

Australia/New Zealand Weed Risk Assessment adapted for United States.

Data used for analysis published in: Gordon, D.R. and C.A. Gantz. 2008. Potential impacts on the horticultural industry of screening new plants for invasiveness. Conservation Letters 1: 227-235. Available at: <http://www3.interscience.wiley.com/cgi-bin/fulltext/121448369/PDFSTART>

<i>Asarum delavayi</i>			
	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 U.S. climates (USDA hardiness 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)	N	0
2.04	Native or naturalized in regions with an average of 11-60 inches of annual precipitation	Y	1
2.05	Does the species have a history of repeated introductions outside its natural range?	Y	1
3.01	Naturalized beyond native range	N	-2
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	N	0
4.01	Produces spines, thorns or burrs	N	0
4.02	Allelopathic		
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		
4.09	Is a shade tolerant plant at some stage of its life cycle	Y	1
4.1	Grows on one or more of the following soil types: alfisols, entisols, or mollisols	Y	1
4.11	Climbing or smothering growth habit	N	0
4.12	Forms dense thickets	?	
5.01	Aquatic	N	0
5.02	Grass	N	0
5.03	Nitrogen fixing woody plant	N	0
5.04	Geophyte	?	
6.01	Evidence of substantial reproductive failure in native habitat	N	0
6.02	Produces viable seed		
6.03	Hybridizes naturally		
6.04	Self-compatible or apomictic		
6.05	Requires specialist pollinators		
6.06	Reproduction by vegetative fragmentation	y	1
6.07	Minimum generative time (years)		
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		
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		
8.04	Tolerates, or benefits from, mutilation or cultivation		
8.05	Effective natural enemies present in U.S.		
Total Score			0

Outcome	Accept
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section	# questions answered	satisfy minimum?
A	11	Yes
B	7	Yes
C	9	Yes
total	27	Yes

Data collected 2008

Question number	Reference	Source data
1.01		
1.02		
1.03		
2.01	1. PERAL NAPPFAST Global Plant Hardiness (http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global%20zones/10-year%20climate/PLANT_HARDINESS_10YR%20Igd.tif). 2. Wu, Z and Raven, PH (1994) Flora of China. Volume 5, Page 254. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200006647 (accessed online 1/10/2008).	1. Global hardiness zones 7-9 (and possibly 10). 2. China: SW Sichuan, NE Yunnan.
2.02		
2.03	1. Köppen-Geiger climate map (http://www.hydro-earth-syst-sci.net/11/1633/2007/hess-11-1633-2007.pdf). 2. Wu, Z and Raven, PH (1994) Flora of China. Volume 5, Page 254.	1. 2 climate regions. 2. China: SW Sichuan, NE Yunnan

	http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200006647 (accessed online 1/10/2008).	
2.04	Climate Source (http://www.climatesource.com/cn/fact_sheets/chinapt_xl.jpg).	For Sichuan Province, the average annual precipitation is 19.7 in/yr -- 78.7 in/yr; For Yunnan Province, the average annual precipitation is 23.6 in/yr -- 196.9 in/yr.
2.05	1. Fraser's Thimble Farms (http://www.thimblefarms.com/1pren.html). 2. Pacific Rim Native Plant Nursery (http://www.hillkeep.ca/). 3. Cotswold Garden Flowers (http://www.cgf.net/plants.php?genus=ASARUM).	1, 2. Sold in Canada. 3. Sold in the United Kingdom. [Note: there are several other UK and Canada sources selling this species online that are not listed here].
3.01		no evidence
3.02		no evidence
3.03		no evidence
3.04		no evidence
3.05		no evidence
4.01	Wu, Z and Raven, PH (1994) Flora of China. Volume 5, Page 254. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200006647 (accessed online 1/10/2008).	no description of these traits
4.02		
4.03	Wu, Z and Raven, PH (1994) Flora of China. Volume 5, Page 254. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200006647 (accessed online 1/10/2008).	no description of parasitism
4.04		
4.05	Wu, Z and Raven, PH (1994) Flora of China. Volume 5, Page 254. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200006647 (accessed online 1/10/2008).	no evidence
4.06		
4.07	Wu, Z and Raven, PH (1994) Flora of China. Volume 5, Page 254. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200006647 (accessed online 1/10/2008).	no evidence
4.08		
4.09	1. Wu, Z and Raven, PH (1994) Flora of China. Volume 5, Page 254. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200006647 (accessed online 1/10/2008). 2. Vancouver Shade Garden Society (http://www.vancouvershadegardensociety.ca/documents/FP_200504.pdf).	1. "Moist shady areas". 2. Partial to full shade.
4.1	USDA, National Resources Conservation Services (NRCS), Soil Survey Division, World Soil Resources (http://soils.usda.gov/use/worldsoils/mapindex/order.html).	Entisols are present in this region.
4.11	1. Wu, Z and Raven, PH (1994) Flora of China. Volume 5, Page 254. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200006647 (accessed online 1/10/2008). 2. Flora of Taiwan Editorial Committee (1975) Flora of Taiwan. Volume 2. Pp. 576-577. Epoch Publishing	1. "Herbs robust". 2. "Low perennial herbs, acaulescent...Leaves few" [genus description].

