

Taxon: Cyclophyllum barbatum	Family: Rubiaceae
Common Name(s): Canthium Cyclophyllum matira	Synonym(s): Plectronia barbata Bentham & J. D. Canthium barbatum (G. Forster)

Assessor: Assessor	Status: Assessor Approved	End Date: 2 May 2014
WRA Score: 1.0	Designation: EVALUATE	Rating: Evaluate

Keywords: Naturalizing, Tropical Tree, Shade tolerant, Fleshy-fruited, Bird-dispersed

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	y
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	n
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
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	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)		
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
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	y=1, n=0	n
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	n
606	Reproduction by vegetative fragmentation		
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	n
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	y=1, n=-1	n
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)	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
	Smith, A. C. 1988, Flora Vitiensis nova: a new flora of Fiji. Volume 4. National Tropical Botanical Garden, Lawai, HI	No evidence

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2014. 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
	Smith, A. C. 1988, Flora Vitiensis nova: a new flora of Fiji. Volume 4. National Tropical Botanical Garden, Lawai, HI	"Distribution: Caroline and Solomon Islands (and perhaps westward into parts of Malesia) through the southern Pacific to the Tuamotus."

202	Quality of climate match data	High
	Source(s)	Notes
	Smith, A. C. 1988, Flora Vitiensis nova: a new flora of Fiji. Volume 4. National Tropical Botanical Garden, Lawai, HI	"Distribution: Caroline and Solomon Islands (and perhaps westward into parts of Malesia) through the southern Pacific to the Tuamotus."

203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	Smith, A. C. 1988, Flora Vitiensis nova: a new flora of Fiji. Volume 4. National Tropical Botanical Garden, Lawai, HI	"This widespread species is seen in Fiji as an often slender tree or shrub 2- 1.5 m. high at elevations from near sea level to 1,030 m., occurring in coastal forests and thickets, in thin or dry forest of interior areas, in forest patches in open country, and in the thickets of crests and ridges." [Occurs in a variety of tropical habitats in an elevation range over 1000 m. Demonstrates environmental versatility]

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes

Qsn #	Question	Answer
	Smith, A. C. 1988, Flora Vitiensis nova: a new flora of Fiji. Volume 4. National Tropical Botanical Garden, Lawai, HI	"Distribution: Caroline and Solomon Islands (and perhaps westward into parts of Malesia) through the southern Pacific to the Tuamotus."
	Wagner, W.L., Herbst, D.R., & Lorence, D.H. 2005. Flora of the Marquesas Islands website. Smithsonian Institution, Washington, D.C. http://botany.si.edu/pacificislandbiodiversity/marquesasflora/index.htm . [Accessed 1 May 2014]	"Distribution: Pacific Islands (New Guinea, Solomon Is., Micronesia, Fiji, Tonga, Samoa, Cook Is., Society Is., Marquesas Is., Tuamoto Is., Gambier Is., Austral Is., and Pitcairn. In the Marquesas, indigenous to Nuku Hiva, Ua Huka, Ua Pou, Hiva Oa, Tahuata, Fatu Hiva."
	McCormack, G. 2007. Cook Islands Biodiversity Database, Version 2007.2. Cook Islands Natural Heritage Trust, Rarotonga. http://cookislands.bishopmuseum.org . [Accessed 1 May 2014]	"GLOBAL DISTRIBUTION: NATIVE Carolines - Solomons - Marquesas COOK ISLANDS STATUS: Native; S.Group only (Rarotonga and the makatea islands); Land, mountains"

205	Does the species have a history of repeated introductions outside its natural range?	n
	Source(s)	Notes
	Frohlich, D.& Lau, A. 2014. New plant records for the Hawaiian Islands 2012–2013. Bishop Museum Occasional Papers 115: 7–17	"Cyclophyllum barbatum, a species very rarely cultivated in hawai'i and previously known only from two locations on O'ahu,..."

