

Taxon: Chamelaucium ciliatum Desf.	Family: Myrtaceae
Common Name(s): stirling wax	Synonym(s): Darwinia ciliata (Desf.) F.Muell. Decalophium darwinioides Turcz. Decalophium rugulosum Turcz. Genetyllis pauciflora Turcz.

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 19 Jun 2020
WRA Score: -3.0	Designation: L	Rating: Low Risk

Keywords: Shrub, Ornamental, Unarmed, Full Sun, Indehiscent Fruit

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)	Intermediate
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	n
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	n=0, y = 1*multiplier (see Appendix 2)	y
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		

Qsn #	Question	Answer Option	Answer
409	Is a shade tolerant plant at some stage of its life cycle		
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
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	y=1, n=-1	n
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		
704	Propagules adapted to wind dispersal		
705	Propagules water dispersed		
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	n
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	y=1, n=-1	y
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
	Webb, M. (2013). Australian Native Plants: The Kings Park Experience. CSIRO Publishing, Collingwood, Australia	[Used in horticulture, but no evidence of domestication] "This is a medium shrub that grows to 1.2 metres high by 0.5 metres wide, and it has many forms with proven horticultural potential. It flowers profusely during spring. The small flowers of white, pink or purple make great fillers for floral arrangements."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2020). 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"	Intermediate
	Source(s)	Notes
	Australian Native Plant Society. (2020). Chamelaucium ciliatum. http://anpsa.org.au/c-cil.html . [Accessed 18 Jun 2020]	"Although native to a dry summer climate, Stirling wax has been cultivated successfully in more humid, temperate and sub-tropical areas but cannot be said to be easy to maintain for long periods in those areas."
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 18 Jun 2020]	"Native Australasia AUSTRALIA: Australia [Western Australia (s.w.)]"

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 18 Jun 2020]	

Qsn #	Question	Answer
203	Broad climate suitability (environmental versatility)	n
	Source(s)	Notes
	Shoot Gardening. (2020). Chamelaucium ciliatum (Stirling wax). https://www.shootgardening.co.uk/plant/chamelaucium-ciliatum . [Accessed 19 Jun 2020]	"USDA zones: Zone 11, Zone 10, Zone 9"

204	Native or naturalized in regions with tropical or subtropical climates	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 19 Jun 2020]	"Native Australasia AUSTRALIA: Australia [Western Australia (s.w.)]"
	Imada, C. (2019). Hawaiian Naturalized Vascular Plants Checklist (February 2019 update). Bishop Museum Technical Report 69. Bishop Museum, Honolulu, HI	No evidence
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

205	Does the species have a history of repeated introductions outside its natural range?	?
	Source(s)	Notes
	San Marcos Growers. (2020). Chamelaucium ciliatum 'Scaddan' - Scaddan Waxflower. https://www.smgrowers.com . [Accessed 19 Jun 2020]	"This plant is a very attractive plant in the garden and also makes a nice container plant - it is quite different from the other wax flowers that we grow but is one of our most favorite." [Cultivated in California]
	Shoot Gardening. (2020). Chamelaucium ciliatum (Stirling wax). https://www.shootgardening.co.uk/plant/chamelaucium-ciliatum . [Accessed 19 Jun 2020]	[Cultivated in the UK] "Cultivation: Outdoors, grow in poor to moderately fertile, sharply-drained, acid to neutral, sandy soil in full sun. May bloom sporadically throughout the year in mild climates. Under glass, grow in ericaceous compost in full light with shade from hot sun. In growth, water moderately & feed monthly. Water sparingly in winter."
	WRA Specialist. (2020). Personal Communication	Cultivated outside native range, but extent of cultivation uncertain

301	Naturalized beyond native range	n
	Source(s)	Notes
	Imada, C. (2019). Hawaiian Naturalized Vascular Plants Checklist (February 2019 update). Bishop Museum Technical Report 69. Bishop Museum, Honolulu, HI	No evidence
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

302	Garden/amenity/disturbance weed	n
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Qsn #	Question	Answer
	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	y
	Source(s)	Notes
	Queensland Government. (2020). Weeds of Australia. <i>Chamelaucium uncinatum</i> Schauer. https://keyserver.lucidcentral.org. [Accessed 19 Jun 2020]	"Geraldton wax (<i>Chamelaucium uncinatum</i>) is regarded as an environmental weed in those parts of Western Australia where it has become naturalised outside its native range. For example, it has escaped from plantings at Kings Park in Perth and invaded nearby bushland areas. This species is noted to be seriously invasive in some situations in south-western Western Australia, and can cause major structural changes to the plant communities that it invades."
	Urban Bushland Council WA Inc. (2020). Geraldton Wax. https://www.bushlandperth.org.au/weeds/geraldton-wax/. [Accessed 19 Jun 2020]	"Impact on Bushland: Geraldton Wax is highly invasive and can cause major structural changes to the plant communities that it invades. It should not be planted near bushland." ... "Priority for removal High: can be a major threat to the conservation values of Banksia woodlands and can cause major structural changes to the plant communities that it invades."

