

Taxon: Banksia quercifolia R.Br.	Family: Proteaceae
Common Name(s): oak-leaved Banksia	Synonym(s): Sirmuelleria quercifolia Kuntze

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 31 Oct 2016
WRA Score: -2.0	Designation: L	Rating: Low Risk

Keywords: Ornamental Shrub, Mediterranean Climate, Fire Prone, Serotinous, Wind 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)	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	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)	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	y=1, n=0	y
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	n

Qsn #	Question	Answer Option	Answer
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	y
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	y
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	y=1, n=-1	y
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)		
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	y
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	n
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
	Australian Biological Resources Study. (1999). Flora of Australia Volume 17B, Proteaceae 3, Hakea to Dryandra. CSIRO Publishing, Melbourne	[No evidence of domestication] "Occurs near the south coast of W.A. from Windy Harbour to Cheyne Beach, in sand, often peaty, in depressions and on swamp margins, in shrubland-sedge formations, sometimes in low woodland."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2016. 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 Biological Resources Study. (1999). Flora of Australia Volume 17B, Proteaceae 3, Hakea to Dryandra. CSIRO Publishing, Melbourne	"Occurs near the south coast of W.A. from Windy Harbour to Cheyne Beach, in sand, often peaty, in depressions and on swamp margins, in shrubland-sedge formations, sometimes in low woodland."
	Australian Native Plants Nursery. (2016). <i>Banksia quercifolia</i> . http://www.australianplants.com/plants.aspx?id=1202 . [Accessed 27 Oct 2016]	"Origin: Mediterranean Climate"

202	Quality of climate match data	High
	Source(s)	Notes
	Australian Biological Resources Study. (1999). Flora of Australia Volume 17B, Proteaceae 3, Hakea to Dryandra. CSIRO Publishing, Melbourne	

203	Broad climate suitability (environmental versatility)	n
	Source(s)	Notes

Qsn #	Question	Answer
	Australian Native Plant Society. (2008). <i>Banksia quercifolia</i> . http://anpsa.org.au/b-que.html . [Accessed 27 Oct 2016]	" <i>B. quercifolia</i> is suited to areas with a dry summer climate but is not widely cultivated. As it occurs in seasonally wet soils it may be more tolerant of poorly drained soils than many other banksias but is unlikely to survive in permanently wet conditions. In common with many other western banksias, it is difficult to maintain in areas of high summer humidity such as coastal areas of New South Wales and Queensland. It should be planted in full sun or partial shade. It is moderately frost hardy."
	Plant This. (2016). <i>Banksia quercifolia</i> . http://plantthis.com.au/plant-information.asp?gardener=9678 . [Accessed 27 Oct 2016]	"Hardiness zones: 9-10"

204	Native or naturalized in regions with tropical or subtropical climates	n
	Source(s)	Notes
	Australian Biological Resources Study. (1999). <i>Flora of Australia</i> Volume 17B, Proteaceae 3, <i>Hakea</i> to <i>Dryandra</i> . CSIRO Publishing, Melbourne	"Occurs near the south coast of W.A. from Windy Harbour to Cheyne Beach, in sand, often peaty, in depressions and on swamp margins, in shrubland-sedge formations, sometimes in low woodland."
	Australian Native Plants Nursery. (2016). <i>Banksia quercifolia</i> . http://www.australianplants.com/plants.aspx?id=1202 . [Accessed 27 Oct 2016]	"Origin: Mediterranean Climate"

205	Does the species have a history of repeated introductions outside its natural range?	n
	Source(s)	Notes
	Australian Native Plant Society. (2008). <i>Banksia quercifolia</i> . http://anpsa.org.au/b-que.html . [Accessed 27 Oct 2016]	" <i>B. quercifolia</i> is suited to areas with a dry summer climate but is not widely cultivated. "
	Moodley, D. (2013). Determinants of introduction and invasion success for Proteaceae. MSc Thesis. Stellenbosch University, Stellenbosch, South Africa	Introduced