301	Naturalized beyond native range	y
	Source(s)	Notes
	Frohlich, D.& Lau, A. 2014. New plant records for the Hawaiian Islands 2012–2013. Bishop Museum Occasional Papers 115: 7–17	"widely scattered distribution, in the understory of established secondary forest in Waimea Valley Botanical Garden.widely scattered distribution, in the understory of established secondary forest in Waimea Valley Botanical Garden." ... "Material examined. O'AHU: Waimea Valley Botanical Garden, along upper maintenance road, 15 Feb 2013, OED 2013021502."

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

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
	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	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[<i>Canthium hispidum</i> listed as a weed, but no evidence of <i>Cyclophyllum</i>]

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Smith, A. C. 1988, Flora Vitiensis nova: a new flora of Fiji. Volume 4. National Tropical Botanical Garden, Lawai, HI	[Genus Description] "Trees or shrubs; stipules interpetiolar, lanceolate to oblong, acute or sometimes long-acuminate to subulate; leaves petiolate or essentially sessile, the blades with obscure tertiary nerves; inflorescences axillary..."

402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	Unknown

403	Parasitic	n
	Source(s)	Notes
	Smith, A. C. 1988, Flora Vitiensis nova: a new flora of Fiji. Volume 4. National Tropical Botanical Garden, Lawai, HI	"This widespread species is seen in Fiji as an often slender tree or shrub 2- 1 5 m. high" [No evidence. Rubiaceae]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	Unknown

405	Toxic to animals	n
	Source(s)	Notes
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence of toxicity in <i>Cyclophyllum</i> or <i>Cathium</i>

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

Qsn #	Question	Answer
	Hoddle, M. S., Hoddle, C. D., & Mound, L. A. 2008. Inventory of Thysanoptera Collected from French Polynesia. <i>Pacific Science</i> , 62(4): 509-515	"Abstract: A survey for Thysanoptera was conducted in the Society (Tahiti, Moorea, and Raiatea), Marquesas (Hiva Oa, Nuku Hiva, Ua Huka, and Ua Pou), and Austral islands (Rurutu and Tubuai) archipelagos in French Polynesia from September 2003 to November 2005. At least 55 thrips species in 36 genera and three families were identified from 823 slide-mounted specimens that were collected from 61 host plants in 33 families. Twelve species are considered to be important pests. The greatest diversity of species, 43 (77%), was collected from the Society Islands, with 60% being recorded from Tahiti alone. Species diversity was intermediate in the Marquesas Islands at 43% (24 species collected), with 35% or 19 species being recorded from Nuku Hiva. Lowest diversity was recorded for the Austral Islands, with 38% or 21 species being found in that archipelago. Less than 10% of collected species are likely to be native, with the majority of identified thrips (>90%) in French Polynesia representing a high diversity of exotic species (leaf, flower, and fungus feeders, and four predatory species) that have successfully infiltrated other island groups in the South Pacific. Survey results and subsequent estimates of thrips species diversity in French Polynesia should be interpreted with caution due to uncontrolled variation in sampling intensity that was affected by survey duration, time of year, and visitation frequency to islands." ... "Host Substrates from Which Thrips Were Collected in Table 1" [Cyclophyllum barbatum included in table. Unknown whether or not the thrips collected is a pest of Cyclophyllum or other plants]

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 of toxicity in Cyclophyllum or Cathium

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Kirch, P. V. 1996. Late Holocene human-induced modifications to a central Polynesian island ecosystem. <i>Proceedings of the National Academy of Sciences</i> , 93(11): 5296-5300	"A 7000-year-long sequence of environmental change during the Holocene has been reconstructed for a central Pacific island (Mangaia, Cook Islands)." ... "The absence of microscopic charcoal in older samples indicates that natural fires were rare or absent in prehuman times." ... "Natural fires were insignificant and erosion was limited to short-term periodic episodes associated with cyclones and/or El Niño-Southern Oscillation events." [No evidence that Cyclophyllum barbatum increases fire risk]
	Mueller-Dombois, D. & Fosberg, F. R. 1998. <i>Vegetation of the tropical Pacific islands</i> . Springer-Verlag, New York, NY	[Unlikely. No evidence that it is from a fire prone ecosystem]

