Kapok Trees of Florida: *Ceiba pentandra* and *Bombax ceiba*

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ABSTRACT

Kapok trees are tropical deciduous hardwood trees that flower and develop seed pods that contain kapok, a fiber known in English as silk cotton. The two most important kapok species are *Bombax ceiba* (bombax) and *Ceiba pentandra* (ceiba), both of which were introduced to Florida in the late nineteenth century, mostly as ornamental trees to grace private estates and botanical gardens. The red-flowering bombax was imported to Clearwater from South Asia, and today it proliferates primarily along Florida's west coast. The white-flowering ceiba, a sacred tree of the Maya, was introduced to Palm Beach and Miami/Key West, and it is found mostly in south and southeast Florida. Both species are sensitive to freezes, the ceiba slightly more so than the bombax. Internet sources—including newspaper articles, floral surveys, iNaturalist listings, and blog postings—coupled with fieldwork conducted from early 2020 to late 2023 produced an inventory of 144 living kapok trees (94 bombaxes, 50 ceibas), not counting nursery stocks or newly planted trees. These are spread among botanical gardens, private estates, parks, public buildings and grounds, and private residential properties. Over half (52) of bombax trees are on residential lots but only one-tenth (5) of ceiba trees are. A recent trend is to relocate trophy trees such as ceibas to private estates, condominium complexes, shopping malls, and public grounds.

Keywords: kapok, *Bombax ceiba*, bombax, *Ceiba pentandra*, ceiba, tropical trees, Florida

INTRODUCTION

Throughout central and southern Florida, especially closer to the coast, people marvel at the giant kapok trees that have been introduced to the state. Many remember the children's book about conservation— Lynn Cherry's *The Great Kapok Tree* (1990)—that was released on the twentieth anniversary of Earth Day. People flock to Florida botanical gardens to see the flowers appear on the deciduous trees as they begin to leaf out in early spring. Others are awed by the size of these trees, notably the Giant Kapok of Palm Beach, the Edison Kapok of Fort Myers, and the namesake of the Kapok Tree Inn in Clearwater. Kapok trees are often called "kapoks" but the term **kapok**,

derived from the Malay **kapuk**, refers to the cotton-like fiber (silk cotton) inside the seed pods. Also, the term **kapok tree** is used to refer to (at least) two species of trees: *Ceiba pentandra* (New World origins) and *Bombax ceiba* (Old World origins). Both species were introduced to Florida in the late nineteenth century for planting in private estates and gardens.

This research began in Spring 2020 with a focus on *Ceiba pentandra* in Florida. It was meant to augment the many field studies conducted by William V. Davidson* (2018, 2019a, 2019b, 2020, 2021, 2022a, 2022b, and 2023) by better understanding the diffusion and distribution of this majestic tropical tree in a region outside of its natural habitat. In Florida the word **ceiba** is used by Spanish speakers and most botanists and horticulturalists for *C. pentandra*, whereas English speakers tend to use the word **kapok** (or, more accurately, **kapok tree**). When I learned that the term kapok was also applied to a different species—*Bombax ceiba*—especially along the west coast of peninsular Florida, I realized that the scope of the study needed to be expanded.

William V. Davidson is a retired Louisiana State University cultural-historical geographer who specializes in ethnic landscapes of Yucatán and Central America. His professional interest in *Ceiba pentandra* goes back to the 1960s, but extensive research on the sacred tree of the Maya began in earnest following his retirement. Dr. Davidson resides in Memphis, TN, and continues to conduct field research in Latin America and the Caribbean. He served as mentor and master's thesis advisor to the author in the late 1970s.

Additional field research over the following years yielded much new information. This article is the result of those efforts.

This article focuses upon the kapok trees of Florida in terms of origins, distribution, and current trends. A brief description of the two species, their environmental niches, their global distribution and diffusion, and their economic utility is presented. A section on species and terminology is included to help understand the use and misuse of terminology related to kapok trees.

HISTORICAL BACKGROUND

In plant classification cotton, jute, and kapok all fall in the Malvaceae family, formerly known as the Bombacaceae family (Gómez-Maqueo and Gamboa-deBuen, 2022). However, at the genus and species levels much confusion prevailed. In the 1750s Carl Linnaeus first adopted the genus name *Bombax* after the Greek **bombyx** that referred to things of silk or cotton, including the seed pods of what became known as "silk-cotton trees" (Nicolson, 1979). The broad classification of Linnaeus—which at one point included the cotton plant *Gossypium* sp.—became fine-tuned over the ensuring centuries based upon both physical variations and geographic origins (Nicolson, 1979).

Bombax ceiba (bombax) and *Ceiba pentandra* (ceiba) exhibit many similarities. Both species have large seed pods that contain silk cotton (kapok). Both are large deciduous trees of the tropics. The ceiba, at up to 250 feet high, is among the largest trees of the Amazon rainforest. The bombax can reach up to 200 feet. Both species have buttressed trunks, often with conical spines (although these tend to fade as the trees age). Both species flower at the end of the dry (winter) season, with the bombax flowering red (or orange) and the ceiba flowering white (occasionally pink). The bombax tree is somewhat more tolerant of freezes whereas the ceiba tree has difficulty surviving prolonged freezes.

Bombax ceiba is native to the Old World tropical monsoon lowlands, but because of its long history of cultivation little is known of its exact origins and paths of diffusion. The tree was long utilized in India and Southeast Asia for medicines, wood, and—especially—kapok. Cultivated for a millennium or so, *B. ceiba* has spread its range up to the foothills of the Himalayas (in Pakistan, Nepal, and Bhutan) and through the lowlands of South and Southeast Asia and into New Guinea and Australia (Hodel and Weissich, 2012). India's Malabar Coast was a major area of bombax cultivation, and the species was known as *Bombax malabaricum* well into the twentieth century (when the synonymous *Bombax ceiba* replaced it). Allegedly, the term "true kapok" was originally applied to the native bombax tree which was historically the major source of silk cotton. The use of *B. ceiba* for kapok harvesting has declined in Asia over time, because of substitution of the higher kapok-yielding *Ceiba pentandra* and also the increased use of synthetic fibers. However, *B. ceiba* has been introduced to the West Indies and Brazil, where it is cultivated for its **bombax cotton** (used in upholstery material) (Encyclopedia Brittanica, 2019).

The New World *Ceiba pentandra* has a much more global history. The word **ceiba** is derived from Arawak, or Taino, the language of the Antillean natives Columbus encountered on his first trips to the Americas. The homeland of the Arawak was originally the Amazon rainforest, and perhaps the word ceiba (meaning dugout canoe) originated there. Both locales are within the hypothesized natural range of *C. pentandra* (Figure 1), and it is likely that Arawaks aided the ceiba's diffusion northward through the Antilles. In the Americas, *C. pentandra* grows naturally as far north as Cuba and Mexico, where it is considered the sacred tree of the Maya (**ya'axché**) (Davidson, 2019b; Hellmuth, 2011).

The natural distribution of the ceiba tree includes West Africa (inset on Figure 1). Evidence from pollen grains shows the ceiba established there about 13,000 BCE and that natural agents of diffusion—wind and water currents—allowed trans-Atlantic migration of the ceiba (Dick et al.,

2007; Gómez-Maqueo and Gamboa-deBuen, 2022). From its arrival in West Africa, the ceiba colonized the wet-and-dry Sahelian savannas (wooded, rather than open), and several savanna ecotypes of the tree developed. The exact mechanism of the introduction of *C. pentandra* to Asia is still debated, but humans are considered to have spread the range eastward to East Africa and then across the Indian Ocean to India between 500 BCE and 500 CE. Cultivation of the ceiba in India is dated to the start of the tenth century (Gómez-Maqueo and Gamboa-deBuen, 2022). The quality of kapok was higher in this introduced species, and *C. pentandra* gradually replaced *B. ceiba* as the dominant source of kapok in Asia. Over time, the term "true kapok" came to refer to the introduced *C. pentandra* (Jain et al., 2009). Kapok trees, especially *C. pentandra*, became cultivated as plantation crops when the plantation system was introduced by colonial powers beginning in the early nineteenth century, and kapok tree plantations were established in Burma, Malaysia, Vietnam, the Philippines, Indonesia, and East Timor (Shepard and McWilliam, 2013).

Figure 1. Global natural distribution of *Ceiba pentandra* (map after Chinea-Rivera 1990 and Mari Mut 2015).

Both species of kapok trees were of great utility to humans. In addition to various ethnomedicinal uses of most parts of the tree, the roots were roasted for food, especially in times of famine (Jain et al., 2009). Oil was made from the seeds, and the vermin-proof kapok was used for mattresses, pillows, insulation, and (later) life jackets. (During the World War II years, the term kapok was synonymous with life jacket, according to Bill Davidson, and in 2023 I saw kapok cushions for sale at a marine supply store in Germany.) The wood, although not as durable as tropical hardwoods such as mahogany or teak, was useful for various construction purposes, notably canoe and boat building (Jain et al., 2009; Mari Mut, 2015; Nordahlia et al., 2016). Today, logging of ceibas for use in the plywood industry is threatening tree populations in the Peruvian and Brazilian Amazon (Gómez-Maqueo and Gamboa-deBuen, 2022). In Asia, by contrast, the ceiba is an important component of agroforesty (especially in India) and also conservation and landscape restoration, notably in Madagascar and southern China (Gómez-Maqueo and Gamboa-deBuen, 2022; A. Smith, 2022).