301	Naturalized beyond native range	n
	Source(s)	Notes
	Moodley, D. (2013). Determinants of introduction and invasion success for Proteaceae. MSc Thesis. Stellenbosch University, Stellenbosch, South Africa	No evidence
	Randall, R.P. 2012. <i>A Global Compendium of Weeds</i> . 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence
	Wagner, W.L., Herbst, D.R. & Lorence, D.H. 2016. <i>Flora of the Hawaiian Islands</i> . Smithsonian Institution, Washington, D.C. http://botany.si.edu/ . [Accessed 30 Oct 2016]	To date, <i>Banksia integrifolia</i> is the only species naturalized in the Hawaiian Islands [East Maui]

302	Garden/amenity/disturbance weed	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

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

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	y
	Source(s)	Notes
	Williams, P.A. 2008. Biological Success and Weediness of Some Terrestrial Weeds Not Presently in the Northland Regional Council's RPMS. Landcare Research Contract Report: LC0708/079/. Landcare Research, New Zealand	"Coastal banksia (<i>Banksia integrifolia</i>) is a widespread coast weed in NZ. Not known as a weed elsewhere except in Western Australia where it has been introduced outside its native range and shades out native biota and competes with native species in vegetation succession."

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Australian Biological Resources Study. (1999). Flora of Australia Volume 17B, Proteaceae 3, Hakea to Dryandra. CSIRO Publishing, Melbourne	[No evidence] "Shrub to 3 m tall, without lignotuber. Bark smooth, greenish brown, becoming lightly tessellated and grey. Stems glabrous, red or reddish brown. Leaves thin; petiole 1–4 mm long; lamina undulate, narrowly cuneate, 3–15 cm long, 1–4 cm wide, truncate; margins not recurved, serrate; both surfaces glabrous except wool in pits in lower surface. Inflorescence –10 cm long; involucre bracts subulate, 5–10 mm long, glabrous with pubescent tips. Flowers yellow, orange or brown with rusty indumentum; styles cream. Perianth 23–27 mm long including limb of 3–3.5 mm and awn of 4–5 mm, pubescent outside, hirsute inside in upper half; awn downturned. Pistil 17–21 mm long, gently curved, stiff, glabrous; pollen presenter 0.8–1 mm long. Old flowers persistent. Follicles up to 35, broadly linear, undulate, 15–20 mm long, 1–15 mm high, 4–6 mm wide; valves semi-circular, slightly rugose, shortly pubescent. Seed obovate, 20–21 mm long; seed body cuneate, 8–9 mm long, 5–6 mm wide, somewhat ridged inside, ridged outside."

Qsn #	Question	Answer
402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown. No evidence

403	Parasitic	n
	Source(s)	Notes
	Australian Biological Resources Study. (1999). Flora of Australia Volume 17B, Proteaceae 3, Hakea to Dryandra. CSIRO Publishing, Melbourne	"Shrub to 3 m tall, without lignotuber." [Proteaceae. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown

405	Toxic to animals	n
	Source(s)	Notes
	Plant This. (2016). <i>Banksia quercifolia</i> . http://plantthis.com.au/plant-information.asp?gardener=9678 . [Accessed 27 Oct 2016]	"No hazards currently listed."
	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
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Dieback Working Group. (2000). Managing Phytophthora Dieback. Local Government Supervisors Association & Institute of Public Works Engineering Australia, WA Division	"Common Plants that are Susceptible to <i>Phytophthora cinnamomi</i> " [Includes <i>Banksia quercifolia</i>]

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Plant This. (2016). <i>Banksia quercifolia</i> . http://plantthis.com.au/plant-information.asp?gardener=9678 . [Accessed 27 Oct 2016]	"No hazards currently listed."
	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
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence

