

Fairchild Tropical GARDEN BULLETIN

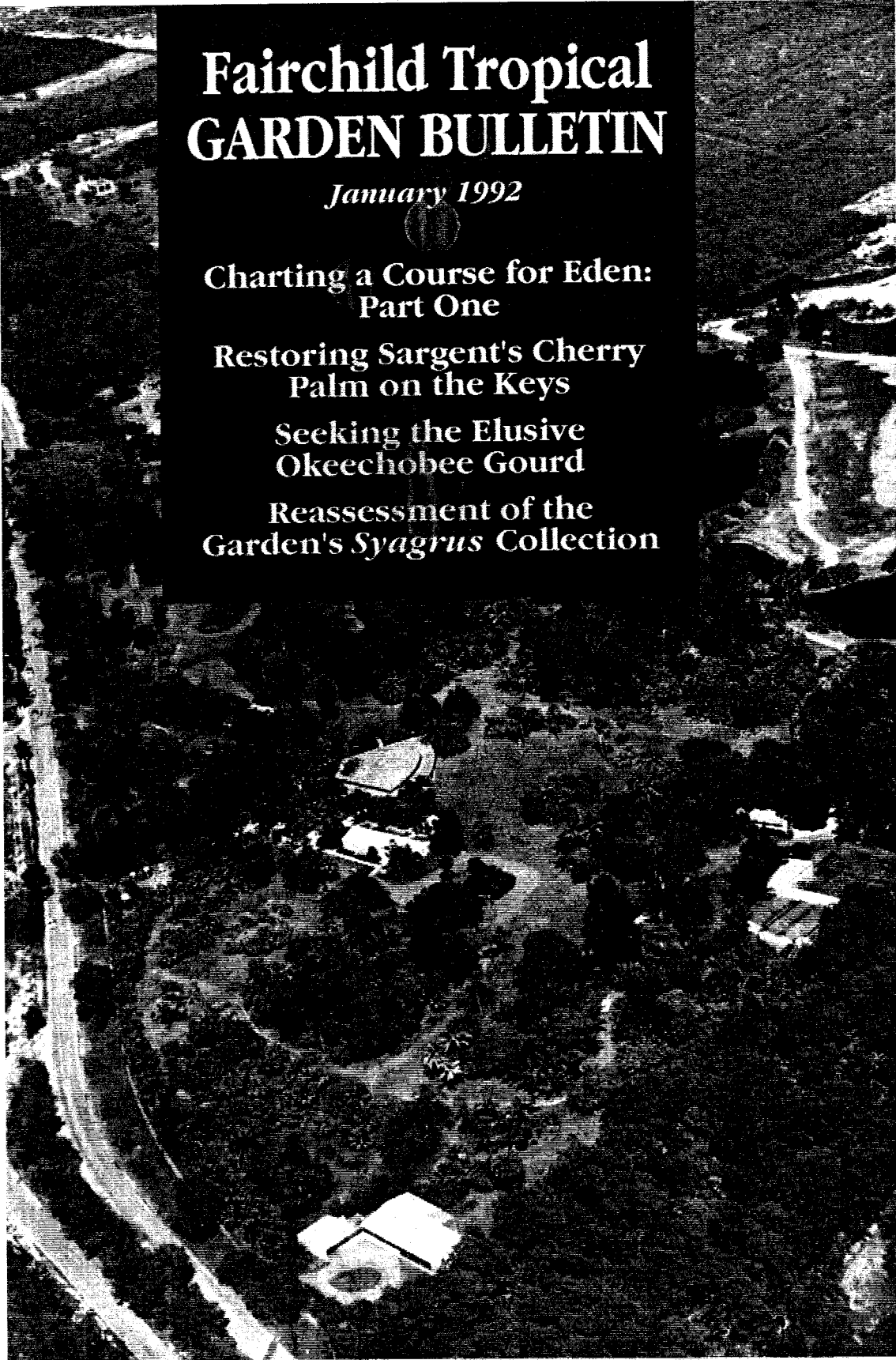
January 1992

**Charting a Course for Eden:
Part One**

**Restoring Sargent's Cherry
Palm on the Keys**

**Seeking the Elusive
Okeechobee Gourd**

**Reassessment of the
Garden's *Syagrus* Collection**



The Fairchild Tropical Garden

10901 Old Cutler Road, Miami, Florida 33156

Telephone: (305) 667-1651; Fax: (305) 661-8953

Hours 9:30 AM to 4:30 PM

A non-profit educational and scientific botanical garden incorporated under the laws of the State of Florida. The eighty-three acres of plant collections are maintained jointly by the Fairchild Tropical Garden Association and the Metropolitan Dade County Park and Recreation Department.

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Covers: Front—aerial view of the Garden in 1958, the same year William Lyman Phillips wrote An introduction to Fairchild Garden—A Memoir. Back—aerial view in 1990, Metro-Dade County.

Fairchild Tropical Garden Bulletin

Volume 47

January 1992

Number 1



William Houghton

Contents

Charting a Course for Eden: Part One, <i>William McK. Klein, Jr.</i>	4
Restoring Sargent's Cherry Palm on the Keys, <i>Carol Lippincott</i>	12
Seeking the Elusive Okeechobee Gourd, <i>Terrence Walters, Deena Decker-Walters & Sue Katz</i>	22
Reassessment of the Garden's <i>Syagrus</i> Collection, <i>Larry Noblick</i>	31

Please Note: The spring issue of Fairchild Tropical Garden's newsletter *Garden News* will contain Research Review, Horticultural Notes, New Books and Membership departments, which are customarily featured in the *Bulletin*.

William McK. Klein Jr., *Director*

Nicholas Cockshutt, *Editor*

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Calendar of Coming Events

FEBRUARY

18 MOONLIGHT TOUR, each member may bring two guests, 7:30 p.m.

MARCH

7 & 8 TROPICAL ROSE SHOW AND SALE, 9:30 a.m. to 4:30 p.m. (show opens at 1 p.m. on 7).

14 ANNUAL MEMBERS' MEETING AND ELECTION OF BOARD, 3 p.m.

APRIL

6 SPRING CLASSES BEGIN.

11 & 12 BEGONIA SHOW AND SALE, 9:30 to 4:30 p.m.

Charting a Course for Eden: Part One



It was decided to put the public entrance and parking space near the dividing line of the two properties, and to extend from that entrance to the east an esplanade, or alley terminating in a terrace thrust out over the lower edge of the escarpment and overlooking the entire lowland.

Note: All captions in this article are from William Lyman Phillips' *Introduction to the Fairchild Tropical Garden—A Memoir*, written in 1958.

William McK. Klein, Jr.

Photographs by William Houghton

Delightful scientific shade
For knowledge as for pleasure made
Oxford Botanic Garden

The dual purpose of the botanic garden, for knowledge and for pleasure, has come down to us through the centuries. The first of the western botanic gardens,

Padua, founded in 1545, with its four squares, was the encapsulation of the world of plants. The Oxford Botanic Garden, founded in 1621, followed a similar formal design, as did the botanical gardens of Leyden and the Jardin du Roi in Paris. Differing in the details of design, they all shared a common purpose—to gather the works of the creation; they were the re-creations of Eden.

The belief that the Garden of Eden was still out there somewhere, and might some day be rediscovered, persisted up until the late 17th Century. Late Fifteenth Century maps, including the one Columbus used, placed Eden somewhere in the East. Disease, pestilence and war in late 15th century Europe made the quest for Eden a survival issue more than simply a vague longing for paradise.

Fairchild Tropical Garden, founded in 1938 by Robert H. Montgomery, is a descendent of that long tradition of botanic gardens. It came about through his passion for collecting palms and his reading of the explorations of David Fairchild: the happy convergence of the collector's acquisitiveness with the desire to create a public garden for pleasure. Robert Montgomery found in David Fairchild the scientific credibility and name recognition that would propel his brainchild into international acclaim.

Right: Illustration from 1904 facsimile edition John Parkinson's *Paradisi in sole, paradisus terrestris*, first published in 1629. Courtesy of Mrs. Alan Steinberg.



PARADISI IN SOLE
Paradisus Terrestris.

A Garden of all sorts of pleasant flowers which our
English ayre will permit to be nourished wth:

A Kitchen garden of all manner of herbes, roots, & fruites,
for meate or sause wth used wth c^os,

An Orchard of all sorte of fruibearing Trees
and shrubbes fit for our Land
together

With the right ordering planting & preserving
of them and their uses & vertues

Collected by John Parkinson
Apothecary of London.

1629

Qui veut parangonner l'artifice a Nature
Et nos parcs a Eden ne s'en fera il moque.

Le pas de l'elephant parle pas du eiron
Et de l'igle vol parait du moineheron.



The smallness of the openings (on the upland) was not thought to be disadvantageous aesthetically, for in Florida small landscape units and close views are apt to be more attractive than wide views, and walks in shade more agreeable than walks in the sun.

For David Fairchild, the Garden provided the means to continue to explore the world of plants. Throughout his life he maintained an insatiable curiosity about nature and an unshakeable belief in the scientific approach as a means for understanding the world. In this, he was the lineal descendent of the Western tradition of thought—man put on earth to multiply and have dominion over nature. No one can argue with the eventual successes of the approach which coupled science and technology and led to the Ages of Reason

and Enlightenment, the conquest of space and Post Industrial Era.

While David Fairchild looked to the scientific approach to improve the human condition, he also deplored the excesses of this advance of science and technology. In his book *The World Was My Garden*, he recounts an event in Venice at the close of the 19th Century. An old rusty anchor was about to be removed in the name of progress, when a delegation of City Fathers confronted the developer and insisted that this picturesque element



It will be noted that the openings and separating spaces between the planting masses are never twice alike; they differ in length, in width, in shape, in orientation, in character (formal, informal). Thus vision along these openings is constantly varied in what is seen, and, by changes in light, how it is seen.

of the landscape should stay. On a wistful note Fairchild declares, "I have often thought of the wisdom of the Venetians and wished that a like intelligence could be transferred to city authorities in my own country who placidly allow the removal of historic landmarks and even encourage their destruction."

