IFAS Assessment of Non-Native Plants in Florida’s Natural Areas

Nandina domestica (heavenly bamboo)

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@IFASassessment http://plants.ifas.ufl.edu/assessment/
• ~85% of all non-native plants enter through Florida
• 1300 non-native species established in Florida /124 currently found in state parks
• Significant impacts to recreation/expensive to manage
• Cost >$34 million/year to control on public land (2004-05)

Lygodium microphyllum  Melaleuca quinquenervia  Eichhornia crassipes
What is The Assessment?

- Tools to assess the status of species currently present in the state
  - Reduce cost & increase efficiency of management efforts
- Protocol to predict the potential invasiveness of species proposed for release
  - Preemptively stop future invasions
Outline

• History & purpose of the Assessment
• 3 tools
  – Status assessment
  – Predictive tool
  – Infraspecific taxon protocol
• New species additions
• Reassessments
• The website
History & Purpose

• Developed in 1999
• UF/IFAS Invasive Plants Working Group
• Descriptions & recommendations for use & management
• 2008 Predictive Tool & Infraspecific Taxon Protocol
Status Assessment

- Evaluates species already in Florida
- 3 Zones
- Describe the status of the species
  - Ecological impacts
  - Potential for expanded distribution in Florida
  - Management difficulty
  - Economic value
- Incorporates field data from experts
Status Assessment

Possible Results

1. **Not considered a problem** species at this time & may be recommended (reassess in 10 years)

2. **Caution** – may be recommended but manage to prevent escape (reassess in 2 years)

3. **Invasive & not recommended except for any ‘specified & limited’** use approved by IFAS Invasive Plants Working Group (reassess in 2 years)

4. **Invasive & not recommended** (reassess in 10 years)
Predictive Tool

• Evaluates species
  – New to state
  – Causes problems elsewhere
  – Proposed for new use

• Rigorous literature search

• Correctly identified high and low risk species with 90 & 70% accuracy (Gordon et al. 2009)
Predictive Tool

• Series of 49 questions
  – Domestication/cultivation
  – Climate/distribution
  – Weed elsewhere?
  – Weedy traits
  – Plant type
  – Reproduction
  – Dispersal mechanisms
  – Persistence attributes

• Scoring
  <1 Low Risk for Invasion
  >6 High Risk for Invasion
  1-6 Evaluate Further

History/biogeography
  }  Life history/ecology
Secondary Screening

Pacific second screening: decision rules for species with WRA scores between 1 and 6
(from Daehler et al. 2004)

Tree or tree-like shrub
A. (Shade tolerant OR known to form dense stands) AND B. Bird- OR clearly wind-dispersed
Life cycle < 4 years?
yes
no
reject

evaluate further

Herb or low stature shrubby life form
Reported as a weed of cultivated lands?
no
yes

Unpalatable to grazers OR known to form dense stands?
yes
no
reject

evaluate further

Vines must pass both tests
Microstegium vimineum

Example Q & A’s

• 2.03 “Broad climate suitability (environmental versatility) “
  – Yes, USDA zones 5a-11 +1

• 4.09 “Is a shade tolerant plant at some stage of its life cycle”
  – Yes, although a C4 grass, adapted to low light +1

• 7.04 “Propagules adapted to wind dispersal”
  – No, adaptations for wind dispersal -1

• 7.06 “Propagules dispersed by animals (externally)”
  – Yes, seeds can attach to fur, feathers, etc. +1
# Scores & Predictions

