

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>Araïostegia pseudocystopteris</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 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		
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	N	0
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	Y	1
7.05	Propagules water dispersed		
7.06	Propagules bird dispersed		
7.07	Propagules dispersed by other animals (externally)		
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		
8.04	Tolerates, or benefits from, mutilation or cultivation		
8.05	Effective natural enemies present in U.S.		
<b>Total Score</b>			<b>3</b>

<b>Outcome</b>	<b>Accept*</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	11	Yes
B	6	Yes
C	10	Yes
total	27	Yes

Data collected 2008

Question number	Reference	Source data
1.01		used horticulturally, but no evidence of significant modification
1.02		
1.03		
2.01	1. PERAL NAPPFAST Global Plant Hardiness ( <a href="http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global%20zones/10-year%20climate/PLANT_HARDINESS_10YR%20lgnd.tif">http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global%20zones/10-year%20climate/PLANT_HARDINESS_10YR%20lgnd.tif</a> ). 2. Flora of China ( <a href="http://flora.huh.harvard.edu/china/mss/volume03/Davalliaceae-MO_reviewing.htm">http://flora.huh.harvard.edu/china/mss/volume03/Davalliaceae-MO_reviewing.htm</a> ). 3. Iwatsuki, K. (1988) An enumeration of the Pteridophytes of Nepal. In <i>The Himalayan Plants, Volume 1</i> . Edited by H. Ohba and S.B. Malla. 1988. Bulletin No. 31. <a href="http://www.um.u-tokyo.ac.jp/publish_db/Bulletin/no31/no31018.html">http://www.um.u-tokyo.ac.jp/publish_db/Bulletin/no31/no31018.html</a> .	1. Global hardiness zones 9-13. 2. Guangxi, Sichuan, Guizhou, Yunnan, Xizang [Bhutan, India, Laos, Myanmar, Nepal, Sikkim, Sri Lanka, Thailand (north), Vietnam]. 3. N India, SW China, Upper Burma, and N Thailand (not actually collected in Nepal). [tropical to subtropical]
2.02		

2.03	<p>1. Köppen-Geiger climate map (<a href="http://www.hydrol-earth-syst-sci.net/11/1633/2007/hess-11-1633-2007.pdf">http://www.hydrol-earth-syst-sci.net/11/1633/2007/hess-11-1633-2007.pdf</a>). 2. Flora of China (<a href="http://flora.huh.harvard.edu/china/mss/volume03/Davalliaceae-MO_reviewing.htm">http://flora.huh.harvard.edu/china/mss/volume03/Davalliaceae-MO_reviewing.htm</a>). 3. Iwatsuki, K. (1988) An enumeration of the Pteridophytes of Nepal. In The Himalayan Plants, Volume 1. Edited by H. Ohba and S.B. Malla. 1988. Bulletin No. 31. <a href="http://www.um.u-tokyo.ac.jp/publish_db/Bulletin/no31/no31018.html">http://www.um.u-tokyo.ac.jp/publish_db/Bulletin/no31/no31018.html</a>.</p>	<p>1. Two climatic regions. 2. Guangxi, Sichuan, Guizhou, Yunnan, Xizang [Bhutan, India, Laos, Myanmar, Nepal, Sikkim, Sri Lanka, Thailand (north), Vietnam]. 3. N India, SW China, Upper Burma, and N Thailand (not actually collected in Nepal).</p>
2.04	<p>1. Climate Source (<a href="http://www.climatesource.com/cn/fact_sheets/chinapt_xl.jpg">http://www.climatesource.com/cn/fact_sheets/chinapt_xl.jpg</a>). 2. Atlapedia Online (<a href="http://www.atlapedia.com/online/countries/">http://www.atlapedia.com/online/countries/</a>). 3. Microsoft Encarta World Precipitation and Average Rainfall (<a href="http://uk.encarta.msn.com/encnet/RefPages/RefMedia.aspx?refid=461530746&amp;artrefid=761554737&amp;pn=3&amp;sec=-1">http://uk.encarta.msn.com/encnet/RefPages/RefMedia.aspx?refid=461530746&amp;artrefid=761554737&amp;pn=3&amp;sec=-1</a>).</p>	<p>1. For the provinces listed, average annual precipitation ranges from 2 inches/year to greater than 196.9 inches/year. 2. For Bhutan: "Average annual precipitation varies from 1,020 to 1,520 mm (40 to 60 inches)"; For Laos: "average annual precipitation varying from 1,270 mm (50 inches) to 2,290 mm (90 inches) depending on the region"; For Myanmar: "The coastal and high mountain precipitation varies between 2,500 to 5,000 mm (98 to 196 inches) annually with the interior receiving 1,000 mm (39 inches) or less."; For Nepal: "Average annual precipitation decreases from 1,778 mm (70 inches) in the east to 899 mm (35 inches) in the west"; For Sri Lanka: "average annual precipitation varies between 1,270 mm and 1,900 mm (50 and 75 inches) on the southeast plains to between 2,540 mm and 5,080 mm (100 and 200 inches) on the southwest plains."; For Thailand: "Average annual precipitation varies from 1,020 mm (40 inches) to 2,030 mm (80 inches) depending on the region."; For Vietnam: "Average annual precipitation in Hanoi is 1,830 mm (72 inches) with areas in the Annamite Mountains exceeding 4,060 mm (160 inches)". 3. For Northern India, average annual precipitation ranges from less than 10 inches/year to greater than 80 inches/year, however the less than 10 inches range is a relatively small proportion of the distribution.</p>
2.05	<p>1. RHS Plant Finder (<a href="http://www.rhs.org.uk/RHSPlantFinder/documents/lastlisted.pdf">http://www.rhs.org.uk/RHSPlantFinder/documents/lastlisted.pdf</a>). 2. Plant Delights Nursery (PDN) (<a href="http://www.plantdelights.com/About/intros.html">http://www.plantdelights.com/About/intros.html</a>).</p>	<p>1. In horticultural plant directory (UK). 2. Sold in the United States.</p>
3.01		no evidence