The quest for Eden in the 16th and 17th centuries, coupled with the growing momentum of science and technology, led to gardens that were living encyclopaedias. Plants gathered from around the world were grown in elaborately designed parterres representing the four continents: Europe, Africa, Asia and America. These gardens, however, were much more than the sum of the plants contained in them. They were the representations of paradise, the re-creations of Eden where spring was eternal, life abundant and peace prevailed. The trees of life and knowledge contained within these mythic garden walls were to give both pleasure and understanding.

To establish a garden that combined both scientific and aesthetic objectives, Robert Montgomery hired the noted landscape architect, William Lyman Phillips (1885 to 1966). It was a most fortunate choice, for Phillips was eminently qualified to arbitrate artfully the competing, and what might otherwise be conflicting, aims of the garden. Phillips' background as a landscape architect, his experience in tropical regions, and, most important, his artistic insight, uniquely qualified him to draw the lines for a garden with appeal to both mind and eye.

Apart from Montgomery's insistence that there be a Palmetum, Phillips was on his own, blazing a new trail in the design of his tropical botanical garden. "I recall no positive help from anybody regarding the character the Garden should have," Phillips states in *A Memoir* that he wrote in 1958 at the urging of the Director, Nixon Smiley. With regard to his grouping of plants according to families, he tells



By way of contrast, the proposed lakes on the lowland would provide much larger openings than any possible on the upland, and deeper, bolder views. The lakes, moreover, would constitute inviolable open spaces

us, "Neither Col. Montgomery, who deplored botany, nor Dr. Fairchild, who was impatient with mere botany, nor Dr. Barbour for some other reason—none of these showed much interest in how or where plantings were made."

Receiving no help from the Colonel and the good doctors, insofar as design was concerned, Phillips was left to draw upon his training as a 1910 graduate from Harvard's distinguished School of Landscape Architecture, and his wide experience with the firm of Frederick Law Olmsted, the country's most prestigious office of landscape architects. Phillips worked within the landscape tradition that we associate with William Kent, Lancelot 'Capability' Brown, and Humphry Repton, the English school of landscape gardening that traces its beginnings to such literary figures as Alexander Pope (1688 to 1744). Phillips' distinction between the lowlands, escarpment and uplands of the Fairchild Tropical Garden calls to mind Pope's famous words:

Consult the Genius of the Place in all;
That tells the Waters or to rise, or fall,

Or helps th' ambitious Hill the heav'n to scale,
Or scoops in circling theatres the Vale,
Calls in the Country, catches opening glades,
Joins willing woods, and varies shades from shades,
Now breaks or now directs, th' intending Lines;
Paints as you plant, and, as you work, designs.
Still follow Sense, of ev'ry Art the Soul,
Parts answer'ing parts shall slide into a whole,
Spontaneous beauties all around advance,
Start ev'n from Difficulty, strike from Chance;
Nature shall join you, Time shall make it grow
A Work to wonder at — perhaps a Stow.

Alexander Pope,
Epistle to the Earl of Burlington, 1731.

In his quest for the "Genius of the Place," Phillips tells us that his "motives can be found in general ideas as to the kind of thing aimed at, in the site—its size, shape, topography..." He goes on to state that "the problem was to evolve a unified plan for the overall tract without distinction of ownership, without proposing work projects that would overlap them."

Phillips discovers the genius of the site in the escarpment "the boldest topographical feature" and by his informal treatment which "would demand no spe-

cific form or character in the vegetation masses."

A series of lakes aids his purpose by serving as essential barriers "inviolable open space" to any overly ambitious future botanists who might be inclined to fill the entire landscape.

The genius of Phillips was creating a design for a tropical garden in which the brushmarks of the artist were invisible. "The plan as it stands has no marked appearance of organization. To the casual eye it might appear to be a rather aimless scramble of lines and shapes," he confesses. "There are, nevertheless, clear purposes and principles underlying it, principles aimed at assuring certain aesthetic qualities regardless of what vegetation may be present, namely: variety, consistency and contrast."

No two openings are alike in size or in alignment, and in this way the Garden achieves variety in the spaces while at the same time assuring varied lighting effects.

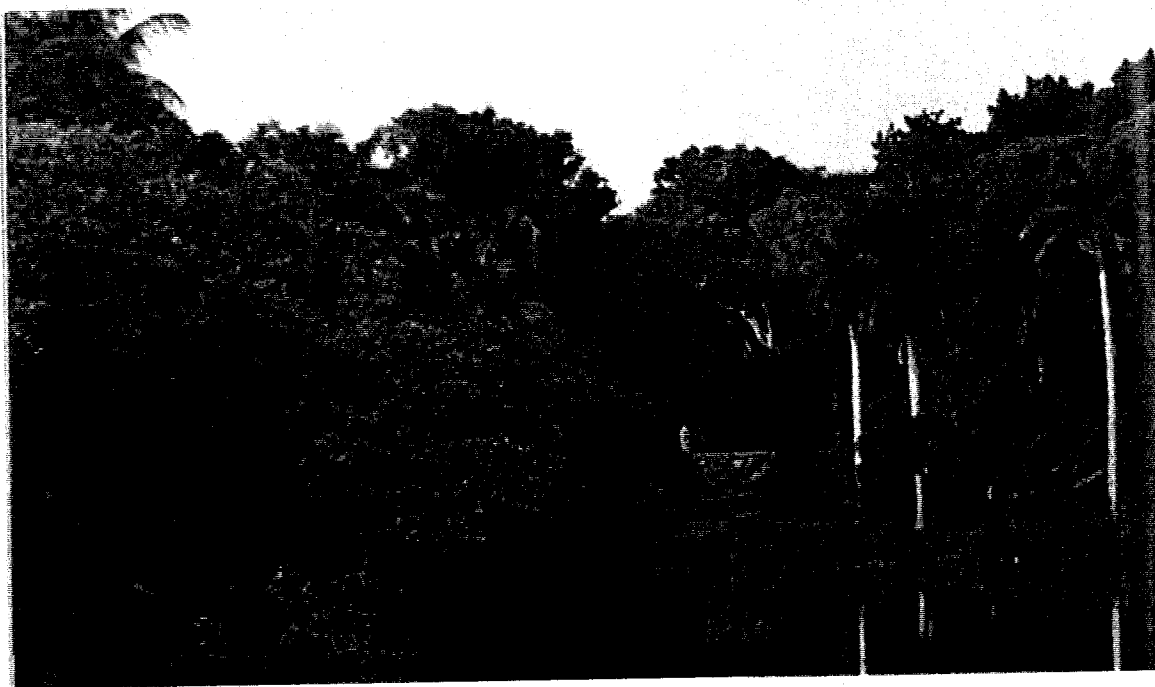
A consistency (unity) of design is achieved through all of the lines and shapes being "free, casual, irregular, naturalistic, favoring if not absolutely assuring a natural randomness in planting." Contrast is achieved in several ways: large versus small spaces, sunny versus shady lighting and intimate views of the upland plantings and panoramic views of the lowlands.

The uplands and lowlands are connected by two major axial views.

Phillips "starts from difficulty and strikes from chance" and creates his Overlook *allée* as the public entrance along the dividing line of two properties. Extending down a 340 foot *allée* he terminates his line in a "terrace thrust out over the lower edge of the escarpment and overlooking the entire lowland." Thus the artist prepares the visitor by the formal, axial treatment with its view focused on the distant prospect of water, reaching an explosive panoramic view at the terminus of the esplanade.



I should like to see the whole area (the lowland) treated as a wilder, more natural place than the upland.



The principle of informality would demand no specific form or character in the vegetation masses.

In contrast, the secondary Palm Glade axis is set back on the upper edge of the escarpment and the view from it is designed to be "narrow and deep." In this way Phillips designs his composition with the assurance of Pope's words, "Parts answering parts shall slide into a whole./ Spontaneous beauties all around advance."

Having solved the problem of connecting the lowlands and the uplands, Phillips turned his attention to the ever-present challenge of accommodating the diversity of the flowering plant families (160 in the Atkins Garden list), while at the same time achieving a unity of design—the stumbling block of every botanical garden. He looks to the uplands for the solution to this design problem. The south of the Overlook axis he allocates for palms, in deference to the strongly expressed wishes of Montgomery who "was insistent that the Palm Family be grouped by itself, and would have obliterated everything else in the Palmetum, but he gave no heed to the genera." The north of the Overlook axis Phillips reserves for flowering plants, trees and shrubs of the

major families, Moraceae, Leguminosae, Rubiaceae etc. These are grouped into island beds with access by a series of paths, some of which diverge from the axis to the Overlook.

With this dual purpose of the botanical garden acknowledged by Phillips in its design, the Fairchild Tropical Garden was destined to become a masterwork of landscape art. Robert Montgomery declared his intention to make his Garden, "the biggest and best of its kind in the world." That the Garden has achieved a measure of international acclaim there can be no doubt. If institutions are "the lengthened shadow of one man," as Emerson says they are, we can clearly see the Fairchild Tropical Garden as shades of Robert H. Montgomery.