To sum up this historical background, both *C. pentandra* and *B. ceiba* were of value to native populations, notably for medicines, food, forage, wood products, and kapok. Cultural attachment to the trees is strong in India, where burning of *B. ceiba* branches is part of Hindu rituals such as **Holi** (Jain et al., 2009) and also among the Maya and Aztec cultures, where *C. pentandra* was a sacred tree that connected the human world with the land of the Gods (Gómez-Maqueo and Gamboa-deBuen, 2022). Even in West Africa, the native *C. pentandra* was regarded as sacred. The ceiba is the national emblem of Guatemala (Hellmuth, 2011), Puerto Rico, and Equatorial Guinea (where it appears on the flag). A massive ceiba in Freetown, Sierra Leone, stands as a symbol of freedom for repatriated slaves.

KAPOKS ARRIVE IN FLORIDA

Both species of kapok tree were introduced to Florida in the nineteenth century, primarily for horticultural, rather than economic, purposes. Kapok trees were planted as "trees of beauty" in private and public gardens, often in large estates. This trend continues today.

The first recorded introduction of a kapok tree to Florida was when a *Bombax malabaricum* seed was imported from India in 1888 (Houk, 1994), and nurseryman Robert Hoyt planted it near his orange grove and fruit stand in Clearwater (Comingore, 2017) (Figure 2). *B. malabaricum* was recorded as "officially" introduced to Florida in 1912 when noted USDA botanist and "plant

explorer" David Fairchild brought a sample to the U.S. Department of Agriculture plant introduction garden in Miami (McCourt, 2021; USDA, 1913). Royal Palm Nurseries (Miami) also claims credit for importing the tree in 1912 (Turner, 2013). The Clearwater red silk-cotton tree became admired by locals and tourists, and soon nurseries aided in its diffusion along the west coast of peninsular Florida (notably St. Petersburg, Sarasota, Fort Myers, and Naples).

The other kapok tree—*Ceiba pentandra*—is most widespread in south and southeast Florida, but this can be attributed either to points of introduction or its more limited tolerance for freezes. Davidson (2019a) traced the introduction of ceibas to Nassau (Bahamas) to the late 1700s, and it is probable that seedlings were introduced to Florida from there (see Figure 2). The railroad magnate Henry Flagler was familiar with Nassau as a tourism destination (and later built a hotel there in 1900), and his gardeners at the Royal Poinciana Hotel in Palm Beach planted one adjacent to the hotel grounds around 1887. Now known as the Giant Kapok of Palm Beach, it is the oldest documented ceiba in Florida, and also the largest. It is the largest tree in the "champion tree" database for Florida, in spite of its status as a non-native (Williams, 2020).

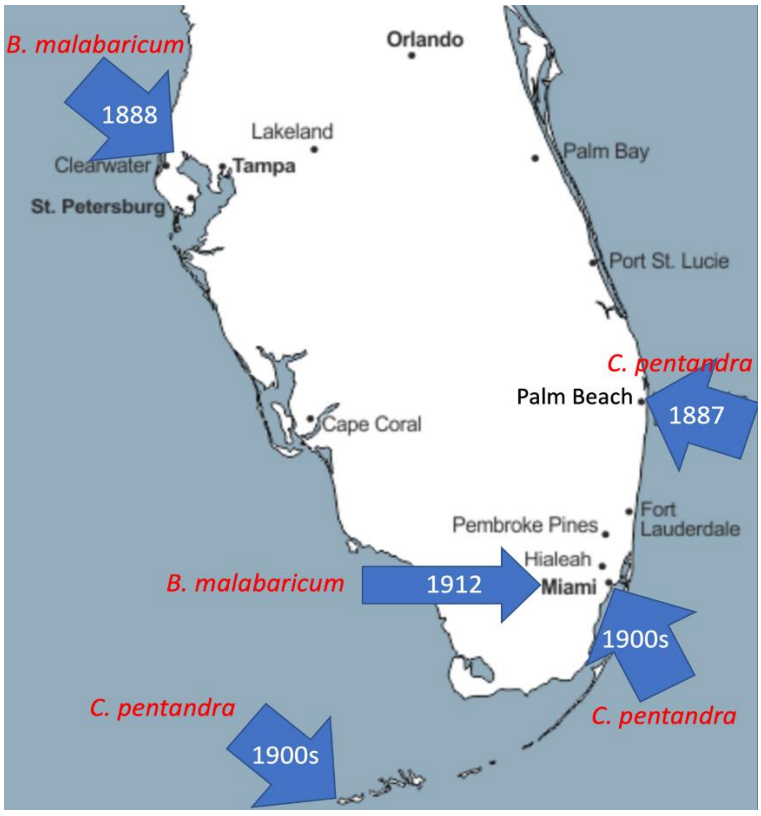

Figure 2. Introduction of *Bombax ceiba* (*B. malabaricum*) and *Ceiba pentandra* to Florida. Map by author.

The role of David Fairchild, the USDA botanist, in diffusing the ceiba throughout South Florida is also not well documented. Fairchild does not mention *Ceiba pentandra* specifically in his writings, yet he rejected *Bombax ceiba* (*Bombax malabaricum*) as a "true kapok" (Fairchild, 1930, 1938). The oldest ceibas in the Miami area date to the early 1900s, and Fairchild planted at least one on his property in Coconut Grove by the 1920s. There may still be a few 100-year-old ceibas in Miami, all south of the Miami River. In Key West, the first ceiba was planted in 1905, and Monroe County historian Tom Hambright suggested that the planting of the six oldest Key West kapoks was influenced by David Fairchild (Davidson, 2018).

Thomas Edison built a winter estate in Fort Myers in 1885, his friend Henry Ford built one next door in 1911, and the properties are today run as one tourist attraction. Both Edison and Ford were friends of David Fairchild and were known to visit him in Miami. The *C. pentandra* on the Edison property was planted in 1915, according to the Edison-Ford Estates website.

LIMITATIONS TO GROWTH

The distribution of both species of kapok is also limited by climatic restraints on growth. The U.S. Department of Agriculture recently updated its 2012 Horticultural Hardiness Zone map to a 2023 Plant Hardiness Zone map (USDA, 2023). The new map is based upon newer climate statistics features more detail. Much of southeast Florida (Palm Beach to the Florida Keys) has shifted to Plant Hardiness Zone (PHZ) 11a from HHZ 10b, in part because of global climate change (USDA, 2023).

According to horticulturalists, *C. pentandra* survives best in PHZ 10b (average winter low: 35-40°F) or higher (Figure 3). However, it can grow in PHZ 10a (average winter low: 30-35°F) as long as freezes are short. Ceibas are very intolerant of severe frosts and won't survive cold winters in Orlando or Tampa (unless in a protected micro-climate). *B. ceiba*, on the other hand, does well in PHZ 10a and may survive in PHZ 9b (average winter low: 25-30°F). The Harry P. Leu Botanical Gardens in Orlando has a mature *B. ceiba* that has survived multiple freezes, whereas the *C. pentandra* trees typically die back and then resprout.

Another limit to growth is soil. Wetland soils do not support either species, and a shallow soil layer (such as over limestone) limits tree growth. Both species need a lot of lateral space because of their far-ranging root systems, especially the larger ceiba which does not easily fit on a typical residential lot.

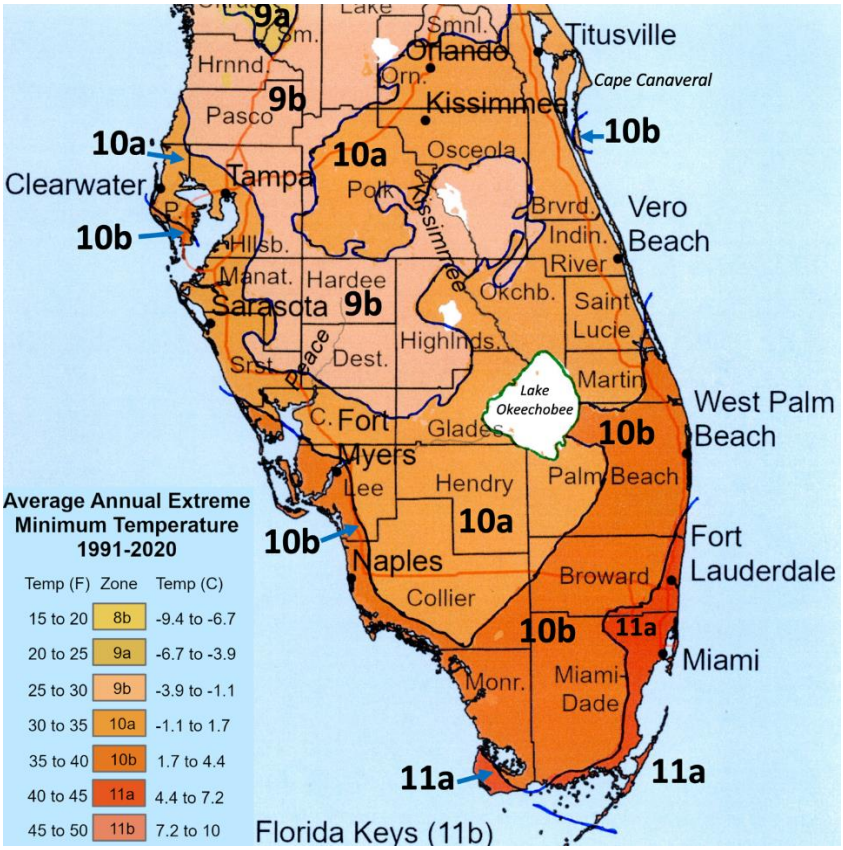

Figure 3. Plant Hardiness Zones for southern Florida. Map from USDA, 2023.

