

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>Pityrogramma calomelanos (silverback fern)</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)		
2.04	Native or naturalized in habitats with periodic inundation		
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	?	
3.03	Weed of agriculture	y	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	y	1
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	n	0
4.09	Is a shade tolerant plant at some stage of its life cycle	n	0
4.1	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils)	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	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)	2	0
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	n	-1
7.06	Propagules bird dispersed	n	-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		
8.04	Tolerates, or benefits from, mutilation or cultivation		
8.05	Effective natural enemies present in Florida, or east of the continental divide		
Total Score			12

Outcome	Reject*
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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	5	yes
B	10	yes
C	18	yes
total	33	yes

Data collected 2006-2007

Question number	Reference	Source data
1.01		cultivated as an ornamental, but no evidence of selection for reduced weediness
1.02		
1.03		
2.01		
2.02		
2.03		
2.04		
2.05	de Winter and Amoroso, eds. (2003) Plant Resources of South-East Asia. No. 15(2). Cryptogams: Ferns and Fern Allies. Backhuys Publishers, Leiden.	" <i>P. calomelanos</i> originates from tropical and subtropical America but has spread throughout the tropics, including South-East Asia. It has been cultivated for a long time and its current, almost pantropical distribution may have been induced by deliberate introductions...If its current distribution is not due to man directly, then at least <i>P. calomelanos</i> takes advantage of the many open habitats created by human activities."
3.01	1. Clifford (1980) Ferns, Fern Allies and Conifers of Australia. University of Queensland Press, St. Lucia, Queensland. 2. de Winter and Amoroso, eds. (2003) Plant Resources of South-East Asia. No. 15(2). Cryptogams: Ferns and Fern Allies. Backhuys Publishers, Leiden.	1. <i>P. calomelanos</i> is naturalized in Australia. 2. " <i>P. calomelanos</i> originates from tropical and subtropical America but has spread throughout the tropics, including South-East Asia."
3.02	Standley (1927) Ferns of Barro Colorado Island II. American Fern Journal 17: 1-8.	"A rather weedy plant...frequently thriving by roadsides or on cut-over land." [unclear whether it is a nuisance]
3.03	1. Spicer, Burnham, Grant, and Glicker (1985) <i>Pityrogramma calomelanos</i> , the primary, post-eruption colonizer of Volcan Chichonal, Chiapas, Mexico. American Fern Journal 75: 1-5. 2. Holm (1979) A	1. "it frequently occurs as a weed in palm and banana plantations" 2. Considered a common weed of agriculture in Hawaii and

	Geographical Atlas of World Weeds. John Wiley and Sons.	Puerto Rico.
3.04		no evidence
3.05		no evidence
4.01	de Winter and Amoroso, eds. (2003) Plant Resources of South-East Asia. No. 15(2). Cryptogams: Ferns and Fern Allies. Backhuys Publishers, Leiden.	no description of these traits
4.02	Peres, Silva, Faccenda, and Hess (2004) Allelopathic potential of species of Pteridaceae (Pteridophyta). Acta Botanica Brasilica 18: 723-730.	Extracts of <i>P. calomelanos</i> inhibited the radicular growth of lettuce seedlings.
4.03	de Winter and Amoroso, eds. (2003) Plant Resources of South-East Asia. No. 15(2). Cryptogams: Ferns and Fern Allies. Backhuys Publishers, Leiden.	no description of this
4.04		
4.05		no evidence
4.06		
4.07	Bruneton (1999) Toxic Plants: Dangerous to Humans and Animals. Lavoisier Publishing, Paris.	"Ferns are rarely harmful to humans"; "Allergies to ferns are very rare"
4.08		no evidence
4.09	1. Spicer, Burnham, Grant, and Glicken (1985) <i>Pityrogramma calomelanos</i> , the primary, post-eruption colonizer of Volcan Chichonal, Chiapas, Mexico. American Fern Journal 75: 1-5. 2. de Winter and Amoroso, eds. (2003) Plant Resources of South-East Asia. No. 15(2). Cryptogams: Ferns and Fern Allies. Backhuys Publishers, Leiden.	1. "It [the genus <i>Pityrogramma</i>] is common in open habitats" 2. " <i>P. calomelanos</i> occurs on open mountain slopes in recently felled areas..., in open forest, savanna woodland and rainforest margins"; "It...should be exposed to moderate sunshine."
4.1	de Winter and Amoroso, eds. (2003) Plant Resources of South-East Asia. No. 15(2). Cryptogams: Ferns and Fern Allies. Backhuys Publishers, Leiden.	"apparently preferring non-calcareous fine sands"
4.11	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	growth habit: forb/herb
4.12		no evidence
5.01	de Winter and Amoroso, eds. (2003) Plant Resources of South-East Asia. No. 15(2). Cryptogams: Ferns and Fern Allies. Backhuys Publishers, Leiden.	terrestrial
5.02	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	Pteridaceae
5.03	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	herbaceous Pteridaceae
5.04	Duncan (1994) Ferns and Allied Plants of Victoria, Tasmania and South Australia. Melbourne University Press, Carlton, Victoria.	fern roots are usually fine and fibrous
6.01		

