

Taxon: Freycinetia multiflora Merr.

Family: Pandanaceae

Common Name(s): climbing pandanus
flowering pandanus

Synonym(s):

Assessor: Chuck Chimera

Status: Assessor Approved

End Date: 11 Dec 2017

WRA Score: 1.0

Designation: EVALUATE

Rating: Evaluate

Keywords: Woody Climber, Tropical, Ornamental, Dioecious, Zoochorous

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	n=0, y = 1*multiplier (see Appendix 2)	n
401	Produces spines, thorns or burrs	y=1, n=0	y
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)		
411	Climbing or smothering growth habit	y=1, n=0	y
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	y=1, n=-1	n
605	Requires specialist pollinators		
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	>3
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	y=1, n=-1	y
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m ²)		
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
	Merrill, E. D. (1907). The flora of Mount Halcon, Mindoro. The Philippine Journal of Science 2(4): 2(4)	[No evidence of domestication] "A species possibly as closely related to <i>Freycinetia luzonensis</i> Presl, as to any oilier, differing from that species in its longer leaves and more numerous and much larger spadices."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2017. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2017. 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. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 7 Dec 2017]	"Native: Asia-Tropical Papuasia: Papua New Guinea"
	Merrill, E. D. (1908). Philippine Freycinetia. The Philippine Journal of Science 3(5): 307-315	[Native to Philippines] " <i>Freycinetia multiflora</i> ... Luzon, Province of Tayabas, Lucban ... Province of Laguna, Mount Maquiling ... Province of Rizal, Bosoboso ... Mindoro, Mount Halcon ... Mindanao. Lake Lanao. Camp Keithley ... Province of Misamis, Mount Malindang ... District of Davao, Mount Apo"

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 7 Dec 2017]	

Qsn #	Question	Answer
203	Broad climate suitability (environmental versatility)	n
	Source(s)	Notes
	Merrill, E. D. (1907). The flora of Mount Halcon, Mindoro. The Philippine Journal of Science 2(4): 2(4)	"Scandent in forests at 900 m. alt."
	Missouri Botanical Garden. 2017. <i>Freycinetia multiflora</i> . http://www.missouribotanicalgarden.org . [Accessed 7 Dec 2017]	"Zone: 10 to 12" ... "Thrives in climates where temperatures range from 85 degrees F. during the day to 65 degrees F. at night. Totally intolerant of frost."

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Missouri Botanical Garden. 2017. <i>Freycinetia multiflora</i> . http://www.missouribotanicalgarden.org . [Accessed 7 Dec 2017]	"Native Range: Philippines Zone: 10 to 12"
	Merrill, E. D. (1908). Philippine <i>Freycinetia</i> . The Philippine Journal of Science 3(5): 307-315	[Native to Philippines] " <i>Freycinetia multiflora</i> ... Luzon, Province of Tayabas, Lucban ... Province of Laguna, Mount Maquiling ... Province of Rizal, Bosoboso ... Mindoro, Mount Halcon ... Mindanao. Lake Lanao. Camp Keithley ... Province of Misamis, Mount Malindang ... District of Davao, Mount Apo"

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	The Institute for Regional Conservation. 2001-2016. Plants of the Island of Puerto Rico. http://www.regionalconservation.org . [Accessed 11 Dec 2017]	" <i>Freycinetia multiflora</i> ... Not native, cultivated only"
	Chong, K.Y., Tan, H.T.W. & Corlett, R.T. 2009. A Checklist of the Total Vascular Plant Flora of Singapore: Native, Naturalized and Cultivated Species. Raffles Museum of Biodiversity Research, National University of Singapore, Singapore	" <i>Freycinetia multiflora</i> Merr.; climber; exotic; cultivated only"
	Dave's Garden. 2017. Climbing Pandanus - <i>Freycinetia multiflora</i> . https://davesgarden.com/guides/pf/go/88251/ . [Accessed 7 Dec 2017]	"Regional This plant has been said to grow in the following regions: Boca Raton, Florida Fort Lauderdale, Florida Haiku, Hawaii Hana, Hawaii"

