomoea* sp., *Lycium carolinianum*, *Piscidia piscipula*, *Pithecellobium unguicati*, *Randia aculeata*, *Sabal palmetto*, *Sesuvium portulacastrum*, *Sophora tomentosa* var. *truncata*, *Yucca aloifolia*, and *Zanthoxylum fagara*.



Threats: Plants appear to be threatened by sea-level rise, development, and exotics such as *Schinus terebinthifolius* and *Casuarina equisetifolia*.

Soils: Wulfer-Kesson-Captiva: Nearly level, very poorly drained and poorly drained soils; some are organic and some are sandy throughout with varying proportions of shell fragments.

Cayo Pelau, Lee County

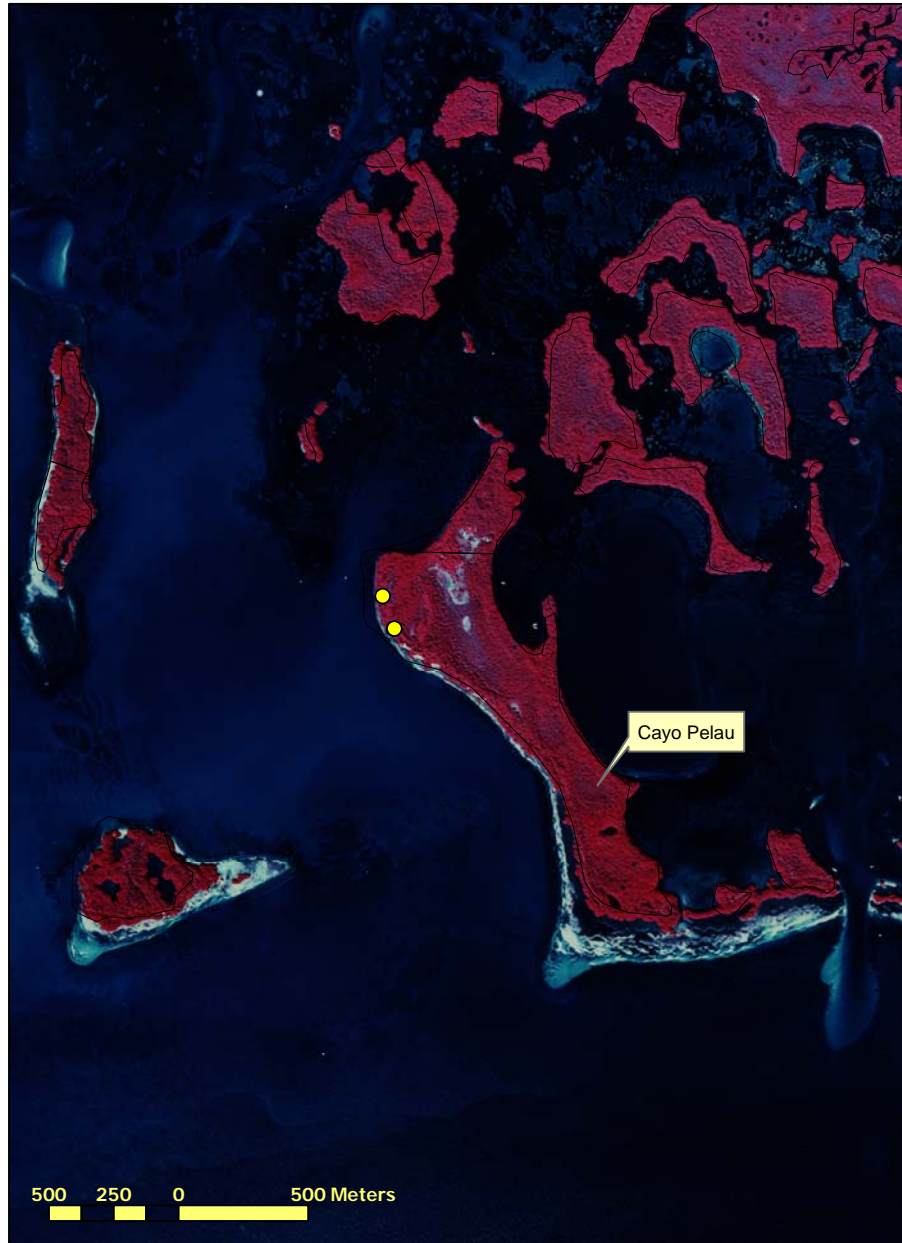


Figure 7. *Harrisia aboriginum* at Cayo Pelau, Lee County.

Occurrence 7: Gasparilla Island, Lee County – Mosquito Ditch Site

Owner: Lee County (not a conservation area)

Background: *Harrisia aboriginum* was first observed by Clyde Nabers in 2001 (Nabers, 2003.). This population was again observed by Woodmansee, Sadle, and C. Nabers in July 2003.

