

**Taxon:** *Goepertia makoyana* (E. Morren) Borchs. & S. Suarez

**Family:** Marantaceae

**Common Name(s):** brainplant  
cathedral-windows  
peacockplant

**Synonym(s):** *Calathea makoyana* E. Morren  
*Maranta makoyana* (E. Morren) K.

**Assessor:** Chuck Chimera

**Status:** Assessor Approved

**End Date:** 31 Aug 2016

**WRA Score:** -3.0

**Designation:** L

**Rating:** Low Risk

**Keywords:** Tropical, Herb, Ornamental, Rhizomatous, Propagated Vegetatively

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	n
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	n
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	n
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed		
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals		
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n

Qsn #	Question	Answer Option	Answer
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	y
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)		
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets		
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat		
602	Produces viable seed		
603	Hybridizes naturally		
604	Self-compatible or apomictic		
605	Requires specialist pollinators	y=-1, n=0	y
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)		
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	n
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal	y=1, n=-1	n
705	Propagules water dispersed		
706	Propagules bird dispersed		
707	Propagules dispersed by other animals (externally)		
708	Propagules survive passage through the gut		
801	Prolific seed production (>1000/m <sup>2</sup> )	y=1, n=-1	n
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire		
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

**Supporting Data:**

Qsn #	Question	Answer
101	Is the species highly domesticated?	n
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[No evidence of domestication] "Calathea makoyana is native to dry, deciduous scrub forests in the state of Minas Gerais, Brazil."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	NA

201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	High
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 29 Aug 2016]	"Native: Southern America Brazil: Brazil"

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 29 Aug 2016]	

203	Broad climate suitability (environmental versatility)	n
	Source(s)	Notes
	Dave's Garden. 2016. Cathedral Windows, Peacock Plant - Calathea makoyana. <a href="http://davesgarden.com/guides/pf/go/69483/">http://davesgarden.com/guides/pf/go/69483/</a> . [Accessed 30 Aug 2016]	"Hardiness: USDA Zone 10a: to -1.1 °C (30 °F) USDA Zone 10b: to 1.7 °C (35 °F) USDA Zone 11: above 4.5 °C (40 °F)"
	Gilman, E.F. 1999. Calathea makoyana Peacock Plant. FPS86. Environmental Horticulture Department, UF/IFAS Extension, Gainesville, FL. <a href="http://edis.ifas.ufl.edu">http://edis.ifas.ufl.edu</a> . [Accessed 30 Aug 2016]	"USDA hardiness zones: 10 through 11"

Qsn #	Question	Answer
204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 29 Aug 2016]	"Native: Southern America Brazil: Brazil"

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"Peacock plant is commonly cultivated in conservatories and as a houseplant in temperate regions, but in tropical America it is a popular landscape plant. In Hawai'i it is grown as a container plant and ground cover, and is used in landscaping."
	Dave's Garden. 2016. Cathedral Windows, Peacock Plant - <i>Calathea makoyana</i> . <a href="http://davesgarden.com/guides/pf/go/69483/">http://davesgarden.com/guides/pf/go/69483/</a> . [Accessed 30 Aug 2016]	"This plant has been said to grow in the following regions: Bartow, Florida Orange Park, Florida Clinton, Mississippi Scio, Oregon"
	Randall, R.P. 2007. The introduced flora of Australia and its weed status. CRC for Australian Weed Management, Glen Osmond, Australia	Introduced to Australia

301	Naturalized beyond native range	n
	Source(s)	Notes
	Vander Velde, N. 2003. The Vascular Plants of Majuro Atoll, Republic of the Marshall Islands. Atoll Research Bulletin 503: 1-141	" <i>Calathea makoyana</i> (Mor.) Nichols peacock plant Recent introduction. Brazil. Rare. Ornamental potted plant in Amata Kabua's garden (RRT 2001) (DPMJ0641, DPMJ0647).**"
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence
	Wagner, W.L., Herbst, D.R. & Lorence, D.H. 2016. Flora of the Hawaiian Islands. Smithsonian Institution, Washington, D.C. <a href="http://botany.si.edu/">http://botany.si.edu/</a> . [Accessed 29 Aug 2016]	No evidence to date