301	Naturalized beyond native range	n
	Source(s)	Notes
	The Institute for Regional Conservation. 2001-2016. Plants of the Island of Puerto Rico. http://www.regionalconservation.org . [Accessed 11 Dec 2017]	" <i>Freycinetia multiflora</i> ... Not native, cultivated only"

Qsn #	Question	Answer
	Chong, K.Y., Tan, H.T.W. & Corlett, R.T. 2009. A Checklist of the Total Vascular Plant Flora of Singapore: Native, Naturalized and Cultivated Species. Raffles Museum of Biodiversity Research, National University of Singapore, Singapore	"Freycinetia multiflora Merr.; climber; exotic; cultivated only"
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence
	Wagner, W.L., Herbst, D.R. & Lorence, D.H. 2017. Flora of the Hawaiian Islands. Smithsonian Institution, Washington, D.C. http://botany.si.edu/ . [Accessed 11 Dec 2017]	No evidence to date

302	Garden/amenity/disturbance weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

304	Environmental weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

305	Congeneric weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	[One species reported to be naturalized] "Freycinetia ponapensis Martelli Pandanaceae Total N° of Refs: 1 Habit: Herb Preferred Climate/s: Tropical References: Federated States of Micronesia-N-230."

401	Produces spines, thorns or burrs	y
	Source(s)	Notes
	Vintage Green Farms. 2017. Freycinetia multiflora. http://tom-piergrossi.squarespace.com/bromeliads/freycinetia-multiflora . [Accessed 7 Dec 2017]	"Pointed spiny leaves, grip trees trunks and act like climbers in the jungle."

Qsn #	Question	Answer
	Merrill, E. D. (1907). The flora of Mount Halcon, Mindoro. The Philippine Journal of Science 2(4): 2(4)	"Scandent, the branches about 7 mm. thick. Leaves lanceolate, 20 to 40 cm. long, 1.5 to 2 cm. wide, the apex acute or acuminate, the base slightly narrowed, clasping, the margins below and towards the apex serrulate, in the median portion entire, the midrib glabrous on both surfaces or beneath with very few teeth in the upper portion."

402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. 2017. Personal Communication	Unknown. No evidence found

403	Parasitic	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 11 Dec 2017]	"Family: Pandanaceae" [No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	de Garine-Wichatitsky, M., Duncan, P., Suprin, B., Chardonnet, P., & Maillard, D. (2003). A review of the diet of Rusa Deer <i>Cervus timorensis russa</i> in New Caledonia: Are the endemic plants defenceless against this introduced, eruptive ruminant?. <i>Pacific Conservation Biology</i> , 9(2), 136-143	[Unknown. <i>Freycinetia</i> spp. browsed by deer in New Caledonia] " ... 12 plants species included in the database had some structures that might provide physical protection against mammalian herbivores, but the few armed endemic and native species (eg, <i>Freycinetia</i> spp., <i>Madura cochinchinensis</i>) were consistently heavily browsed by deer ..."
	Stone, C. P. 1985. Impact of Alien Plants on Hawaii's Native Biota. Pp. 251-297 in Stone & Scott (eds.). <i>Hawaii's Terrestrial Ecosystems: Preservation & Management</i> . CPSU, Honolulu, HI	[Unknown. Hawaiian species consumed by pigs and rats] "Pigs (and rats) also consume <i>Freycinetia</i> , favored by 'o'u and 'alala, and probably lower habitat quality of these birds accordingly."
	Stewart, G. H., Wardle, J. A., & Burrows, L. E. (1987). Forest understorey changes after reduction in deer numbers, northern Fiordland, New Zealand. <i>New Zealand Journal of Ecology</i> , 10: 35-42	[Unknown. New Zealand species not preferred by introduced deer] "Table 2: Groupings of woody plant species within three food preference categories for deer." ... "Least Preferred ... <i>Freycinetia banksii</i> "

405	Toxic to animals	n
	Source(s)	Notes
	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. Some species used medicinally

Qsn #	Question	Answer
406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Missouri Botanical Garden. 2017. <i>Freycinetia multiflora</i> . http://www.missouribotanicalgarden.org . [Accessed 7 Dec 2017]	"Problems No known serious insect or disease problems."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Dave's Garden. 2017. Climbing Pandanus - <i>Freycinetia multiflora</i> . https://davesgarden.com/guides/pf/go/88251/ . [Accessed 11 Dec 2017]	"Danger: Unknown - Tell us" [No evidence]
	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. Some species used medicinally