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	Notes

Qsn #	Question	Answer
	Florence, J., Waldren, S., & Chepstow-Lusty, A. J. 1995. The flora of the Pitcairn Islands: a review. <i>Biological Journal of the Linnean Society</i> , 56(1-2): 79-119	"A fairly common shrub from the understorey of the plateau forest." [Presumably yes, as an understory shrub]
	Decker, B.G. 1992. Secondary plant cover on upland slopes, Marquesas Islands, French Polynesia. <i>Atoll Research Bulletin</i> 363: 1-36	"As Casuarina sheds its long, fine needle-like foliage, the duff accumulates rapidly to a depth of ten cm or more. Herbs grow sparsely in this loose, dry litter; a few scattered individuals of <i>Emilia sonchifolia</i> and <i>Polypodium scolopendria</i> are typical. At Puamau, two shrubs often appear in the soft shade on duff-covered ground- <i>Canthium barbatum</i> and <i>Canthium odoratum</i> ." ... "Above the deeper ravines, on the steep slopes of the backvalleys, <i>ihi</i> becomes uncommon and <i>hau</i> dominates the forest. Higher still, along and immediately below buttress ridge crests, <i>Pandanus tectorius</i> may in turn assume local dominance over <i>hau</i> . Stature of this forest is shorter than in the ravine bottoms, around 5m for most trees, and the canopy is less dense, admitting enough light to support an herbaceous ground cover beneath a sparse shrubby understorey. <i>Coffea arabica</i> flourishes in the understorey and is often dominant in it. Other shrubs and small trees in the understorey are: <i>Canthium barbatum</i> , <i>Glochidion</i> sp., <i>Wikstroemia coriacea</i> , <i>Morinda citrifolia</i> , and <i>Piper latifolium</i> ."
	Lau, A.& Frohlich, D. 2014. Oahu Early Detection Botanists. <i>Pers. Comm.</i> 15 April	" <i>Cyclophyllum barbatum</i> – growing in both full sun and in dense shade" [Waimea Botanical Garden, Oahu, Hawaiian Islands]

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	
	Source(s)	Notes
	Smith, A. C. 1988, <i>Flora Vitiensis nova: a new flora of Fiji</i> . Volume 4. National Tropical Botanical Garden, Lawai, HI	"This widespread species is seen in Fiji as an often slender tree or shrub 2- 1 5 m. high at elevations from near sea level to 1,030 m., occurring in coastal forests and thickets, in thin or dry forest of interior areas, in forest patches in open country, and in the thickets of crests and ridges." [Specifics of soil tolerance unknown, but as a widespread species, probably not limited by soil type]

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Smith, A. C. 1988, <i>Flora Vitiensis nova: a new flora of Fiji</i> . Volume 4. National Tropical Botanical Garden, Lawai, HI	"This widespread species is seen in Fiji as an often slender tree or shrub 2- 1 5 m. high..."

412	Forms dense thickets	n
	Source(s)	Notes
	Amerson Jr, A.B., Whistler, W.A. & Schwaner, T.D. 1982. <i>Wildlife and wildlife habitat of American Samoa</i> . II. Accounts of flora and fauna. US Fish and Wildlife Service, Honolulu, HI	" <i>Canthium barbatum</i> (Forst. f.) Seem.: A small tree or shrub, uncommon in the montane scrub and ridge forest. Widespread in the Pacific islands." [No evidence from American Samoa]
	Mueller-Dombois, D. & Fosberg, F. R. 1998. <i>Vegetation of the tropical Pacific islands</i> . Springer-Verlag, New York, NY	No evidence from within native range