Qsn #	Question	Answer
302	Garden/amenity/disturbance weed	n
	Source(s)	Notes
	Gilman, E.F. 1999. Calathea makoyana Peacock Plant. FPS86. Environmental Horticulture Department, UF/IFAS Extension, Gainesville, FL. <a href="http://edis.ifas.ufl.edu">http://edis.ifas.ufl.edu</a> . [Accessed ]	"Invasive potential: not known to be invasive"
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

304	Environmental weed	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

305	Congeneric weed	
	Source(s)	Notes
	Leoni, J. M., & Costa, F. R. C. (2013). Sustainable use of Calathea lutea in handicrafts: A case study from the Amanã Sustainable Development Reserve in the Brazilian Amazon. <i>Economic Botany</i> , 67(1), 30-40	[Calathea lutea considered a weed by farmers. G. cylindrica formerly included in Calathea genus] "The cauçu (area dominated by cauçu - Calathea lutea) is a plant formation that arises in abandoned fields. C. lutea sprouts quickly after forest or fallow areas are cut and burned; cauçu grows so vigorously that farmers eliminate it to prevent it from overcrowding crop plants. Dense stands are usually associated with high várzeas along the river channel that passes through the Corací sector." ... "Cauçu is considered a weed by farmers of Corací, and by contrast, a NTFP by artisans." [NTFP = non-timber forest products] "Cauçu is considered a weed because the stands grow fast and compete with other plants in the same areas. Due to its aggressive nature, cauçu must be cut frequently, a task considered arduous by local farmers."
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	Possibly. Several Calathea species listed as naturalized or as weeds of unspecified impacts. No evidence of invasive Goepertia species

401	Produces spines, thorns or burrs	n
	Source(s)	Notes

Qsn #	Question	Answer
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[No evidence] "Stemless herb 10-26" tall. Lvs borne singly; pet red-purple, pulvinus yellow-green; blades ovate, elliptic in small lvs, 4-13.5" x 2-6.5", upper side faint green to whitish with 2 rows of dark green, oval, leaflet-like blotches, margin and veins dark green, underside patterned similarly in red-purple and light green, glabrous, base obtuse to rounded."

402	Allelopathic	
	Source(s)	Notes
	Leoni, J. M., & Costa, F. R. C. (2013). Sustainable use of <i>Calathea lutea</i> in handicrafts: A case study from the Amanã Sustainable Development Reserve in the Brazilian Amazon. <i>Economic Botany</i> , 67(1), 30-40	[Unknown, Related genus may have species with allelopathic properties] "Shading, mechanical interference by litter, or even allelopathy are possible causes of suppression, as has been observed in experimental studies of other species (Bosyl and Reader 1995)."

403	Parasitic	n
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"Stemless herb 10-26" tall. Lvs borne singly; pet red-purple, pulvinus yellow-green; blades ovate, elliptic in small lvs, 4-13.5" x 2-6.5", upper side faint green to whitish with 2 rows of dark green, oval, leaflet-like blotches, margin and veins dark green, underside patterned similarly in red-purple and light green, glabrous, base obtuse to rounded." [Marantaceae. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Palatability of foliage unknown

405	Toxic to animals	n
	Source(s)	Notes
	California Poison Control System. 2009. Know Your Plants. <a href="http://www.calpoison.org/hcp/KNOW%20YOUR%20PLANTS-plant%20list%20for%20CPCS%2009B.pdf">http://www.calpoison.org/hcp/KNOW%20YOUR%20PLANTS-plant%20list%20for%20CPCS%2009B.pdf</a> . [Accessed 30 Aug 2016]	"Table 1. – Nontoxic Plants by Common Name" [Includes <i>Calathea makoyana</i> ]
	Quattrocchi, U. 2012. <i>CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology</i> . CRC Press, Boca Raton, FL	No evidence
	Wagstaff, D.J. 2008. <i>International poisonous plants checklist: an evidence-based reference</i> . CRC Press, Boca Raton, FL	No evidence

