Mid-Atlantic Invaders Tool
A New Information Portal for Invasives in the Mid-Atlantic States

Judy Fulton
EcoPlant Consulting: Native & Invasive Plants Board, Mid-Atlantic Invasive Plant Council
Maryland Invasive Species Council

Jil Swearingen
Invasive Species Consultant, In the Weeds Board, Mid-Atlantic Invasive Plant Council
Maryland Invasive Species Council

Chuck Bargeron
Associate Director for Invasive Species & IT Center for Invasive Species & Ecosystem Health
University of Georgia
Goal of Mid-Atlantic Invaders Tool

Provide a powerful tool for people with diverse backgrounds, interests and skills to obtain up-to-date information on invasive species

Japanese Barberry (Berberis thunburgii)
Leslie J. Mehrhoff
University of Connecticut
Bugwood.org
MAIT Uses

Provide vital data for individuals and organizations to:

- Become more aware of invasives
- Report the presence of invasives
- Implement early detection/rapid response to prevent establishment of new invasives
- Inform policy-makers
- Solicit funding for research, control and prevention
- Foster collaborations

Waterwheel (Aldrovanda vesiculosa)
Jan Wieneke, Wikimedia Commons 8/4/05
Provide vital data for individuals & organizations to:

- Control invasives more effectively in the field
- Understand importance of being responsible in:
  - Choosing non-invasive plants for landscaping
  - Enjoying recreational activities without spreading invasive plants, animals and pathogens

Purple Loosestrife, (*Lythrum salicaria*)
Judy Fulton 8/18/15
MAIT Constituencies

- Public & private organizations or individuals
  - Government agencies
  - Educational institutions
  - Policy-makers
  - Landscape architects
  - Invasive species managers
  - The public
  - The media

- Beginners to experts

Japanese Knotweed (Fallopia japonica)
Tom Heutte, USDA Forest Service
www.invasive.org
Limitations of Existing Lists

Invasive Species of Concern in Maryland

**Aquatic Plants**

This list includes updates as ratified at the May 17, 2018 MISC Meeting.

<table>
<thead>
<tr>
<th>Key Code</th>
<th>Scientific Name</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>* Aldrovanda vesiculosa</td>
<td>Waterwheel plant</td>
</tr>
<tr>
<td>1, 2, 3</td>
<td>* Caulerpa taxifolia</td>
<td>Marine Macroalgae</td>
</tr>
<tr>
<td>2</td>
<td>* Didymosphenia geminata</td>
<td>Didymo, Rock Snot</td>
</tr>
<tr>
<td>*</td>
<td>* Egeria densa</td>
<td>Brazilian Waterweed</td>
</tr>
<tr>
<td>* 1, 2, 3</td>
<td>* Eichhornia crassipes</td>
<td>Water Hyacinth</td>
</tr>
<tr>
<td>1, 2, 3</td>
<td>* Hydrilla verticillata</td>
<td>Hydrilla</td>
</tr>
<tr>
<td>1, 2</td>
<td>* Iris pseudacorus</td>
<td>Yellow iris</td>
</tr>
<tr>
<td>2, 3</td>
<td>* Myriophyllum aquaticum</td>
<td>Parrot Feather</td>
</tr>
<tr>
<td>1, 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2, 3</td>
<td>* Myriophyllum spicatum</td>
<td>Eurasian Water-Milfoil</td>
</tr>
<tr>
<td></td>
<td>* Pistia stratiotes</td>
<td>Water Lettuce</td>
</tr>
</tbody>
</table>
MAIT Design

Mid-Atlantic Invaders Tool (MAIT)
Delaware, District of Columbia, Maryland, New Jersey, Pennsylvania, Virginia, West Virginia

Frequently Asked Questions

What is a native species?
What is a non-native or 'alien' species?
What is an invasive species?
MAIT Strengths

- Ease of use for beginners
- More sophisticated tools for power users
- Customizable features
- Established technical platform in nationally used invasive.org
- Regional orientation, not national
- Excellent maintenance capabilities
  - Links to other databases
  - Invasive.org database updates automatically showing in MAIT

Chinese Silvergrass
(*Miscanthus sinensis*)
James H. Miller
USDA Forest Service
Bugwood.org
Invasive.org Platform

Diseases

- Root/Butt Diseases
- Stem Decays/CANKERS
- Foliage Diseases
- Decline Complexes Dieback/Wilts
- Stem Rusts
- Broom Rusts
- Biotic Damage
- Diseases of Insects
- Fungi

More Sources of Disease Images

- Diseases of Crops
- Invasive / Exotic Diseases
- American Phytopathological Society

Photo by Robert Anderson, USDA Forest Service
MAIT System Capabilities

- Add useful features to invasive.org
- Offer flexible online data access
- Tailor to interest level & expertise
- Enable users to
  - View default tables by taxa
  - Select a subset of a table
  - Sort a table by data type
  - Create a customized table by selecting from data elements
  - Search for particular species and call up a dedicated webpage
- Offer downloads in formats for manipulating data

Norway Maple (Acer plananoides)
Zelimir Borzan, University of Zagreb, Bugwood.org
MAIT Data Sources: Databases

- All Invasives: Invasive.org, Center for Invasive Species, Univ. of Georgia
- Plants: USDA-ARS Germplasm Resources Information Network (GRIN)
- Plants: Wetland Ratings, U.S. Army Corps of Engineers
- Grasses: Tropicos Catalogue of New World Grasses
- Taxonomy: ITIS.gov, Integrated Taxonomic Information System
- Aquatics: Nonindigenous Aquatic Species, USGS
- Aquatics: National Exotic Marine & Estuarine Species Information System
MAIT Data Sources: Databases