<table>
<thead>
<tr>
<th>Species</th>
<th>Score</th>
<th>Risk of Invasion</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Arundo donax</em></td>
<td>11</td>
<td>High</td>
</tr>
<tr>
<td><em>Barringtonia racemosa</em></td>
<td>3</td>
<td>Evaluate</td>
</tr>
<tr>
<td><em>Eucalyptus gunnii</em></td>
<td>1</td>
<td>Low</td>
</tr>
<tr>
<td><em>Eucalyptus macarthurii</em></td>
<td>5</td>
<td>Evaluate</td>
</tr>
<tr>
<td><em>Eucalyptus tereticornis</em></td>
<td>10</td>
<td>High</td>
</tr>
<tr>
<td><em>Lantana montevidensis</em></td>
<td>29</td>
<td>High</td>
</tr>
<tr>
<td>L 79-1002 Sugarcane</td>
<td>-1</td>
<td>Low</td>
</tr>
<tr>
<td><em>Microstegium vimineum</em></td>
<td>24</td>
<td>High</td>
</tr>
</tbody>
</table>

- 74 species evaluated to date
- 43 species scheduled for evaluations in 2013
Biomass Planting Rule

“to control the introduction into, or movement within, Florida of plant species intended for biomass plantings.”

• Requires permit to plant >2 contiguous acres

• By law, include weed risk assessment
Bioenergy Crops

Miscanthus x giganteus
LOW RISK

Pennisetum purpureum
HIGH RISK

Arundo donax
HIGH RISK
Infraspecific Taxon Protocol

• Cultivars, varieties, or sub-species of resident species
• Determine if recommendations for resident species apply
• Request submitted to IFAS Assessment staff
  • Supporting evidence indicating the taxon is a distinct entity
  • Reasons for expecting the taxon to behave differently resulting in different recommendations
Nandina domestica

• North, Central = Invasive
  – Specified limited use approved

• South = Caution
  – may be recommended/manage to prevent escape
Nandina domestica cvs.

Firepower, Harbour dwarf, & Gulf Stream: ok to recommend
All zones

Jaytee (Harbour Belle) = Same as resident species
(North, Central = No unless limited use approved; South = Caution)
New Additions 2012-2013

775 species evaluated

- 12 new species
- Conclusions amended 104 species

Conclusions of the IFAS Assessment

- Not a problem species: 69%
- Invasive: 10%
- Caution: 13%
- Predicted to be invasive: 5%
- Prohibited: 3%
Re-evaluations 2013

- *Miscanthus sinensis*
  - Not a problem all zones 10 yr
- *Elaeagnus pungens*
  - Caution all zones 2 yr
- *Cinnamomum camphora*
  - Invasive, not recommended North, Central
  - Not a problem South 10 yr
- *Lonicera japonica*
  - Invasive, not recommended all zones 10 yr
## Re-evaluations 2013

<table>
<thead>
<tr>
<th>Adenanthera pavonina</th>
<th>Elaeagnus pungens</th>
<th>Pennisetum alopecuroides</th>
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<tbody>
<tr>
<td>Agave sisalana</td>
<td>Hibiscus cannibinus</td>
<td>Pennisetum setaceum</td>
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<tr>
<td>Ardisia crenata</td>
<td>Koelreuteria elegans subsp. formosana</td>
<td>Pithecellobium dulce</td>
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<td>Ardisia japonica</td>
<td>Landoltia punctata</td>
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<td>Asparagus setaceus</td>
<td>Ligustrum lucidum</td>
<td>Salvinia minima</td>
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<td>Bischofia javanica</td>
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<td>Broussonetia papyrifera</td>
<td>Melia azedarach</td>
<td>Sesbania punicea</td>
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<td>Buddleja lindleyana</td>
<td>Melinis minutiflora</td>
<td>Sporobolus indicus</td>
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<td>Canavalia brasiliensis</td>
<td>Miscanthus sinensis</td>
<td>Syzygium cumini</td>
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<td>Cinnamomum camphora</td>
<td>Momordica charantia</td>
<td>Thespesia populnea</td>
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<td>Citrus × aurantium</td>
<td>Nandina domestica</td>
<td>Urena lobata</td>
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<td>Cocos nucifera</td>
<td>Nymphoides cristata</td>
<td>Zamia furfuracea</td>
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<td>Colocasia esculenta</td>
<td>Panicum repens</td>
<td>Zeuxine strateumatica</td>
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Website

Click Here for a Quick Guide to the links on the left

The IFAS Assessment of Non-Native Plants in Florida's Natural Areas (IFAS Assessment) was developed by the UF/IFAS Invasive Plants Working Group so that Extension faculty could provide consistent recommendations concerning the use of non-native plants. The Assessment and the Working Group were created in response to the growing awareness of the threat posed (especially to threatened and endangered species) by non-native invasive species. Learn more about how and why the IFAS Assessment was developed.

