



Small and Medium Sized Trees for Your Landscape

for Tight Spaces in the South Florida Landscape

*John Roberts w/ some slides from Kara Krueger and Yvette
Goodiel, UF/IFAS Extension*

July 13, 2026

What makes a tree resistant to wind?

- Form
- Defect creation
- Wood density
- Flexibility

Wind and Trees: Lessons Learned from Hurricanes¹

Mary L. Duryea, Eliana Kampf, Allyson Salisbury, Richard Hauer, Ryan Klein, Michael Andreu, Andrew Koeser, and Alyssa Vinson²

Introduction

Hurricane-force winds can be extremely damaging to communities and urban forests. Without question, trees can become damaged and pose risks to personal safety and property. As destructive as these storms are, it is important not to forget that trees provide many environmental benefits, such as providing shade and energy conservation, reducing the “heat island” effect in cities caused by concrete and pavement, increasing property values, and enhancing human health. Also, there are opportunities to better prepare for the next hurricane season by rebuilding a healthy urban forest. Valuable lessons can be learned from knowing more about how, when, and why trees fail in storms. A key issue facing communities is how to manage the urban forest from an ecological standpoint, so urban forests are healthier and more wind resistant.

A healthy urban forest is composed of trees that maximize ecosystem benefits while being able to withstand natural and anthropogenic stresses and disturbances, such as wind from hurricanes and tropical storms, flooding, pollution, etc.

This fact sheet reports on the lessons learned from research conducted after 10 hurricanes by scientists at the

when Hurricane Georges crossed over the entire island of Puerto Rico. In 2004, four hurricanes (Charley, Jeanne, Francis, and Ivan) struck Florida with maximum sustained winds ranging from 105 to 145 mph. In 2005, Hurricanes Dennis, Katrina, and Rita struck the Gulf Coast of the US (Figure 1).



Figure 1. In the UF/IFAS study, urban trees were measured in neighborhoods following the 9 hurricanes striking Florida and the Gulf Coast and 1 hurricane in Puerto Rico. For each hurricane, the year and maximum sustained wind speed (mph) are included.

Credit: UF/IFAS, Mary Duryea and Eliana Kampf

Table 4. Tropical/SubTropical Tree Species and Wind Resistance

Highest Wind Resistance	Medium-High Resistance	Medium-Low Resistance	Lowest Wind Resistance
Dicots			
→ <i>Bursera simaruba</i> , gumbo limbo	<i>Annona glabra</i> , pond apple	<i>Acer rubrum</i> , red maple	<i>Casuarina equisetifolia</i> , Australian pine ^a
→ <i>Carya floridana</i> , Florida scrub hickory	<i>Calophyllum calaba</i> , Brazilian beautyleaf ^c	<i>Bauhinia blakeana</i> , Hong-Kong orchid	<i>Cassia fistula</i> , golden shower
→ <i>Conocarpus erectus</i> , buttonwood	<i>Chrysophyllum oliviforme</i> , satinleaf	<i>Bucidas buceras</i> , black olive	<i>Chorisia speciosa</i> , floss-silk tree
→ <i>Chrysobalanus icaco</i> , cocoplum	<i>Coccoloba uvifera</i> , sea grape	<i>Callistemon</i> spp, bottlebrush	<i>Ficus benjamina</i> , weeping banyan
→ <i>Cordia sebestena</i> , geiger tree	<i>Coccoloba diversifolia</i> , pigeon plum	<i>Cinnamomum camphora</i> , Camphor ^b	<i>Grevillea robusta</i> , silk oak
→ <i>Eugenia axillaris</i> , white stopper	<i>Liquidambar styraciflua</i> , sweetgum	<i>Delonix regia</i> , royal poinciana ^c	<i>Jacaranda mimosifolia</i> , jacaranda
→ <i>Eugenia confusa</i> , redberry	<i>Lysiloma latsilqua</i> , wild tamarind	<i>Enterolobium cyclocarpum</i> , ear tree	<i>Melaleuca quinquenervia</i> , melaleuca ^a
→ <i>Eugenia foetida</i> , boxleaf stopper	<i>Magnolia virginiana</i> , sweetbay magnolia	<i>Eriobotrya japonica</i> , loquat ^c	<i>Quercus nigra</i> , water oak
→ <i>Guaiacum sanctum</i> , lignum vitae	<i>Nyssa sylvatica</i> , black tupelo	<i>Eucalyptus cinerea</i> , silverdollar eucalyptus	<i>Peltophorum pterocarpa</i> , yellow poinciana
→ <i>Ilex cassine</i> , dahoon holly	<i>Sideroxylon foetidissimum</i> , mastic	<i>Ficus aurea</i> , strangler fig	<i>Prunus caroliniana</i> , Carolina laurelcherry
→ <i>Krugiodendrum ferreum</i> , ironwood	<i>Simarouba glauca</i> , paradise tree	<i>Kigelia pinnata</i> , sausage tree	<i>Sapium sebiferum</i> , Chinese tallow ^a
→ <i>Lagerstroemia indica</i> , crape myrtle	<i>Swietenia mahagoni</i> , mahogany	<i>Myrica cerifera</i> , wax myrtle	<i>Spathodea campanulata</i> , African tuliptree
<i>Magnolia grandiflora</i> , southern magnolia		<i>Persea borbonia</i> , redbay	<i>Tabebuia caraiba</i> , silver trumpet tree
→ <i>Podocarpus</i> spp, podocarpus		<i>Platanus occidentalis</i> , sycamore	<i>Ulmus parvifolia</i> , Chinese elm
<i>Quercus virginiana</i> , live oak		<i>Quercus laurifolia</i> , laurel oak	
<i>Quercus geminata</i> , sand live oak		<i>Tabebuia heterophylla</i> , pink trumpet tree	
		<i>Terminalia catappa</i> , tropical almond ^c	

