

Assessing and Ranking Invasive Plant Species in Virginia

Kevin Heffernan

Stewardship Biologist

DCR Division of Natural Heritage



Virginia Invasive Plant Species List



Tree-of-heaven



Phragmites



Scientific Name	Common Name	Virginia Invasiveness Rank	REGION		
			Mountain	Piedmont	Coastal
<i>Ailanthus altissima</i>	Tree-of-heaven	High	•	•	•
<i>Alliaria petiolata</i>	Garlic Mustard	High	•	•	•
<i>Alternanthera philoxeroides</i>	Alligator-weed	High			•
<i>Ampelopsis brevipedunculata</i>	Porcelain-berry	High		•	•
<i>Carex kobomugi</i>	Japanese Sand Sedge	High			•
<i>Celastrus orbiculatus</i>	Oriental Bittersweet	High	•	•	•
<i>Centaurea stoebe</i> ssp. <i>micranthos</i>	Spotted Knapweed	High	•	•	•
<i>Cirsium arvense</i>	Canada Thistle	High	•	•	•
<i>Dioscorea polystachya</i>	Cinnamon Vine	High	•	•	•
<i>Elaeagnus umbellata</i>	Autumn Olive	High	•	•	•
<i>Euonymus alatus</i>	Winged Euonymus	High	•	•	
<i>Ficaria verna</i>	Lesser Celandine	High		•	•
<i>Hydrilla verticillata</i>	Hydrilla	High	•	•	•
<i>Iris pseudacorus</i>	Yellow Flag	High	•	•	•
<i>Lespedeza cuneata</i>	Chinese Lespedeza	High	•	•	•
<i>Ligustrum sinense</i>	Chinese Privet	High	•	•	•
<i>Lonicera japonica</i>	Japanese Honeysuckle	High	•	•	•
<i>Lonicera maackii</i>	Amur Honeysuckle	High	•	•	•
<i>Lonicera morrowii</i>	Morrow's Honeysuckle	High	•	•	
<i>Lythrum salicaria</i>	Purple Loosestrife	High	•	•	•
<i>Microstegium vimineum</i>	Japanese Stiltgrass	High	•	•	•

A Venus flytrap (Dionaea muscipula) is shown in a green plastic pot on a grassy lawn. The plant has a thick, green, ribbed stem that curves upwards. At the top of the stem is a large, red, spotted structure that resembles a flower head with a wide, open mouth. The mouth is lined with white tissue and contains several sharp, yellowish teeth. The background is a red brick wall.

Is this species “invasive?”

A definition

Invasive species are introduced species that cause or have the potential to cause ecological or economic harm or harm to humans.

--Executive Order 13112



The Invasive Species Assessment Protocol: A Tool for Creating Regional and National Lists of Invasive Nonnative Plants That Negatively Impact Biodiversity

Author(s): John M. Randall, Larry E. Morse, Nancy Benton, Ron Hiebert, Stephanie Lu, and Terri Killeffer

Source: *Invasive Plant Science and Management*, 1(1):36-49. 2008.