The process by which recommendations are derived is well-documented and open to review. When plant species are assessed, data are collected from all available resources by designated IFAS staff. The IFAS Assessment system is typically applied to species in each of three climate zones in Florida: north, central, and south. The IFAS Assessment has three components. The main one is the Status Assessment and from this the use of the Predictive Tool or Infraspecific Taxon Protocol may be decided.

If a species is already prohibited by state or federal law no further assessment is needed because the species cannot be recommended for use. All other species are initially evaluated using the Status Assessment and as this is completed, information is organized to provide Results that describe the status of the species for four specific topics:

- Ecological impacts
- Potential for expanded distribution in Florida
- Management difficulty
- Economic value

Such results are reported as scores (for Ecological Impacts and Management Difficulty) or as a low or high status (for Potential for Expanded Distribution in Florida and Economic Value). For examples of results, click on the “Results Table” link in the sidebar.

From these Results, Conclusions are derived which specify what recommendations can be made about each species. These Conclusions are:

- Not considered a problem species at this time and may be recommended by IFAS faculty (reassess in 10 years)
- Caution – may be recommended by IFAS faculty but manage to prevent escape (reassess in 2 years)
- Invasive and not recommended by IFAS faculty except for any ‘specified and limited’ use that has been approved by the IFAS Invasive Plants Working Group (reassess in 2 years)
- Invasive and not recommended by IFAS faculty (reassess in 10 years)

If the species has not yet been assessed, the Conclusion is essentially that for a non-invasive species (Not yet assessed; not considered a problem species at this time and may be recommended by IFAS faculty). However, this Conclusion may be changed upon assessment; please check for the latest updates in the Conclusions Tables (link in the sidebar).

If species have not escaped into Florida's natural areas but are either recent arrivals to the state or have been known to cause problems in areas with similar habitats and climate to Florida, the Status Assessment directs the use of a predictive tool. The Australian Weed Risk Assessment system has been adapted for use in Florida to complete the assessment of such species (“The Predictive Tool” link in the sidebar).

The Status Assessment is generally applied at the species level. It is only applied independently to infraspecific taxa (e.g., cultivars, varieties, or sub-species) if these taxa can be clearly distinguished in the field and are not likely to revert. (Throughout the Status Assessment, reference to the species under consideration could also refer to such distinct infraspecific taxa). Other infraspecific taxa may be proposed for assessment using the Infraspecific Taxon Protocol (link in the sidebar). This protocol uses the same conclusions as the Status Assessment so even though they are derived differently, the conclusions for these infraspecific taxa are reported in the Conclusions Tables with those for all species evaluated using the Status Assessment.
Website

View results
- Comprehensive list
- By zone
- By recommendation

Conclusions are updated several times a year and should be referenced. Please check the Conclusions Tables each time you cite the IFAS Assessment to be sure that you are using the most up-to-date information.

<table>
<thead>
<tr>
<th>All Species &amp; Zones</th>
<th>North Zone</th>
<th>Central Zone</th>
<th>South Zone</th>
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<td>Conclusions by Genus</td>
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Footnotes DOC (41 KB) - Contains all footnotes found on the Conclusions table by genus and common names only.
Website

- Links to protocols & request forms
- Additional tabs
  - Detailed data: results by species
  - Description of zones by county
- Experts always needed
Contact Us

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