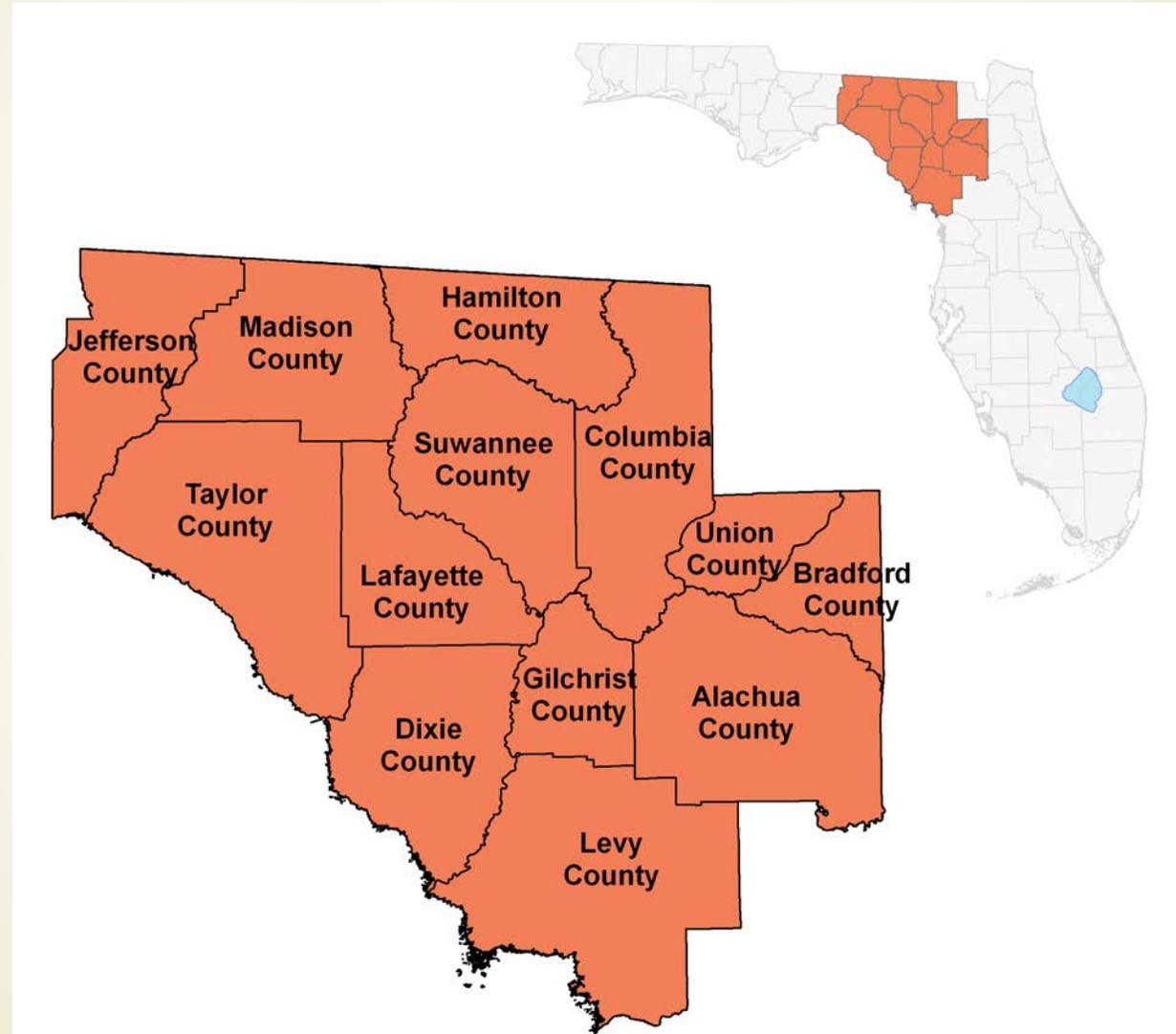


# North Central Florida Cooperative Invasive Species Management Area





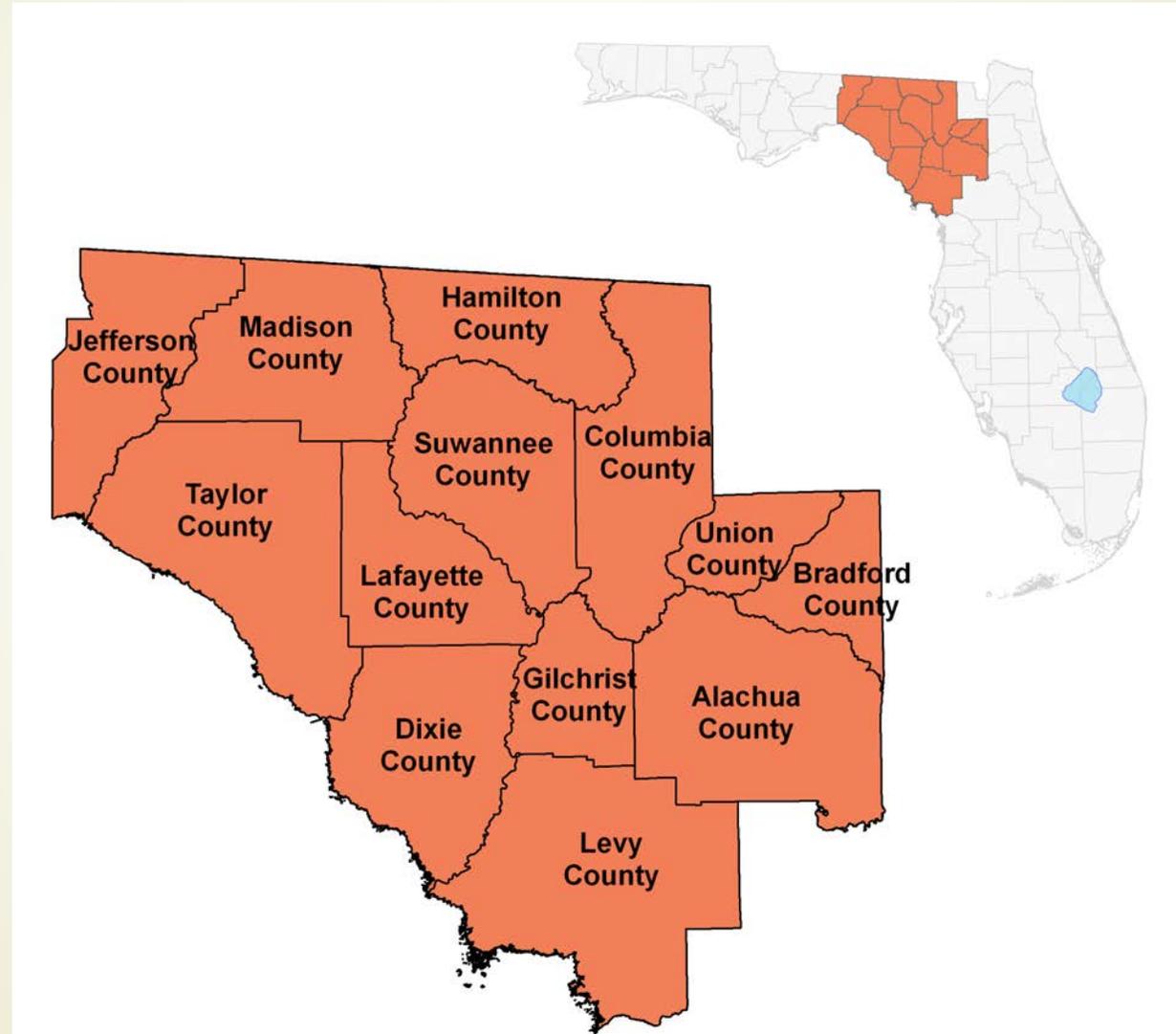
# Identification and Treatment of Key Invasive Species in North Central Florida

Andi Christman

Alachua County Parks and Conservation Lands

North Central Florida CISMA

# North Central Florida Cooperative Invasive Species Management Area





# North Central Florida

## Early Detection Rapid Response

- ▶ *Ardisia japonica*, Japanese ardisia
- ▶ ~~*Ruellia blechum*, Browne's blechum~~
- ▶ ~~*Casuarina equisetifolia*, Australian pine~~
- ▶ *Dioscorea polystachya*, Chinese yam
- ▶ ~~*Eichhornia azurea*, anchored waterhyacinth~~
- ▶ *Elaeagnus umbellata*, autumn olive
- ▶ ~~*Hygrophila polysperma*, miramar weed~~
- ▶ *Melinis repens*, natalgrass
- ▶ *Paederia foetida*, skunk-vine
- ▶ *Panicum maximum*, guinea grass
- ▶ ~~*Schinus terebinthifolia*, Brazilian peppertree~~
- ▶ ~~*Solanum diphyllum*, twoleaf nightshade~~
- ▶ *Solanum viarum*, tropical soda apple

# Herbicides and Active Ingredients

(From SP 242 – *Integrated Management of Non-native Plants in Natural Areas of Florida*,