Published By: Weed Science Society of America

DOI: 10.1614/IPSM-07-020.1

URL: <http://www.bioone.org/doi/full/10.1614/IPSM-07-020.1>

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400,000 +/-



plant species on Earth



18,000 +/-

*plant species in North
American flora*



30,000 +/-

*plant species introduced
to North America*



5,000 +/-

*plant species naturalized
in North America*

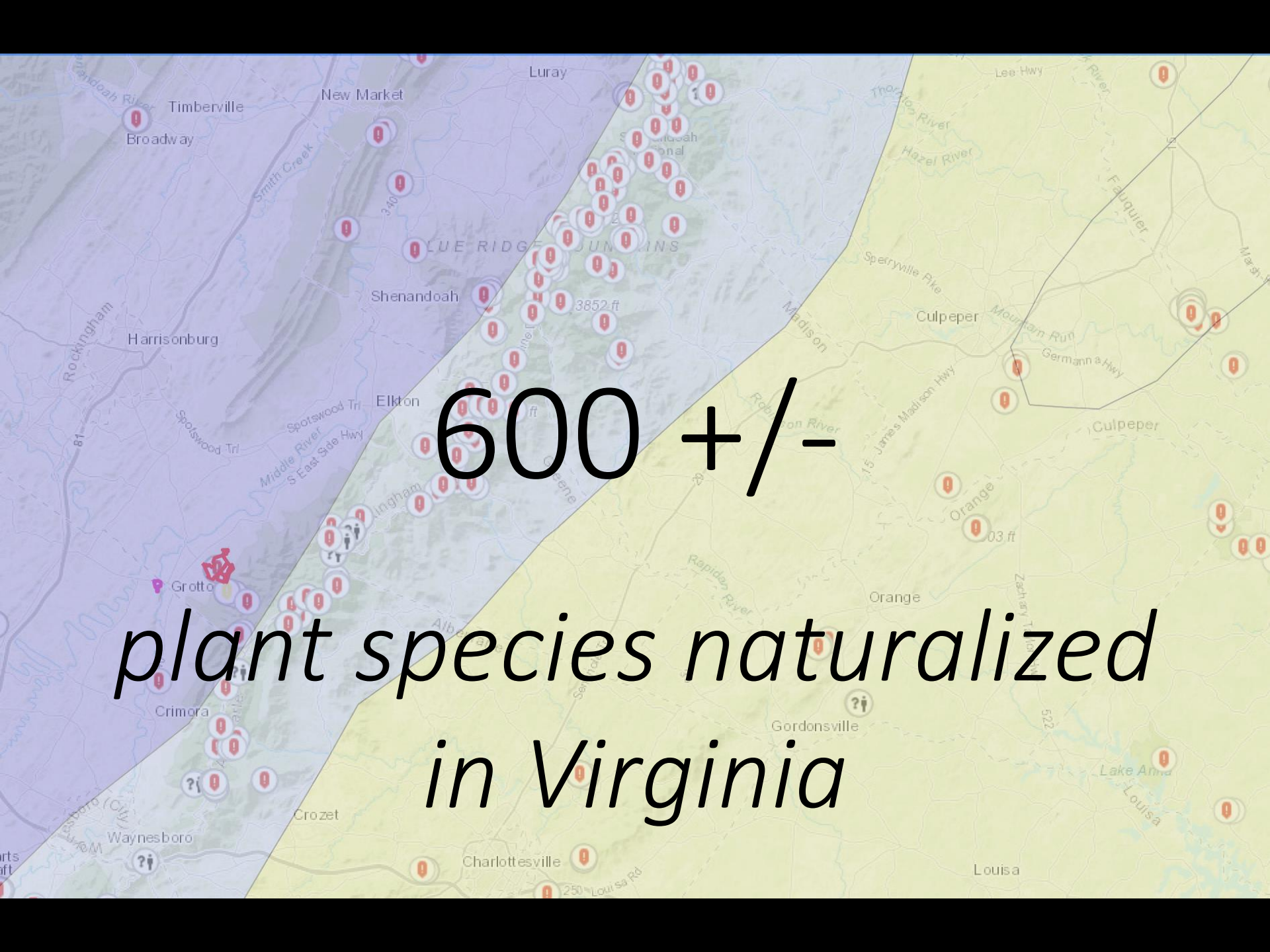
500 +/-

*plant species considered
“invasive”*

A map of Virginia showing county boundaries and a color-coded distribution of plant species. The colors range from light green in the western mountains to dark blue in the coastal plain. The text is overlaid on the central part of the map.

3,164 +/-

*plant species in
Virginia*



600 +/-

*plant species naturalized
in Virginia*

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Carex kobomugi	Japanese Sand Sedge	High			•
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Cirsium arvense	Canada Thistle	High	•	•	•
Dioscorea polystachya	Cinnamon Vine	High	•	•	•
Elaeagnus umbellata	Autumn Olive	High	•	•	•
Euonymus alatus	Winged Euonymus	High	•	•	
Ficaria verna	Lesser Celandine	High		•	•
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Lonicera japonica	Japanese Honeysuckle	High	•	•	•
Lonicera maackii	Amur Honeysuckle	High	•	•	•
Lonicera morrowii	Morrow's Honeysuckle	High	•	•	
Lythrum salicaria	Purple Loosestrife	High	•	•	•
Microstegium vimineum	Japanese Stiltgrass	High	•	•	•
Murdannia keisak	Marsh Dewflower	High	•	•	