Hurricanes are another hazard. Strong winds can either snap high stems and branches or totally uproot the trees. In either case, the trees will often grow back (and flourish until the next major hurricane). The owner of Unbelievable Acres botanical garden (West Palm Beach) can describe the ages of his ceibas by the hurricanes that toppled their predecessors.

SPECIES and TERMINOLOGY

There is much confusion about kapok trees in the popular literature. So, prior to examining the distribution of *Ceiba pentandra* and *Bombax ceiba* it is important that some of the sources of confusion be identified (Table 1).

1. *Ceiba pentandra*, formerly *Bombax pentandrum*. The ceiba, also known as the kapok, silk-cotton, or white silk-cotton tree in Florida, is an introduced species that grows to 75-125 feet tall (in Florida). It is broad, deciduous, and the trunk is typically buttressed. It flowers white or white-to-pink. Its seed pods contain fiber known as kapok or silk cotton.

2. *Bombax ceiba*, formerly *Bombax malabaricum*. This tree, also referred to as ceiba, bombax, cotton, silk-cotton, Malabar silk-cotton, or red silk-cotton tree, is native to the Asian tropics. Both species (*C. pentandra* and *B. ceiba*) are called kapok, ceiba, and even silk-cotton tree, but only the *Bombax ceiba* flowers red (hence the more accurate term red silk-cotton tree).

3. *Ceiba speciosa*, formerly *Chorisia speciosa*. This tree, native to the tropical Americas, is known as the silk floss tree (or floss silk tree) but is often referred to as a ceiba or kapok tree by horticulturalists. The trunk is straighter and slightly bottle-shaped, shows less buttressing, and exhibits big spines on the trunk. (Such spines also appear, albeit less densely, on both *C. pentandra* and *B. ceiba*.) *C. speciosa* flowers pink and it also has a fiber-filled seed pod. It is widely sold at nurseries in Florida as it is easily grown on residential lots and is more tolerant of freezes.

name	species
ceiba, ceiba tree	***Ceiba pentandra*** (formerly *Bombax pentandrum*) ***Bombax ceiba*** (formerly *Bombax malabaricum*) ***Ceiba speciosa*** (formerly *Chorisia speciosa*) ***Ceiba insignis*** ***Ceiba chodatii*** + 14 additional species of *Ceiba*
kapok tree (also kapok)	***Ceiba pentandra*** (formerly *Bombax pentandrum*) ***Bombax ceiba*** (formerly *Bombax malabaricum*) ***Cochlospermum*** *sp.* (Australia/Papua New Guinea) occasionally ***Ceiba speciosa*** (formerly *Chorisia speciosa*)
cotton tree	***Ceiba pentandra*** (formerly *Bombax pentandrum*) ***Bombax ceiba*** (formerly *Bombax malabaricum*) ***Gossypium*** (cotton) ***Hibiscus tilliaceus*** (cottonwood)
silk-cotton tree	***Ceiba pentandra*** (formerly *Bombax pentandrum*) ***Bombax ceiba*** (formerly *Bombax malabaricum*) ***Cochlospermum religiosum***
white silk-cotton tree Java cotton tree	***Ceiba pentandra*** (formerly *Bombax pentandrum*)
red silk-cotton tree red cotton tree Malabar silk-cotton tree red kapok tree	***Bombax ceiba*** (formerly *Bombax malabaricum*)
silk-floss (or floss-silk) tree	***Ceiba speciosa*** (formerly *Chorisia speciosa*) ***Ceiba insignis*** ***Ceiba chodatii***
bombax, bombax tree	***Bombax ceiba*** (formerly *Bombax malabaricum*) ***Pseudobombax ellipticum*** (aka *Bombax ellipticum*) + 7 additional species of *Bombax* occasionally ***Ceiba speciosa*** (formerly *Chorisia speciosa*) rarely ***Ceiba pentandra*** (formerly *Bombax pentandrum*)

Table 1. Correlation of colloquial and scientific names.

4. *Ceiba insignis*. Known as the white silk floss tree (or floss silk tree), this species is native to the western Amazon Basin (Ecuador, northern Peru). It has a bottle-shaped trunk with spines.

5. *Ceiba chodatii*. Also known as the silk floss tree (or floss silk tree), this species is native to Bolivia and the Chaco region of Paraguay and Argentina. It also has a bottle-shaped trunk. (Of the 18 species of *Ceiba*, one can see that there is much overlap in characteristics as well as confusion in names.)

6. *Cochlospermum religiosum*. In addition to *C. pentandra* and *B. ceiba*, this tree—native to the Asian tropics—is also known as a silk-cotton tree. It has a similar seed pod filled with silky fiber which also is called kapok.

One further source of confusion, not included above or in Table 1, is the banyan tree. Technically the banyan is a fig (*Ficus*, family Moraceae) that begins life as an epiphyte. Its seed germinates in a crack or crevice of a host tree, then sends roots to the ground. Eventually the host tree becomes hidden or "strangled" by the fig, hence the colloquial term "strangler fig". The original banyan—*Ficus benghalensis*—is native to India, but today the term banyan refers to any of at least ten species of *Ficus*, including two species—*F. citifolia* and *F. aurea* (Florida strangler fig)—that are considered native to south Florida. The late Isabel Zucker of North Lauderdale, FL, in a PowerPoint project for a plant course at University of California at Davis, noted that ceibas (*C. pentandra* or *B. ceiba*) were sometimes referred to as banyans in Asia after serving as hosts for *Ficus* species. Whether kapoks have served as hosts for *Ficus* species and ended up as banyans in Florida is not well documented. However, this process may have occurred at Hugh Taylor Birch State Park (Fort Lauderdale) where a young tree—possibly a ceiba—was nearly completely "strangled" by a *Ficus* (as seen on a visit in 2020).

The following sections will address the present-day distribution of kapoks in Florida. Information was obtained from literature searches, internet searches, botany blog postings, iNaturalist (www.inaturalist.org) listings, interviews with horticulturalists and botanists, visits to numerous botanical gardens, and field research from Spring 2020 to Fall 2023. The Institute for Regional Conservation (IRC), has inventoried plant species found on public conservation lands in various regions of the USA and its territories since 2001 (Gann et al., 2001-2024). Its Floristic Inventory of South Florida is one such study, designed to identify plants and better manage conservation lands.

CEIBA PENTANDRA IN FLORIDA

A total of 50 living *Ceiba pentandras* were identified (Appendix 1; Figure 4). These include eight ceibas in Key West found by Davidson (2018). Most of the Florida ceibas can be placed into the following categories: 1) ceibas planted in private estates or gardens, 2) ceibas planted in private or public parks, and 3) ceibas relocated to public, commercial, or private sites. The first category includes the oldest ceibas, dating to the late 1800s and early 1900s as well as the newest ceibas in the private garden landscape (i.e., residential lots), because nurseries continue to sell the trees to homeowners and developers. The second category comprises ceibas planted in parks for both landscape and preservation value, and also in parks (or zoos) established to produce a "jungle" landscape for tourists to enjoy. The third category is a trend that has developed in the last couple of decades, in which mature ceibas (at least 20 years old) are relocated to public parks, outdoor malls, condominiums, and private residential lots.

Ninety per cent of the ceibas in Florida grow in A, or tropical, climates as defined in the climate classification system devised by Wladimir Köppen (Arnfield, 2023). The A climates are subdivided into tropical rainforest (Af), tropical monsoon (Am), and tropical wet-and-dry savanna (Aw) (see Figure 4). To the north of a line extending from Fort Myers to Jupiter, Florida's climate is considered to be C (temperate), and more specifically Cfa, or humid subtropical. Although this classification system is not as good as the USDA plant hardiness zones in predicting plant survivability, it provides a good general overview of climate regions. And it reinforces the fact that ceibas—most of which are found in A climate zones—cannot withstand frosts as well as bombaxes, which in Florida straddle the A and C climate zones.