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Langenberger, G. (2000). Forest vegetation studies on the foothills of Mt. Pangasugan, Leyte/The Philippines. Deutsche Gesellschaft für Technische Zusammenarbeit, Eschborn, Germany	"The climate of western Leyte can be classified as 'humid, rain evenly distributed throughout the year with at most three dry months` (Kintanar 1984)." "Appendix 2: Species Encountered in the Study Area" [Includes <i>Freycinetia multiflora</i> . Does not occur in fire prone areas]

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	Notes
	Dave's Garden. 2017. Climbing Pandanus - <i>Freycinetia multiflora</i> . https://davesgarden.com/guides/pf/go/88251/ . [Accessed 7 Dec 2017]	"Sun Exposure: Light Shade" ... "On Mar 26, 2015, Mauimaggie from Haiku, HI wrote: ... Grows well for me in damp, dense shade. Prefers moist conditions, but tolerates dry."
	Missouri Botanical Garden. 2017. <i>Freycinetia multiflora</i> . http://www.missouribotanicalgarden.org . [Accessed 7 Dec 2017]	"Sun: Part shade" ... "Best in moist but well-drained soils in bright but indirect or filtered sun."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	
	Source(s)	Notes
	Missouri Botanical Garden. 2017. <i>Freycinetia multiflora</i> . http://www.missouribotanicalgarden.org . [Accessed 11 Dec 2017]	"Best in moist but well-drained soils in bright but indirect or filtered sun."
	Lemke, C. 1999. Cal's Plant of the Week - <i>Freycinetia multiflora</i> - Climbing Pandanus. http://www.plantoftheweek.org/week023.shtml . [Accessed 11 Dec 2017]	" <i>Freycinetia multiflora</i> does best in bright indirect or curtain-filtered sunlight; if only artificial light is available, provide at least 400 foot candles. Night temperatures of 65 to 70 degrees and day temperatures of 75 to 85 degrees are ideal. Let the soil become moderately dry between thorough waterings."

Qsn #	Question	Answer
	Dave's Garden. 2017. Climbing Pandanus - Freycinetia multiflora. https://davesgarden.com/guides/pf/go/88251/ . [Accessed 11 Dec 2017]	"Requires consistently moist soil; do not let dry out between waterings"

411	Climbing or smothering growth habit	y
	Source(s)	Notes
	Merrill, E. D. (1907). The flora of Mount Halcon, Mindoro. The Philippine Journal of Science 2(4): 2(4)	"Scandent, the branches about 7 mm. thick."
	Missouri Botanical Garden. 2017. Freycinetia multiflora. http://www.missouribotanicalgarden.org . [Accessed 7 Dec 2017]	"This plant is a climbing shrub (leaves will attach to tree trunks)."
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume III. Flowering plants, Monocotyledons: Liliales (except Orchidaceae). Springer-Verlag, Berlin, Heidelberg, New York	"Woody climbers."

412	Forms dense thickets	
	Source(s)	Notes
	Merrill, E. D. (1907). The flora of Mount Halcon, Mindoro. The Philippine Journal of Science 2(4): 2(4)	"Scandent in forests at 900 m. alt." [No evidence]

501	Aquatic	n
	Source(s)	Notes
	Merrill, E. D. (1907). The flora of Mount Halcon, Mindoro. The Philippine Journal of Science 2(4): 2(4)	[Terrestrial climber] "Scandent in forests at 900 m. alt."

502	Grass	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 6 Dec 2017]	Family: Pandanaceae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 6 Dec 2017]	Family: Pandanaceae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume III. Flowering plants, Monocotyledons: Liliaceae (except Orchidaceae). Springer-Verlag, Berlin, Heidelberg, New York	[Generic description. No evidence] "Woody climbers. Leaves in 3 spiral rows, remote or imbricate on stem, amplexicaul or semiamplexicaul, at base with distinct auricles, these persistent or caducous. Inflorescences in both sexes similar with regard to number and arrangement of spikes. Spikes pseudumbellate, generally 3, sometimes 4-7, rarely 1, 2 or racemose. Flowers unisexual, the other sex vestigial or occ. missing. Staminate flowers indistinct. Pistillate flowers with multiovulate carpels. Fruit a berry."

