

WILDFLOWERS AND WEEDS: EXPLORING NATIVENESS

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Lupinus villosus (lady lupine)
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Today's topics

- What do we mean by native
- How botanists determine if a particular plant species is native to Florida
- Examples of recent status changes
- Some things to consider when purchasing and gardening with Florida native plants or using them in restoration projects

What do we mean by native?

- *A species that occurs naturally in a specified geographic area (Iannone et al. 2020)*
- In North America, plants are often defined as being native if they were present at the time of European contact and settlement



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A more nuanced definition



- *A species that occurs naturally in a particular region, state, ecosystem, and habitat **without direct or indirect human actions** (Federal Native Plant Conservation Committee, 1994)*
- Plants that have evolved and adapted to a specific location or ecosystem over millennia and have remained genetically unaltered by humans

Native to where?

- Every plant species is native to somewhere!
- It's important to note geographic extent
 - *native to eastern North America*
 - *native to the southeastern USA*
 - *native to Florida*
 - *native to North Florida*
 - *native to Alachua County*
- Plant species aren't confined by geographic borders but by ecosystems and habitat conditions




Inherent bias in terminology?

- Neil Anderson and colleagues suggest that the terms native and nonnative (exotic) are value-laden, potentially limiting our capacity to respond (control and regulate)
- Using the example of reed canarygrass in the Midwest, they argue that it is possible (but rare) for a plant to be both native and invasive
- Anderson suggests we view each plant species independent of the associated labels, so that we can evaluate its capacity to establish and spread and its potential threats to both natural and managed lands
- Do these biases influence our evaluation of ecosystem services provided by native vs nonnative plants?

Where to check if a species is native: Atlas of Florida Plants

<https://florida.plantatlas.usf.edu/>



Atlas of Florida Plants

Institute for Systematic Botany

Scientific Name ▾

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Atlas of Florida Plants » Species Page

Lobelia cardinalis

Jump to a section: [Classification](#) | [Citation](#) | [Source](#) | [Synonyms](#) | [Specimens](#)

Family:	CAMPANULACEAE
Species:	Lobelia cardinalis L.
Common Name:	CARDINALFLOWER
Status:	Native, Threatened-State , OBL (PCE) , FACW (NWPL)
Specimen:	View details for herbarium specimens

** Not applicable or data not available.

Classification

Order	ASTERALES
Family	CAMPANULACEAE
Genus	Lobelia
Species	Lobelia cardinalis L. - CARDINALFLOWER

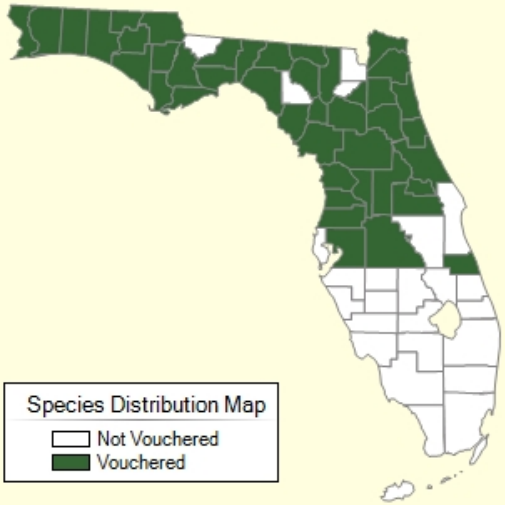
Citation

Citation	LOBELIA CARDINALIS Linnaeus, Sp. Pl. 930. 1753.
Basionym:	**
Type:	VIRGINIA: Without data (lectotype: LINN 1051.19). Lectotypified by McVaugh, Rhodora 38: 276. 1936.

** Not applicable or data not available.

Map | [Photo Gallery](#) | [Browse Photos](#)

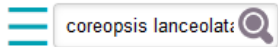
Distribution Map: Based on **vouchered** plant specimens from **wild** populations. **Cultiva** mapped. View county names by placing the cursor over the map.