3.02		no evidence
3.03		no evidence
3.04		no evidence
3.05		no evidence
4.01	1. Flora of China ( <a href="http://flora.huh.harvard.edu/china/mss/volume03/Davalliaceae-MO_reviewing.htm">http://flora.huh.harvard.edu/china/mss/volume03/Davalliaceae-MO_reviewing.htm</a> ). 2. Iwatsuki, K. (1988) An enumeration of the Pteridophytes of Nepal. In The Himalayan Plants, Volume 1. Edited by H. Ohba and S.B. Malla. 1988. Bulletin No. 31. <a href="http://www.um.u-tokyo.ac.jp/publish_db/Bulletin/no31/no31018.html">http://www.um.u-tokyo.ac.jp/publish_db/Bulletin/no31/no31018.html</a> .	no description of these traits
4.02		
4.03	1. Flora of China ( <a href="http://flora.huh.harvard.edu/china/mss/volume03/Davalliaceae-MO_reviewing.htm">http://flora.huh.harvard.edu/china/mss/volume03/Davalliaceae-MO_reviewing.htm</a> ). 2. Iwatsuki, K. (1988) An enumeration of the Pteridophytes of Nepal. In The Himalayan Plants, Volume 1. Edited by H. Ohba and S.B. Malla. 1988. Bulletin No. 31. <a href="http://www.um.u-tokyo.ac.jp/publish_db/Bulletin/no31/no31018.html">http://www.um.u-tokyo.ac.jp/publish_db/Bulletin/no31/no31018.html</a> .	no description of parasitism
4.04		
4.05	Flora of China ( <a href="http://flora.huh.harvard.edu/china/mss/volume03/Davalliaceae-MO_reviewing.htm">http://flora.huh.harvard.edu/china/mss/volume03/Davalliaceae-MO_reviewing.htm</a> ).	no evidence
4.06		
4.07	Flora of China ( <a href="http://flora.huh.harvard.edu/china/mss/volume03/Davalliaceae-MO_reviewing.htm">http://flora.huh.harvard.edu/china/mss/volume03/Davalliaceae-MO_reviewing.htm</a> ).	no evidence
4.08		
4.09		
4.1	USDA, National Resources Conservation Services (NRCS), Soil Survey Division, World Soil Resources ( <a href="http://soils.usda.gov/use/worldsoils/mapindex/order.html">http://soils.usda.gov/use/worldsoils/mapindex/order.html</a> ).	Alfisols occur in these regions.
4.11	1. Bhardwaja, TN, Gena, CB, Takker, T, Kaur, R and Wadhwani, C (1981) Newly recorded and rediscovered ferns at Mount Abu, Rajasthan. Journal of the Bombay Natural History Society 78(3): 639-641. 2. Dhir, KK and Datta, KS (1977) Ferns of Dharamsala Hills Ophioglossaceous Schizaeaceous and Hymenophyllaceous series. Journal of the Bombay Natural History Society 74(3) : 459-480. 3. Seth, MK, Kumari, A, Bhandari, A and Khullar, SP (2004) Common Pteridophytes of Shimla (Himachal Pradesh). Part I. Adiantaceae, Hemionitidaceae, Davalliaceae and Aspleniaceae. Journal of Economic and Taxonomic Botany 28(3): 635-652. 4. Flora of Taiwan Editorial Committee (1975) Flora of Taiwan. Volume 1. P. 271. Epoch Publishing Company, Taipei.	1. "Rhizome creeping on the moist surfaces of rocks, sympodial". 2. "Rhizome 3-6 mm thick, woody, wide-creeping, epigaeous". 3. "Rhizome long creeping, branched, 0.3-0.4 cm in diameter". 4. "Rhizomes fleshy, creeping" [genus description].
4.12		
5.01	1. Flora of China ( <a href="http://flora.huh.harvard.edu/china/mss/volume03/Davalliaceae-MO_reviewing.htm">http://flora.huh.harvard.edu/china/mss/volume03/Davalliaceae-MO_reviewing.htm</a> ). 2. Iwatsuki, K. (1988) An enumeration of the Pteridophytes of Nepal. In The Himalayan Plants, Volume 1. Edited by H. Ohba and	Terrestrial