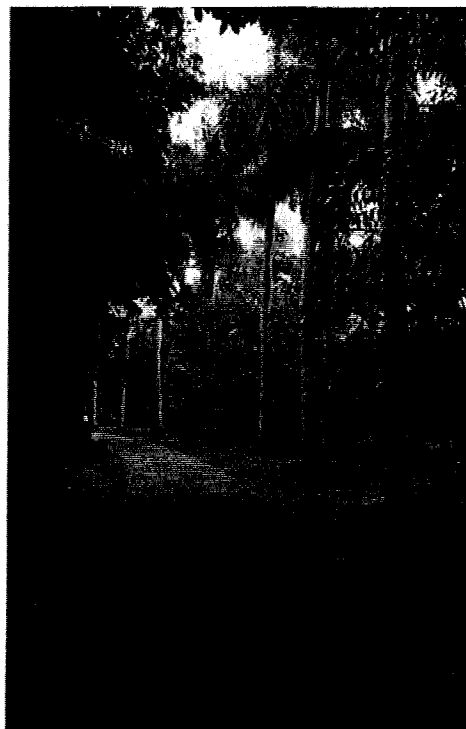
Robert Montgomery and David Fairchild created a place that could and should set the world's highest possible standard—in its landscape design, living collections and horticultural exhibits—for tropical botanical gardens today. The Garden should resound with new meaning in our quest for knowledge and the



extension of that knowledge to a broader public. To that end, we look forward to uniting our collective imaginations, and solicit your support and involvement as we work to shape this delightful shade, for knowledge as for pleasure made.

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3. Fairchild, David. 1938. *The World Was My Garden; Travels of a Plant Explorer*. Charles Scribners' Sons, New York.
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Open space, furthermore, could be compared to rooms and corridors in a picture gallery, where the walls carry the things displayed.

Return of the Native **Restoring Sargent's Cherry Palm on the Florida Keys**

Carol Lippincott

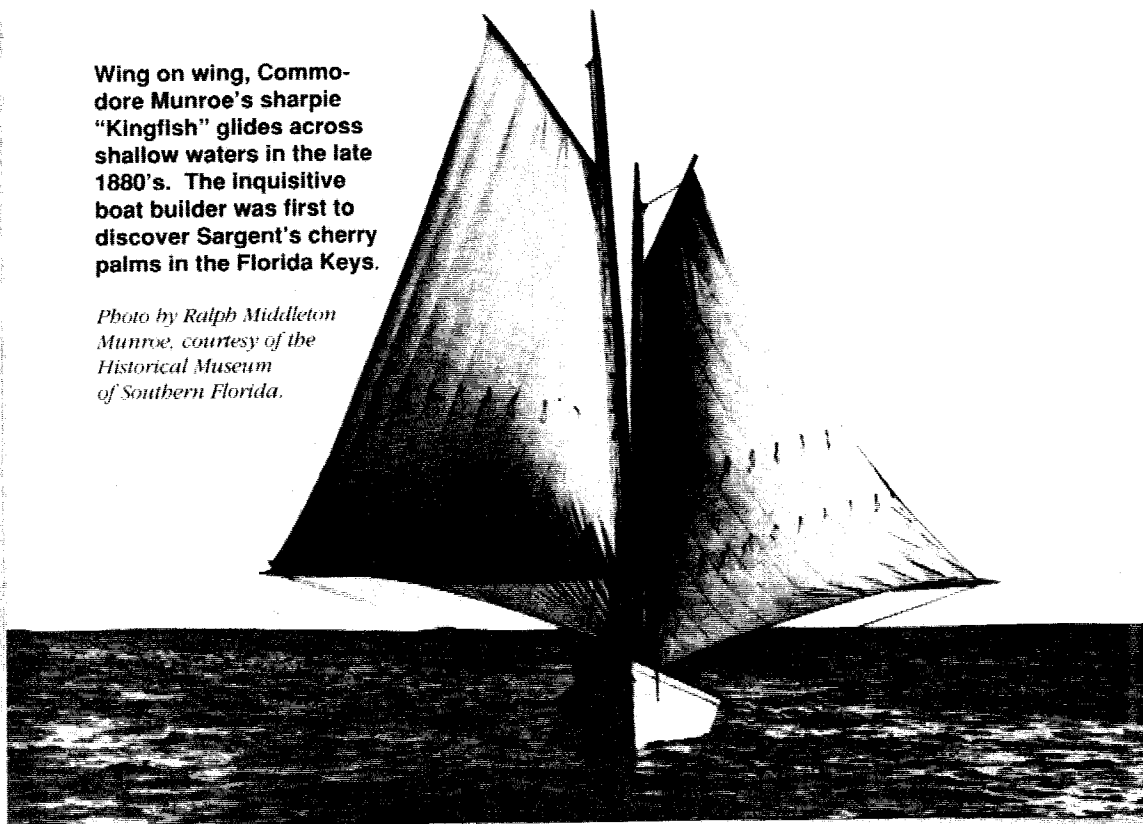
At last, I spotted the slender, banded trunk of a palm through the tangled maze of hammock limbs, and my involuntary squeal brought the others. We had found the survivors, the relic Sargent's cherry palms of Elliott Key. To us, it seemed a great discovery, but our efforts were merely a recent chapter in a century-old tale of the near extinction of this stalwart palm from the wilds of the Florida Keys.

Munroe's Discovery

In the early winter of 1886, Commodore Ralph Munroe sailed one of his famous shallow-draft sharpies south from Cocoanut (sic) Grove to visit a friend's new coconut plantation on Long Key. While exploring this middle Keys island, the inquisitive boat builder discovered a grove of what appeared to be small royal palms growing amongst the scrubby

Wing on wing, Commodore Munroe's sharpie "Kingfish" glides across shallow waters in the late 1880's. The inquisitive boat builder was first to discover Sargent's cherry palms in the Florida Keys.

Photo by Ralph Middleton Munroe, courtesy of the Historical Museum of Southern Florida.





hammock vegetation. Munroe's photograph of *Pseudophoenix sargentii* on Long Key is the first record of this northern Caribbean species in Florida.

In the spring of that same year, Charles Sargent, director of Harvard University's Arnold Arboretum, was a guest on a pineapple plantation on Elliott Key on the edge of Biscayne Bay, 50 miles northeast of Long Key. Soon after coming ashore, Sargent spotted a palm which resembled a young royal palm, but was quickly determined to be of an unknown species. In fact, a new genus and species, *Pseudophoenix sargentii* Wendl. ex Sarg., was soon described, based on the six Elliott Key palms found by Sargent.

Renowned botanists John Kunkel Small (above) and Liberty Hyde Bailey searched Long Key in the winter of 1924, and found only these paired Sargent's cherry palms remaining in the low coastal hammock.

Portrait of John Kunkel Small (1869-1938) by Nation-wide News Service. Photo to the right by John Kunkel Small, courtesy of FTG Archives.

"Dwarf Royal Palms"

The indiscriminate harvest of these attractive palms for ornamental use began soon after Munroe's discovery on Long Key, as the hundreds of Sargent's cherry palms there were gradually dug up and hauled off by plant collectors. The Reasoner brothers, Pliny and Egbert, owners of the Royal Palm Nursery in Manatee, Florida, obtained exclusive rights to remove young Sargent's cherry palms from Long Key. In their 1887-88 catalogue, they offered these transplanted palms for up to \$100 each, an exorbitant price willingly paid by coveters of rare palms.

At the turn of the century, mature landscape plants were in great demand in the young city of Miami. Sargent's cherry palms were taken from Elliott and Long





Photo by Stanley Kiem

Bruce Ledín measures one of the last three Sargent's cherry palms on Long Key in 1958. In 1961, Fairchild awarded Ledín the Montgomery Founder's Medal for distinguished achievement in the world of palms and cycads.

Keys to become ornamental features in new developments such as Henry Flagler's Royal Palm Hotel. As the supply of the popular native royal palms for landscaping dwindled, palm collectors began harvesting Sargent's cherry palms from Long Key and from the Bahamas, and marketing them to the unsuspecting as "dwarf royal palms." Many of these are now tall specimens still seen throughout Key West's Old Town.

Brink of Extinction

Elliott Key, one of the largest of the upper Florida Keys, is eight miles long, yet less than half a mile wide. Although the exact size of the *Pseudophoenix sargentii* population on Elliott Key prior to Sargent's visit is unknown, it declined rapidly thereafter as the dense hammock was chopped and burned for pineapple and lime plantings. By 1904, only one lone

Sargent's cherry palm was found rising above the Elliott Key hammock by N.L. Britton, a distinguished botanist from the New York Botanical Garden.

From 1901 through the 1920's, John Kunkel Small, another eminent botanist from the New York Botanical Garden, explored southern Florida, reporting several times on the status of *Pseudophoenix sargentii* on Elliott and Long Keys. By 1920, a short 34 years after its discovery, Small reported that due to pineapple farming and horticultural collecting, the Sargent's cherry palm was nearly extinct on Elliott Key.

On a visit to Long Key in 1922, Small was able to find only about two dozen Sargent's cherry palms, in an area apparently less accessible to collectors. Three years later, Small and Liberty Hyde Bailey, a horticulturist with Cornell University who later became one of the world's great palm taxonomists, photographed the only



Photo by Tina Watsman

A Sargent's cherry palm frames a church window in Old Town Key West. Reckless harvest of wild palms from the hammocks of Long and Elliott Keys led to near loss of this species in Florida.

two palms they found remaining on Long Key.

Small optimistically continued to search for new populations of *Pseudophoenix sargentii* in the Florida Keys. A report of wild palms growing on Upper Matecumbe Key drew Small to the island in 1919, where he found a planting of "young royal palms," actually Sargent's cherry palms, recently transplanted from the hammocks of Long Key. A turn of good luck in 1922 sent Small to Sands Key, just north of Elliott Key, with Commodore Munroe's son Wirth, who had spotted a palm during the previous winter. They resorted to tree-top observation and finally spotted a lone Sargent's cherry palm completely surrounded by hammock trees.

There was hope for the Sargent's cherry palm!

Rediscovery on Elliott Key

There are no written records of findings of this palm in Florida for the next 25 years. Then, in 1950, Bruce Ledin, of the University of Florida Sub-Tropical Experiment Station in Homestead, and members of the Gifford Society of Tropical Botany of the University of Miami, made a trip to Elliott Key to collect plants and to investigate a report that royal palms were growing in the dense hammock. The 20 palms which the botanists found were actually Sargent's cherry palms of several

Palm of Many Names

A plant much used by northern Caribbean peoples, the Sargent's cherry palm, *Pseudophoenix sargentii*, has numerous other common names. John Kunkel Small thought that the shape of the palm warranted the name hootch palm or bootleg palm, apt names during the Prohibition era of Small's time. My personal favorite, the feather-leaf Florida cherry palm, was an overly cumbersome effort to describe both the fronds and fruit.