Species Distribution Map
☐ Not Vouchered
☒ Vouchered

Where to check if a species is native: Weakley's Flora of the Southeastern US

<https://fsus.ncbg.unc.edu/>



Flora of the Southeastern United States 2023 Edition • [GET THE APP](#)



ASTERACEAE

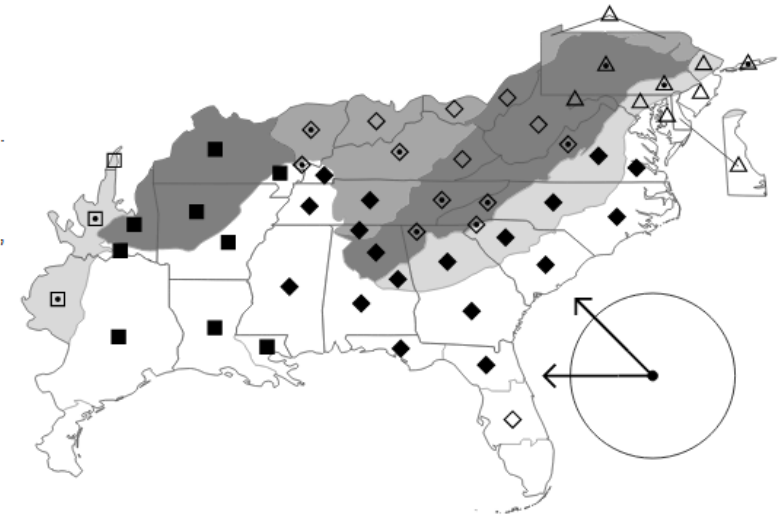
Coreopsis lanceolata Linnaeus. LONGSTALK COREOPSIS. **Phen:** Apr-Jun. **Hab:** Open sandy prairies; eastwards in disturbed areas. **Dist:** S. MA, MI and WI south to c. peninsular FL, e. TX, and NM. Often spread from cultivation, its original range obscure, but perhaps limited to the sc. United States.

Origin/Endemic status: Native

Syn: = Ar, C, FI7, FNA21, GrPI, K1, K3, K4, Mi, NcTx, NE, NY, Oh3, Ok, Pa, RAB, SE1, Tn, Tx, Va, W, WH3, WV, Schilling, Johnson, & Iacona (2015), Smith (1976); > *Coreopsis crassifolia* Aiton – II, S; > *Coreopsis heterogyna* Fernald – F; > *Coreopsis lanceolata* L. – II, S; > *Coreopsis lanceolata* L. var. *lanceolata* – F, Sherff & Alexander (1955); > *Coreopsis lanceolata* L. var. *villosa* Michx. – F, G, Sherff & Alexander (1955)










[Show in key\(s\)](#)

[Show parent](#)