	S.B. Malla. 1988. Bulletin No. 31. <a href="http://www.um.u-tokyo.ac.jp/publish_db/Bulletin/no31/no31018.html">http://www.um.u-tokyo.ac.jp/publish_db/Bulletin/no31/no31018.html</a> .	
5.02	1. Flora of China ( <a href="http://flora.huh.harvard.edu/china/mss/volume03/Davalliaceae-MO_reviewing.htm">http://flora.huh.harvard.edu/china/mss/volume03/Davalliaceae-MO_reviewing.htm</a> ). 2. Iwatsuki, K. (1988) An enumeration of the Pteridophytes of Nepal. In The Himalayan Plants, Volume 1. Edited by H. Ohba and S.B. Malla. 1988. Bulletin No. 31. <a href="http://www.um.u-tokyo.ac.jp/publish_db/Bulletin/no31/no31018.html">http://www.um.u-tokyo.ac.jp/publish_db/Bulletin/no31/no31018.html</a> .	Davalliaceae
5.03	1. Flora of China ( <a href="http://flora.huh.harvard.edu/china/mss/volume03/Davalliaceae-MO_reviewing.htm">http://flora.huh.harvard.edu/china/mss/volume03/Davalliaceae-MO_reviewing.htm</a> ). 2. Iwatsuki, K. (1988) An enumeration of the Pteridophytes of Nepal. In The Himalayan Plants, Volume 1. Edited by H. Ohba and S.B. Malla. 1988. Bulletin No. 31. <a href="http://www.um.u-tokyo.ac.jp/publish_db/Bulletin/no31/no31018.html">http://www.um.u-tokyo.ac.jp/publish_db/Bulletin/no31/no31018.html</a> .	Herb; Davalliaceae
5.04	1. Bhardwaja, TN, Gena, CB, Takker, T, Kaur, R and Wadhwani, C (1981) Newly recorded and rediscovered ferns at Mount Abu, Rajasthan. Journal of the Bombay Natural History Society 78(3): 639-641. 2. Dhir, KK and Datta, KS (1977) Ferns of Dharamsala Hills Ophioglossaceous Schizaeaceous and Hymenophyllaceous series. Journal of the Bombay Natural History Society 74(3) : 459-480. 3. Seth, MK, Kumari, A, Bhandari, A and Khullar, SP (2004) Common Pteridophytes of Shimla (Himachal Pradesh). Part I. Adiantaceae, Hemionitidaceae, Davalliaceae and Aspleniaceae. Journal of Economic and Taxonomic Botany 28(3): 635-652. 4. Flora of Taiwan Editorial Committee (1975) Flora of Taiwan. Volume 1. P. 271. Epoch Publishing Company, Taipei.	1. "Rhizome creeping on the moist surfaces of rocks, sympodial". 2. "Rhizome 3-6 mm thick, woody, wide-creeping, epigaeous". 3. "Rhizome long creeping, branched, 0.3-0.4 cm in diameter". 4. "Rhizomes fleshy, creeping" [genus description].
6.01		no evidence
6.02	1. Bhardwaja, TN, Gena, CB, Takker, T, Kaur, R and Wadhwani, C (1981) Newly recorded and rediscovered ferns at Mount Abu, Rajasthan. Journal of the Bombay Natural History Society 78(3): 639-641. 2. Dhir, KK and Datta, KS (1977) Ferns of Dharamsala Hills Ophioglossaceous Schizaeaceous and Hymenophyllaceous series. Journal of the Bombay Natural History Society 74(3) : 459-480. 3. Seth, MK, Kumari, A, Bhandari, A and Khullar, SP (2004) Common Pteridophytes of Shimla (Himachal Pradesh). Part I. Adiantaceae, Hemionitidaceae, Davalliaceae and Aspleniaceae. Journal of Economic and Taxonomic Botany 28(3): 635-652	This is a fern, so most likely produces viable spores.
6.03		
6.04		
6.05	1. Bhardwaja, TN, Gena, CB, Takker, T, Kaur, R and Wadhwani, C (1981) Newly recorded and rediscovered ferns at Mount Abu, Rajasthan. Journal of the Bombay Natural History Society 78(3): 639-641. 2. Dhir, KK and Datta, KS (1977) Ferns of Dharamsala Hills Ophioglossaceous Schizaeaceous and Hymenophyllaceous series. Journal of the	Fern, so does not require specialist pollinators (most likely wind pollinated).