90

*plant species on the DCR
Invasive Plant Species List*

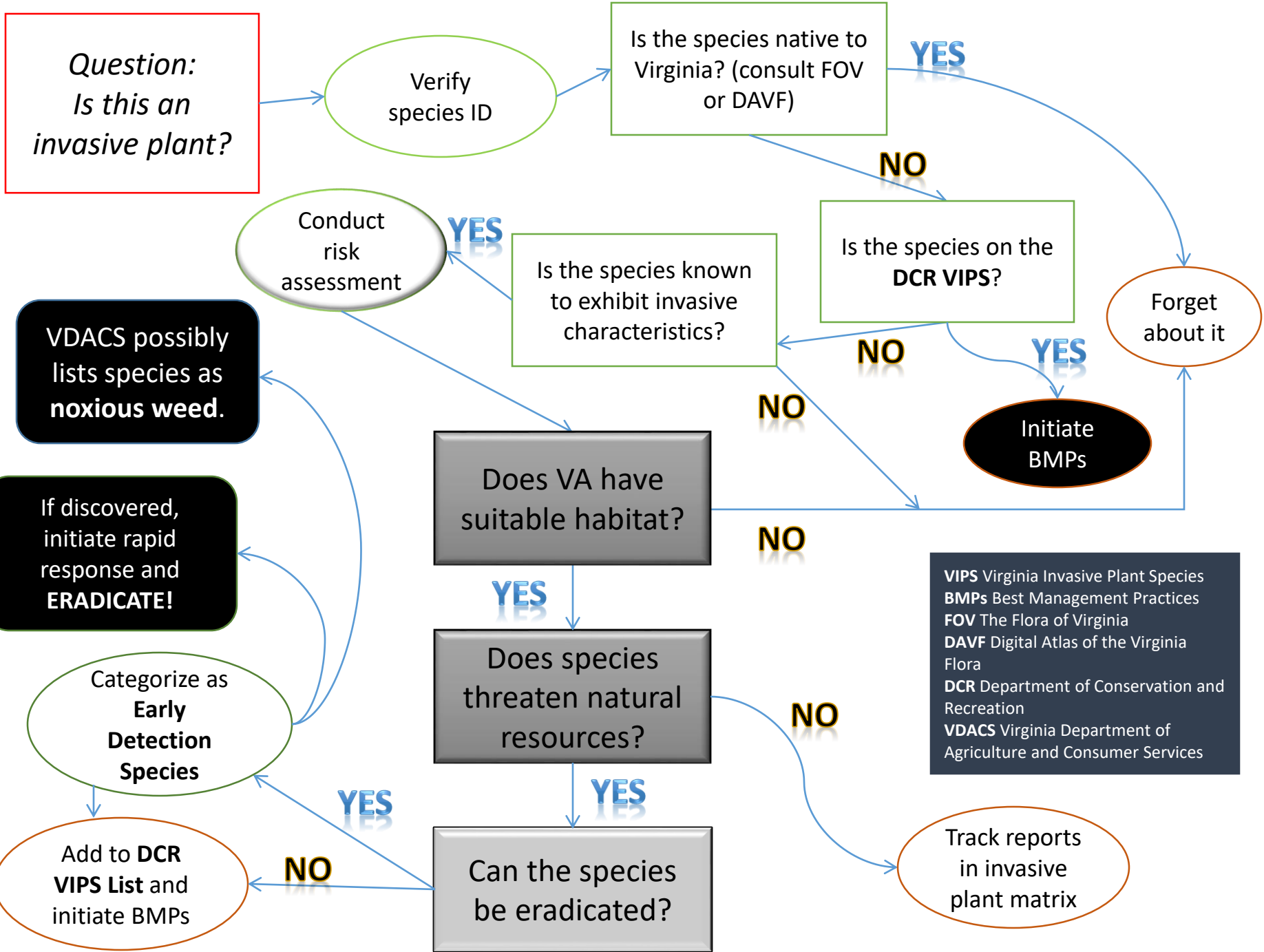
Invasive Plant Risk Assessment Protocol

- Developed by NatureServe and partners
- Scalable to specific state or region
- Multiple choice questions with weighted answers
- Creates a record of the various information sources that goes into the ranking process



The I-rank of a species increases to the degree the species is documented to:

- alter ecosystem processes, such as succession, light availability, water or soil chemistry, hydrology or fire regime
- invade undisturbed natural communities
- cause substantial impacts on rare or vulnerable species or natural communities or high-quality examples of more common communities
- be widely distributed or generally abundant where present
- disperse readily to new areas
- resist control



