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

Thelypteris beddomei			
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?	?	
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	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	?	
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	n	-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.		
Total Score			2

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	7	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 (http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global%20zones/10-year%20climate/PLANT_HARDINESS_10YR%20lgnd.tif). 2. You-xin, L (2008) Parathelypteris beddomei. In: Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. In Preparation. Flora of China. Vol. 2 (Psilotaceae-Thelypteridaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis. Accessed online at http://hua.huh.harvard.edu/china/mss/volume02/Thelypteridaceae-MO_original.htm. 3. Shimura, Y (1966) Observations on the distribution and ecology of Thelypteris beddomei (Bak.) Ching at the western foot of Mt. Fuji, Japan. Japanese Journal of Ecology 16(4): 145-146.	1. Global hardiness zones 7-13. 2. N. Taiwan and Zhejiang [S. India, Indonesia, Japan, Malaysia, and Philippines]. 3. Uchino, Ashigata district and around Lake Tanuki, Fujinomiya City, Shizuoka Prefecture.
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. You-xin, L (2008) Parathelypteris beddomei. In: Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. In Preparation. Flora of China. Vol. 2 (Psilotaceae-Thelypteridaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis. Accessed online at http://hua.huh.harvard.edu/china/mss/volume02/Thelypteridaceae-MO_original.htm. 3. Shimura, Y (1966) Observations on the distribution and ecology of Thelypteris beddomei (Bak.) Ching at the western foot of Mt. Fuji, Japan. Japanese	1. Two climatic regions. 2. N. Taiwan and Zhejiang [S. India, Indonesia, Japan, Malaysia, and Philippines]. 3. Uchino, Ashigata district and around Lake Tanuki, Fujinomiya City, Shizuoka Prefecture.

	Journal of Ecology 16(4): 145-146.	
2.04	1. Climate Source (http://www.climatesource.com/tw/fact_sheets/taippt_xl.jpg). 2. Climate Source (http://www.climatesource.com/cn/fact_sheets/chinappt_xl.jpg). 3. Microsoft Encarta World Precipitation and Average Rainfall (http://uk.encarta.msn.com/encnet/RefPages/RefMedia.aspx?refid=461530746&artrefid=761554737&pn=3&sec=-1). 4. Atlapedia Online (http://www.atlapedia.com/online/countries/). 5. MSN Encarta (http://encarta.msn.com/encyclopedia_761566679_4/Japan.html).	1. Average annual precipitation in northern Taiwan ranges from 55.1 inches/year to greater than 275.6 inches/year. 2. For Zhejiang Province, the average annual precipitation is 39.4 inches/year to 196.9 inches/year. 3. For southern India, average annual precipitation ranges from 20 inches/year to over 80 inches/year; For Indonesia, average annual precipitation is over 80 inches/year; For the Philippines, average annual precipitation is over 80 inches/year. 4. For Malaysia: "Average annual precipitation for West Malaysia is 2,540 mm (100 inches) and for East Malaysia it is 4,420 mm (150 inches)." 5. Average annual precipitation in Sapporo [north] is 1,130 mm (45 in), while in Tokyo [central] it is 1,410 mm (55 in) and in Kagoshima [south] it is 2,240 mm (88 in). [distribution is in central Japan]
2.05		no evidence
3.01		no evidence
3.02		no evidence
3.03		no evidence
3.04		no evidence
3.05	Holm, L, JV Pancho, JP Herberger, and DL Plucknett (1979) A Geographical Atlas of World Weeds. John Wiley and Sons, New York.	One congener is present as a weed in the Philippines [not enough evidence to be considered a weed].
4.01	You-xin, L (2008) *Parathelypteris beddomei*. In: Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. In Preparation. Flora of China. Vol. 2 (Psilotaceae-Thelypteridaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis. Accessed online at http://hua.huh.harvard.edu/china/mss/volume02/Thelypteridaceae-MO_original.htm.	no description of these traits
4.02		