Location: South of the Lee County Mosquito Control headquarters, between Boca Grande Drive and the Boca Grand Trail, 0.5 km (0.3 mi) south of downtown Boca Grande, ca. 150 m south of Damficare Street (figure 8).

Site Description: A large plant/colony was observed growing on spoil (shell fill from mosquito ditch) in tidal swamp.

Plant Description: A single large plant/colony having approximately 500 stems, was observed. The tallest stem approached 2.5 meters (8.2 feet). At the time, it also possessed two immature fruits. Plant/colony is growing directly under *Casuarina equisetifolia*, *Schinus terebinthifolius*, and *Zanthoxylum fagara*.

Plant associates: *Borrichia frutescens*, *Ficus aurea*, *Passiflora suberosa*, *Pleopeltis polypodioides* var. *michauxiana*, *Tillandsia recurvata*, *Tillandsia usneoides*, and *Zanthoxylum fagara*.

Threats: This colony is threatened by both exotic plants and exotic animals. Clyde and Misty Nabers observed several flowers on this plant one morning in Summer 2003, and in the afternoon, most all flowers were entirely gone. C. Nabers & M. Nabers believe that introduced iguanas consumed them (Nabers, 2003). Being fill, the soil is prone to exotic plants especially *Casuarina equisetifolia* and *Schinus terebinthifolius*. Although owned by Lee County, this site is not designated as a conservation area, and may be altered in the future.

Soils: Kesson fine sand. Nearly level, very poorly drained soils on broad tidal swamps Henderson (1984b).



Gasparilla Island, Lee County – Mosquito Ditch Site



Figure 8. *Harrisia aboriginum* at Gasparilla Island, Lee County – Mosquito Ditch Site.

Occurrence 8: Bocilla Preserve, Bokeelia Island, Lee County

Owner: Lee County

Background: *Harrisia aboriginum* was reported for the Bocilla Preserve in a 1991 management plan (Loflin 1991). It was again observed and mapped there by Gann, Meghan Fellows, and Roger Clark in May 2002. Plants were also reported from elsewhere on Bokeelia Island, but these were not encountered despite searches during that same visit by Gann, Fellows, and Clark.

Location: Bocilla Preserve is located on Bokeelia Island, just northwest of Pine Island (figure 9).

Site Description: Plants were growing on coastal berm surrounded by tidal swamp.

Plant Description: Six groupings were observed here comprising several hundred individuals.

Threats: Plants appear to be threatened by sea-level rise and exotics such as *Schinus terebinthifolius* and *Casuarina equisetifolia*.

Soils: Peckish mucky fine sand. Nearly level, very poorly drained soil on broad tidal swamp areas.