Qsn #	Question	Answer
501	Aquatic	n
	Source(s)	Notes
	Smith, A. C. 1988, Flora Vitiensis nova: a new flora of Fiji. Volume 4. National Tropical Botanical Garden, Lawai, HI	"...occurring in coastal forests and thickets, in thin or dry forest of interior areas, in forest patches in open country, and in the thickets of crests and ridges." [Terrestrial]
502	Grass	n
	Source(s)	Notes
	Smith, A. C. 1988, Flora Vitiensis nova: a new flora of Fiji. Volume 4. National Tropical Botanical Garden, Lawai, HI	"Trees or shrubs;" [Rubiaceae]
503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	Smith, A. C. 1988, Flora Vitiensis nova: a new flora of Fiji. Volume 4. National Tropical Botanical Garden, Lawai, HI	Rubiaceae
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Smith, A. C. 1988, Flora Vitiensis nova: a new flora of Fiji. Volume 4. National Tropical Botanical Garden, Lawai, HI	"slender tree or shrub 2- 1 5 m."
601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Kingston, N., & Waldren, S. 2005. A conservation appraisal of the rare and endemic vascular plants of Pitcairn Island. Biodiversity & Conservation, 14(4): 781-800	"In addition a whole suite of native species (16) are being threatened on the island by the lack of a bird disperser including <i>Celtis pacifica</i> , <i>Cocculus ferrandianus</i> , <i>Xylosma suaveolens</i> , <i>Psydrax odoratum</i> and <i>Cyclophyllum barbatum</i> ." ... "Several species are collected as timber for house and road building, for carvings, domestic use, or for ornamentation. Examples are <i>Cyathea medullaris</i> , a tree fern whose stems are used for carving inlays (currently dead stems are primarily used); <i>Psydrax odorata</i> and <i>C. barbatum</i> , which are collected annually as Christmas trees;" [Possibly on Pitcairn Island]
	Whistler, W.A. 1994. Botanical Inventory of the Proposed Tutuila and Ofu Units of the National Park of American Samoa. Technical Report 87. Cooperative National Park Resources Studies Unit UH Manoa, Honolulu, HI	"Small tree with small opposite leaves, small white flowers, and a red, irregularly subglobose pyrene. Occasional to common in montane scrub and coastal forest, reported from near sea level to 450 m elevation. Indigenous, ranging from Fiji to the Marquesas."
	Smith, A. C. 1988, Flora Vitiensis nova: a new flora of Fiji. Volume 4. National Tropical Botanical Garden, Lawai, HI	"This widespread species is seen in Fiji as an often slender tree or shrub 2- 1 5 m. high at elevations from near sea level to 1,030 m.," [No evidence]
602	Produces viable seed	y

Qsn #	Question	Answer
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R., & Lorence, D.H. 2005. Flora of the Marquesas Islands website. Smithsonian Institution, Washington, D.C. http://botany.si.edu/pacificislandbiodiversity/marquesasflora/index.htm . [Accessed 1 May 2014]	"Seeds: Pyrenes 1-seeded, ellipsoid to reniform, compressed, 8-12 mm long, 4-6 mm wide, testa bony, brown to black." [Presumably Yes]
603	Hybridizes naturally	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	Unknown
604	Self-compatible or apomictic	
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R., & Lorence, D.H. 2005. Flora of the Marquesas Islands website. Smithsonian Institution, Washington, D.C. http://botany.si.edu/pacificislandbiodiversity/marquesasflora/index.htm . [Accessed 2 May 2014]	"Inflorescences short axillary symes or fascicles, few to many flowered. Flowers with pedicels 2-6 mm long, to 13 mm long in fruit; calyx short, cupuliform, limb with (4-)5(-6) short teeth; corolla white to cream when fresh, turning yellowish-orange, corolla tube 2.5-5 mm long, white villose in mouth of tube, lobes (4-)5(-6), narrowly ovate-elliptic, 2-2.5 mm long, 1-1.5 mm wide; stamens with anthers c. 1 mm long; stigmatic knob subcylindric-capitate, exserted." [With perfect flowers, but compatibility unknown]
605	Requires specialist pollinators	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R., & Lorence, D.H. 2005. Flora of the Marquesas Islands website. Smithsonian Institution, Washington, D.C. http://botany.si.edu/pacificislandbiodiversity/marquesasflora/index.htm . [Accessed 1 May 2014]	"Inflorescences short axillary symes or fascicles, few to many flowered. Flowers with pedicels 2-6 mm long, to 13 mm long in fruit; calyx short, cupuliform, limb with (4-)5(-6) short teeth; corolla white to cream when fresh, turning yellowish-orange, corolla tube 2.5-5 mm long, white villose in mouth of tube, lobes (4-)5(-6), narrowly ovate-elliptic, 2-2.5 mm long, 1-1.5 mm wide; stamens with anthers c. 1 mm long; stigmatic knob subcylindric-capitate, exserted." [No evidence from floral morphology]
606	Reproduction by vegetative fragmentation	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	Unknown
607	Minimum generative time (years)	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	Unknown
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n