Enloe et al., 2018

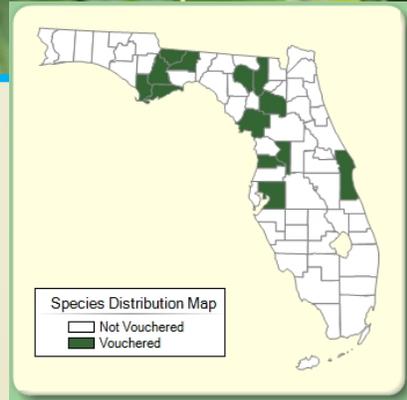
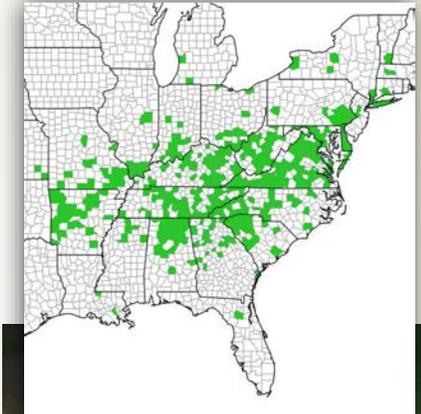
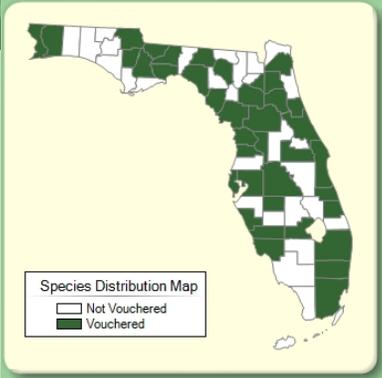
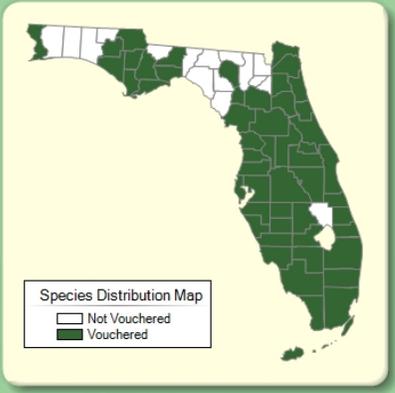
<http://edis.ifas.ufl.edu/pdffiles/WG/WG20900.pdf>

Product	Formulation	Comments
Many generics	2,4-D various	Some products may be applied directly to water.
Method	Aminocyclopyrachlor 21.2% SL	High degree of soil activity. Do not apply directly to water.
Milestone	Aminopyralid 21.1% L	Do not apply directly to water.
Fusilade II	Fluazifop 24.5% EC	Postemergence, grass-specific. Cannot be applied directly to water.
Glyphosate product examples: Roundup Custom, Rodeo, AquaNeat, and many others	Glyphosate (isopropylamine salt) 41.0–53.8% L	Use aquatic formulation for emergent vegetation control in and around water. There has been a trend towards more concentrated formulations, from Roundup original (41%) to Roundup Custom and many others (53.8%). Glyphosate product recommendations in Table 5 can be applied to any glyphosate product with a % active ingredient in the 41–53.8% range, provided the product is appropriately labeled for use.
Velpar DF	Hexazinone 75% DF	May cause groundwater contamination if applied to areas where soils are permeable, especially where the water table is shallow. Nontarget plants can be damaged by root absorption.
Velpar L	Hexazinone 25% L	May cause groundwater contamination if applied to areas where soils are permeable, especially where the water table is shallow. Nontarget plants can be damaged by root absorption.
Plateau and generics	Imazapic 22.2% SL	Highly soil active.
Clearcast	Imazamox 12.1% L	Can be applied directly to water.
Arsenal, Habitat, Polaris	Imazapyr 22.6% L	Can be applied directly to water. Nontarget plants can be damaged by root absorption.
Stalker	Imazapyr 22.6% L	May be applied to non-irrigation ditch banks. Nontarget plants can be damaged by root absorption.
Escort XP	Metsulfuron 60% DF	May not be applied directly to water. 24(c) SLN label for control of Old World climbing fern in freshwater marshes, mesic forests, hydric forests, Everglades tree islands, and Everglades prairie scrub.
TIGR	Sethoxydim 18% EC	24(c) label for use on emergent aquatic grasses in water
Trycera	Triclopyr acid 29.4% L	Acid formulation of triclopyr. May be slightly less selective than other triclopyr formulations. Aquatic use permitted.
Brush-B-Gon Brush Killer	Triclopyr amine 8.0–8.8% L	Homeowner formulations readily available in retail stores. Much lower concentration than Garlon 3A and may require follow-up applications.
Garlon 3A, Renovate, and generics	Triclopyr amine 44.4% L	Water-soluble triclopyr formulation for foliar and cut stump treatments. Use aquatic labeled product for emergent vegetation.
Vastlan	Triclopyr choline 39% L	New water-soluble formulation for foliar and cut stump treatments. Signal word reduced to warning for this formulation compared to Garlon 3A and Trycera.
Garlon 4 Ultra and generics	Triclopyr ester 61.6% L	Oil-soluble formulation for basal bark and cut stump, but can be mixed with water and used for foliar treatments. Do not apply directly to water.
Pathfinder II	Triclopyr ester 13.6% L	Ready-to-use oil-soluble formulation for basal bark and cut stump treatments. Do not apply directly to water.