406	Host for recognized pests and pathogens	
	Source(s)	Notes

Qsn #	Question	Answer
	Grow Plants. 2016. Calathea makoyana. <a href="http://www.growplants.org/growing/calathea-makoyana">http://www.growplants.org/growing/calathea-makoyana</a> . [Accessed 30 Aug 2016]	"Pests and diseases in Calathea makoyana: Aphids, spider mites"
	Gilman, E.F. 1999. Calathea makoyana Peacock Plant. FPS86. Environmental Horticulture Department, UF/IFAS Extension, Gainesville, FL. <a href="http://edis.ifas.ufl.edu">http://edis.ifas.ufl.edu</a> . [Accessed 30 Aug 2016]	"Pests and Diseases: Mites can be a serious pest problem, particularly if the plant is in a sunny location. No diseases are of major concern."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Dave's Garden. 2016. Cathedral Windows, Peacock Plant - Calathea makoyana. <a href="http://davesgarden.com/guides/pf/go/69483/">http://davesgarden.com/guides/pf/go/69483/</a> . [Accessed 30 Aug 2016]	"Danger: N/A"
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"Stemless herb 10- 26" tall." [No evidence. Unlikely given habit]

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	Notes
	Gilman, E.F. 1999. Calathea makoyana Peacock Plant. FPS86. Environmental Horticulture Department, UF/IFAS Extension, Gainesville, FL. <a href="http://edis.ifas.ufl.edu">http://edis.ifas.ufl.edu</a> . [Accessed 30 Aug 2016]	"Light requirement: plant grows in the shade"
	Dave's Garden. 2016. Cathedral Windows, Peacock Plant - Calathea makoyana. <a href="http://davesgarden.com/guides/pf/go/69483/">http://davesgarden.com/guides/pf/go/69483/</a> . [Accessed 30 Aug 2016]	"Sun Exposure: Light Shade Partial to Full Shade Full Shade"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	
	Source(s)	Notes
	Dave's Garden. 2016. Cathedral Windows, Peacock Plant - Calathea makoyana. <a href="http://davesgarden.com/guides/pf/go/69483/">http://davesgarden.com/guides/pf/go/69483/</a> . [Accessed 30 Aug 2016]	"Soil pH requirements: 6.1 to 6.5 (mildly acidic)"

Qsn #	Question	Answer
	Gilman, E.F. 1999. <i>Calathea makoyana</i> Peacock Plant. FPS86. Environmental Horticulture Department, UF/IFAS Extension, Gainesville, FL. <a href="http://edis.ifas.ufl.edu">http://edis.ifas.ufl.edu</a> . [Accessed 30 Aug 2016]	"Soil tolerances: clay; sand; loam; slightly alkaline; acidic"

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	"Stemless herb 10-26" tall. Lvs borne singly; pet red-purple, pulvinus yellow-green; blades ovate, elliptic in small lvs, 4-13.5" x 2-6.5", upper side faint green to whitish with 2 rows of dark green, oval, leaflet-like blotches, margin and veins dark green, underside patterned similarly in red-purple and light green, glabrous, base obtuse to rounded."

412	Forms dense thickets	n
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	[Unknown] "native to dry, deciduous scrub forests in the state of Minas Gerais, Brazil."