Qsn #	Question	Answer
	Source(s)	Notes
	Fall, P. L., Drezner, T. D., & Franklin, J. 2007. Dispersal ecology of the lowland rain forest in the Vava'u island group, Kingdom of Tonga. <i>New Zealand Journal of Botany</i> , 45(2): 393-417	"Appendix 1 Plant species in the lowland tropical hardwood forests of the Vava'u island group, Kingdom of Tonga" ... "(1) dispersal mechanisms, including: ant (An), ballistic (Bl), bird (Br), bat (Bt), land crab (Cr), endozoochory (En), epizoochory (Ep), fish (Fi), gravity (Gr), human cultivated (He), human-unintentional (Hu), non volant mammal (Ma), reptile (Re), rodent (Ro), water (Wa), wind (Wi)." [Dispersal Mechanisms of <i>Cyclophyllum barbatum</i> include bird (Br) & endozoochory (En). No evidence for other dispersal mechanisms]
	Wagner, W.L., Herbst, D.R., & Lorence, D.H. 2005. Flora of the Marquesas Islands website. Smithsonian Institution, Washington, D.C. http://botany.si.edu/pacificislandbiodiversity/marquesasflora/index.htm . [Accessed 1 May 2014]	"Fruit: Fruit fleshy, ripening pink to red when fresh, subglobose to obovoid or pyriform, compressed, often shallowly bilobed, 8-15 mm long, 7-12 mm wide, with 1-2 pyrenes. Seeds; Pyrenes 1-seeded, ellipsoid to reniform, compressed, 8-12 mm long, 4-6 mm wide, testa bony, brown to black. " [No evidence. Fruits & seeds relatively large & lack means of external attachment]

702	Propagules dispersed intentionally by people	n
	Source(s)	Notes
	Frohlich, D. & Lau, A. 2014. New plant records for the Hawaiian Islands 2012–2013. <i>Bishop Museum Occasional Papers</i> 115: 7–17	" <i>Cyclophyllum barbatum</i> , a species very rarely cultivated in Hawai'i and previously known only from two locations on O'ahu,..." [Intentionally introduced into the Hawaiian Islands, but not widely cultivated by nurseries or landscaping industry]
	WRA Specialist. 2014. Personal Communication	No evidence found of widespread cultivation or deliberate introductions by nursery or landscaping industries

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Fall, P. L., Drezner, T. D., & Franklin, J. 2007. Dispersal ecology of the lowland rain forest in the Vava'u island group, Kingdom of Tonga. <i>New Zealand Journal of Botany</i> , 45(2): 393-417	"Appendix 1 Plant species in the lowland tropical hardwood forests of the Vava'u island group, Kingdom of Tonga" ... "(1) dispersal mechanisms, including: ant (An), ballistic (Bl), bird (Br), bat (Bt), land crab (Cr), endozoochory (En), epizoochory (Ep), fish (Fi), gravity (Gr), human cultivated (He), human-unintentional (Hu), non volant mammal (Ma), reptile (Re), rodent (Ro), water (Wa), wind (Wi)." [Dispersal Mechanisms of <i>Cyclophyllum barbatum</i> include bird (Br) & endozoochory (En). No evidence for other dispersal mechanisms]
	Wagner, W.L., Herbst, D.R., & Lorence, D.H. 2005. Flora of the Marquesas Islands website. Smithsonian Institution, Washington, D.C. http://botany.si.edu/pacificislandbiodiversity/marquesasflora/index.htm . [Accessed 1 May 2014]	"Fruit: Fruit fleshy, ripening pink to red when fresh, subglobose to obovoid or pyriform, compressed, often shallowly bilobed, 8-15 mm long, 7-12 mm wide, with 1-2 pyrenes. Seeds: Pyrenes 1-seeded, ellipsoid to reniform, compressed, 8-12 mm long, 4-6 mm wide, testa bony, brown to black. " [Fruits & seeds relatively large & unlikely to be grown with, or become a contaminant, of produce]

