

Taxon: <i>Beaufortia sparsa</i> R. Br.	Family: Myrtaceae
Common Name(s): gravel bottlebrush swamp bottlebrush	Synonym(s): <i>Beaufortia splendens</i> Baxter ex A. C. Smith

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 15 May 2020
WRA Score: -3.0	Designation: L	Rating: Low Risk

Keywords: Shrub, Unarmed, Bird-Pollinated, Serotinous, Fire Resprouter

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)	Low
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	n
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	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		
409	Is a shade tolerant plant at some stage of its life cycle		

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	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	y=1, n=-1	n
704	Propagules adapted to wind dispersal		
705	Propagules water dispersed	y=1, n=-1	y
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)		
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
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	[No evidence] "Occurs in the South-West Botanical Province where it is almost confined to the Warren bioregion, but extends northward to near Busselton and Capel at the southern end of the Perth subregion, into the southern edge of the Southern Jarrah Forest subregion, and eastwards to Chester Pass, Stirling Range, near the western edge of the Fitzgerald subregion"
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"	Low
	Source(s)	Notes
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	"Occurs in the South-West Botanical Province where it is almost confined to the Warren bioregion, but extends northward to near Busselton and Capel at the southern end of the Perth subregion, into the southern edge of the Southern Jarrah Forest subregion, and eastwards to Chester Pass, Stirling Range, near the western edge of the Fitzgerald subregion (Figure 8)."
202	Quality of climate match data	High
	Source(s)	Notes
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	

Qsn #	Question	Answer
203	Broad climate suitability (environmental versatility)	n
	Source(s)	Notes
	Australian Native Plant Society. (2020). <i>Beaufortia sparsa</i> . http://anpsa.org.au/b-spa.html . [Accessed 13 May 2020]	" <i>Beaufortia</i> , generally, is not common in cultivation, particularly in areas of summer humidity and rainfall where they can be short lived even in well drained soils. Unfortunately <i>B. sparsa</i> is no exception to this general rule. Plants are more successful in drier climates where they are desirable garden subjects, the colourful bottlebrush or globular-shaped flower clusters being attractive to birds."
	Plant This. (2020). <i>Beaufortia sparsa</i> - Swamp Brush Myrtle. http://plantthis.com.au . [Accessed 14 May 2020]	"Hardiness zones: 9-10"

204	Native or naturalized in regions with tropical or subtropical climates	n
	Source(s)	Notes
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	"Distribution and habitat. Occurs in the South-West Botanical Province where it is almost confined to the Warren bioregion, but extends northward to near Busselton and Capel at the southern end of the Perth subregion, into the southern edge of the Southern Jarrah Forest subregion, and eastwards to Chester Pass, Stirling Range, near the western edge of the Fitzgerald subregion (Figure 8). Grows in seasonally swampy soils with peaty and loamy sands, often semi-dominant in peaty flats." [Temperate climate]
	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?	n
	Source(s)	Notes
	Australian Native Plant Society. (2020). <i>Beaufortia sparsa</i> . http://anpsa.org.au/b-spa.html . [Accessed 13 May 2020]	" <i>Beaufortia</i> , generally, is not common in cultivation, particularly in areas of summer humidity and rainfall where they can be short lived even in well drained soils. Unfortunately <i>B. sparsa</i> is no exception to this general rule. Plants are more successful in drier climates where they are desirable garden subjects, the colourful bottlebrush or globular-shaped flower clusters being attractive to birds."

