

Taxon: Calathea burle-marxii	Family: Marantaceae
Common Name(s): calathea 'ice blue' ice-blue calathea	Synonym(s):

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 8 Dec 2015
WRA Score: 0.0	Designation: L	Rating: Low Risk

Keywords: Tropical Herb, Ornamental, Cut Flowers, Suckers, Rarely Seeds

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	?
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
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	y

Qsn #	Question	Answer Option	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	n
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	y=1, n=-1	y
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)		
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	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	y
708	Propagules survive passage through the gut		
801	Prolific seed production (>1000/m ²)	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 that this species is highly domesticated.
102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	NA
103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2015. 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
	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	"Native to the state of Bahia, Brazil, <i>C. burle-marxii</i> grows below 500' elevation in tropical evergreen Atlantic forests."
202	Quality of climate match data	High
	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	
203	Broad climate suitability (environmental versatility)	n
	Source(s)	Notes
	Dave's Garden. (2015). <i>Calathea</i> 'Ice Blue' - <i>Calathea burle-marxii</i> . http://davesgarden.com/guides/pf/go/128781/ . [Accessed 4 Dec 2015]	"Hardiness: USDA Zone 10b: to 1.7 °C (35 °F) USDA Zone 11: above 4.5 °C (40 °F)"
	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	[Tropical. Elevation range <1000 m] "Native to the state of Bahia, Brazil, <i>C. burle-marxii</i> grows below 500' elevation in tropical evergreen Atlantic forests."

Qsn #	Question	Answer
204	Native or naturalized in regions with tropical or subtropical climates	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	"Native to the state of Bahia, Brazil, <i>C. burle-marxii</i> grows below 500' elevation in tropical evergreen Atlantic forests."

Qsn #	Question	Answer
205	Does the species have a history of repeated introductions outside its natural range?	?
	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	"...used in landscaping in Hawaii and is being tried as a cut flower."
	Dave's Garden. (2015). <i>Calathea</i> 'Ice Blue' - <i>Calathea burle-marxii</i> . http://davesgarden.com/guides/pf/go/128781/ . [Accessed 2 Dec 2015]	Regional "This plant has been said to grow in the following regions: Newport Beach, California Fort Lauderdale, Florida (2 reports) Loxahatchee, Florida Kihei, Hawaii"

Qsn #	Question	Answer
301	Naturalized beyond native range	n
	Source(s)	Notes
	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. 2015. Flora of the Hawaiian Islands. Smithsonian Institution, Washington, D.C. http://botany.si.edu/pacificislandbiodiversity/hawaiianflora/index.htm . [Accessed 2 Dec 2015]	No evidence to date

Qsn #	Question	Answer
302	Garden/amenity/disturbance 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

Qsn #	Question	Answer
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

Qsn #	Question	Answer
304	Environmental weed	n

Qsn #	Question	Answer
	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
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	Possibly. Several species listed as naturalized or as weeds of unspecified impacts

401	Produces spines, thorns or burrs	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] "Erect herb 2.8-5' tall. Lvs 3-5; peti green, pulvinus yellow-green, ± glabrous; blades ovate, 14.5-28.5" x 8-14", upper side green, underside lighter gray-green, soft-herbaceous, base rounded."

402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	Unknown

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	"Erect herb 2.8-5' tall." [No evidence. Marantaceae]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	Unknown

405	Toxic to animals	n
	Source(s)	Notes
	Pillay, V.V. (2012). Modern Medical Toxicology. Jaypee Brothers Publishers, New Delhi, India	"Table 10.1: Non-Toxic Houseplants" [Includes Calathea species]
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence

406	Host for recognized pests and pathogens	

Qsn #	Question	Answer
	Source(s)	Notes
	GardensOnline. 2015. <i>Calathea burle-marxii</i> Ice Blue. http://www.gardensonline.com.au/ . [Accessed 4 Dec 2015]	"Diseases: Mealy bugs, slugs and snails. Don't let the roots become waterlogged or they will develop root-rot."
407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	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	"Erect herb 2.8-5' tall ... "in tropical evergreen Atlantic forests." [No evidence. Growth form & habitat unlikely to increase fire risk]
409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	Notes
	Flora and Fauna - Plants and Critters. 2014. <i>Calathea burle-marxii</i> . http://plantsandcritters.blogspot.com/2014/03/calathea-burle-marxii.html . [Accessed 4 Dec 2015]	"Basically they like shaded and semi shaded spots where the soil remains moist or does not get dried up for too long. It is a good understory plant."
	Towen Mount Tropicals. 2015. Ginger calatheas. http://www.towenmounttropicals.com.au/Gallery/ginger/calatheas.html . [Accessed 4 Dec 2015]	" <i>Calathea burle-marxii</i> 'Blue Ice' ... Grows to 1.0m high in half to full shade."
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	n
	Source(s)	Notes
	Mazza, G. (2015). <i>Calathea burle-marxii</i> . http://www.photomazza.com/Calathea-burle-marxii . [Accessed 7 Dec 2015]	"...it requires a soil rich of organic substance, draining, kept constantly humid."
	GardensOnline. 2015. <i>Calathea burle-marxii</i> Ice Blue. http://www.gardensonline.com.au/ . [Accessed 4 Dec 2015]	"Soil: Well drained and humus rich soils e.g. plenty of peat moss to ensure some moisture retention."
411	Climbing or smothering growth habit	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	"Erect herb 2.8-5' tall."
412	Forms dense thickets	

Qsn #	Question	Answer
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	Unknown. No information found

501	Aquatic	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	[Terrestrial] "Erect herb 2.8-5' tall."

502	Grass	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2015. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 4 Dec 2015]	Marantaceae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network, 2015. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 4 Dec 2015]	Marantaceae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Mazza, G. (2015). <i>Calathea burle-marxii</i> . http://www.photomazza.com/Calathea-burle-marxii . [Accessed 7 Dec 2015]	"a perennial evergreen rhizomatous herbaceous species"
	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. <i>Plant Protection Quarterly</i> , 25(2): 56-74	"This question relates to perennial plants with tubers, corms or bulbs. This question is specifically to deal with plants that have specialized organs and should not include plants merely with rhizomes/ stolons"

601	Evidence of substantial reproductive failure in native habitat	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	Unknown

602	Produces viable seed	y
	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	"In the wild, the seeds develop and are shed during the rainy season but do not germinate until the following rainy season, surviving the dry season in dormancy."
	Mazza, G. (2015). <i>Calathea burle-marxii</i> . http://www.photomazza.com/Calathea-burle-marxii . [Accessed 7 Dec 2015]	"It reproduces by seed, but, usually and easily, by division."

603	Hybridizes naturally	
	Source(s)	Notes
	Kennedy, H. (1978). Systematics and Pollination of the "closed flowered" Species of <i>Calathea</i> (Marantaceae). University of California Publications in Botany Volume 71. University of California Press, Berkeley and Los Angeles, CA	[Unknown. Natural hybrids documented in genus] "Near the La Lola Cacao Institute (Milla 28) Limón Province. Costa Rica. a natural hybrid between <i>C. warscewiczii</i> ; and <i>C. marantifolia</i> was found by Dr. R. L. Dressler"

604	Self-compatible or apomictic	
	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	[Possibly Yes] "Species tend to be self-compatible and hybrids are often possible between species in the same section of the genus."
	Kennedy, H. (1978). Systematics and Pollination of the "closed flowered" Species of <i>Calathea</i> (Marantaceae). University of California Publications in Botany Volume 71. University of California Press, Berkeley and Los Angeles, CA	[Self-compatibility documented in other species in genus] "Nine flowers of <i>Calathea marantifolia</i> on Pipeline Road, Canal Zone, were artificially self-pollinated. All nine flowers set seed indicating that this species is probably self-compatible."

605	Requires specialist pollinators	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	"Euglossine bees are the main pollinators in the wild. Some species have flowers that are naturally closed at maturity but are forced open by bees, which then pollinate them."