408	Creates a fire hazard in natural ecosystems	y
	Source(s)	Notes
	Cochrane, J. A., Hoyle, G. L., Yates, C. J., Wood, J., & Nicotra, A. B. (2015). Evidence of population variation in drought tolerance during seed germination in four <i>Banksia</i> (Proteaceae) species from Western Australia. <i>Australian Journal of Botany</i> , 62(6), 481-489	"The four species (<i>Banksia baxteri</i> , <i>B. coccinea</i> , <i>B. media</i> and <i>B. quercifolia</i>) are fire-killed and rely wholly on seeds for regeneration. Fires are highly seasonal in this region, with wildfires tending to increase from west to east (Barrett et al. 2009)."
	Burrows, N., & Middleton, T. (2016). Mechanisms enabling a fire sensitive plant to survive frequent fires in south-west Australian Eucalypt forests. <i>Fire Ecology</i> , 12(1), 26-40	[Forms thickets that burn. Younger thickets of seedlings are less flammable] "A fire sensitive plant, <i>Banksia quercifolia</i> R.Br., that often occurs as thickets embedded in forest landscapes in south-west Australia was exposed to repeated broad-scale fires at short intervals. Fire severity and patchiness was mapped using satellite imagery and the response of the <i>B. quercifolia</i> population monitored. Over the study period, the mean interval of fire in the landscape in which <i>B. quercifolia</i> occurred was 1.7 yr almost half the juvenile period of the species and the landscape fire frequency was six fires per decade. The population increased in response to episodes of fire escape and fire-caused mortality and consequent regeneration. Unlike surrounding vegetation, immature <i>B. quercifolia</i> thickets were not flammable under conditions of mild weather and moist fuels, so they burnt at a lower frequency than more flammable vegetation in the surrounding landscape, enabling the species to persist. When the thickets had developed sufficiently to burn, the plants had reached maturity and regenerated readily from seed. However, the juvenile period increased by 58 % following a period of 16 % below average rainfall, which has implications for fire management in a drying climate." ... "In the current study, with the exception of two plots that were affected by the localized build-up of eucalypt leaf litter, immature populations of <i>B. quercifolia</i> were not able to burn under mild weather and fire behaviour conditions."

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	Notes
	Australian Native Plants Nursery. (2016). <i>Banksia quercifolia</i> . http://www.australianplants.com/plants.aspx?id=1202 . [Accessed 27 Oct 2016]	"Exposure: Full Sun to Partial Shade"
	Australian Native Plant Society. (2008). <i>Banksia quercifolia</i> . http://anpsa.org.au/b-que.html . [Accessed 27 Oct 2016]	"It should be planted in full sun or partial shade."
	Plant This. (2016). <i>Banksia quercifolia</i> . http://plantthis.com.au/plant-information.asp?gardener=9678 . [Accessed 27 Oct 2016]	"Sunlight: hot overhead sun to dappled light"

Qsn #	Question	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	n
	Source(s)	Notes
	Australian Native Plant Society. (2008). <i>Banksia quercifolia</i> . http://anpsa.org.au/b-que.html . [Accessed 27 Oct 2016]	"As it occurs in seasonally wet soils it may be more tolerant of poorly drained soils than many other banksias but is unlikely to survive in permanently wet conditions."
	Plant This. (2016). <i>Banksia quercifolia</i> . http://plantthis.com.au/plant-information.asp?gardener=9678 . [Accessed 27 Oct 2016]	"Soil Moisture: dry for extended periods to usually boggy Soil: ordinary soil, enriched soil, mildly acidic to mildly alkaline"
	Australian Native Plants Nursery. (2016). <i>Banksia quercifolia</i> . http://www.australianplants.com/plants.aspx?id=1202 . [Accessed 27 Oct 2016]	"Soil: Well-drained to poorly drained soils"

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Australian Biological Resources Study. (1999). <i>Flora of Australia Volume 17B, Proteaceae 3, Hakea to Dryandra</i> . CSIRO Publishing, Melbourne	"Shrub to 3 m tall, without lignotuber. Bark smooth, greenish brown, becoming lightly tessellated and grey. Stems glabrous, red or reddish brown. Leaves thin; petiole 1–4 mm long; lamina undulate, narrowly cuneate, 3–15 cm long, 1–4 cm wide, truncate; margins not recurved, serrate; both surfaces glabrous except wool in pits in lower surface."