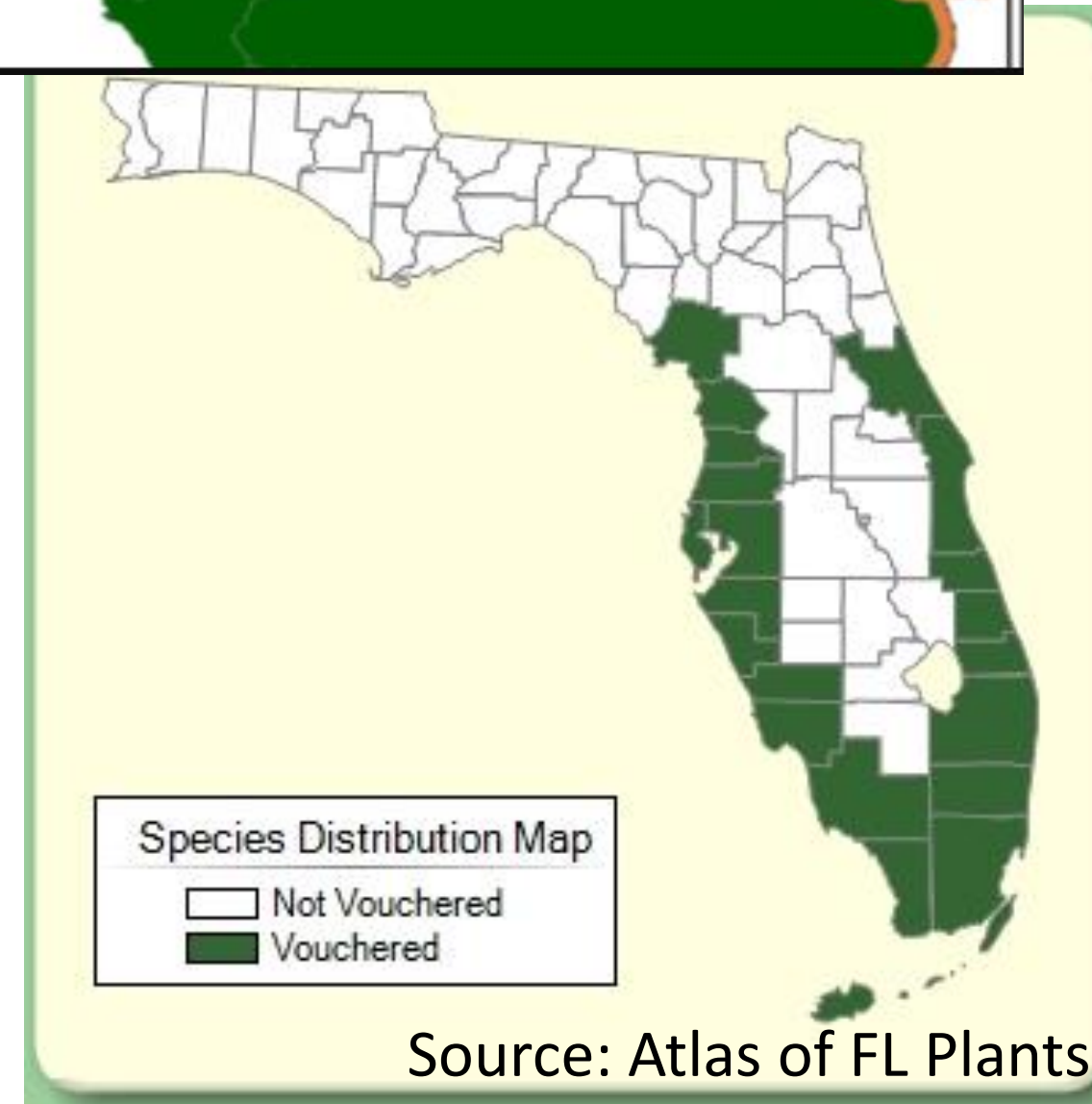
Buttonwood (*Conocarpus erectus*)

- **Family:** *Combretaceae*
- **Form:** vase-shaped, to a height of 45' and a spread of 30'
- **Leaf:** simple, alternate, entire margin, oblong/lanceolate, 1-4 in in length
- **Flower:** not showy, season is spring to early fall
- **Fruit:** round, ½ inch in size, brown/red



Buttonwood (*Conocarpus erectus*)

- **Native Range:** Tropical coastal Americas
- **Hardiness:** 10B-11
- **Wind Resistance:** Highest wind resistance
- **Other:** Highly tolerant of saltwater and relative shade; durable tree



Silver Buttonwood (*Conocarpus erectus* var. *sericeus*)



Silver Buttonwood



Photo credits: Yvette Goodiel, UF



Native Plants for Small Spaces

Simpson's Stopper (*Myrcianthes fragrans*)

- Evergreen
- Shrub or small tree, usually 10-20' tall
- Narrow canopy, upright growth habit
- Smooth, flaking bark
- Grows in hardwood hammocks
- Shade-tolerant
- Moderately tolerant of drought
- Low salt/brackish water tolerance



Native Plants for Small Spaces

Simpson's Stopper

- Dark green leaves, aromatic when crushed
- Winter-spring fragrant blooms
- Attractive to native bees
- Red-orange berries for birds
- Threatened species in FL



Red-berry stopper

(*Eugenia confusa*)

- **Family:** Myrtaceae
- **Form:** 15-25' in height (up to 46'); taller than wide
- **Leaf:** simple, opposite; falcate shape; caudate apex
- **Flower:** white, semi-showy, flowers throughout the year but peaks in spring-summer
- **Fruit:** red berry
- **Bark:** vertical cracks/furrows