601	Evidence of substantial reproductive failure in native habitat	
	Source(s)	Notes
	Villanueva, E. L. C., & Buot Jr, I. E. (2015). Threatened Plant Species of Mindoro, Philippines. IAMURE International Journal of Ecology and Conservation, 14, 168-190	[<i>Freycinetia multiflora</i> classified as Vulnerable (VU) in this study. Unknown if experiencing reproductive failure] <ul style="list-style-type: none"> • Classified as VU either by the IUCN or Fernando et al. (2008) • Restricted local distribution within the Philippines • The habitat is affected negatively by human settlement • Indigenous in the Philippines and is threatened due to collection, mining, slash-and-burn or intensive agriculture

602	Produces viable seed	y
	Source(s)	Notes
	Murphy, M. 2017. Plant Pono Specialist. BIISC Early Detection Technician. personal communication. 6 December	"A person posted a picture of <i>Freycinetia multiflora</i> seeds. Apparently, it finally fruited after 15 years." [Unknown if seeds were produced]
	Lemke, C. 1999. Cal's Plant of the Week - <i>Freycinetia multiflora</i> - Climbing Pandanus. http://www.plantoftheweek.org/week023.shtml . [Accessed 11 Dec 2017]	[No mention of seeds] "Propagation: <i>Freycinetia multiflora</i> are propagated any season from the young shoots, or suckers that spring up from the base of the plant."
	Dave's Garden. 2017. Climbing Pandanus - <i>Freycinetia multiflora</i> . https://davesgarden.com/guides/pf/go/88251/ . [Accessed 11 Dec 2017]	[No success from cuttings, or seeds. Implies seeds are available] "On Mar 26, 2015, Mauimaggie from Haiku, HI wrote: Stunning, although short-lived prolific peach-colored blooms in an unusual petal configuration. Always gets a "wow" from guests when in bloom (spring in HI). Grows well for me in damp, dense shade. Prefers moist conditions, but tolerates dry. Challenging to propagate - I have had no success from cuttings, or seeds. Literature suggests using root sprouts. Nice bushy form. Very slow growing."

603	Hybridizes naturally	
	Source(s)	Notes
	WRA Specialist. 2017. Personal Communication	Unknown. No evidence found

604	Self-compatible or apomictic	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Missouri Botanical Garden. 2017. <i>Freycinetia multiflora</i> . http://www.missouribotanicalgarden.org . [Accessed 7 Dec 2017]	" <i>Freycinetia multiflora</i> , commonly called climbing pandanus, is a dioecious, climbing or scrambling shrubby plant of the screw pine family that is native to the Philippine Islands."

605	Requires specialist pollinators	
	Source(s)	Notes
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume III. Flowering plants, Monocotyledons: Liliales (except Orchidaceae). Springer-Verlag, Berlin, Heidelberg, New York	" <i>Freycinetia</i> is pollinated by vertebrates (e.g. bats, flying foxes, rats),"
	Cox, P. (1990). Pollination and the Evolution of Breeding Systems in Pandanaceae. <i>Annals of the Missouri Botanical Garden</i> , 77(4), 816-840	[Unknown for <i>F. multiflora</i>] "Pollination biology. <i>Freycinetia</i> inflorescences are adapted to pollination by several kinds of vertebrates such as flying foxes (Burck, 1892; van der Pijl, 1956; Cox, 1982, 1984); smaller bats (Knuth & Loew, 1904; Daniel, 1976); squirrels (Heidi, 1927); crows (Cox, 1983); pigeons (Cox, 1984); honeycreepers (Cox, 1983); and white eyes (Cox, 1983); but not rats (Cox, 1983). The openness and availability of the inflorescence to a wide taxonomic variety and size range of pollinators suggest a lack of tightly coupled plant-pollinator coevolution. Indeed, <i>Freycinetia</i> pollinators tend to be frugivores."

606	Reproduction by vegetative fragmentation	y
	Source(s)	Notes
	Missouri Botanical Garden. 2017. <i>Freycinetia multiflora</i> . http://www.missouribotanicalgarden.org . [Accessed 7 Dec 2017]	"Plants will sucker from the base."