412	Forms dense thickets	y
	Source(s)	Notes
	Burrows, N., & Middleton, T. (2016). Mechanisms enabling a fire sensitive plant to survive frequent fires in south-west Australian Eucalypt forests. <i>Fire Ecology</i> , 12(1), 26-40	"A fire sensitive plant, <i>Banksia quercifolia</i> R.Br., that often occurs as thickets embedded in forest landscapes in south-west Australia was exposed to repeated broad-scale fires at short intervals." ... "Unlike surrounding vegetation, immature <i>B. quercifolia</i> thickets were not flammable under conditions of mild weather and moist fuels, so they burnt at a lower frequency than more flammable vegetation in the surrounding landscape, enabling the species to persist." ... "When the thickets had developed sufficiently to burn, the plants had reached maturity and regenerated readily from seed." ... " <i>B. quercifolia</i> commonly occurs as thickets or in clumps with little or no overstorey provided by other vegetation."

501	Aquatic	n
	Source(s)	Notes
	Australian Biological Resources Study. (1999). <i>Flora of Australia Volume 17B, Proteaceae 3, Hakea to Dryandra</i> . CSIRO Publishing, Melbourne	[Terrestrial shrub] "Occurs near the south coast of W.A. from Windy Harbour to Cheyne Beach, in sand, often peaty, in depressions and on swamp margins, in shrubland-sedge formations, sometimes in low woodland."

502	Grass	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Australian Biological Resources Study. (1999). Flora of Australia Volume 17B, Proteaceae 3, Hakea to Dryandra. CSIRO Publishing, Melbourne	Proteaceae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	Australian Biological Resources Study. (1999). Flora of Australia Volume 17B, Proteaceae 3, Hakea to Dryandra. CSIRO Publishing, Melbourne	Proteaceae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Australian Biological Resources Study. (1999). Flora of Australia Volume 17B, Proteaceae 3, Hakea to Dryandra. CSIRO Publishing, Melbourne	"Shrub to 3 m tall, without lignotuber."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Western Australian Herbarium (1998–2016). FloraBase—the Western Australian Flora. Department of Parks and Wildlife. https://florabase.dpaw.wa.gov.au/ . [Accessed 27 Oct 2016]	"Conservation Code: Not threatened"
	Australian Native Plant Society. (2008). <i>Banksia quercifolia</i> . http://anspa.org.au/b-que.html . [Accessed 27 Oct 2016]	"Conservation Status: Not currently listed as threatened under the EPBC Act*. Regarded as rare in the wild and classified as 2RC under the ROTAP * system."

602	Produces viable seed	y
	Source(s)	Notes
	Australian Biological Resources Study. (1999). Flora of Australia Volume 17B, Proteaceae 3, Hakea to Dryandra. CSIRO Publishing, Melbourne	"Seed obovate, 20–21 mm long; seed body cuneate, 8–9 mm long, 5–6 mm wide, somewhat ridged inside, ridged outside."
	Cochrane, J. A., Hoyle, G. L., Yates, C. J., Wood, J., & Nicotra, A. B. (2015). Evidence of population variation in drought tolerance during seed germination in four <i>Banksia</i> (Proteaceae) species from Western Australia. <i>Australian Journal of Botany</i> , 62(6), 481-489	"The four species (<i>Banksia baxteri</i> , <i>B. coccinea</i> , <i>B. media</i> and <i>B. quercifolia</i>) are fire-killed and rely wholly on seeds for regeneration." ... "Low- and medium rainfall populations of <i>B. baxteri</i> at 15°C and <i>B. quercifolia</i> at 10°C outperformed other populations at most moisture levels; at 15°C, all <i>B. quercifolia</i> populations germinated well (>80%), even at -1 MPa."

