

**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>Rumex crispus (curly dock)</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	y	1
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	y	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	y	1
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)	n	0
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	y?	1
6.04	Self-compatible or apomictic	y	1
6.05	Requires specialist pollinators	n	0
6.06	Reproduction by vegetative fragmentation	y	1
6.07	Minimum generative time (years)	1	1
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y	1
7.02	Propagules dispersed intentionally by people	n	-1
7.03	Propagules likely to disperse as a produce contaminant	y	1
7.04	Propagules adapted to wind dispersal	y	1
7.05	Propagules water dispersed	y	1
7.06	Propagules bird dispersed	y?	1
7.07	Propagules dispersed by other animals (externally)	?	
7.08	Propagules dispersed by other animals (internally)	n	-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	y	1
8.05	Effective natural enemies present in Florida, or east of the continental divide		
<b>Total Score</b>			<b>26</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	8	yes
B	10	yes
C	21	yes
total	39	yes

Data collected 2006-2007

Question number	Reference	Source data
1.01		no evidence of cultivation
1.02		
1.03		
2.01	Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing.	"cool to mildly warm, temperate and subtropical regions"
2.02		
2.03	Weber (2003) Invasive Plant Species of the World. CABI Publishing.	Native throughout Europe (northern through Mediterranean), north Africa, and temperate and tropical Asia.
2.04	Weber (2003) Invasive Plant Species of the World. CABI Publishing.	invaded habitats include freshwater wetlands and coastal marshes
2.05	Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing.	"They have been introduced to North and South America, Africa, Indonesia, Papua New Guinea, New Zealand and Australia"
3.01	Wagner, Herbst, and Sohmer (1999) Manual of the flowering plants of Hawai'i. University of Hawai'i Press/Bishop Museum Press, Honolulu.	"now widely naturalized in temperate regions of the Northern Hemisphere; in Hawaii naturalized primarily in disturbed areas such as along roadsides and near developed areas"
3.02	1. Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing. 2. Holm, Plucknett, Pancho, and Herberger (1977) The World's Worst Weeds: Distribution and Biology. The University Press of Hawaii, Honolulu.	1. "they are extremely troublesome...in recreational areas such as playing fields, and in urban gardens" 2. "It is found on roadsides and neglected lands and in lawns and home gardens"
3.03	1. Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing. 2. Holm, Plucknett, Pancho, and Herberger (1977) The World's Worst Weeds: Distribution and Biology. The University Press of Hawaii, Honolulu.	1. "Agriculturally, they are extremely troublesome in arable, horticultural and pastoral lands" 2. " <i>R. crispus</i> is a weed of agriculture on all continents."
3.04	Weber (2003) Invasive Plant Species of the World. CABI Publishing.	Considered an environmental weed in Australia - invades forests, grassland, riparian habitats, freshwater wetlands, and coastal marshes.
3.05	Weber (2003) Invasive Plant Species of the World. CABI Publishing.	<i>R. acetosella</i> , <i>R. conglomeratus</i> , and <i>R. sagittatus</i> are all considered environmental weeds.
4.01	Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing.	no description of these traits