606	Reproduction by vegetative fragmentation	y
	Source(s)	Notes
	Mazza, G. (2015). <i>Calathea burle-marxii</i> . http://www.photomazza.com/Calathea-burle-marxii . [Accessed 7 Dec 2015]	"It reproduces by seed, but, usually and easily, by division."
	Flora and Fauna - Plants and Critters. 2014. <i>Calathea burle-marxii</i> . http://plantsandcritters.blogspot.com/2014/03/calathea-burle-marxii.html . [Accessed 4 Dec 2015]	"You need to give it room to grow as it will start sending up suckers once it becomes established."

607	Minimum generative time (years)	
	Source(s)	Notes

Qsn #	Question	Answer
	Flora and Fauna - Plants and Critters. 2014. <i>Calathea burle-marxii</i> . http://plantsandcritters.blogspot.com/2014/03/calathea-burle-marxii.html . [Accessed 8 Dec 2015]	[Time to first flowering unknown, but plants may be able to reproduce vegetatively at an earlier age] "You need to give it room to grow as it will start sending up suckers once it becomes established."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	
	Source(s)	Notes
	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	"Dispersal. Most species with arillate seeds are probably myrmecochorous ... Twenty one species of ants were observed to be attracted by <i>Calathea</i> seeds."
	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	[Generic description. Seeds, if produced in cultivation, lack means of external attachment] "Capsule 3-seeded. Seed aril basal, white (rarely colored)."

702	Propagules dispersed intentionally by people	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	" <i>Calathea burle-marxii</i> is used in landscaping in Hawaii and is being used in cut flower...Hawaii is second only to Brazil in the cultivation of this species."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	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."
	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, and unlikely in cultivation] "Most species in the Hawaiian Islands rarely set fruit unless hand-pollinated."

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	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."

Qsn #	Question	Answer
705	Propagules water dispersed	
	Source(s)	Notes
	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	[Unknown. Seeds, if produced, might possibly be dispersed if occurring near riparian areas] "Most species with arillate seeds are probably myrmecochorous."

706	Propagules bird dispersed	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	"Most species in the Hawaiian Islands rarely set fruit unless hand-pollinated."
	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."

707	Propagules dispersed by other animals (externally)	y
	Source(s)	Notes
	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." [Likely yes, if seeds are produced]

708	Propagules survive passage through the gut	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	Fruit & seeds presumably rarely produced in cultivation. Unknown if they would be consumed or survive gut passage

801	Prolific seed production (>1000/m2)	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	"Most species in the Hawaiian Islands rarely set fruit unless hand-pollinated."

Qsn #	Question	Answer
802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	Dalling, J. W., Swaine, M. D., & Garwood, N. C. (1998). Dispersal patterns and seed bank dynamics of pioneer trees in moist tropical forest. <i>Ecology</i> , 79(2): 564-578	[Other 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)."
	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	[Possibly] "In the wild, the seeds develop and are shed during the rainy season but do not germinate until the following rainy season, surviving the dry season in dormancy."

803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. 2015. 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
	Mazza, G. (2015). <i>Calathea burle-marxii</i> . http://www.photomazza.com/Calathea-burle-marxii . [Accessed 8 Dec 2015]	[Unknown. Possible that mechanical damage to rhizomes may result in resprouting] "It reproduces by seed, but, usually and easily, by division."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits

- Thrives in tropical climates
- Shade tolerant
- Reproduces by seeds (rarely in cultivation) & vegetatively by suckers
- May be self-compatible
- Seeds dispersed by ants & intentionally by people
- Seeds, if produced, may persist in the soil
- Limited ecological information may limit accuracy of risk prediction

Low Risk Traits

- No reports of invasiveness or naturalization, but no evidence of widespread introduction outside native range
- Unarmed (no spines, thorns or burrs)
- Ornamental
- Limited fruit & seed production in cultivation
- Requires specialized pollinators
- Limited seed production reduces risk of inadvertent dispersal