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

Qsn #	Question	Answer
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	No evidence
401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	[No evidence] "Shrub to 2.5 m high and 1.8 m wide, often multi-stemmed at ground level. Stems glabrescent, red when young. Leaves mostly spiralled but sometimes sub-opposite, sessile, ovate to lanceolate, 8–10 mm long, 3–4 mm wide, 5-veined (may not be obvious in fresh specimens), glabrous. Inflorescence a spike. Bracts pale brown, triangular, 6 mm long, 3.5 mm wide at base, 5–7-veined, hairy proximally, glabrous distally, often shed at anthesis. Bracteoles typically absent. Hypanthium red, c. 1.5 mm long, 1.5 mm wide, hairy. Sepals dark red, triangular, c. 1–2 mm long and wide, faintly 1-veined. Petals yellow to orange, c. 2 mm long, sometimes sparsely ciliate. Staminal bundles claw red or yellow-orange to pale pink, 12–20 mm long, glabrous; free filaments 5–7, emerging from the claw at different points, red, occasionally paler near base, 6–10 mm long, glabrous. Style pink to red. Fruits united or clumped, 15–35 mm long, 10–12 mm wide."
402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	Unknown. No evidence found
403	Parasitic	n

Qsn #	Question	Answer
	Source(s)	Notes
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	"Shrub to 2.5 m high and 1.8 m wide, often multi-stemmed at ground level." [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
	Fairall, A. R. 2013. <i>West Australian Native Plants in Cultivation</i> . Pergamon Press, Rushcutters Bay, NSW	[No evidence] "Even more impressive than its associated species, <i>B. decussata</i> . Its brilliant scarlet flowers cover acres of peaty swamps in the lower South West at a time when little else is in flower in the area. An erect, little branched shrub to 6 feet. The flowers in January to May are in "bottlebrushes" often below the new season's growth. Leaves are similar to those of <i>B. decussata</i> but narrower and not in pairs."
	Quattrocchi, U. 2012. <i>CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology</i> . CRC Press, Boca Raton, FL	No evidence
	Wagstaff, D.J. 2008. <i>International poisonous plants checklist: an evidence-based reference</i> . CRC Press, Boca Raton, FL	No evidence

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

Qsn #	Question	Answer
	Morin, L., Aveyard, R., Lidbetter, J. R., & Wilson, P. G. (2012). Investigating the host-range of the rust fungus <i>Puccinia psidii</i> sensu lato across tribes of the family Myrtaceae present in Australia. <i>PLoS One</i> , 7(4): e35434	[<i>Beaufortia sparsa</i> a host of <i>A. psidii</i>] "The exotic rust fungus <i>Puccinia psidii</i> sensu lato was first detected in Australia in April 2010. This study aimed to determine the host-range potential of this accession of the rust by testing its pathogenicity on plants of 122 taxa, representative of the 15 tribes of the subfamily Myrtoideae in the family Myrtaceae. Each taxon was tested in two separate trials (unless indicated otherwise) that comprised up to five replicates per taxon and six replicates of a positive control (<i>Syzygium jambos</i>). No visible symptoms were observed on the following four taxa in either trial: <i>Eucalyptus grandis</i> , <i>Eucalyptus camaldulensis</i> , <i>E. moluccana</i> , <i>Lophostemon confertus</i> and <i>Sannantha angusta</i> . Only small chlorotic or necrotic flecks without any uredinia (rust fruiting bodies) were observed on inoculated leaves of seven other taxa (<i>Acca sellowiana</i> , <i>Corymbia calophylla</i> 'Rosea', <i>Lophostemon suaveolens</i> , <i>Psidium cattleianum</i> , <i>P. guajava</i> 'Hawaiian' and 'Indian', <i>Syzygium unipunctatum</i>). Fully-developed uredinia were observed on all replicates across both trials of 28 taxa from 8 tribes belonging to the following 17 genera: <i>Agonis</i> , <i>Austromyrtus</i> , <i>Beaufortia</i> , <i>Callistemon</i> , <i>Calothamnus</i> , <i>Chamelaucium</i> , <i>Darwinia</i> , <i>Eucalyptus</i> , <i>Gossia</i> , <i>Kunzea</i> , <i>Leptospermum</i> , <i>Melaleuca</i> , <i>Metrosideros</i> , <i>Syzygium</i> , <i>Thryptomene</i> , <i>Tristania</i> , <i>Verticordia</i> . In contrast, the remaining 83 taxa inoculated, including the majority of <i>Corymbia</i> and <i>Eucalyptus</i> species, developed a broad range of symptoms, often across the full spectrum, from fully-developed uredinia to no visible symptoms. These results were encouraging as they indicate that some levels of genetic resistance to the rust possibly exist in these taxa. Overall, our results indicated no apparent association between the presence or absence of disease symptoms and the phylogenetic relatedness of taxa. It is most likely that the majority of the thousands of Myrtaceae species found in Australia have the potential to become infected to some degree by the rust, although this wide host range may not be fully realized in the field."
	WRA Specialist. (2020). Personal Communication	Unknown if <i>Beaufortia sparsa</i> could serve as an important host to the fungus <i>Austropuccinia psidii</i> , but this pathogen is already present in the Hawaiian Islands and has been documented on a fairly wide host range of native and non-native plants. The cultivation of <i>Beaufortia sparsa</i> is therefore unlikely to significantly affect the distribution of <i>Austropuccinia psidii</i> .