**Plant Viruses:** International Committee on Taxonomy of Viruses

**Plant Fungi:** Index Fungorum, Royal Botanical Gardens Kew

**Plant Bacteria:** Bull, C.T. et al., Comprehensive List of Names of Plant Pathogenic Bacteria, Journal of Plant Pathology

**Nematodes:** Plant & Insect Parasitic Nematodes, Univ. of Nebraska

**Insect Plant Pests:** EPPO Global Database, European and Mediterranean Plant Protection Organization

**Mollusks:** MolluscaBase, Multiple Malacologists
Input from expert scientists on taxa at State of MD departments

Pathogens
Insects

Aquatic species
Non-aquatic vertebrates

Crown Gall
(Rhizobium radiobacter)
Brian Olsen
Oklahoma State University
Bugwood.org

Common Water Hyacinth
(Eichhornia crassipes)
Wilfredo Robles, Mississippi State University
Bugwood.org
MAIT Data Sources: Lists

- 29 Lists from throughout Mid-Atlantic region
  - Delaware
  - District of Columbia
  - Maryland
  - New Jersey
  - Pennsylvania
  - Virginia
  - West Virginia
  - Entire Mid-Atlantic region

- Taxa on lists
  - All with invasive plants
  - Some with species in all taxa
The following organisms are invasive or at risk for becoming invasive in the Mid-Atlantic region. To reorder the table, click on a column heading. For more information on a species, click on the species name.

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Habit</th>
<th>Habitat</th>
<th>Aquatic Form</th>
<th>Ornamental</th>
<th>Regulated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acer platanoides</td>
<td>Norway maple</td>
<td>Tree</td>
<td>Terrestrial</td>
<td></td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>Acorus calamus</td>
<td>American sweetflag</td>
<td>Forb</td>
<td>Aquatic</td>
<td>Emergent</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>Ailanthus altissima</td>
<td>Tree-of-heaven</td>
<td>Forb</td>
<td>Aquatic/Wetland</td>
<td></td>
<td>Yes</td>
<td>WV</td>
</tr>
<tr>
<td>Akebia quinata</td>
<td>Chocolate vine</td>
<td>Vine</td>
<td>Terrestrial</td>
<td></td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>Albizia julibrissin</td>
<td>Mimosa</td>
<td>Tree</td>
<td>Terrestrial</td>
<td></td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>Alliaria petiolata</td>
<td>Garlic mustard</td>
<td>Forb</td>
<td>Aquatic/Wetland</td>
<td></td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>Allium vineale</td>
<td>Wild garlic</td>
<td>Forb</td>
<td>Aquatic/Wetland</td>
<td></td>
<td>Yes</td>
<td>DE, MD, NJ, PA, VA, WV</td>
</tr>
<tr>
<td>Aralia elata</td>
<td>Japanese angelica</td>
<td>Tree</td>
<td>Terrestrial</td>
<td></td>
<td>Yes</td>
<td>N/A</td>
</tr>
</tbody>
</table>
## Standard plant table:
- **Scientific name**
- **Common name**
- **Habit** (e.g., tree, forb)
- **Aquatic/wetland/terrestrial**
- **Aquatic form** (e.g., SAV)
- **Ornamental**
- **Regulatory**

### Kudzu

*(Pueraria montana var. lobata)*

Mark Atwater

Weed Control Unlimited, Inc.

Bugwood.org

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**Kudzu**

*(Pueraria montana var. lobata)*

Johnny Randall

North Carolina Botanical Garden

Bugwood.org
MAIT Example: Customized Table

- Customized plant table with user-selected data such as:
  - Taxonomic family
  - Taxonomic subfamily or tribe
  - Scientific name synonyms
  - Uses (e.g., forage)
  - Wetland indicator status
  - Native range
  - Mid-Atlantic states & invasive sources listing the species

Tawny Daylily (Hemerocallis fulva)
Dan Tenaglia, Missouriplants.com, Bugwood.org
MAIT Example: Species Webpage

- One webpage per species with additional data:
  - Species description
  - Resource links (e.g., control suggestions)
  - Distribution maps
  - Photos

U.S. Distribution of Tree-of-Heaven
(*Ailanthus altissima*)
EDDMapS 2018
Early Detection & Distribution Mapping System
The University of Georgia
Center for Invasive Species and Ecosystem Health
Future Directions

- Add new species as they become invasive or at risk in Mid-Atlantic
- Continue to add and maintain data on individual species
  - Downloads from other databases
  - Manual entry
- Link to EDDMapS/MAEDN
- Investigate link to ID feature in iNaturalist
- Make MAIT’s features available to other users of invasive.org (e.g., customized reports)

Linden Viburnum (Viburnum dilatatum)
Hamachidori, Wikimedia Commons 11/15/10

Linden Viburnum (Viburnum dilatatum)
Kenpel, Wikimedia 11/12/10
MAIT Collaborators & Funding Sources
Questions?

Judy Fulton
EcoPlant Consulting: Native & Invasive Plants
jfulton5@gmail.com
410-337-3701

Jil Swearingen
Invasive Species Consultant, In the Weeds
jilswearingen@gmail.com

Chuck Bargeron
Associate Director for Invasive Species and Information Technology
Center for Invasive Species & Ecosystem Health, University of Georgia
cbargero@uga.edu

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