

Australia/New Zealand Weed Risk Assessment adapted for Florida.

Data used for analysis published in: Gordon, D.R., D.A. Onderdonk, A.M. Fox, R.K. Stocker, and C. Gantz. 2008. Predicting Invasive Plants in Florida using the Australian Weed Risk Assessment. Invasive Plant Science and Management 1: 178-195.

<i>Nandina domestica (heavenly bamboo)</i>			
Question number	Question	Answer	Score
1.01	Is the species highly domesticated?	n	0
1.02	Has the species become naturalised where grown?		
1.03	Does the species have weedy races?		
2.01	Species suited to Florida's USDA climate zones (0-low; 1-intermediate; 2-high)	2	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	2	
2.03	Broad climate suitability (environmental versatility)		
2.04	Native or naturalized in habitats with periodic inundation		
2.05	Does the species have a history of repeated introductions outside its natural range?	y	
3.01	Naturalized beyond native range	y	0
3.02	Garden/amenity/disturbance weed	n	0
3.03	Weed of agriculture	n	0
3.04	Environmental weed	y	0
3.05	Congeneric weed	n	0
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic	n	0
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals		
4.05	Toxic to animals	y	1
4.06	Host for recognised pests and pathogens	n	0
4.07	Causes allergies or is otherwise toxic to humans	n	0
4.08	Creates a fire hazard in natural ecosystems	n	0
4.09	Is a shade tolerant plant at some stage of its life cycle	y	1
4.1	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils)	y	1
4.11	Climbing or smothering growth habit	n	0
4.12	Forms dense thickets	y	1
5.01	Aquatic	n	0

5.02	Grass	n	0
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte	n	0
6.01	Evidence of substantial reproductive failure in native habitat		
6.02	Produces viable seed	y	1
6.03	Hybridizes naturally		
6.04	Self-compatible or apomictic		
6.05	Requires specialist pollinators		
6.06	Reproduction by vegetative fragmentation	y	1
6.07	Minimum generative time (years)	2	0
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
7.02	Propagules dispersed intentionally by people	y	1
7.03	Propagules likely to disperse as a produce contaminant	n	-1
7.04	Propagules adapted to wind dispersal	n	-1
7.05	Propagules water dispersed	n	-1
7.06	Propagules bird dispersed	y	1
7.07	Propagules dispersed by other animals (externally)	n	-1
7.08	Propagules dispersed by other animals (internally)	y	1
8.01	Prolific seed production	y	1
8.02	Evidence that a persistent propagule bank is formed (>1 yr)	y?	1
8.03	Well controlled by herbicides	y	-1
8.04	Tolerates, or benefits from, mutilation or cultivation		
8.05	Effective natural enemies present in Florida, or east of the continental divide		
Total Score			12

Outcome	Reject*
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*Used secondary screen from: Daehler, C. C., J.L. Denslow, S. Ansari, and H. Kuo. 2004. A risk assessment system for screening out harmful invasive pest plants from Hawaii's and other Pacific islands. *Conserv. Biol.* 18: 360-368.

section	# questions answered	satisfy minimum?
A	6	yes
B	11	yes
C	17	yes
total	34	yes

Data collected 2006-2007

Question number	Reference	Source data
1.01		cultivated, but no evidence of selection for reduced weediness
1.02		
1.03		
2.01	1. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA. 2. Horticopia 4.0	1. minimum temperature: 2°F 2. hardiness zones 6B to 9B
2.02		
2.03		
2.04		
2.05	Whetstone, Atkinson, and Spaulding (1997) <i>Nandina</i> . In: Flora of North America north of Mexico. Volume 3. Oxford University Press, New York.	" <i>Nandina domestica</i> is commonly cultivated as an ornamental."
3.01	Whetstone, Atkinson, and Spaulding (1997) <i>Nandina</i> . In: Flora of North America north of Mexico. Volume 3. Oxford University Press, New York.	Native to India, China and Japan; naturalized throughout southeastern U.S.; "mature plants have been found far from areas of current cultivation in the southeastern United States".
3.02		no evidence
3.03		no evidence
3.04	1. Randall and Marinelli, eds. (1996) Weeds of the Global Garden. Brooklyn Botanical Garden. 2. Miller, James H. 2003. Nonnative invasive plants of southern forests: a field guide for identification and control. Gen. Tech. Rep. SRS-62. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 93 p.	1. Invading pine flatwood communities in the southeastern U.S., primarily in Georgia and Alabama; "outcompeting native shrubs and associated understory herbaceous vegetation". 2. "Escaped and spreading from around old homes" in the southeastern U.S.; states with suspected infestations include: TX, LA, MS, AL, GA, SC, NC, and VA.
3.05		genus is monotypic
4.01	Dehgan (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	no description of these traits
4.02	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data	not allelopathic

	compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	
4.03	Dehgan (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	no description of this
4.04		
4.05	1. Burrows and Tyrl (2001) Toxic Plants of North America. Iowa State University Press, Ames. 2. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	1. "Many but not all cultivars of Nandina are strongly cyanogenic and represent a hazard to ruminants that gain access to them. Occasionally other animals, such as puppies, may be at risk." BUT 2. no toxicity
4.06	Dehgan (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	no serious pests or problems
4.07	1. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA. 2. Hortocopia 4.0	1. no toxicity 2. causes little or no allergy problems
4.08		no evidence
4.09	1. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA. 2. Dehgan (1998) Landscape Plants for Subtropical Climates. University Press of Florida. 3. Gilman (1999) <i>Nandina domestica</i> . FPS-421, University of Florida, IFAS Extension (http://hort.ufl.edu/shrubs/NANDOMA.PDF).	1. shade tolerant 2. full sun (for best color) to partial shade 3. "plant grows in part shade/part sun"; "Nandina grows and flowers well in partial shade but will exhibit richer-colored red fall foliage if planted in the sun."
4.1	1. Gilman (1999) <i>Nandina domestica</i> . FPS-421, University of Florida, IFAS Extension (http://hort.ufl.edu/shrubs/NANDOMA.PDF). 2. Dehgan (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	1. soil tolerances include sand BUT 2. fertile, organic soils
4.11	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	growth habit: shrub
4.12	Weber (2003) Invasive Plant Species of the World. CABI Publishing.	"It forms extensive and dense stands displacing native vegetation."
5.01		terrestrial
5.02	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	Berberidaceae
5.03	USDA, NRCS. 2005. The PLANTS Database,	does not fix nitrogen (and

	Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	Berberidaceae)
5.04	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	not propagated by bulbs, corms, or tubers
6.01		
6.02	1. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA. 2. Dehgan (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	propagated by seed (1, 2)
6.03		
6.04		
6.05		
6.06	1. Weber (2003) Invasive Plant Species of the World. CABI Publishing. 2. Gilman (1999) <i>Nandina domestica</i> . FPS-421, University of Florida, IFAS Extension (http://hort.ufl.edu/shrubs/NANDOMA.PDF).	1. "The plant has rhizomes." 2. "Nandina spreads slowly by underground stems"
6.07	Cherry (2002) Ecophysiology and control of <i>Nandina domestica</i> Thunb. M.S. thesis, University of Florida.	"plants as young as 18 months can produce numerous fruits"
7.01		
7.02	1. Burrows and Tyrl (2001) Toxic Plants of North America. Iowa State University Press, Ames. 2. Whetstone, Atkinson, and Spaulding (1997) <i>Nandina</i> . In: Flora of North America north of Mexico. Volume 3. Oxford University Press, New York.	1. "Very common and widely cultivated throughout North America" 2. " <i>Nandina domestica</i> is commonly cultivated as an ornamental."
7.03		no evidence
7.04	Weber (2003) Invasive Plant Species of the World. CABI Publishing.	fruits are globular berries
7.05		no evidence
7.06	Weber (2003) Invasive Plant Species of the World. CABI Publishing.	seeds are dispersed by birds
7.07	Weber (2003) Invasive Plant Species of the World. CABI Publishing.	fruits are globular berries - no evidence of any means of attachment
7.08		fleshy fruited
8.01	1. Weber (2003) Invasive Plant Species of the World. CABI Publishing. 2. Whetstone, Atkinson, and Spaulding (1997) <i>Nandina</i> . In: Flora of North America north of Mexico. Volume 3. Oxford University Press, New York.	1. about 2 seeds per fruit; "berries are abundantly produced" 2. "Inflorescences with hundreds of flowers"
8.02	Cherry (2002) Ecophysiology and control of <i>Nandina domestica</i> Thunb. M.S. thesis, University of Florida.	"seeds remain dormant for at least one year" [unknown whether in soil or storage]

8.03	<p>1. Weber (2003) Invasive Plant Species of the World. CABI Publishing. 2. Cherry (2002) Ecophysiology and control of <i>Nandina domestica</i> Thunb. M.S. thesis, University of Florida.</p>	<p>1. "An effective control is cutting the stems close to the ground and treating the stumps with a glyphosate or triclopyr herbicide." 2. "Complete control of <i>N. domestica</i> can be achieved with basal bark applications of triclopyr butoxyethyl ester with rates as low as 3.75% (0.018 kg acid equivalent/liter) in an oil solution."</p>
8.04		
8.05		