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Australian Native Plant Society. (2020). <i>Chamelaucium ciliatum</i> . http://anpsa.org.au/c-cil.html . [Accessed 19 Jun 2020]	[No evidence] " <i>Chamelaucium ciliatum</i> is usually a small, erect or spreading shrub to about 1 metre high. It has linear, narrow leaves up to 40 mm long and highly aromatic when crushed. The small, white or pink flowers occur in spring and summer and age to a deeper pink colour. They are circular in shape and about 15 mm in diameter."

402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	Unknown. No evidence found

403	Parasitic	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Western Australian Herbarium (1998–2020). FloraBase—the Western Australian Flora. Department of Parks and Wildlife. https://florabase.dpaw.wa.gov.au/ . [Accessed 19 Jun 2020]	"Erect or spreading shrub, 0.15-1.2 m high" [Myrtaceae. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	Unknown

405	Toxic to animals	n
	Source(s)	Notes
	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

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Growns, D. (2005). Waxflower for cut flower production. Department of Agriculture and Food Farmnote, No. 86/95. State of Western Australia	"Insects are not a major problem in waxflower, but flowers will be rejected if insects are found in shipments on entry to countries such as Japan and USA with strict quarantine requirements." ... "Species of Pythium and Phytophthora can cause root rots and eventual death of plants. Pythium is a problem in winter, or in poorly drained areas." ... "Botrytis flower blight is the main above-ground disease. It can cause significant losses both in the field and during shipment to export markets. The symptoms are brownish lesions on the petals and in severe cases, shedding of the buds and flowers. Post-harvest, it develops on flowers in export cartons as a hairy mould, mostly on buds and flowers."
	Kings Park & Botanic Garden. (2013). Wax Flower <i>Chamelaucium ciliatum</i> . Native Plant Notes. https://www.bgpa.wa.gov.au/ . [Accessed 19 Jun 2020]	"This species is susceptible to dieback (the soil-borne fungus, <i>Phytophthora cinnamomi</i>) but is generally hardy."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	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

Qsn #	Question	Answer
408	Creates a fire hazard in natural ecosystems	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	Unknown. No evidence found

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	Notes
	Australian Native Plants. (2020). <i>Chamelaucium ciliatum</i> . https://www.australianplants.com/plants.aspx?id=1571 . [Accessed 19 Jun 2020]	"Exposure: Full Sun"
	San Marcos Growers. (2020). <i>Chamelaucium ciliatum</i> 'Scaddan' - Scaddan Waxflower. https://www.smgrowers.com . [Accessed 19 Jun 2020]	"Exposure: Full Sun"
	Webb, M. (2013). Australian Native Plants: The Kings Park Experience. CSIRO Publishing, Collingwood, Australia	"Ideally suited to mass planting, this species enjoys a full sun position but will adapt to semi-shaded positions."
	Fairall, A. R. (1970). West Australian Native Plants in Cultivation. Pergamon Press, Rushcutters Bay, NSW	"It grows well in light sandy soil, in full sun"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Fairall, A. R. (1970). West Australian Native Plants in Cultivation. Pergamon Press, Rushcutters Bay, NSW	"It grows well in light sandy soil, in full sun"
	Australian Native Plants. (2020). <i>Chamelaucium ciliatum</i> . https://www.australianplants.com/plants.aspx?id=1571 . [Accessed 19 Jun 2020]	"Soil: Well-drained, sandy"
	Kings Park & Botanic Garden. (2013). Wax Flower <i>Chamelaucium ciliatum</i> . Native Plant Notes. https://www.bgpa.wa.gov.au . [Accessed 19 Jun 2020]	"The Wax Flower is a proven performer on all soil types providing there is good drainage."