	Company, Taipei.	
4.12	1. Wu, Z and Raven, PH (1994) Flora of China. Volume 5, Page 254. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200006647 (accessed online 1/10/2008). 2. Flora of Taiwan Editorial Committee (1975) Flora of Taiwan. Volume 2. Pp. 576-577. Epoch Publishing Company, Taipei.	1. "Herbs robust". 2. "Low perennial herbs, acaulescent...Leaves few" [genus description].
5.01	Wu, Z and Raven, PH (1994) Flora of China. Volume 5, Page 254. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200006647 (accessed online 1/10/2008).	"Herbs robust. Rhizomes horizontal"; terrestrial
5.02	Wu, Z and Raven, PH (1994) Flora of China. Volume 5, Page 254. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200006647 (accessed online 1/10/2008).	Aristolochiaceae
5.03	Wu, Z and Raven, PH (1994) Flora of China. Volume 5, Page 254. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200006647 (accessed online 1/10/2008).	"Herbs robust"; Aristolochiaceae
5.04	Wu, Z and Raven, PH (1994) Flora of China. Volume 5, Page 254. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200006647 (accessed online 1/10/2008).	"Rhizomes horizontal, 2-3 mm in diam., internodes less than 1 cm."
6.01		no evidence
6.02		
6.03		
6.04		
6.05		
6.06	1. Wu, Z and Raven, PH (1994) Flora of China. Volume 5, Page 254. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200006647 (accessed online 1/10/2008). 2. Flora of Taiwan Editorial Committee (1975) Flora of Taiwan. Volume 2. Pp. 576-577. Epoch Publishing Company, Taipei. 3. Portland Classical Chinese Garden (http://www.portlandchinesegarden.org/plants/PlantDisplay.php?ID=779).	1. "Rhizomes horizontal, 2-3 mm in diam., internodes less than 1 cm." 2. "With creeping rhizomes" [genus description]. 3. "Spreads slowly by stolons".
6.07		
7.01		
7.02	1. Fraser's Thimble Farms (http://www.thimblefarms.com/1pren.html). 2. Pacific Rim Native Plant Nursery (http://www.hillkeep.ca/). 3. Cotswold Garden Flowers (http://www.cgf.net/plants.php?genus=ASARUM).	1, 2. Sold in Canada. 3. Sold in the United Kingdom. [Note: there are several other UK and Canada sources selling this species online that are not listed here].
7.03		no evidence
7.04	1. Wu, Z and Raven, PH (1994) Flora of China. Volume 5, Page 254. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=102755 (accessed online 1/10/2008). 2. Flora of Taiwan Editorial Committee (1975) Flora of Taiwan. Volume 2. Pp. 576-577. Epoch Publishing Company, Taipei.	1. "Seeds convex dorsally, plane or grooved ventrally, with fleshy funicle at base" [genus description]. 2. "Fruits capsular...irregularly dehiscent; seeds ellipsoidal, rounded on back, involute on margin, complanate, and with fleshy appendage on ventral face" [genus

		description] [no evidence of adaptations to wind dispersal]
7.05		
7.06		
7.07	<p>1. Wu, Z and Raven, PH (1994) Flora of China. Volume 5, Page 254. http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=102755 (accessed online 1/10/2008). 2. Flora of Taiwan Editorial Committee (1975) Flora of Taiwan. Volume 2. Pp. 576-577. Epoch Publishing Company, Taipei.</p>	<p>1. "Seeds convex dorsally, plane or grooved ventrally, with fleshy funicle at base" [genus description]. 2. "Fruits capsular...irregularly dehiscent; seeds ellipsoidal, rounded on back, involute on margin, complanate, and with fleshy appendage on ventral face" [genus description] [no evidence of adaptations to external dispersal]</p>
7.08		
8.01		
8.02		
8.03		
8.04		
8.05		