\* Alphabetical by active ingredient. All concentrations are active ingredients. Original, branded-product names are used for convenience. Generic products that contain the same active ingredient may be available.

# Air potato, Air yam, Chinese yam, & Florida yam

*Dioscorea bulbifera*, *D. alata*, *D. polystacha*, *D. floridana*



# The *Dioscoreas*

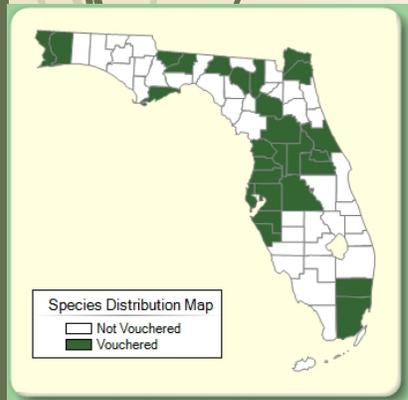
## Air potato, Air yam, and Chinese yam

- ▶ Treatment:
- ▶ **Biological:** the air potato leaf beetle, *Lilioceris cheni*, has been effective on air potato only.
- ▶ **Manual:** cut vines that are high in trees; cut bulbils and remove from site. Dig up underground tubers if possible.
- ▶ **Foliar:** 1–2% glyphosate product.
- ▶ **Cut stem** for large vines: 10% Garlon 4.



# Skunk vine

*Paederia foetida*





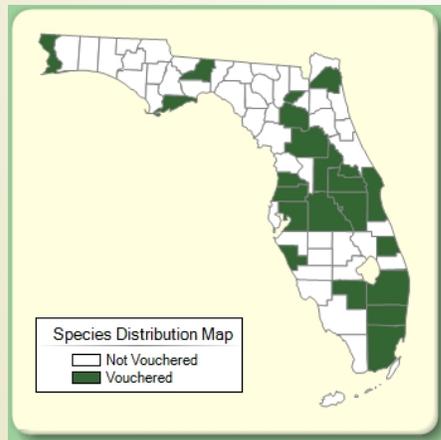
# Skunk vine

## *Paederia foetida*

- ▶ Treatment:
- ▶ **Foliar:** 0.15–0.25% Milestone, 1–3% Garlon 3A, 2% Garlon 4, or 1–1.5% Plateau. Thoroughly wet foliage. Homeowners can use Brush-B-Gon or Brush Killer at maximum label rates.
- ▶ **Cut stump:** 10% Garlon 4.
- ▶ **Comments:** Perennial twining vine from woody rootstock. Leaves and stems have disagreeable odor, especially when crushed. Most common in west central Florida, documented northward to Nassau and Escambia Counties and southward to Miami-Dade County.

# Cat's claw vine

*Dolichandra unguis-cati*





# Cat's claw vine

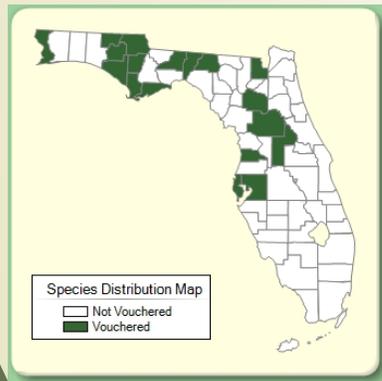
## *Dolichandra unguis-cati*

- ▶ Treatment:
- ▶ **Manual:** hand pull new seedlings. Vines are difficult to remove from trees.
- ▶ **Cut stem** (i.e., cut stump): 100% glyphosate product.
- ▶ **Foliar:** 2–3% glyphosate product, 2-4% Garlon 3A. Multiple treatments will be required.
- ▶ **Comments:** Cat's-claw vine is one of the most difficult vines to control in Florida. It reestablishes from numerous seedlings with tuberous roots that typically grow around the base of trees. Re-treatment will be required.