Although often called the Buccaneer Palm, this name is correctly applied to *Pseudophoenix vinifera*, a larger palm from Hispaniola, because of the native "bucaneeri" who historically went out into the hills to bring back the palms for hog food or for wine-making. A few other common names are:

Hog cabbage palm, hog palmetto, hog palm—so called because the pith of the stems is rich in sugar and, along with the fruit and trunk, is used for feeding hogs in the Greater Antilles.

False date palm, datelet, dummy date—because *Pseudophoenix* were originally thought to be a New World counterpart of the date palms (*Phoenix*).

False royal palm, dwarf royal palm—since it superficially resembles a royal palm (*Roystonea* sp.).

Mountain cabbage palm—since the boiled bud, the "cabbage," is used for human food.

Wine palm—because a saccharine juice is derived from the pithy trunk and fermented in the hollow of the stump to obtain wine.

Cherry palm—since the fruit is the size and color of a cherry.

Ram's horn palm—a local Florida term, since the spathe of the inflorescence suggests this shape.

Lost palm—because of the notable scarcity of specimens.

Sargent's palm—because Wendland named the species after Charles Sargent, who first described the palm in Florida.

—Carol Lippincott

Pseudophoenix sargentii. Plate by C.E. Faxon, 1894.



Photo by Carol Lippincott

Stanley Kiem, former superintendent at FTG, next to a Sargent's cherry palm which he rescued from the bulldozers on Elliott Key and brought to the Garden in 1958.

age groups. These palms appeared to be no more than 50 years old, indicating that they were progeny of the earlier trees seen by Sargent and others in the 1880's. Unfortunately, this new-found palm colony bordered Elliott Key Highway, a narrow unpaved road which ran the length of the island, recently cleared by property owners in anticipation of future development.

Later that decade, Ledin, along with Stanley Kiem, then superintendent of Fairchild Tropical Garden, and Robert Read, a University of Miami student and part-time assistant at Fairchild Tropical Garden, again surveyed the remains of Florida's wild *Pseudophoenix sargentii*. In the spring of 1958, they surveyed Elliott Key and mapped a total of 28 palms, an encouraging number. They also found the decaying stumps of 17 very large specimens, a few with two-to-three foot diameters! Concerned for the palms' fate—

since Elliott was slated for development—Kiem and friends transplanted a palm to Fairchild Tropical Garden, where it still thrives in plot 113 (tag# 58-872).

Islandia's Last Stand

In 1960, the owners of the islands which lined the eastern edge of Biscayne Bay, including Elliott and Sands Keys, incorporated and named the area "Islandia." Since Islandia was accessible only by boat, they planned to build an automobile causeway lined with hotels from Key Biscayne to Key Largo, through the heart of the Elliott Key hammocks. This proposal was strongly opposed by Dade County's fledgling environmental movement, which included Marjory Stoneman Douglas and the late Alice Wainwright, both FTG Trustees, who urged federal acquisition of the area.

In February, 1968, Islandia property owners hired a bulldozer operator to widen Elliott Key Highway to 125 feet. This gaping wound down the spine of Elliott Key, now called "Spite Highway," destroyed more than 120 acres of hammock, likely including the grove of Sargent's cherry palms found in 1950. Finally, later that same year Congress approved the federal purchase of much of Islandia, and Biscayne National Monument was created. Twelve years later, the preserve was enlarged and renamed Biscayne National Park. At last, the Elliott Key palms were protected from the bulldozer.

Lost from Long Key

In the mid 1950's, 25 years after Small's last visit to Long Key, George Avery, a budding field botanist newly arrived in South Florida and eager to learn the native flora, spotted three Sargent's cherry palms while hiking across the island. Sargent's cherry palms were still alive on Long Key! In the fall of 1958, Ledin, Kiem

KEY BISCAYNE to LARGO



DADE COUNTY PLANNING BOARD
1950

Difficult to imagine today, a causeway from Key Biscayne to Key Largo was the dream of planners in 1950. Grassroots opposition resulted in the acquisition of Biscayne National Park and last-minute protection of the Sargent's cherry palms on Elliott Key.



The few surviving Sargent cherry palms on Long Key emerge from the hammock canopy in 1958. Recent searches across Long Key revealed only one decayed palm stump.

The Sargent's cherry palm is rarely taller than 30 feet, with a slender grey-green trunk encircled with conspicuous rings. Its pinnate fronds reach 10 feet long and often have silvery undersides. In the fall, the flower stalk is loaded with hundreds of bright red fruit, which may be eaten by squirrels, raccoons and other wildlife. Reproduction of this palm in the wild in Florida is sporadic, as frequently observed since its first sighting here. Seedling survival may be linked to irregular weather events such as hurricanes, which create sunlit gaps in the hammock canopy. Nowadays, these palms are readily available at several South Florida native plant nurseries and are an excellent drought-tolerant landscape plant.

Photo by Stanley Kiem.



Robert Read counts growth rings on a tall Sargent's cherry palm in 1958. Read later monographed the genus *Pseudophoenix* as palm taxonomist with the Smithsonian Institution.

and Read also visited Long Key, and were able to find three Sargent's cherry palms growing on a sand ridge only a few hundred feet from the shore. These palms were estimated to be 80 to 100 years old and were thought to be part of the original grove first spotted by Commodore Munroe in 1886. Dozens of eroding stumps were also found in the area, a sign that hurricanes, excessive salt, disease and old age may contribute to a high natural mortality.

In the summer of 1966, Avery again hiked across Long Key, vigorously searching the hammock where he had spotted the three lone survivors a decade before. He climbed up a tree for a better look, but to no avail. Meanwhile, Avery's companion had become sick with heat exhaustion, so they trudged slowly home.

After consulting with Kiem as to the location of the palms which he had seen on Long Key in 1958, I returned to the island in 1990 with Jim Duquesnel, a Florida Department of Natural Resources (DNR) biologist. Armed with Kiem's maps, we slogged through mangroves and spiny thickets with no luck. Duquesnel hoisted me up several Australian pine trees, yet I saw only a palmless canopy of glistening green. In less than a century, the Sargent's cherry palm groves were indeed gone from Long Key.

Volunteers and Collaboration

Anxious to care for their endangered plant species, staff of Biscayne National Park (BNP) made periodic surveys of the Elliott Key palms in the late 70's and early 80's, and were able to locate 29 Sargent's cherry palms. In 1989, I began helping Richard Curry, resource manager for BNP, to survey and monitor the Elliott Key population. At the same time, Renate Skinner, regional biologist with the Florida DNR, had been inquiring about reintro-



Photo by Carol Lippincott.

Rob Campbell tags nursery-grown Sargent's cherry palms for their return to Long Key, a century after their discovery and subsequent loss on the island.

ducing these lost palms to Long Key, much of which was purchased by the state in 1961. Using the Elliott Key population as a seed source for re-establishing the palm on Long Key was the obvious choice.

Because of our common interest in protecting and enhancing the greatly reduced native population of Sargent's cherry palms, Fairchild Tropical Garden initiated a cooperative agreement with BNP and Florida DNR in 1990. Ann Deaton and Joseph Nemec, both DNR staff, and Nemec's wife, Marcella, volunteered their time on weekends to help survey and monitor the palms on Elliot Key and to collect seed.

On one early trip, towards the end of a discouraging afternoon, with the low winter light within the hammock strangely disorienting, Nemec let out a cry I won't soon forget—as if he had found Black Caesar's buried treasure! There, in a tight cluster, was a remarkable stand of six healthy fruiting Sargent's cherry palms, poking their heads up into the hammock

canopy. To date, the team has located, tagged and mapped 41 palms, 12 more than previously known.

Return to the Wild

Richard Curry issued a permit for limited collection of seed, and the Garden nursery is now nurturing several hundred seedlings for reintroduction to Elliott, Sands and Long Keys over the next several years. Fortunately, back in 1982 BNP staff had the foresight to collect seeds from Elliott Key, and brought them to the Garden to propagate. The intent was to replant them on islands where they had occurred historically to augment the small existing population on Elliott Key. By 1990, these palms were eight years old and ready to be reintroduced to the rigors of life in a coastal Keys hammock.

A generous grant from the South Florida Chapter of the International Palm Society allowed me to contract with Rob Campbell, a skilled native plant propagator, to carry out the planting project. In the summer of 1991 Campbell and his two helpers battled

clouds of mosquitoes and stifling heat to haul the palms, soil, water, and tools to the far reaches of Elliott, Sands and Long Keys. Chipping holes in the sharp coral rock and carrying water buckets through the tangled hammock was cheerfully described by Campbell as "the job from hell." Deaton and the Nemees are following up with careful year-long care and monitoring of the planted palms, which are doing well to date.

Return to Long Key

The grant also assisted us in what I think is the most exciting and fulfilling part of this long series of events. Finally, 105 years after Munroe's discovery and more than 30 years since the last palms were seen there, the Sargent's cherry palm was returned to Long Key. As the holes were being dug on that sunny July day, I thought of how thrilling it must have been to discover hundreds of these sturdy little palms on Long Key, their distinctive fronds thrust above the tree line, and how incomplete that particular

Northern Caribbean Genus

In 1968, Robert Read of the Smithsonian Institution published a monograph on the genus *Pseudophoenix*. Based on this treatise and his observations since, Read describes four species from the northern Caribbean, three of which are mostly confined to Hispaniola.

Pseudophoenix sargentii, the most widespread taxon in the genus, is currently known in Florida, the Bahamas, Cuba, Hispaniola, Navassa Island, Saona Island, Mona Island, Ambergris Cay off the coast of Belize, and the coastal Yucatan peninsula of Mexico.