Qsn #	Question	Answer
704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Smith, A. C. 1988, Flora Vitiensis nova: a new flora of Fiji. Volume 4. National Tropical Botanical Garden, Lawai, HI	[Genus Description] "fruit fleshy, subspherical to bilobed or didymous, drupaceous, the pyrenes obovoid-ellipsoid, crested around apex." [Species Description] "the fruits turn from green through red to black at maturity."
705	Propagules water dispersed	n
	Source(s)	Notes
	Fall, P. L., Drezner, T. D., & Franklin, J. 2007. Dispersal ecology of the lowland rain forest in the Vava'u island group, Kingdom of Tonga. New Zealand Journal of Botany, 45(2): 393-417	"Appendix 1 Plant species in the lowland tropical hardwood forests of the Vava'u island group, Kingdom of Tonga" ... "(1) dispersal mechanisms, including: ant (An), ballistic (Bl), bird (Br), bat (Bt), land crab (Cr), endozoochory (En), epizoochory (Ep), fish (Fi), gravity (Gr), human cultivated (He), human-unintentional (Hu), non volant mammal (Ma), reptile (Re), rodent (Ro), water (Wa), wind (Wi)." [Dispersal Mechanisms of <i>Cyclophyllum barbatum</i> include bird (Br) & endozoochory (En). Water may secondarily move seeds, but this does not appear to be a common dispersal vector]
706	Propagules bird dispersed	y
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R., & Lorence, D.H. 2005. Flora of the Marquesas Islands website. Smithsonian Institution, Washington, D.C. http://botany.si.edu/pacificislandbiodiversity/marquesasflora/index.htm . [Accessed 1 May 2014]	"Fruit fleshy, ripening pink to red when fresh, subglobose to obovoid or pyriform, compressed, often shallowly bilobed, 8-15 mm long, 7-12 mm wide, with 1-2 pyrenes. "
	Spotswood, E. N., Meyer, J. Y., & Bartolome, J. W. 2012. An invasive tree alters the structure of seed dispersal networks between birds and plants in French Polynesia. Journal of Biogeography, 39(11): 2007-2020	"Table 3 Composition of diets of three frugivores on Moorea and Tahiti. % represents the percentage of total faecal samples containing seeds. Mean seeds is the average number of seeds per faecal sample" [<i>Cyclophyllum barbatum</i> seeds collected in fecal samples of <i>Pycnonotus cafer</i> (0.68% of samples) & <i>Ptilinopus purpuratus</i> (15.23% of samples)]
	Smith, A. C. 1988, Flora Vitiensis nova: a new flora of Fiji. Volume 4. National Tropical Botanical Garden, Lawai, HI	[Genus Description] "fruit fleshy, subspherical to bilobed or didymous, drupaceous, the pyrenes obovoid-ellipsoid, crested around apex." [Species Description] "the fruits turn from green through red to black at maturity." [Presumably bird or mammal dispersed. A fleshy-fruited tree]

Qsn #	Question	Answer
707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Fall, P. L., Drezner, T. D., & Franklin, J. 2007. Dispersal ecology of the lowland rain forest in the Vava'u island group, Kingdom of Tonga. <i>New Zealand Journal of Botany</i> , 45(2): 393-417	"Appendix 1 Plant species in the lowland tropical hardwood forests of the Vava'u island group, Kingdom of Tonga" ... "(1) dispersal mechanisms, including: ant (An), ballistic (Bl), bird (Br), bat (Bt), land crab (Cr), endozoochory (En), epizoochory (Ep), fish (Fi), gravity (Gr), human cultivated (He), human-unintentional (Hu), non volant mammal (Ma), reptile (Re), rodent (Ro), water (Wa), wind (Wi)." [Dispersal Mechanisms of <i>Cyclophyllum barbatum</i> include bird (Br) & endozoochory (En). No evidence for external dispersal by animals, and fruit & seeds lack means of external attachment]