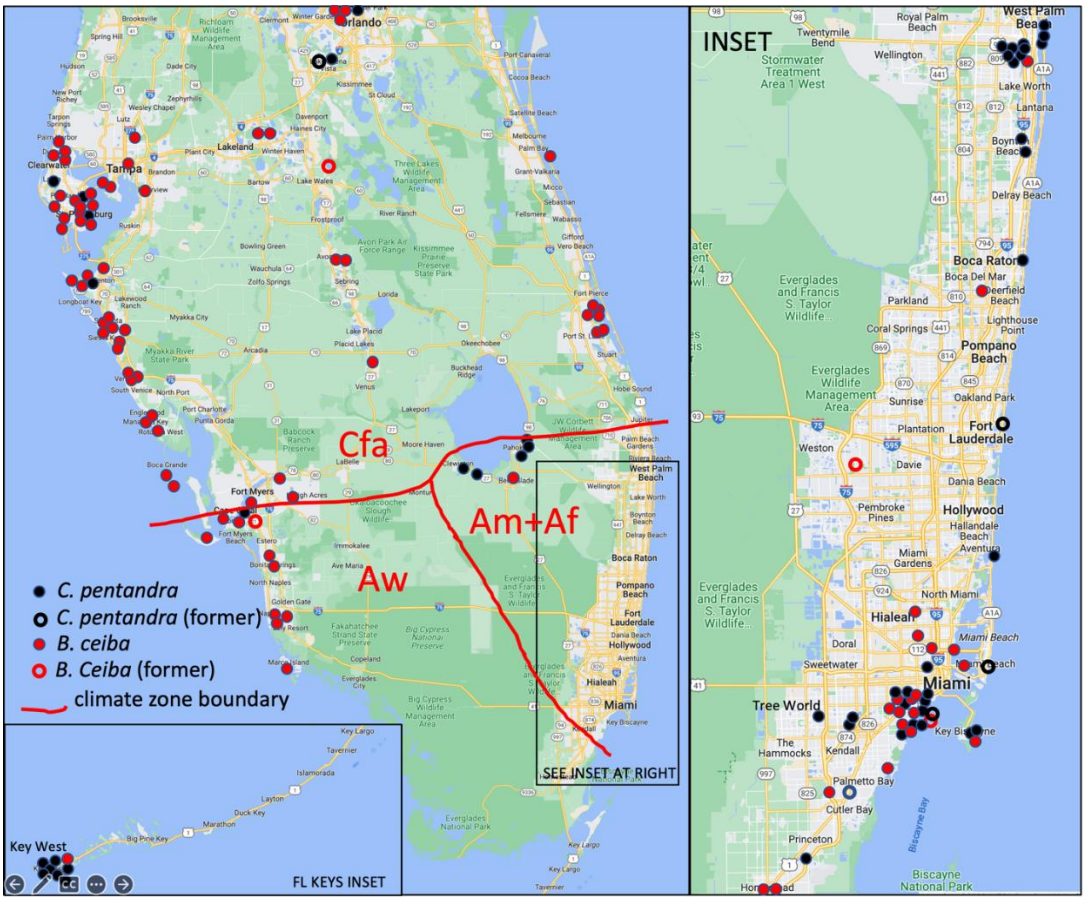

Figure 4. Kapok distribution in Florida and Köppen climate zones. Maps by author.

Ceibas Planted in Private Estates

The oldest category of planted ceibas is that of ceibas planted in private estates. In the nineteenth century, Florida was sparsely populated and a handful of individuals acquired large parcels of property. These parcels were often landscaped with tropical flora from around the globe. Several of these properties have since come under public ownership and others have been subdivided by private developers. In the twentieth century, estates became smaller, but still large enough to support the planting and growth of ceibas. However, more typical modern residential lots of half an acre or less don't have the space for a ceiba to grow to full maturity. Although a few ceibas can be found on residential lots, several have been "relocated" as they outgrew their space. Smaller species, such as *Ceiba speciosa*, are better suited to smaller residential lots.

The Giant Kapok Tree of Palm Beach

The Giant Kapok of Palm Beach, with a diameter of 23.8 feet (chest high) and a height of 74 feet, is listed as the largest ceiba in Florida (Williams, 2020) (Figure 5). It is probably also the oldest. A writer for the *Palm Beach Daily News* (2016) asserted that the tree dates to 1830, but this is highly unlikely. European settlement in the area dates to 1872, and the shipwrecked cargo of coconuts that gave Palm Beach its name dates to 1878. The first hotel in the area—the Cocoanut Grove—was built in 1880. Henry Flagler, the oil tycoon/railroad magnate/tourism entrepreneur, was a long-term guest at the hotel while he built his own hotels (such as the Royal Poinciana and the Breakers) as well as a winter house (Whitehall). The more believable story is that Flagler probably had his gardeners plant a ceiba seedling—probably brought in from Nassau—at the corner of his Whitehall property, up against the boundary of the Royal Poinciana Hotel, in 1887.

Figure 5. The Giant Kapok of Palm Beach. Photos by author. Top: March 2021; Bottom: May 2023.

Hugh Taylor Birch State Park, Ft. Lauderdale

Hugh Taylor Birch State Park is often referred to as the Central Park of Ft. Lauderdale because of its large expanse of green space surrounded by development. From the mid-1890s until 1940 this 180-acre property was the private estate of Hugh Taylor Birch, an attorney for Standard Oil Company from Chicago. Shortly before his death in 1943, Birch donated the property to the State of Florida, and the state park was created.

Although the original estate had floral species from all over the world, park horticulturalists told me (in 2020) that non-native species were being eradicated so that the park could function as a conservation area for native Florida species (including *Ficus*, for which the park is mostly known). They were unaware of a ceiba on the property. The IRC Floristic Inventory (Gann et al., 2001-2024) still lists a ceiba, but the original survey was conducted in 1983 (Buckley and Hendrickson, 1983). I did not find any mature ceibas in 2020, although one tree was possibly a young *Ceiba pentandra* serving as a host for a strangler fig. (Lacking confirmation, I left it off the inventory.)

David Fairchild's Kampong, Coconut Grove (Miami)

David Fairchild was a botanist and "plant explorer" who traveled the world as an employee of the U.S. Dept. of Agriculture (USDA) to seek out economically useful plants for introduction to the USA (Stone, 2018). He was instrumental in bringing cherry trees to Washington, DC, and introducing kale, quinoa, and avocados (among many other edible plants) to the American diet. The USDA established a "plant introduction garden" in South Florida for the many tropical species brought by Fairchild to the USA. In 1898 this "garden" comprised six acres at the mouth of the Miami River, and by 1914 a 25-acre space was acquired at the Charles Deering Buena Vista Estate. In 1923, a 197-acre parcel of the decommissioned Army Air Corps facility called Chapman Field became the permanent location; today it is the Subtropical Horticulture Research Station (USDA, no date). No records were found of the original introduction of *Ceiba pentandra*, however.

In 1916, Fairchild purchased an 8-acre waterfront parcel in Coconut Grove (south Miami), where he would retire in 1935. He named his property Kampong (a Malay term meaning family compound) and turned this property into a garden filled with many exotic plants, including a *C. pentandra* (as well as a *B. ceiba*). Internet sources still list the ceiba as present on the property, but in 2020 a staff horticulturalist told me that the sole *C. pentandra* was blown over during Hurricane Andrew in 1992.

Edison-Ford Winter Estates, Fort Myers, FL

Thomas Edison planted a ceiba at his estate in Fort Myers in 1915, perhaps on the advice of his friend David Fairchild. The website monumentaltrees.com lists an inventory of the largest trees in various states and countries, and the Edison-Ford kapok is listed as having a circumference of 13 feet (Monumental Trees, 2015). Its height is estimated at about 80-90 feet, higher than the Giant Kapok of Palm Beach. (Two *B. ceiba* were also planted at the estate.)

The Moorings, Coconut Grove (Miami)

An upscale gated community near the southwest corner of Coconut Grove—not far from Fairchild's Kampong—is well known for its giant ceiba just inside the gates. A sign at the tree's base lists 1929 as year of planting. The property was once two large waterfront parcels owned by Frank Church and Jessie Moore, founders of the Church of Christian Science. In the early 1920s, the elite

subdivision The Moorings (named after Moore) was carved out of these parcels as part of the national City Beautiful movement (https://therealestatecoconut.com/the-moorings-coconut-grove/). The ceiba was planted as part of the new landscaping in the subdivided estate.

The Terrazas

The Terrazas, a condominium complex along the south bank of the Miami River, contains a large mature ceiba. This property is adjacent to Sewell Park, and both parcels were once part of a large private estate owned by Massachusetts politician Gen. Samuel Crocker Lawrence. The tree may well be over 100 years old.

The Boca Raton Cloister Hotel

A large mature ceiba stands on the southwest corner of the Boca Raton Hotel, also called the Boca Raton Cloister. Today part of a large 1047-room resort complex, the original 100-room hotel opened in 1926 as the Ritz-Carlton Cloister Inn, designed by well-known architect Addison Mizner. Although not an "estate ceiba" as the previous examples, it is part of an elaborately landscaped hotel complex. The age is unknown, but it could be close to the age of the original hotel.

Other Private-Estate Ceibas

There are undoubtedly many ceibas on private property that have not been identified. Some ceibas on residential lots include the following: 1) a mature ceiba on the John Volk-designed estate on Palm Beach's South Lake Trail (at Primavera Way), near the Giant Kapok (Vanamee, 2021), 2) a large mature ceiba in Fort Myers shown on a 2012 University of Florida IFAS Extension (Lee County) brochure on *Ceiba pentandra*, 3) a very large ceiba at 3065 Freeman St. in Coconut Grove (Miami), 4) a young ceiba on a small residential lot in Miami's Little Havana (1890 SW 11th St.), 5) a 40-50-year-old ceiba in Miami's Westchester district (9142 SW 34th St.), 6) a large mature ceiba in Pahokee (a photo is online in one blog and it's mentioned in another, but I could not find the tree), 7) a mature ceiba in the middle of an empty block in Princeton (an unincorporated community in southern Miami-Dade County), south of Coconut Palm Dr. and west of 114th Ave., 8) a century-old ceiba at 612-614 Fleming in Key West, probably planted in the 1910s by a former Assistant

Superintendent of Lighthouses (Davidson, 2018), and a ceiba in Crescent Heights, St. Petersburg. One mature ceiba on a private commercial lot is in the Chase Bank parking lot near Greenbrier Dr. and U.S. Highway 1 in Boynton Beach. Another ceiba was planted on the east side of the Beacon on Third condominiums in St. Petersburg (470 2nd Ave. S.).

The Role of Nurseries

Southern Florida, especially from West Palm Beach to Homestead, has dozens of plant nurseries—both retail and wholesale—and many of these sell ceibas (various species, especially the more popular *Ceiba speciosa*) and bombax trees. One of the largest is Tree World Wholesale (www.treeworldwholesale.com), whose owner and horticulturalist Guillermo Valenzuela assured me (via telephone) that there are many hundreds of ceibas growing in South Florida. He also stated that there are different "types" of *Ceiba pentandra*, some of which are smaller, less spiky and with different-colored trunks, and more suitable for smaller yards. Such nurseries ensure that the planting of ceibas and bombax on private lots—no matter what size—will continue.