Since visiting extensive populations of *P. sargentii* in the Yucatan, Read feels that the use of subspecies is weakened

considerably and perhaps has no taxonomic value at all.

Members of the genus occur naturally in areas of very little rainfall on very well-drained sand or porous limestone, always where the substrate is alkaline or saline. Sargent's cherry palms throughout their range frequently grow among hardwood vegetation in cracks or solution holes in limestone near the coast, where they are protected from the wind but may be frequently inundated by salt water during storms. This is true on Elliott Key, which consists of sharply eroded limestone derived from ancient coral reefs. In contrast, Long Key is composed of coarse alkaline sand mixed with small shell fragments.



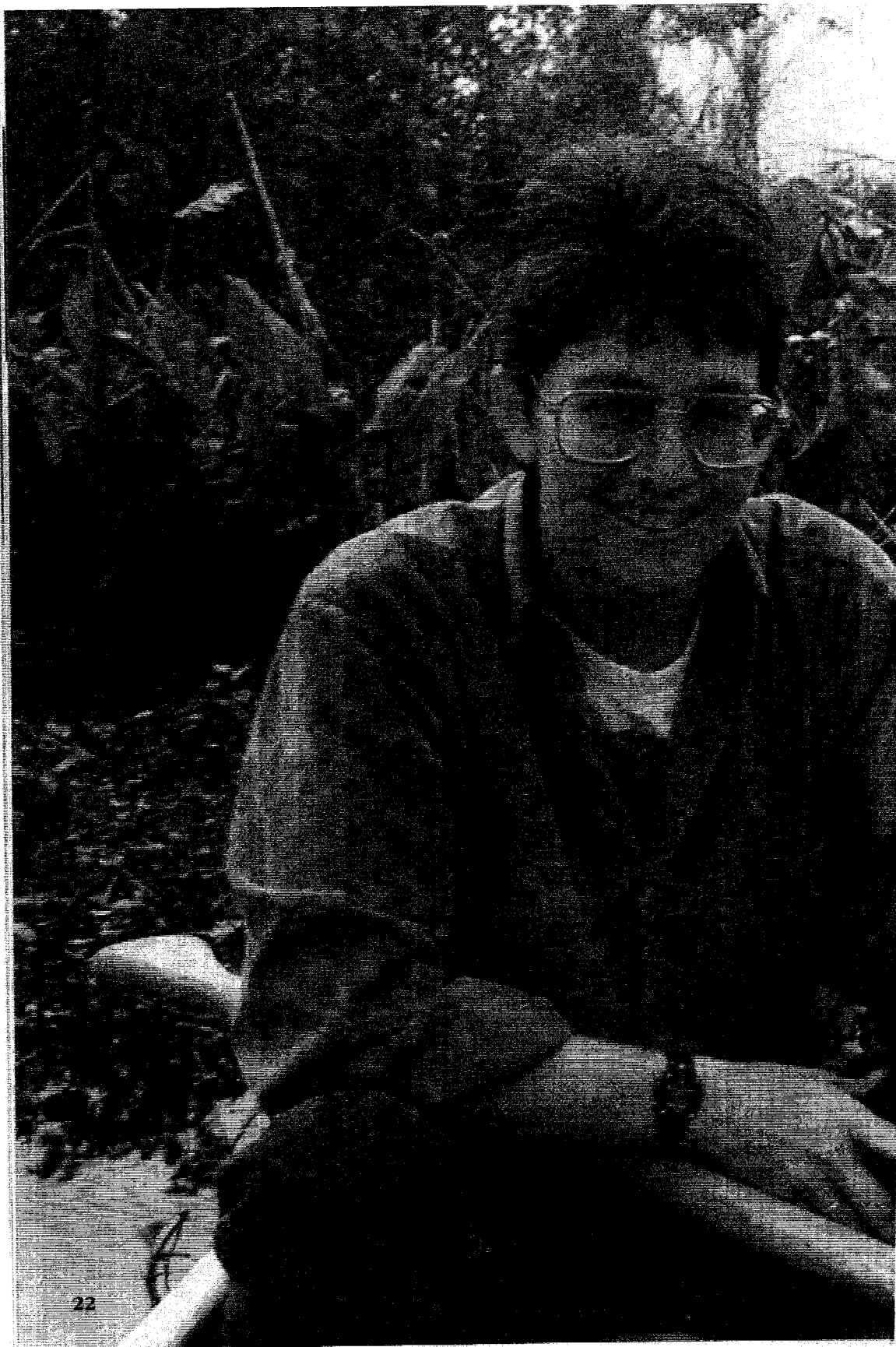
Wood cut of *Pseudophoenix* sp. on an idyllic Caribbean coastline. Courtesy of Robert Read

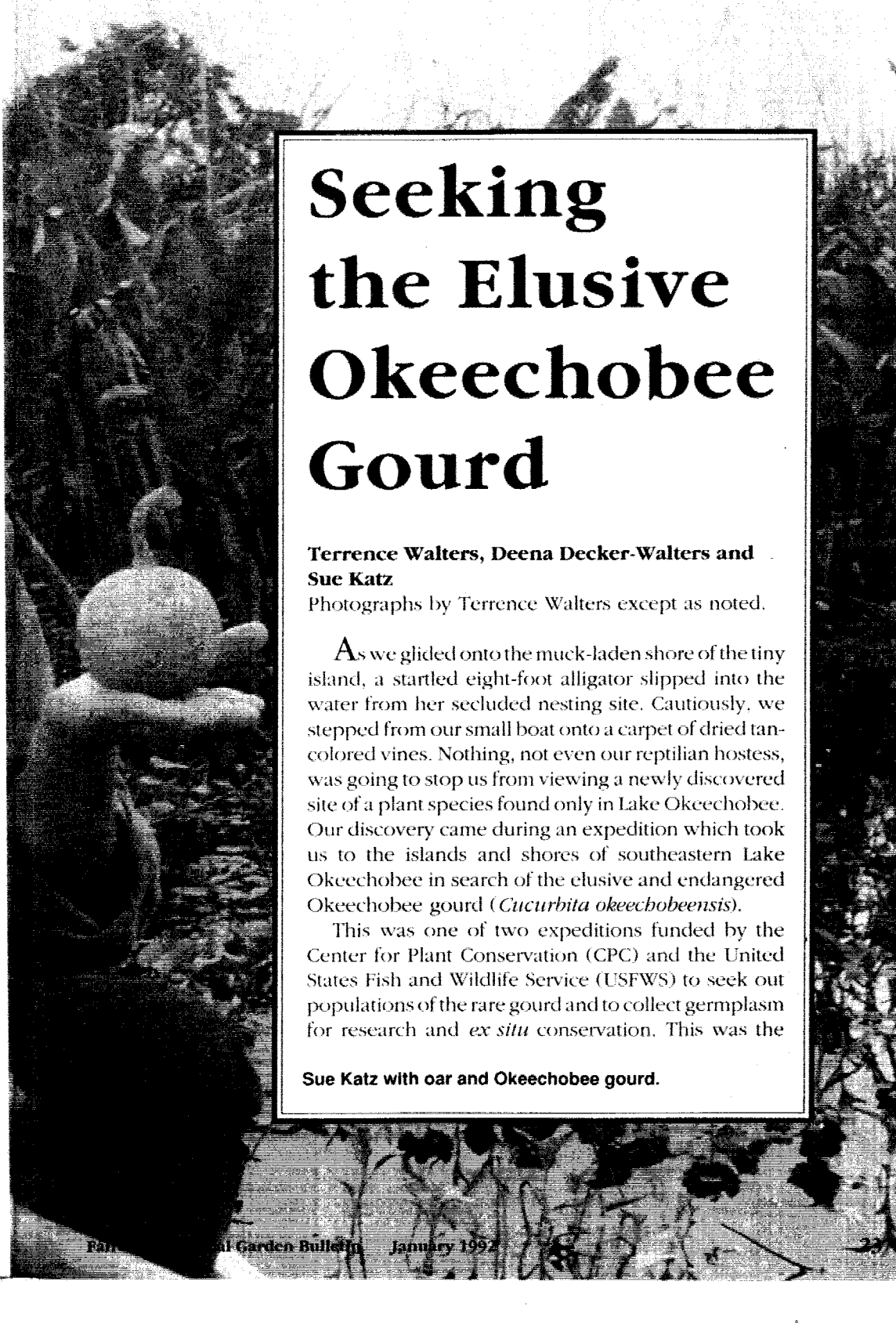
island seemed without them. If the newly-planted young palms thrive, sailors in the next century can marvel at the palm-dotted forests just as Munroe and other early pioneers did.

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Carol Lippincott, a native Miamian, is Curator of Endangered Species for Fairchild Tropical Garden.





Seeking the Elusive Okeechobee Gourd

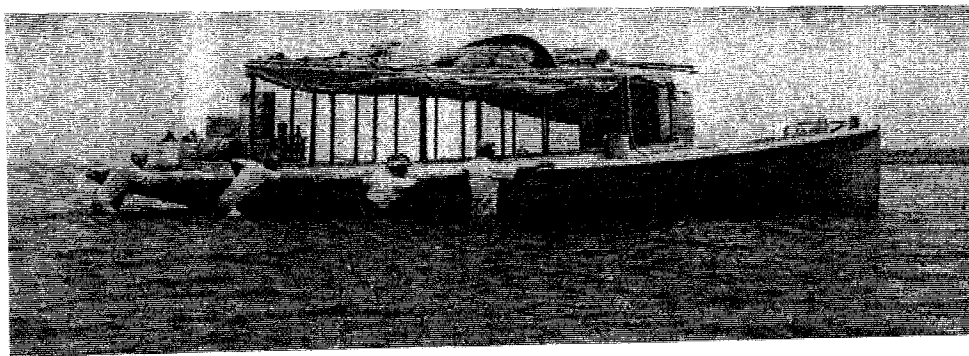
**Terrence Walters, Deena Decker-Walters and
Sue Katz**

Photographs by Terrence Walters except as noted.