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Western Australian Herbarium (1998–2020). FloraBase—the Western Australian Flora. Department of Parks and Wildlife. https://florabase.dpaw.wa.gov.au/ . [Accessed 19 Jun 2020]	"Erect or spreading shrub, 0.15-1.2 m high"

412	Forms dense thickets	n
	Source(s)	Notes
	Fairall, A. R. (1970). West Australian Native Plants in Cultivation. Pergamon Press, Rushcutters Bay, NSW	"A 3-foot shrub from the granite soils of the lower Coolgardie, Stirling and Eyre districts where it is well shaped and bushy in the open, or Jax and straggling in close vegetation." [No evidence]

501	Aquatic	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Australian Native Plant Society. (2020). <i>Chamelaucium ciliatum</i> . http://anpsa.org.au/c-cil.html . [Accessed 19 Jun 2020]	"Distribution: Woodland and heath in south Western Australia"
	Western Australian Herbarium (1998–2020). FloraBase—the Western Australian Flora. Department of Parks and Wildlife. https://florabase.dpaw.wa.gov.au/ . [Accessed 19 Jun 2020]	[Terrestrial] "Erect or spreading shrub, 0.15-1.2 m high"

502	Grass	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 19 Jun 2020]	Family: Myrtaceae Subfamily: Myrtoideae Tribe: Chamelaucieae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 19 Jun 2020]	Family: Myrtaceae Subfamily: Myrtoideae Tribe: Chamelaucieae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Western Australian Herbarium (1998–2020). FloraBase—the Western Australian Flora. Department of Parks and Wildlife. https://florabase.dpaw.wa.gov.au/ . [Accessed 19 Jun 2020]	"Erect or spreading shrub, 0.15-1.2 m high."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Western Australian Herbarium (1998–2020). FloraBase—the Western Australian Flora. Department of Parks and Wildlife. https://florabase.dpaw.wa.gov.au/ . [Accessed 19 Jun 2020]	"Conservation Code: Not threatened"
	Australian Native Plant Society. (2020). <i>Chamelaucium ciliatum</i> . http://anpsa.org.au/c-cil.html . [Accessed 19 Jun 2020]	"Conservation Status: Not considered to be at risk in the wild"

602	Produces viable seed	y
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Qsn #	Question	Answer
	Source(s)	Notes
	Sweedman, L. & Merritt, D. 2006. Australian seeds: a guide to their collection, identification and biology. Csiro Publishing, Collingwood, Australia	"Appendix 1: Seed germination records" [<i>Chamelaucium ciliatum</i> - M Mean time to germinate = 61; Q Quickest time to germinate = 50; L Longest time to germinate = 78; T Times sown = 3]
	Australian Native Plant Society. (2020). <i>Chamelaucium ciliatum</i> . http://anpsa.org.au/c-cil.html . [Accessed 19 Jun 2020]	"Propagation from seed is difficult but cuttings of firm, current seasons growth usually strike readily."

603	Hybridizes naturally	
	Source(s)	Notes
	Egerton-Warburton, L. M., Ghisalberti, E. L., & Burton, N. C. (1998). Intergeneric hybridism between <i>Chamelaucium</i> and <i>Verticordia</i> (Myrtaceae) based on analysis of essential oils and morphology. <i>Australian Journal of Botany</i> , 46(2), 201-208	[Unknown. Hybrids might be possible in genus] "'Eric John' is a novel variant and spontaneous hybrid that demonstrates the floral characteristics of two myrtaceous genera, <i>Verticordia</i> and <i>Chamelaucium</i> . A comparison was made between the essential oil profiles and morphological characters of 'Eric John', <i>Chamelaucium ciliatum</i> , <i>C. floriferum</i> , <i>C. uncinatum</i> , and <i>Verticordia plumosa</i> from the site of origin of 'Eric John' to identify the parentage of the novel variant and assess the potential for intergeneric crosses. Biochemically, 'Eric John' was strongly aligned with <i>C. floriferum</i> , while, morphologically, 'Eric John' was closely associated with <i>V. plumosa</i> . These data distinguished 'Eric John' as a possible <i>C. floriferum</i> × <i>V. plumosa</i> hybrid and indicate the potential for development of novel gene combinations for horticulture. Large dissimilarities between the essential-oil profiles and morphometry of 'Eric John', <i>C. ciliatum</i> and <i>C. uncinatum</i> negated these latter species as parental stock."