Ceibas Planted in Parks and Public Places

The second category of ceibas comprises ceiba trees planted in public places. These include various types of parks and preserves, including private parks created for tourism purposes and landscaped properties surrounding public facilities.

Hattie Bauer Hammock Park (Orchid Jungle)

The oldest of these parks is now known as Hattie Bauer Hammock Park, in Miami. It encompasses the historic Modello Hammock, later known as The Orchid Jungle. Opened in 1923 as one of Florida's earliest roadside attractions, it was run by four generations of the Fennell family and mentioned in Susan Orlean's 1998 book *The Orchid Thief*. The park did not survive Hurricane Andrew (1992) and closed in 1994. It is now a conservation area maintained by Miami-Dade County Parks and Recreation. *C. pentandra* was listed on the IRC Floristic Inventory (Gann et al., 2001-2024), referencing a field survey of 2005 (Bradley and Mahoney, 2005). A Historic American Landscapes Survey (2009) conducted by the University of Miami Architecture Department and available online through the Library of Congress, lists two silk-cotton trees (*C. pentandra*), on a map

of the property. On a visit in 2022, the park was closed and fenced off for "restoration and enhancement" and hence I could not verify the presence (let alone age) of ceibas hidden within the "jungle".

Matheson Hammock Park

Matheson Hammock Park, adjacent to the Fairchild Botanical Garden in Coral Gables, is a 630-acre (formerly 80-acre) county park. It opened in 1930 as the first Dade County park, and benefactor William J. Matheson wanted it to "preserve the wild and natural beauty" of the area. The park was extended into Biscayne Bay and an artificial atoll created. In 1936, the Civilian Conservation Corps (CCC) developed most of the existent coral-stone infrastructure on the bayfront atoll. The IRC Floristic Inventory listed a *C. pentandra* as present in the park (Gann et al., 2001-2024). However, I could not locate it.

Fairchild Tropical Botanical Garden, Coral Gables

Southwest of Matheson Hammock Park, in Coral Gables, an 83-acre botanical garden was established in 1936 by attorney/businessman/plant-collector Robert H. Montgomery. He named the garden after his friend David Fairchild who had just retired to his Kampong a few miles up the road in Coconut Grove. The botanical garden is today run by Miami-Dade County. Many of the plants growing in the garden were hand-planted by Fairchild himself, although it is not known if these included ceibas. Two *C. pentandra* trees were observed on a 2021 visit, although neither appeared to be much older than 50 years.

Cuban Memorial Boulevard Park, Miami

The Cuban Memorial Boulevard Park occupies a median on 13th Avenue in Little Havana, extending south several blocks from 8th St. At the north end of the park is the Bay of Pigs Monument. About 150 feet south (across from 840 SW 13th Ave.) is a mature ceiba tree, planted in the 1970s or so.

Key Biscayne Village Green

Key Biscayne is a municipality south of Miami Beach sandwiched between two parks on the barrier island of the same name. Authorities connected the key to the mainland by causeway around 1950, and developers sold lots. The village green lies in the center of town, and two ceiba trees grow there, along with a *B. ceiba* and various other subtropical trees. The older of the two ceibas appears to have been planted in the 1950s and is considered a "witness tree" (WRT and Hammer, 2009). The Cuban-born park employees (who spoke no English) raved about the ceibas in their homeland, where the trees allegedly had religious significance.

Palmetto Bay

Until recently, one ceiba stood in the northern part of Coral Reef Park, according to a listing (with photo) on iNaturalist in 2019. On a visit to the popular urban park in southern Miami-Dade County in early 2023, the site of the tree was found. But the ceiba had been removed, probably because its root system would soon interfere with sidewalks and other infrastructure.

Boynton Beach

In the public municipal core area of Boynton (as the mainland settlement was originally called), two mature ceibas stood next to schools. A major urban renewal project in 2018 called for saving one tree but removing the other (Todaro, 2018). This created such a public uproar (Hartz-Seeley, 2019) that authorities agreed to relocate—and not cut down—the second ceiba (J. Smith, 2019). It was relocated by the landscape company Green Integritys of Deerfield Beach. The urban renewal project was finished in 2021, and the first ceiba (next to the old high school) became the centerpiece of a new Town Square (sometimes called Ceiba Square by locals).

West Palm Beach

Dreher Park is a 108-acre former landfill site acquired by the City of West Palm Beach in 1951. According to palmbeachzoo.org, German-born horticulturalist Paul Dreher—the "Johnny Appleseed of Palm Beach County"—was responsible for creating most of the park and introducing trees and plants from around the county. The park contains the Palm Beach Zoo, a disc-golf course,

and an education center. A total of seven mature ceibas were identified on a visit in May 2023, all in Dreher Park North. Also, one *B. ceiba* was found growing in the park.

Unbelievable Acres is a 2.5-acre private botanical garden west of West Palm Beach airport (Salisbury, 2017). Owner Gene Joyner is considered Palm Beach County's most famous gardener who collected hundreds of plants in Latin America and trained dozens of master gardeners. His 65-foot ceiba tree toppled during Hurricane Irma (2017) but it was growing back during a visit in 2023. Joyner said that ceibas usually are felled by major storms but they always grow anew.

Lake Okeechobee

The southern shore of 734-square-mile Lake Okeechobee is the warmest part of the lake. Cold winter air from the north is tempered by the wide expanse of water, and the southern shore marks the northern reaches of the A (tropical) climates (see Figure 4). This is the heart of Florida's sugarcane belt. Ceibas grow here as well, as evidenced by two specimens in Clewiston's Civic Park. A tall ceiba stands on the southwest corner of the USDA Sugarcane Research Station in Canal Point, near the southeast shore of Lake Okeechobee. The 2023 USDA Plant Hardiness Zone map indicates that this area has shifted from HHZ 10a to PHZ 10b since 2012 (see Figure 3).

Key West

Seven of the eight ceibas identified by Davidson (2018) were planted on public property: three at the Harvey Government Center (the old Truman School), one at the Monroe County Courthouse, one at the Jeptha Vinning Harris School, one on a former army base (now the Peary Court apartment complex, and one (stressed) in Mallory Square, next to the Waterfront Playhouse. The first five of these trees are over 100 years old. The largest, at the courthouse, was planted in 1905. The Harris School ceiba was planted in 1909, and the three Truman School ceibas date to 1915. David Fairchild allegedly influenced the planting of these early kapoks (Davidson, 2018).

Disney World, Lake Buena Vista

One mature ceiba is in the Animal Kingdom of Disney World, where it was planted prior to opening in 1999. There was another one in the "jungle" next to the Mayan pyramid at Epcot Center (along with a *B. ceiba* and a *C. speciosa*). Both ceibas had suffered damage over the course of

several severe freezes, and the Epcot one was removed in the late 2010s because it had outgrown its space (palmtalk.org/forum, topic/890078-kapok-rees-in-florida/, posted June 20, 2023).

Harry P. Leu Gardens, Orlando

A 50-acre city-run botanical garden (and former private estate) minutes from downtown Orlando, Leu Gardens has many exotic species, including *C. pentandra* and also *B. ceiba.* There were two mature ceibas growing here in the 1950s, but they probably succumbed to freezes in the late 1950s. In 2023, there was at least one, resprouted from a ceiba tree that had been snapped off by a hurricane.

Florida Botanical Gardens, Largo

The 182-acre Pinellas County-run Florida Botanical Garden has one mature ceiba growing at its northern end. Closer to the Gulf of Mexico, the climate here is more conducive to ceiba survival than in Orlando.

Relocated Ceibas

The third category of ceibas comprises trees that have been relocated, most often to privately-owned public spaces such as shopping malls, but also to parks, condominium complexes, and even private estates. This trend dates to around 2009 in South Florida, and is the subject of recent articles in the *Wall Street Journal* (Clarke, 2021) and the *Daily Mail* (Court, 2021). These articles focus mostly on the nouveau riche and their predilections for mature exotic species of trees on their properties. Sometimes these trees are imported from places such as Madagascar (e.g., the rainbow eucalyptus), but in other cases large trophy trees—including ceibas, banyans, live oaks, or baobabs—are often relocated from other parts of Florida. These trees may have outgrown their spaces (e.g., suburban lots) or they may have been in the way of development (or redevelopment) projects. The cost of such relocation can easily reach $250,000, but mature, unique trees are desired by many to complement their south Florida mansions (Court, 2021; Clarke, 2021).

This trend of tree relocation has created a niche opportunity for entrepreneurs. Two names that frequently pop up are Miami-based landscape architect Raymond Jungles and landscaper Walter Acree. Jungles does much work for private and corporate clients, including designing an update of the pedestrian Lincoln Road mall in Miami Beach. Acree, long established in the landscaping

business, is a "tree broker" who finds and buys big trees—often surprising suburban homeowners with (up to) $12,000 payments—and then relocates them for clients. Based out of a modest suburban home in Deerfield Beach, completely hidden in vegetation (including at least one *Bombax ceiba*), Acree has acquired quite a reputation as a tree relocator. *Ceiba pentandra* trees have played roles in the designs and works of both men.