407	Causes allergies or is otherwise toxic to humans	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
	Wagstaff, D.J. 2008. <i>International poisonous plants checklist: an evidence-based reference</i> . CRC Press, Boca Raton, FL	No evidence

408	Creates a fire hazard in natural ecosystems	
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Qsn #	Question	Answer
	Source(s)	Notes
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	[Occurs in areas with frequent fire. Resprouts from fire, but contributions to fire frequency or fuel load unspecified] "Response to fire. <i>Beaufortia</i> has serotinous fruits that release seeds after fire (Lamont et al. 1991). Most species regenerate only from seed; however, <i>B. macrostemon</i> Lindl. and <i>B. sparsa</i> , both with distributions in areas of high rainfall where fire is relatively frequent, can re-sprout from a lignotuberous root-stock."

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	Notes
	Gardening With Angus. (2020). <i>Stenocarpus Beaufortia sparsa</i> – Swamp Bottlebrush. https://www.gardeningwithangus.com.au . [Accessed 14 May 2020]	"Light: Sunny, Light shade"
	Australian Native Plant Society. (2020). <i>Beaufortia sparsa</i> . http://anpsa.org.au/b-spa.html . [Accessed 14 May 2020]	"The species should be grown in well drained conditions in full sun or dappled shade and it is tolerant of at least moderate frost."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	n
	Source(s)	Notes
	Australian Native Plant Society. (2020). <i>Beaufortia sparsa</i> . http://anpsa.org.au/b-spa.html . [Accessed 14 May 2020]	" <i>Beaufortia</i> , generally, is not common in cultivation, particularly in areas of summer humidity and rainfall where they can be short lived even in well drained soils."
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	"Grows in seasonally swampy soils with peaty and loamy sands, often semi-dominant in peaty flats."
	Gardening With Angus. (2020). <i>Stenocarpus Beaufortia sparsa</i> – Swamp Bottlebrush. https://www.gardeningwithangus.com.au . [Accessed 14 May 2020]	"Ph Level: Acid, Neutral, Alkaline Soil Type: Sandy, Loamy, Sandy loam"
	Plant This. (2020). <i>Beaufortia sparsa</i> - Swamp Brush Myrtle. http://plantthis.com.au . [Accessed 14 May 2020]	"Soil: ordinary soil, enriched soil, mildly acidic to mildly alkaline"

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	"Shrub to 2.5 m high and 1.8 m wide, often multi-stemmed at ground level."

412	Forms dense thickets	
	Source(s)	Notes
	Bradshaw, S. D., & Bradshaw, F. J. (2017). Long-term recovery from fire by a population of honey possums (<i>Tarsipes rostratus</i>) in the extreme south-west of Western Australia. <i>Australian Journal of Zoology</i> , 65(1), 1-11	" <i>Beaufortia sparsa</i> (to 2 m) is widespread in the swamp/sedge/heath habitat, while <i>Banksia occidentalis</i> (to 3 m) has been found in only two localised patches of heath in the extreme eastern portion of the study area." [No evidence]