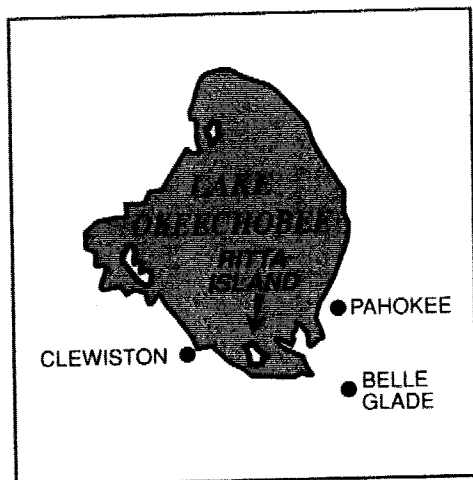
As we glided onto the muck-laden shore of the tiny island, a startled eight-foot alligator slipped into the water from her secluded nesting site. Cautiously, we stepped from our small boat onto a carpet of dried tan-colored vines. Nothing, not even our reptilian hostess, was going to stop us from viewing a newly discovered site of a plant species found only in Lake Okeechobee. Our discovery came during an expedition which took us to the islands and shores of southeastern Lake Okeechobee in search of the elusive and endangered Okeechobee gourd (*Cucurbita okeechobeensis*).

This was one of two expeditions funded by the Center for Plant Conservation (CPC) and the United States Fish and Wildlife Service (USFWS) to seek out populations of the rare gourd and to collect germplasm for research and *ex situ* conservation. This was the

Sue Katz with oar and Okeechobee gourd.



"Defying alligators and giant catfish in the dark waters, we gradually maneuvered the boat into a deeper channel a quarter of a mile to the northward. The expedition's party on the 'Barbee' was democratic, sometimes all were officers—and sometimes all were crew, as when the boat struck this bank of putty-like mud near Kreamer Island. The 'Barbee' was generously outfitted for the expedition by Charles Deering, of Miami. Besides the captain and a man who acted as crew and cook, there were three scientists aboard, namely, a conchologist, a horticulturist and a botanist." Caption and photo from John Kunkel Small's article "Narrative of a cruise to Lake Okeechobee," *The American Museum Journal*, 1918.



second day of our first two-day foray during the last week of January 1991. In February we embarked on another two-day field trip.

The presence of the Okeechobee gourd in the pond apple (*Annona glabra* L.) hammocks of the Lake Okeechobee region has been intermittently documented by botanists throughout this century. These periodic assessments of the gourd and its habitat have revealed a substantial decline in population and taxon distribution in large part due to hammock destruction from cultivation practices. Specifically, habitat that has not already been lost directly to agriculture is often de-

stroyed by flooding resulting from water management policies (Nabhan 1989). Consequently, the survival of the Okeechobee gourd is in jeopardy.

The Okeechobee gourd's endangered status has been recognized for many years. Ward (1979), in the series *Rare and Endangered Biota of Florida*, suggested that low temperatures or agricultural practices could wipe out remaining populations. Although listed at the state level as an endangered plant, legal protection of the Okeechobee gourd through the U.S. Endangered Species Act is lacking because of confusion concerning this taxon's rank.

When John Kunkel Small first described the Okeechobee gourd, he wrote that this climbing vine had been common in the extensive hammocks that surrounded the southern shore of Lake Okeechobee during the early 1900's (Small 1930). Yet, by 1930, Small estimated that at least 95 percent of the gourd's geographic area surrounding the lake had been reduced during the previous two decades.

Since the 1930's, collections and sightings of the gourd have been few. In fact, during the early 1980's, botanists believed that this species was extinct or nearly so. In 1987, Gary Nabhan and Jono Miller ventured out onto the lake in a

ECOLOGY OF LAKE OKEECHOBEE: THE ALLIGATOR



Nesting sites for alligators apparently provide excellent sites for gourd seed germination. These areas are cleared by the alligator, limiting immediate competition from the typical opportunistic species of these islands against the relatively weak Okeechobee gourd seedlings. The sites are open and sunny, the warmth of the soil encouraging earlier germination of the sun-loving gourd plants. Also, nesting sites, which are near the shore, are accessible to water dispersed fruits.

Photograph by William Houghton

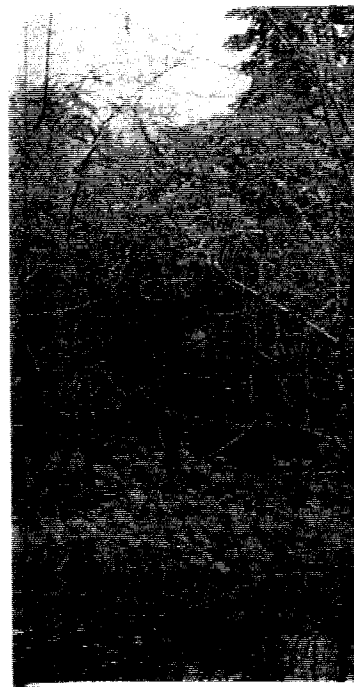


Domes of dried gourd vines by the water's edge.

ECOLOGY OF LAKE OKEECHOBEE: CHANGES IN WATER LEVEL

Current water management practices in Lake Okeechobee, prior agriculture on the islands within the lake, and the introduction of exotics to the islands and the lake shores may account for the limited number of Okeechobee gourd sightings during the last decade (Nabhan 1989). Water management objectives have been and currently are to maintain Lake Okeechobee's level between 15 feet and 17.5 feet above sea level, to provide storage of water supplies for agricultural irrigation and municipal needs. This practice, along with dikes and drainage ditches for flood control, and routine spraying of herbicides, has resulted in unnaturally high water levels and contamination of shoreline habitats. The high water levels have flooded and killed most of the original pond apple forests—the major habitat for the Okeechobee gourd in the past (Small 1930). Today, the gourd makes do with scrambling up and over exotic trees and shrubs.

One important conclusion from our field work in Lake Okeechobee is that lower lake levels may not be necessary for the continued existence of the Okeechobee gourd, as previously thought. Instead, we believe that fluctuations in lake level are necessary for the gourd to maintain viable, healthy populations. High lake levels facilitate gourd dispersal and inundate and destroy aggressive weeds in local habitats. As lake levels drop, the cleared, open habitats allow the quickly germinating Okeechobee gourd seeds to sprout and begin climbing before they have to compete with other pioneer species.



Above Right: Dried Okeechobee vines drape the shrubs and trees at the Ritta Island. "This site seemed magical". Below Right: Heading towards Ritta island.

small canoe, hoping to see the elusive gourd. Nabhan, in his 1989 book, *Enduring Seeds*, wonderfully recounts their adventure through the canals of Torry Island. They found only three fruits and no live plants during their travels; one of the gourds was floating in a canal, and the other two were hanging over the canal on dead vines gracefully draped over a small pond apple tree.

The thick mat of dried gourd vines crackled under our feet as we surveyed the alligator nesting site. The extensiveness of these annual vines on the ground and surrounding forest attested to numerous generations of gourd occupation. We counted over 50 fruits dangling in the trees and scattered along the ground. We remembered Nabhan's frustration as our own began to subside in light of our newest discovery.

After taking notes on the site and a few gourds for their seeds, we settled back in our motorized transport and eventually

returned to dock. It had been a rewarding gourd hunting day. But it did not start out that way.

Early that morning, we began our exploration in a canoe. This had been suitable and enjoyable transport the day before, when we paddled peacefully along the canals of Torry Island. But this day we ventured out into the lake toward Kreamer Island. As we got farther away from land, the clouds rolled in, the wind and waves picked up, and the already cold temperature dropped. After an hour and a half of struggling with the elements and the canoe, we had no choice but to turn back to base camp on Torry Island, and exchange the tranquil canoe for a noisy motor boat. Our respect for the lake had grown.

On February 10, we again rented a small motor boat from a vendor on Torry Island. We had decided to search the westernmost island in the southern part of Lake Okeechobee. We left Torry Island

ECOLOGY OF LAKE OKEECHOBEE: WATER DISPERSAL

Seeds of the Okeechobee gourd typically germinate in early spring during the dry season in Florida when lake levels are naturally lower. By the time the rainy season arrives in the summer, causing lake levels to rise and fluctuate, the vines have climbed upon woody perennials, thus avoiding complete inundation. Some fruits fall off the vines into the water and are dispersed to new locations, starting the cycle anew.



at 8 a.m.; the locals had told us it would take an hour and a half to reach Ritta Island.

The day was cold and cloudy, and the wind and waves made the trip across the lake seem like an eternity. Along the way, we came across numerous land masses that had become exposed due to the drought in Florida. Of course, our map did not show these land masses. So for most of the travel, we were lost. In fact, we circled Ritta Island before we realized that it was the correct island. Good

navigators we're not!

We finally pulled into a canal on Ritta Island at 11:30. As if in recognition of our efforts, the sun began to break out from behind the clouds, warming us and drying out our clothes soaked with water spray. We slowly navigated through the canal, our eyes peeled for evidence of gourd populations. Something looked familiar in the distance beyond a dense five-foot-tall forest of taro. We pulled our boat onto the shore in anticipation of documenting the most western site known for the Okeechobee gourd. Sue grabbed the boat oar and began breaking a path through the taro to some dead vines. She beat the plants down with the oar, making as much noise as possible, just in case there were snakes or gators hiding in the dense vegetation.

As we came into the clearing where we had seen the dead vines, our suspicions were confirmed. It was one of the most beautiful areas we had seen in Lake Okeechobee. Old gourd plants had completely covered all the small trees, shrubs, and ground vegetation in the area, creating a landscape dominated by domes of



Marshland of Lake Okeechobee.

dried vines five to eight feet tall. At one edge of the domes, a thick canopy of taller trees shadowed bare ground dotted only with gourd seedlings.

This site seemed magical: we half expected gnomes to jump out from behind the trees and under the domes to greet us. This became our "Enchanted Forest Site".