Lincoln Road, Miami Beach

Lincoln Road is a historic cross-island commercial street in Miami Beach that was first developed in 1912 after clearing a strip of mangroves. From the 1930s until the 1950s it looked like a typical downtown shopping street with lots of stores, sidewalks, parking spaces, and a busy roadway in the center (Hunter, 2020). In 1960, Lincoln Road became the first "outdoor mall" in America, and cars were replaced by pedestrians and a streetcar. In the 1980s, the streetcar was removed, and al fresco dining made the venue a popular destination for locals and tourists. In 2010, Lincoln Road got yet another makeover. Landscape architect Raymond Jungles wanted the pedestrian roadway to also be a greenway, and six bald cypresses, five live oaks, and one "Kapok *Ceiba pentandra*" were planted (Hunter, 2020). A 2010 photograph showed the newly installed ceiba, but by 2021 it was no longer there. Perhaps it outgrew its space.

Jade Signature Condominium, Sunny Isles

Another example of a Raymond Jungles project is the relocated *C. pentandra* at the Jade Signature condominium complex in Sunny Isles, FL (just north of North Miami Beach). In late 2017, a 65,000-lb, 38-year-old ceiba was lifted into a tight spot above an underground parking garage (PROFILEMiami, 2017). The PROFILEMiami website links to a YouTube video that shows the installation of the tree. During a visit in March 2021, the tree looked stressed.

Royal Park Bridge, Palm Beach

Walter Acree, the landscaper, promotes *Ceiba pentandra* on his company's website (www.greenintegritys.com). The website shows examples of ceiba-relocation projects and ceibas rehabilitated and sold. One project entailed moving a *C. pentandra*—by barge—to a small park at the east end of the Royal Park Bridge in Palm Beach. The tree is now firmly established and no

evidence of relocation is apparent. Indeed, the City of Boynton Beach contacted Walter Acree when a ceiba had to be removed for urban renewal in 2019.

CocoWalk, Coconut Grove

CocoWalk (or Cocowalk) is an open-air shopping mall in the commercial heart of Coconut Grove. It was redesigned in 2020, and its new centerpiece was a 60-ft kapok tree relocated from North Miami (RSP Architects, 2021). The Miami newspaper described it as a "stunning 60-foot kapok tree, or **ceiba**" (*Miami Herald*, 2021). It appeared stressed during a visit in May 2021: the leaves were turning brown and the buttresses appeared cut (perhaps to fit it when it was planted).

BOMBAX CEIBA **IN FLORIDA**

A total of 94 *Bombax ceibas* were identified (Appendix 2; see Figure 4). When a *Bombax malabaricum* seed, brought in from India, was planted at the edge of an orange grove in Clearwater, FL in 1888 (or 1870, according to some sources), this may have been the first kapok (of either species) in Florida. Not only is this original tree still there but on the west coast of peninsular Florida, the term kapok is overwhelmingly used for *Bombax ceiba*, perhaps in part because of the rarity of *Ceiba pentandra* in the area. Miami-based Richard Lyons Nursery notes that *B. ceiba* is most often seen in southwest Florida, including Naples, Fort Myers, Sarasota, and Manasota Key (Turner, 2013). My inventory of *B. ceiba* reveals that over 80 per cent are along the west coast of Florida. Over half (55%) are on private residential lots, and the remainder (45%) are in public or private parks, botanical gardens, or landscaped gardens around private or public institutions. Perhaps the most interesting story is that of the *B. ceiba* and the Kapok Tree Inn.

The Kapok Tree Inn

The bombax tree planted at Hoyt's orange grove in Clearwater had grown considerably and become a big tourist attraction by the 1940s and 1950s, especially when the red flowers bloomed in spring. In the mid-1950s, the property was sold to bandleader/saxophone player Richard Baumgardner (aka Dick "Hot Cha" Gardner) and local businessman Jim Jones, who opened the

Kapok Tree Inn restaurant adjacent to its namesake tree in 1957 (DeYoung, 2022; RoadsideAmerica.com, 2020). It ultimately contained eight dining rooms that could seat 1700 people (Houk, 1994), and the décor was a mix of Roman, Greek, and other Mediterranean influences, both inside and outside (that many have described as "gaudy").

The restaurant was successful, and by the early 1970s the owners decided to expand and franchise three more Kapok Tree Inns. The first was nearby, just inland from Madeira Beach (today within St. Petersburg city limits). The second was in Davie, close to the Everglades west of Ft. Lauderdale. A third location, in Daytona Beach, was less successful, and it closed in 1981 (Whitaker, 2011). Bombax trees were planted near the Madeira Beach and Davie restaurants, but the cooler winters of Daytona Beach precluded survival of *B. ceiba.*

In 1983, Baumgardner's widow (his second wife, a former Kapok Tree Inn waitress) sold her shares to all three remaining restaurants to Houston businessman Murray Steinfeld who brought in Clearwater-based property developer Aaron Fodiman as partner (DeYoung, 2022; Lade, 2015). Fodiman, a real estate investor and later owner of *Tampa Bay* magazine, made many upgrades to the restaurants that increased their popularity and profitability (DeYoung, 2022). In 1988, the *Chicago Sun-Times* called Kapok Tree Inn the number 15 restaurant in the USA, with sales of $10 million (*Creative Loafing Tampa Bay*, 2019). However, Steinfeld used his shares of the Kapok Tree Inns as collateral on various bad business investments, and within two years of his death in 1988, debts were called in and the restaurant chain filed for bankruptcy (DeYoung, 2022).

The Clearwater restaurant closed in 1991, and new owners leased the property to Sam Ash Music Stores, which still occupies the site today. Part of the old restaurant still serves as a venue for special events, and the original décor is still on full display. The original *B. ceiba* still stands, over 100 feet high and 20 feet in circumference (Figure 6). The Kapok Tree Inn just inland of Madeira Beach also closed around the same time and is now the clubhouse for a gated residential community (Kapok Grand). A stunted kapok tree still stands on the south side.

Figure 6. *Bombax ceiba* at the former Kapok Tree Inn, Clearwater. Photo by Robert M. Schwartz, 20 February 2024.

The Kapok Tree Inn in Davie had a similar lifespan as the one in Madeira Beach, but many more memories of it were posted on the internet. This may be because it was the only Kapok Tree Inn in South Florida, and many now-middle-aged residents of the area have fond memories of heading out to this party restaurant at the edge of the Everglades (Lade, 2015). The serene setting—

with Greek columns, wandering peacocks, fountains, and eleborately furnished rooms—made Davie's Kapok Tree Inn a popular venue for weddings as well as parties, just as in Clearwater.

In 1990, Broward County bought the 157-acre property, and in 2008 it re-opened as the Long Key Natural Area and Nature Center. The core of the park is an elevated live oak hammock, but other than a fountain and few columns, little evidence of the Kapok Tree Inn remains. A modern visitor center occupies a site adjacent to where the restaurant stood. In 2021, allegedly the last kapok tree blew over in a hurricane, possibly Hurricane Irma in 2017.

Museum of Fine Arts, St. Petersburg

A stately example of a *Bombax ceiba* tree, often erroneously described in the online literature as a *Ceiba pentandra*, is at the Museum of Fine Arts in St. Petersburg (Figure 7). The museum was built and opened to the public in Spring 1965, and the *B. ceiba* was planted as a 3-ft-high seedling on the museum's south side shortly thereafter (MFA, no date). Today the 60-year-old tree is a big attraction, it is lit up at night, and it draws throngs of visitors in late February/early March when it blooms bright red.

Figure 7. *Bombax ceiba* at the Museum of Fine Arts, St. Petersburg, FL. Photo by author, 16 June 2021.

Botanical Gardens, Parks, and Public Spaces

Fifteen bombax trees are located in botanical gardens or zoos. Three large trees are in the downtown Sarasota unit of Marie Selby Botanical Gardens, and they attract many visitors during the spring bloom (McCourt, 2021). Two bombaxes are in ZooMiami (South Miami Heights), and the following gardens have one bombax each: Wonder Gardens (Bonita Springs), The Kampong (Coconut Grove, Miami), Fairchild Tropical Botanical Garden (Coral Gables), West Matheson Hammock Park (Coral Gables), Four-Mile Cove Ecological Preserve (Fort Myers), Sarasota Jungle Gardens (Sarasota), Naples Botanical Garden, Pinecrest Gardens (Miami-Dade County), and Botanical Gardens of the Sanibel Moorings (Sanibel) (see Appendix 2). Harry P. Leu Gardens (Orlando) has one tall, older bombax and at least two young ones. One bombax stood at Bok Tower Gardens (near Lake Wales); it was killed by a freeze in 1989, then regrew to a 50-ft height until Hurricane Charley toppled it in 2004.

Bombax trees are also part of the landscaping in parks or estates that attract visitors for other reasons. One example is the Ringling Estate in Sarasota, where two bombax trees are near the Tibbals Learning Center and Circus Museum. Other examples, with one bombax each, include Koreshan State Park (Estero), Country Club (Coral Springs), Village Green (Key Biscayne), Newton Estates Park (North Sarasota), Ingram Park (Opa-Locka), Dreher Park South (West Palm Beach), and Crescent Lake Park (St. Petersburg). The Edison-Ford Estates (Fort Myers) had two *B. ceiba* trees, but one—planted around 1905 and standing next to the main house—fell to Hurricane Wilma in 2005; only one bombax remains. A *B. ceiba* listed (on iNaturalist) for Burns Square in Sarasota could not be found and thus was not counted.

Bombax ceibas are also planted in public or government spaces, such as the two trees on the south side of the Central Library in Bradenton. Other such bombaxes are found on the Main Street median of Avon Park (two trees in front of the Jacaranda Hotel), the DeLeon Triangle (aka DeLeon Park a road median in Miami Springs), 5313 Bayshore Rd. (a road median in Sarasota), Riverview Drive and 26th St. West (two young trees on a scenic Bradenton right-of-way), and on the Tampa campus of the University of South Florida.