VIPS Virginia Invasive Plant Species
BMPs Best Management Practices
FOV The Flora of Virginia
DAVF Digital Atlas of the Virginia Flora
DCR Department of Conservation and Recreation
VDACS Virginia Department of Agriculture and Consumer Services

Invasive Plant Risk Assessment Components

- Screening Questions
- Ecological Impacts
- Current Distribution and Abundance
- Trends in Distribution and Abundance
- Management Difficulty

Ecological Impact

- ecosystem processes
- community structure
- community composition
- individual species
- conservation significance

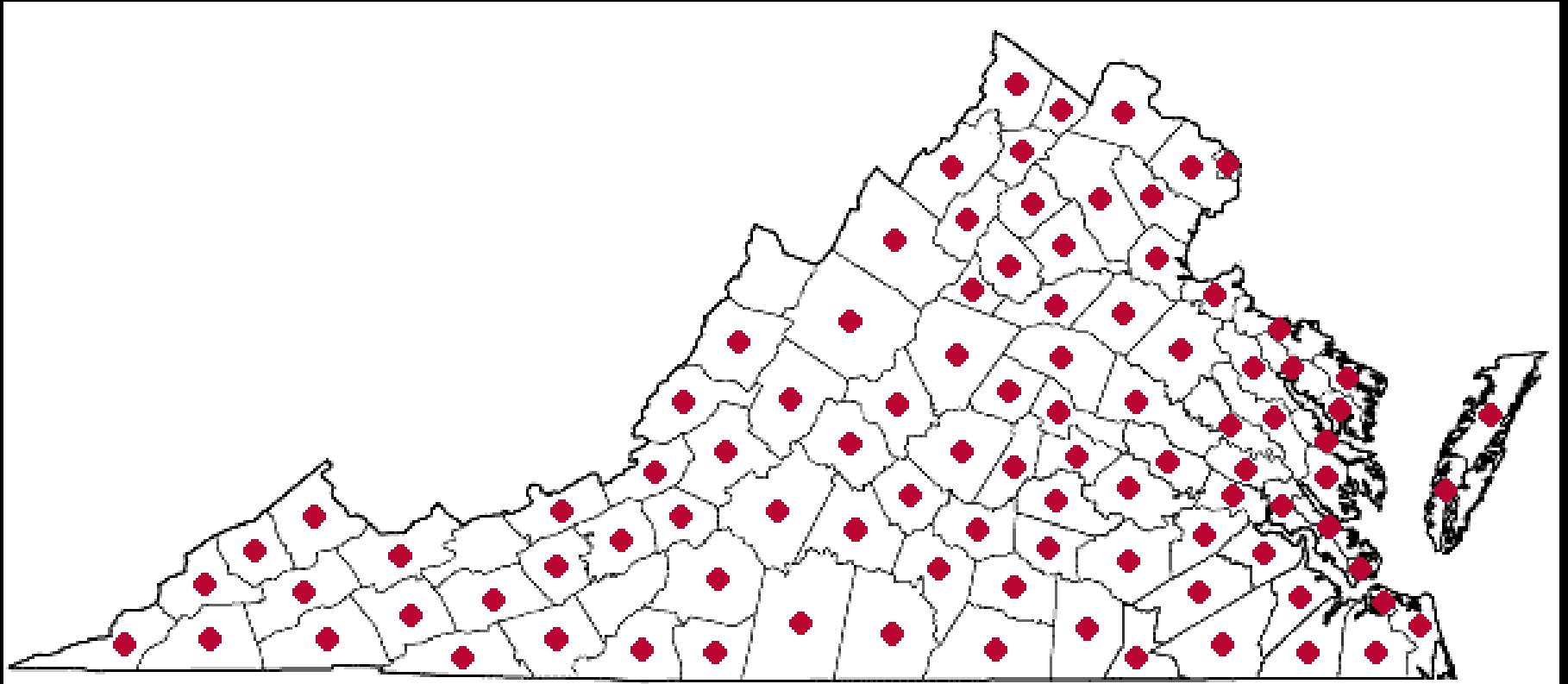




Current Distribution and Abundance

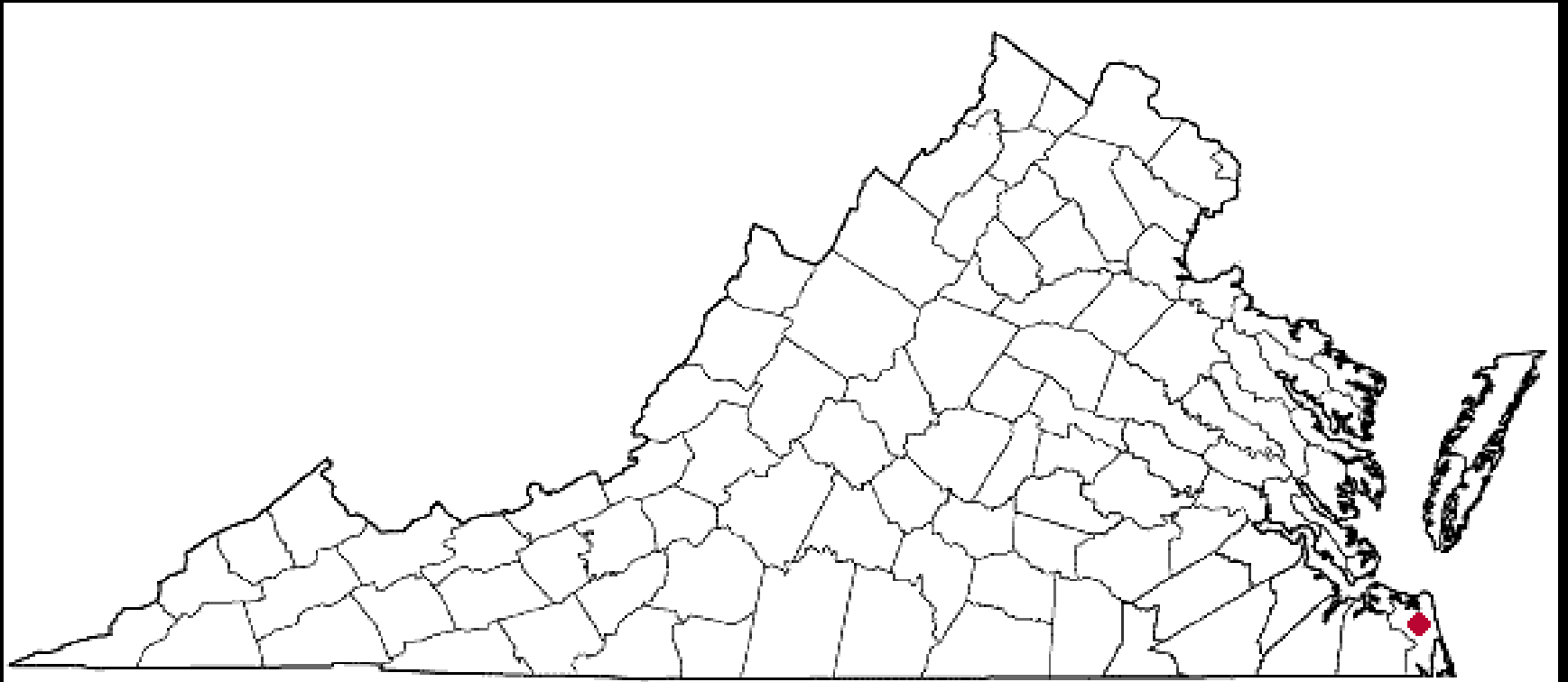
- current range in region
- proportion of range where negative impacts
- proportion of region's habitats impacted
- diversity of habitats impacted