Bocilla Preserve, Bokeelia Island, Lee County

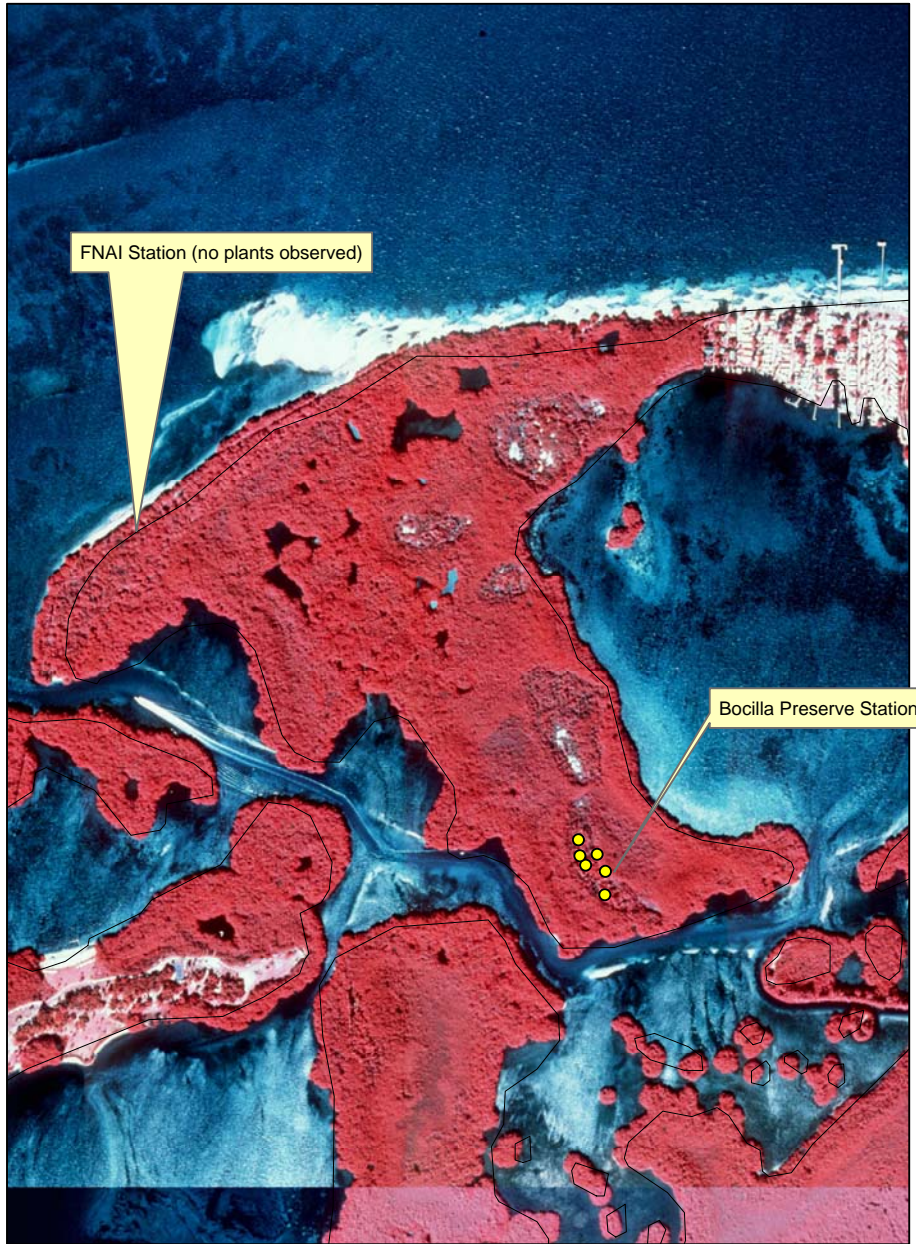


Figure 9. *Harrisia aboriginum* at Bocilla Preserve, Bokeelia Island, Lee County. *H. aboriginum* location data was provided by Jennifer Possley, Fairchild Tropical Botanic Garden.

Occurrence 9: Cayo Costa Island, Cayo Costa State Park, Lee County

Owner: State of Florida

Background: *Harrisia aboriginum* was known from Cayo Costa State Park since 1977 when Herwitz first reported it on a plant list (Herwitz 1997). It was reported again in an anonymous (1994) plant list for the state park. On October 13, 2002 Annette Nielsen observed a single plant. This plant was again observed on more than one occasion by IRC staff and Andrea Bishop between April and July 2003.



Location: Cayo Costa Island is accessible only by boat. It is located 1 mile south of Gasparilla Island and 5.5 air miles west of Little Pine Island (figure 10).

Site Description: The single plant was observed in coastal grassland with a shelly substrate in the south central portion of the island. Approximately ninety percent of the coastal grassland habitat, and all shell mound habitats were surveyed here during this study, but no additional plants were found.

Plant Description: Despite several days of surveying, only a single fertile plant was observed growing beneath *Jacquina keyensis* and *Smilax auriculata*.

Plant associates: *Bouteloua hirsuta*, *Ernodea littoralis*, *Jacquina keyensis*, *Licania michauxii*, *Monarda punctata*, *Polygala grandiflora*, *Sabal palmetto*, and *Smilax auriculata*.

Threats: Stochastic events.

Soils: Canaveral fine sand. Nearly level, moderately drained and somewhat poorly drained soil on low ridges.