501	Aquatic	n
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	[Terrestrial] "Stemless herb 10-26" tall."

502	Grass	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 29 Aug 2016]	Marantaceae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 29 Aug 2016]	Marantaceae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes



Qsn #	Question	Answer
	Gordon, D. R., Mitterdorfer, B., Pheloung, P. C., Ansari, S., Buddenhagen, C., Chimera, C., ... & Williams, P. A. 2010). Guidance for addressing the Australian Weed Risk Assessment questions. Plant Protection Quarterly, 25(2): 56-74	"This question is specifically to deal with plants that have specialized organs and should not include plants merely with rhizomes" [Goepertia makoyana is rhizomatous, and can likely can spread vegetatively]

601	Evidence of substantial reproductive failure in native habitat	
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2016. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 30 Aug 2016]	"Native: Southern America Brazil: Brazil" [Unknown]

602	Produces viable seed	
	Source(s)	Notes
	Gilman, E.F. 1999. Calathea makoyana Peacock Plant. FPS86. Environmental Horticulture Department, UF/IFAS Extension, Gainesville, FL. <a href="http://edis.ifas.ufl.edu">http://edis.ifas.ufl.edu</a> . [Accessed 30 Aug 2016]	"Fruit shape: unknown" ... "Propagation is by cuttings or division." [Possibly not in cultivation]
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	Unknown. No description of fruit or seeds given

603	Hybridizes naturally	
	Source(s)	Notes
	Kennedy, H. (1978). Systematics and Pollination of the "closed flowered" Species of Calathea (Marantaceae). University of California Publications in Botany Volume 71. University of California Press, Berkeley and Los Angeles, CA	[Unknown. Natural hybrids documented in genus Calathea] "A more detailed study of the breeding system of these plants and their potential for crossing with related species should prove of interest, since both self-compatible and self-incompatible species are present and since one natural hybrid has been found ."

604	Self-compatible or apomictic	
	Source(s)	Notes
	Flora of North America Editorial Committee. 2000, Flora of North America: North of Mexico, Volume 22. Oxford University Press, Oxford, UK	[Possibly. Unconfirmed] "Marantaceae are self-compatible but are mainly allogamous (out-crossing). In spite of the elaborate pollination system, some 8% of the species are known to be autogamous (self pollinating), including all three species in the flora [very rarely cleistogamous]. Such self-pollen is deposited in the stigma during pollen transfer within the bud prior to anthesis, not during subsequent stylar movement.

605	Requires specialist pollinators	y
	Source(s)	Notes

Qsn #	Question	Answer
	Flora of North America Editorial Committee. 2000, Flora of North America: North of Mexico, Volume 22. Oxford University Press, Oxford, UK	"Florally, Marantaceae are characterized by their highly modified staminodes and unusual pollination mechanism: explosive, secondary pollen presentation. During the bud stage, pollen is shed onto the back of the style, behind the stigma. At anthesis the style is under tension and is enfolded and held in place by the cucullate (hooded) staminode. Bees, probing for nectar in the flower, depress the appendage (trigger) of the cucullate staminode. This releases the style, which springs forward, moving in a single plane or helically, bringing the cup-shaped stigma in contact with pollen on the pollinator and, in the same motion, depositing fresh pollen on the same spot."
	Barreto, A. A., & Freitas, L. (2007). Atributos florais em um sistema de polinização especializado: <i>Calathea cylindrica</i> (Roscoe) K. Schum.(Marantaceae) e abelhas Euglossini. Revista Brasileira de Botânica, 30(3), 421-431	[Specialized pollinators & pollination] "(Floral traits in a specialized pollination system: <i>Calathea cylindrica</i> (Roscoe) K. Schum. (Marantaceae) and Euglossini bees). Pollination specialization is promoted by floral features that favor pollinator fidelity and hinder the access to resources by other visitors. We investigated the pollination mechanism of one understory herb in southeastern Brazil. <i>Calathea cylindrica</i> flowers year-round and its flowers are peculiar because of the fusion and modification of some elements, asymmetry, secondary pollen presentation, hidden nectar, and a long and narrow tube, which is closed before pollinator visit. Pollination occurs by means of an explosive mechanism, and once it is triggered, the floral parts do not return to their initial position. Thus, there is only a single possibility for pollen transference. Pollinators are female Euglossini bees and all flowers have already been visited by mid-morning. Specific movements with enough force are necessary for the visitors to access the nectar. Bagged flowers secreted around 13 µL of nectar with 32% of sugar concentration. Nectar secretion continues after removals, but in small volumes. Continual flowering, high production of nectar and secretion after pollination may promote pollinator fidelity. The complex floral structure, the secretion in which the flower base (nectar chamber) is dipped, and the narrow tube with inner hairs make the access to nectar difficult and may work as barriers for other visitors. Altogether, these factors seem to regulate the highly specialized pollination system of <i>Calathea cylindrica</i> ."