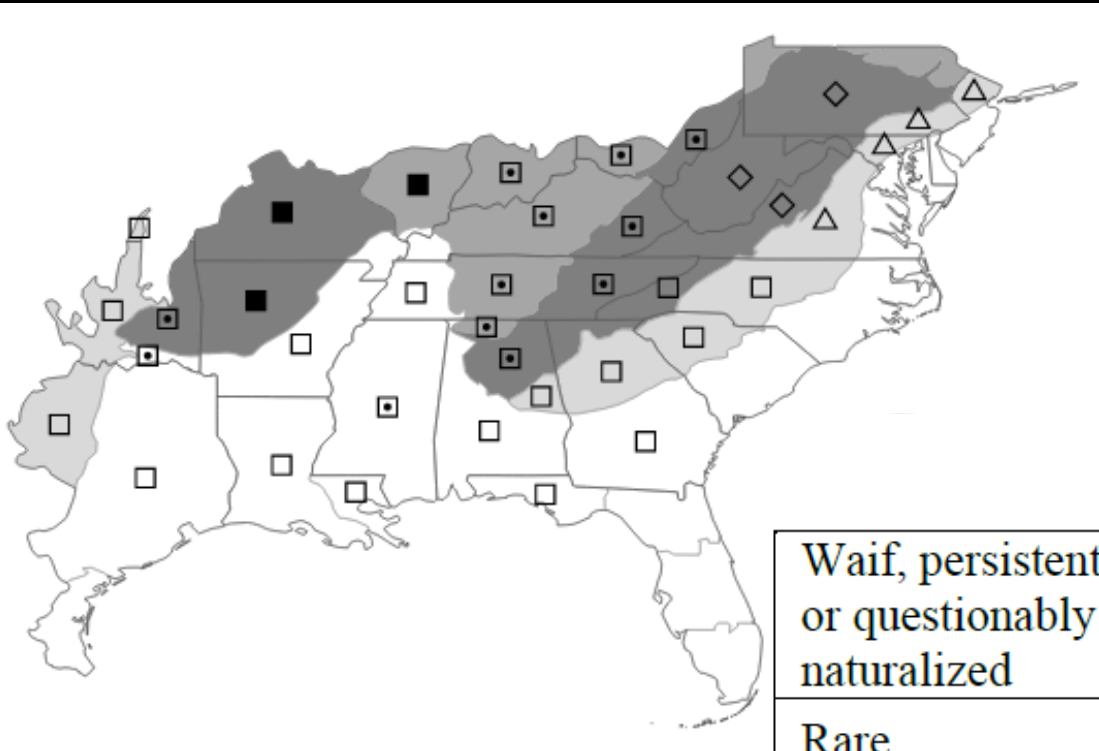


Hover over a shape, letter, icon, or arrow on the map to see what it means.



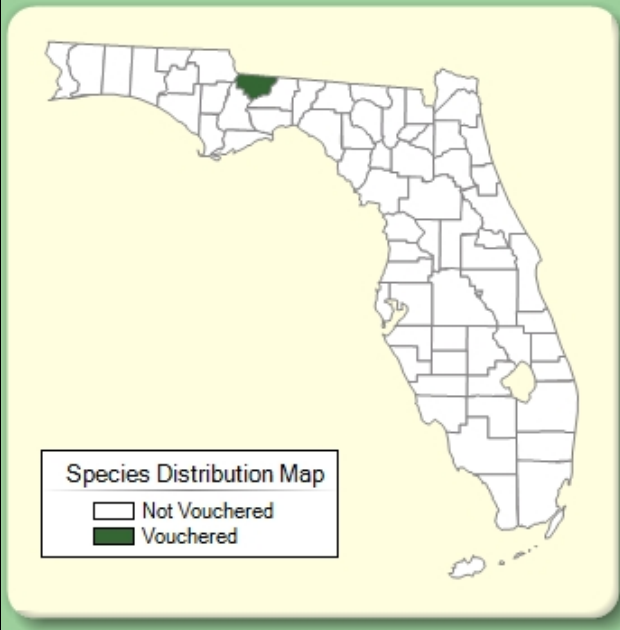
	Native	Maybe Exotic	Exotic
Waif, persistent, or questionably naturalized	n/a	*	*
Rare			
Uncommon			
Common			

An example: *Echinacea purpurea* (eastern purple coneflower)



Distribution from Weakley's Flora of the Southeastern United States 2023 edition

	Native	Maybe Exotic	Exotic
Waif, persistent, or questionably naturalized	n/a	*	*
Rare	□	◇	△
Uncommon	◻	◈	◤
Common	■	◆	▲