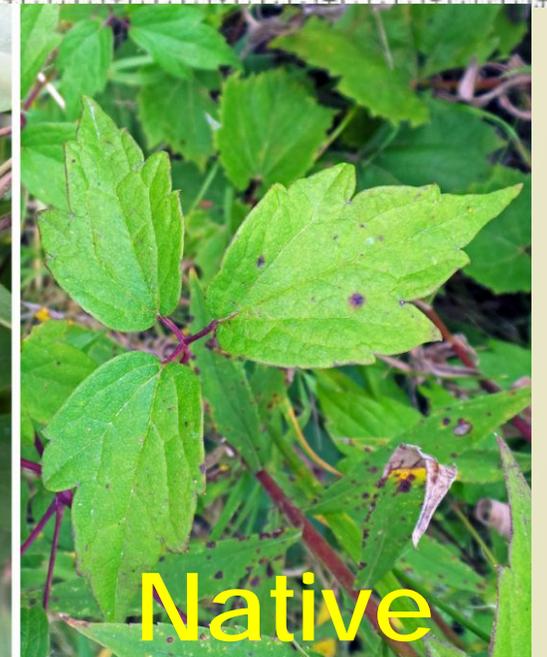
# Japanese clematis

## *Clematis terniflora*

Images courtesy of JK Marlow



Exotic



Native

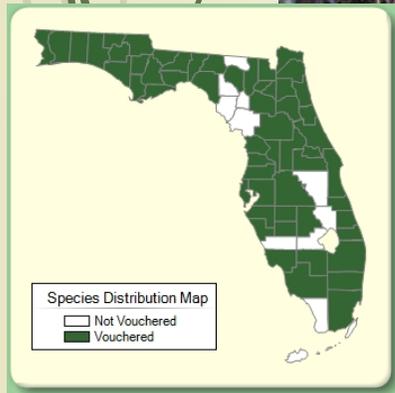


# Japanese clematis

## *Clematis terniflora*

- ▶ Treatment
- ▶ Foliar: 2-3% Garlon 3A,
- ▶ Basal bark :15% Garlon 4 oil for basal-bark applications
- ▶ Cut stump
- ▶ Foliar application of glyphosate (e.g. 3% Roundup ) provides good, but short-term control.

# Japanese climbing fern *Lygodium japonicum*





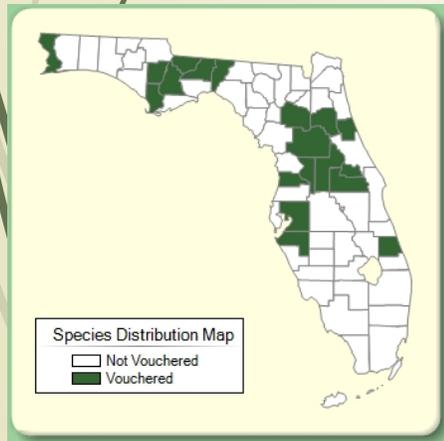
# Japanese climbing fern

## *Lygodium japonicum*

- ▶ Treatment:
- ▶ **Foliar:** 2% glyphosate product, or Plateau 40 oz/100 gal.
- ▶ Comments: Fern with twining, climbing fronds, leaflets lobed. Occurs throughout west and north Florida, moving into central Florida. Smothers seedlings of overstory tree species.

# *Tradescantia fluminensis*

## Small-leaved spiderwort





# Small-leaved spiderwort

## *Tradescantia fluminensis*

- ▶ Treatment:
- ▶ **Manual:** hand pull small patches.
- ▶ **Foliar:** 1–2% Garlon 3A.
- ▶ Comments: Plants recover from very small fragments. Dense mats may also require retreatment. This species is exceptionally frustrating due to its rapid recovery from seed.

Natal grass  
*Melinis repens*





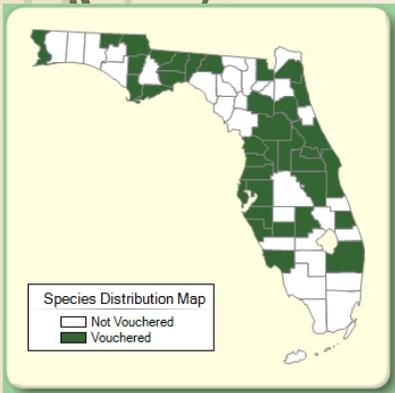
# Natal grass

## *Melinis repens*

- ▶ Treatment:
  - ▶ **Foliar** applications of glyphosate 2–3 quarts per acre or 1–2% v/v; imazapyr 0.5–1 quart per acre or 0.5–1% v/v. Hexazinone at 1–2 quarts per acre is also effective. Imazapic (Plateau, Impose, others) at 12 oz per acre for seed suppression.
  - ▶ Comments: New seedlings are common following glyphosate treatment. Imazapyr and hexazinone provide some residual control, but may prevent recovery of desirable native species. Imazapic can be used to reduce seed production and provide better selectivity to native species.
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# Coral ardisia

