

**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>Desmodium tortuosum</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)	y	1
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	n	-1
4.05	Toxic to animals	n	0
4.06	Host for recognised pests and pathogens	y	1
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	n	0
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	y	1
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		
6.06	Reproduction by vegetative fragmentation	n	-1
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)	y	1
7.08	Propagules dispersed by other animals (internally)	n	-1
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	y	1
8.05	Effective natural enemies present in Florida, or east of the continental divide		
<b>Total Score</b>			<b>14</b>

<b>Outcome</b>	<b>Reject*</b>
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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	7	yes
B	12	yes
C	17	yes
total	36	yes

Data collected 2006-2007

Question number	Reference	Source data
1.01		used as a forage crop, but no evidence of selection for reduced weediness
1.02		
1.03		
2.01	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	minimum temperature: 17°F
2.02		
2.03	Webster and Cardina (2004) A review of the biology and ecology of Florida beggarweed ( <i>Desmodium tortuosum</i> ). <i>Weed Science</i> 52: 185-200.	"Florida beggarweed is native to the Western Hemisphere but is naturalized around the world", including in many African countries, Australia, China, Fiji, Hong Kong, India, Madagascar, and Papua New Guinea.
2.04		
2.05	FAO, Grassland Index ( <a href="http://www.fao.org/ag/AGP/AGPC/doc/GBASE/data/pf000036.htm">http://www.fao.org/ag/AGP/AGPC/doc/GBASE/data/pf000036.htm</a> ).	"Native to the West Indies; widespread in...Central and South America and also in tropical Africa. Occurs in Hawaii below 900 m elevation."
3.01	Webster and Cardina (2004) A review of the biology and ecology of Florida beggarweed ( <i>Desmodium tortuosum</i> ). <i>Weed Science</i> 52: 185-200.	"Florida beggarweed is native to the Western Hemisphere but is naturalized around the world."
3.02	1. Lorenzi (2000) Plantas Daninhas do Brasil. Instituto Plantarum. 2. Dwyer et al. (1980) Flora of Panama, Part 5. Family 83. Leguminosae, subfamily Papilionoideae. <i>Annals of the Missouri Botanical Garden</i> 67: 523-808. 3. Wagner, Herbst, and Sohmer (1999) Manual of the flowering plants of Hawai'i. University of Hawai'i Press/Bishop Museum Press, Honolulu.	1. "it can be found infesting...roadsides and vacant lots" 2. "It is found as an escape from cultivation and becomes weedy in most tropical areas of the world." 3. "in Hawai'i naturalized and common in pastures, dry, disturbed areas near the coast, open, disturbed wet forest, and along roadsides"
3.03	Holm (1979) A Geographical Atlas of World Weeds. John Wiley and Sons.	Considered a common weed of agriculture in Colombia, Hawaii, and Puerto Rico.
3.04		no evidence
3.05	Holm (1979) A Geographical Atlas of World	Several congeneric species are considered

	Weeds. John Wiley and Sons.	principal agricultural weeds.
4.01	Webster and Cardina (2004) A review of the biology and ecology of Florida beggarweed ( <i>Desmodium tortuosum</i> ). Weed Science 52: 185-200.	no description of these traits
4.02	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	not allelopathic
4.03	Webster and Cardina (2004) A review of the biology and ecology of Florida beggarweed ( <i>Desmodium tortuosum</i> ). Weed Science 52: 185-200.	no description of this
4.04	FAO, Grassland Index ( <a href="http://www.fao.org/ag/AGP/AGPC/doc/GBASE/data/pf000036.htm">http://www.fao.org/ag/AGP/AGPC/doc/GBASE/data/pf000036.htm</a> ).	"Very palatable... Because it is so palatable it tends to disappear under grazing."
4.05	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	no toxicity
4.06	Webster and Cardina (2004) A review of the biology and ecology of Florida beggarweed ( <i>Desmodium tortuosum</i> ). Weed Science 52: 185-200.	Florida beggarweed is a host of several important insect pests, nematode pests, and pathogens.
4.07	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	no toxicity
4.08		no evidence
4.09	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	shade intolerant
4.1	1. FAO, Grassland Index ( <a href="http://www.fao.org/ag/AGP/AGPC/doc/GBASE/data/pf000036.htm">http://www.fao.org/ag/AGP/AGPC/doc/GBASE/data/pf000036.htm</a> ). 2. Webster and Cardina (2004) A review of the biology and ecology of Florida beggarweed ( <i>Desmodium tortuosum</i> ). Weed Science 52: 185-200.	1. "Adapted to a wide range of soils" 2. "Florida beggarweed was said to be the best leguminous forage for light sandy soils"
4.11	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	growth habit: subshrub, forb/herb
4.12		no evidence

