

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>Adiantum thalictroides</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)	Y	1
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?	?	
3.01	Naturalized beyond native range	N	-1
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	?	
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	?	
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.		
Total Score			4

Outcome	Accept*
----------------	----------------

*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	10	Yes
B	5	Yes
C	9	Yes
total	24	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 (http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global%20zones/10-year%20climate/PLANT_HARDINESS_10YR%20lgn d.tif). 2. Tryon, RM and Stolze, RG (1989) Pteridophyta of Peru. Part II. Fieldiana No. 22. Field Museum of Natural History, Chicago. 3. Zuloaga, FO and Morrone, O (1996) Catálogo de las plantas vasculares de la República Argentina. Missouri Botanical Garden, St. Louis. 4. Giudice, GE (1999) Sinopsis de las especies Argentinas del genero Adiantum (Pteridaceae, Pteridophyta). Darwiniana	1. Global hardiness zones 9-13. 2. "Cajamarca and Amazonas, south to Puno and Arequipa [Peru]. Mexico and the West Indies, south to Argentina; mid-Atlantic islands and Africa and adjacent islands." 3. Adiantum thalictroides var. hirsutum is distributed in Bolivia and Chile. Adiantum thalictroides var. thalictroides is distributed in Chile. Adiantum thalictroides forma bottini is possibly distributed in Argentina

	37(3-4): 279-300. 5. Kiesling, R (1994) Flora de San Juan, República Argentina. Vazquez Mazzini Editores, Buenos Aires.	[country not specified, but reference is about plants in Argentina]. 4. Distribution: from Mexico down to Peru, Paraguay, and Uruguay; also in subtropical Africa, the islands of east Africa, South Africa, and India. It is common in Argentina in the Oriental Mountain Range, Sierra Subandinas, Sierra Pampeanas. 5. In Argentina it grows in the NW and in the Cuyana Region. In San Juan it has been found in the Fertile Valley. [tropical to sub-tropical]
2.02		
2.03	1. Köppen-Geiger climate map (http://www.hydrol-earth-syst-sci.net/11/1633/2007/hess-11-1633-2007.pdf). 2. Tryon, RM and Stolze, RG (1989) Pteridophyta of Peru. Part II. Fieldiana No. 22. Field Museum of Natural History, Chicago. 3. Zuloaga, FO and Morrone, O (1996) Catálogo de las plantas vasculares de la República Argentina. Missouri Botanical Garden, St. Louis. 4. Giudice, GE (1999) Sinopsis de las especies Argentinas del genero Adiantum (Pteridaceae, Pteridophyta). Darwiniana 37(3-4): 279-300. 5. Kiesling, R (1994) Flora de San Juan, República Argentina. Vazquez Mazzini Editores, Buenos Aires.	1. 3 climatic regions. 2. "Cajamarca and Amazonas, south to Puno and Arequipa [Peru]. Mexico and the West Indies, south to Argentina; mid-Atlantic islands and Africa and adjacent islands." 3. Adiantum thalictroides var. hirsutum is distributed in Bolivia and Chile. Adiantum thalictroides var. thalictroides is distributed in Chile. Adiantum thalictroides forma bottini is possibly distributed in Argentina [country not specified, but reference is about plants in Argentina]. 4. Distribution: from Mexico down to Peru, Paraguay, and Uruguay; also in subtropical Africa, the islands of east Africa, South Africa, and India. It is common in Argentina in the Oriental Mountain Range, Sierra Subandinas, Sierra Pampeanas. 5. In Argentina it grows in the NW and in the Cuyana Region. In San Juan it has been found in the Fertile Valley. [At least 3 biomes]
2.04	1. Atlapedia Online (http://www.atlapedia.com/online/countries/peru.htm). 2. Microsoft Encarta World Precipitation and Average Rainfall (http://uk.encarta.msn.com/encnet/RefPages/RefMedia.aspx?refid=461530746&artrefid=761554737&pn=3&sec=-1). 3. World Trade Press (http://www.worldtradeexpress.com/Precipitation_Map_Argentina.html).	1. For Peru: "Average annual precipitation varies from 2,540 mm (100 inches) to 3,960 mm (156 inches) depending on the region." 2. For Mexico: ranges from under 10 inches to over 80 inches; For the West Indies: range is 40-60 inches/year; For Tropical Africa: ranges from under 10 inches to over 80 inches. 3. Northern Argentina receives between 9.8 and 98.4 inches of rainfall per year, depending upon the region.
2.05	1. Plant Delights Nursery (http://www.plantdelights.com/Catalog/Current/Detail/06207.html). 2. Jiménez, AM (1984) Flora de	1. Sold in the U.S. 2. "Por ser ornamental se la cultiva en macetas" [because it is ornamental,