*Ardisia crenata*



# Coral ardisia

## *Ardisia crenata*

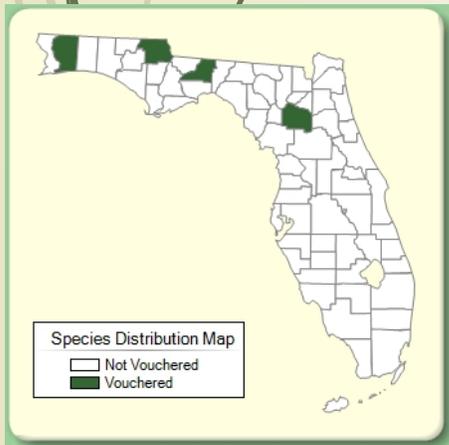
- ▶ Treatment:
- ▶ **Hand Pull** – Get entire root system
- ▶ **Basal bark:** 10% Garlon 4.
- ▶ **Foliar:** 3% Garlon 3A. The addition of 1% Plateau to Garlon 3A as a foliar treatment may provide preemergent suppression of new seedlings for several months.
- ▶ Comments: Small shrub, easily recognized by shiny, leathery leaves, with scalloped margins, calluses in the margin notches, and persistent bright red (sometimes white) fruits.



# Japanese ardisia

## *Ardisia japonica*

(photos courtesy of Grace Howell)



(photos courtesy of Grace Howell)



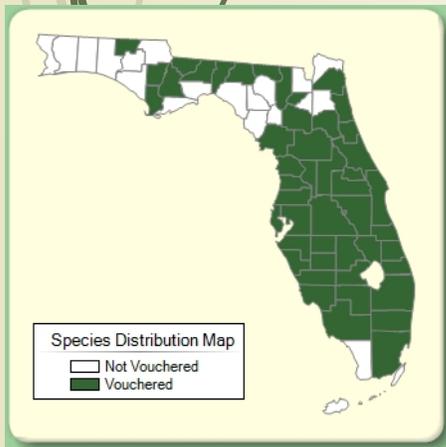
**Ardisia japonica**  
**Japanese ardisia**



**Carolina laurelcherry**  
**Prunus caroliniana**



# Tropical soda apple *Solanum viarum*



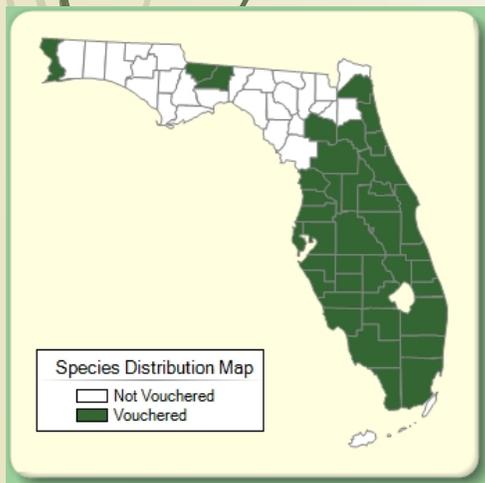
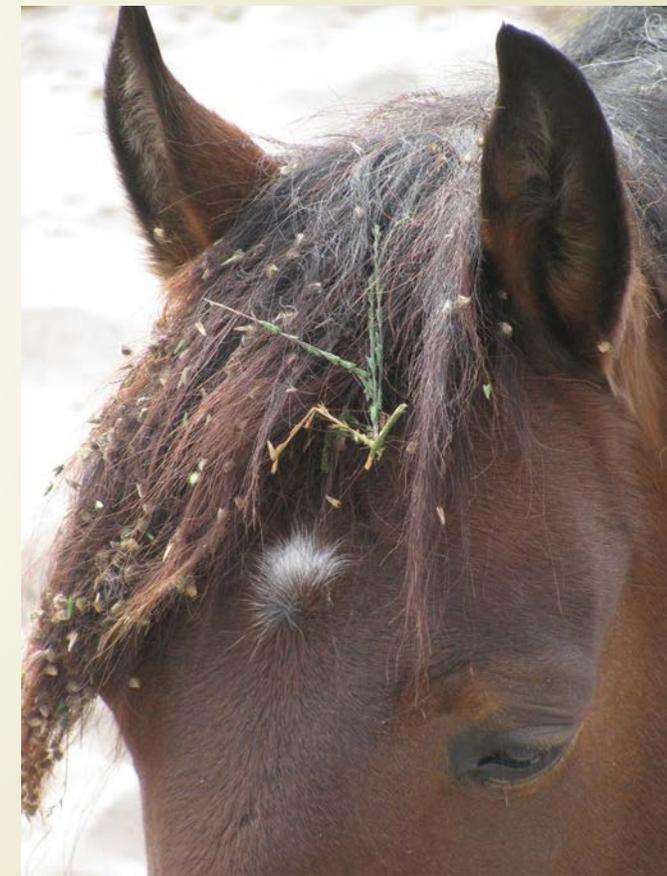