604	Self-compatible or apomictic	
	Source(s)	Notes
	O'Brien, S. P. (1996). Timetable of stigmatic receptivity and development and pollen tube growth in <i>Chamelaucium uncinatum</i> (Myrtaceae). <i>Australian Journal of Botany</i> , 44(6), 649-659	[Unknown. Related taxon may be self-fertile] "Secondary pollen presentation occurs in <i>C. uncinatum</i> with the stigmatic region being used as a pollen presenter. If the self-pollen is not removed from the stigma prior to the onset of receptivity self-pollination may occur."

605	Requires specialist pollinators	n
	Source(s)	Notes
	O'Brien, S. P. (1996). Timetable of stigmatic receptivity and development and pollen tube growth in <i>Chamelaucium uncinatum</i> (Myrtaceae). <i>Australian Journal of Botany</i> , 44(6), 649-659	[Probably similarly pollinated by bees and other insects] "The only reference to potential pollinators of <i>C. uncinatum</i> in the Australian literature is very general and implicates bees, flies and beetles (Keighery 1982). The structure of the flowers and the nectar-pollen reward suggests this species is most likely insect-pollinated as other similar myrtaceous species are insect-pollinated (Armstrong 1979)."

Qsn #	Question	Answer
606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	Australian Native Plant Society. (2020). <i>Chamelaucium ciliatum</i> . http://anpsa.org.au/c-cil.html . [Accessed 19 Jun 2020]	"Propagation from seed is difficult but cuttings of firm, current seasons growth usually strike readily." [No evidence of natural vegetative spread in wild]

607	Minimum generative time (years)	>3
	Source(s)	Notes
	Fairall, A. R. (1970). <i>West Australian Native Plants in Cultivation</i> . Pergamon Press, Rushcutters Bay, NSW	"It grows well in light sandy soil, in full sun, where it has reached 4 ft x 3 ft and flowered in 4½ years"

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Beardsell, D. V., Obrien, S. P., Williams, E. G., Knox, R. B., & Calder, D. M. (1993). Reproductive biology of Australian Myrtaceae. <i>Australian Journal of Botany</i> , 41(5), 511-526	"Species of the <i>Chamelaucium</i> alliance of Johnson and Briggs (1984) have nuts which generally contain one seed (Rye 1980; Green 1983)." ... "Woody capsules and nuts do not provide dispersal of seeds over great distances." [Unlikely. No means of external attachment]

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Australian Native Plants. (2020). <i>Chamelaucium ciliatum</i> . https://www.australianplants.com/plants.aspx?id=1571 . [Accessed 19 Jun 2020]	"Excellent cut flower and container plant."
	Shoot Gardening. (2020). <i>Chamelaucium ciliatum</i> (Stirling wax). https://www.shootgardening.co.uk/plant/chamelaucium-ciliatum . [Accessed 19 Jun 2020]	[Cultivated in the UK] "Cultivation: Outdoors, grow in poor to moderately fertile, sharply-drained, acid to neutral, sandy soil in full sun. May bloom sporadically throughout the year in mild climates. Under glass, grow in ericaceous compost in full light with shade from hot sun. In growth, water moderately & feed monthly. Water sparingly in winter."

703	Propagules likely to disperse as a produce contaminant	
	Source(s)	Notes
	Australian Native Plants. (2020). <i>Chamelaucium ciliatum</i> . https://www.australianplants.com/plants.aspx?id=1571 . [Accessed 19 Jun 2020]	"Excellent cut flower and container plant." [No evidence, but seeds could potentially be spread unintentionally as a "contaminant" of dry flower arrangements]

Qsn #	Question	Answer
704	Propagules adapted to wind dispersal	
	Source(s)	Notes
	Beardsell, D. V., Obrien, S. P., Williams, E. G., Knox, R. B., & Calder, D. M. (1993). Reproductive biology of Australian Myrtaceae. Australian Journal of Botany, 41(5), 511-526	"Species of the Chamelaucium alliance of Johnson and Briggs (1984) have nuts which generally contain one seed (Rye 1980; Green 1983)." ... "Woody capsules and nuts do not provide dispersal of seeds over great distances." [Probably gravity dispersed, but wind may influence distance and direction of dispersal]

705	Propagules water dispersed	
	Source(s)	Notes
	Beardsell, D. V., Obrien, S. P., Williams, E. G., Knox, R. B., & Calder, D. M. (1993). Reproductive biology of Australian Myrtaceae. Australian Journal of Botany, 41(5), 511-526	"Species of the Chamelaucium alliance of Johnson and Briggs (1984) have nuts which generally contain one seed (Rye 1980; Green 1983)." ... "Woody capsules and nuts do not provide dispersal of seeds over great distances." [Buoyancy of seed unknown. Probably not an important mode of dispersal]