6.02	de Winter and Amoroso, eds. (2003) Plant Resources of South-East Asia. No. 15(2). Cryptogams: Ferns and Fern Allies. Backhuys Publishers, Leiden.	" <i>P. calomelanos</i> can be propagated by spores"
6.03	Nelson (2000) Ferns of Florida. Pineapple Press, Sarasota, Florida.	Reported to hybridize with several species. [prob. natural?]
6.04	Spicer, Burnham, Grant, and Glicken (1985) <i>Pityrogramma calomelanos</i> , the primary, post-eruption colonizer of Volcan Chichonal, Chiapas, Mexico. American Fern Journal 75: 1-5.	"Even if prothalli are spatially separated so as to prevent outcrossing, self-fertilization can give rise to a new sporophyte in a relatively short time."
6.05		fern
6.06	1. Spicer, Burnham, Grant, and Glicken (1985) <i>Pityrogramma calomelanos</i> , the primary, post-eruption colonizer of Volcan Chichonal, Chiapas, Mexico. American Fern Journal 75: 1-5. 2. de Winter and Amoroso, eds. (2003) Plant Resources of South-East Asia. No. 15(2). Cryptogams: Ferns and Fern Allies. Backhuys Publishers, Leiden.	1. "Regrowth from buried rhizomes accounted for the largest plants of <i>Pityrogramma</i> that were observed" 2. " <i>P. calomelanos</i> can be propagated by spores and by rhizome cuttings."
6.07	Spicer, Burnham, Grant, and Glicken (1985) <i>Pityrogramma calomelanos</i> , the primary, post-eruption colonizer of Volcan Chichonal, Chiapas, Mexico. American Fern Journal 75: 1-5.	Fertile fronds of <i>P. calomelanos</i> were found about 2 years after a volcanic eruption, having regenerated from buried rhizomes. [so 2 years is an upper limit of the generative time]
7.01		
7.02	de Winter and Amoroso, eds. (2003) Plant Resources of South-East Asia. No. 15(2). Cryptogams: Ferns and Fern Allies. Backhuys Publishers, Leiden.	" <i>P. calomelanos</i> is a plant cultivated world-wide"; it is "often cultivated as an ornamental in gardens and greenhouses".
7.03		no evidence
7.04	Spicer, Burnham, Grant, and Glicken (1985) <i>Pityrogramma calomelanos</i> , the primary, post-eruption colonizer of Volcan Chichonal, Chiapas, Mexico. American Fern Journal 75: 1-5.	"vast numbers of wind-dispersed spores are produced"
7.05		no evidence
7.06		unlikely for spores
7.07		
7.08		unlikely for spores
8.01	Spicer, Burnham, Grant, and Glicken (1985) <i>Pityrogramma calomelanos</i> , the primary, post-eruption colonizer of Volcan Chichonal, Chiapas, Mexico. American Fern Journal 75: 1-5.	"vast numbers of wind-dispersed spores are produced"
8.02	Dyer and Lindsay (1992) Soil spore banks of temperate ferns. American Fern Journal 82: 89-122.	<i>P. calomelanos</i> known to form a spore bank. [unclear for how long]
8.03		
8.04		
8.05		