607	Minimum generative time (years)	>3
	Source(s)	Notes
	Murphy, M. 2017. Plant Pono Specialist. BIISC Early Detection Technician. personal communication. 6 December	"A person posted a picture of <i>Freycinetia multiflora</i> seeds. Apparently, it finally fruited after 15 years."
	Dave's Garden. 2017. Climbing Pandanus - <i>Freycinetia multiflora</i> . https://davesgarden.com/guides/pf/go/88251/ . [Accessed 11 Dec 2017]	"Very slow growing."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume III. Flowering plants, Monocotyledons: Liliales (except Orchidaceae). Springer-Verlag, Berlin, Heidelberg, New York	"Fruit a drupe (<i>Pandanus</i>) or berry (<i>Freycinetia</i> , <i>Sararanga</i>)." [Presumably dispersed by birds or other frugivorous animals. No means of external attachment]

Qsn #	Question	Answer
702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Vintage Green Farms. 2017. <i>Freycinetia multiflora</i> . http://tom-piergrossi.squarespace.com/bromeliads/freycinetia-multiflora . [Accessed 7 Dec 2017]	[Sold commercially] "A climbing member of the screwpine family (Pandanus) native to the Pacific Islands. Pointed spiny leaves, grip trees trunks and act like climbers in the jungle. Part shade, tropical plants, need perfect drainage. Showy light orange flowers are produced terminally. Needs perfect drainage just like other members of the Bromeliad clan, grow in bark or cinder. Looks great climbing a tree trunk."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Murphy, M. 2017. Plant Pono Specialist. BIISC Early Detection Technician. personal communication. 6 December	"A person posted a picture of <i>Freycinetia multiflora</i> seeds. Apparently, it finally fruited after 15 years." [Unlikely to become a contaminant of other plants if it takes so long to reach reproductive maturity]
	WRA Specialist. 2017. Personal Communication	Unlikely. Most websites that discuss propagation of this species describe vegetative methods, and that it is slow growing. Seed set appears to be limited, and may occur only after years in cultivation.

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume III. Flowering plants, Monocotyledons: Liliaceae (except Orchidaceae). Springer-Verlag, Berlin, Heidelberg, New York	"Fruit a drupe (Pandanus) or berry (<i>Freycinetia</i> , <i>Sararanga</i>)." [Presumably dispersed by birds or other frugivorous animals]

705	Propagules water dispersed	
	Source(s)	Notes
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume III. Flowering plants, Monocotyledons: Liliaceae (except Orchidaceae). Springer-Verlag, Berlin, Heidelberg, New York	[Presumably adapted for zoochory. Buoyancy of fruit and potential for secondary dispersal by water unknown] "Fruit a drupe (Pandanus) or berry (<i>Freycinetia</i> , <i>Sararanga</i>)." [Presumably dispersed by birds or other frugivorous animals]

706	Propagules bird dispersed	y
	Source(s)	Notes
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume III. Flowering plants, Monocotyledons: Liliaceae (except Orchidaceae). Springer-Verlag, Berlin, Heidelberg, New York	"Fruit a drupe (Pandanus) or berry (<i>Freycinetia</i> , <i>Sararanga</i>)." [Presumably dispersed by birds or other frugivorous animals]
	Merrill, E. D. (1907). The flora of Mount Halcon, Mindoro. The Philippine Journal of Science 2(4): 2(4)	"Fruits very numerous, the free, portions subpyramidal, strongly ridged."

Qsn #	Question	Answer
	Ingle, N. R. (2003). Seed dispersal by wind, birds, and bats between Philippine montane rainforest and successional vegetation. <i>Oecologia</i> , 134(2), 251-261	[Unidentified <i>Freycinetia</i> species dispersed into successional areas] "Each seed morphotype was assumed to correspond to a single plant species, with the following exceptions. For the genera <i>Medinilla</i> , <i>Freycinetia</i> , <i>Schefflera</i> , and <i>Eurya</i> , two or more species are thought to be represented, based on species presence in the vegetation or differences in seed morphology." ... "Most seeds were small, <= 0.35 mg mass and =1.5 mm long. <i>Freycinetia</i> spp., a minute-seeded climber in the Pandanaceae, dominated the forest seeds trapped in the successional area."