5.01		terrestrial
5.02	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	Fabaceae
5.03	Webster and Cardina (2004) A review of the biology and ecology of Florida beggarweed ( <i>Desmodium tortuosum</i> ). Weed Science 52: 185-200.	"Roots form nodules in association with nitrogen-fixing <i>Rhizobium</i> bacteria."
5.04	1. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA. 2. Webster and Cardina (2004) A review of the biology and ecology of Florida beggarweed ( <i>Desmodium tortuosum</i> ). Weed Science 52: 185-200.	1. not propagated by bulbs, corms, or tubers 2. taprooted
6.01		
6.02	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	propagated by seed
6.03		
6.04	Padua, Bunyapraphatsara, and Lemmens, eds. (1999) Plant Resources of South-East Asia. No. 12. Medicinal and poisonous plants 1. Backhuys Publishers, Leiden.	" <i>Desmodium</i> appears to be predominantly self-pollinating. However, when flowers are touched, they spring open and release pollen, which makes outcrossing possible."
6.05		
6.06	1. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA. 2. Lorenzi (2000) Plantas Daninhas do Brasil. Instituto Plantarum.	1. vegetative spread rate: none 2. "Propagates solely by seed."
6.07	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 ( <a href="http://plants.usda.gov">http://plants.usda.gov</a> ). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	annual
7.01		
7.02	Webster and Cardina (2004) A review of the biology and ecology of Florida beggarweed ( <i>Desmodium tortuosum</i> ). Weed Science 52: 185-200.	Introduced into Hawaii, Africa, and other parts of the world as a forage crop.
7.03		no evidence

7.04	Webster and Cardina (2004) A review of the biology and ecology of Florida beggarweed ( <i>Desmodium tortuosum</i> ). Weed Science 52: 185-200.	fruit is a multi-segmented loment
7.05		no evidence
7.06	Webster and Cardina (2004) A review of the biology and ecology of Florida beggarweed ( <i>Desmodium tortuosum</i> ). Weed Science 52: 185-200.	eaten by quail [unclear whether they are dispersers or predators]
7.07	1. Webster and Cardina (2004) A review of the biology and ecology of Florida beggarweed ( <i>Desmodium tortuosum</i> ). Weed Science 52: 185-200. 2. Dwyer et al. (1980) Flora of Panama, Part 5. Family 83. Leguminosae, subfamily Papilionoideae. Annals of the Missouri Botanical Garden 67: 523-808.	1. "The loment [fruits] are densely pubescent with hooked hairs that readily attach to passing animals." 2. "The fruits of many species [of <i>Desmodium</i> ] are covered with hooked hairs which become attached to...trouser legs very easily."
7.08		externally dispersed
8.01		
8.02	1. Egley and Chandler (1983) Longevity of weed seeds after 5.5 years in the Stoneville 50-year buried-seed study. Weed Science 31: 264-270. 2. Webster and Cardina (2004) A review of the biology and ecology of Florida beggarweed ( <i>Desmodium tortuosum</i> ). Weed Science 52: 185-200.	1. Florida beggarweed showed 11% seed viability after 3.5 years of burial, 5% after 4.5 years, and 5% after 5.5 years. 2. "It seems that seed survival in the soil, due to a hard seed coat, is an important factor in the persistence of this species."
8.03	Webster and Cardina (2004) A review of the biology and ecology of Florida beggarweed ( <i>Desmodium tortuosum</i> ). Weed Science 52: 185-200.	Several herbicide treatments were found to be effective in controlling Florida beggarweed.
8.04	FAO, Grassland Index ( <a href="http://www.fao.org/ag/AGP/AGPC/doc/GBASE/data/pf000036.htm">http://www.fao.org/ag/AGP/AGPC/doc/GBASE/data/pf000036.htm</a> ).	"Vigorous, recovers rapidly from cutting or grazing"
8.05		