In addition to the dried vines and seedlings, we saw flowers on young gourd plants and an abundance of fruits dangling from the domed structures. Of the 11 gourd sites we surveyed, 10 of which were new discoveries, this site was the least disturbed, the most protected, and probably occupied by the oldest sustaining gourd population. We had been richly rewarded for our endurance against the elements.

It had been a long day, so we cranked up the outboard motor and headed back to Torry Island. Throughout the day, the engine had become repeatedly clogged by vegetation in the water. Every 10 to 15 minutes we had to remove the tangled vegetation from the propellers. Now it was late afternoon and all of a sudden our engine died; it had had enough.

We were stranded and alone, when most fishermen had already called it a day. After an hour of anxious waiting, we finally saw a boat off in the distance and flagged it down with Terrence's red bandana. We were in luck—the boater had a Citizens' Band Radio. He called the vendor of our boat, and an hour and a half later, the vendor found us, examined the engine, and determined that it was beyond repair. He tied our boat to his and towed us back to Torry Island, where we arrived two hours later.

Our field work in Lake Okeechobee had been productive, adventuresome, and challenging. At the end of our travels, we packed up fruits from each of the 11 sites and brought them back to Fairchild Tropical Garden (FTG). We carefully removed

ECOLOGY OF LAKE OKEECHOBEE: THE RABBIT

Canals, tidal action, and lake level changes appear to transport those fruits that find themselves water borne. The marsh rabbit is probably the only terrestrial dispersal agent for fruits, although smaller rodents may disperse seeds. Habitats that are either slightly elevated on the shoreline or inland from the shore appear to be the best sites for seed germination and plant growth because gourd plants do not tolerate water-soaked soils for extended periods of time.



Top: Gourd gnawed by marsh rabbit.

Below: Marsh rabbit. Photo by William Houghton.

and stored seeds from the green and white striped fruits. Subsequently, much of this valuable germplasm was distributed to cucurbit researchers throughout the world as well as to the United States Department of Agriculture for long term storage.

Many of the seeds were used to produce plants for our research on the Okeechobee gourd. We had to determine if the Okeechobee gourd is a species distinct from *Cucurbita martinensis*, a close relative that occurs in Mexico. The Center for Plant Conservation (CPC), the United States Fish and Wildlife Service (USFWS), and cucurbitologists throughout the world wanted to know.

Acknowledgments

We would like to thank Jono Miller (New College, Sarasota, Florida), Richard Moyroud (Gemini Botanical Garden, Manalapan, Florida), and Carol Lippincott (Fairchild Tropical Garden) for the original stimulus leading to this project. Airboat transportation in Lake Okeechobee was kindly provided for by Florida Game and Freshwater Fish Commission (West

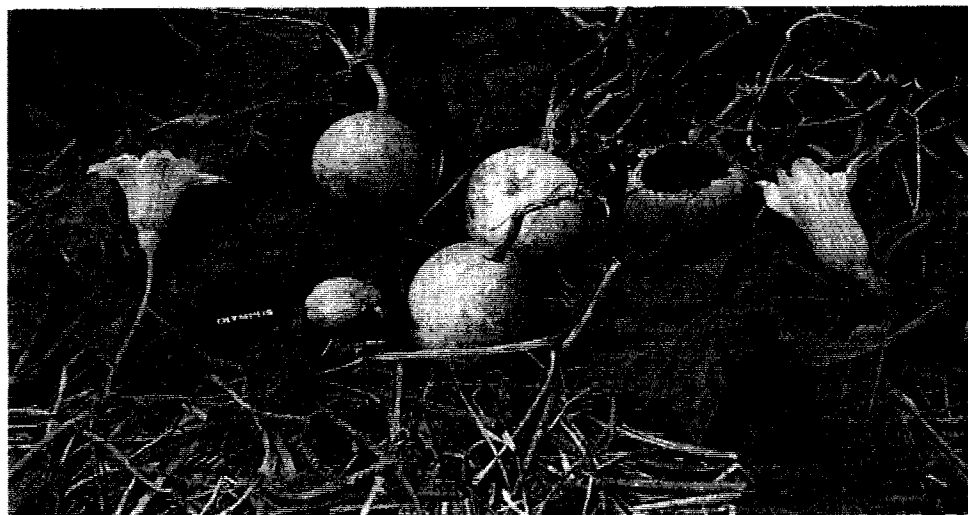
Palm Beach). Finally, we would like to thank the Center for Plant Conservation and the United States Fish and Wildlife Service for financial support of the project.

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Note: The story of the elusive and endangered Okeechobee gourd, Part 2 "The Experiment," will be continued in a future issue of the FTG Bulletin.

Dr. Terrence Walters (FTG systematist) and Dr. Deena Decker-Walters (FTG collaborator) study the evolutionary relationships between domesticated cucurbits (e.g., melons, squashes, gourds) and their putative progenitor species. Sue Katz is the nursery manager at FTG.



From left to right: Male flower, one-year old fruit, cracked two-year old fruit and female flower.

Reassessment of the Garden's *Syagrus* Collection

Larry Noblick

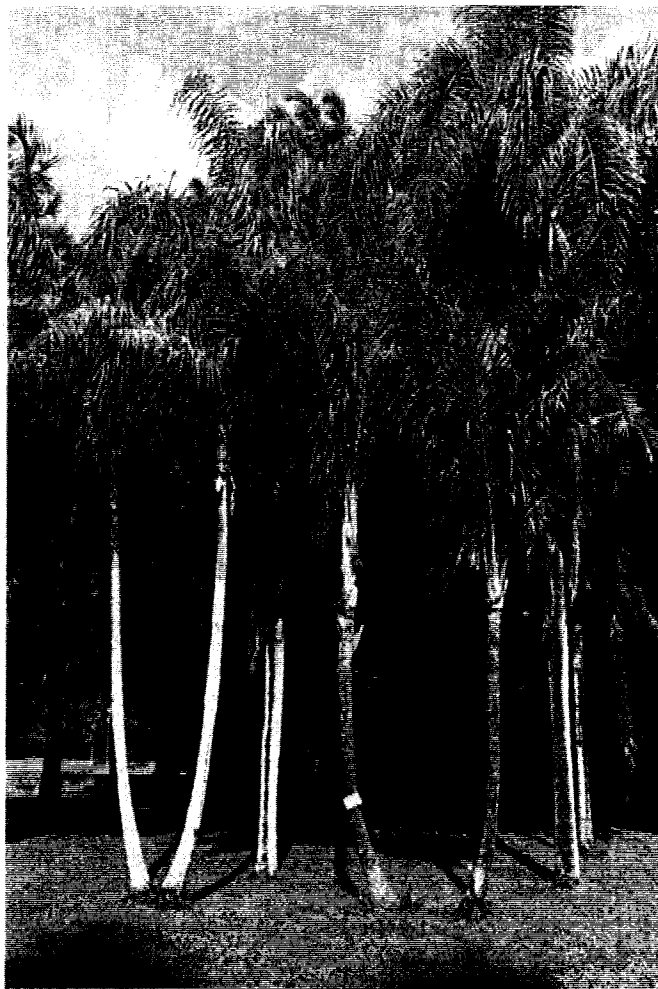
Photographs by William Houghton

The best way to study palms is to examine living material and Fairchild Tropical Garden offers outstanding opportunities to do just that.

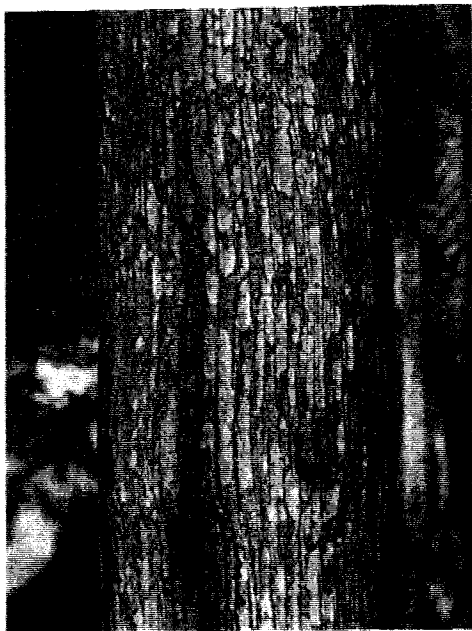
I am an enthusiastic specialist in the study of a group of palms popularly known as cocosoids (the tribe Cocoeae). The palm family contains about 2,700 species, 1,100 of which are New World palms. It is divided into six subfamilies, four of these further divided into tribes. The Cocoeae tribe is an especially large group, consisting of 22 genera and about 583 species. Most of these are distributed in the New World, with only a few in the Old. In fact, the majority of New World palms are cocosoids.

The one cocosoid palm that all are familiar with is *Cocos nucifera*, the coconut. Others of the group, like their coconut cousin, have a tremendous, and yet unexplored, economic potential. I am studying the American genus *Syagrus* and species of closely related genera, and trying to find out how these species are interrelated and how they evolved.

At the onset of this study, the Garden's *Syagrus* collection was thought to consist of the following 12 species and two hybrids:



These palm "twins" with multiple trunks have long been mistakenly identified as *S. flexuosa*, but they are either fertile hybrids or unrecognized new species.



The smooth trunk of *Syagrus oleracea* (left), contrasts with the rough trunks of its hybrid *S x costae* (center) and the other parent *S. coronata* (right).

Syagrus tessmannii, *S. amara*, *S. comosa*, *S. coronata*, *S. flexuosa*, *S. oleracea*, *S. orinocensis*, *S. picrophylla*, *S. romanzoffiana*, *S. sancona*, *S. schizophylla*, *S. vagans*, *S. x fairchildensis*, and *S. x tostana*. During the course of this study, I made a number of discoveries concerning the nomenclature of the Garden's collection as follows.