4.02		no evidence
4.03	Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing.	no description of this
4.04	Allen (1975) Docks in Western Australia. Journal of Agriculture Western Australia 16: 67-71.	"Nearly half the farmers interviewed mentioned grazing management as a means of controlling dock [including <i>R. crispus</i> , an important weed in the area]."
4.05	Holm, Plucknett, Pancho, and Herberger (1977) The World's Worst Weeds: Distribution and Biology. The University Press of Hawaii, Honolulu.	" <i>R. crispus</i> is quite toxic to poultry. If large amounts are eaten by cattle, the animals may suffer gastric disturbances and dermatitis."
4.06		
4.07	Burrows and Tyrl (2001) Toxic Plants of North America. Iowa State University Press, Ames.	"Species of <i>Rumex</i> are eaten commonly by humans throughout the world as potherbs and in rare instances may cause intoxications" [toxicity rare]
4.08		no evidence
4.09		
4.1	Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing.	"a wide range of fertile, nitrogen-rich, moist or wet loams or clay soils"
4.11	Weber (2003) Invasive Plant Species of the World. CABI Publishing.	"an upright herb of 30-150 cm height"
4.12		no evidence, and is an herb
5.01		terrestrial
5.02	Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing.	Polygonaceae
5.03	Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing.	herbaceous Polygonaceae
5.04	Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing.	root "a thick underground stem or crown...subtending a long slender taproot...with thin laterals in the surface soil"
6.01		
6.02	Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing.	reproducing by seed
6.03	1. Wagner, Herbst, and Sohmer (1999) Manual of the flowering plants of Hawai'i. University of Hawai'i Press/Bishop Museum Press, Honolulu. 2. Grime, Hodgson, and Hunt (1988) Comparative Plant Ecology: a Functional Approach to Common British Species. Unwin Hyman Ltd., London.	1. " <i>Rumex crispus</i> sometimes hybridizes with <i>R. obtusifolius</i> ." [sounds natural?] 2. "Ten hybrids involving <i>R.c.</i> are recorded for Britain." [natural?]
6.04	1. Bond and Turner (2004) The biology and non-chemical control of broad-leaved dock ( <i>Rumex obtusifolius</i> L.) and curled dock ( <i>R. crispus</i> L.). HDRA, Ryton Organic Gardens. ( <a href="http://www.gardenorganic.org.uk/organicweeds/downloads/dock%20review.pdf">http://www.gardenorganic.org.uk/organicweeds/downloads/dock%20review.pdf</a> ). 2. Grime, Hodgson, and Hunt (1988) Comparative Plant Ecology: a Functional Approach to Common British Species. Unwin Hyman Ltd., London.	1. "It is reported that 25 to 100% of plants are self-fertile." BUT 2. "floral structure prevents autogamy"

6.05	Holm, Plucknett, Pancho, and Herberger (1977) The World's Worst Weeds: Distribution and Biology. The University Press of Hawaii, Honolulu.	"The flowers have no nectar and are wind-pollinated."
6.06	Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing.	"young plants are capable of propagating vegetatively from buds on the crown or upper part of the taproot"
6.07	Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing.	"Under favourable conditions, young plants are capable of propagating vegetatively from buds on the crown or upper part of the taproot about 30 to 50 days after germination. Uncrowded plants produce stems and flower in the spring of their first growth season, but, in very dense stands, flowers may not form until the second season."
7.01	Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing.	"Some fruit are also spread in mud adhering to...machinery and other vehicles...The crown and the upper part of the taproot are both capable of regeneration and local spread occurs when fragments are dragged by cultivation equipment."
7.02		no evidence
7.03	Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing.	"Some fruit are also spread...as contaminants of agricultural seeds."
7.04	Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing.	"These valves are large wing-like and, acting as sails, materially assist spread by wind..."
7.05	Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing.	"...while the tubercles at their base act as flotation chambers, assisting spread by water"
7.06	Grime, Hodgson, and Hunt (1988) Comparative Plant Ecology: a Functional Approach to Common British Species. Unwin Hyman Ltd., London.	"Fruits survive ingestion by some birds and R.c. may be dispersed in this way."
7.07	Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing.	"Some fruit are also spread in mud adhering to hooves..." [a minor means of dispersal?]
7.08		wind dispersed
8.01	Parsons and Cuthbertson (2001) Noxious Weeds of Australia. CSIRO Publishing.	"All species of dock are prolific seeders, curled dock...producing up to 60,000 seeds per plant."
8.02	Weber (2003) Invasive Plant Species of the World. CABI Publishing.	"Seeds may remain viable in the soil for decades."
8.03	Weber (2003) Invasive Plant Species of the World. CABI Publishing.	"Effective herbicides include glyphosate, dicamba, picloram, or triclopyr."
8.04	Holm, Plucknett, Pancho, and Herberger (1977) The World's Worst Weeds: Distribution and Biology. The University Press of Hawaii, Honolulu.	"The plants can withstand close grazing and mowing"
8.05		