Source: John Roberts, UF/IFAS



Eugenia confusa
Photo by Craig Huegel



Source: Brickell Hammock - CC BY-SA 4.0, Douglas Goldman, iNaturalist



Source: Brickell Hammock - CC BY-SA 4.0, Douglas Goldman, iNaturalist



Sources: John Ro



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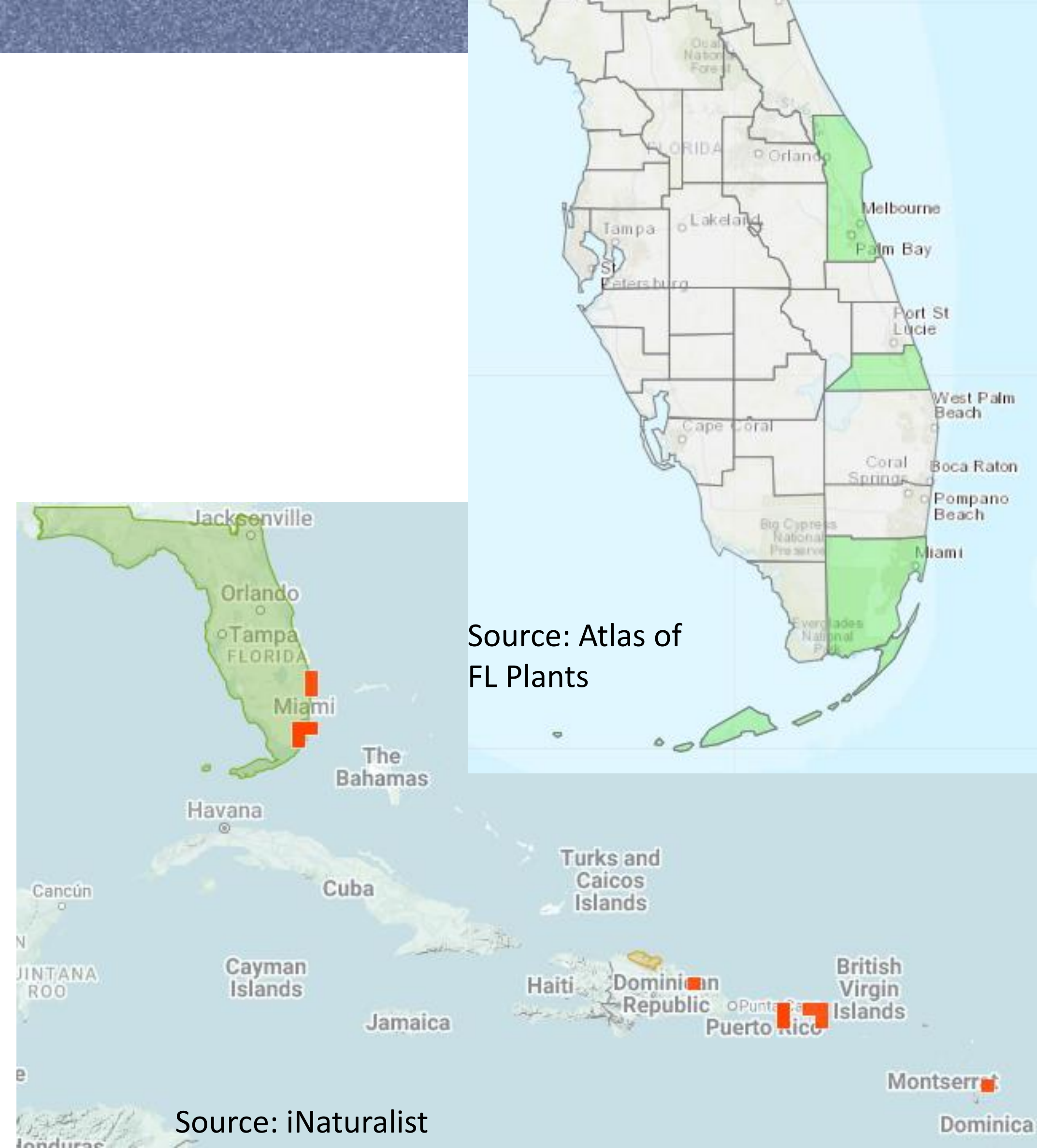


Sources: Joh

Red-berry stopper

(*Eugenia confusa*)

- **Native Range:** Florida and parts of the West Indies
- **Hardiness:** 9B-11; low salt tolerance
- **Wind Resistance:** high
- **Availability:** Somewhat available
- **Other:** Slow to very slow growth rate; considered endangered within the state of Florida



White stopper (*Eugenia axillaris*)

- **Family:** Myrtaceae
- **Form:** 15-25' (up to 30') by 8-15'
- **Leaf:** simple, opposite/subopposite; elliptic/oval shape,
- **Flower:** blooms year-round but peaks in winter/spring
- **Fruit:** globose-shape; red to black; edible
- **Bark:** pale, smooth to forming vertical cracks (not as platy or peeling as other stoppers)



Sources: John Roberts, UF/IFAS







Source: ©Roberto Bello Acervado,
iNaturalist



Source: Jame Vincent Salafia©, iNaturalist

White stopper (*Eugenia axillaris*)

Native Range: Much of Coastal Florida, the Caribbean Basin, Bermuda, Eastern Mexico, and Central America

Hardiness: 9B-11; tolerates some salt exposure

Native habitat: Coastal habitats; sandy sites

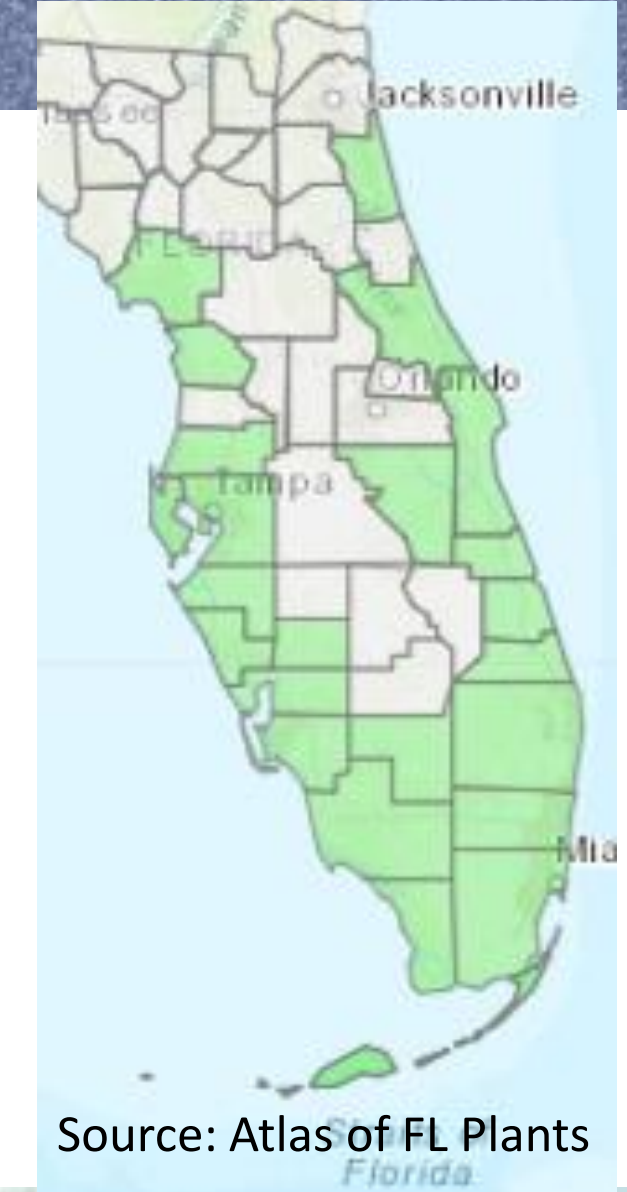
Wind Resistance: High

Availability: Not live oak, but relatively wide availability

Other: Can have a skunky odor (strength of the odor is dependent on the person); larval host for tantalus sphinx (*Aellopos tantalus*)