Residential plantings of *Bombax ceiba*

Over half (52 out of 94, or 55%) of bombaxes are found on private residential lots. Most of these were identified via postings on the iNaturalist website, and there are undoubtedly many more.

Not all of the bombax reports on iNaturalist were field-checked, but if a photo was posted and the tree could be identified, then it was added to the inventory (Appendix 2). However, many postings on iNaturalist were either not recognized as *B. ceiba*—or only a blooming flower was posted—and thus were not included. Several postings listed incorrect GPS locations, and they were left off the inventory unless the photos clearly showed a *B. ceiba*. Several residential sites were field-checked, especially those without photos, and if they were not located then they were excluded from the inventory (see Appendix 2).

SUMMARY

A total 144 living trees (94 bombaxes and 50 ceibas) were identified as result of this research. These were found via internet research (including blogs, newspaper stories, real estate ads, iNaturalist postings, botanical inventories, and other sources), visits to botanical gardens and private estates, field observations, and references from other people. The total numbers of trees identified in Appendices 1 and 2, and in Figure 4 are presumably an undercount. Since so many of the kapok trees, especially the bombaxes, were on private residential lots, many were undoubtedly missed.

But the following conclusions can be made:

- There is much confusion as to which trees are kapoks. *Ceiba pentandra* and *Bombax ceiba* are the main two species known by these terms. But it is more complicated than that, as Table 1 shows.
- *Ceiba pentandra* does not tolerate frosts and is thus found mostly in Plant Hardiness Zones 10b or higher, and occasionally in PHZ 10a. *Bombax ceiba* is a bit hardier and survives well in PHZ 10a and even in PHZ 9b. Both species can succumb to prolonged freezes, and both can be damaged or uprooted by hurricanes.
- Both species of kapok were introduced in the late nineteenth century, *Bombax ceiba* (formerly *Bombax malabaricum*) first to Clearwater and later to Miami, and *Ceiba pentandra* to Palm Beach and soon after to Miami and Key West. Their modern distribution reflects these early points of entry to a great extent, with the bombax dominant on the west coast and the ceiba dominant in southeast Florida.
- There are only a handful of truly old kapoks in Florida, especially trees over a century in age. Old ceibas are found in Palm Beach, Miami, Key West, and Fort Myers, and the only

remaining century-old bombax is in Clearwater. Perhaps only a few were planted or they succumbed to hurricanes or severe freezes.

- The original Kapok Tree Inn in Clearwater, built around a tree planted in 1888, helped popularize appreciation of *Bombax ceiba* along the west coast of peninsular Florida in the twentieth century. This was reinforced by a bombax planted at the Edison Estate (Fort Myers) in 1905 (toppled in 2005), the Museum of Fine Arts (St. Petersburg) in 1965, the two additional Kapok Tree Inns in the 1970s, numerous botanical gardens, public places, and many residential properties.
- Both species of kapok trees have been planted in various locations: on large private estates and gardens, in public areas such as libraries and government complexes, in public and private parks, in public and private botanical gardens, in "jungle" settings of zoos and private roadside attractions, on landscaped highways and medians, and on private residential lots. The ceiba is rarely found on small residential lots because the tree will outgrow the space, but the red-flowering bombax is popular among homeowners (especially along the west coast of Florida).
- *Ceiba pentandra* is a stately tree (aka trophy tree or monument tree), and several large specimens have been relocated to sites such as outdoor malls, public areas, condominium complexes, and private estates.
- Many nurseries propagate kapoks (bombaxes and several species of *Ceiba*), and it is estimated that there are at least several hundreds of kapoks growing on private lots or private housing developments throughout southern Florida.
- There are undoubtedly many more kapok trees in Florida than this research has found. Instead of 144 trees, there may be two or three times that many. But the patterns of diffusion and distribution identified are likely accurate.

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APPENDICES

Appendix 1. Inventory of Ceiba pentandra trees in Florida. Compiled by author.

tree	#	city	location	year planted	notes
C. pentandra	1	Boca Raton	Boca Raton Cloister, E. Camino Real (gated)	1970s?	iNaturalist (photo)
C. pentandra	1	Boynton Beach	"Ceiba Park", west of old BBHS, Seacrest Blvd.	early 1930s?	KJMA photo
C. pentandra	1	Boynton Beach	Chase Bank parking lot, US 1 and Greenbrier	1980s?	KJMA photo
C. pentandra	1	Bradenton	Manatee Avenue West	1980s?	iNaturalist (photo); location wrong
C. pentandra	1	Canal Point	in front of USDA Sugarcane research station	1980s?	KJMA photo
C. pentandra	2	Clewiston	in Civic Park	1980s?	KJMA photo
C. pentandra	0	Coconut Grove, Miami	The Kampong (estate of David Fairchild)	1930s	lost to Hurricane Andrew, 1992
C. pentandra	1	Coconut Grove, Miami	3065 Freeman St.	1930s	KJMA photo; giant buttresses
C. pentandra	1	Coconut Grove, Miami	entrance to the Moorings subdivision (former estate)	1929	KJMA photo
C. pentandra	1	Coconut Grove, Miami	CocoWalk Shopping Center	relocated	KJMA photo; moved to mall in 2021
C. pentandra	2	Coral Gables	Fairchild Tropical Botanical Garden	1980s?	KJMA photo
C. pentandra	1	Coral Gables	Matheson Hammock Park	?	in IRC inventory; could not find
C. pentandra	0	Fort Lauderdale	Hugh Taylor Birch State Park	1930s	in IRC inventory; host for *Ficus* ???
C. pentandra	1	Ft. Myers	residential tree	1980s?	in IFAS brochure
C. pentandra	1	Ft. Myers	Edison-Ford Winter Estates	1910	KJMA photo
C. pentandra	2	Key Biscayne	Village Green	1950s?	KJMA photo
C. pentandra	3	Key West	at fomer Truman School (now Harvey Gov't Ctr)	1915	documented by WV Davidson
C. pentandra	1	Key West	Monroe County Courthouse	1905	documented by WV Davidson
C. pentandra	1	Key West	Jeptha Vinning Harris School (812 Southard)	1909	documented by WV Davidson
C. pentandra	1	Key West	playground, betw 136A and 138C Peary Court (n end of Southard)	1940s?	documented by WV Davidson
C. pentandra	1	Key West	SW corner of Waterfront Playhouse, Mallory Square	2005	documented by WV Davidson
C. pentandra	1	Key West	612-614 Fleming (backyard of a B&B)	1910s?	documented by WV Davidson
C. pentandra	0	Lake Buena Vista	Epcot Center (Mex. Pavilion), Disney World	1970s	removed in late 2010s
C. pentandra	1	Lake Buena Vista	Animal Kingdom, Disney World	pre-1999	mentioned in palmtalk blog 2023
C. pentandra	1	Largo	NW corner of Florida Botanical Gardens	1970s?	KJMA photo
C. pentandra		Miami	Tree World Wholesale		sells *C. pentandr* a + *B. ceiba*
C. pentandra	2	Miami	Hattie Bauer Hammock Park (ex Orchid Jungle)	1920s?	detailed maps by U Miami
C. pentandra	1	Miami	1890 SW 11th St. (Little Havana)	2000s?	KJMA photo
C. pentandra	1	Miami	Cuban Memorial Boulevard Park (across from 840 SW 13th Av)	1970s?	on Google Maps street view
C. pentandra	1	Miami	9142 SW 34th St. (Westchester)	1980s?	on Google Maps street view
C. pentandra	1	Miami	The Terrazas condominium, west of Sewell Park	1920s?	KJMA photo
C. pentandra	0	Miami Beach	near west end of Lincoln Road	relocated	planted 2010, later removed
C. pentandra	1	Orlando	Leu Gardens	2000?	KJMA photo
C. pentandra	1	Pahokee	residential tree	1980s	photo on internet; could not find
C. pentandra	1	Palm Beach	the "Giant Kapok", near Flagler Museum	1887	KJMA photo
C. pentandra	1	Palm Beach	south side of east end of Royal Park Bridge	relocated	KJMA photo; relocated 2019?
C. pentandra	1	Palm Beach	Primavera Way, off S. Lake Trail	late 1800s?	KJMA photo
C. pentandra	0	Palmetto Bay	north end of Coral Reef Park	1990s?	last documented 2019; now gone
C. pentandra	0	Pompano Beach	ceibas in parking lot, NE 1st+2nd, NE 1st+2nd	2010?	possibly not *Ceiba pentandra*
C. pentandra	1	Princeton	middle of empty block s. of Coconut Palm, w. of 134th Av.	1970s?	KJMA photo
C. pentandra	1	St. Petersburg	25th Ave. N, between 5th and 7th St. N	1980s?	iNaturalist (photo); location wrong
C. pentandra	1	St. Petersburg	470 2nd Ave. S, east side of Beacon on Third condominiums	1980s?	on Google Maps street view
C. pentandra	1	Sunny Isles	Jade Signature Condominium	relocated	KJMA photo; on parking garage 2017
C. pentandra	7	West Palm Beach	Dreher Park Disc Golf Course	1970s?	KJMA photo
C. pentandra	1	West Palm Beach	Unbelievable Acres Botanical Park	1974	KJMA photo; post-Irma 2017 (3rd gen.)