In Glassman's 1987 revision of the genus, *Syagrus tessmannii* was included under the older name *S. sancona*. Collections labeled as these two species in the Garden confirm that these are indeed one and the same. *S. sancona*, originally from the Andean regions of South America, is a very tall and fairly common palm in the Garden.

Syagrus x fairchildensis is no longer an acceptable name for the hybrid palm between *Butia capitata* and *S. romanzoffiana*. Because it is an intergeneric hybrid (a cross between two different genera, *Butia* and *Syagrus*), the accepted name is now *x Butyagrus*

nabonnandii.

Those who have obtained *Syagrus comosa* as seed or plants from the Garden have either *S. coronata*, *S. oleracea*, or most probably, the hybrid between these two, called *S. x costae*. Unfortunately, the Garden has no *S. comosa*. Some specimens of the hybrid *S. x costae* in the Garden are mislabeled as *S. oleracea*, but can be distinguished from it by a very characteristic trunk. The trunk is shorter and has a very rough and angular, *S. coronata*-like appearance, due to very short internodes and the large leaf scars that are compressed against each other.

The only flowering Garden specimen, labeled *Syagrus orinocensis*, in plot 19B, has turned out to be another *S. sancona*. Although the Garden has other trees approaching maturity and labeled as this species, there are no mature flowering specimens of *S. orinocensis*. The presence of this specimen cannot be confirmed. *Syagrus picrophylla* also has not



flowered, but having personally seen this species in the field, I feel reasonably confident about its identification.

The palm in the Garden labeled *Jubaea chilensis* is a suspected hybrid between *Jubaea chilensis* and probably *Syagrus romanzoffiana*. There are fewer stamens in the male flowers than normally found in *Jubaea* (10-14 vs. 15-30), and certain abnormalities in the stony endocarp of the fruit indicate that something is amiss.

One unidentified *Syagrus* species whose source is Colombia is probably a hybrid between the widely cultivated southeastern Brazilian *S. romanzoffiana* and the Andean *S. sancona* that grows on the western side of Latin America from Venezuela to Bolivia.

Syagrus flexuosa, from the Garden, or the nearby collection of the United States Department of Agriculture (U.S.D.A.) at Chapman Field, is definitely not *S. flexuosa*. Because it is such a fertile palm, I suspect that it may turn out to be a distinct species,

even though it appears to be somewhat intermediate (hybrid?) between *S. flexuosa* and *S. oleracea*. Pure unadulterated *S. flexuosa* has smaller leaves, narrower leaflets, a thinner trunk, strongly beaked fruits, and inflorescences with branches directed to one side only, and has not yet been seen in South Florida.

Not all of the palms labeled *Syagrus x tostana* (a hybrid between *S. schizophylla* and *S. coronata*) are that hybrid. One true specimen of *S. x tostana* can be found in plot 73, but at least one of the palms labeled *S. x tostana* and located in plot 19B is a new undescribed hybrid whose parents are *S. schizophylla* and *S. romanzoffiana*, not *S. coronata*. The new hybrid has many characteristics that have led me to suspect *S. romanzoffiana*: a very robust palm with a thicker and taller trunk, larger leaves, larger inflorescences, a hairy ovary (like *S. romanzoffiana*) rather than a smooth or glabrous ovary (like *S. coronata*), and fruits with smaller "seeds" (stony endocarps) with three apical bumps near the tip (just like *S. romanzoffiana*). The new hybrid will be named in honor of Robert H. Montgomery and the Montgomery Foundation, which is providing the support for this study.

In summary, the following *Syagrus* species and other related cocosoid palms have positively been identified in the Garden: *S. amara*, *S. coronata*, *S. oleracea*, *S. picrophylla*, *S. romanzoffiana*, *S. sancona*, *S. schizophylla*, *S. vagans*, *S. x costae*, *S. x montgomeriana* (a new hybrid), and *S. x tostana*. In addition to *Syagrus*, the following closely related cocosoid palms (subtribe Butiinae) have been found: *Allagoptera arenaria*, *Allagoptera campestris*, *Allagoptera leucocalyx*, *Cocos nucifera*, *Elaeis guineensis*, *Elaeis oleifera*, *Lytocaryum weddellianum*, and *Polyandrococos caudescens*. The only specimen of *Lytocaryum insigne* is a misclassified *L.*



True *Syagrus x tostana*. The thicker trunk of *S. x tostana* (hybrid between *S. coronata* x *S. schizophylla*) on the left contrasts with its shorter and thinner *S. schizophylla* parents on the right.

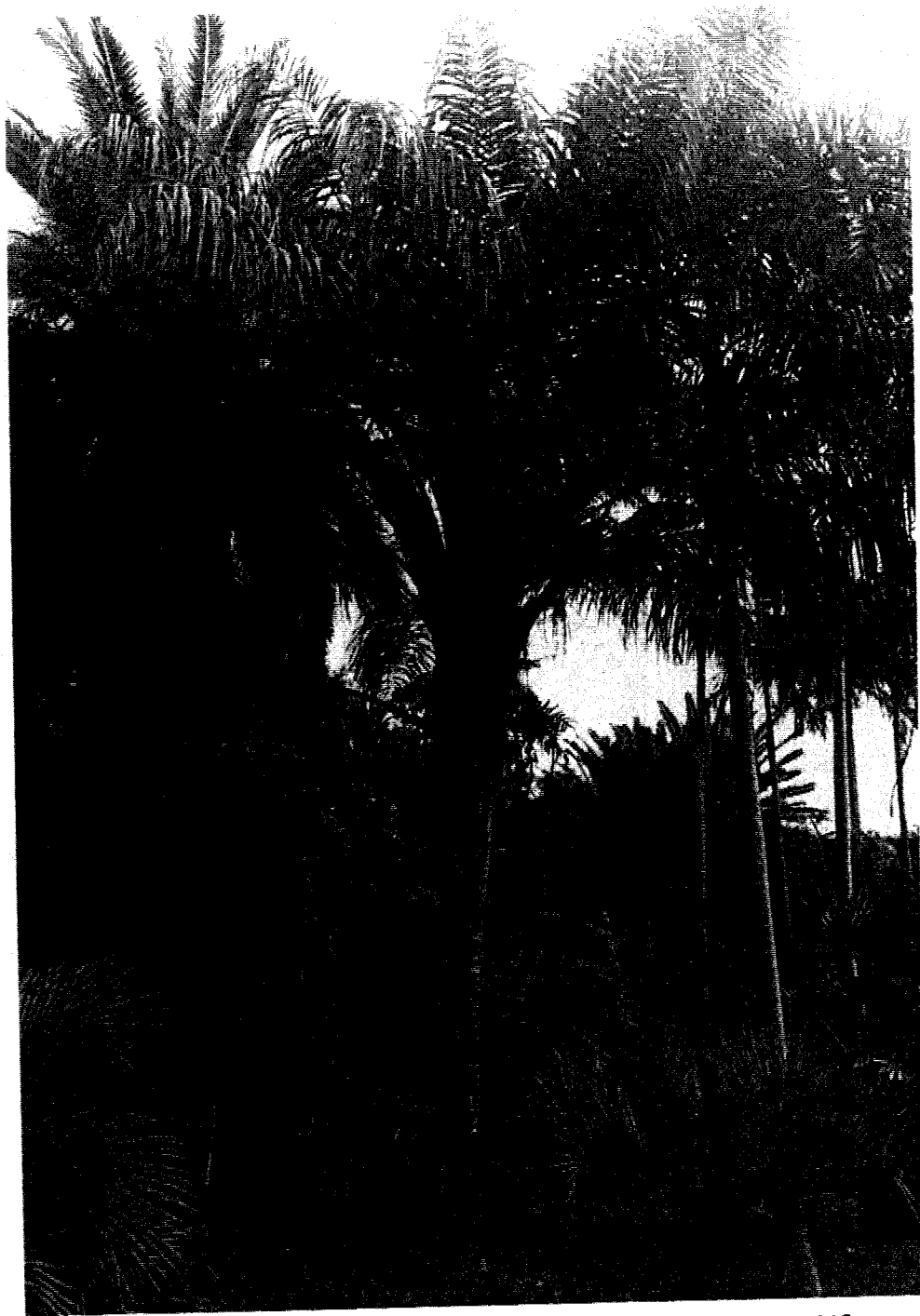
may be distributing "illegitimate" (hybridized) seed.

The *Syagrus* collection at the Garden encompasses only about a quarter of the known number of species available in the genus. The confusion among species or hybrids and the small number of representatives in the Garden's collections help to highlight the importance of the 1992 trip to Brazil jointly funded by a 1985 donation from Bernard Bowker and the South Florida Chapter of the International Palm Society. The knowledge and material gathered on this trip will be invaluable in helping to solve problems in this group of palms and assuring the Garden's leadership as a center for palm research and as a source of accurate information.

weddellianum. There is much confusion and too many unanswered questions about *Butia*, and a trip to Brazil will help clarify many of these. *Jubaeopsis caffra* and the species of *Parajubaea* are still too young to make a positive identification. There are also a number of cocosoid specimens in the Garden which I cannot positively identify until I have compared them to their natural populations.

It is clear that if our purpose is to maintain and preserve the integrity of species in botanical gardens, then we must do more than distribute seed from palms which have been allowed to pollinate one another indiscriminately. We

Dr. Larry Noblick recently obtained his Ph.D. from the University of Illinois at Chicago, where he worked in close association with the Field Museum. His Bachelor and Master degrees were from the Ohio State University. He has been a university professor in Brazil, a Peace Corps Volunteer, a naturalist, a field botanist, a public school teacher, and a supervisor of a greenhouse-conservatory complex. His interest in palms comes from his Peace Corps experience in Brazil, and he continues to maintain close ties to that country through his Brazilian wife, child and relatives.



New hybrid: The majestic palm in the center of this figure is a new undescribed (*S. x montgomeriana*) which is mistakenly identified as *S. tostana*, but the robustness of the palm and the flower and fruit characters suggest that the parents are *S. romanzoffiana* and *S. schizophylla*.



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