Source: CC-BY-NC 4.0, Sabrina Carle, iNaturalist



Source: Atlas of FL Plants



Source: iNaturalist

Lignum vitae (*Guaiacum sanctum*)

- **Family:** Zygophyllaceae
- **Form:** Up to 30', usually 8-12', multi-trunked, drooping branches
- **Canopy:** round or vase
- **Leaf:** evenly pinnate, opposite, entire, evergreen



Photo source: Atlas of Florida Plants

Lignum vitae (*Guaiaacum sanctum*)

- **Hardiness:** 10B-11
- **Light:** full sun or part shade
- **Wind Resistance:** Highest
- **Natural habitat:** hammocks
- **Wildlife:** Larval host plant for lyside sulphur butterflies; food and cover for birds; bee/butterfly pollinator plant.
- **Availability:** yes, widely



Figure: Atlas of FL Plants
Photo: John Roberts, UF



Lignum vitae

(Guaiacum sanctum)

- **Soil:** sand, loam or clay; acidic or alkaline; well-drained; does best with some organic content
- **Drought:** tolerant
- **Salt spray:** moderately tolerant
- **Other:** Very slow growing – as little as one inch per year without fertilizer.
- **AKA:** tree of life and holywood

Guaiacum sanctum

Photo and © by Roger Hammer
Wildflowers of the Everglades



Photo source: Atlas of FL Plants

Nagi podocarpus (*Nageia nagi*)

- Family: Podocarpaceae
- Form: pyramidal; excurrent; grow to about 40'
- Leaf: evergreen; opposite; parallel venation
- Flower: Dioecious; yellow; not showy
- Fruit: round; purple/blue



Nagi podocarpus (*Nageia nagi*)

- Native Range: SE Asia
- Hardiness: 9A through 11
- Wind Resistance: Highest
- Notes: Very slow growing; highly revered in Japan



Nagi podocarpus (*Nageia nagi*)





...there's another list.



Improving Community Hurricane Resilience through a Comprehensive Assessment of Tree Species Wind Resistance

July 2023



FEMA

Sea Torchwood (*Amyris elemifera*)

- **Family:** Rutaceae
- **Form:** 10-20' but up to 40'
- **Leaf:** Trifoliate compound leaves; opposite to sub-opposite
- **Flower:** Flowers all year, peaks spring-fall; white, small on branched clusters (very aromatic)
- **Fruit:** Purplish to black drupe ¼" in diameter



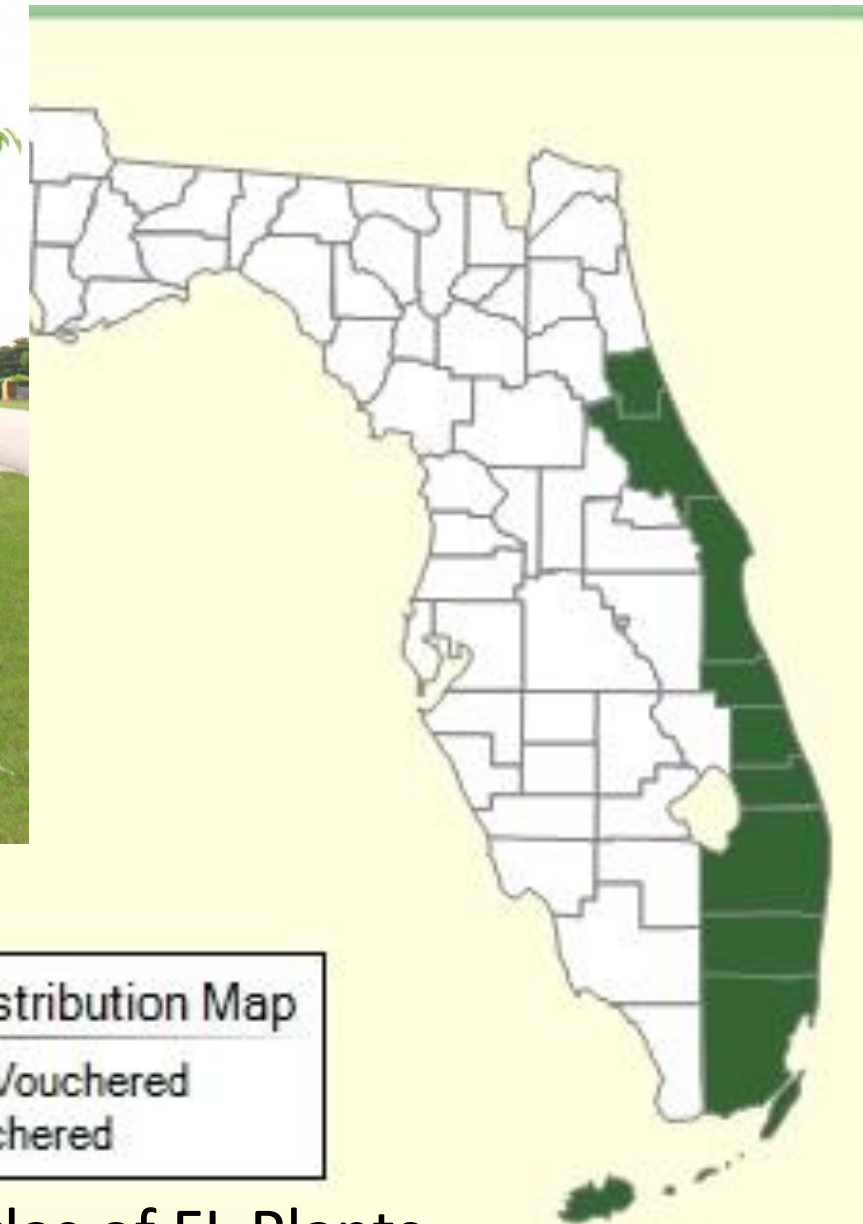
Source: Roger Hammer



Source: John Bradford, FNPS

Sea Torchwood (*Amyris elemifera*)