Appendix 2. Inventory of Bombax Ceiba trees in Florida. Compiled by author.

	tree	#	city	location	year planted	notes
1	*B. ceiba*	1	Archbold	south of Placid Lakes		iNaturalist (photo)
2	*B. ceiba*	2	Avon Park	median, front of Jacaranda Hotel	?	KJMA photo
3	*B. ceiba*	1	Belle Glade	El Prado Dr.		iNaturalist (photo)
4	*B. ceiba*	1	Boca Grande	135 Gilchrist Ave.		iNaturalist (photo)
5	*B. ceiba*	1	Boca Grande	341 Gasparilla St.		iNaturalist (photo)
6	*B. ceiba*	1	Bonita Springs	Wonder Gardens	?	iNaturalist (photo)
7	*B. ceiba*	2	Bradenton	Central Library, 1319 2nd Ave. W		KJMA photos
8	*B. ceiba*	2	Bradenton	corner of Riverview & 26th St. West	2000s?	KJMA photos
9	*B. ceiba*	1	Bradenton	49th Ave. E		iNaturalist (photo)
10	*B. ceiba*	1	Cape Coral	El Dorado Pkwy.		iNaturalist (photo)
11	*B. ceiba*	1	Clearwater	west side of former Kapok Tree Inn	1870s?	KJMA photo
12	*B. ceiba*	1	Clearwater	Spanish Dr.		iNaturalist (photo)
13	*B. ceiba*	1	Coconut Grove, Miami	The Kampong (estate of David Fairchild)	?	?
14	*B. ceiba*	0	Coconut Grove, Miami	?	ca. 1930	lost to hurricane, Irma 2017
15	*B. ceiba*	1	Coral Gables	Fairchild Tropical Botanical Garden	?	iNaturalist (photo)
16	*B. ceiba*	1	Coral Gables	817 Granada Blvd.		iNaturalist (photo)
17	*B. ceiba*	1	Coral Gables	south of Hammock Dr.		iNaturalist (photo)
18	*B. ceiba*	1	Coral Gables	West Matheson Park		iNaturalist (photo)
19	*B. ceiba*	1	Coral Springs	Country Club		iNaturalist (photo)
20	*B. ceiba*	0	Davie	Long Key Nature Center (former Kapok Tree Inn)	1980s?	lost to hurricane, Irma 2017?
21	*B. ceiba*	1	Deerfield Beach	NW 41st Way	2000s?	KJMA photo
22	*B. ceiba*	1	Dunedin	559 Milwaukee	1990s?	iNaturalist (photo)
23	*B. ceiba*	1	Dunedin	Mina Vista Dr.		iNaturalist (photo)
24	*B. ceiba*	1	Englewood	1644-1798 New Point Comfort Rd.		iNaturalist (photo)
25	*B. ceiba*	1	Englewood	1460-1414 Sanderling Dr.		iNaturalist (photo)
26	*B. ceiba*	1	Estero	Koreshan State Park		iNaturalist (photo); 2 trees?
27	*B. ceiba*	1	Ft. Myers	Four-Mile Cove Ecological Preserve		iNaturalist (photo)
28	*B. ceiba*	1	Ft. Myers	Edison-Ford Estates		overflow parking lot
29	*B. ceiba*	0	Ft. Myers	Edison-Ford Estates	1905?	next to main house; fell to Wilma 2005
30	*B. ceiba*	4	Fort Pierce	2319 S. Indian River Dr.		2 in front yard, 2 in backyard
31	*B. ceiba*	1	Fort Pierce	5807 S. Indian River Dr.		in front, near road
32	*B. ceiba*	1	Homestead	Short Key (SW 304th St., east of SW 202nd Ave.)	1980s?	iNaturalist (photo)
33	*B. ceiba*	1	Homestead	S. Krome Ave. & busway		iNaturalist (photo)
34	*B. ceiba*	1	Indian Beach	Sarasota Jungle Gardens (zoo)		iNaturalist (photo)
35	*B. ceiba*	1	Indian Rocks Beach	10th Ave. N		iNaturalist (photo)
36	*B. ceiba*	1	Key Biscayne	Village Green	1990s?	iNaturalist (photo)
37	*B. ceiba*	1	Lake Alfred	MacKay Blvd. (east of Auburndale)		iNaturalist (photo)
38	*B. ceiba*	0	Lake Wales	killed by 1989 freeze, regrew, toppled by H. Charley 2004	1950s orig?	Bok Tower Gardens
39	*B. ceiba*	1	Lehigh Acres	Westminster		iNaturalist (photo)
40	*B. ceiba*	0	Lido Key	Coolidge & Ben Franklin ??		unverified
41	*B. ceiba*	1	Madeira Beach	south side of former Kapok Tree Inn (Kapok Grand Circle)	1980s	KJMA photo; appears stunted
42	*B. ceiba*	1	Manasota Key	on postcard	?	
43	*B. ceiba*	1	Marco Island	Winterberry Dr.		iNaturalist (photo)
44	*B. ceiba*	1	Melbourne Beach	backbarrier west of Melbourne Beach Resort		iNaturalist (photo)
45	*B. ceiba*	1	Miami	NW 24th St.		iNaturalist (photo)
46	*B. ceiba*	1	Miami	Watson Island		iNaturalist (photo)
47	*B. ceiba*	1	Miami	25°45'42.1"N 80°11'30.4"W ???		iNaturalist (photo), but location incorrect
48	*B. ceiba*	1	Miami	SW 13th Ave.		iNaturalist (photo)
49	*B. ceiba*	1	Miami	1197 South Shenandoah Park		iNaturalist (photo)
50	*B. ceiba*	1	Miami	Musial Circle (SW 20th)		iNaturalist (photo)
51	*B. ceiba*	1	Miami Springs	DeLeon Park Triangle		iNaturalist (photo)
52	*B. ceiba*	1	Naples	Ninth St. S		iNaturalist (photo)
53	*B. ceiba*	1	Naples	Turtle Island, Naples Botanical Garden		iNaturalist (photo)
54	*B. ceiba*	1	Naples	private lot (Missi, IPS member)		snapped by Irma 2017, toppled by Ian 2022
55	*B. ceiba*	1	Nokomis	102 Bolanza Ct.		iNaturalist (photo)
56	*B. ceiba*	1	Nokomis	Albee Farm Rd. N		iNaturalist (photo)
57	*B. ceiba*	1	Nokomis	Palmetto Road E		iNaturalist (photo)
58	*B. ceiba*	1	North Sarasota	near Newton Estes Park		iNaturalist (photo)
59	*B. ceiba*	1	Olga	Werner Drive		iNaturalist (photo)
60	*B. ceiba*	1	Opa-Locka	Ingram Park		iNaturalist (photo)
61	*B. ceiba*	3	Orlando	Leu Gardens	1980s	KJMA photo
62	*B. ceiba*	1	Palma Sola	621 Wildlife Glen		iNaturalist (photo)
63	*B. ceiba*	1	Palmetto	1218 12th Ave. W		iNaturalist (photo)
64	*B. ceiba*	1	Pinecrest	Pinecrest Gardens		iNaturalist (photo)
65	*B. ceiba*	1	Port St. Lucie	SW Commargo St.		iNaturalist (photo)
66	*B. ceiba*	1	Riverview	Weston Course Loop (east of Tampa Bay)		iNaturalist (photo)
67	*B. ceiba*	1	Sanibel	Botanical Gardens of the Sanibel Moorings	?	iNaturalist (photo)
68	*B. ceiba*	3	Sarasota	in Marie Selby Botanical Gardens Downtown	?	in article + online
69	*B. ceiba*	2	Sarasota	S + E of Tibbals Learning Center and Circus….	?	KJMA photo
70	*B. ceiba*	1	Sarasota	5313 Bay Shore Rd (street median)	1970s?	KJMA photo
71	*B. ceiba*	1	Sarasota	5281 Creekside Trail		iNaturalist (photo)
72	*B. ceiba*	0	Sarasota	Burns Square		could not find; possibly replaced
73	*B. ceiba*	0	Sarasota	1500 North Dr.		iNaturalist (no photo); could not find
74	*B. ceiba*	1	Sarasota Springs	3215 Pafko Dr.		iNaturalist (photo)
75	*B. ceiba*	2	South Miami Heights	Zoo Miami		iNaturalist (photo)
76	*B. ceiba*	1	South Pasadena	1848 Shore Dr. S		iNaturalist (photo)
77	*B. ceiba*	1	St. Pete Beach	Long Key		iNaturalist (photo)
78	*B. ceiba*	1	St. Petersburg	southside of Museum of Fine Arts	1930s	KJMA photo
79	*B. ceiba*	1	St. Petersburg	Andalusia Way NE		iNaturalist (photo)
80	*B. ceiba*	1	St. Petersburg	Crescent Lake Rd.		iNaturalist (photo)
81	*B. ceiba*	1	St. Petersburg	621 16th St. N		iNaturalist (photo)
82	*B. ceiba*	1	St. Petersburg	501 2nd St. A		iNaturalist (photo)
83	*B. ceiba*	1	St. Petersburg	1120 Country Club Way S		iNaturalist (photo)
84	*B. ceiba*	1	St. Petersburg	Bahama Shores: 121 56th Ave. S	1980s?	iNaturalist (photo)
85	*B. ceiba*	1	Tampa	530 Luzon Ave.		iNaturalist (photo)
86	*B. ceiba*	1	Tampa	2102 S. McDill Ave		iNaturalist (photo)
87	*B. ceiba*	1	Tampa	817 W. Amelia (tree on N. Popular)		iNaturalist (photo)
88	*B. ceiba*	1	Tampa	USF Botanical Gardens	1970s?	verified by Kimberly Boucireb, gardener
89	*B. ceiba*	1	West Palm Beach	Dreher Park South	1980s?	KJMA photo