Vouchered distribution from Atlas of Florida Plants

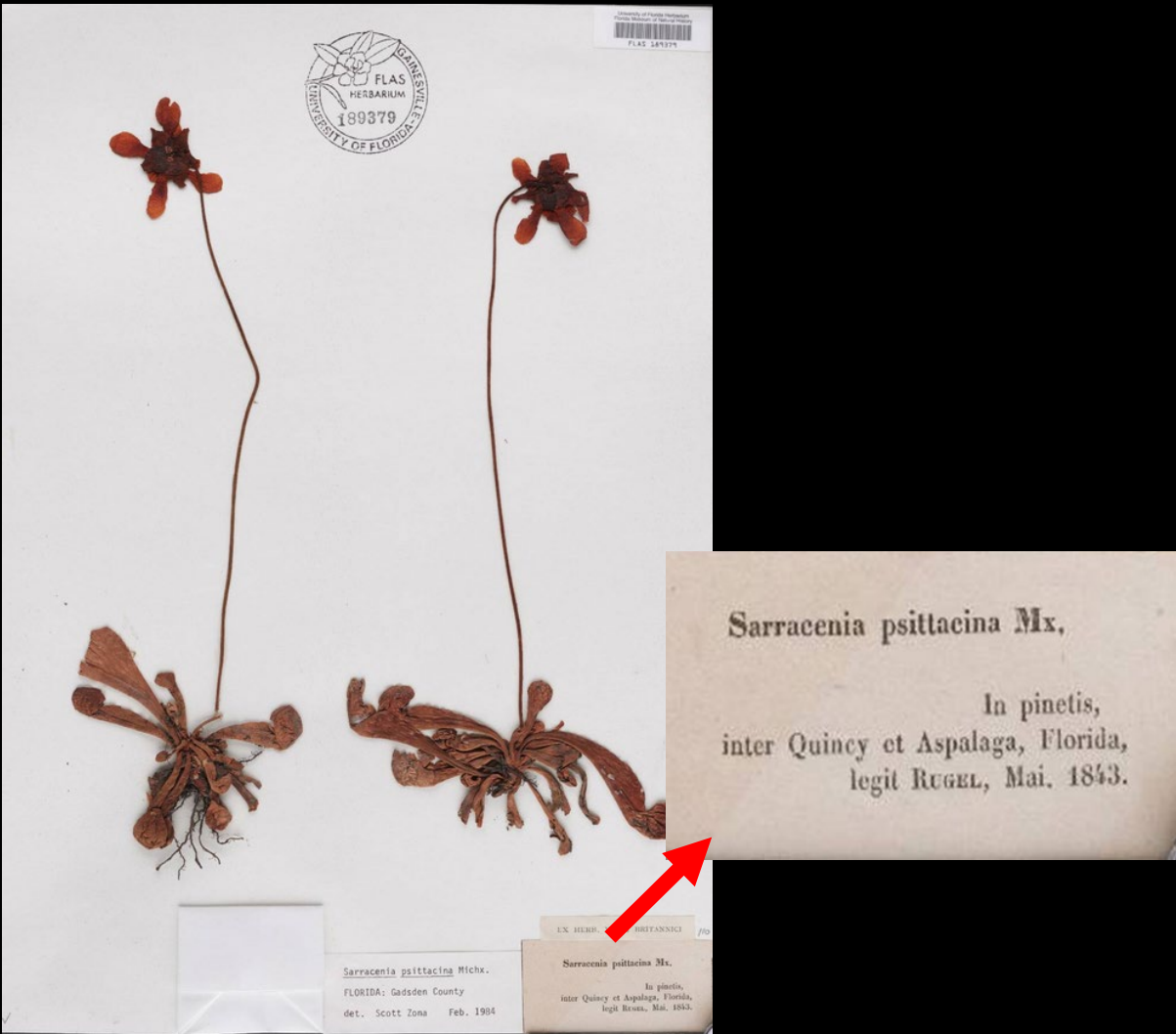


Botanists examine multiple types of evidence to evaluate nativeness

- Herbarium specimens
- Early published floras
- Early explorer/naturalist accounts
- Paleontological and archaeological remains
- Distributional info
- Types of habitats



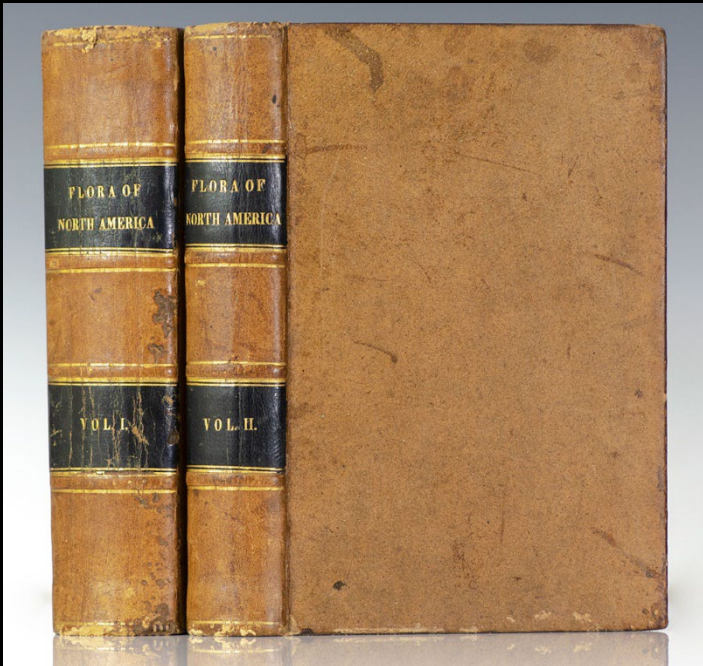
Herbarium specimens



- Search for earliest specimens in both Florida herbaria and larger herbaria outside the state
- Note any relevant habitat or location information on specimen label
- Physical specimens allow for ID verification and provide the opportunity to study population genetics