- **Native Range:** Caribbean Basin
- **Hardiness:** 9B-11
- **Wind Resistance:** NA
- **Other:** Schaus swallowtail – larval food source (among others); highly combustible



Source: Atlas of FL Plants

Rubiaceae Family

- AKA Coffee or Madder family
- Florida-specific genera:
 - Lilythorns (*Catesbaea*) – 1 native species found in the FL Keys
 - Caribbean Princewood (*Exostema*) – 1 native species
 - Bluets (*Houstonia*) – 7 native species
- Growth habit of herbs, vines, shrubs, or trees
- Leaves opposite or whorled
- Some species have capsuled or berry fruits

Source: florida.plantatlas.usf.edu/family/289



Source: Roger Hammer

Source: John Bradford, FNPS

Princewood

(*Exostema caribaeum*)

- **Family:** Rubiaceae
- **Form:** 10-20' (up to 40'); slender
- **Leaf:** simple, opposite; lanceolate in shape; entire leaf margin; interpetiolar stipule
- **Flower:** complete, perfect, actinomorphic, solitary flowers occur in leaf axils; five-lobed cylindrical calyx; white corolla with tube that is five or more centimeters in length
- **Fruit:** brown capsule that opens along suture lines; winged seeds (up to 0.5 cm in length) come from the capsule



Source: CC-BY-NC, Yolanda Leon, iNaturalist



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Source: ©Jeff Stauffer, iNaturalist



Source: CC-BY-NC, Yolanda Leon, iNaturalist

Princewood

(*Exostema caribaeum*)

- **Native Range:** SE Florida, Caribbean Basin, Mexico, and Central America
- **Hardiness:** 10B-11
- **Native Habitat:** rockland hammocks, pine woodlands; high salt tolerance
- **Wind Resistance:** high
- **Availability:** difficult to source
- **Other:** bark extracts have been used to treat various medical conditions – originally within the genus *Cinchona*; considered Endangered by the State of Florida; flowers are considered attractive – could see more usage

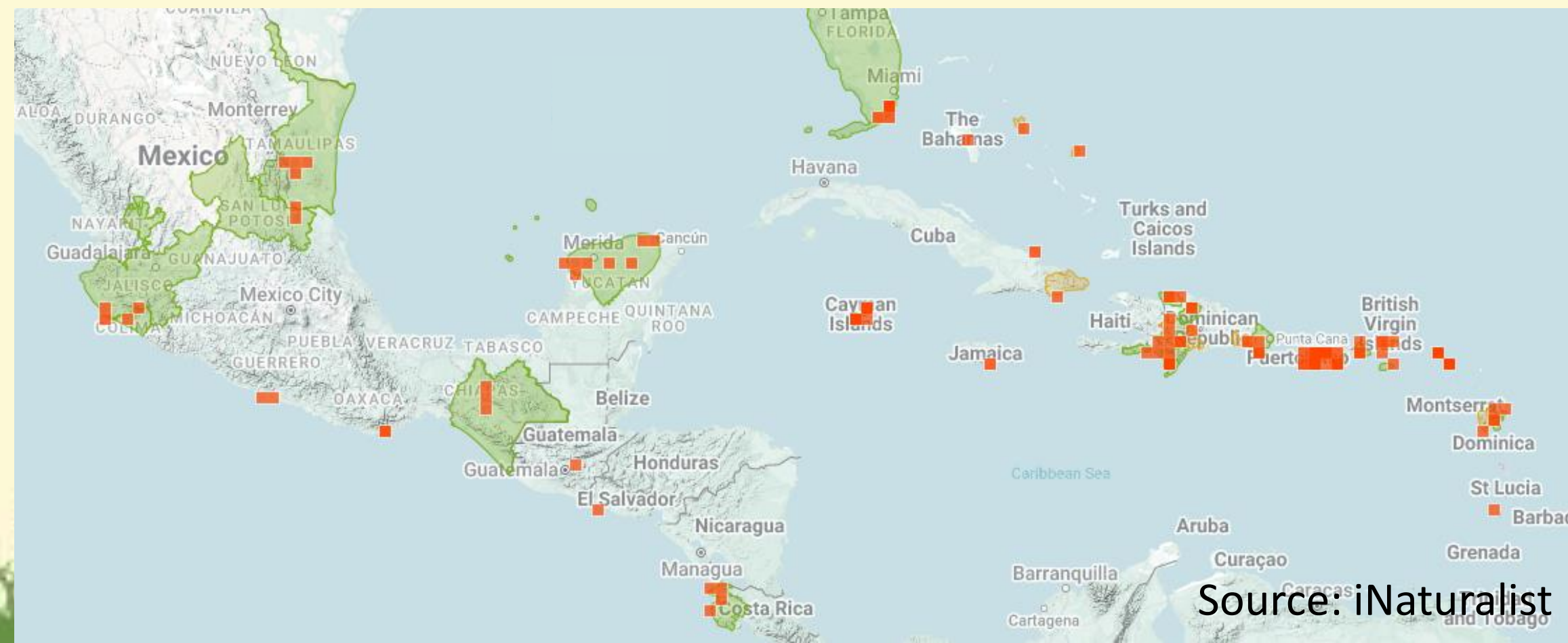
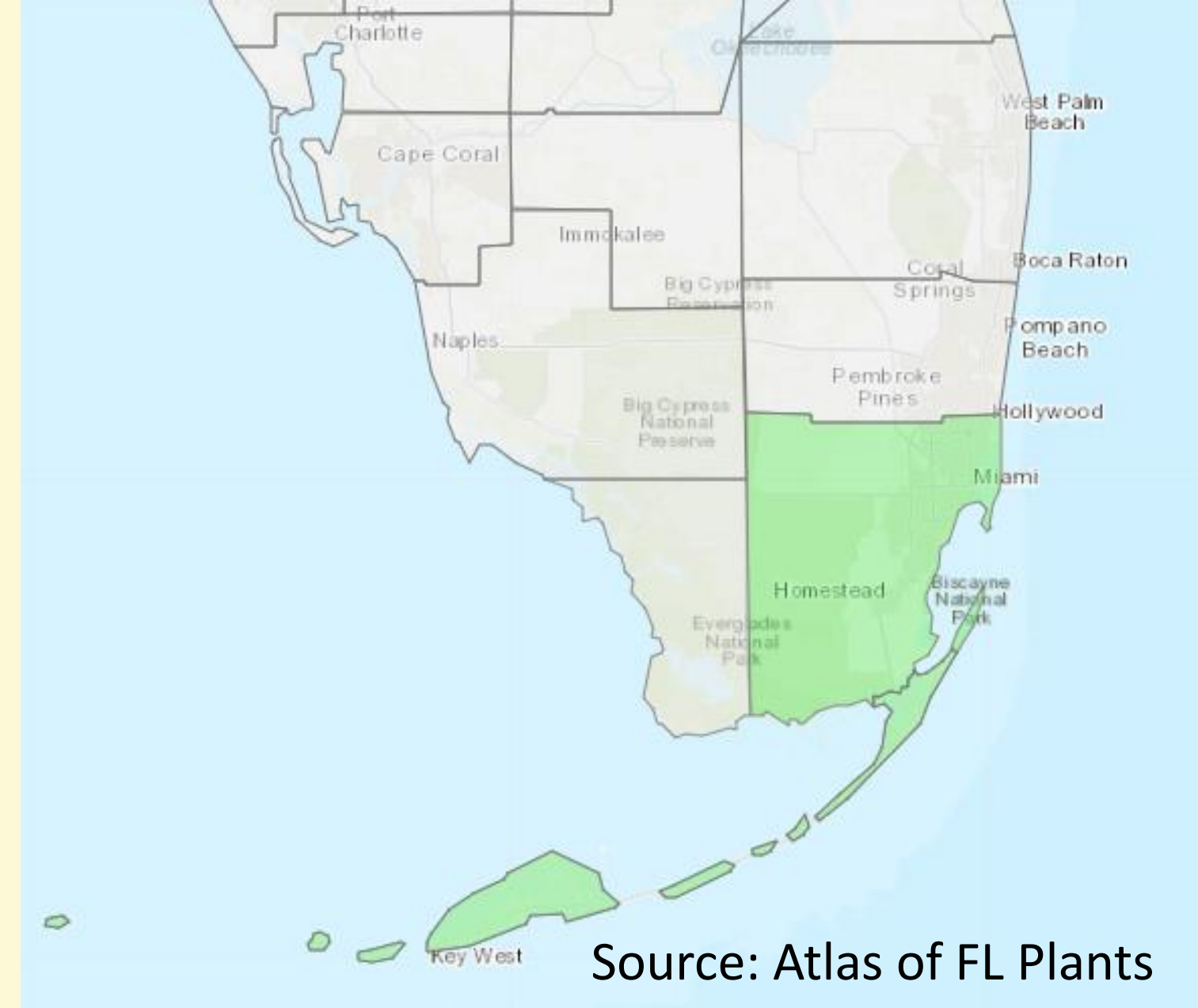