603	Hybridizes naturally	
	Source(s)	Notes

Qsn #	Question	Answer
	Renshaw, A. (2005). The reproductive biology of four <i>Banksia</i> L. f. species with contrasting life histories. PhD Dissertation. University of Western Sydney	[Unknown. Hybridization documented in genus] "George (1981) considered that significant differences in the morphology of flowers and/or fruits were necessary for species distinction. <i>Banksia cunninghamii</i> Sieber ex Reichb and <i>Banksia collina</i> R. Br. were reduced to varieties of <i>B. spinulosa</i> by George in 1981 for this reason. Four varieties of <i>Banksia spinulosa</i> are currently formally recognised (George, 1988). Varietal distinction is given to <i>Banksia spinulosa</i> var. <i>cunninghamii</i> because it is non-lignotuberos, the other three varieties are lignotuberos. <i>Banksia ericifolia</i> and <i>B. spinulosa</i> are closely related species belonging to the series <i>Spicigeræ</i> and several presumed hybrids have been reported (Table 7.2). Interestingly George (1981) noted that no intermediates between <i>B. spinulosa</i> var. <i>cunninghamii</i> and var. <i>spinulosa</i> (nonlignotuberos X lignotuberos) have been reported, even though they occur as mixed populations. Hybrids between <i>B. ericifolia</i> subsp. <i>ericifolia</i> and <i>B. spinulosa</i> var <i>spinulosa</i> have been reported (lignotuberos X nonlignotuberos). The possible link between hybridisation and the observed variation (resprouting <i>B. ericifolia</i>) will be discussed."

604	Self-compatible or apomictic	
	Source(s)	Notes
	Moodley, D. (2013). Determinants of introduction and invasion success for Proteaceae. MSc Thesis. Stellenbosch University, Stellenbosch, South Africa	[Unknown] "The five <i>Banksia</i> species that were assessed are self-compatible but four species have a significantly higher reproductive output when pollinators visit inflorescences." ... "Table S4. Raw data of all introduced, naturalized and invasive species and the fourteen traits that were measured." [<i>Banksia quercifolia</i> - Compatibility = NA]

605	Requires specialist pollinators	y
	Source(s)	Notes
	Australian Native Plant Society. (2008). <i>Banksia quercifolia</i> . http://anpsa.org.au/b-que.html . [Accessed 27 Oct 2016]	"Like all banksias, the flowers are attractive to honey-eating birds."
	Moodley, D. (2013). Determinants of introduction and invasion success for Proteaceae. MSc Thesis. Stellenbosch University, Stellenbosch, South Africa	"Table S4. Raw data of all introduced, naturalized and invasive species and the fourteen traits that were measured." [<i>Banksia quercifolia</i> - Bird-pollinated]

606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	Burrows, N. D., Wardell-Johnson, G., & Ward, B. (2008). Post-fire juvenile period of plants in south-west Australia forests and implications for fire management. <i>Journal of the Royal Society of Western Australia</i> , 91(2), 163-174	" <i>Banksia quercifolia</i> ... Post-fire regeneration strategy = depends on canopy-stored seed]
	Australian Native Plant Society. (2008). <i>Banksia quercifolia</i> . http://anpsa.org.au/b-que.html . [Accessed 31 Oct 2016]	"This species does not develop a lignotuber and is killed by fire. It relies on seed for regeneration."