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Cox, P. (1990). Pollination and the Evolution of Breeding Systems in Pandanaceae. <i>Annals of the Missouri Botanical Garden</i> , 77(4), 816-840	[Adapted for frugivory & presumably internal dispersal] "Dispersal. The infructescences of <i>Freycinetia</i> are usually brightly colored, frequently red, and are rich in sugars. These attributes make them attractive to various birds and perhaps some flying foxes."

708	Propagules survive passage through the gut	y
	Source(s)	Notes
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume III. Flowering plants, Monocotyledons: Liliales (except Orchidaceae). Springer-Verlag, Berlin, Heidelberg, New York	"Fruit a drupe (<i>Pandanus</i>) or berry (<i>Freycinetia</i> , <i>Sararanga</i>)." [Presumably dispersed by birds or other frugivorous animals]
	Cox, P. (1990). Pollination and the Evolution of Breeding Systems in Pandanaceae. <i>Annals of the Missouri Botanical Garden</i> , 77(4), 816-840	[Rats may be seed predators in the Hawaiian Islands] "Perkins (1902) reported that rats eat <i>F. arborea</i> in Hawaii, and they are implicated as seed dispersers in New Zealand"

801	Prolific seed production (>1000/m ²)	
	Source(s)	Notes
	Merrill, E. D. (1907). The flora of Mount Halcon, Mindoro. <i>The Philippine Journal of Science</i> 2(4): 2(4)	"Fruits very numerous, the free, portions subpyramidal, strongly ridged." [Seed densities unknown]

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	Royal Botanic Gardens Kew. (2017) Seed Information Database (SID). Version 7.1. Available from: http://data.kew.org/sid/ . [Accessed 11 Dec 2017]	No information on seed storage of this species
	WRA Specialist. 2017. Personal Communication	Unknown

803	Well controlled by herbicides	
	Source(s)	Notes

Qsn #	Question	Answer
	Carpenter, S. B. 1966. Herbicides for site preparation: broadcast spray by mist blower tested against understory in Hawaii rain forest. U.S. Forest Service Research Note PSW 115. Pacific Southwest Forest and Range Experiment Station, Berkeley, CA	[Herbicides apparently ineffective on native Freycinetia species] "Two studies started in 1964 tested control of dense understory vegetation in Hawaii rain forests with herbicides applied by a large turbine blower spraying from widely spaced bulldozer lines. Brushkiller and Tordon 101 were effective on shrubs." ... " 'le'ie vine (<i>Freycinetia arborea</i> Gaud.) was present in a few plots. It appeared to be resistant to all herbicides tested."
	WRA Specialist. 2017. Personal Communication	Unknown. No evidence of herbicide efficacy or chemical control of this species

804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	Notes
	Missouri Botanical Garden. 2017. <i>Freycinetia multiflora</i> . http://www.missouribotanicalgarden.org . [Accessed 11 Dec 2017]	"Plants will sucker from the base." [Unknown if plants will resprout if cut from base]

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. 2017. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits

- Thrives in tropical climates
- Reported to have pointed, spiny leaves
- Shade tolerant
- Climbing habit (could potentially smother other plants)
- Reproduces by seeds, and vegetatively by suckers
- Seeds, if produced, dispersed by birds, bats, or other frugivorous animals
- Limited ecological information reduces accuracy of risk prediction

Low Risk Traits

- No reports of invasiveness or naturalization
- Non-toxic
- Ornamental
- Dioecious
- Long time to reproductive maturity (exact age unknown, but anecdotally make take 15 years or longer)

Second Screening Results for Vines & Lianas

- (A) Reported as a weed of cultivated lands?> No evidence
(B) Unpalatable to grazers Or known to form dense stands?> Unknown if palatable.
(C) Shade tolerant or known to form dense stands?> Yes. Shade tolerant
(D) Bird- Or clearly wind- dispersed?> Yes. Presumably adapted for bird-dispersal
(E) Life cycle <4 years? No. First reproduction noted after 15 years (anecdotal)
Outcome = Evaluate (due to inability to answer all questions in second screening)