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		<i>Terminalia catappa</i> , tropical almond ^c	

Paradise Tree (*Simarouba glauca*)

- **Family:** Simaroubaceae
- **Form:** Height to 40 feet; spread to 30 feet
- **Leaf:** even-pinnately compound; made up of 10–14 oval-shaped leaflets



Source: Shirley Denton, FNPS



Source: UF/IFAS

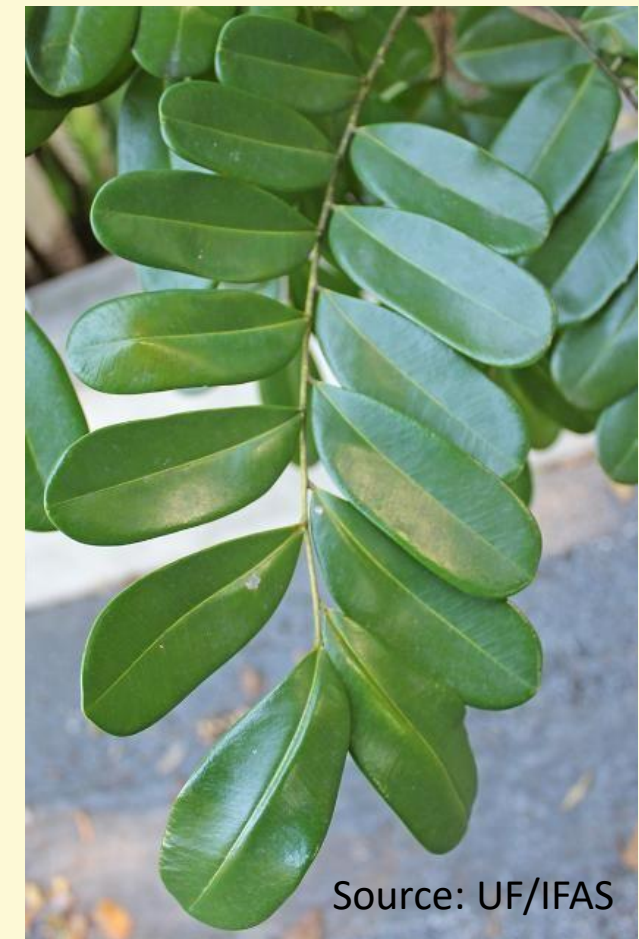
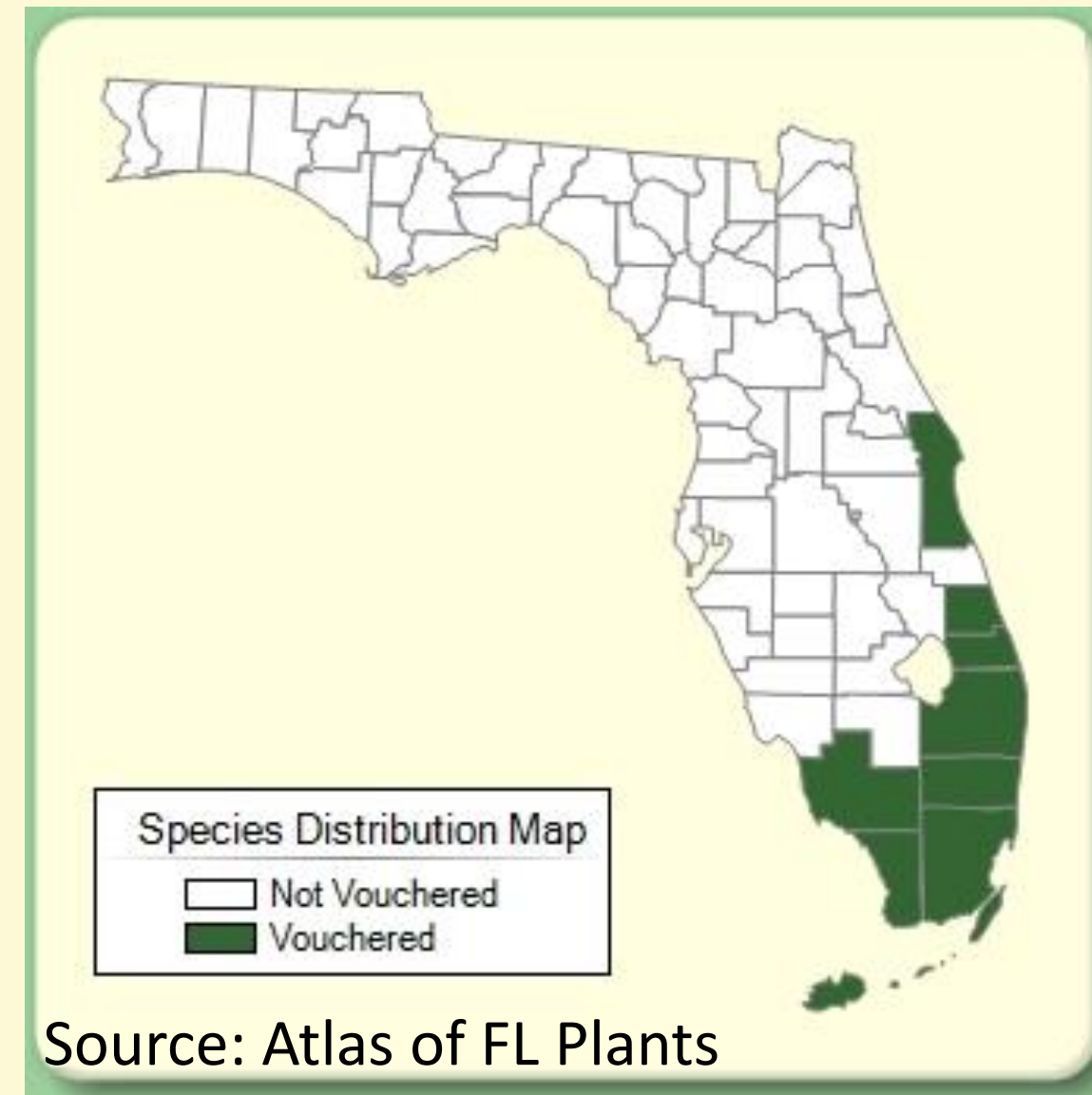
Paradise Tree (*Simarouba glauca*)

