

**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>Mollugo verticillata (carpetweed)</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	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	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	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	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	y	1
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		
<b>Total Score</b>			<b>8</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	6	yes
B	11	yes
C	15	yes
total	32	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. Mohlenbrock (2001) Flowering Plants: Pokeweeds, Four-o'clocks, Carpetweeds, Cacti, Purslanes, Goosefoots, Pigweeds, and Pinks. Southern Illinois University Press. 2. Flora of North America, vol. 4 ( <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=220008715">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=220008715</a> ).	1. native to tropical America 2. current distribution includes Eurasia, Africa, and the U.S.
3.01	Chapman, Stewart, and Yarnell (1974) Archaeological evidence for precolumbian introduction of <i>Portulaca oleracea</i> and <i>Mollugo verticillata</i> into eastern North America. Economic Botany 28: 411-412.	" <i>M. verticillata</i> is another plant that has spread widely as a weed of disturbed areas."
3.02	1. Chapman, Stewart, and Yarnell (1974) Archaeological evidence for precolumbian introduction of <i>Portulaca oleracea</i> and <i>Mollugo verticillata</i> into eastern North America. Economic Botany 28: 411-412. 2. Flora of North America, vol. 4 ( <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=220008715">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=220008715</a> ).	1. " <i>M. verticillata</i> is another plant that has spread widely as a weed of disturbed areas." 2. "weedy in fields, gardens, roadsides"
3.03	1. Lorenzi (2000) Plantas Daninhas do Brasil. Instituto Plantarum. 2. Lorenzi (2000) Manual de Identificacao e Controle de Plantas Daninhas. Instituto Plantarum. 3. Richardson, Wilson, Armel, and Hines (2005) Responses of imidazolinone-resistant corn, several weeds, and two rotational crops to trifloxysulfuron. Weed Technology 19: 744-748.	Infests annual crops and orchards in Brazil (1), where it is subject to control (2). Also an agricultural weed in the U.S. (3).
3.04		no evidence
3.05	Holm (1979) A Geographical Atlas of World Weeds. John Wiley and Sons.	<i>M. pentaphylla</i> considered a principal weed of agriculture in Indonesia,

		Malaysia, and Japan.
4.01	Payne (1933) Morphology and anatomy of <i>Mollugo verticillata</i> L. The University of Kansas Science Bulletin 21: 399-411.	no description of these traits
4.02		no evidence
4.03	Payne (1933) Morphology and anatomy of <i>Mollugo verticillata</i> L. The University of Kansas Science Bulletin 21: 399-411.	no description of this
4.04		
4.05		no evidence
4.06	Kahn, Walgenbach, and Kennedy (2005) Summer weeds as hosts for <i>Frankliniella occidentalis</i> and <i>Frankliniella fusca</i> (Thysanoptera: Thripidae) and as reservoirs for tomato spotted wilt Tospovirus in North Carolina. Journal of Economic Entomology 98: 1810-1815.	<i>M. verticillata</i> is among the summer weeds that "have the potential to act as significant sources for spread of TSWV to winter annual weeds in fall".
4.07		no evidence
4.08		no evidence
4.09	Illinois Wildflowers ( <a href="http://www.illinoiswildflowers.info/weeds/plants/carpetweed.htm">http://www.illinoiswildflowers.info/weeds/plants/carpetweed.htm</a> ).	"This plant is typically found in full or partial sun...Open disturbed sites are preferred because it is not competitive with taller vegetation."
4.1	1. Payne (1933) Morphology and anatomy of <i>Mollugo verticillata</i> L. The University of Kansas Science Bulletin 21: 399-411. 2. Mohlenbrock (2001) Flowering Plants: Pokeweeds, Four-o'clocks, Carpetweeds, Cacti, Purslanes, Goosefoots, Pigweeds, and Pinks. Southern Illinois University Press.	1. "The 'carpet weed' can grow in dry, sandy places because of its efficient root system and the water-storing tissue in the leaves and nodes." 2. "often in sand or moist soil"
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: forb/herb
4.12	1. Payne (1933) Morphology and anatomy of <i>Mollugo verticillata</i> L. The University of Kansas Science Bulletin 21: 399-411. 2. Illinois Wildflowers ( <a href="http://www.illinoiswildflowers.info/weeds/plants/carpetweed.htm">http://www.illinoiswildflowers.info/weeds/plants/carpetweed.htm</a> ).	1. "The stems are prostrate on the earth and form a rather dense mat" 2. "often forms colonies" [but an herb]
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.	Molluginaceae
5.03	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.	herbaceous Molluginaceae