# Tropical soda apple

## *Solanum viarum*

- ▶ Treatment:
- ▶ **Hand pull** and destroy individual plants when practical.
- ▶ **Foliar:** 0.15–0.25% Milestone, 1% Garlon 4, 3% glyphosate product, or 0.5% Arsenal.
- ▶ Comments: Destroy fruit and treat plants immediately after detection. Spreads rapidly. Livestock and wild animals eat fruits and readily disperse seed.
- ▶ Best results are obtained with the use of a non-ionic surfactant (0.25% v/v) in the spray mix

# Caesarweed *Urena lobata*





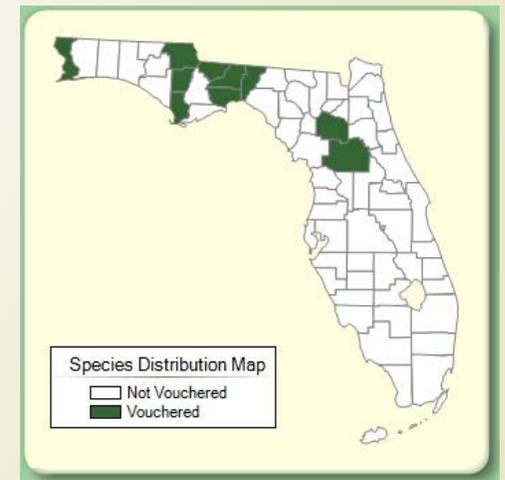
# Caesarweed

## *Urena lobata*

- ▶ Treatment:
- ▶ **Foliar** applications of 1% 2,4-D, 1% Garlon 4 (in water), 1% Vista XRT, or 0.15% Milestone (1 fl oz per 5 gallons of water) are effective, even on mature plants.
- ▶ Comments: Undershrub growing from 1.5 to 8 feet in height. Leaves are shallowly 3- to 5-lobed with the upper surface coated in rough hairs. Barbed fruits stick to clothing and fur, aiding in dispersal.

# Nandina/ Heavenly bamboo

*Nandina domestica*



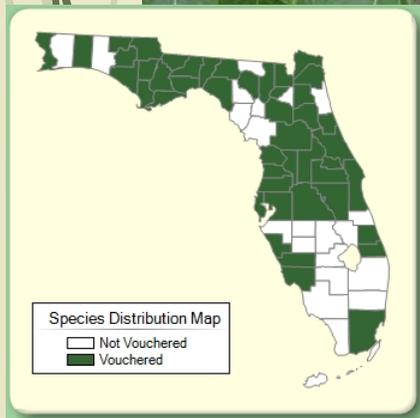
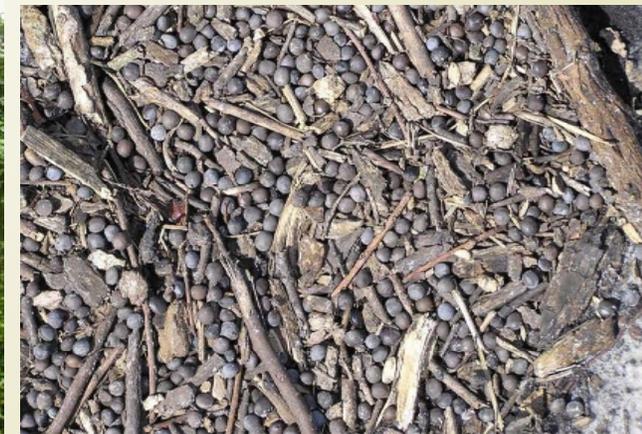


