

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>Richardia scabra (Florida pusley)</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	y	0
3.03	Weed of agriculture	y	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		
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	n	-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)	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			8

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	9	yes
C	14	yes
total	29	yes

Data collected 2006-2007

Question number	Reference	Source data
1.01		no evidence of cultivation
1.02		
1.03		
2.01		
2.02		
2.03		
2.04		
2.05	1. Wunderlin (2003) Guide to the Vascular Plants of Florida. University Press of Florida, Gainesville. 2. Lewis and Oliver (1974) Revision of <i>Richardia</i> (Rubiaceae). Brittonia 26: 271-301. 3. Mishra (1999) Florida pusley (<i>Richardia scabra</i> L.): a problem weed of upland rice - its growth behaviour, economic use and control. Indian Journal of Weed Science 31: 271-273.	Native to South America (1); introduced into east and southern Africa(2) and India (3).
3.01	Flora of Zimbabwe (http://www.zimbabweflora.co.zw/speciesdata/species.php?species_id=156700).	<i>R. scabra</i> and <i>R. brasiliensis</i> both "now naturalised weeds in many tropical and subtropical regions of the world".
3.02	1. Lorenzi (1991) Plantas Daninhas do Brasil. Instituto Plantarum. 2. Flora of Zimbabwe (http://www.zimbabweflora.co.zw/speciesdata/species.php?species_id=156700).	1. "This nuisance plant is quite frequent, principally infesting...roadsides and vacant lots." 2. Considered a naturalized weed in many tropical and subtropical regions of the world.
3.03	1. Mishra (1999) Florida pusley (<i>Richardia scabra</i> L.): a problem weed of upland rice - its growth behaviour, economic use and control. Indian Journal of Weed Science 31: 271-273. 2. Holm (1979) A Geographical Atlas of World Weeds. John Wiley and Sons.	1. <i>R. scabra</i> is a weed of rice in India. 2. <i>R. scabra</i> is a common weed of agriculture in El Salvador and the U.S.
3.04		no evidence
3.05	Holm (1979) A Geographical Atlas of World Weeds. John Wiley and Sons.	<i>R. brasiliensis</i> is a principal weed of agriculture in Brazil, Rhodesia (Zimbabwe), and Swaziland, and it is a common

		weed in Argentina, Hawaii, Indonesia, and South Africa.
4.01	Lewis and Oliver (1974) Revision of <i>Richardia</i> (Rubiaceae). Brittonia 26: 271-301.	no description of these traits
4.02		no evidence
4.03	Lewis and Oliver (1974) Revision of <i>Richardia</i> (Rubiaceae). Brittonia 26: 271-301.	no description of this
4.04		
4.05		no evidence
4.06		
4.07		no evidence
4.08		no evidence
4.09		
4.1	Lewis and Oliver (1974) Revision of <i>Richardia</i> (Rubiaceae). Brittonia 26: 271-301.	"It inhabits savannas and grasslands in sandy soil"
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: forb/herb
4.12		no evidence, and is an herb
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.	Rubiaceae
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 Rubiaceae
5.04	Lewis and Oliver (1974) Revision of <i>Richardia</i> (Rubiaceae). Brittonia 26: 271-301.	"from a long, often thick taproot or from slender fibrous roots" [referring to subgenus <i>Richardia</i> , to which <i>R. scabra</i> belongs]
6.01		
6.02	Biswas, Bell, Crayton, and Paul (1975) Germination behavior of Florida pusley seeds. 1. Effects of storage, light, temperature and planting depths on germination. Weed Science 23: 400-403.	propagated by seeds
6.03		
6.04		
6.05	The Pollination Home Page, plant/pollinator database (http://pollinator.com/plant_pol/richardia_scabra.htm).	Flowers visited by butterflies and honeybees.
6.06	Lewis and Oliver (1974) Revision of <i>Richardia</i> (Rubiaceae). Brittonia 26: 271-301.	"not usually rooting at the nodes"
6.07	Lewis and Oliver (1974) Revision of <i>Richardia</i> (Rubiaceae). Brittonia 26: 271-301.	annual
7.01		
7.02		no evidence of intentional introduction
7.03		no evidence
7.04	Hall, Vandiver, and Ferrell (2004) Florida Pusley,	"Each flower typically produces

	<i>Richardia scabra</i> L. University of Florida, IFAS Extension, SP 37 (http://edis.ifas.ufl.edu/pdffiles/FW/FW03400.pdf).	3 nutlets from 2-3.5 mm in length and about 1.5-2 mm in width." [no evidence of adaptations for wind dispersal]
7.05		no evidence
7.06		
7.07	Lewis and Oliver (1974) Revision of <i>Richardia</i> (Rubiaceae). Brittonia 26: 271-301.	no evidence of any means of attachment
7.08		
8.01		
8.02	1. Chivinge, Munjoma, and Mashingaidze (1997) Germination and seedling emergence in Mexican clover (<i>Richardia scabra</i> L.) and its interference with groundnut (<i>Arachis hypogaea</i> L.). Crop Research Hisar 14: 191-198. 2. Biswas, Bell, Crayton, and Paul (1975) Germination behavior of Florida pusley seeds. 1. Effects of storage, light, temperature and planting depths on germination. Weed Science 23: 400-403.	1. "Germination, which decreased with seed age, was highest (58.5%) in 1-year-old seeds, whereas 9-year-old seeds failed to germinate." [probably not in soil, but still a high germination percentage after 1 year] 2. "Air-dried seeds can be stored either at 5 or at 25 C without losing viability, at least up to a period of 1 year after harvest." [not in soil, but no loss of viability for a year]
8.03	Hall, Vandiver, and Ferrell (2004) Florida Pusley, <i>Richardia scabra</i> L. University of Florida, IFAS Extension, SP 37 (http://edis.ifas.ufl.edu/pdffiles/FW/FW03400.pdf).	Prowl, Sonalan, and Treflan all provide effective control of Florida pusley.
8.04		
8.05		