706	Propagules bird dispersed	n
	Source(s)	Notes
	Kubitzki, K. (ed.). 2011. The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	"Fruit indehiscent. Seed usually 1"
	Beardsell, D. V., Obrien, S. P., Williams, E. G., Knox, R. B., & Calder, D. M. (1993). Reproductive biology of Australian Myrtaceae. Australian Journal of Botany, 41(5), 511-526	"Species of the Chamelaucium alliance of Johnson and Briggs (1984) have nuts which generally contain one seed (Rye 1980; Green 1983)." ... "Woody capsules and nuts do not provide dispersal of seeds over great distances." [No evidence. Not fleshy fruited]

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Beardsell, D. V., Obrien, S. P., Williams, E. G., Knox, R. B., & Calder, D. M. (1993). Reproductive biology of Australian Myrtaceae. Australian Journal of Botany, 41(5), 511-526	"Species of the Chamelaucium alliance of Johnson and Briggs (1984) have nuts which generally contain one seed (Rye 1980; Green 1983)." ... "Woody capsules and nuts do not provide dispersal of seeds over great distances." [No evidence. No means of external attachment]

708	Propagules survive passage through the gut	n
	Source(s)	Notes
	Beardsell, D. V., Obrien, S. P., Williams, E. G., Knox, R. B., & Calder, D. M. (1993). Reproductive biology of Australian Myrtaceae. Australian Journal of Botany, 41(5), 511-526	"Species of the Chamelaucium alliance of Johnson and Briggs (1984) have nuts which generally contain one seed (Rye 1980; Green 1983)." ... "Woody capsules and nuts do not provide dispersal of seeds over great distances." [No evidence of consumption or internal dispersal]

801	Prolific seed production (>1000/m2)	n

Qsn #	Question	Answer
	Source(s)	Notes
	Kubitzki, K. (ed.). 2011. The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	"Fruit indehiscent. Seed usually 1."
	Beardsell, D. V., Obrien, S. P., Williams, E. G., Knox, R. B., & Calder, D. M. (1993). Reproductive biology of Australian Myrtaceae. Australian Journal of Botany, 41(5), 511-526	"Species of the Chamelaucium alliance of Johnson and Briggs (1984) have nuts which generally contain one seed (Rye 1980; Green 1983)."

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	Royal Botanic Gardens Kew. (2020) Seed Information Database (SID). Version 7.1. Available from: http://data.kew.org/sid/ . [Accessed 19 Jun 2020]	"Storage Behaviour: No data available for species. Of 1 known taxa of genus Chamelaucium, 100.00% Orthodox(p/?)"

803	Well controlled by herbicides	
	Source(s)	Notes
	Western Australian Herbarium (1998–2020). FloraBase—the Western Australian Flora. Department of Parks and Wildlife. https://florabase.dpaw.wa.gov.au/ . [Accessed 19 Jun 2020]	[Unknown. Related taxon controlled with herbicide. Efficacy unspecified] "Chamelaucium uncinatum ... Suggested method of management and control. Cut to base and paint with 50% glyphosate."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	Notes
	Kings Park & Botanic Garden. (2013). Wax Flower <i>Chamelaucium ciliatum</i> . Native Plant Notes. https://www.bgpa.wa.gov.au/ . [Accessed 19 Jun 2020]	"This species is highly responsive to pruning. To maintain well-shaped flowering plants it is advisable to cut back one-third of the foliage each year after flowering."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	Kings Park & Botanic Garden. (2013). Wax Flower <i>Chamelaucium ciliatum</i> . Native Plant Notes. https://www.bgpa.wa.gov.au/ . [Accessed 19 Jun 2020]	"This species is susceptible to dieback (the soil-borne fungus, <i>Phytophthora cinnamomi</i>) but is generally hardy." [Possibly. Pathogen present in Hawaiian Islands]

Summary of Risk Traits:

High Risk / Undesirable Traits

- Other species in genus are invasive
- Tolerates many soil types
- Reproduces by seeds
- Seeds dispersed by gravity, possibly wind, and intentionally by people
- Tolerates repeated cutting and pruning

Low Risk Traits

- No reports of invasiveness or naturalization, but limited evidence of introduction outside native range
- Unarmed (no spines, thorns, or burrs)
- Non-toxic
- Ornamental
- Not reported to spread vegetatively
- Seeds generally lack means for long-distance dispersal