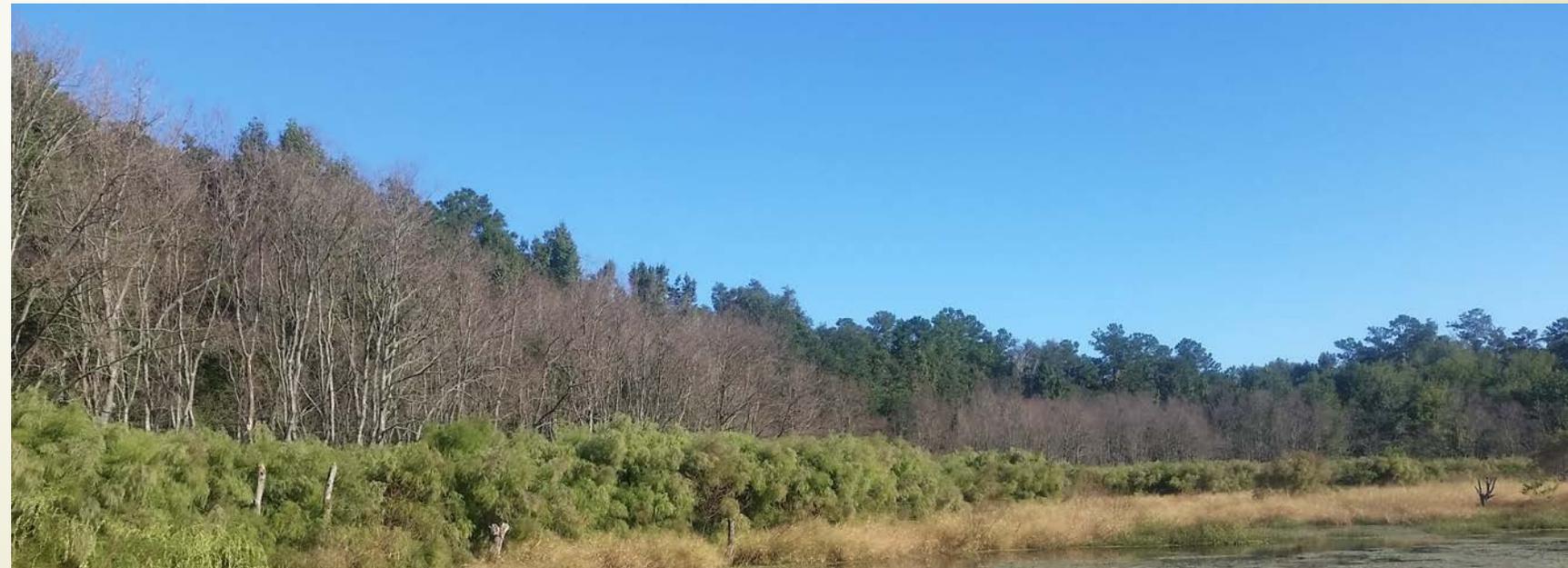
# Nandina/ Heavenly bamboo

## *Nandina domestica*

- ▶ Treatment:
  - ▶ **Manual:** hand pull seedlings and juveniles. Multi-stemmed clumps are very difficult to hand pull.
  - ▶ **Basal bark:** 15% Garlon 4. Collect and destroy attached fruits.
  - ▶ Comments: Naturalized throughout the Panhandle and north central Florida.
- 

# Chinese tallow *Triadica sebifera*







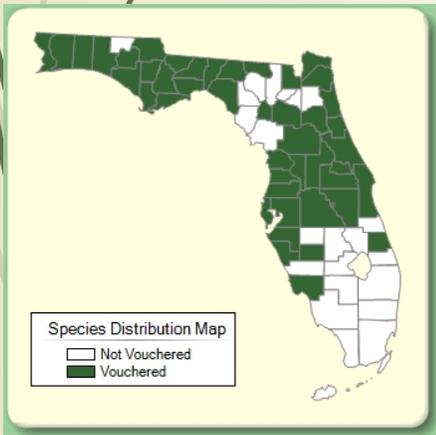
# Chinese tallow

## *Triadica sebifera*

- ▶ Treatment:
- ▶ **Cut stump:** 10% Milestone, 50% Garlon 3A or Renovate, 20–30% Garlon 4, 10% Habitat. Basal bark: 20% Garlon 4 or 100% Pathfinder II. Addition of 3% Stalker will reduce resprouting on older trees.
- ▶ **Foliar:** 2% Clearcast, 0.5–0.75% Arsenal or Habitat, 0.5% Method.
- ▶ **Incision point application:** one hack for every 6 inches DBH, 100% Method, 0.5 mL per hack. Some follow-up treatment may be necessary for lateral root sprouts.
- ▶ **Comments:** Extremely aggressive tree with broad ecological tolerance. Resprouting from lateral roots is common. Re-treatment for resprouts and new seedlings is almost always necessary.

# Camphor tree

*Cinnamomum camphora*





# Camphor tree

## *Cinnamomum camphora*

- ▶ Treatment:
- ▶ **Cut stump:** 50% Garlon 3A.
- ▶ **Basal bark:** 20% Garlon 4.
- ▶ Comments: Leaves exhibit a strong camphor odor when crushed. Abundant in north and central Florida.



# Acknowledgements

- ▶ UF IFAS – Center for Aquatic and Invasive Plants
  - ▶ SP 242 -- *Integrated Management of Non-native Plants in Natural Areas of Florida*, Stephen F. Enloe, Ken Langeland, Jason Ferrell, Brent Sellers, and Greg MacDonald. 2018  
<http://edis.ifas.ufl.edu/pdffiles/WG/WG20900.pdf>
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