607	Minimum generative time (years)	>3
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Qsn #	Question	Answer
	Source(s)	Notes
	Burrows, N. D., Wardell-Johnson, G., & Ward, B. (2008). Post-fire juvenile period of plants in south-west Australia forests and implications for fire management. <i>Journal of the Royal Society of Western Australia</i> , 91(2), 163-174	"Table 4 Shrubs and small trees species with known juvenile periods > 3 years. Habitat flammability rating takes account of seasonal moisture regime and fuel characteristics including quantity, structure and continuity." [Banksia quercifolia - Juvenile period (months) = 48]
	Burrows, N., & Middleton, T. (2016). Mechanisms enabling a fire sensitive plant to survive frequent fires in south-west Australian Eucalypt forests. <i>Fire Ecology</i> , 12(1), 26-40	"The juvenile period for <i>B. quercifolia</i> population in Surprise Forest that regenerated following the early autumn (March) wildfire in 2003 was 3.9 yr, and by ~5.9 yr post fire, about 90 % of the population had flowered and set fruit."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Australian Biological Resources Study. (1999). <i>Flora of Australia</i> Volume 17B, Proteaceae 3, Hakea to Dryandra. CSIRO Publishing, Melbourne	"Seed obovate, 20–21 mm long; seed body cuneate, 8–9 mm long, 5–6 mm wide, somewhat ridged inside, ridged outside." [Serotinous species. Seeds stored in canopy until released by fire. Seeds lack means of external attachment]

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Australian Native Plant Society. (2008). <i>Banksia quercifolia</i> . http://anpsa.org.au/b-que.html . [Accessed 31 Oct 2016]	" <i>B. quercifolia</i> is suited to areas with a dry summer climate but is not widely cultivated." [Yes, but limited]
	eBay. (2016). <i>Banksia quercifolia</i> seeds. http://www.ebay.com/ . [Accessed 31 Oct 2016]	Seeds sold online

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Australian Biological Resources Study. (1999). <i>Flora of Australia</i> Volume 17B, Proteaceae 3, Hakea to Dryandra. CSIRO Publishing, Melbourne	"Seed obovate, 20–21 mm long; seed body cuneate, 8–9 mm long, 5–6 mm wide, somewhat ridged inside, ridged outside." [No evidence. Serotinous species. Seeds stored in canopy until released by fire. Trees reach maturity in 4+ years]

704	Propagules adapted to wind dispersal	y
	Source(s)	Notes
	Moodley, D. (2013). Determinants of introduction and invasion success for Proteaceae. MSc Thesis. Stellenbosch University, Stellenbosch, South Africa	"Proteaceae are predominantly wind dispersed (Table S4)," ... "Table S4. <i>Banksia quercifolia</i> - Dispersal = Wind]

705	Propagules water dispersed	
	Source(s)	Notes

Qsn #	Question	Answer
	Burrows, N., & Middleton, T. (2016). Mechanisms enabling a fire sensitive plant to survive frequent fires in south-west Australian Eucalypt forests. <i>Fire Ecology</i> , 12(1), 26-40	[Possibly. Wind-dispersed seeds might be secondarily dispersed by water if growing near aquatic habitats] "B. quercifolia is a woody shrub that grows to a height of about 2.5 m. It occurs along the south coast and adjacent hinterland of southwest Western Australia and its preferred habitat is on the margins of swamps and in the often abrupt ecotone between seasonally wet and densely vegetated heathlands and open eucalypt forests."

706	Propagules bird dispersed	n
	Source(s)	Notes
	Moodley, D. (2013). Determinants of introduction and invasion success for Proteaceae. MSc Thesis. Stellenbosch University, Stellenbosch, South Africa	"Proteaceae are predominantly wind dispersed (Table S4)," ... "Table S4. <i>Banksia quercifolia</i> - Dispersal = Wind]
	Australian Biological Resources Study. (1999). Flora of Australia Volume 17B, Proteaceae 3, Hakea to Dryandra. CSIRO Publishing, Melbourne	"Seed obovate, 20–21 mm long; seed body cuneate, 8–9 mm long, 5–6 mm wide, somewhat ridged inside, ridged outside." [No evidence]

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Australian Biological Resources Study. (1999). Flora of Australia Volume 17B, Proteaceae 3, Hakea to Dryandra. CSIRO Publishing, Melbourne	"Seed obovate, 20–21 mm long; seed body cuneate, 8–9 mm long, 5–6 mm wide, somewhat ridged inside, ridged outside." [No evidence, & no means of external attachment]