4.03	You-xin, L (2008) *Parathelypteris beddomei*. In: Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. In Preparation. Flora of China. Vol. 2 (Psilotaceae-Thelypteridaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis. Accessed online at http://hua.huh.harvard.edu/china/mss/volume02/Thelypteridaceae-MO_original.htm.	no description of parasitism
4.04		
4.05	You-xin, L (2008) *Parathelypteris beddomei*. In: Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. In Preparation. Flora of China. Vol. 2 (Psilotaceae-Thelypteridaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis. Accessed online at http://hua.huh.harvard.edu/china/mss/volume02/Thelypteridaceae-MO_original.htm.	no evidence
4.06		
4.07	You-xin, L (2008) *Parathelypteris beddomei*. In: Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. In Preparation. Flora of China. Vol. 2 (Psilotaceae-Thelypteridaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis. Accessed online at http://hua.huh.harvard.edu/china/mss/volume02/Thelypteridaceae-MO_original.htm.	no evidence
4.08		
4.09	Shimura, Y (1966) Observations on the distribution and ecology of Thelypteris beddomei (Bak.) Ching at the western foot of Mt. Fuji, Japan. Japanese Journal of Ecology 16(4): 145-146.	"Grows in somewhat shady and damp sites".
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 these regions.
4.11	You-xin, L (2008) *Parathelypteris beddomei*. In: Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. In Preparation. Flora of China. Vol. 2 (Psilotaceae-Thelypteridaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis. Accessed online at http://hua.huh.harvard.edu/china/mss/volume02/Thelypteridaceae-MO_original.htm.	"Plants 20-40 cm tall" [species description]; "mid or small terrestrial plants" [genus description].

4.12	You-xin, L (2008) *Parathelypteris beddomei*. In: Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. In Preparation. Flora of China. Vol. 2 (Psilotaceae-Thelypteridaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis. Accessed online at http://hua.huh.harvard.edu/china/mss/volume02/Thelypteridaceae-MO_original.htm.	"Plants 20-40 cm tall" [species description]; "mid or small terrestrial plants" [genus description].
5.01		terrestrial
5.02		Thelypteridaceae
5.03		Thelypteridaceae
5.04	You-xin, L (2008) *Parathelypteris beddomei*. In: Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. In Preparation. Flora of China. Vol. 2 (Psilotaceae-Thelypteridaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis. Accessed online at http://hua.huh.harvard.edu/china/mss/volume02/Thelypteridaceae-MO_original.htm.	"Rhizomes extremely long and creeping".
6.01		no evidence
6.02		
6.03		
6.04		
6.05	You-xin, L (2008) *Parathelypteris beddomei*. In: Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. In Preparation. Flora of China. Vol. 2 (Psilotaceae-Thelypteridaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis. Accessed online at http://hua.huh.harvard.edu/china/mss/volume02/Thelypteridaceae-MO_original.htm.	Fern, so does not require specialist pollinators (most likely wind pollinated).
6.06	You-xin, L (2008) *Parathelypteris beddomei*. In: Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. In Preparation. Flora of China. Vol. 2 (Psilotaceae-Thelypteridaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis. Accessed online at http://hua.huh.harvard.edu/china/mss/volume02/Thelypteridaceae-MO_original.htm.	"Rhizomes extremely long and creeping".
6.07		
7.01		
7.02		no evidence

7.03		no evidence
7.04	You-xin, L (2008) *Parathelypteris beddomei*. In: Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. In Preparation. Flora of China. Vol. 2 (Psilotaceae-Thelypteridaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis. Accessed online at http://hua.huh.harvard.edu/china/mss/volume02/Thelypteridaceae-MO_original.htm.	Fern (spores dispersed by wind).
7.05		
7.06		
7.07		
7.08		
8.01	You-xin, L (2008) *Parathelypteris beddomei*. In: Wu, Z. Y., P. H. Raven & D. Y. Hong, eds. In Preparation. Flora of China. Vol. 2 (Psilotaceae-Thelypteridaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis. Accessed online at http://hua.huh.harvard.edu/china/mss/volume02/Thelypteridaceae-MO_original.htm.	This is a fern, so produces many spores.
8.02		
8.03		
8.04		
8.05		