Tree-of-heaven



Digital Atlas of the Virginia Flora

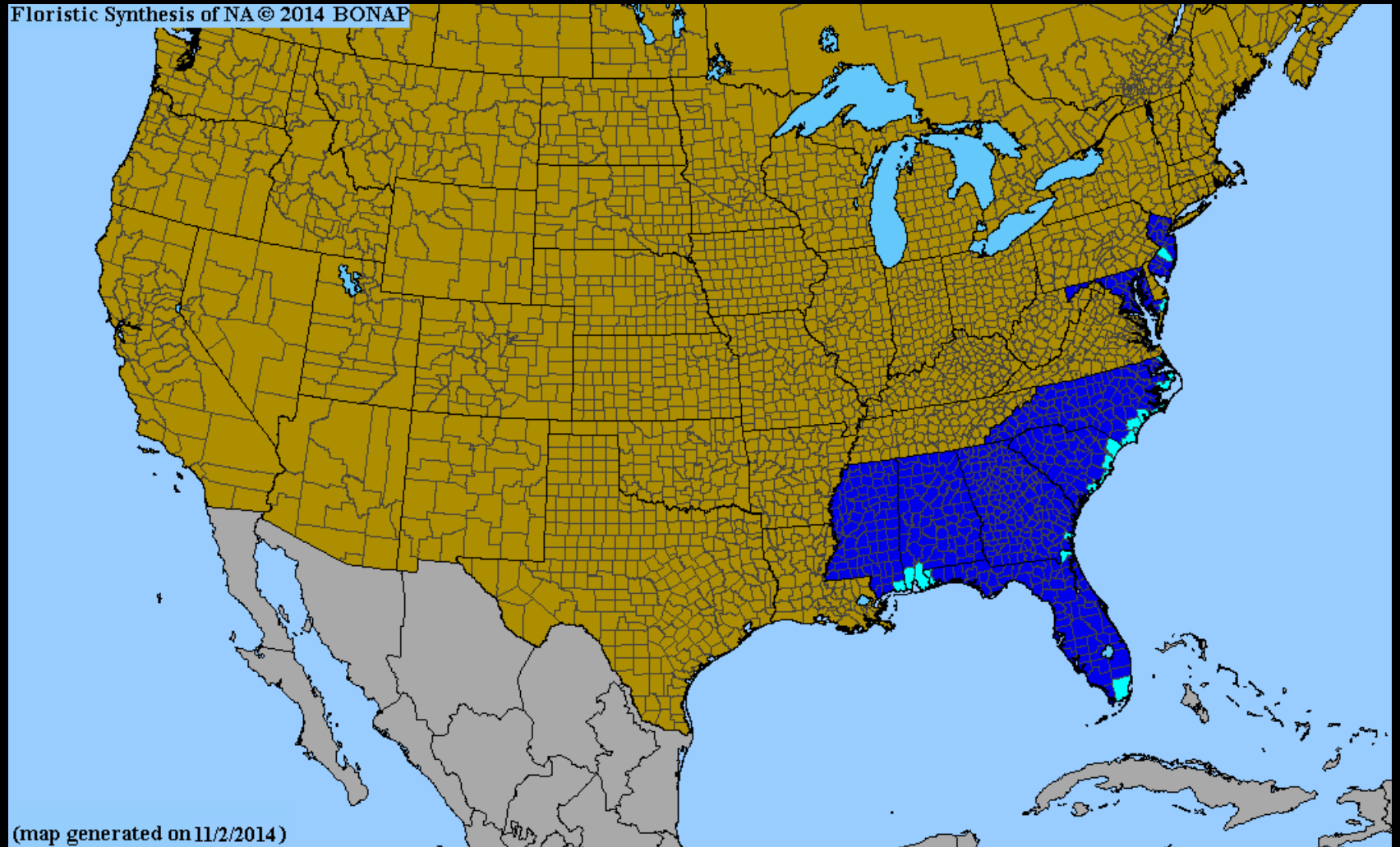
Beach Vitex



Digital Atlas of the Virginia Flora

Beach Vitex

Floristic Synthesis of NA © 2014 BONAP



(map generated on 11/2/2014)

Trend in Distribution and Abundance

- current trend in region
- proportion of potential range occupied
- long-distance dispersal potential
- ability to invade conservation areas
- similar habitats invaded elsewhere
- reproductive characteristics



5469

Management Difficulty

- general management difficulty
- minimum time commitment
- management impacts on natives
- accessibility of invaded areas