Qsn #	Question	Answer
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	"Grows in seasonally swampy soils with peaty and loamy sands, often semi-dominant in peaty flats." [No evidence]
	Bradshaw, S. D., Phillips, R. D., Tomlinson, S., Holley, R. J., Jennings, S., & Bradshaw, F. J. (2007). Ecology of the Honey possum, <i>Tarsipes rostratus</i> , in Scott National Park, Western Australia. <i>Australian Mammalogy</i> , 29(1), 25-38	[This study mentions a <i>Beaufortia sparsa</i> thicket. Suggests the possibility that this species reaches high stem densities and could potentially dominate or exclude other vegetation] "Movement patterns for animal number 6male (mass 9.2 g) are shown in Fig. 9, illustrating extensive nightly movements of up to ~370 m between the <i>B. ilicifolia</i> grove, where it was first trapped, and the <i>Beaufortia sparsa</i> thicket that it used as a daytime refuge."

501	Aquatic	n
	Source(s)	Notes
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	[Terrestrial] "Grows in seasonally swampy soils with peaty and loamy sands, often semi-dominant in peaty flats."

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 13 May 2020]	Family: Myrtaceae Subfamily: Myrtoideae Tribe: Melaleuceae

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 13 May 2020]	Family: Myrtaceae Subfamily: Myrtoideae Tribe: Melaleuceae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	"Shrub to 2.5 m high and 1.8 m wide, often multi-stemmed at ground level."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	"Conservation status. Not threatened."
	Australian Native Plant Society. (2020). <i>Beaufortia sparsa</i> . http://anpsa.org.au/b-spa.html . [Accessed 13 May 2020]	"Conservation Status: Not considered to be at risk in the wild."

Qsn #	Question	Answer
602	Produces viable seed	y
	Source(s)	Notes
	Australian Native Plant Society. (2020). <i>Beaufortia sparsa</i> . http://anpsa.org.au/b-spa.html . [Accessed 13 May 2020]	"Flowering occurs in summer and may extend into autumn. Following flowering, seeds develop in woody capsules similar to those formed with <i>Melaleuca</i> species. The seeds are retained within the capsules indefinitely." ... "Propagation is easy from both seed and cuttings. However, the seeds are difficult to remove from the capsules which, unlike most <i>Melaleuca</i> species, do not open of their own accord a few days after collection. One method that has been successful is to break up the capsules in an electric coffee grinder and then sow the resulting debris, which contains the seeds."

603	Hybridizes naturally	
	Source(s)	Notes
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	[Unknown. Hybridization suspected in genus] " <i>Beaufortia incana</i> ... It differs from <i>B. incana</i> by having five free filaments that are about the same length as the staminal claw and may be a hybrid between <i>B. incana</i> and <i>B. puberula</i> ." ... "Another atypical specimen, from east of Lake Grace (J.S. Beard 2163), has 4–5 mm long and 0.5 mm wide glabrescent leaves; green, ciliate, 3–5-veined triangular sepals; pale pink, ovate, ciliate petals; 4–6 mm long staminal claws that are hairy on inner surface, and three or rarely five staminal filaments that are pale pink proximally and darker near tip. Fruits are absent. This specimen may be a hybrid between <i>B. incana</i> and <i>B. schaueri</i> ."

604	Self-compatible or apomictic	
	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	"Floral dimorphism, in the form of andromonoecy, is common in the Myrtaceae and was first recorded by Bentham (1 867). Rye (1 980) found andromonoecy in 30 species from the genera <i>Beaufortia</i> , <i>Conothamnus</i> , <i>Eucalyptus</i> , <i>Leptospermum</i> , <i>Melaleuca</i> , <i>Phymatocarpus</i> and <i>Regelia</i> ."
	Keighery, G. J. (1982). Bird-pollinated plants in western Australia. In <i>Pollination and Evolution</i> (eds. J. A. Armstrong, J. M. Powell and A. J. Richards), pp. 77–89. Royal Botanic Garden, Sydney	[Potentially yes. Species not identified] "TABLE 6 Pollination syndromes: South Western Myrtaceae" [<i>Beaufortia</i> - Self-comp = ** present in several species]