606	Reproduction by vegetative fragmentation	y
	Source(s)	Notes
	Gilman, E.F. 1999. <i>Calathea makoyana</i> Peacock Plant. FPS86. Environmental Horticulture Department, UF/IFAS Extension, Gainesville, FL. <a href="http://edis.ifas.ufl.edu">http://edis.ifas.ufl.edu</a> . [Accessed 31 Aug 2016]	"Propagation is by cuttings or division." ... "Roots: sprouts from roots or lower trunk" [Presumably yes]

Qsn #	Question	Answer
607	<b>Minimum generative time (years)</b>	
	<b>Source(s)</b>	<b>Notes</b>
	Gilman, E.F. 1999. <i>Calathea makoyana</i> Peacock Plant. FPS86. Environmental Horticulture Department, UF/IFAS Extension, Gainesville, FL. <a href="http://edis.ifas.ufl.edu">http://edis.ifas.ufl.edu</a> . [Accessed 31 Aug 2016]	"Propagation is by cuttings or division." ... "Roots: sprouts from roots or lower trunk" [Unknown. Time to first flowering unknown, but plants may be able to reproduce vegetatively at an earlier age]

701	<b>Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Anonymous. 1945. <i>Flora of Panama</i> . Part III. Fascicle I. <i>Annals of the Missouri Botanical Garden</i> , 32(1): 1-105	"fruit a loculicidally dehiscent, 3-seeded capsule." [Generic description. Seeds may be rarely produced in cultivation & lack means of external attachment]
	Gilman, E.F. 1999. <i>Calathea makoyana</i> Peacock Plant. FPS86. Environmental Horticulture Department, UF/IFAS Extension, Gainesville, FL. <a href="http://edis.ifas.ufl.edu">http://edis.ifas.ufl.edu</a> . [Accessed 31 Aug 2016]	"Fruit shape: unknown" [Seeds, if produced, lack means of external attachment]

702	<b>Propagules dispersed intentionally by people</b>	y
	<b>Source(s)</b>	<b>Notes</b>
	Staples, G.W. & Herbst, D.R. 2005. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	"Peacock plant is commonly cultivated in conservatories and as a houseplant in temperate regions, but in tropical America it is a popular landscape plant. In Hawai'i it is grown as a container plant and ground cover, and is used in landscaping."

703	<b>Propagules likely to disperse as a produce contaminant</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Gilman, E.F. 1999. <i>Calathea makoyana</i> Peacock Plant. FPS86. Environmental Horticulture Department, UF/IFAS Extension, Gainesville, FL. <a href="http://edis.ifas.ufl.edu">http://edis.ifas.ufl.edu</a> . [Accessed 31 Aug 2016]	"Fruit shape: unknown Fruit length: less than .5 inch Fruit cover: dry or hard Fruit color: unknown Fruit characteristic: inconspicuous and not showy" [No evidence. Seeds may be rare or absent in cultivation]
	Staples, G.W. & Herbst, D.R. 2005. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	No description of fruit or seeds provided. [No evidence. Seeds may be rare or absent in cultivation]

704	<b>Propagules adapted to wind dispersal</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Anonymous. 1945. <i>Flora of Panama</i> . Part III. Fascicle I. <i>Annals of the Missouri Botanical Garden</i> , 32(1): 1-105	"fruit a loculicidally dehiscent, 3-seeded capsule." [Generic description. Not adapted for wind dispersal. Seeds may be rarely, if ever, produced in cultivation]