Cayo Costa Island, Cayo Costa State Park, Lee County

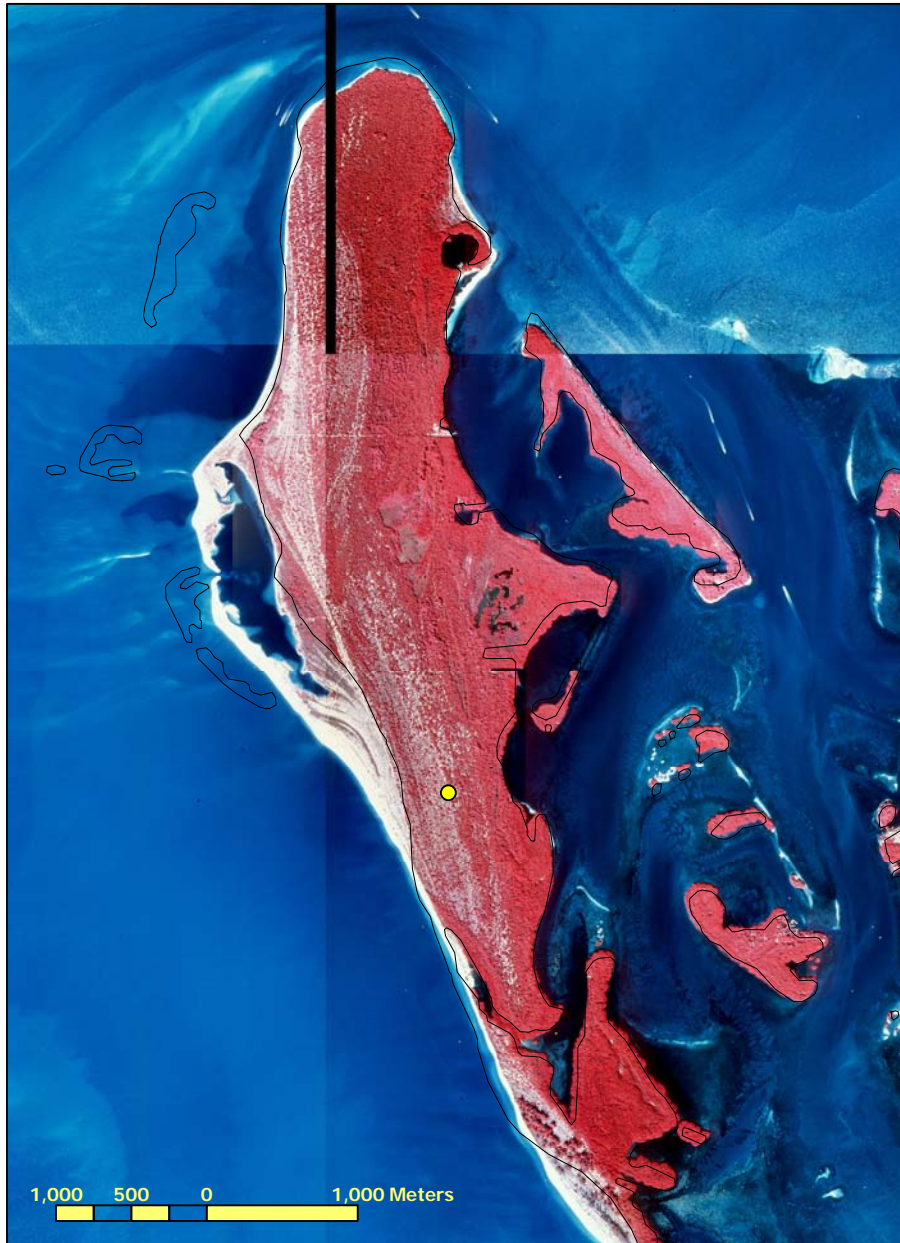


Figure 10. *Harrisia aboriginum* at Cayo Costa Island, Cayo Costa State Park, Lee County.

Occurrence 10: Buck Key, J.N. “Ding” Darling National Wildlife Refuge, Lee County

Owner: United States Fish and Wildlife Service, Sanibel Captiva Conservation Foundation, and a private owner

Background: *Harrisia aboriginum* was collected on Buck Key by Daniel F. and Sandra K. Austin in 1979 (Austin et al. 1980). Mark L. Hooten also collected it at this station, and illegitimately described it as a new species *H. donae-antoniae* (Hooten, 1991). In 2001, Richard Workman reported that between 100 and 200 plants of *H. aboriginum* were present on Buck Key in Lee County. He last observed plants in 2000. Several dozen plants were observed and mapped there by Gann, Meghan Fellows, Jennifer Possley, Dee Serage, and Richard Workman in 2001, although the entire site was not surveyed.

Location: Buck Key is located off the east side of Captiva Island, just north of Sanibel Island (figure 11).

Site Description: Buck Key is divided amongst three owners, including the U.S. Fish and Wildlife Service, the Sanibel Captiva Conservation Foundation, and a private owner. Habitat here consists of coastal berm dominated by tropical hardwoods.

Plant Description: Richard Workman reports 100 to 200 plants on the island. He reported that most of the plants are located on the old Mariner properties, in what is now J.N. "Ding" Darling National Wildlife Refuge.

Plant associates: *Bursera simaruba* and *Ficus aurea*,

Threats: Development on private portions of Buck Key.

Soils: Canaveral fine sand. Nearly level, moderately well drained and somewhat poorly drained soil on low ridges.

Buck Key, J.N. “Ding” Darling National Wildlife Refuge, Lee County



Figure 11. *Harrisia aboriginum* at Buck Key, J.N. “Ding” Darling National Wildlife Refuge, Lee County. *H. aboriginum* location data was provided by Jennifer Possley, Fairchild Tropical Botanic Garden.

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