P29		Known from 10 counties in nineteen locations totalling at least 220 acres. In Many sites are located near the Appalach																		
	AB	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S		
2	SPECIES INFORMATION											ASSESSOR'S INFORMATION								
3	Scientific name:				Oplismenus hirtellus ssp. undulatifoliu:							Assessor:			Liz Engle, Kevin Heffernan					
4	Synonyms:											Assessor's Affiliation:			VA DCR Natural Heritage					
5	Common Name(s):				Wavyleaf grass							Mailing Address:			600 E Main St., Richmond, VA 23219 16th Fl					
6	Native Range:				Southern Europe; Southeast Asia							Phone:			804-786-9112			Fax:		
7	Region of Interest (e.g., U.S.):				Mid-Atlantic; Eastern U.S.							Email:			kevin.heffernan@dcr.virginia.gov					
8	Mixed-Status Species (y/n):											Date Evaluated (mm/dd/yyyy):			August 2013; revised March 2014					
11	QUALIFYING QUESTIONS											COMMENTS & SHORT CITATIONS								
12	i. Non-native established outside of cultivation in region of interest?											Yes			i. Wavyleaf is native to southern Europe and southeast Asia.					
13	ii. Occurs in conservation areas?											Yes			ii. Numerous patches were found in Shenandoah National Park (Hughes).					
15	I. ECOLOGICAL IMPACT																			
16	1. Impact on ecosystem processes and system-wide parameters											C			1. Does not effect nitrogen/water use as an ecosystem process. It can have					
17	2. Impact on ecological community structure											A			2. Outcompetes herbaceous layer species. Can inhibit woody species					
18	3. Impact on ecological community composition											A			3. Wavyleaf produces a sharp reduction of locally common native species					
19	4. Impact on individual native plant or animal species											A			4. It outcompetes nearly all native plants at the ground level- USDA					
20	5. Conservation significance of the communities and native species threatened											A			5. The particular park (SNP) that wavyleaf is in does support rare species					
22	II. CURRENT DISTRIBUTION AND ABUNDANCE																			
23	6. Current range size in region											C			6. Known from 10 counties in nineteen locations totalling at least 220 acres.					
24	7. Proportion of current range where species is negatively impacting biodiversity											A			7. There is high species richness in areas that are invaded (Fleming 2013)					
25	8. Proportion of region's biogeographic units invaded											B			8. Known from 10 counties in nineteen locations totalling at least 220 acres.					
26	9. Diversity of habitats or ecological systems invaded in region											C			9. Upland forests and well-drained plains (Fleming 2013)					
28	III. TREND IN DISTRIBUTION AND ABUNDANCE																			
29	10. Current trend in total range within region											A			10. Known from 10 counties in nineteen locations totalling at least 220 acres.					
30	11. Proportion of potential range currently occupied											A			11. USDA says that only a small proportion of the potential range is currently					
31	12. Long-distance dispersal potential within region											A			12. The potential for long distance dispersal is very high and within a large					
32	13. Local range expansion or change in abundance											B			13. Expanding and increasing areas, but to what degree unsure (Beauchamp,					
33	14. Inherent ability to invade conservation areas and other native species habitats											A			14. Undisturbed native hardwood forests have been encroached upon					
34	15. Similar habitats invaded elsewhere											B			15. Maryland (Beauchamp 2013; Kyde 2013)					
35	16. Reproductive characteristics											A			16. "It reproduces vegetatively, but we have no idea how fast it is able to					
37	IV. MANAGEMENT DIFFICULTY																			
38	17. General management difficulty											C			17. Can be treated with herbicide. Small patches can be controlled by hand-					
39	18. Minimum time commitment											C			18. Typical herbaceous plant control effort. Difficulty in that it is widely					
40	19. Impacts of management on native species											C			19. Not managing it will be worse for native species than collateral damage					
41	20. Accessibility of invaded areas											B			20. invaded areas in park are difficult to get to and they are so spotty it is hard					
43												OTHER CONSIDERATIONS:								
44	I-Rank: HIGH											ADJUSTMENT JUSTIFICATION:								
45	(Add * to I-Rank if adjusted from calculated I-Rank)											I-RANK REASONS SUMMARY:								
48	INFORMATION SOURCES:																			
49	<ul style="list-style-type: none"> Beauchamp, V., et al. 2013. An introduction to Oplismenus undulatifolius, wavyleaf basketgrass, a recent invader in Mid-Atlantic forest und Fleming, G. 2013. Pers. comm. Hughes, J. 2013. Pers. comm. 																			

How Were Plants Chosen for Assessment?

- 109 species on the list in 2012
- Created a database
- Added species from other state and federal lists for the Mid-Atlantic
- EDDMapS
- NatureServe
- recommendations from field staff

Results of the 2013 Assessment

- 90 species
 - 2009 list = 109
- 31 species removed
- 12 species added
 - Eight are early detection species
- 6 species increased ranks
- 4 species decreased ranks

Invasiveness Ranks (I-ranks)

- High
 - 38 species
- Medium
 - 36 species
- Low
 - 16 species

Invasive Plant List - Early Detection Species

- Not yet present, or
- Present, not yet widely established
- Pose demonstrated threat to ecological or economic values
- 10 species on the 2013

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