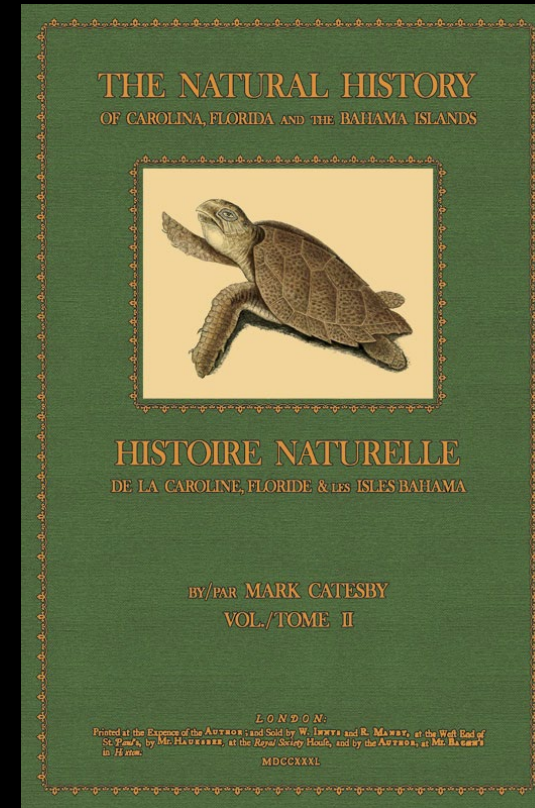
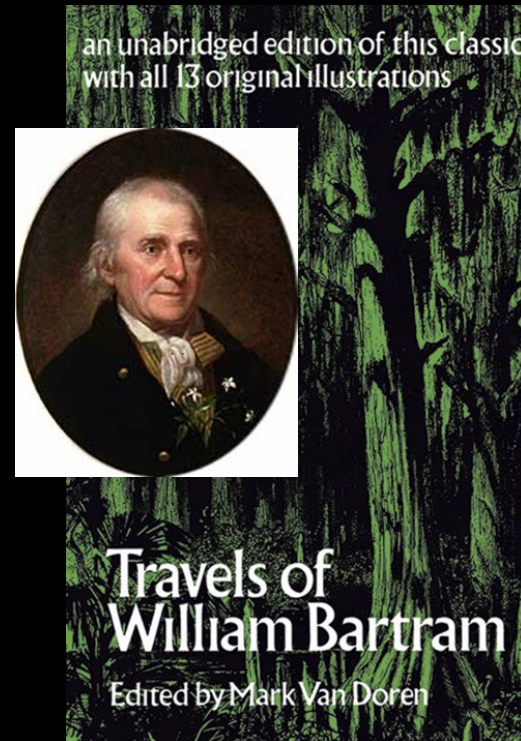
Early floras

- André Michaux
Flora Boreali-Americana (Flora of North America) 1803
- John Torrey and Asa Gray
Flora of North America (incomplete) 1838-1843
- Alvan Wentworth Chapman
Flora of the Southern United States 1897
- John Kunkel Small
Flora of the Southeastern United States 1903, 1913
Manual of the Southeastern Flora 1933



Early naturalist's accounts

- Mark Catesby *Natural History of Carolina, Florida, and the Bahama Islands* (observations from 1722-1726)
- William Bartram *Travels through North and South Carolina, Georgia, East and West Florida, the Cherokee Country, etc.* (observations from 1773-1777)