- **Flower:** Dioecious, not showy
- **Fruit:** fleshy drupe; only on female plants; attracts birds



Paradise Tree (*Simarouba glauca*)

- **Native Range:** S. Florida, parts of the Caribbean basin, Central America
- **Hardiness:** 10B through 11
- **Wind Resistance:** Medium-High
- **Other:** Low salt tolerance to water but high/moderate tolerance to salt wind; roots tend to be close to surface



Satinleaf (*Chrysophyllum oliviforme*)

- Family: Sapotaceae (Sapodilla Family)
- Form: 35-45' tall by 18-25' wide
- Leaf: 1-5" long, simple and alternate with entire margins; shiny green upper and rusty pubescence covered underside

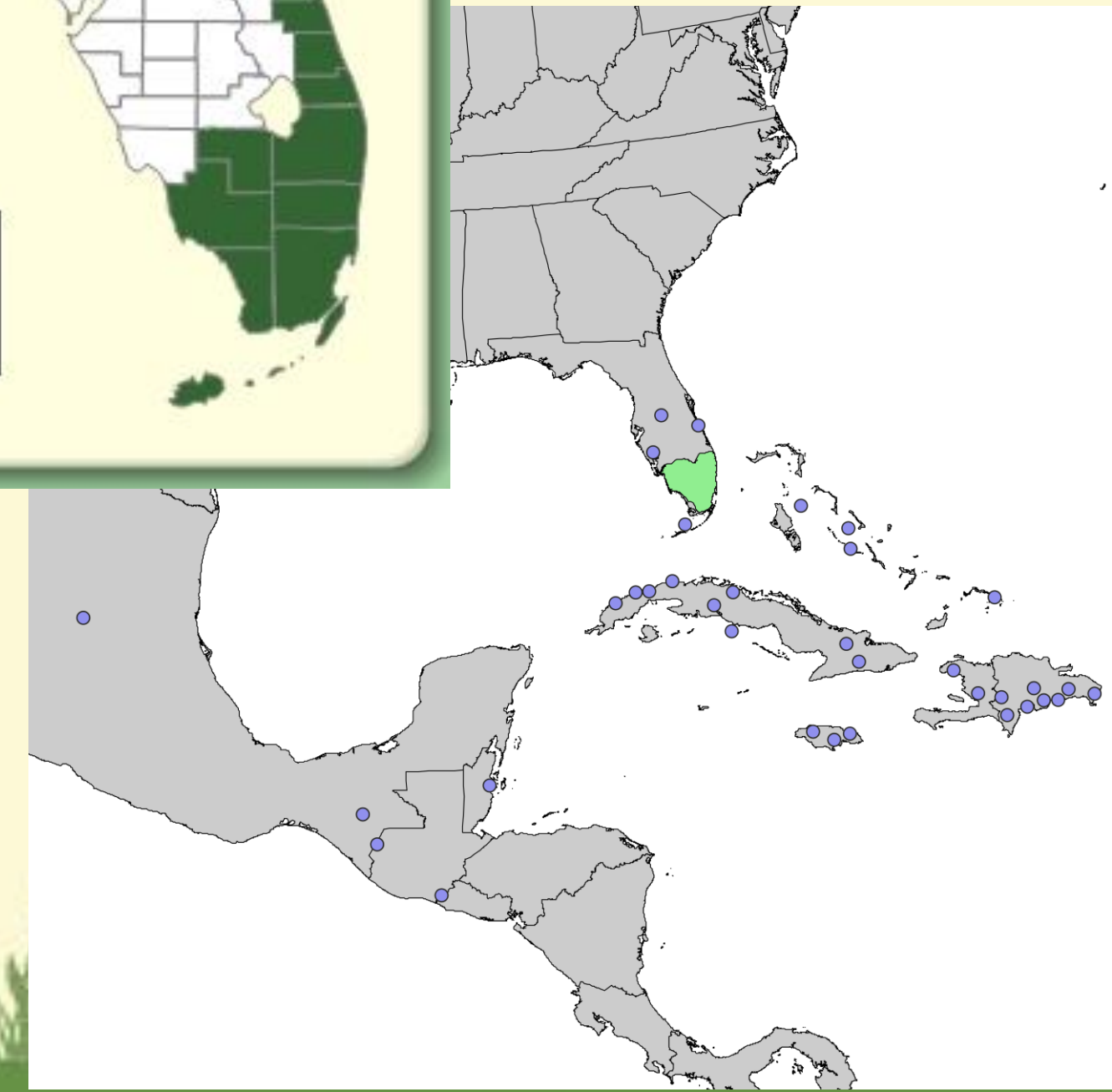


Credit: UFEI



Satinleaf (*Chrysophyllum oliviforme*)

- Native Range: S. FL (listed as a state threatened species), West Indies, and Central America
- Hardiness: 10a-11
- Wind Resistance: Medium-High





Credit: Alex Cooper – CC-BY-3.0



Wrap-up

Other resources:

Highest

- Sea torchwood (*Amyris elemifera*)

Medium high

Native Plants for Small Spaces

More Plants to Think About

- Soldierwood -
- Thatch Palm – *Thrinax radiata*
- Key Thatch Palm – *Leucothrinax morrisii*
- Marlberry – *Ardisia escallonioides*
- Spanish Stopper – *Eugenia foetida*
- Jamaican Caper – *Quadrella jamaicensis*
- Locustberry – *Byrsonima lucida*
- Maidenbush – *Heterosavia bahamensis*
- Crabwood/Oysterwood - *Gymnanthes lucida*
- Myrtle-of-the-River – *Myrcia zuzygium*
- Joewood – *Jacquinia keyensis*
- Sweet Acacia – *Vachellia farnesiana* var. *farnesiana*

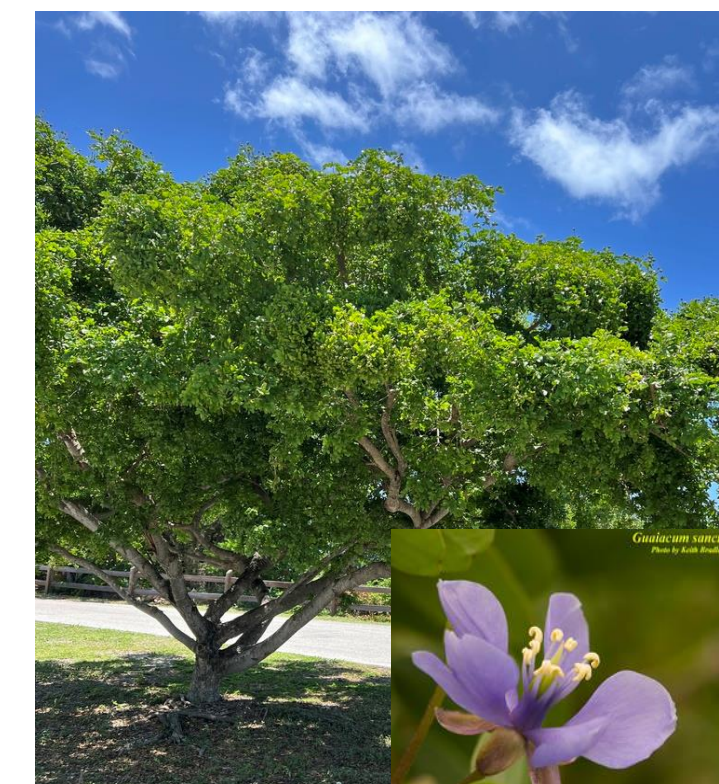


Photo Credit: mdarst,
iNaturalist

Small native trees / shrubs

- *Ilex cassine*
- *Ilex krugiana*
- *Canella winterana*