605	Requires specialist pollinators	n
	Source(s)	Notes

Qsn #	Question	Answer
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	[Bird and bee pollinated] "Pollination. Limited information suggests pollination is mainly by honeyeaters (Meliphagidae) and the honey possum (<i>Tarsipes rostratus</i>), although the pygmy possum (<i>Cercartetus concinnus</i>), a megachilid bee and a halictid bee have been recorded visiting flowers, as has the introduced honey bee (<i>Apis mellifera</i>) (Brown et al. 1997). Museum of Victoria (2015) records several species of native bees from the families Apidae, Colletidae, Halictidae and Megachilidae visiting <i>Beaufortia</i> species and Brooks et al. (1998) reported that wasps and unidentified bees had been observed feeding on <i>B. aestiva</i> K.J.Brooks, so insects may be significant pollinators. Honey possums at Cheyne Beach were shown to carry loads of <i>Beaufortia</i> pollen, as well as the pollen of other plant genera (Hopper 1980)."

606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	[Resprouts, but no evidence of vegetative spread] " <i>Beaufortia</i> has serotinous fruits that release seeds after fire (Lamont et al. 1991). Most species regenerate only from seed; however, <i>B. macrostemon</i> Lindl. and <i>B. sparsa</i> , both with distributions in areas of high rainfall where fire is relatively frequent, can re-sprout from a lignotuberous root-stock."

607	Minimum generative time (years)	>3
	Source(s)	Notes
	Fairall, A. R. 2013. <i>West Australian Native Plants in Cultivation</i> . Pergamon Press, Rushcutters Bay, NSW	"Has grown 2 ft x 1 ft and is flowering sparingly after 3½ years in heavily composted and loamed sand in partial shade."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Sweedman, L. & Merritt, D. 2006. <i>Australian seeds: a guide to their collection, identification and biology</i> . Csiro Publishing, Collingwood, Australia	" <i>Beaufortia</i> - Fruits are removed from the woody stems. Seeds fall from the fruits as the valves open. This genus appears unique in the Myrtaceae since the seeds are persistent in the capsules and can take three months or longer to drop free of their capsules once collected."
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	" <i>Beaufortia</i> has serotinous fruits that release seeds after fire (Lamont et al. 1991). Most species regenerate only from seed"

Qsn #	Question	Answer
702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Australian Native Plant Society. (2020). <i>Beaufortia sparsa</i> . http://anpsa.org.au/b-spa.html . [Accessed 13 May 2020]	" <i>Beaufortia</i> , generally, is not common in cultivation, particularly in areas of summer humidity and rainfall where they can be short lived even in well drained soils. Unfortunately <i>B.sparsa</i> is no exception to this general rule. Plants are more successful in drier climates where they are desirable garden subjects, the colourful bottlebrush or globular-shaped flower clusters being attractive to birds."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	[No evidence. Unlikely given Serotinous fruit] " <i>Beaufortia</i> has serotinous fruits that release seeds after fire (Lamont et al. 1991). Most species regenerate only from seed; however, <i>B. macrostemon</i> Lindl. and <i>B. sparsa</i> , both with distributions in areas of high rainfall where fire is relatively frequent, can re-sprout from a lignotuberous root-stock."

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. <i>Australian Journal of Botany</i> , 41(5), 511-526	"The seeds of most Myrtaceae, including those of <i>Eucalyptus</i> , are too heavy for long distance wind dispersal."
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	[Wind may facilitate dispersal upon release from serotinous fruits, but unknown how important this mode of dispersal may be] " <i>Beaufortia</i> has serotinous fruits that release seeds after fire (Lamont et al. 1991). Most species regenerate only from seed; however, <i>B. macrostemon</i> Lindl. and <i>B. sparsa</i> , both with distributions in areas of high rainfall where fire is relatively frequent, can re-sprout from a lignotuberous root-stock."