708	Propagules survive passage through the gut	n
	Source(s)	Notes
	Moodley, D. (2013). Determinants of introduction and invasion success for Proteaceae. MSc Thesis. Stellenbosch University, Stellenbosch, South Africa	"Proteaceae are predominantly wind dispersed (Table S4), therefore small seed size is favourable." [Banksia quercifolia is identified as a wind-dispersed species. No evidence that seeds are consumed or internally dispersed]

801	Prolific seed production (>1000/m2)	n
	Source(s)	Notes
	Australian Biological Resources Study. (1999). Flora of Australia Volume 17B, Proteaceae 3, Hakea to Dryandra. CSIRO Publishing, Melbourne	"Shrub to 3 m tall, without lignotuber." ... "Seed obovate, 20–21 mm long; seed body cuneate, 8–9 mm long, 5–6 mm wide, somewhat ridged inside, ridged outside." [Seed densities unknown]

802	Evidence that a persistent propagule bank is formed (>1 yr)	y
	Source(s)	Notes
	Burrows, N., & Middleton, T. (2016). Mechanisms enabling a fire sensitive plant to survive frequent fires in south-west Australian Eucalypt forests. <i>Fire Ecology</i> , 12(1), 26-40	"B. quercifolia is a woody shrub that grows to a height of about 2.5 m." ... "It relies on canopy stored seed for regeneration and, typical of many Banksias, it is Serotinous (Lamont and Barker 1988, Lamont et al. 1991a)."

Qsn #	Question	Answer
	Burrows, N. D., Wardell-Johnson, G., & Ward, B. (2008). Post-fire juvenile period of plants in south-west Australia forests and implications for fire management. <i>Journal of the Royal Society of Western Australia</i> , 91(2), 163-174	"Table 4 Shrubs and small trees species with known juvenile periods > 3 years. Habitat flammability rating takes account of seasonal moisture regime and fuel characteristics including quantity, structure and continuity." [Banksia quercifolia - Post-fire regeneration = Stem girdling or 100% scorch kills, depends on canopy-stored seed]

803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown. No information on herbicide efficacy or chemical control of this species

804	Tolerates, or benefits from, mutilation, cultivation, or fire	n
	Source(s)	Notes
	Cochrane, J. A., Hoyle, G. L., Yates, C. J., Wood, J., & Nicotra, A. B. (2015). Evidence of population variation in drought tolerance during seed germination in four <i>Banksia</i> (Proteaceae) species from Western Australia. <i>Australian Journal of Botany</i> , 62(6), 481-489	"The four species (<i>Banksia baxteri</i> , <i>B. coccinea</i> , <i>B. media</i> and <i>B. quercifolia</i>) are fire-killed and rely wholly on seeds for regeneration."
	Australian Native Plant Society. (2008). <i>Banksia quercifolia</i> . http://anpsa.org.au/b-que.html . [Accessed 27 Oct 2016]	"This species does not develop a lignotuber and is killed by fire. It relies on seed for regeneration."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. 2016. Personal Communication	Unknown. No evidence from the Hawaiian Islands

Summary of Risk Traits:

High Risk / Undesirable Traits

- Other *Banksia* species have become invasive
- From fire prone ecosystems and may increase fire risk
- Reported to form thickets in native range
- Reproduces by seeds
- May reach reproductive maturity in 4+ years
- Seeds dispersed by wind & intentionally by people
- Forms canopy stored seed bank (serotiny)

Low Risk Traits

- No reports of invasiveness or naturalization, but limited evidence of widespread introduction outside native range
- Unarmed (no spines, thorns or burrs)
- Non-toxic
- Ornamental
- Not reported to spread vegetatively
- Seeds relatively large & unlikely to be inadvertently dispersed
- Does not tolerate fire or heavy pruning