

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>Salvia splendens (scarlet sage)</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	n	0
3.05	Congeneric weed	y	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	n	0
4.06	Host for recognised pests and pathogens	?	
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	?	
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	n	0
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	y	1
6.05	Requires specialist pollinators	n	0
6.06	Reproduction by vegetative fragmentation		
6.07	Minimum generative time (years)	1	1
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		
7.07	Propagules dispersed by other animals (externally)	n	-1
7.08	Propagules dispersed by other animals (internally)		
8.01	Prolific seed production		
8.02	Evidence that a persistent propagule bank is formed (>1 yr)		
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			4

Outcome	Accept*
----------------	----------------

*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	9	yes
C	14	yes
total	29	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. Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida. 2. Hortocopia 4.0.	1. zone 9b 2. hardy range: 10A to 11
2.02		
2.03	Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	native habitat: southern Brazil [naturalized elsewhere]
2.04		
2.05	Whistler (2000) Tropical Ornamentals: a Guide. Timber Press, Portland.	" <i>Salvia splendens</i> , scarlet sage, is native to southern Brazil but is widely cultivated in the tropics and warm temperate areas for its scarlet, purple, or pink flowers".
3.01	1. Whistler (2000) Tropical Ornamentals: a Guide. Timber Press, Portland. 2. Hortocopia 4.0. 3. 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. "sometimes escapes or becomes naturalized in disturbed areas" 2. naturalizing 3. Naturalized in Puerto Rico, Utah, Wisconsin, Ohio, Connecticut, and Massachusetts.
3.02		no evidence
3.03		no evidence
3.04		no evidence
3.05	Weber (2003) Invasive Plant Species of the World. CABI Publishing.	<i>Salvia verbenaca</i> is considered invasive in Australia.
4.01	Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	no description of these traits
4.02		no evidence
4.03	Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	no description of this
4.04		
4.05		no evidence
4.06	1. Missouri Botanical Garden, Kemper Center for	1. "No serious insect or disease

	Home Gardening (http://www.mobot.org/gardeninghelp/plantfinder/Plant.asp?code=A606). 2. Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida. 3. Gilman and Howe (1999) <i>Salvia splendens</i> . University of Florida, IFAS Extension (http://hort.ufl.edu/shrubs/SALSPLA.PDF).	problems. Susceptible to downy and powdery mildew." 2. "Problems: scale, caterpillars, chewing insects." 3. "long-term health usually not affected by pests" but susceptible to slugs, aphids, and sweet potato whitefly.
4.07		no evidence
4.08		no evidence
4.09	1. Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida. 2. Gilman and Howe (1999) <i>Salvia splendens</i> . University of Florida, IFAS Extension (http://hort.ufl.edu/shrubs/SALSPLA.PDF). 3. Hortocopia 4.0.	1. full sun to partial shade 2. part shade/part sun 3. full sun
4.1	1. Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida. 2. Gilman and Howe (1999) <i>Salvia splendens</i> . University of Florida, IFAS Extension (http://hort.ufl.edu/shrubs/SALSPLA.PDF). 3. Hortocopia 4.0.	1. various well-drained soils 2. soil tolerances: clay, sand, acidic, loam BUT 3. "Soil should be fertile and well-drained."
4.11	Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida.	herbaceous subshrub
4.12		no evidence
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.	Lamiaceae
5.03	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.	herbaceous Lamiaceae
5.04	Hortocopia 4.0	"This plant's roots are fibrous."
6.01		
6.02	1. Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida. 2. Whistler (2000) Tropical Ornamentals: a Guide. Timber Press, Portland.	propagate by seeds (1, 2)
6.03		
6.04	1. Sanchez, Picado, Sommeijer, and Slaa (2002) Floral biology, pollination ecology and seed production of the ornamental plant <i>Salvia splendens</i> Sello. Journal of Horticultural Science and Biotechnology 77: 498-501. 2. Miyajima (2001) Floral variation and its effect on self-pollination in <i>Salvia splendens</i> . Journal of Horticultural Science and Biotechnology 76: 187-194.	1. "selfing and outcrossing are equally effective in terms of seed set" 2. " <i>S. splendens</i> is self-compatible"
6.05	Sanchez, Picado, Sommeijer, and Slaa (2002) Floral biology, pollination ecology and seed production of the ornamental plant <i>Salvia splendens</i> Sello. Journal of	"All flower characteristics (red corolla, large tubular flowers with abundant but dilute nectar)

	Horticultural Science and Biotechnology 77: 498-501.	indicate that <i>S. splendens</i> is adapted to hummingbird pollination. Honeybees, however, were also found to be good pollinators of this plant." [includes, but is not limited to, specialist pollinator]
6.06		
6.07	1. Dehgan, B. (1998) Landscape Plants for Subtropical Climates. University Press of Florida. 2. Horticultura 4.0.	1. perennial, but can be grown as an annual; rapid growth 2. fast growth rate
7.01		
7.02	Whistler (2000) Tropical Ornamentals: a Guide. Timber Press, Portland.	" <i>Salvia splendens</i> , scarlet sage, is native to southern Brazil but is widely cultivated in the tropics and warm temperate areas for its scarlet, purple, or pink flowers".
7.03		no evidence
7.04	Whistler (2000) Tropical Ornamentals: a Guide. Timber Press, Portland.	"Fruit of four small nutlets borne within the calyx." [no evidence of adaptations for wind dispersal]
7.05		no evidence
7.06		
7.07	Whistler (2000) Tropical Ornamentals: a Guide. Timber Press, Portland.	"Fruit of four small nutlets borne within the calyx." [no evidence of any means of attachment]
7.08		
8.01		
8.02		
8.03	1. Hurt, RT and WK Vencill (1994) Phytotoxicity and nutsedge control in woody and herbaceous landscape plants with Manage (MON12037). Journal of Environmental Horticulture 12: 135-137. 2. Hurt, RT and WK Vencill (1994) Evaluation of three imidazolinone herbicides for control of yellow and purple nutsedge in woody and herbaceous landscape plants. Journal of Environmental Horticulture 12: 131-134.	The herbicide Manage caused little to no damage in red and purple salvia (two cultivars of <i>S. splendens</i>) (1), but neither cultivar was tolerant to the herbicide Pursuit (>75% visual injury) (2).
8.04		
8.05		