	Cochabamba. Impr. "Los Huérfanos", Santa Cruz de la Sierra [Bolivia].	it is cultivated in flower pots].
3.01		no evidence
3.02		no evidence
3.03		no evidence
3.04		no evidence
3.05	New Zealand Plant Conservation Network (2005) New Zealand Adventive Vascular Plant List.	Two congeners are "fully naturalised" [not enough evidence to be considered weeds].
4.01	Tryon, RM and Stolze, RG (1989) Pteridophyta of Peru. Part II. Fieldiana No. 22. Field Museum of Natural History, Chicago.	no description of these traits
4.02		
4.03	Tryon, RM and Stolze, RG (1989) Pteridophyta of Peru. Part II. Fieldiana No. 22. Field Museum of Natural History, Chicago.	no description of parasitism
4.04		
4.05	Tryon, RM and Stolze, RG (1989) Pteridophyta of Peru. Part II. Fieldiana No. 22. Field Museum of Natural History, Chicago.	no evidence
4.06		
4.07	Tryon, RM and Stolze, RG (1989) Pteridophyta of Peru. Part II. Fieldiana No. 22. Field Museum of Natural History, Chicago.	no evidence
4.08		
4.09	Tryon, RM and Stolze, RG (1989) Pteridophyta of Peru. Part II. Fieldiana No. 22. Field Museum of Natural History, Chicago.	"Wooded hillsides, open woods, thickets, lomas, and rocky places".
4.1	USDA, National Resources Conservation Services (NRCS), Soil Survey Division, World Soil Resources (http://soils.usda.gov/use/worldsoils/mapindex/order.html).	All three soil orders are found in these regions.
4.11	Tryon, RM and Stolze, RG (1989) Pteridophyta of Peru. Part II. Fieldiana No. 22. Field Museum of Natural History, Chicago.	"Stem slender, rather long-creeping, with tufts of petioles borne at intervals, or sometimes more compact".
4.12		
5.01	Tryon, RM and Stolze, RG (1989) Pteridophyta of Peru. Part II. Fieldiana No. 22. Field Museum of Natural History, Chicago.	terrestrial
5.02	Tryon, RM and Stolze, RG (1989) Pteridophyta of Peru. Part II. Fieldiana No. 22. Field Museum of Natural History, Chicago.	Pteridaceae
5.03	Tryon, RM and Stolze, RG (1989) Pteridophyta of Peru. Part II. Fieldiana No. 22. Field Museum of Natural History, Chicago.	Pteridaceae
5.04	1. Kiesling, R (1994) Flora de San Juan, República Argentina. Vazquez Mazzini Editores, Buenos Aires. 2. Schelpe, E.A.C.L.E. (1970) Flora Zambesiaca. Volume 0, Part 0. Adiantaceae. http://www.aluka.org/action/showMetadata?doi=10.5555/AL.AP.FLORA.FZ7634&pgs= .	1. "Plants with thin rhizomes, scrambling". 2. "Rhizomes slender, wide creeping, producing at intervals short thicker creeping branch-rhizomes with closely spaced fronds".
6.01		no evidence
6.02		

6.03		
6.04		
6.05	Tryon, RM and Stolze, RG (1989) Pteridophyta of Peru. Part II. Fieldiana No. 22. Field Museum of Natural History, Chicago.	Fern, so does not require specialist pollinators (most likely wind pollinated).
6.06	1. Kiesling, R (1994) Flora de San Juan, República Argentina. Vazquez Mazzini Editores, Buenos Aires. 2. Schelpe, E.A.C.L.E. (1970) Flora Zambesiaca. Volume 0, Part 0. Adiantaceae. http://www.aluka.org/action/showMetadata?doi=10.5555/AL.AP.FLORA.FZ7634&pgs= .	1. "Plants with thin rhizomes, scrambling". 2. "Rhizomes slender, wide creeping, producing at intervals short thicker creeping branch-rhizomes with closely spaced fronds".
6.07		
7.01		
7.02	1. Plant Delights Nursery (http://www.plantdelights.com/Catalog/Current/Detail/06207.html). 2. Jiménez, AM (1984) Flora de Cochabamba. Impr. "Los Huérfanos", Santa Cruz de la Sierra [Bolivia].	1. Sold in the U.S. 2. "Por ser ornamental se la cultiva en macetas" [because it is ornamental, it is cultivated in flower pots].
7.03		no evidence
7.04	Tryon, RM and Stolze, RG (1989) Pteridophyta of Peru. Part II. Fieldiana No. 22. Field Museum of Natural History, Chicago.	This is a fern, so produces spores.
7.05		
7.06		
7.07		
7.08		
8.01	Tryon, RM and Stolze, RG (1989) Pteridophyta of Peru. Part II. Fieldiana No. 22. Field Museum of Natural History, Chicago.	This is a fern, so produces numerous spores.
8.02		
8.03		
8.04		
8.05		