	Bombay Natural History Society 74(3) : 459-480. 3. Seth, MK, Kumari, A, Bhandari, A and Khullar, SP (2004) Common Pteridophytes of Shimla (Himachal Pradesh). Part I. Adiantaceae, Hemionitidaceae, Davalliaceae and Aspleniaceae. Journal of Economic and Taxonomic Botany 28(3): 635-652	
6.06	1. Bhardwaja, TN, Gena, CB, Takker, T, Kaur, R and Wadhwani, C (1981) Newly recorded and rediscovered ferns at Mount Abu, Rajasthan. Journal of the Bombay Natural History Society 78(3): 639-641. 2. Dhir, KK and Datta, KS (1977) Ferns of Dharamsala Hills Ophioglossaceous Schizaeaceous and Hymenophyllaceous series. Journal of the Bombay Natural History Society 74(3) : 459-480. 3. Seth, MK, Kumari, A, Bhandari, A and Khullar, SP (2004) Common Pteridophytes of Shimla (Himachal Pradesh). Part I. Adiantaceae, Hemionitidaceae, Davalliaceae and Aspleniaceae. Journal of Economic and Taxonomic Botany 28(3): 635-652. 4. Flora of Taiwan Editorial Committee (1975) Flora of Taiwan. Volume 1. P. 271. Epoch Publishing Company, Taipei.	1. "Rhizome creeping on the moist surfaces of rocks, sympodial". 2. "Rhizome 3-6 mm thick, woody, wide-creeping, epigaeous". 3. "Rhizome long creeping, branched, 0.3-0.4 cm in diameter". 4. "Rhizomes fleshy, creeping" [genus description].
6.07		
7.01		
7.02	1. RHS Plant Finder ( <a href="http://www.rhs.org.uk/RHSPlantFinder/documents/la-stlisted.pdf">http://www.rhs.org.uk/RHSPlantFinder/documents/la-stlisted.pdf</a> ). 2. Plant Delights Nursery (PDN) ( <a href="http://www.plantdelights.com/About/intros.html">http://www.plantdelights.com/About/intros.html</a> ).	1. In horticultural plant directory (UK). 2. Sold in the United States.
7.03		no evidence
7.04	1. Bhardwaja, TN, Gena, CB, Takker, T, Kaur, R and Wadhwani, C (1981) Newly recorded and rediscovered ferns at Mount Abu, Rajasthan. Journal of the Bombay Natural History Society 78(3): 639-641. 2. Dhir, KK and Datta, KS (1977) Ferns of Dharamsala Hills Ophioglossaceous Schizaeaceous and Hymenophyllaceous series. Journal of the Bombay Natural History Society 74(3) : 459-480. 3. Seth, MK, Kumari, A, Bhandari, A and Khullar, SP (2004) Common Pteridophytes of Shimla (Himachal Pradesh). Part I. Adiantaceae, Hemionitidaceae, Davalliaceae and Aspleniaceae. Journal of Economic and Taxonomic Botany 28(3): 635-652	This is a fern, so produces spores.
7.05		
7.06		
7.07		
7.08		
8.01	1. Bhardwaja, TN, Gena, CB, Takker, T, Kaur, R and Wadhwani, C (1981) Newly recorded and rediscovered ferns at Mount Abu, Rajasthan. Journal of the Bombay Natural History Society 78(3): 639-641. 2. Dhir, KK and Datta, KS (1977) Ferns of Dharamsala Hills Ophioglossaceous Schizaeaceous and Hymenophyllaceous series. Journal of the Bombay Natural History Society 74(3) : 459-480. 3. Seth, MK, Kumari, A, Bhandari, A and Khullar, SP	This is a fern, so produces numerous spores.

	(2004) Common Pteridophytes of Shimla (Himachal Pradesh). Part I. Adiantaceae, Hemionitidaceae, Davalliaceae and Aspleniaceae. Journal of Economic and Taxonomic Botany 28(3): 635-652	
8.02		
8.03		
8.04		
8.05		