5.04	Mohlenbrock (2001) Flowering Plants: Pokeweeds, Four-o'clocks, Carpetweeds, Cacti, Purslanes, Goosefoots, Pigweeds, and Pinks. Southern Illinois University Press.	"Annual herb from a slender taproot"
6.01		
6.02	Lorenzi (2000) Plantas Daninhas do Brasil. Instituto Plantarum.	"Reproduces solely by seeds."
6.03		
6.04		
6.05	Illinois Wildflowers ( <a href="http://www.illinoiswildflowers.info/weeds/plants/carpetweed.htm">http://www.illinoiswildflowers.info/weeds/plants/carpetweed.htm</a> ).	"The nectar and pollen of the flowers attract Halictid bees and various flies, including Syrphid flies, flesh flies, and Muscid flies."
6.06	1. Lorenzi (2000) Plantas Daninhas do Brasil. Instituto Plantarum. 2. Illinois Wildflowers ( <a href="http://www.illinoiswildflowers.info/weeds/plants/carpetweed.htm">http://www.illinoiswildflowers.info/weeds/plants/carpetweed.htm</a> ).	1. "Reproduces solely by seeds." 2. "This plant spreads by reseeding itself"
6.07	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. Mohlenbrock (2001) Flowering Plants: Pokeweeds, Four-o'clocks, Carpetweeds, Cacti, Purslanes, Goosefoots, Pigweeds, and Pinks. Southern Illinois University Press.	annual (1, 2)
7.01		
7.02	Chapman, Stewart, and Yarnell (1974) Archaeological evidence for precolumbian introduction of <i>Portulaca oleracea</i> and <i>Mollugo verticillata</i> into eastern North America. Economic Botany 28: 411-412.	"carpetweed is of little food value [and no evidence of other uses of this species]"
7.03		no evidence
7.04	Mohlenbrock (2001) Flowering Plants: Pokeweeds, Four-o'clocks, Carpetweeds, Cacti, Purslanes, Goosefoots, Pigweeds, and Pinks. Southern Illinois University Press.	fruit a 2.5-3.0 mm-long capsule
7.05		no evidence
7.06		
7.07		no evidence of any means of attachment
7.08		
8.01	1. Payne (1933) Morphology and anatomy of <i>Mollugo verticillata</i> L. The University of Kansas Science Bulletin 21: 399-411. 2. Mohlenbrock (2001) Flowering Plants: Pokeweeds, Four-o'clocks, Carpetweeds, Cacti, Purslanes, Goosefoots, Pigweeds, and Pinks. Southern Illinois University Press.	1. ovary contains about 30 kidney-shaped seeds 2. "seeds many"
8.02		
8.03	1. Lorenzi (2000) Manual de Identificacao e Controle de Plantas Daninhas. Instituto Plantarum. 2. Richardson, Wilson, Armel, and Hines (2005) Responses of imidazolinone-	1. Several herbicides provide effective control of <i>M. verticillata</i> . 2. Carpetweed ( <i>M. verticillata</i> ) was

	resistant corn, several weeds, and two rotational crops to trifloxysulfuron. Weed Technology 19: 744-748.	"controlled by at least 95% by S-metolachlor fb trifloxysulfuron applications".
8.04		
8.05		