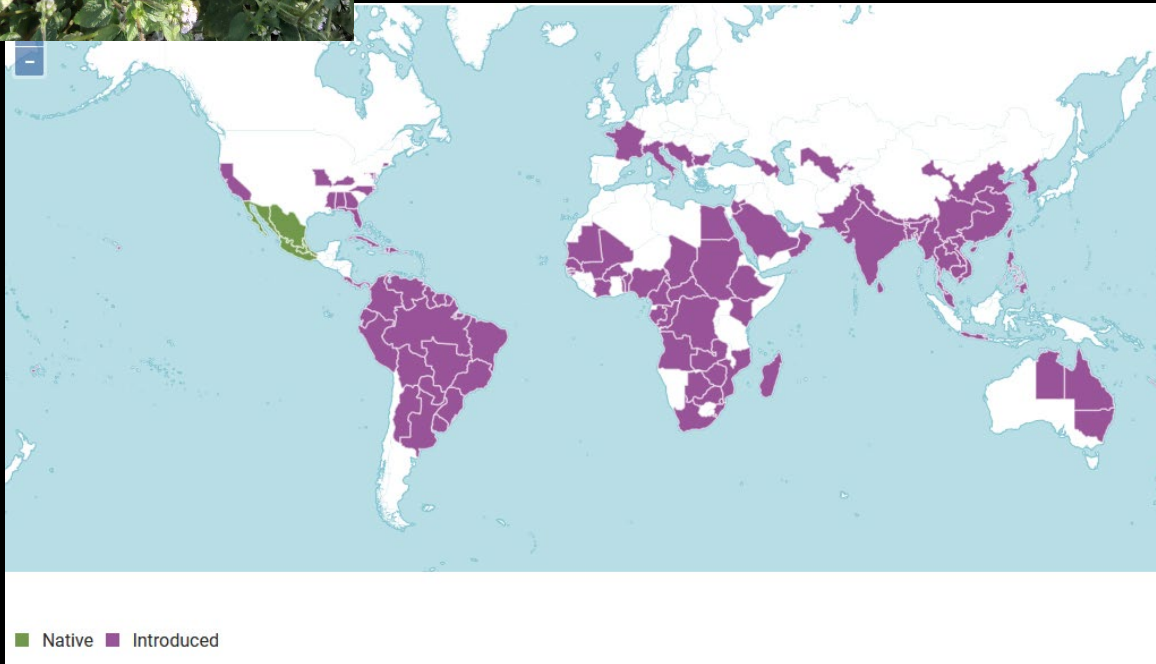
Paleontological and archaeological remains

- Paleontology—fossil remains predating humans
 - Preservation is fortuitous (mineralized)
 - Species can be hard to identify and often distinct from (ancestral to) our modern species
- Archaeology—remains associated with humans
 - Preservation is fortuitous (carbonized or waterlogged)
 - Species represented are often those used by humans, either for firewood or for food, or weeds associated with human habitation





Distributional data



Global distribution of *Ageratum conyzoides*
(tropical whiteweed, bluetop) from
[Plants of the World Online](https://www.plantsoftheworld.org/)

- What is the broader geographic distribution of the species?
- Is that distribution geographically contiguous with or disjunct from Florida?
- For widely cultivated species and those well-adapted to disturbed habitats, the original native distribution may be obscure

Habitat preferences

- Native species are commonly found in undisturbed natural habitats and are sometimes very habitat specific
 - Disturbances to native habitats often results in loss of native plant species
- In contrast, non-native species are very commonly observed on disturbed sites (roadsides, pastures, fields, urban and suburban landscapes, vacant lots, ditches, etc.) but of course are also capable of invading natural areas



Evaluating Native Status



Cucumis melo var. *texanus*
(wild cantaloupe, pocket melon)

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- Botanists are not always in agreement!
- The most robust hypotheses are those drawn from multiple lines of evidence
- Opinions can change over time--especially as new evidence comes to light or in re-evaluation of existing evidence
- Let's look at some examples...

Distimake dissectus **(formerly Merremia dissecta)** **Alamo vine, noyau vine**



- Long thought to be introduced to Florida
- Austin 2007 argued it is native to Florida based on
 - 1774 observation/illustration by Bartram in Putnam County and 1788 observation by Michaux in Marion County
 - Broader, circum-Caribbean distribution

https://cals.arizona.edu/herbarium/sites/cals.arizona.edu/herbarium/files/old_site/assoc/people/daustin/Merremia%20dissecta.pdf

Gaillardia pulchella

firewheel, Indian blanket

- Uncertainty on its status since the late 19th century
- Weakley et al. 2020 argued it is native to Mexico and the southwestern US but not the eastern US
 - Absence of early herbarium specimen
 - Not mentioned in early explorers' accounts
 - Confusion in early floras with the native *G. aestivalis*

“If (it) were native to coastal dunes or other habitats in the eastern USA, it is extremely doubtful that a very colorful, conspicuous coastal plant would have been overlooked for so long. Its native distribution in nearby Texas and its propensity for inhabiting dunes in the eastern USA has probably given the false impression it is native to the eastern USA.”