705	Propagules water dispersed	y
	Source(s)	Notes
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	[Occurrence in swampy habitat suggests water may facilitate secondary dispersal] " <i>Beaufortia</i> has serotinous fruits that release seeds after fire (Lamont et al. 1991). Most species regenerate only from seed; however, <i>B. macrostemon</i> Lindl. and <i>B. sparsa</i> , both with distributions in areas of high rainfall where fire is relatively frequent, can re-sprout from a lignotuberous root stock." ... "Grows in seasonally swampy soils with peaty and loamy sands, often semi-dominant in peaty flats."

706	Propagules bird dispersed	n
	Source(s)	Notes

Qsn #	Question	Answer
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	" <i>Beaufortia</i> has serotinous fruits that release seeds after fire (Lamont et al. 1991). Most species regenerate only from seed; however, <i>B. macrostemon</i> Lindl. and <i>B. sparsa</i> , both with distributions in areas of high rainfall where fire is relatively frequent, can re-sprout from a lignotuberous root-stock."
	Kubitzki, K. (ed.). 2011. The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	"Fruit a woody, loculicidal capsule, the valves included in the fruiting hypanthium. Seeds obovoid-angular; embryo straight, cotyledons flat, longer than the hypocotyl."

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	" <i>Beaufortia</i> has serotinous fruits that release seeds after fire (Lamont et al. 1991). Most species regenerate only from seed; however, <i>B. macrostemon</i> Lindl. and <i>B. sparsa</i> , both with distributions in areas of high rainfall where fire is relatively frequent, can re-sprout from a lignotuberous root-stock." [No evidence]

708	Propagules survive passage through the gut	n
	Source(s)	Notes
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	" <i>Beaufortia</i> has serotinous fruits that release seeds after fire (Lamont et al. 1991). Most species regenerate only from seed; however, <i>B. macrostemon</i> Lindl. and <i>B. sparsa</i> , both with distributions in areas of high rainfall where fire is relatively frequent, can re-sprout from a lignotuberous root-stock." [No evidence]

801	Prolific seed production (>1000/m ²)	n
	Source(s)	Notes
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	[Production or densities unknown] " <i>Beaufortia</i> has serotinous fruits that release seeds after fire (Lamont et al. 1991). Most species regenerate only from seed; however, <i>B. macrostemon</i> Lindl. and <i>B. sparsa</i> , both with distributions in areas of high rainfall where fire is relatively frequent, can re-sprout from a lignotuberous root-stock."
	Australian Native Plant Society. (2020). <i>Beaufortia sparsa</i> . http://anpsa.org.au/b-spa.html . [Accessed 15 May 2020]	[Unknown] "Following flowering, seeds develop in woody capsules similar to those formed with <i>Melaleuca</i> species. The seeds are retained within the capsules indefinitely."

Qsn #	Question	Answer
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 15 May 2020]	"Storage Behaviour: No data available for species. Of 7 known taxa of genus <i>Beaufortia</i> , 100.00% Orthodox(p/?)"
	Australian Native Plant Society. (2020). <i>Beaufortia sparsa</i> . http://anpsa.org.au/b-spa.html . [Accessed 15 May 2020]	[Soil seed longevity unknown, but seeds may be retained for a long period of time on plants] "Following flowering, seeds develop in woody capsules similar to those formed with <i>Melaleuca</i> species. The seeds are retained within the capsules indefinitely."

803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	No information on herbicide efficacy and chemical control of this species. However, methods to control the invasive <i>Melaleuca quinquenervia</i> may be effective in controlling <i>Beaufortia sparsa</i> if required

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	Notes
	Burbidge, A. A. (2016). A taxonomic revision of <i>Beaufortia</i> (Myrtaceae: Melaleuceae). <i>Nuytsia</i> , 27: 165-202	"Response to fire. <i>Beaufortia</i> has serotinous fruits that release seeds after fire (Lamont et al. 1991). Most species regenerate only from seed; however, <i>B. macrostemon</i> Lindl. and <i>B. sparsa</i> , both with distributions in areas of high rainfall where fire is relatively frequent, can re-sprout from a lignotuberous root-stock."
	Wardell-Johnson, G., Luxton, S., Craig, K., Brown, V., Evans, N., & Kennedy, S. (2017). Implications of floristic patterns, and changes in stand structure following a large-scale, intense fire across forested ecosystems in southwestern Australia's high-rainfall zone. <i>Pacific Conservation Biology</i> , 23(4), 399-412	[Apparently a resprouter, able to recover from fire with lignotuber/epicormic buds] "Appendix 2. Frequency of species records in 48 plots near Walpole, 18 months after an intense fire" [<i>Beaufortia sparsa</i> classified with Fire response traits = lignotuber/epicormic buds]