- *Capparis flexuosa*
- *Quadrella jamaicensis*
- *Conocarpus erectus*
- *Gymnantes lucida*
- *Damburneya coriacea*
- *Persea borbonia*
- *Morus rubra*
- *Calypttranthes pallens*
- All of the *Eugenias*/stoppers
- *Myrcia zuzygium*
- *Drypetes diversifolia*
- *Drypetes laterifolia*
- *Krugiodendron ferreum*
- *Colubrina elliptica*
- *Reynosia septentrionalis*
- *Prunus myrtifolia*
- *Exostema caribaeum*
- *Guettarda elliptica*
- *Guettarda scabra*
- *Amyris elemifera*
- *Zanthoxylum clava-herculis*
- *Zanthoxylum coriaceum*
- *Zanthoxylum fagara*
- *Zanthoxylum flavum*
- *Exothea paniculata*
- *Sapindus Saponaria*
- *Guaiacum sanctum*
- *Schafferia frutescens*

Palms...

Highest Wind Resistance	Medium-High Resistance	Medium-Low Resistance	Lowest Wind Resistance
<i>Butia capitata</i> , pindo or jelly <i>Dypsis lutescens</i> , areca <i>Coccothrinax argentata</i> , Florida silver <i>Hyophorbe lagenicaulis</i> , bottle <i>Hyophorbe verschaffeltii</i> , spindle <i>Latania loddigesii</i> , blue latan <i>Livistona chinensis</i> , Chinese fan ^b <i>Phoenix canariensis</i> , Canary Island date <i>Phoenix dactylifera</i> , date <i>Phoenix reclinata</i> , Senegal date ^b <i>Phoenix roebelenii</i> , pygmy date <i>Ptychoesperma elegans</i> , Alexander <i>Sabal palmetto</i> , cabbage, sabal <i>Thrinax morrisii</i> , key thatch <i>Thrinax radiata</i> , Florida thatch <i>Veitchia merrillii</i> , Manila	<i>Caryota mitis</i> , fishtail <i>Cocos nucifera</i> , coconut <i>Dypsis decaryi</i> , triangle <i>Roystonea elata</i> , royal		<i>Syagnus romanzoffiana</i> , queen ^c <i>Washingtonia robusta</i> , Washington fan

Thank you!

Questions?

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