<https://www.researchgate.net/publication/346966543> *Studies in the vascular flora of the southeastern United States VI*



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Clusia rosea

autograph tree, pitch-apple



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- Native to the Caribbean, southern Mexico, Central America, and northern South America
- In Florida, it is found in cultivation (and rarely escaped and established) as far north as Brevard and Pinellas counties, but its native status is uncertain
- Mid-19th century herbarium specimens from the Florida keys but no other part of the state
- Likely native only to rockland habitats in the Keys and perhaps Miami-Dade County but has been introduced via cultivation up to the central peninsula

Bidens alba

beggarticks, Spanish needles

- Thought to be native to Mexico, Central America, and northern South America; uncertain in the SE US and Caribbean; and exotic in the Old World
- In his 1803 flora of the eastern US, Michaux lists two other species of *Bidens* but not *B. alba*
- Earliest herbarium specimens from Florida are from coastal areas and date to the 1870s; 1879 specimen from Philadelphia indicates it was brought as ballast
- Multiple specimens dating to 1840s-1860s from locations where it clearly was not native (Hawaii, Canary Islands, Malaysia, Madagascar, Australia)
- In Florida, ubiquitous on disturbed sites but relatively uncommon in undisturbed natural habitats



Frequent questions from Florida gardeners about native plants

- Are native plants easier to grow in than nonnative ones?
- Are all native plants desirable garden subjects?
- Are all nonnative plants invasive?
- Are native plants more drought tolerant?
- What about buying native plants from nurseries outside of Florida?



Kalmia hirsuta (sandhill laurel)

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Smilax bona-nox (sawtooth greenbrier)

©mbintexas CC-BY-NC



Parthenocissus quinquefolia (Virginia creeper)

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Nativars (cultivated varieties of native plants)



- Be aware that cultivars of native species may involve varying degrees of genetic alteration
- Improved nativars with strong garden performance are often more heavily modified
- If you are planting in a context where nativeness is of concern, select wild types or cultivars close to wild types

Salvia coccinea 'Summer Jewel Lavender'

Outcrossing and Native Plants

- Introduced species or subspecies can interbreed with native forms in garden or nursery settings --resulting in plants with different genetics and physical attributes
 - Native firebush *Hamelia patens* var. *patens* interbreeding with the nonnative *Hamelia patens* var. *glabra* and *Hamelia cuprea*

See Hammer, R.L. The *Hamelia* Mess

<https://www.fann.org/info/plants/the-hamelia-mess/>



Hamelia patens var. *glabra*
(South American firebush)
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Outcrossing and Native Plants

- *Helianthus debilis* (beach dune sunflower) has three geographically distinct subspecies in Florida--one on the east coast, one on the SW coast, one from the panhandle to the NW peninsula
- Cultivated in nurseries and gardens outside of their traditional ranges, these subspecies may interbreed



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Conclusions



Hibiscus grandiflorus
©jecmanatee CC BY-NC

- For some Florida plants, native status is uncertain; more and different types of data are needed to resolve
- We may need to be more alert to potential biases in how we discuss, evaluate, and manage native and nonnative plants
- When it comes to purchasing native plants, be an aware and inquisitive consumer
 - These choices are particularly important in habitat restoration projects, native plant demonstration gardens, and landscapes adjacent to natural areas
- Be alert to regional limits in distribution within Florida
- For success in cultivation, pay attention to habitat

For more information: internet resources on Florida native plants

Ask IFAS <https://edis.ifas.ufl.edu/topics/native-plants>

Norcini, J.G. 2019. Native Plants: An Overview. UF/IFAS Extension publication ENH1045/EP297 <https://edis.ifas.ufl.edu/publication/EP297>

Florida Native Plant Society <https://www.fnps.org/>

Florida Wildflower Foundation <https://www.flawildflowers.org/>

For more information: native plant guides

Field Guides

Hall, D.W. & W.J. Weber. 2011. *Wildflowers of Florida and the Southeast*.

Hammer, R.L. 2018. *Complete Guide to Florida Wildflowers*.

Nelson, G. 1996. *The Shrubs and Woody Vines of Florida*.

Nelson, G. 2000. *The Ferns of Florida*.

Nelson, G. 2010. *The Trees of Florida*.

Habitat/Ecological Guides

Taylor, W.K. 1998. *Florida Wildflowers in their Natural Communities*.

Simons, R.W. 2021. *The Ecology of Trees, Shrubs, and Woody Vines of Northern Florida*.

Gardener's Guides

Nelson, G. 2003. *Florida's Best Native Landscape Plants*.

Osorio, R. 2001. *A Gardener's Guide to Florida Native Plants*.

Questions?