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes

Qsn #	Question	Answer
	<p>Morin, L., Aveyard, R., Lidbetter, J. R., & Wilson, P. G. (2012). Investigating the host-range of the rust fungus <i>Puccinia psidii</i> sensu lato across tribes of the family Myrtaceae present in Australia. <i>PLoS One</i>, 7(4): e35434</p>	<p>"The exotic rust fungus <i>Puccinia psidii</i> sensu lato was first detected in Australia in April 2010. This study aimed to determine the host-range potential of this accession of the rust by testing its pathogenicity on plants of 122 taxa, representative of the 15 tribes of the subfamily Myrtoideae in the family Myrtaceae. Each taxon was tested in two separate trials (unless indicated otherwise) that comprised up to five replicates per taxon and six replicates of a positive control (<i>Syzygium jambos</i>). No visible symptoms were observed on the following four taxa in either trial: <i>Eucalyptus grandis</i> camaldulensis, <i>E. moluccana</i>, <i>Lophostemon confertus</i> and <i>Sannantha angusta</i>. Only small chlorotic or necrotic flecks without any uredinia (rust fruiting bodies) were observed on inoculated leaves of seven other taxa (<i>Acca sellowiana</i>, <i>Corymbia calophylla</i> 'Rosea', <i>Lophostemon suaveolens</i>, <i>Psidium cattleianum</i>, <i>P. guajava</i> 'Hawaiian' and 'Indian', <i>Syzygium unipunctatum</i>). Fully-developed uredinia were observed on all replicates across both trials of 28 taxa from 8 tribes belonging to the following 17 genera: <i>Agonis</i>, <i>Austromyrtus</i>, <i>Beaufortia</i>, <i>Callistemon</i>, <i>Calothamnus</i>, <i>Chamelaucium</i>, <i>Darwinia</i>, <i>Eucalyptus</i>, <i>Gossia</i>, <i>Kunzea</i>, <i>Leptospermum</i>, <i>Melaleuca</i>, <i>Metrosideros</i>, <i>Syzygium</i>, <i>Thryptomene</i>, <i>Tristania</i>, <i>Verticordia</i>. In contrast, the remaining 83 taxa inoculated, including the majority of <i>Corymbia</i> and <i>Eucalyptus</i> species, developed a broad range of symptoms, often across the full spectrum, from fully-developed uredinia to no visible symptoms. These results were encouraging as they indicate that some levels of genetic resistance to the rust possibly exist in these taxa. Overall, our results indicated no apparent association between the presence or absence of disease symptoms and the phylogenetic relatedness of taxa. It is most likely that the majority of the thousands of Myrtaceae species found in Australia have the potential to become infected to some degree by the rust, although this wide host range may not be fully realized in the field."</p>
	<p>WRA Specialist. (2020). Personal Communication</p>	<p>Unknown. <i>Austropuccinia psidii</i> is present in the Hawaiian Islands, and may affect <i>Beaufortia sparsa</i>, as it does other Myrtaceae genera</p>

Summary of Risk Traits:

High Risk / Undesirable Traits

- Reproduces by seeds
- Possibly self-compatible
- Dispersed by water, and intentionally by humans (after serotinous capsules open following fire)
- Resprouts after fire

Low Risk Traits

- No reports of invasiveness or naturalization, but no evidence of widespread introduction outside native range
- Unarmed (no spines, thorns, or burrs)
- Non-toxic
- Not reported to spread vegetatively
- Reaches maturity in 3 ½+ years
- Serotinous capsules retain seeds until affected by fire; may limit ability to spread as long as fires are prevented or suppressed