705	<b>Propagules water dispersed</b>	
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. 2016. Personal Communication	Unknown. Seeds, if produced, or rhizome fragments, might be secondarily dispersed by water if growing in riparian areas

706	Propagules bird dispersed	
	<b>Source(s)</b>	<b>Notes</b>
	Anonymous. 1945. Flora of Panama. Part III. Fascicle I. Annals of the Missouri Botanical Garden, 32(1): 1-105	"fruit a loculicidally dehiscent, 3-seeded capsule." [Arillate seeds, if produced, might be bird or ant-dispersed]
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume IV. Flowering plants, Monocotyledons: Alismatanae and Commelinanae (except Gramineae). Springer-Verlag, Berlin, Heidelberg, New York	"Most species with arillate seeds are probably myrmecochorous." [Seeds may be rare or absent in cultivation]

707	Propagules dispersed by other animals (externally)	
	<b>Source(s)</b>	<b>Notes</b>
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume IV. Flowering plants, Monocotyledons: Alismatanae and Commelinanae (except Gramineae). Springer-Verlag, Berlin, Heidelberg, New York	"Most species with arillate seeds are probably myrmecochorous." [Arillate seeds, if produced, might be bird or ant-dispersed]

708	Propagules survive passage through the gut	
	<b>Source(s)</b>	<b>Notes</b>
	Anonymous. 1945. Flora of Panama. Part III. Fascicle I. Annals of the Missouri Botanical Garden, 32(1): 1-105	"fruit a loculicidally dehiscent, 3-seeded capsule." [Unknown. Seeds may be rare or absent in cultivation. Possibly bird or ant-dispersed]

801	Prolific seed production (>1000/m2)	n
	<b>Source(s)</b>	<b>Notes</b>
	Gilman, E.F. 1999. Calathea makoyana Peacock Plant. FPS86. Environmental Horticulture Department, UF/IFAS Extension, Gainesville, FL. <a href="http://edis.ifas.ufl.edu">http://edis.ifas.ufl.edu</a> . [Accessed 31 Aug 2016]	"Fruit shape: unknown Fruit length: less than .5 inch Fruit cover: dry or hard Fruit color: unknown Fruit characteristic: inconspicuous and not showy"
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	No evidence. No description of fruit or seeds given

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	<b>Source(s)</b>	<b>Notes</b>
	Dalling, J. W., Swaine, M. D., & Garwood, N. C. (1998). Dispersal patterns and seed bank dynamics of pioneer trees in moist tropical forest. Ecology, 79(2): 564-578	[Unknown for <i>G.makoyana</i> . Other <i>Calathea</i> species form a persistent seed bank] "Most seeds of <i>Calathea ovandensis</i> , a gap-dependent herb, can persist for several years in the soil under natural conditions (Horvitz and Schemske 1994)."

Qsn #	Question	Answer
803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown. No information on herbicide efficacy or chemical control of this species.

804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	Notes
	Gilman, E.F. 1999. Calathea makoyana Peacock Plant. FPS86. Environmental Horticulture Department, UF/IFAS Extension, Gainesville, FL. <a href="http://edis.ifas.ufl.edu">http://edis.ifas.ufl.edu</a> . [Accessed 30 Aug 2016]	"Propagation is by cuttings or division." ... "Roots: sprouts from roots or lower trunk" [Unknown. Possible that mechanical damage to rhizomes may result in resprouting]

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown

**Summary of Risk Traits:**

High Risk / Undesirable Traits

- Thrives in tropical climates
- Other Calathea species have become invasive. Formerly classified in genus
- Shade tolerant
- Possibly reproduces by seeds & vegetatively by rhizomes
- Seeds, if produced, may be dispersed by ants, birds & intentionally by people
- Seeds, if produced, may persist in the soil
- May be able to resprout from rhizomes after cutting or damage to top foliage

Low Risk Traits

- Unarmed (no spines, thorns or burrs)
- Ornamental
- Non-toxic
- Requires specialized pollinators
- Limited or no seed production may reduce risk of inadvertent dispersal