708	Propagules survive passage through the gut	y
	Source(s)	Notes
	Spotswood, E. N. 2011. Interactions of Avian Frugivores and Invasive Trees in French Polynesia. PhD Dissertation. University of California, Berkeley, CA	
	Fall, P. L., Drezner, T. D., & Franklin, J. 2007. Dispersal ecology of the lowland rain forest in the Vava'u island group, Kingdom of Tonga. <i>New Zealand Journal of Botany</i> , 45(2): 393-417	"Appendix 1 Plant species in the lowland tropical hardwood forests of the Vava'u island group, Kingdom of Tonga" ... "(1) dispersal mechanisms, including: ant (An), ballistic (Bl), bird (Br), bat (Bt), land crab (Cr), endozoochory (En), epizoochory (Ep), fish (Fi), gravity (Gr), human-cultivated (He), human-unintentional (Hu), non volant mammal (Ma), reptile (Re), rodent (Ro), water (Wa), wind (Wi)." [Dispersal Mechanisms of <i>Cyclophyllum barbatum</i> include bird (Br) & endozoochory (En). No evidence for other dispersal mechanisms]
	Franklin, J., & Steadman, D. W. 1991. The potential for conservation of Polynesian birds through habitat mapping and species translocation. <i>Conservation Biology</i> , 5(4): 506-521	"Table 3. Digestive tract contents of frugivorous land birds, Atiu, Mitiaro, and Ma'uke, Cook Islands" [Canthium barbatum consumed by <i>Ducula pacifica</i>]
	Steadman, D. 1997. The historic biogeography and community ecology of Polynesian pigeons and doves. <i>Journal of Biogeography</i> , 24(6), 737-753	"The diet of <i>Ducula pacifica</i> has been noted more than that of any other Polynesian columbid, with fruits of <i>Myristica</i> spp., <i>Elaeocarpus</i> spp., <i>Ficus</i> spp., <i>Cananga odorata</i> (non-native), <i>Guettarda speciosa</i> and <i>Scaevola</i> sp. most often mentioned in West Polynesia and Melanesia. At the eastern margin of its range in the Cook Islands, the digestive tracts of twenty-seven specimens of <i>D. pacifica</i> contained (% dry weight) 53% <i>Guettarda speciosa</i> , 15% <i>Myrsine cheesmanii</i> , 11% <i>Jasminum didyllum</i> , 7% <i>Ceiba pentandra</i> (non-native), 4% <i>Elaeocarpus tonganus</i> , 4% <i>Pipturus argenteus</i> , 3% <i>Canthium barbatum</i> and 2% <i>Hernandia moerenhoutiana</i> (Franklin & Steadman, 1991)."

801	Prolific seed production (>1000/m ²)	n
	Source(s)	Notes
	McCormack, G. 2007. Cook Islands Biodiversity Database, Version 2007.2. Cook Islands Natural Heritage Trust, Rarotonga. http://cookislands.bishopmuseum.org . [Accessed 1 May 2014]	"Slender tree to 10m" ... "FRUITS tear-shaped tapering to base, to 15mm, ripen red; seeds 1-2." [Unlikely, Relatively small-statured tree with 1-2 seeds/fruit]

Qsn #	Question	Answer
802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	Unknown

803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. 2014. 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
	WRA Specialist. 2014. Personal Communication	Unknown

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. 2014. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits

- Thrives in tropical climates
- Elevation range exceeds 1000 m, demonstrating some environmental versatility
- Naturalizing on Oahu, Hawaiian Islands
- Shade tolerant
- Viable seeds dispersed by birds and other frugivorous animals
- Not widely planted outside native range. Limited biological and ecological information makes accurate risk prediction difficult

Low Risk Traits

- No reports of detrimental impacts or invasiveness to date (but not widely cultivated)
- No related species documented as invasive
- Unarmed (no spines, thorns or burrs)
- Non-toxic
- Ornamental

Second Screening Results for Tree/tree-like shrubs

- (A) Shade tolerant?> Yes
(B) Bird-dispersed?> Yes
(C) Life cycle < 4 years? Unknown
Outcome = Evaluate Further